A TAXONOMIC STUDY OF AFRICAN ALLODAPINE BEES (HYMENOPTERA, ANTHOPHORIDAE, CERATININI)

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ABSTRACT

The present paper is a taxonomic revision, with keys, descriptions, and illustrations, of the allodapine bees of Africa. A key to the genera of the world is included. The 267 names previously proposed for African forms are reduced to 96 species, including the following new ones: *Braunsapis pallida*, *ghanae*, *aureoscopa*; *Allodape australissima*, *skaifeorum*; and *Allodapula empeyi*. As they have been dealt with in other recent publications, the small genera *Nasutapis*, *Macrogalea*, and *Eucondylops* are here treated in summary form only.

INTRODUCTION

A study of the allodapine bees of Africa exclusive of Madagascar is presented herein. The allodapine bees constitute a section of the tribe Ceratinini of the subfamily Xylocopinae, family Anthophoridae, as these groups are defined by Michener (1965). The allodapine genera in Africa are *Allodape*, *Allodapula*, *Braunsapis*, *Compsomelissa*, *Eucondylops*, *Halterapis*, *Macrogalea*, and *Nasutapis*. Outside of Africa the additional genera *Exoneura*, *Exoneurella*, *Exoneuridia*, and *Inquilina* are found.

Distinctive Features of Allodapine Bees. Allodapine genera differ from other Ceratinini most noticeably in the presence of only two submarginal cells. All other genera have three. Other allodapine group characters (see fig. 1) are the: (1) relatively soft integument; (2) somewhat flattened dorsum of the last three metasomal terga (except in *Eucondylops*), with at least some blunt, often thickened rather short hairs that slope posteriorly and bend in the same direction so that their apices are usually almost parallel to the tergal surfaces; (3) absence of basitibial plates or indication of them only by a carina demarking the posterior side of a small basal plate, the distal end of the carina slightly elevated and marking the presumptive distal end of the plate which is not over one-sixth as long as the tibia or (in Australian forms) a more complete plate of the same small size; (4) pointed or narrowly rounded apex of the marginal cell, the apex usually being on or close to the wing margin; (5) dull, minutely and uniformly roughened dorsal surface of the propodeum, which is much longer than the metanotum; and (6) position of the tentorial pits usually at or below the middle of the clypeus because of the upward extension of the upper portion of the clypeus so that the subantennal sutures are rarely longer than the diameter of an antennal socket (*Eucondylops* is an exception).

Among the distinctive features of the apex of the male metasoma are the following: (a) the short, broad, roundly truncate to feebly emarginate apex of the seventh tergum with a subapical fringe of long hairs that are longest and curved medially at the sides; (b) the large membranous roof of the genital chamber, i.e., the area between the elongate lateral sclerites of the eighth metasomal tergum. This area is generally biconvex as seen from above when the metasoma is dissected, but of course is biconcave from the ventral, external viewpoint. The concavity contains the genitalia and is provided with spicules which are numerous, long, and hairlike in most species. The membrane is usually wrinkled so that the convexities appear brainlike. The relationship of this structure to adjacent sclerites in shown in figure 2; the lower (lateral) extremities of the sclerotic parts of this tergum are attached to the adjacent and fused lateral extremities of sterna 7 and 8.

Of the numerous morphological features listed above several, such as (2) and (6) and most of the characters of male terminalia, are noteworthy specializations not of a reductional nature and hence not likely to be parallelisms. The allodapines therefore are almost certainly a monophyletic group. It would not be unreasonable to accord them tribal rank as the Allodapini.

Biologically the group is also distinctive, for larvae are not placed in separate cells and in most genera are fed progressively. Nests are usually in hollow or pithy stems or twigs. An interesting feature is the long life cycle. Larvae grow slowly and adults, even males, survive for long periods.

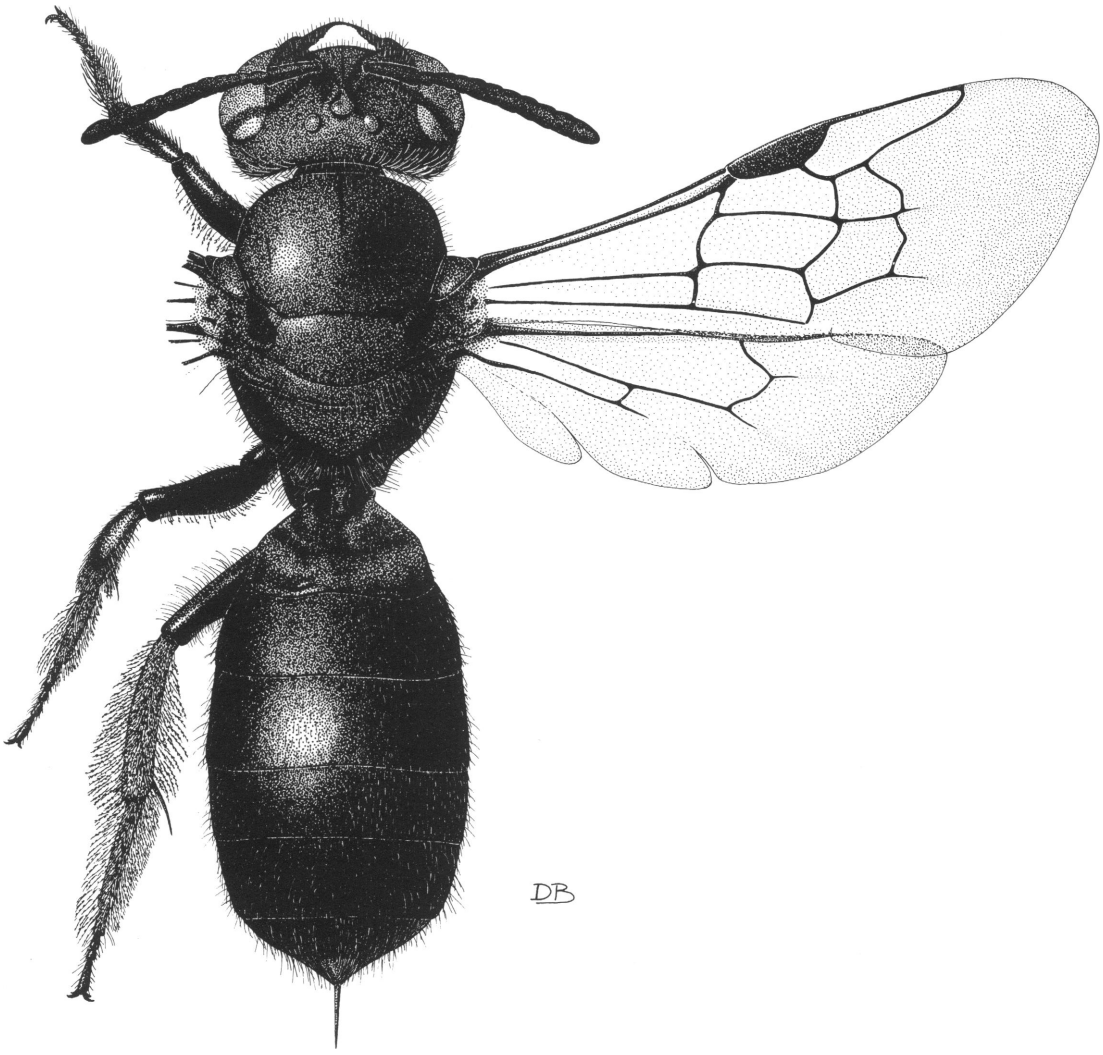

FIG. 1. *Braunsapis facialis*, female. (Drawing by Denis J. Brothers.)

Details of nests, life cycles, and of caste and social behavior are given by Michener (1971a).

Objectives of This Study. A principal objective of a year of field work in Africa (1966-1967) was to study the biologies, especially the social organization, of allodapine bees. The results of this study have been published (Michener, 1968; 1970a; 1970b; 1971a). To determine appropriate names for the various species, an extensive taxonomic examination of allodapine bees of Africa was undertaken.

No less than 267 specific or other trivial names have been applied to African species of the genus. The species were difficult or impossible to recognize from the descriptions, and examination of types plus study of variation of long series of specimens showed a vast amount of synonymy. Most authors seem to have operated on the principle, "If it is from Africa it is probably undescribed; name it!" Since many species are widespread and highly variable, this tendency has resulted in much seemingly duplicate naming.

Only 96 species including a number of new ones are here listed as presumably valid.

The many specific names have hitherto scarcely been organized into groups except that the genera *Eucondylops* and *Macrogalea* have been recognized. The remaining African species have either all been placed in *Allodape* or divided between two generic names, *Allodape* and *Allodapula*, in an unsatisfactory and unnatural way. Within these two groups little or no indication of relationships among species has been provided. The description of a new species often compared it to a distant species, sometimes one now known to be in a different genus, while ignoring its close relationship to, or specific identity with, another form, sometimes described a few pages away in the same work.

A major objective, therefore, has been to group the named kinds into natural units for comparative use in conjunction with the biological data. A preliminary step was taken in a generic classification of African allodapines (Michener, 1969a). The species as I have recognized them are phenetic units. Some are excessively similar; in this sense I have tended to split rather than lump. Others, however, as indicated in the species accounts, are highly variable and probably composite. Further biological studies, perhaps especially of *Braunsapis facialis*, are likely to show that two or three or more sym-

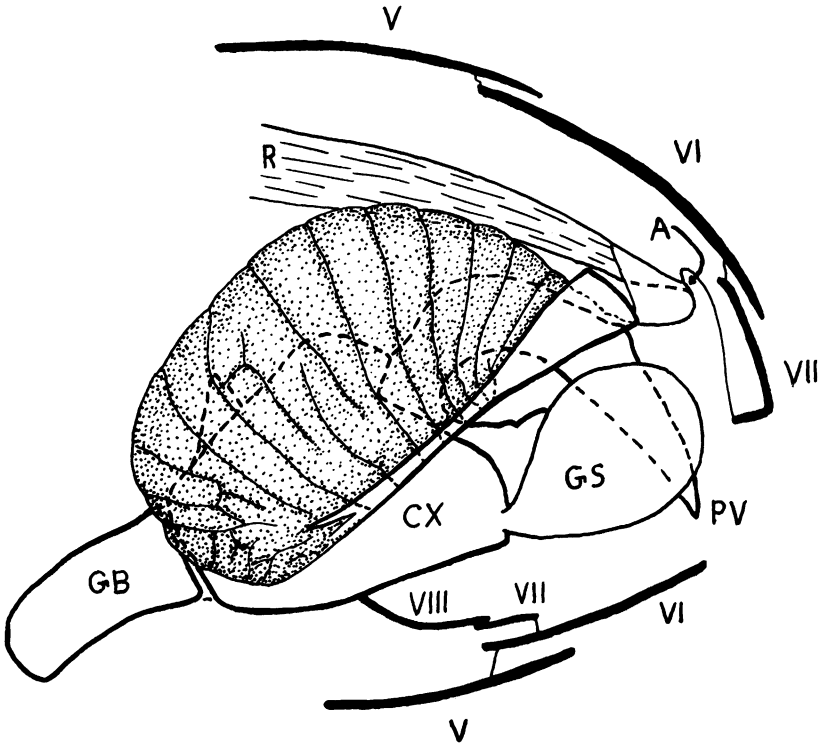

FIG. 2. Diagram of longitudinal dissection of apex of metasoma of male *Allodape stellarum*. Terga and sterna, numbered with Roman numerals (first metasomal tergum as I), are shown in sagittal section. Stippled area represents elaborated and wrinkled membranous roof of genital chamber, probably derived from eighth tergum, and is margined posteriorly on each side by sclerotized lateral rods of eighth tergum, whose upper ends are connected by membrane above anus.

Abbreviations: A, anus; CX, gonocoxite; GB, gonobase; GS, gonostylus; PV, penis valve; R, rectum.

patric species exist. I cannot now sort them out and relate them to names, although certain differences among larvae, still not adequately studied, may be useful. In *B. fasciata* geographical differences among larvae suggest either two species or geographical variation of one species. Papers on the larvae will be prepared later. The time is premature for the detailed application of biological species concepts.

The classification and synonymies must be taken as hypotheses based on examination of limited numbers of adult characters (although all that I could find) and interpretations of intraspecific variation often based on samples smaller than one would like to have. At least I believe that present understanding is greatly improved over that of the past. Although some of the synonymy will probably prove false and some forms here left as distinct will probably be found to be synonyms, at least similar forms are placed close together so that they can be considered jointly in future work.

The larvae of allodapines have the most striking characters of any bee larvae. Indeed the genera differ in features that would doubtless place them in several different families if bees were known only from larvae. Another objective of the present study is therefore to provide a basis for a comparative systematic study to be prepared later, in which adult taxonomy will be compared with larval taxonomy. In the present paper larval characters are scarcely mentioned except at the generic level although larval characters have been evaluated in reaching certain decisions.

An account of the relationships among the genera and species, based on adult characters as well as on characters of the immature stages, will be presented in a later paper. Evolutionary material is therefore excluded from the present paper.

Nomenclatural Problems. African allodapine bees have been plagued by a curious set of nomenclatural problems, quite aside from the excessive number of synonyms described. This is related to the excellent work of the late Dr. H. Brauns of Willowmore, Cape Province. He was the first to investigate the biology of these bees and to collect and recognize local species. Moreover, he gave them manuscript names and planned a large work on these bees which unfortunately was never written. He appears to have avoided use of his manuscript names in print. Thus when he described the parasite *Eucondylops* (Brauns, 1902), he did not use the specific names of the host allodapines.

Unfortunately, however, he sent specimens labeled with his manuscript names to European authors. Friese (1909) used one of Brauns's names, giving characters for its recognition; later (1914a) he listed other Brauns names, without characters. Strand (1915) briefly characterized several more Brauns species. Friese (1924) described a whole series of Brauns's species, including those which he (1909) and Strand (1915) had briefly treated. Although these authors credited the names to "Brauns i.l." or "Br. i.l.," the comments and descriptions are clearly their own, not Brauns's, and the names must be attributed to them. Moreover, Friese in 1924 considered that he was describing the species as new, even though specimens were often the same as those on which he and Strand had based earlier descriptive comments. Finally Brauns himself (1926) described a few of the same species as new, using the same names but different specimens for types.

The result is that some names were treated as new three times. For example, *Allodape hirsuta* (= *punctata*) was briefly characterized by Strand (1915) and described as new by Friese (1924) using the same material as that seen by Strand. The type for both characterizations is the same specimen in the Berlin Museum. The species was again described as new under the same name by Brauns (1926). His type is in the Transvaal Museum. Friese's and Brauns's names are synonyms as well as homonyms of Strand's. The details of each case are shown in the annotated synonymies of the various species.

The potentiality for similar problems arose when Michener, 1970a, was published before 1971a. The new names that appeared first in 1970 were *nomina nuda* and were validated the following year. I have not cited these *nomina nuda* in the synonymies below except in two cases where a further explanation seemed desirable.

Distribution. Allodapine bees are restricted to Old World tropical and austral regions, with *Exo-*

neuridia ranging into the north temperate zone in Asia Minor. Table 1 shows the distributions of the various genera.

The table demonstrates the richness of the African fauna. In that continent they are among the commonest bees, and several genera may be found nesting in the dead twigs of a single tree or in dead stems in a single field (Michener, 1970a).

A wide variety of distributional patterns can be found among African allodapine species, as follows:

1. Cape macchia and sometimes adjacent karoo vegetation from the Cape region eastward to the vicinity of Grahamstown, South Africa. Examples are *Braunsapis elizabethana, acuticauda, paradoxa*; *Allodape ceratinoides, panurgoides, tridentipes, friesei, pictifrons, quadrilineata, punctata, mucronata*; *Allodapula acutigera, melanopus, ornaticeps, xerica* and allies; and *Halterapis angustula.*

2. Cape macchia and often adjacent desertic (karoo) areas eastward to Natal and commonly also to Mozambique and Rhodesia. Examples are *Allodape rufogastra, exoloma*; *Allodapula dichroa, variegata*; and *Halterapis nigrinervis* group.

3. Eastern subtropical–Natal, Mozambique, Malawi, Rhodesia, sometimes to eastern Cape Province. Examples are *Braunsapis rhodesi, draconis*; *Allodape stellarum, pernix*; and *Compsomelissa zaxantha.*

4. Widespread southern African, excluding the Cape macchia, but sometimes including the xeric areas like Namaqualand, some karoo areas, parts of South West Africa, eastward to Rhodesia and Natal, and even Malawi. Examples are *Braunsapis vitrea, fuscinervis, otavica*, and *albipennis.*

5. Widespread tropical and subtropical, often ranging from Senegal to Ethiopia southward to Angola or South West Africa, Natal, and even eastern Cape Province. Examples are *Braunsapis facialis, bouyssoui, leptozonia*, and *foveata.*

6. Equatorial–similar to 5 but not extending into the subtropical parts of southern Africa and often limited to the equatorial region proper. Examples are *Braunsapis gorillarum, simplicipes, rolini*, and *luapulana.*

7. Humid tropical, ranging through tropical west Africa east to Uganda and sometimes localized areas of Tanzania, but absent from the largely upland and savanna regions of east Africa. Examples are *Braunsapis lyrata*; *Allodape brachycephala, derufata, mea, dapa, nula, interrupta, collaris, macula*, and *laeviceps.*

8. Equatorial east African. Examples are *Braunsapis trochanterata* and *Macrogalea candida* (but extending to South West Africa).

Many species, especially in the tropics, are too little known to be placed in one or another of these categories. Hence many species are omitted from the above lists.

The lists of species associated with the distributional patterns recognized above give an accurate idea of the richness of the South African fauna (distributional patterns 1-4). More extensive collecting would considerably enlarge the list of species found in humid tropical areas (patterns 5-7), where the real diversity is probably at least equal to that of the Cape region. There are few species in the desert areas and grasslands. (There is not a single record from the Orange Free State.) Relative to the Cape region and the moist tropics, the east African savanna region has few species although some localities have interesting assemblages.

Parasitic Allodapines. As explained by Michener (1970b), some allodapines are social parasites in nests of others. Some parasitic species are very similar to their hosts and not regarded as generically distinct. Genera containing such species are marked with daggers in table 1. Other parasites are more different from their hosts and are considered as generically distinct. Such genera are marked by asterisks in table 1. Each of the parasitic genera is believed to have arisen from the genus before it in the list.

Parasitism has arisen once for each genus marked by asterisks or daggers in table 1, except for *Braunsapis*, in which it must have arisen several times. Not surprisingly, there is considerable parallelism among the parasitic forms, as described by Michener (1970b).

The relations of the parasites to their hosts is similar to that of *Psithyrus* to *Bombus* (Michener, 1971a). The female parasite is believed to destroy the eggs of the host while replacing them with her own eggs. The parasite becomes in effect the queen of a tiny colony. The larvae of the parasite are fed by the adults of the host. Females of parasitic species mostly lack the pollen collecting scopa and in the more highly evolved species the parasites have shortened mouthparts and are never seen on flowers. Such

TABLE 1
Distribution of the Allodapine Genera[a]

†*Braunsapis*	Subsaharan Africa, Madagascar, Southern Asia to Formosa, Philippines, Indonesia, Solomon Islands, northern half of Australia
**Nasutapis*	Natal (South Africa)
†*Allodape*	Subsaharan Africa
Halterapis	South Africa, Rhodesia
Compsomelissa	Subsaharan Africa, Arabian Peninsula
Exoneura	Australia, Tasmania
**Inquilina*	Eastern Australia
Exoneurella	Eastern Australia
Exoneuridia	Asia Minor
†*Allodapula*	South Africa to Tanzania
**Eucondylops*	South Africa
†*Macrogalea*	Tropical Africa, Madagascar

[a]For explanation of asterisks and daggers, see section on Parasitic Allodapines.

adults, too, must feed only in nests on food brought in by the hosts. Parasitic species are unknown as enemies of the more or less completely solitary allodapines; probably parasites of this type can only evolve in association with social forms where there is a queen to be replaced.

MATERIALS AND METHODS

Sources of material. Museums that have lent important material or that contain type specimens, together with such abbreviations as are used in the synonymies and elsewhere, are the following:

AMNH, the American Museum of Natural History, New York
Berlin, Museum für Naturkunde der Humboldt-Universität, Berlin
BM, British Museum (Natural History), London
Bruxelles, Institut Royal des Sciences Naturelles de Belgique, Brussels
CAS, California Academy of Sciences, San Francisco
DEI, Deutsches Entomologisches Institut, Eberswalde bei Berlin
Durban, Durban Museum and Art Gallery, Durban, Natal
Genoa, Museo Civico di Storia Naturale "Giacomo Doria," Genoa
Grahamstown, Albany Museum, Grahamstown, Cape Province
KU, Snow Entomological Museum, University of Kansas, Lawrence (includes most of the results of my own collecting in Africa)
NMNH, National Museum of Natural History, Smithsonian Institution, Washington
Paris, Muséum National d'Histoire Naturelle, Paris
Pretoria, Transvaal Museum, Pretoria
SAM, South African Museum, Cape Town
Tervuren, Musée Royal de l'Afrique Centrale, Tervuren, Belgium

Mr. H. N. Empey of Highlands North, near Johannesburg, South Africa has generously lent important material from his collection.

Methods. As shown above, the present study was not undertaken as an end in itself but as a basis for biological and behavioral investigations, studies of larval characters, and the like. It is therefore somewhat different from, more abbreviated than, a typical taxonomic study planned without such objectives. To save space many of the descriptions are brief, heavy weight being placed on comparisons with other descriptions in this paper. Thus the number of characters used in any one species group is often reduced. The numbering of the characters, however, facilitates comparing descriptions so that a full list of characters can be obtained. Certain species that are little known to me are not treated in a style parallel to the rest, since it seemed best to present what is possible to say about these species in the simplest form, without trying to force it into the standard pattern.

The description of the female of a species always precedes that of the male, partly because females, being long-lived, are more common than males and therefore known for more species. Nonetheless, when males provide the best characters, I have made males the holotypes of certain new species.

Species of the genera *Nasutapis*, *Eucondylops*, and *Macrogalea* are treated very briefly since they were all described and illustrated in recent publications (Michener, 1970b, 1971b).

The numbering of variables or structures allows ready comparison among species and also provides for ready access to an explanatory list of the variables used, found in the following subsection.

To save space, many descriptions are comparative, using expressions such as "similar to" or "as in." In all cases these mean "as in the description of." It is agreement with the description, not with unmentioned or unknown attributes, that is intended. In many descriptions certain characters are italicized. Such characters are unique to the species or are found in only one or two other species; the alternative feature, if it is obvious, is not mentioned in each of the other descriptions.

Distributional data are provided only briefly. Since all allodapines can be taken as adults either on the wing or in nests in twigs, usually both, at all seasons of the year, dates of collection are entirely omitted except for types of new species. Because of the large increase in space that would be required if collectors' names were to be included, they too are omitted. This is unfortunate, for collectors have been essential in assembling the materials used in this study, but brevity seemed more important.

Genitalia and mouthparts were mostly examined in glycerine after treatment in cold KOH and acidulation with acetic acid. Drawings were made from such preparations, not flattened on slides.

The photographic illustrations are all to the same scale: 5 cm. on the figures = 3.4 mm.

Synonymies usually list only the original citation for each name although occasionally a taxonomically important secondary reference is shown. The synonymies are annotated to show the type locality and location of the type for each name, together with designations of lectotypes and any such material needed. Except as otherwise stated, all types have been seen by me. Some have not been available, however, for direct comparison. And some were seen early in the study before I was aware of certain taxonomic problems. In most such cases types have been re-examined.

Characters. As indicated above, the features or structures that vary among species have been numbered for ready comparison of the species. The numbers usually do not represent characters in the sense of numerical taxonomists, but groups of such characters. Thus (1) represents both body length and forewing length, each of which is a variable, i.e., a character in the numerical taxonomic sense. Below is a list of numbered items in the descriptions, with explanations as needed. Numbers 1 to 57 are for females, 1m to 57m and 58 to 65 are for males, except that 49, and 54 to 56 are strictly female features with no equivalents in males. The numbers 49m and 54m to 56m are therefore omitted in descriptions of males. The same is usually true for 52m, so that it is omitted except in descriptions of males of certain species of *Braunsapis.* The terminology is that of Michener (1944, 1965) except as indicated.

(1) Body length. Measured with calipers or ruler held beside body. Because of variation due to positions of head and metasoma and telescoping of metasoma, reliability is low. Measurements are mostly accurate only to nearest 0.5 mm. Forewing length. Measured as above or with eyepiece micrometer, from wing tip to base of veins C and R, that is, approximately to the apex of median axillary sclerite.

(2) Body color. Background color, indicated separately for various major parts if necessary.

(3) Clypeal color. As for 4 to 12, color is given only when different from the ground color.

(4) Lateral face marks. Yellow or whitish parts of paraocular areas.

(5) Posterior orbital marks. Yellow or whitish parts of genal areas, along posterior margins of eyes.

(6) Color of labrum and of mandible.

(7) Color of antennal scape.

(8) Color of pronotal collar (posterior dorsal portion of pronotum) and of pronotal lobes.

(9) Color of tegula and of axillary sclerites, especially median axillary sclerite.

(10) Color of mesothorax (scutum, scutellum, mesepisternum) and metathorax (metanotum, metepisternum).

(11) Color of legs including tibial spurs.

(12) Color of metasoma.

(13) Color of wings, wing veins, and stigma.

(14) Color of pubescence, including scopa; color and size of tibial brush. The tibial brush is area of dense, usually thickened hairs on the outer surface of hind tibia in *Allodape.* It is not the entire scopa. Form of hairs of terga 4 to 6.

(15) Clypeal structure.

(16) Clypeal punctation and pubescence.

(17) Strength and length of lateroclypeal carina. This is an arcuate carina at side of lower part of clypeus extending from lower lateral clypeal angle upward toward the anterior tentorial pit. The lower part of the carina is clypeal in origin, the upper part paraocular.

(18) Head shape as seen from front, as indicated by relationship between maximum interocular distance and eye length (estimated).

(19) Position of antennal bases as indicated by their level on face and relation between interantennal and antennocular distances. Both these distances are estimated to the carina margining antennal sockets.

(20) Features of vertex. In facial view the summit of the vertex is visible above and beyond the ocelli; it varies from convex to concave. The interocellar distance (distance between posterior ocelli) is estimated in relation to the ocellocular distance. Both are measured to the margin of a posterior ocellus. The more or less horizontal area behind the posterior ocelli varies in width but measurements are suspect because the horizontal vertex usually curves gradually down to the more or less vertical occiput, with no clear landmark to facilitate measurements. The ocelloccipital distance given is therefore an estimate of the distance from the posterior margin of the ocellus rearward to a point where the surface becomes as near vertical as horizontal.

(21) Presence of preoccipital carina.

(22) Structure of frons. The frontal tubercle is the small tubercle often present between the antennae at the lower end of the frontal line.

(23) Extent and upper demarcation of antennal depression. This is the large, shallow depression in which each antenna arises, usually delimited above only by gentle, rounded contours of the head.

(24) Comparison of size and form of antennocellar triangle with ocellar triangle. The former is formed by centers of the median ocellus and the antennal sockets, the latter by centers of all three ocelli.

(25) Form of upper clypeal margin. This is the summit of the clypeus, i.e., the epistomal suture between the lower ends of the subantennal sutures.

(26) Length of upper clypeal margin (see 25) compared with width of paraocular area at level of upper end of clypeus.

(27) Clypeoantennal distance, i.e., length of subantennal suture in relation to diameter of antennal socket. Both measurements are estimated to summit of carina surrounding socket.

(28) Level of centers of anterior tentorial pits in relation to upper and lower clypeal margins.

(29) Relation of clypeocular distances to greatest width of scape. The upper clypeocular distance is minimum such distance above the tentorial pit. The lower clypeocular distance is minimum distance from lateroclypeal carina (see 17) to eye margin.

(30) Relative positions of mandibular and ocular axes. The former is line from apex of mandible to middle of base. The latter is line representing maximum length of eye.

(31) Shape and breadth of genal area. Its width is estimated, as is that of the eye, in direct side view. The head is not moved to maximize the width.

(32) Shape of eye. Unlike 31, the head is moved to maximize width and length; the view is therefore from an anterolateral direction.

(33) Length of malar area in relation to maximum width of scape. The length of the malar area is the minimum distance between the lower end of the eye and the base of the mandible. It is in front of the middle of the mandibular base.

(34) Surface convexity and shape of labrum.

(35) Convexity of hypostomal area.

(36) Relation of length to maximum width of scape. Length is exclusive of the basal bulb. Both measurements were estimated.

(37) Flagellar structure. The length of the first segment is estimated on the shortest (ventral) side. Lengths and widths of other segments are also estimated in ventral view.

(38) Distance across mandible at apex, i.e., length of toothed apical margin.

(39) Number of mandibular teeth.

(40) Shapes of submentum, mentum, and prementum.

(41) Labial palpus.

(42) Maxillary palpus and galea. Galeal width is maximal, estimated slightly distal to base of palpus.

(43) Stigma and marginal cell. The measurement from apex of cell to wing tip is a straight line, not a measurement around the wing margin.

(44) Apex of marginal cell. The apex of this cell is usually slightly bent away from the wing margin. Measurement of its distance from the margin is based on the width of the unthickened wing membrane between the apex of the cell and the wing margin, i.e., from costal margin of the vein, not from the middle.

(45) Submarginal cells and recurrent veins.

(46) Basal vein and cu-v of forewing.

(47) Length of jugal lobe of hind wing.

(48) Number of hamuli and shape of hamular sinus. The latter is between the costal margin of the hind wing and vein Rs. Its width is at level of vein r-m; its depth is from the base to the level of vein r-m.

(49) Curvature of hairs of fore basitarsus (female only).

(50) Tibial brush and apical tibial spines. Apical tibial spines are on the outer sides of the apices of fore and mid tibiae; they are not the movable tibial spurs.

(51) Leg thickness and spine of front coxa. The spine, when present, is a thick, hairy projection from the inner distal part of the front coxa. Form of front tarsus in rare cases where it is unusual in females.

(52) Basitibial plate.

(53) Size of arolia.

(54) Development of scopa and of brush at base of mid-femur and apex of mid-trochanter (female only).

(55) Form of sixth tergum (female only).

(56) Form of posterior lateral margins of sixth tergum (female only).

(57) Posterior extensions of tergal graduli.

(58) Form of front tarsus (male only).

(59) Form of hind trochanter and femur, and peculiarities of hind tibia in rare cases where it shows unusual features (male only).

(60) Peculiarities of tergal margins, including sixth tergum; shape and wrinkling of membranous convexities of eighth tergum, i.e., roof of genital chamber (male only).

(61) Shapes and setae of joined seventh and eighth terga (male only).

(62) Shape of gonobase (male only).

(63) Form and setae of gonocoxite (male only).

(64) Form and setae of gonostylus (male only).

(65) Form and setae of penis valve (male only).

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KEY TO THE GENERA OF ALLODAPINE BEES OF THE WORLD

1. Rather robust bees with hairy head and thorax, females with transverse fasciae of short, appressed plumose hairs on terga 2-5; stigma slender, basal part parallel-sided; prestigma about as long as distance from base of stigma to base of vein r; jugal lobe of hind wing enormous, almost as long as vannal lobe . . . . . *Macrogalea*

   Slender, inconspicuously hairy bees without metasomal fasciae of plumose hairs; stigma broad, not parallel-sided; prestigma usually half as long as distance from base of stigma to base of vein r; jugal lobe of ordinary size, extending little if any beyond vein cu-v except in *Braunsapis trochanterata* 2

2. Labial palpus with last two segments similar to preceding ones and not divergent; maxillary palpus 3-4 segmented; frons or apex of clypeus with projection 3

   Labial palpus with last two segments much shorter than preceding segments and usually diverging from axis of those segments; maxillary palpus 5-6 segmented; apex of clypeus and frons without projections 4

3. Second recurrent vein absent; facial projection on frons, bilobed or paired . . . . . *Eucondylops*

   Second recurrent vein present; facial projection on apex of clypeus, snoutlike, not bilobed or paired . . . . . *Nasutapis*

4. Second recurrent vein absent 5

   Second recurrent vein present 9

5. Anterior margin of pronotum with sharp angle at level of base of fore coxa; mandible of female bidentate; face of female broadly concave; scopa reduced (Australia) . . . . . *Inquilina*

   Anterior margin of pronotum not so angulate; mandible of female tridentate; face not excavated; scopa present in female . 6

6. Malar space (female) nearly as long as broad; anterior basitarsus (female) much shorter than remaining tarsal segments together, with long hairs, wavy apically, on outer surface, some of them twice as long as basitarsus; terga 5 and 6 of female each with sharp, lateral lamella or strong carina (no males available) (Asia Minor) . . . . . *Exoneuridia*

   Malar space much wider than long; anterior basitarsus little if any shorter than remaining tarsal segments and without very long hairs, terga 5 and 6 without lateral lamellate carinae, at most 5 with lateral part of gradulus as on preceding terga . . 7

7. Maxillary palpus 5-segmented; thorax and abdomen without yellow or white markings except sometimes on posterior lobe of pronotum, tegula, and axillary sclerites (Australia) 8

   Maxillary palpus 6-segmented; thorax and metasoma with yellow or white markings (Africa, Arabian Peninsula) . . . . . *Compsomelissa*

8. Costal margin of second submarginal cell short, often less than half as long as first transverse cubital vein; basitibial plate not indicated; sixth metasomal tergum of female with apex strongly produced, upturned, bidentate, not at all hidden by pubescence . . . . . *Exoneurella*

   Costal margin of second submarginal cell usually almost as long as first transverse cubital vein; basitibial plate of female usually indicated by carina strongly raised across apex of plate; sixth metasomal

tergum of female with apex little produced, not or weakly upturned, not or minutely bidentate, and usually hidden by pubescence denser at apex of tergum than elsewhere . . . . . *Exoneura*

9. Sixth tergum of female with lateral parts bent under rather abruptly, usually a rather abrupt change in vestiture along this bend, dorsal part of tergum rather flat or even concave (*Halterapis nigrinervis* shows these features only weakly); apex of sixth tergum of female without minute median apical pygidial plate or plate completely covered by hairs; gonostyli of male much reduced or slender, if thin and flattened, then more than three times as long as broad 10

Sixth tergum of female with lateral parts bent under in a broadly rounded way (i.e., in transverse section bend would be broad), change in vestiture at bend gradual, dorsal part of tergum convex (exceptions in those species with laterally projecting or angulate terga, *Allodape mucronata* and *Braunsapis angolensis* and *paradoxa*); apex of sixth tergum of female usually with minute, median, apical elevated pygidial plate (absent in species with modified tergum listed above); gonostyli of male broad, flattened, concave on inner surfaces, flaplike, less than twice as long as broad 12

10. Thorax and metasoma with extensive yellow markings . . . . . *Compsomelissa*

Metasoma without yellow markings; thorax with yellow absent or in females limited to pronotal lobe and collar, tegula, wing bases, and scutellum; more extensive yellow thoracic markings in a few males . . 11

11. Ventroapical plate of male gonocoxite with long, apically directed projection arising mesally; upper margin of clypeus strongly concave; scutellum without yellow . . . . . *Halterapis*

Ventroapical plate of male gonocoxite without projection from mesal apical portion; upper margin of clypeus not or less strongly concave; scutellum with or without yellow . . . . . *Allodapula*

12. Outer surface of tibia of female, on distal half, with brush of dense, usually coarse hairs, commonly coarser or of different form and color than hairs of adjacent areas; indications of brush present in most males; distance from first transverse cubital vein to first recurrent vein much greater than from second recurrent to second transverse cubital in most species; yellow along inner and outer orbits of most females . . . . . *Allodape*

Outer surface of tibia without dense brush except in *Braunsapis trochanterata*; distance from first transverse cubital vein to first recurrent vein subequal to that from second recurrent to second transverse cubital in most species; yellow along outer orbits absent (spot in female *aureopilosa*), along inner orbits absent in females except for *aureopilosa* . . . . . *Braunsapis*

GENUS *BRAUNSAPIS*

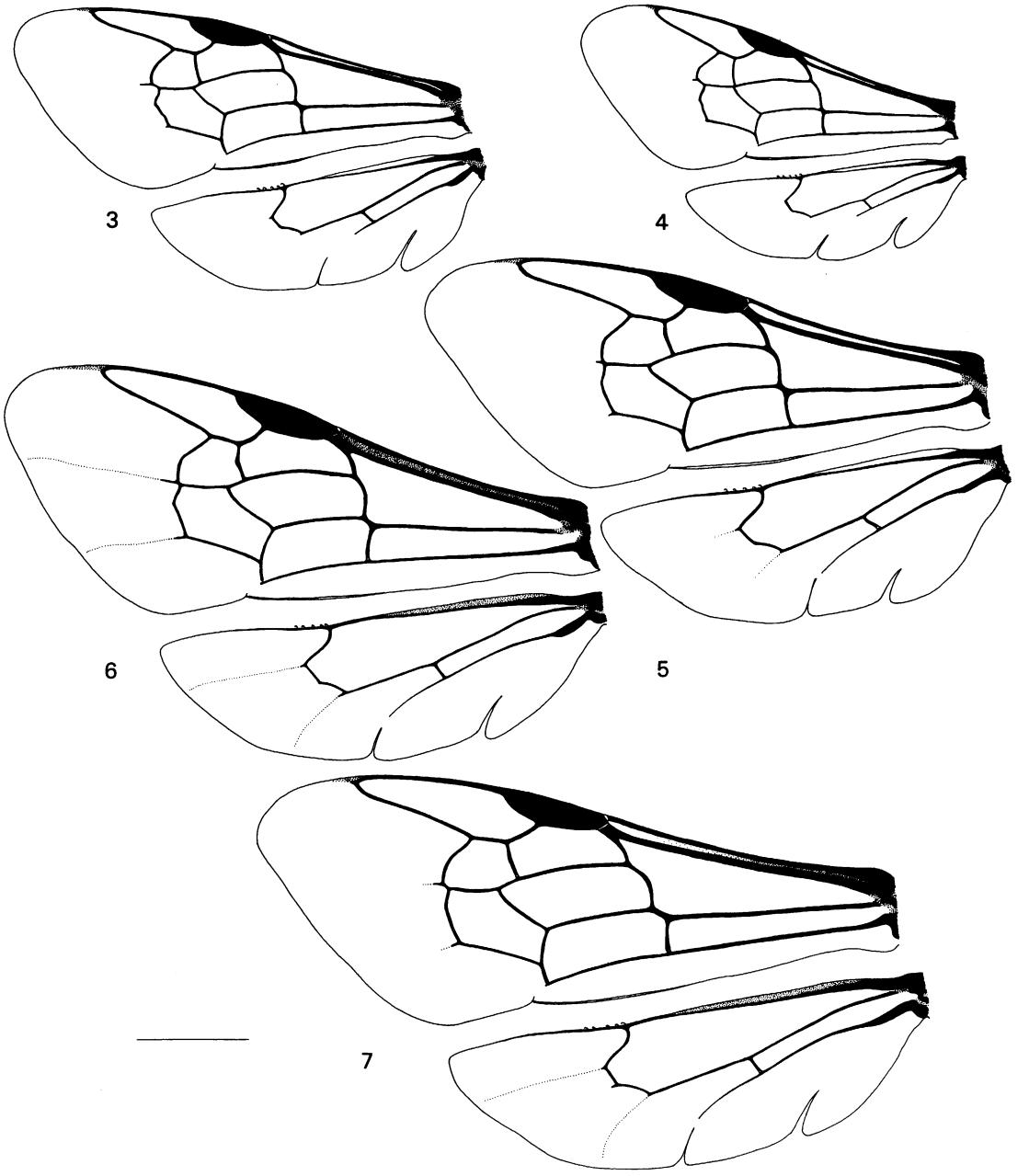
Braunsapis Michener, 1969a, p. 290. (Type species: *Allodape facialis* Gerstaecker, 1857, by original designation.)

This is the largest and most widespread genus of allodapine bees. Wherever allodapine bees of any kind exist, this genus is present, except in the southern half of Australia and in Tasmania, where *Exoneura* occurs alone, and in montane localities in Asia Minor where *Exoneuridia* is the only allodapine. Because of its abundance, *Braunsapis* was selected as the "ordinary" allodapine for full generic description. Only *Macrogalea* and *Eucondylops* are treated in comparable fashion. All other genera are described by comparison to *Braunsapis* in view of their similarity to it.

Description. Female. (1) Length 4-9 mm.; forewing length 2.7-6 mm. (2) Body black (brown or testaceous in *Braunsapis pallida* and *rubicundula*), metasoma rarely red (*B. debilis*, some specimens of *rolini*). (3) Clypeus concolorous with rest of body, often with yellow or white markings, or almost entirely yellow or white. (4) Lateral face marks absent or indicated by small spot or streak on lateroclypeal carina, extensive only in *B. aureoscopa*. (5) Posterior orbital marks absent (except for spot above posterior mandibular articulation in B. *aureoscopa*). (6) Labrum

and mandible sometimes with yellow spots or wholly yellow. (7) Scape black or reddish, sometimes yellow or white beneath. (8) Pronotal collar concolorous; pronotal lobe concolorous to yellow or white. (9) Tegula brown to nearly clear, sometimes with whitish spot; axillary sclerites brown or black to white or yellowish. (10) Pterothorax without pale markings. (11) Legs black to red, sometimes yellow at bases of tibiae and forming line on fore tibia (*B. debilis*); tibial spurs brown to light brown. (12) Tergal margins concolorous to brownish or pallid; terga without yellow or white fasciae or maculations. (13) Wings clear to brown, veins and stigma light brown to blackish (in species of the *vitrea* group stigma relatively clear with dark posterior margin as in *Compsomelissa*). (14) Pubescence sparse, yellow to whitish, sometimes with a little fuscous; dorsal blunt metasomal hairs sometimes fuscous or blackish. (15) Clypeus slightly protuberant, produced below level of lower ends of eyes, lower lateral part curved back at sides almost to a longitudinal plane, anterior margin not modified. (16) Clypeus with at least a few coarse punctures on shining or dull ground. (17) Lateroclypeal carina strong, reaching almost to level of lower part of tentorial pit, although fading away above so that upper extremity cannot be objectively located. (18) Head rather elongate, maximum interocular distance less than length of eye. (19) Antennal bases at or somewhat above level of middle of eyes; interantennal distance equal to or slightly more than antennocular distance. (20) Vertex behind ocelli slightly concave to slightly convex as seen from front, interocellar distance slightly more than to slightly less than ocellocular distance; ocelloccipital distance slightly more than or rarely nearly twice ocellar diameter, less than ocellar diameter in *B. pallida*. (21) Preoccipital carina absent. (22) Frons not protuberant, depressed line extending from anterior ocellus down to level of lower margins of antennal sockets, no frontal tubercle. (23) Antennal depression demarked above by rounded ridge extending from eye margin upward and mesally toward median ocellus (this ridge very weak in some species, e.g., *B. aureoscopa*). (24) Antennocellar triangle much more elongate than small, short ocellar triangle. (25) Upper clypeal margin concave to straight, often with median convexity (as strongly concave as in *Halterapis* in *B. debilis* and *simplicipes* but usually less strongly if at all concave). (26) Upper clypeal margin twice as long as width of paraocular area or somewhat less (much less in *B. trochanterata*). (27) Clypeoantennal distance subequal to or less than diameter of antennal socket. (28) Anterior tentorial pits approximately at level of middle of clypeus. (29) Lower clypeocular distance more than to less than width of scape; upper clypeocular distance one to two times width of scape. (30) Mandibular axis slightly behind ocular axis. (31) Genal area narrower than eye, often strongly convex and not declivous immediately behind summit of eye as seen in side view. (32) Eye more than twice as long as wide. (33) Malar area usually shorter than width of scape but sometimes (*B. trochanterata*) longer. (34) Labrum convex, less than twice as wide as long. (35) Hypostomal area convex. (36) Scape more than four times as long as wide. (37) Flagellum two or more times as long as scape, first segment variable, penultimate segment longer than broad, two to five segments broader than long. (38) Apical width of mandible about half of basal width (less than half in *B. trochanterata*). (39) Apex of mandible tridentate. (40) Prementum several times as long as wide, without long setae; mentum and submentum of usual shape. (41) Labial palpus with last two segments small and projecting to one side from greatly elongate, flattened first two segments; first segment longer than second. (42) Maxillary palpus six-segmented, nearly four to over five times as long as galeal width; galea with a series of flattened hairs. (43) Stigma broad or moderately so, shorter than or as long as costal margin of marginal cell, the latter shorter than to as long as distance from apex of cell to wing tip. (44) Apex of marginal cell bluntly to sharply pointed, on wing margin or separated from it by only a vein width. (45) Second submarginal cell usually little more than half as long as first (but almost three-fourths length of first in some specimens of *B. lyrata* and similar large species); second recurrent vein present, first usually near first transverse cubital (figs. 3, 4) (but in some larger species, *B. calidula*, *lyrata*, *somatotheca*, *trochanterata*, well separated from it, figs. 5-7, as is usual for *Allodape*).

(46) Basal vein strongly curved, posterior part transverse; discal cell petiolate. (47) Jugal lobe about attaining level of cu-v (exceeding cu-v in *B. trochanterata*). (48) Hamuli 5; hamular sinus



FIGS. 3-7. Wings of *Braunsapis*. 3. *B. facialis*. 4. *B. leptozonia*. 5. *B. trochanterata*. 6. *B. somatotheca*. 7. *B. calidula* from Mto Wa Mbu, Tanzania. Scale line represents 1.0 mm.

wider than deep (about as wide as deep in *B. lyrata*). (49) Hairs of fore basitarsus, at least some on outer side, bent apically. (50) Tibial brush absent (feebly developed in *B. trochanterata* and with denser but little modified hairs in *B. somatotheca* and *debilis*); tibiae 1 and 2 with small apical spines more or less completely hidden by hairs. (51) Coxa 1 without apical spine; legs rather slender. (52) Basitibial plate absent or defined by carina along posterior margin. (53) Arolia rather large. (54) Scopa well developed (reduced in *B. natalica* and *pallida*); brush at base of mid-femur and apex of mid-trochanter present. (55) Tergum 6 with upper surface usually convex in cross section, straight in profile (profile concave in *B. pallida*), rarely surface broadly concave (*B. angolensis*, *paradoxa*); apex upturned only in these same species; extreme apex with small notch or emargination in which is a minute, elevated pygidial plate (poorly defined in *B. debilis*), the whole often hidden with hairs of pygidial fimbria, but apex bare and pygidial plate not elevated and not well defined in *B. angolensis* and *paradoxa*. (56) Posterior lateral margins of tergum 6 broadly rounded in section (flattened and angulate in *B. angolensis* and *paradoxa*). (57) Graduli of terga 4 and 5 usually extending back, laterally, about or over halfway from spiracles to posterior tergal margins (but in *B. trochanterata* extending but little behind spiracle); gradulus of tergum 3 extending little or none behind spiracle.

Male. Similar to female except as follows: (1m) length 3.5-7 mm.; forewing length 2.5-5 mm. (3m) Clypeus usually wholly white or yellow, sometimes partly or wholly black. (4m) Lateral face marks often present, sometimes extending above level of summit of clypeus. (11m) Leg coloration as in female but basitarsi and other tarsal segments sometimes white. (Male with yellow line on fore tibia unknown.) (19m) Interantennal distance much more than and often twice antennocular distance. (20m) Vertex as in female but interocellar distance often more than ocellocular distance. (29m) Lower clypeocular distance equal to or less than width of scape, sometimes half width of scape or less; upper clypeocular distance less than to more than width of scape, nearly twice width of scape in *B. trochanterata*. (30m) Mandibular axis approximately the same as ocular axis. (32m) Eye about or slightly less than twice as long as wide, more than twice as long as wide in *B. trochanterata*. (33m) Malar area usually much shorter than width of scape, at least two-thirds width of scape in *B. trochanterata*. (37m) Flagellum over three times as long as scape. (38m) Apical width of mandible less than half width at base. (39m) Mandible with apex usually rounded, edentate, but sometimes bidentate (*B. trochanterata*, often also in *B. somatotheca*) or tridentate (*B. paradoxa* group). (50m) Tibial brush absent. (58) Front tarsus very ordinary or with segments 2-4 somewhat enlarged and flattened; undersides of these segments with a vestiture of fine, rather short hairs; basitarsus much shorter than tibia, slightly longer than to considerably shorter than remaining tarsal segments together; fourth segment a little longer than broad (nearly twice as long as broad in *B. trochanterata*). (59) Hind trochanter simple or with ventral submedian and apical projections, the latter with a horizontally expanded shining head suggestive of *Allodape* in *B. calidula* and *trochanterata*; hind femur simple or with ventral angle or projection situated well beyond base of femur. (60) Eighth tergum with two membranous convexities, variously wrinkled and with internal hairs (except in *B. bouyssoui* and *rolini* and in which they are not wrinkled, and the hairs are reduced). (61) Seventh sternum usually emarginate apically, but margin sometimes convex; eighth with strong upturned spiculum; both hairless (rarely with a hair on each side of emargination). (62) Gonobase much wider than long and shorter than gonocoxite. (63) Gonocoxite somewhat longer than wide with strong dorsal apical mesal lobe; ventral apical plate well developed, often with various angles and projections but with no large projection closely associated with gonostylus (large projection near gonostylus in *B. facialis*), usually with a few setae or pegs. (64) Gonostylus laterally flattened, flaplike, concave internally and convex externally, wider than long to longer than wide, usually with one or a few setae on outer surface. (65) Penis valve large, strongly curved downward, extending as far as or not greatly beyond apices of styli, with setae and commonly with bristles or pegs on lateral median projection.

KEY TO THE AFRICAN SPECIES OF *BRAUNSAPIS*[1]

FEMALES

1. Malar area as long as width of scape and lower clypeocular distance about 1.5 times width of scape . . . . . *trochanterata*
   Malar area and lower clypeocular distance both less than width of scape 2
2. Paraocular area below level of antennae largely yellow . . . . . *aureoscopa*
   Lateral face marks absent or represented only by spot or streak on lateroclypeal carina 3
3. Thorax (except for dark dorsum) and metasoma testaceous . . . . . *pallida*
   Body black, metasoma rarely red 4
4. Sixth tergum flattened or concave dorsally with marginal "shoulders" laterally . . . 5
   Sixth tergum convex in transverse section, tapering apically without lateral shoulders 6
5. Sixth sternum with two apical teeth extending beyond tergum . . . . . *paradoxa*
   Sixth tergum of the usual simple form. . . . . *angolensis*
6. Stigma largely clear with broad dark posterior margin and sometimes also anterior margin, wings very clear (southern Africa) . . . . . *vitrea* group
   Stigma rather uniformly brown; wings at least slightly brownish 7
7. Front tibiae and commonly other parts of legs red 8
   Legs black except for commonly reddish tarsi 11
8. Metasoma red with dark lateral spots; summit of clypeus strongly concave (fig. 62) . . . . . *debilis*
   Metasoma black, rarely red in *rolini* in which summit of clypeus not or weakly concave 9
9. Upper half of clypeus conspicuously although finely reticulate and dull. Clypeus above tentorial pits usually with black at least on either side of midline, yellow coloration extending down along lateral clypeal margins (figs. 87, 88) . . . . . *rolini* (part)
   Clypeal roughening very fine, usually not very different above and below. (This concerns the surface between scattered punctures.) Clypeus above tentorial pits all yellowish or if not, with pale color above and in center, not extending down along clypeal margins 10
10. Dorsal hairs of terga 4-6 robust, black or dusky as seen in side view, rarely most of them pallid and translucent; wing length 4-5 mm. . . . . *facialis* (part)
    Dorsal hairs of terga 4-6 slender, whitish or yellowish seen in side view; wing length 3.5-4 mm. . . . . *bouyssoui, strandi*
11. Pale clypeal mark extending down along lateral margins of clypeus from upper clypeal margin, sometimes also extending down medially, but not T-shaped 12
    Pale clypeal mark central or often occupying entire upper half of clypeus, often T-shaped in which case ends of cross bar may be hamate, i.e., extending for short distance down along lateral clypeal margins; or clypeus entirely dark or with only weak light line across upper margin. . . 13
12. Distance between first recurrent vein and first transverse cubital little more than between second recurrent and second transverse cubital; wing length 4 mm. or less . . . . . *rolini* (part), *nautica*
    Distance between first recurrent vein and first transverse cubital much greater than that between second recurrent and second transverse cubital; wing length 5 mm. or more . . . . . *calidula* (part), *lyrata*
13. Distance between first recurrent vein and first transverse cubital much greater than that between second recurrent and second transverse cubital 14
    Distance between first recurrent vein and first transverse cubital about the same as that between second recurrent and second transverse cubital 15
14. Clypeus entirely dark or with only pale line across upper end . . . . . *calidula* (part)
    Clypeus with extensive yellow area, more or less T-shaped . . . . . *somatotheca*
15. First flagellar segment about 1.5 times as long as broad; clypeal mark absent to very slender T (Cape Province) . . . . . *elizabethana, acuticauda*
    First flagellar segment less than 1.5 times as long as broad; clypeal mark variable but

[1]In addition to the unplaced species listed at the end of the account of *Braunsapis*, the following forms have been omitted from the keys because of lack of material: *flavitarsis, rugosella, minutula, longula.* See also "*Allodape*" *albolineata* among the species of uncertain generic position.

usually present and usually not a slender T 16

16. Pale tergal hairs denser near apical margins of terga than elsewhere, forming weak pale hair bands accentuated by light brown or pallid tergal margins; upper genal area behind summit of eye slightly swollen . . . . . *foveata*

Pale tergal hair bands absent; tergal margins brownish but rarely pallid; upper genal area not swollen 17

17. Basitibial plate delimited posteriorly by carina 18

Basitibial plate not delimited 19

18. Upper margin of clypeus strongly concave (fig. 51) . . . . . *simplicipes*

Upper margin of clypeus less concave . . . . . *facialis* (part), *natalica*, *gorillarum*

19. Upper genal area clearly more densely hairy and punctate than lower part of gena . . . . . *leptozonia*, *albitarsis*

Upper genal area nearly as shining and sparsely punctate as lower part of gena 20

20. Clypeal mark occupying most of upper half of clypeus, much as in *B. leptozonia* . . 21

Clypeal mark T-shaped 22

21. Wing length 4.75 mm. . . . . *langenburgensis*

Wing length 3 mm. or less . . *minutula* group

22. Dorsal hair of terga 4-6 blackish . . *liliputana*

Dorsal hair of terga 4-6 whitish to light brown . . . . . *luapulana*, *rhodesi*, *draconis*, *stuckenbergorum*

MALES

1. Apex of mandible tridentate, much as in female 2

Apex of mandible simple, rarely bilobed, bidentate, or very feebly three lobed . . 3

2. Clypeus yellow or largely so . . . . . *elizabethana*, *acuticauda*

Clypeus black, sometimes with yellow line or yellow T . . . . . *paradoxa*

3. Stigma largely clear with broad dark posterior margin and sometimes also anterior margin; wings very clear (southern Africa) . . . . . *vitrea* group

Stigma rather uniformly brown; wings usually slightly brownish 4

4. Body largely brown 5

Body largely black 6

5. Head and dorsum of thorax dark brown or blackish except for usual pale areas . . . . . *pallida*

Body uniformly brown except for usual pale areas . . . . . *rubicundula*

6. Hind trochanter and femur simple, femur at most thickened submedially to form rounded hairy angle on ventral side, no strong angle or concave surface.[1] 7

Hind trochanter or femur or both with distinct angles, femur usually with a concave surface basally on underside 9

7. Upper margin of clypeus strongly concave (figs. 52, 53) . . . . . *simplicipes*

Upper margin of clypeus not or weakly concave 8

8. Hind femur thickened submedially to form rounded hairy angle on ventral side. . . . . *facialis*

Hind femur not thickened . . . . . *gorillarum*, *natalica*

9. Distance between first recurrent vein and first transverse cubital much greater than that between second recurrent vein and second transverse cubital; wing length 5 mm. 10

Distance between first recurrent vein and first transverse cubital subequal to that between second recurrent vein and second transverse cubital; wing length, except for *B. aureoscopa*, 4.5 mm. or less 13

10. Apical projection of hind trochanter more or less horizontally flattened and expanded, shining, suggestive of many species of *Allodape* 11

Apical projection of hind trochanter absent or not so expanded and shining 12

11. Hind femur simple . . . . . *trochanterata*

Hind femur with strong premedian angle, basal to which strong, shining concavity . . . . . *calidula*

12. Hind trochanter unmodified . . . . . *somatotheca*, *lyrata*

Hind trochanter with submedian and apical ventral angle . . . . . *neavei*

13. Apical projection of hind trochanter more or less horizontally flattened and expanded, shining, bright yellow . . . . . *aureoscopa*

Apical projection of hind trochanter not expanded or shining, black or brown or absent 14

14. Hind trochanter simple 15

[1] *B. lyrata* has a simple trochanter and a femur that appears nearly simple in outline but has a basal concavity on lower outer surface.

Hind trochanter with two ventral angles or convexities 16

15. Upper half of clypeus with ground dull because of relatively coarse reticulation . . . . . *rolini*
Upper half of clypeus somewhat shining, its surface only very inconspicuously roughened between the punctures . . . . *strandi*

16. Fore tibiae and often other parts of legs red . . . . . *bouyssoui*
Legs dark except for often brownish or rufescent tarsi 17

17. Pale tergal hairs denser near apical margins of terga than elsewhere, forming weak pale hair bands accentuated by light brown or pallid tergal margins; upper genal area behind summit of eye slightly swollen . . . . . *foveata*
Pale tergal hair bands absent; tergal margins brownish but rarely pallid; upper genal area not swollen 18

18. Upper genal area clearly more densely hairy and punctate than lower part of gena . . . . . *leptozonia, albitarsis*
Upper genal area nearly as shining and sparsely punctate as lower part of gena 19

19. Hind femur with large, basally directed median tooth . . . . . *stuckenbergorum*
Hind femur with angle on lower surface near base but no long tooth 20

20. Wing length 2.5 mm. . . . . *ghanae*
Wing length 3 mm. or more. . . . . *luapulana, rhodesi, draconis*

Braunsapis facialis (Gerstaecker)

Figures 1, 3, 8-37, 188

Allodape facialis Gerstaecker, 1857, p. 461. (Lectotype ♀, here designated, Berlin, from "Mozambique, Peters S." There are two females similarly labeled in the Berlin museum; one of them is the lectotype. Transferred to *Braunsapis* by Michener, 1969a.)

Allodape ictis Vachal, 1903, p. 387. (New synonym. Lectotype ♀, Paris, from Libreville, Gabon, 30 VIII 97 Bouyssou.)

Prosopis gracilis Bingham, 1903, p. 50. (New synonym. Type ♀, BM, from Durban (?), Natal.)

Allodape exolomoides Strand, 1915, p. 55. (New synonym. Type ♀, Berlin, from Togo hinterland.)

Allodape kibonotonis Strand, 1915, p. 52. (New synonym. Lectotype ♀, Berlin, from Kibonoto, 1300-1900 m., Kilimanjaro, Tanzania. Strand described the female in some detail and the male only comparatively; the female is therefore designated as lectotype. The male, which as Strand indicates, had been labeled "*foveolata* Sm." by Friese [there is a *foveata* Smith but no *foveolata*] and was marked Type in the Berlin museum, is *B. foveata.* The yellow of the clypeus of the lectotype is not properly colored; except for the upper margin it is brown and the color scarcely recognizable.)

Allodape lolonis Strand, 1915, p. 45. (New synonym. Type ♀, Berlin, from Lolodorf, Cameroon.)

Allodape lolonis var. *usambarae* Strand, 1915, p. 46. (New synonym. Type ♀, Berlin, from "Usambara und Bondei," Tanzania.)

Allodape taita Strand, 1915, p. 49. (New synonym. Lectotype ♀, Berlin, from Taita, Kenya.)

Allodape taita ab. *humeralia* Strand, 1915, p. 51. (New synonym. Type ♂, Berlin, from Taita, Kenya.)

Allodape transvaalensis Strand, 1915, p. 57. (New synonym. Type ♀, from Three Sisters near Barberton, Transvaal. I have not seen the type but placement here seems extremely probable.)

Allodape maurula Cockerell, 1917, p. 44. (New synonym. Type ♂, present location unknown, from Durban, Natal; it is neither in the British Museum nor the Durban Museum. The latter contains a female cotype [= paratype] without abdomen and NMNH contains an intact female cotype.)

Allodape equatorialis Cockerell, 1932b, p. 13. (New synonym. Type ♂, AMNH, from Kisangani [= Stanleyville], Zaire.)

Allodapula albomaculata Cockerell, 1936a, p. 2. (New synonym. Type ♂, AMNH, from Matopo Hills, near Bulawayo, Rhodesia.)

Allodapula durbanensis Cockerell, 1936a, p. 6. (New synonym. Type ♀, AMNH, from Durban, Natal. Whole body of type with heavy, irregular pitting, an occasional abnormality seen in various species; this influences clypeal mark, which is asymmetrical and reduced.)

Allodapula innata Cockerell, 1936a, p. 10. (New synonym. Type ♀, AMNH, from Matopo Hills, near Bulawayo, Rhodesia.)

Allodapula littoralis Cockerell, 1936a, p. 12. (New synonym. Type ♀, AMNH, from Moçambique, Mozambique.)

Allodapula nativitatis Cockerell, 1936a, p. 16.

(New synonym. Type ♀, AMNH, from Christmas Pass, Umtali, Rhodesia.)

Allodapula pulchripes Cockerell, 1936a, p. 21. (New synonym. Type ♀, AMNH, from Matopo Hills, near Bulawayo, Rhodesia.)

Allodapula umtalica Cockerell, 1936a, p. 26. (New synonym. Type ♂, AMNH, from Vumba, Umtali, Rhodesia.)

Allodapula umtalica ornata Cockerell, 1936a, p. 26. (New synonym. Type ♂, AMNH, from Umtali, Rhodesia.)

Allodapula flavibasis Cockerell, 1936a, p. 7. (Type ♀, AMNH, from Niunzu, Zaire; yellow of clypeus ill-defined and brownish, restricted to area near but not on upper margin.)

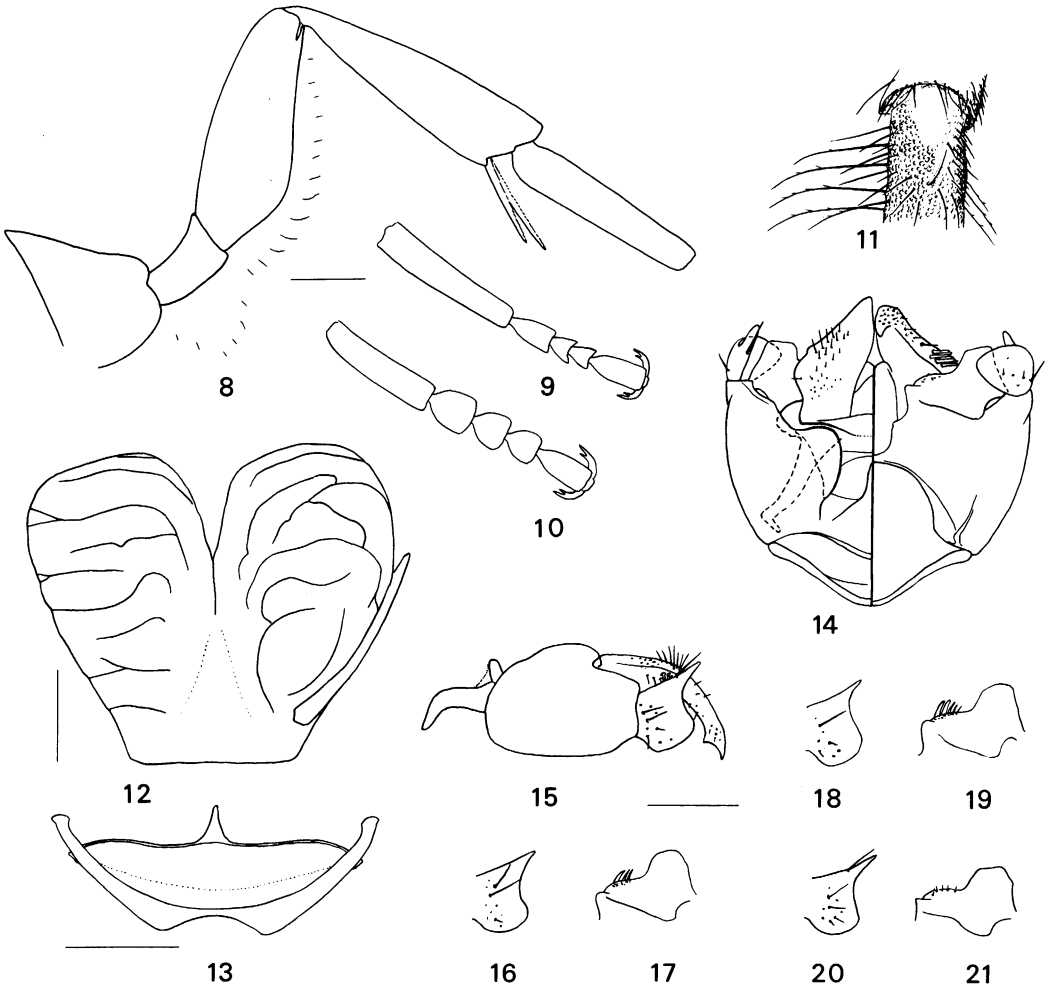
Allodapula kivuensis Cockerell, 1936a, p. 11. (New synonym. Type ♀, AMNH, from Lake Kivu, Bukavu, Zaire.)

Allodapula dissimulans Cockerell, 1939b, p. 39. (New synonym. Type ♂, BM, from The Bluff, Durban, Natal.)

Description. Female. (1) Length 5-6 mm. or, in equatorial areas, 7 mm.; forewing length 4-4.5 mm. or, in equatorial areas, 5 mm. (2-12) Black, the following parts yellow: clypeal mark (varying in form, see figures and section on variation), in equatorial region very rarely reduced to transverse line across upper part of clypeus; sometimes line on underside of scape, often reduced to basal and apical spots, usually absent; posterior lobe of pronotum (varying to black in equatorial region); sometimes small anteromedian tegular spot; sometimes outer half of median axillary sclerite. Flagellum sometimes dark brown beneath. Tegula transparent brownish, in equatorial region often brown or even infuscated. Legs black to red, small tarsal segments brownish. Posterior margins of terga brownish, sometimes only inconspicuously so. (13) Wings slightly brown, veins and stigma dark brown. (14) Dorsal hairs on terga 4-6 usually black or infuscated as seen in profile, short, robust, blunt, curved somewhat posteriorly. (16) Clypeus with numerous punctures, rather small except below marginally, on shining or slightly dull ground. (20) Interocellar distance slightly more than ocellocular distance; ocelloccipital distance more than ocellar diameter. (25) Upper margin of clypeus uniformly concave or sometimes with median convexity practically never reaching as high as upper lateral angles of clypeus (variation exists in this feature in specimens from one nest; type of *pulchripes* has maximal median convexity). (27) Clypeoantennal distance slightly less than diameter of antennal socket. (29) Lower clypeocular distance less than width of scape, upper about 1.5 times width of scape. (31) Genal area slightly roughened, with only small scattered punctures and hairs. (33) Malar area about half as long as diameter of antennal scape. (37) First flagellar segment somewhat wider than long, middle segments as wide as long or slightly longer than wide. (43) Stigma shorter than costal margin of marginal cell, which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell separated from wing margin by about a vein width. (45) Submarginal cells usual for genus. (52) Basitibial plate delimited by carina, often elevated apically, along posterior margin.

Male. Similar to female except as follows: (1m) Length 4.5-5.5 mm., in equatorial areas 6 mm.; forewing length 3.5-4 mm., in equatorial areas to 4.5 mm. (2m-12m) Black, the following parts yellow: entire clypeus, varying in equatorial region to clypeus entirely black (see figures and Variation); small paraocular mark between lower part of clypeus and eye, sometimes extending up halfway to summit of clypeus, sometimes absent; most of labrum, varying to black; most of mandible, varying to black; underside of scape, varying to black in equatorial areas; pronotal, tegular, and median axillary yellow as in female. Distal part of mandible reddish brown. Leg coloration as in female but basitarsi pale yellow, occasionally largely brown in equatorial regions but at least hind basitarsus nearly always partly pale yellow. (29m) Lower clypeocular distance about half width of scape, upper slightly less than width of scape. (33m) Malar area with length much less than half width of scape. (37m) First flagellar segment over 1.5 times as wide as long. (52m) Basitibial carina demarking posterior edge of plate absent or, in some of the specimens from Nigeria and Cameroon, weakly developed. (58) Front basitarsus about as long as segments 2-4 together, mediotarsal segments flattened, segments 2-3 wider than basitarsus; hind basitarsus widest at base, slightly tapering apically, over half as wide as tibia, 0.70-0.75 times as long as tibia, less than twice as wide as following seg-

ments, longer than rest of tarsal segments taken together; middle basitarsus also much shorter than tibia, subequal to remaining tarsal segments taken together. (59) Hind trochanter simple; hind femur thickened and rounded basad of middle; underside of trochanter with sparse plumose hairs longer than diameter of segment, of femur with much shorter, sparsely branched hairs,



FIGS. 8-21. *Braunsapis facialis*. 8. Hind leg of male (St. Lucia Estuary, Natal), side view. 9. Mid tarsus of male, top view. 10. Fore tarsus of male, top view. 11. Base of hind tibia of female showing carina representing posterior margin of basitibial plate. 12. Eighth tergum and roof of genital chamber of male (Salt Rock, Natal, specimen with much yellow on mandibles). 13. Seventh and eighth sterna of male. 14, 15. Dorsal, ventral, and lateral views of genitalia of male. 16, 17. Gonostylus and ventroapical plate of gonocoxite of male with yellow on the mandibles from Salt Rock, Natal. 18, 19. Gonostylus (lateral view) and ventroapical plate (ventral view) of gonocoxite of male with yellow on mandibles from Catuane, Lourenço Marques District, Mozambique. 20, 21. Gonostylus and ventroapical plate of gonostylus of male with only small yellowish area on mandible, from 18 km. S of Pietermaritzburg, Natal.

All scale lines represent 0.25 mm. Separate lines serve for figures 8-10, 12, 13, and 14-21.

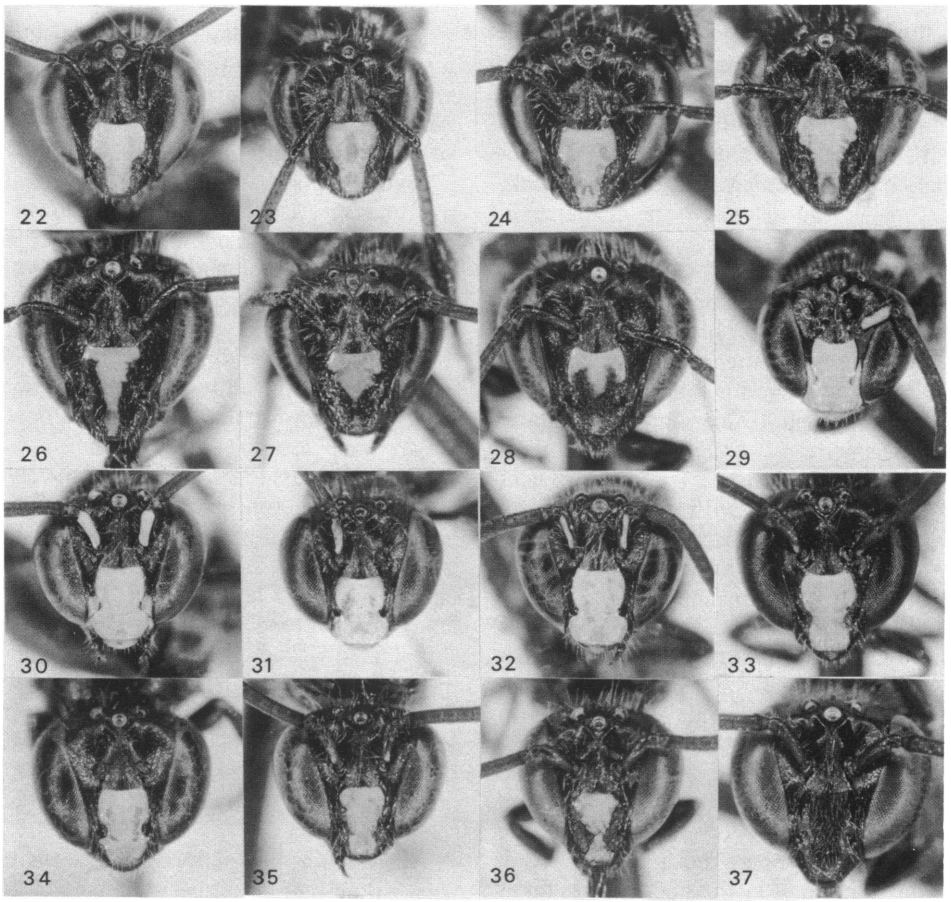
mostly arising from outer surface of femur, many of those on basal part of femur bent apically beyond middle of each hair. (60) Membranous convexities of eighth tergum with rather few and generally transverse wrinkles. (61) Seventh sternum emarginate medioapically. (63) Ventroapical plate of gonocoxite with apical margin as in figures 14-21, hairs usually present but variable, sometimes thickened, scattered, along mesal part of margin only. (64) Gonostylus wider than long with dorsal projection. (65) Penis valve rather slender with some peglike setae on median lateral projection.

Distribution. Transkei to Ethiopia, west to Zaire and Senegal. SOUTH AFRICA: *Transkei*: Port St. Johns. *Natal*: Durban; Escombe; Eshowe; 19 km. N of Greytown; Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; Kloof; Mfongosi, Zululand; Nagle Dam, 27 km. E of Pietermaritzburg; Ndumu Reserve, Zululand; Pietermaritzburg; 18 km. S of Pietermaritzburg; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Scottburgh; Sordwana Bay, 80 km. E of Ubombo; Tugela Mouth; 16 km. N of Ubombo, 160 m. altitude; Umbilo, Durban; Umhlali; Winklespruit. *Transvaal*: Hope, Ellisras; Louis Trichardt; 27 km. E of Nelspruit, 915 m. altitude; Retiefs Kloof; Rustenburg; Swartruggens; Three Sisters near Barberton; Zoutpansberg, Louis Trichardt. RHODESIA: Bulawayo; Christmas Pass, Umtali; Matopo Hills near Bulawayo; Shangani; Victoria Falls; Vumba, Umtali; Zimbabwe. MOZAMBIQUE: Catuane, Lourenço Marques District; Gorongosa District; Lourenço Marques; Masiene; Moçambique. MALAWI: Blantyre; Kasungu, Central District; 80 km. N of Kasungu, Central District; Limbe; Monkey Bay, Lake Malawi; Nkata Bay, Lake Malawi; Rumpi, Northern District; Shire River W of Blantyre; Vipya Plateau, 19 km. NE of Mzimba, 1590 m. altitude. ANGOLA: 23 km. NW of Cacula, 1000 m. altitude; Dundo, Luanda; Vila Flor, Huambo; Vila Luso, Mox. GABON: Libreville. CONGO (BRAZZAVILLE): Point Noire. ZAIRE: *Shaba* (= *Katanga*): Biano; Kamina, Lomani; Kapanga, Lulua; 16 km. S of Kapona, 1570 m. altitude; Kolwezi, Lualaba; La Mofia; 29 km. W of Luanza, 1300 m. altitude; Lubumbashi (= Elizabethville); Lusinga, Upemba Park, 1800 m. altitude; 51 km. W of Lusinga, Upemba Park, 1400 m. altitude; Nasoni, 45 km. N of Kassji, 1070 m. altitude; Niunzu, District of Tanganyika Moero. *East Kasai*: Lodja, Sankuru. *West Kasai*: Kamponde, Territory of Dibaya. *Bandundu*: Leverville, middle Kwilu; Wombali. *Lower Zaire*: Banana; Boma Sundi; Lemba; Kinshasa (= Leopoldville); Moanda; Tshela, Mayumbe; Vista. *Equator*: Mimbo, Likimi. *Kivu*: Beni to Lesse; Bukavu (= Costermansville); 8 km. N of Bukavu, 1475 m. altitude; Irangi; Kalembelembe-Baraka; Kibombo; Lokandu; Lwiro River, 47 km. N of Bukavu, 1950 m. altitude; Mulungu; Rutshuru Region. *Upper Zaire*: Adia, Ituri; Bambili; Eala; Kasenyi, Kibali-Ituri; Kisangani (= Stanleyville); Madyu, La Moto, Ituri; Mauda, upper Uele; Moto, upper Uele. BURUNDI: Bururi, 1800-2000 m. altitude; Cankuzo of Ruyigi. RWANDA; Gisenyi; Lake Nyakibugu; mountain E of Muhavura, 2100 m. altitude. TANZANIA: Kibonoto, Kilimanjaro, 1300-1900 m. altitude; Mto Wa Mbu, Lake Manyara; Ngurdoto Crater, Momela Lakes, and Mt. Meru (all in Ngurdoto National Park, near Arusha), 1430 m. altitude; Tabora; Usambara and Bondei. UGANDA: Kawanda, Kampala; 35 km. W of Tororo. KENYA: Karen, Nairobi, 1830 m. altitude; Kikuyu Summit; Lake Naivasha; 21 km. S of Malindi; Nairobi; Taita. ETHIOPIA: Lake Abayita, Shewa; 6 km. NE of Welenchiti, Shewa. CENTRAL AFRICAN REPUBLIC: Fort Crampel. RIO MUNI: Bata. CAMEROON: Bambui, near Bamenda, Western Province, 1370 m. altitude; Buea, Western Province; Lolodorf. NIGERIA: Lagos; Ndoro; Olokemeji, Ibadan. DAHOMEY: Zaguanado. TOGO: No locality. GHANA: Legon, Accra. IVORY COAST: Danané (Fort Hittos); 8 km. ESE of Touba, 800 m. altitude. LIBERIA: Cuttington College, Bong County. GUINEA: Iles de Los. SENEGAL: Dakar.

Variation. Many specimens from northern Natal (especially Ndumu, less commonly at Hluhluwe and elsewhere), Mozambique, northern Transvaal (Barberton; Hope, Ellisras), Rhodesia (Bulawayo area), Angola, and some from Malawi, Tanzania, Zaire, and West Africa, have varying amounts of red on the legs. The tarsi are reddish, the basitarsi usually infuscated, often black, in any area but in the regions listed above the tarsi, hind tibiae, sometimes also other tibiae, and sometimes the apices or even also the bases of

the femora may be red. A specimen from Rumpi, Malawi, the type of *pulchripes* from Rhodesia, and many from Angola have the trochanters also red, and in some from Angola as well as in the type of *pulchripes* the coxae are also largely red. Females with partly red legs usually have a yellow or reddish yellow spot at the base and apex of the scape, these often united to form a yellow line on the underside of the scape. In the same regions some of those specimens with the usual dark legs also have such yellow markings on the scape. This fact supports the view that the red-legged specimens are conspecific with the dark legged ones (see also table 2). The names *innata*, *littoralis*, *lolonis*, *pulchripes*, *transvaalensis*, and *usambarae* are based on red-legged individuals.

The individuals with red or partly red legs not only tend to have yellow on the scape of the



FIGS. 22-37. *Braunsapis facialis*, facial views. 22-28. Females. 29-37. Males. 22. Pietermaritzburg, Natal. 23. Blantyre, Malawi. 24. Mto Wa Mbu, Tanzania. The above show typical facial pattern. 25, 26. Kawanda, Kampala, Uganda. 27. Vipya Plateau, 19 km. NW of Mzimba, 1620 m. altitude, Malawi. 28. Nairobi, Kenya. 29. Hluhluwe Reserve, Zululand, Natal (mandibles pale). 39. Pietermaritzburg, Natal (mandibles with small pale area). 31. 18 km. S of Pietermaritzburg, Natal (except as noted the mandibles are black in this and the following individuals). 32. Kasungu, Malawi. 33. Bambui near Bamenda, Cameroon, 1370 m. altitude. 34. Taita, Tanzania (holotype of *humeralia*). 35. Karen near Nairobi, Kenya. 36. 35 km. W of Tororo, Uganda. 37. Kawanda, Kampala, Uganda (mandibles with yellow).

female, but also are often less melanic in other respects. The lower part of the clypeus, lateral to the pale mark, in females is often brown or red (as in the type of *littoralis*). Moreover, the tegula is usually transparent and the median axillary sclerite is commonly half or even wholly white. At the opposite extreme, specimens from Malawi and equatorial Africa including Ethiopia often have the tegulae brown and the median axillary sclerite blackish. All intermediates exist, and some specimens as far south as Durban have the black axillary sclerite. However, the situation may be complex, for a small series of females from Dakar, Senegal, and another of both sexes from Kampala, Uganda, seem to be divisible into two kinds, one larger and darker, with the median axillary dark and the legs of the female black, the other smaller and paler with the median axillary pale, the tegula very transparent, and the tibiae sometimes reddish. The few males from Kampala belonging to the dark form seem to have the swelling of the hind femur slightly nearer the base than in other specimens. Some of them also have the posterior lobes of the pronotum black, although some otherwise more ordinary specimens of *facialis* from tropical Africa also have this feature. These dark males are also among the few with the basitarsi infuscated; in most specimens of the species they are ivory colored.

In equatorial Africa (Tanzania, Kenya, Cameroon) not all specimens have the dorsal abdominal hairs black, as in specimens from elsewhere. The hairs have the same form, being thick, curved, and blunt, but may be translucent. The type of *kibonotonis* is almost such a specimen, having only a few of the shorter hairs blackish, and in the type of *flavibasis* they are brown.

The amount of yellow or white on the face varies considerably among the males. In Natal, Malawi, and sometimes in the highlands as far as Nairobi, the whole clypeus is pale; variable but usually small lateral face marks are commonly present, sometimes extending up to halfway between the tentorial pits and the summit of the clypeus; the labrum is largely pale; the underside of the scape is pale; and sometimes the mandible is almost all pale. However, the mandible may be wholly dark, or may have a small pale area. In equatorial Africa darker forms are common. The scape is often entirely dark. The clypeus is sometimes extensively black laterally, the pale area being occasionally reduced to a spot shaped about like that of the female, and the labrum, mandibles, and sides of face are commonly entirely dark. Sometimes even the clypeus is largely or wholly black, as in some specimens from Uganda. However, even when this is the case, the mandibles may be largely pale.

The posterior lobes of the pronotum are pale except sometimes in the tropical forms. Some nest series from Malawi contain individuals with a small pale area on the pronotal lobe and others with the lobe completely black. The types of *nativitatis*, *umtalica*, and *humeralis* as well as two of the cotypes of *taita* have black pronotal lobes.

Females associated with the dark males average relatively large and dark, the lower part of the yellow clypeal mark often being narrower than usual, occasionally tapering to a point below or even being absent, and the upper transverse part of the clypeal mark being sometimes reduced, not extending downward to the tentorial pits as in fully marked specimens, for example, from Natal. In the type of *flavibasis*, as an extreme example, there is only a transverse light band across the upper end of the clypeus.

The mesal ventroapical plate of the male gonocoxite usually bears a few small hairs. In some specimens, however, there are no hairs or alternatively the hairs are long and slender, long and thick, or long and blunt (peglike). At least in Natal and Uganda intermediates occur, with a peg or two and hairs. There is no evident relationship between this character and larval characters in Natal populations. For example, males reared from larvae lacking ventrolateral projections may either have or lack the genital pegs.

In Natal, as in equatorial Africa, there is some suggestion that two species might be involved. While in Senegal and Uganda, as indicated above, there are indications of larger darker vs. smaller paler specimens, in Natal the forms are of the same (smaller) size and relatively pale. Table 2, based on 15 selected males, shows the situation. The first column shows the presence (+) or absence (0) of a bristle on the dorsal process of the gonostylus. (Two such bristles are found in one specimen from Malawi and one from Camer-

oon; the single bristle may be either present or absent in most areas although among the few males dissected from Uganda and Cameroon there was always at least one bristle.) The second column shows the condition of hairs on the ventroapical plates of the gonocoxites–0, absent; + present but minute, sometimes only one or two, sometimes several; ++ relatively long and slender; +++ long and thickened but pointed at tips; ++++ long, robust and blunt, like long although often curved pegs. The third column shows the amount of yellow on the mandibles–0 none; + small yellow areas; ++ most of mandible yellow. The fourth column shows the amount of yellow on the median axillary sclerite–0 none; + about half the sclerite yellow. The fifth column shows the condition of large larvae from some of the same nests–P, with ventral processes; H, with ventral hairs only.

Specimens with ++ mandibles usually have long hairs on the ventroapical gonocoxal plates, lack the bristle on the gonostylus, and some of them have yellow on the median axillary sclerites. The equivalent females often have yellow at least on the bases and apices of the scape. Some have red legs. It is tempting to think that this is a species sympatric with a widespread species having darker mandibles and the converse states of the other characters as well. However, intermediate and mixed individuals occur as shown in table 2 and a high percentage, especially of females, could not be placed in one group or the other. The matter should be studied in detail in Natal but for the present it seems best to recognize only a single species.

In most specimens the disc of the scutum, mesal to the parapsidal lines, is shiny in comparison to the lateral parts of the scutum and the rest of the thoracic dorsum. However, in occasional specimens from every area the whole scutum is variably dull, the disc sometimes no more shining than adjacent areas.

The grouping of the forms here placed under *facialis* is obvious, especially on the basis of the distinctive features of the male genitalia, of the hind femur of the male, and the basitibial carina

TABLE 2
Some Characters of Selected Males of *Braunsapis facialis* from Natal[a]

	Bristle on process of gonostylus	Hairs on ventroapical plate	Yellow on mandible	Yellow on median axillary	Larva of siblings
Pietermaritzburg area	+	+	0	0	P
	+	+	+	0	–
	+	0	+	0	–
	+	0	0	0	–
St. Lucia Estuary	+	0	+	0	P
	+	+	++	0	–
Pietermaritzburg area	+	++	++	+	H
	+	++	++	0	H
	0	+	++	0	–
Nagle Dam	0	+++	++	0	–
Salt Rock	0	+++	++	+	–
	0	++++	++	+	–
Hluhluwe	0	+++	++	0	–
Ndumu	0	+++	++	+	(red legs)
	0	+++	++	+	–

[a]For explanation see p. 92.

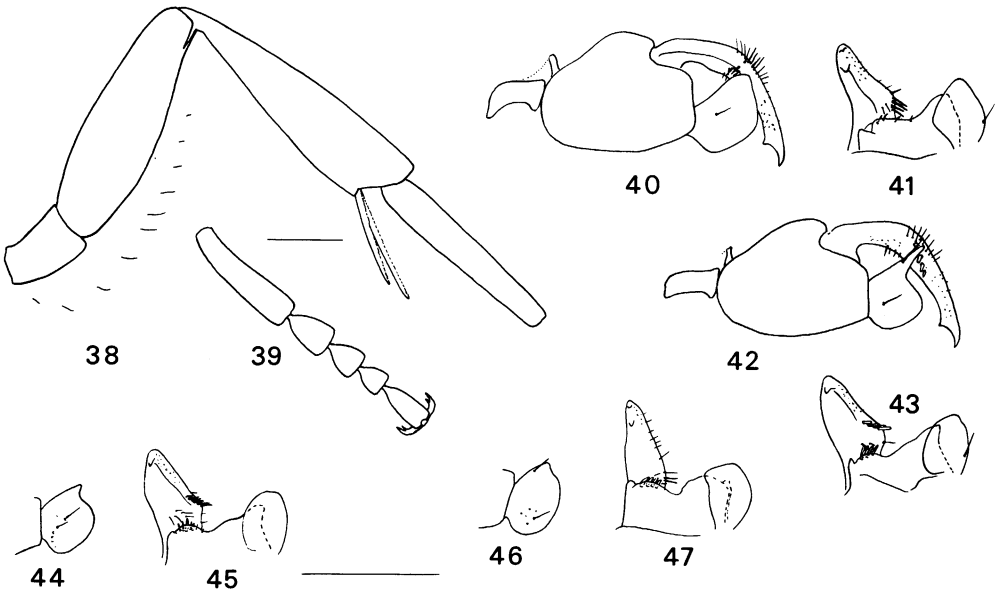
of the female. I believe that they probably constitute one biological species but further study in the field with large numbers of specimens is needed to develop reasonable assurance of the single species viewpoint.

Braunsapis natalica Michener
Figures 38-43

Braunsapis natalica Michener, 1970b, p. 204. (Type ♀, on temporary deposit KU, from Salt Rock, near Umhlali, Natal.)

Description. Female. Similar to *Braunsapis facialis* except as follows: (1) Length 5-6 mm.; forewing length 4 mm. (2-12) Coloration as in *B. facialis* from southern Africa, variable as indicated for that species in that area; clypeal mark, as in most *B. facialis*, occupying upper half or two-fifths of clypeus and extending down as broad band to lower clypeal margin; scape, as in *B. facialis*, with or without basal and apical yellow spots on underside; legs, as in most *B. facialis*, black except for brownish tarsi. (29) Upper clypeocular distance over 1.5 times width of scape, clypeus therefore narrower than in *B. facialis*. (37) Middle flagellar segments wider than long (in holotype) to about as long as wide. (54) Scopa (in holotype but not all other specimens, see below) reduced.

Male. Similar to *Braunsapis facialis* except as follows: (1m) Length 5-5.5 mm.; forewing length 3.5 mm. (2m-12m) Coloration as in *B. facialis* from southern Africa; paraocular mark limited to yellow on lateroclypeal carina; labrum mostly yellow; mandible black with small yellow spot (allotype) to mostly yellow; underside of scape black with yellow at base (allotype) to all yellow. (29m) Lower clypeocular distance less than half as wide as scape, upper about as wide as scape. (58) Front tarsal segments 2-3 wider than basi-



FIGS. 38-41. *Braunsapis natalica*, male allotype, Salt Rock, Natal. 38. Hind leg, side view. 39. Fore tarsus, top view. 40. Lateral view of genitalia. 41. Ventral view of ventroapical plate of gonocoxite, penis valve, and gonostylus.

FIGS. 42, 43. Same structures and view of *B. ?natalica* from Kasungu, Malawi.

FIGS. 44, 45. *Braunsapis gorillarum*, male, Nairobi, Kenya. 44. Lateral view of gonostylus. 45. Ventral view of ventroapical plate of gonocoxite, penis valve, and gonostylus.

FIGS. 46, 47. *Braunsapis simplicipes*, male, Nairobi, Kenya. Same structures and views.

Both scale lines represent 0.25 mm. Separate lines serve for figures 38, 39, and 40-47.

tarsus but perhaps not so much so as in *B. facialis*. (59) *Hind femur rather slender, widest near middle, without thickening or angle.* (64) Gonostylus in allotype longer than wide without dorsal projection (see discussion below). (65) Penis valve in allotype without peglike setae (see discussion below).

Comparative Comments and Variation. This species was described from Natal and Mozambique as a parasite of *Braunsapis leptozonia* and perhaps *B. facialis*. It is closely related to the latter but differs in the male genitalia, narrower clypeus, simple hind femora of the male, narrower front mediotarsal segments, etc., as described by Michener (1970b). For comparative purposes new sketches showing the distinctive features of the genitalia are provided here; the outer apical part of the ventroapical plate of the gonocoxite and, at least in Natal, the gonostylus and lack of pegs on the penis valve provide distinctive characters. For illustrations of other characters, see the original description. The type female and several others from Natal have a reduced scopa, as in some other parasitic species. However, females having the narrow clypeus of *B. natalica* and associated on flowers with males of that species at St. Lucia Estuary, Natal, have a full tibial scopa, as stated in the original publication. Moreover, three females from nest 1526 from Salt Rock have a clypeus that could belong to either *B. facialis* or *natalica*; they were associated with males of *B. natalica*, one reared from a pupa, and have a fully developed scopa. These females could represent the host species, *B. facialis*, or females of *B. natalica* with full scopas. A new record for *B. natalica* based on a single male specimen is Sordwana Bay, 80 km. east of Ubombo, Natal.

Four males having the hind femoral, front tarsal (except for the *Braunsapis facialis*-like front tarsi of the one from Angola), and gonocoxal characters of *B. natalica*, but with the gonostylus shaped as in *B. facialis* and with pegs on the penis valves are from certain localities in southern Africa. Corresponding females are known from my nests 1583 and 1591 in Malawi. The females do not seem to differ from those of *B. facialis* although the clypeus is rather narrow and adequate series might show an average difference from *B. facialis*. Variation in other characters among these specimens parallels that known in *B. facialis*. For the time being these specimens are simply called *B. ?natalica*. See comments under *B. gorillarum*. The localities involved are those in Malawi and Angola listed below.

Another confusing male specimen is from Mto Wa Mbu, Lake Manyara, Tanzania. It agrees with *Braunsapis natalica* in the hind femoral and front tarsal characters, but the gonostylus has merely an angle on it, as in *B. gorillarum*, and is thus intermediate between typical *B. natalica* and the specimens discussed in the above paragraph. The ventral apical plate of the gonocoxite is as in *B. natalica* and the coarsest setae on the penis valves are rather slender bristles, not pegs. The specimen differs from *B. gorillarum* in being somewhat larger and with more extensive yellow marks (entire clypeus, labrum, mandible, underside of scape, basitarsi). The identity of specimens such as this must remain in doubt until adequate series are obtained.

No firm decisions can now be reached on such forms as *Braunsapis natalica*. They could be rare variants of *B. facialis*. More likely they represent one or two rare species, one of which (*natalica*) is parasitic and sometimes has the scopa reduced.

One or more of the names listed under *Braunsapis facialis* could be based on almost indistinguishable scopate females of *B. natalica* but there is no evidence in favor of this, and the rarity of these forms suggests that it is improbable.

Distribution: Natal and Mozambique, perhaps to Malawi, Tanzania, and Angola. As indicated above, there is confusion as to the limits of the species which probably will not be clarified until more material is available. SOUTH AFRICA: *Natal*: Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; 18 km. S of Pietermaritzburg; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Sordwana Bay, 80 km. E of Ubombo. MOZAMBIQUE: Lourenço Marques. MALAWI: Kasungu, Central District. ANGOLA: Vila Flor, Huambo.

Braunsapis gorillarum (Cockerell)
Figures 44, 45, 48-50

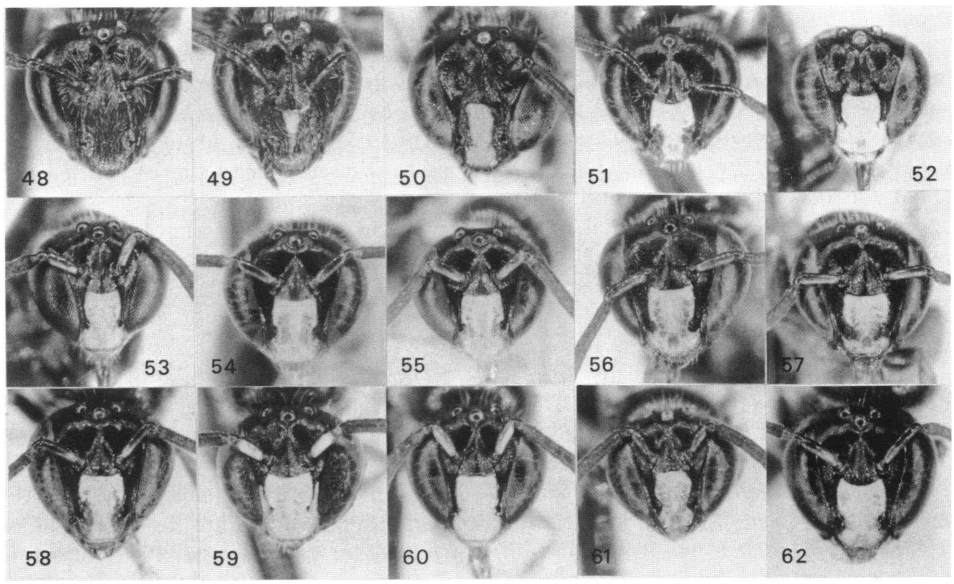
Allodapula gorillarum Cockerell, 1936a, p. 8. (Type ♂, AMNH, from near Tshibinda, Zaire. Placed in *Braunsapis* by Michener, 1971a.)

Braunsapis kenyae Michener, 1970a, p. 4 (*nomen nudum*).

This is the species called *Braunsapis kenyae* by Michener (1970a). At the time of preparation of that paper, it was to be described promptly as new, but discovery that the proper name is *B. gorillarum* caused the description to be withdrawn.

Description. Female. Similar to *Braunsapis facialis* except as follows: (1) Length 5-6 mm.; forewing length 3.5-4 mm. (2-12) Black without yellow marks or with weak yellowish T on clypeus; posterior lobe of pronotum probably partly yellow in some populations but no such females available; small segments of tarsi slightly brownish; tegula translucent dark brown; wing base black. (14) Dorsal metasomal hairs often gray or pallid. (29) Upper clypeocular distance over 1.5 times width of scape. (37) Middle flagellar segments slightly wider than long to about as wide as long.

Male. Similar to *Braunsapis facialis* except as follows: (1m) Length 4.5 mm.; forewing length 3.5-4 mm. (2m-12m) Black with irregular longitudinal clypeal band, sometimes a spot on labrum and on mandible, and (in holotype only) posterior part of pronotal tubercle yellow. Tegular, wing base, and leg coloration as in female, basitarsi being black. (37m) Middle flagellar segments as long as broad or broader than long. (59) Hind leg as illustrated for *B. natalica* or femur even more slender. (63) Ventroapical plate of gonocoxite as shown in figure 45, about as in *B. natalica*, convex part of



FIGS. 48-50. *Braunsapis gorillarum*, facial views. 48, 49. Females, Nairobi, Kenya. 50. Holotype male, near Tshibinda, Zaire.

FIGS. 51-53. *Braunsapis simplicipes*, facial views. 51. Female, Nairobi, Kenya. 52. Male, same locality. 53. Holotype male, same locality.

FIGS. 54, 55. *Braunsapis pallida*, facial views, Kasungu, Malawi. 54. Allotype female. 55. Holotype male.

FIGS. 56-61. *Braunsapis bouyssoui*, facial views. 56, 57. Females, Salt Rock, Natal. 58. Female, Lagos, Nigeria. 59. Male, Catuana, Lourenço Marques District, Mozambique. 60. Male, Kasungu, Malawi. 61. Male, Matopo Hills, Rhodesia.

FIG. 62. *Braunsapis debilis*, facial view, female, Tingoh, Menchin River, near Wum, West Cameroon.

margin with mixture of pegs and hairs. (64) Gonostylus about as wide as long, with dorsal angle, not so long and slender as in *B. facialis*. (65) Penis valves with some rather coarse bristles, some of which are blunt in some specimens and thus like slender pegs.

Comparative Comments. This is a form which, like *Braunsapis natalica* and *?natalica*, is very close to *B. facialis*. In fact it is in some ways intermediate between the forms called *B. natalica* and *?natalica*. In coloration *B. gorillarum* is the equivalent of the large, dark, tropical forms of *B. facialis*. It is, however, distinctly smaller, about the size of or slightly smaller than the Natal populations of *B. facialis*.

Distribution. Zaire to Kenya. A good series is available from the highlands of Kenya but only one male from Zaire. ZAIRE: *Kivu*: Tshibinda. BURUNDI: Bururi, 1800-2000 m. altitude. RWANDA: Kayove, Gisenyi, 2000 m. altitude; Rugege, Rutovu, 2350 m. altitude. KENYA: Karen, Nairobi, 1830 m. altitude; Kikuyu Summit, 2135 m. altitude; Lake Naivasha; Nairobi; 80 km. SE of Nairobi.

Braunsapis simplicipes Michener
Figures 46, 47, 51-53

Braunsapis simplicipes Michener, 1971a, p. 296. (Type ♂, AMNH, from Nairobi, Kenya [*nomen nudum* in Michener, 1969b and 1970a].)

Description. Female. Similar to *Braunsapis facialis* except as follows: (1) Length 4.5-5 mm.; forewing length 3.5-4 mm. (2-12) Black, the following parts yellow: most of upper half of clypeus, extended as a broad longitudinal band through lower half; pronotal lobe. Tegula translucent brown; wing base including median axillary sclerite light brown to black. Basitarsi brownish black, small segments of tarsi lighter brown to brownish black. (14) Hairs of terga 4-6 dusky, short, blunt, slender, usually straighter than in *B. facialis*. (20) Ocelloccipital distance slightly less than ocellar diameter (a poor character; because of rounding of head there is no sharp line between vertex and occiput). (25) Upper margin of clypeus strongly concave (as in *Halterapis nigrinervis*) (both sexes). (27) Clypeo-antennal distance nearly equal to diameter of antennal socket (both sexes). (29) Lower clypeocular distance nearly two-thirds width of scape. (37) Middle flagellar segments wider than long.

Male. Similar to *Braunsapis facialis* except as follows: (1m) Length 4 mm.; forewing length 3.5 mm. (2m-12m) Black, the following parts yellow: clypeus; most of labrum; most of mandible; rim on paraocular area adjacent to lower half of clypeus (rarely extending up as far as tentorial pit); pronotal tubercle. Thoracic coloration as in female. Tarsi rather dark brown. (29m) Lower clypeocular distance little more than one-fourth width of scape, upper one-half to two-thirds width of scape. (33m) Malar area almost linear, length much less than half width of scape. (58) Tarsal structure as described for *B. facialis*, front tarsal segments 2 and 3 broader than basitarsus in holotype and most other males but sometimes subequal to basitarsus in width. (59) Hind leg as illustrated for *B. natalica*. (63) Ventroapical plate of gonocoxite as shown in figure 47, lateral part a broadly rounded lobe as seen from beneath. (64) Gonostylus broader than long with dorsal angle present but weaker than in *B. gorillarum* (distribution of setae on gonostylus not necessarily as in figure 46; upper seta may be absent and another seta may be on central area). (65) Penis valves without coarse bristles or pegs.

Comparative Comments. This species has the size and most structural features of *Braunsapis gorillarum* from which it differs in the more extensive yellow maculation, strong concavity of the upper clypeal margin, more slender dorsal metasomal hairs, and in details of male genitalia.

Distribution. Highlands of Kenya. KENYA: Karen, Nairobi, 1830 m. altitude; Nairobi; 80 km. SE of Nairobi. The other localities listed by Michener (1971a) are based on misidentifications of a species near *Braunsapis facialis*.

Braunsapis rubicundula (Strand), new combination

Allodape rubicundula Strand, 1915, p. 57. (Type ♂, Berlin, from Kilonda [= Langenburg], Tanzania.)

The species is known from only two males and one doubtfully associated female; the males

have not been available for full comparative descriptions. The body is brown all over, a little darker than in *Braunsapis pallida*, but without the dark head and thoracic dorsum of that species. The wings are clear and, except for body color, there is no evidence that the specimens are teneral.

The hind trochanter of the male is simple, the femur thickened and with a rounded angle before the middle, as in *Braunsapis facialis*, but the smaller size, noticeably concave upper clypeal margin (as in some specimens of *facialis*), pale tegula, and pale wing bases are more as in *B. bouyssoui*.

A female, which probably belongs to this species, is from 23 km. NW of Cacula, Angola, 1000 m. altitude, May 25, 1958 (E. S. Ross and R. E. Leech). It has face marks as in fully marked individuals of *Braunsapis facialis* and the underside of the scape and the pronotal lobes are yellow. The body coloration is as for the type males, including transparent tegulae and pale wing bases. The dorsal abdominal hairs are as in *B. facialis* but pale. The posterior margin of the basitibial plate is weakly indicated, as in *B. facialis*. In size the specimen is small for *B. facialis*, length 4.5 mm., forewing length 3.5 mm.

Both sexes are for practical purposes like small, pale individuals of *B. facialis*. The specimens could represent a distinct species or pale, depauperate specimens of *B. facialis*.

Braunsapis pallida, new species
Figures 54, 55, 63-66

Diagnosis. Readily recognized by the largely testaceous body, reduced scopa, and the flattened and somewhat upturned sixth tergum of the female. Differs from the only other largely brown species, *Braunsapis rubicundula*, by these characters and the essentially simple rather than angulate hind femur of the male.

Description. Female. (1) Length 5 mm.; forewing length 4 mm. (2-12) *Body and legs testaceous except for scutum, scutellum, metanotum, and propodeum which are dark brown* (or the last three light brown); mesepisternum light brown; head black except for dark brown supraclypeal and lower hypostomal areas and labrum, mandible, and lateral parts of lower half of clypeus, which are testaceous; the following parts yellowish white: clypeus except lateral parts of lower half; underside of scape at least basally. Pronotal lobe yellowish white, rather densely covered with short, plumose white hairs. Antenna dark brown except as indicated above. Tegula transparent. Median axillary sclerite pale yellowish testaceous, like rest of wing base apparatus. (13) Wings transparent, veins and stigma brown. (14) Dorsal metasomal hairs rather slender, nearly straight, light brown, some of the larger ones infuscated. (16) Clypeus with scattered large punctures, whole surface dull and minutely and closely reticulate, more coarsely so above than below. (20) Interocellar distance subequal to or slightly more than ocellocular distance; ocelloccipital distance less than ocellar diameter. (25) Upper margin of clypeus uniformly gently concave. (27) Clypeoantennal distance slightly less than diameter of antennal socket. (29) Clypeocular distance about as in *Braunsapis facialis*. (31) Genal area somewhat narrower than in *B. facialis*, almost impunctate. (33) Malar area anteriorly less than half as long as diameter of scape. (37) First flagellar segment nearly twice as wide as long, middle segments slightly longer than wide. (43) Stigma about as long as costal margin of marginal cell which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell as in *B. facialis*. (45) Second submarginal cell about half as long as first, distance from first transverse cubital vein to first recurrent less than distance from second recurrent to second transverse cubital. (52) Basitibial plate not defined. (54) *Tibial scopa reduced*, somewhat like that of *Allodapula guillarmodi*, hairs of lower surface of tibia nearly straight and not or scarcely branched; brush at base of mid-femur and apex of mid-trochanter not well developed, being replaced by ordinary hairs. (55, 56) *Sixth tergum rather flattened and upturned apically, lateral margins more narrowly rounded in cross section than usual in the genus*, thus approaching *Allodapula* in this respect. Ventrolateral part of sixth tergum with transverse band of erect, plumose white hairs, this band weakly continued across sixth sternum. *Apex of sixth sternum acute and upturned with small apical notch*; sting strong and curved upward.

Male. Similar to female except as follows: (1m) Length 4.5 mm.; forewing length 4 mm. (2m-12m) Coloration as in female but clypeus, labrum, mandible, and underside of scape largely yellowish white. (29m) Lower clypeocular distance less than half width of scape, upper about width of scape. (58) Front basitarsus about as long as segments 2-5 together, mediotarsal segments not flattened, no wider than basitarsus; tarsi otherwise as in *B. facialis* but middle basitarsus as long as segments 2-5 together. (59) Hind trochanter without teeth, femur simple except for barely perceptible angle on underside before middle, both trochanter and femur with long, rather sparse, sparsely and briefly branched hairs on undersurfaces, longer than trochanteral diameter, somewhat shorter than maximum femoral diameter. (60) Membranous convexities of eighth tergum about as in *B. facialis*. (61) Seventh sternum not emarginate. (63) Ventroapical plate of gonocoxite as shown in figure 66, with about four short, upturned, robust, marginal pegs. (64) Gonostylus longer than wide, not angulate. (65) Penis valve rather broad, with neither pegs nor coarse bristles.

Comparative Comments. The italicized features in the description are especially distinctive. The only other largely brown *Braunsapis* is *B. rubicundula.*

Distribution. Known only from the type locality.

Type Material. Holotype male, allotype female, and one female and four male paratypes: Kasungu, Central District, Malawi, April 10, 1967 (C. D. Michener). Types at AMNH except one paratype at KU and one at BM.

All the specimens were taken from a single nest in a dead twig of *Thevetia* growing in the shade of a tree in the town of Kasungu. Nothing about the nest suggested that the bees were parasitic and the species was not included in the treatment of parasitic allodapines (Michener, 1970b). However, having now noted the reduced scopa (the same in both females), I presume that it is parasitic, a view corroborated by the unusual shape of the last tergum and the strong, slightly curved sting. There was no associated host; hence if the bees were parasitic in the manner of other allodapines, the host female(s) must have died or left after rearing a substantial number of the parasite. Both females of *B. pallida* were unworn and neither had any pollen whatever on the scopa or body, facts consistent with the idea that the species is parasitic.

Etymology. The name refers to the pale testaceous coloration, which is unique in the genus although approached by *Braunsapis rubicundula.*

Braunsapis bouyssoui Group

This group contains *Braunsapis bouyssoui* and *B. strandi*, which are not distinguishable, so far as known, in females. Unfortunately it is a group in which males are relatively uncommon, and all eight of the synonymous names are based on female types. Males were collected with the female types of the two oldest names, and these males belong to the species here called *B. bouyssoui.* However, one or more of the other names could be based on females of *B. strandi.*

Braunsapis bouyssoui has the remarkable feature of a simple, scarcely convex membranous area of the eighth tergum of the male. This perhaps primitive feature is shared with *B. rolini*, and for this and other reasons it seems that the group of *B. bouyssoui* is closely related to *B. rolini* and *nautica.*

Braunsapis bouyssoui (Vachal)

Figures 56-61, 67-75

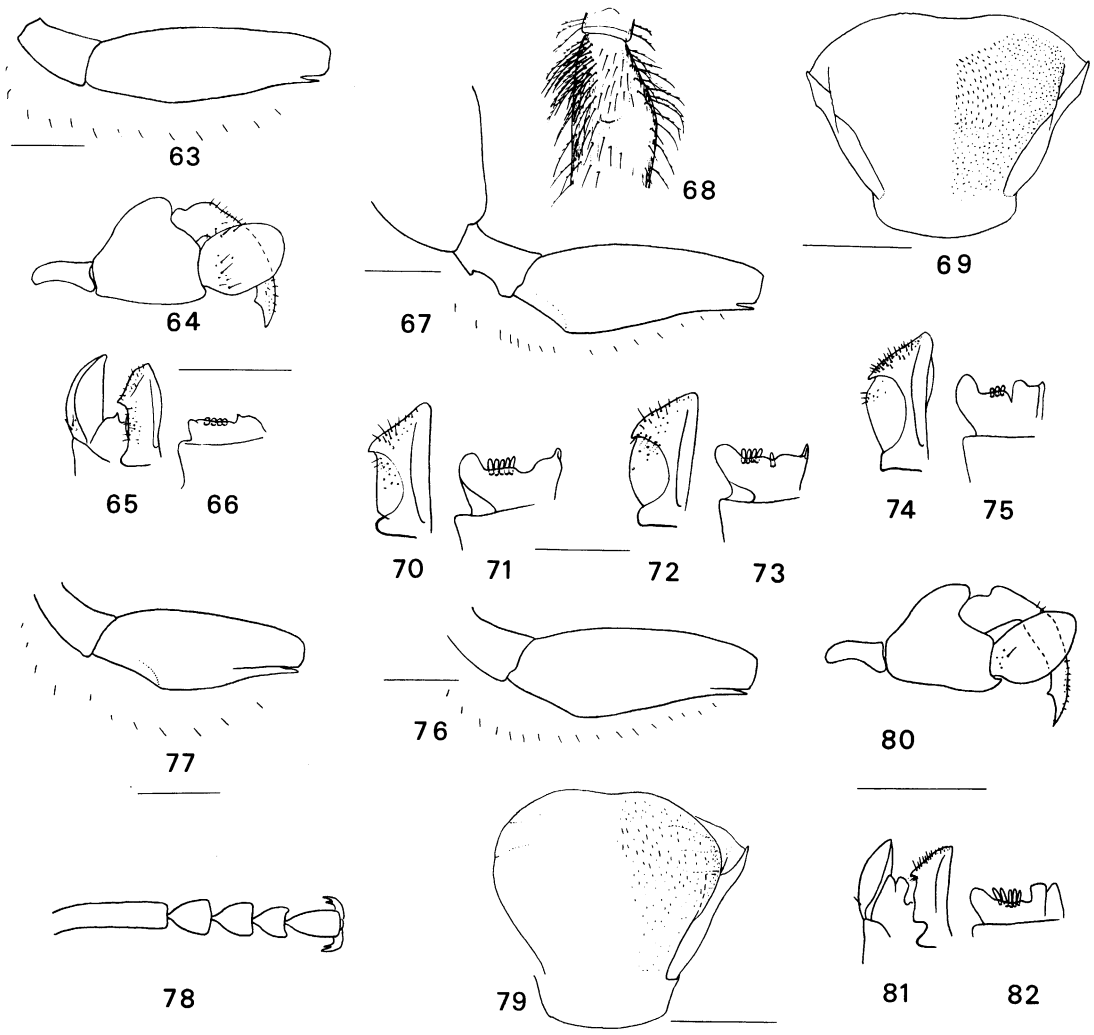
Allodape bouyssoui Vachal, 1903, p. 386. (Lectotype ♀, Paris, from Rio Muni. Placed in *Braunsapis* by Michener, 1971a.)

Allodape rufipes Friese, 1914a, p. 148. (New synonym. Lectotype ♀, Berlin, from Kigonsera near Kilonda [= Langenburg], Tanzania. A female in the Berlin museum was labeled "Typus," a male "type." The female was described first and in greatest detail, hence is designated lectotype; two other females and one male with original data are doubtless cotypes. Placed in *Braunsapis* by Michener, 1969b.)

Allodape claripes Friese, 1914a, p. 148. (New synonym. Lectotype ♀, Berlin, from Conakry, Guinea.)

Allodape sansibarica Strand, 1915, p. 56. (New synonym. Type ♀, Berlin, from Zanzibar, Tanzania.)

Allodapula bevisi Cockerell, 1920, p. 308. (New synonym. Type ♀, BM, from Umbila, Durban, Natal.)



FIGS. 63-66. *Braunsapis pallida*, male paratype, Kasungu, Malawi. 63. Lateral view of hind trochanter and femur. 64. Lateral view of male genitalia. 65. Dorsal view of left gonostylus and penis valve. 66. Ventral view of left ventroapical plate of gonocoxite.

FIGS. 67-75. *Braunsapis bouyssoui*, male, Salt Rock, Natal, except as otherwise stated. 67. Lateral view of hind coxa, trochanter, and femur. 68. Underside of base of hind femur, outer side to right. 69. Eighth tergum and roof of genital chamber. 70. Dorsal view of left penis valve. 71. Ventral view of left ventroapical plate of gonocoxite. 72-75. Same views of two other specimens, the last from Blantyre, Malawi.

FIGS. 76. *Braunsapis strandi*, lateral view of hind trochanter and femur of male.

FIGS. 77-82. *Braunsapis rolini*, male, Nairobi, Kenya. 77. Lateral view of hind trochanter and femur. 78. Top view of front tarsus. 79. Eighth tergum and roof of genital chamber. 80. Lateral view of genitalia. 81. Dorsal view of left gonostylus and penis valve. 82. Ventral view of left ventroapical plate of gonocoxite.

All scale lines represent 0.25 mm. Separate lines serve for figures 63, 64-66, 67, 69, 70-75, 76, 77 and 78, 79, 80-82.

Allodape citrifloris Cockerell, 1935c, p. 3. (New synonym. Type ♀, AMNH, from Martini's Concession, Eritrea, Ethiopia.)
Allodape comperei Cockerell, 1935c, p. 3. (New synonym. Type ♀, AMNH, from Martini's Concession, Eritrea, Ethiopia.)
Allodapula bevisi vagans Cockerell, 1936a, p. 3. (New synonym. Type ♀, BM, from Bukavu, Zaire.)
Allodapula matopina Cockerell, 1936a, p. 14. (New synonym. Type ♀, AMNH, from Matopo Hills, near Bulawayo, Rhodesia.)

Description. Female. (1) Length 4-5 mm.; forewing length 3.5-4 mm. (2-12) Black, the following parts yellow: entire clypeus or sometimes upper half and longitudinal median band on lower half (as in fully marked *Braunsapis facialis*); parts of labrum and mandible (sometimes); underside of scape (sometimes); pronotal lobe; spot on tegula; and wing base (median axillary sclerite sometimes with inner half dark). The following parts red: scape, labrum, and often mandible except for yellow areas sometimes present and dark mandibular apex. Lower lateral parts of clypeus usually red or brown when these areas are not yellow. Flagellum dark brown or blackish. Tegula transparent. *Legs with varying amounts of red, minimally tarsi and front tibia* (middle and hind basitarsi infuscated), maximally entire legs except coxae. Posterior margins of terga inconspicuously brownish. (13) Wings only slightly brownish, veins and stigma dark brown. (14) Dorsal hairs on terga 4-6 whitish or more often yellowish or golden, sometimes light fuscous, slender, blunt, only slightly curved posteriorly. (16) Clypeal punctures small or minute, widely spaced; punctures large, irregular and closer along lower and lower lateral margins; ground between punctures minutely reticulate (more finely so than in *B. rolini*), slightly to noticeably dull. (20) Interocellar distance slightly to distinctly more than ocellocular distance; ocelloccipital distance less than ocellar diameter. (25) Upper margin of clypeus distinctly concave, sometimes with median convexity. (27) Clypeo-antennal distance usually less than but sometimes equal to diameter of antennal socket. (29) Lower clypeocular distance less than width of scape, upper about 1.3 times width of scape. (31) Genal area scarcely roughened, shining, with only minute, widely scattered punctures and hairs. (33) Malar area anteriorly (where shortest) less than half as long as diameter of antennal scape. (37) First flagellar segment wider than long, middle segments wider than long or about as long as wide. (43) Stigma scarcely shorter than costal margin of marginal cell which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell separated from wing margin by about a vein width. (45) Submarginal cells usual for the genus. (52) Basitibial plate not defined or sometimes with weak carina along posterior margin apically.

Male. Similar to female except as follows: (1m) Length 4-4.5 mm.; forewing length 3-3.5 mm. (2m-12m) Black, the following parts yellow: clypeus (very rarely dark laterally); labrum (rarely dark); usually mandible or spot on it (rarely mandible black except for yellowish red apex); often paraocular area to above level of tentorial pit; and underside of scape or scape except for dark upper surface; thoracic yellow areas as in female. Red areas absent on head but present on legs as in female, or basitarsi, all or only posterior ones, dull whitish or reddish white, not much contrasting with tibiae and more distal tarsal segments. (29m) Lower clypeocular distance less than half, often one-third, width of scape, upper less than width of scape. (33m) Malar area with length about or less than one-fourth of width of scape. (37m) First flagellar segment more than twice as wide as long. (58) Front basitarsus longer than segments 2-4 together, these segments not broadened, equal in width to apex of basitarsus; hind tarsus as described for *B. facialis* or basitarsus subequal in length to remaining segments; mid-tarsus as described for *B. facialis* or basitarsus subequal in length to tibia. (59) Hind trochanter on ventral surface with median and apical tubercles separated by broad concavity, median one very rarely absent, longest hairs about equal to diameter of trochanter; hind femur with ventral angle near base and flattened or slightly excavated surface basal to angle, this surface with long and rather conspicuous, plumose hairs mesally (fig. 68). (60) *Eighth tergum only gently biconvex, not at all wrinkled in brainlike pattern, with only spicules or short hairlike projections.* (61) Seventh sternum weakly emarginate medioapically. (63)

Ventroapical plate of gonocoxite with two to five rather long pegs, shaped as in figures 71, 73, and 75, lateral portion at right angles to ventral portion, separated from it by a carina, the lateral portion not reliably shown in illustrations since it extends back, away from the observer. (64) Gonostylus slightly longer than wide, rounded, reticulately roughened. (65) Penis valves without coarse bristles, in side view about as in *B. rolini.*

Distribution. The Transkei to Ethiopia, west to Angola to Senegal. Localities from which males are available and therefore specific identity clear, are marked with an asterisk. Localities that are not marked are included by virtue of females only, probably of the commoner *B. bouyssoui* but some may be based on females of the rarer *B. strandi.* SOUTH AFRICA: *Transkei*: Port St. Johns. *Natal*: Durban; 19 km. N of Greytown; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Hluhluwe; Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; Isipingo; 10 km. S of Kwambonambi; *Mfongosi, Zululand; Nagle Dam, 27 km. E of Pietermaritzburg; Ndumu Reserve, Zululand; *Pietermaritzburg; *St. Lucia Estuary, Zululand; *Salt Rock, 47 km. N of Durban; *Scottburgh; 16 km. N of Ubombo; *Umbilo, Durban. *Transvaal*: Barberton; Hope (Ellisras); 14 km. W of Kaapsenhoop; 27 km. E of Nelspruit, 915 m. altitude. RHODESIA: *Bulawayo; *Matopo Hills, 64 km. S of Bulawayo. MOZAMBIQUE; Catuane, Lourenço Marques District; Lourenço Marques; Masiene. MALAWI: *Blantyre; *Cape McClear, Lake Malawi; Mlanje; Monkey Bay, Lake Malawi. ANGOLA: Benguela; 23 km. NW of Cacula, 1000 m. altitude; 8 km. E of Vila Arriaga, 1000 m. altitude. GABON; Lambaréné, Moyen-Ogooué; Lastoursville. ZAIRE: *Shaba* (= *Katanga*): 29 km. W of Luanza, 1300 m. altitude. *Bandundu*: Wombali. *Lower Zaire*: Benza Mazola; Kinshasa (= Leopoldville); Kisantu; Lemba; Matadi; Mayumbe. *Equator*: Bokuma. *Kivu*: Bukavu (= Costermansville); Nyangwe; Rutshuru Region. *Upper Zaire*: Basoko; Eala; Gangala-na-Bodio, Uele; Paulis, upper Uele; Yangambi. RWANDA: Mountain east of Muhavura, 2100 m. altitude; Ruhengeri, 1900 m. altitude. TANZANIA: *Kigonsera, near Kilonda (= Langenburg); Morogoro; *Mto Wa Mbu, Lake Manyara; *Tabora; Zanzibar. UGANDA: Kawanda, Kampala. KENYA: 18 km. S of Maktsu, Teita Province; *21 km. S of Malindi; *Nairobi; Timboroa, 64 km. SE of Eldoret, 2810 m. altitude. ETHIOPIA: Martini's Concession, Eritrea; 6 km. NE of Welenchiti, Shewa. RIO MUNI; No locality. NIGERIA: Lagos; *Olokemeji, Ibadan. GHANA: Dadowa; Legon, Accra. LIBERIA: *Cuttington College, Bong County. GUINEA: Conakry. SENEGAL: *Dakar.

Variation. Types of the two names based on specimens from Eritrea have the upper margin of the clypeus rather uniformly concave (especially in *citrifloris*), the upper lateral angles of the clypeus right angular rather than acute and separated from the antennal sockets by the diameter of a socket instead of a lesser distance, and the dorsal metasomal pubescence whitish rather than golden (especially in *citrifloris*). Farther south individuals with these characters occur intermixed with more usual specimens; in the absence of other specimens from Eritrea it cannot be stated that these are regional attributes of a northeastern population.

Although in most females nearly the whole clypeus is pale, in some individuals and to varying degrees the lateral parts of the lower half of the clypeus are brown, red, or black so that, with the pale upper half, a clypeal mark like that of well-marked specimens of *Braunsapis facialis* is formed. Such a clypeal mark is especially common in specimens from West Africa, for example, the lectotype of *claripes.* Commonly in such specimens the labrum and scape are red, without pale markings, whereas the labrum is sometimes largely pale and the underside of the scape is usually pale in specimens with the whole clypeus pale. The mandible is black, brown, or with a pale patch, or almost all pale, the last being most common in material from lowland equatorial parts of Africa (Kenya coast, Uganda, Nigeria, etc.).

In one male studied (Matopo Hills, Rhodesia) only the longitudinal median part of the clypeus and the underside of the scape were pale, but usually the whole clypeus, labrum, mandibles, and often lateral face marks extending well above the tentorial pits are also pale.

In all populations sampled the red of the legs varies. In some individuals the legs are all red except for the coxae. At the other extreme are a

few specimens with red limited to the tarsi and front tibiae. All intermediates exist.

In one male from Dakar the median projection on the hind trochanter is absent; in all others studied including specimens from Dakar, it is present although its position varies somewhat, from before to beyond the middle of the segment.

The male genitalia vary as shown in figures 70 to 75. The specimens from which figures 70 to 73 were prepared are from the same locality. The third genitalia figure represents a specimen differing from all others in having only two or three pegs on the ventral apical plate of the gonocoxite and these directed upward instead of posteriorly as in other specimens dissected. There are also differences in the shape of these plates and the penis valves. Externally, however, the specimen is typical of *Braunsapis bouyssoui.*

Braunsapis strandi (Masi), new combination
Figure 76

Allodape strandi Masi, 1930, p. 68. (Two female cotypes, Genoa, from Villagio Duca, Abruzzi, Somalia.)

I have not seen types of this species. Photographs of two female cotypes kindly sent by Dr. E. Tortonese indicate a bee of the group of *Braunsapis bouyssoui,* and Masi's description of the associated male's hind legs indicates the species.

Description. Female. Probably not distinguishable from *Braunsapis bouyssoui*; those definitely associated with males of *B. strandi* have maximal yellow markings for *B. bouyssoui* including whole labrum and nearly whole mandible.

Male. Similar to *Braunsapis bouyssoui* except as follows: (2m-12m) Labrum and mandible largely yellow; yellow of paraocular area absent to reaching nearly to middle of upper half of clypeus. (59) Hind trochanter simple (fig. 76). (60) Eighth tergum coarsely wrinkled with hairlike projections as in most *Braunsapis.*

Comparative Comments. The unwrinkled eighth tergum, with only spicules or short projections, is an extraordinary feature of *Braunsapis bouyssoui*, a feature unique in the genus except for *B. rolini.* That an otherwise closely similar species, *B. strandi*, has a perfectly normal eighth tergum illustrates that a major evolutionary change in one character is not necessarily accompanied by changes in many other characters.

Distribution. Malawi, Somalia, Nigeria and Liberia. The localities listed below are based on males; some of the localities listed under *Braunsapis bouyssoui* may be based upon unrecognized females of *B. strandi.* MALAWI: Kasungu, Central District. SOMALI REPUBLIC: Villagio Duca, Abruzzi. NIGERIA: Olokemeji, Ibadan. LIBERIA: Cuttington College, Bong County.

Variation. The specimens from Nigeria have only the tarsi and front tibiae red, the other parts of the legs black, whereas a male of *Braunsapis bouyssoui* from the same locality has the legs almost wholly red. However, the male of *B. strandi* from Malawi has the legs almost all red and those from Liberia have them variably but largely red, showing that the amount of red on the legs is not a specific character, at least when the whole range is considered.

Braunsapis rolini (Vachal)
Figures 77-82, 86-89

Allodape rolini Vachal, 1903, p. 387. (Type ♀, Bruxelles, from Boma Sundi, Zaire; lacks metasoma. Placed in *Braunsapis* by Michener, 1969b.)

Allodape perpusilla Strand, 1912, p. 290. (New synonym. Type ♀, Berlin, from Alen, Benito region, Rio Muni.)

Allodape progonia Strand, 1915, p. 54 (♂, not ♀, new synonym. Lectotype ♂, Berlin, from "Nord-Kamerun." Description based primarily on two males, one here designated lectotype; the female, from different locality, was mentioned only comparatively and is another species.)

Description. Female. (1) Length 3.5-5 mm.; forewing length 3-3.5 mm. (2-12) Black, the following parts yellow: clypeal markings (figs. 86-88), underside of scape in some individuals with red legs, pronotal lobe, most or all of median axillary sclerite and other parts of wing base. Labrum, distal part of mandible, and underside of scape and entire metasoma red-brown in some of the individuals with red legs. Tegula transparent brown. Legs black with small tarsal segments brown to entirely red. Posterior mar-

gins of terga brownish. (13) Wings slightly brown, veins and stigma dark brown. (14) Dorsal hairs of terga 4-6 rather slender but blunt, nearly straight, light brown to dusky brown. (16) Clypeus relatively broad compared to most species, part above tentorial pits about twice as broad as long; punctures small and very scattered above, larger below; surface dull, minutely reticulated, more coarsely so above than below, as in *B. pallida* but reticulation coarser than in other species (both sexes). (20) Interocellar distance equal to ocellocular distance; ocelloccipital distance subequal to ocellar diameter. (25) Upper clypeal margin gently concave, usually with median convexity often as high as upper lateral angles of clypeus (both sexes). (27) Clypeoantennal distance less than diameter of antennal socket (both sexes). (29) Lower clypeocular distance about half diameter of scape, upper more than diameter of scape. (31) Genal area shining, with only sparse hairs and minute punctures (both sexes). (33) Malar area less than half as long as diameter of scape. (37) First flagellar segment about 1.5 times as wide as long; middle flagellar segments wider than long. (43) Stigma subequal to or slightly shorter than costal margin of marginal cell, which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell separated from margin by a vein width or less. (45) Submarginal cells usual for genus. (52) Basitibial plate not defined or with apical portion of posterior margin defined by carina.

Male. (1m) Length 4-4.5 mm.; forewing length 3-3.5 mm. (2m-12m) Black, the following parts yellow: clypeus, labrum, sometimes part of mandible, pronotal lobe. (Males with red legs probably exist and probably have more extensive yellow areas.) Median axillary sclerite largely or wholly dark brown. Legs black with small tarsal segments brown. (29m) Lower clypeocular distance about one-fourth width of scape, equal in width to length of malar area; upper clypeocular distance one-half to two-thirds width of scape. (33m) Malar area about one-fourth as long as diameter of scape. (37m) First flagellar segment twice as wide as long, middle segments longer than wide. (52) Basitibial plate not defined. (58) Tarsi as described for *B. facialis*, including enlarged mediotarsal segments of front leg, but middle basitarsus nearly as long as tibia and sometimes shorter than remaining tarsal segments together. (59) Hind trochanter simple; hind femur appearing simple in some views but with weak angle about one-third distance from base to apex and shallow concavity on outer ventral surface basal to angle, only small distal part of concavity next to angle smooth; trochanter and femur with rather sparse, not or sparsely branched hairs on undersurfaces, those of trochanter as long as diameter of trochanter, those of femur shorter than diameter of femur. (60) *Eighth tergum without strongly convex paired membranous areas*, but with whole membrane gently convex and having only very weak wrinkles; surface with only short hairlike projections. (61) Seventh sternum subtruncate or very feebly emarginate apically. (63) Ventroapical plate of gonocoxite in ventral view as in figure 82, lateral projection bilobed as seen from side, at right angles to remaining part, the two meeting in longitudinal carina. (64) Gonostylus much longer than wide (fig. 80), directed somewhat more upward than in some species. (65) Penis valve rather slender with hairs sparse, absent from basal part, outer margin near base with incision resulting in right angular outline.

Distribution. Tropical Africa from Mozambique to Kenya and Zaire to Liberia, from sea level to near 2000 m. altitude in the Kenya highlands. MOZAMBIQUE: Lourenço Marques. ZAIRE: *Shaba* (= *Katanga*): 29 km. W of Luanza, 1300 m. altitude; Lubumbashi (= Elizabethville). *Lower Zaire*: Boma Sundi. *Kivu*: Rutshuru. *Upper Zaire*: Eala; Kisangani (= Stanleyville) to Kilo. UGANDA: 35 km. W of Tororo. KENYA: Kaimosi Mission, 43 km. NE of Kisumu, 1650 m. altitude; Nairobi. RIO MUNI: Alen, Benito District. CAMEROON: Buea, Western Province; 11 km. S of Ebolowa, Eastern Province, 580 m. altitude. NIGERIA: Lagos; Olokemeji, Ibadan. GHANA: Legon, Accra. LIBERIA: Cuttington College, Bong County.

Variation. Some of the females from Lourenço Marques, Accra, Ibadan, and Cuttington College have the tibiae and tarsi partly or wholly red-brown, and one of the males from Ibadan has similarly colored legs. A series, consisting entirely of females, from near Luanza, Zaire, has the legs, often including the coxae, red, and in some of these specimens the meta-

soma is largely or wholly red. Red coloration on the legs (except for tarsi) or metasoma was not found in other localities, even those geographically between the ones where red-legged individuals occur.

The variation in the facial marks is considerable (figs. 86-88), specimens with red on the legs having, on the average, more extensive pale markings.

Braunsapis nautica (Cockerell), new combination
Figures 84, 85

Allodapula nautica Cockerell, 1935a, p. 370. (Type ♀, Tervuren, from Eala, Zaire.)

Description. Female. Similar to *Braunsapis rolini* except as follows: (1) Length 5-6.5 mm.; forewing length 4 mm. (2-12) Labrum, legs, scape, metasoma, etc., largely black as in dark specimens of *B. rolini.* In the type and the two specimens from Nigeria, pronotal lobe and median axillary sclerite black, but in Uganda specimen coloration of these parts as in *B. rolini.* (20) Ocelloccipital distance greater than ocellar diameter. (29) Clypeocular distances somewhat greater than in *B. rolini.*

Distribution: Uganda to west Africa. ZAIRE: *Bandundu*: Wombali. *Upper Zaire*: Eala. UGANDA: Kampala. NIGERIA: Olokemeji, Ibadan.

Braunsapis debilis (Cockerell), new combination
Figure 62

Allodape debilis Cockerell, 1934a, p. 235. (Type ♀, Tervuren, from Du River, Liberia.)

Because of the presence of a weakly developed tibial brush and the weak pygidial plate and red metasoma, this is an unusual species. More material and especially males are needed to verify its generic position.

Description. Female. (1) Length 4-5 mm.; forewing length 3 to nearly 4 mm. (2-12) Black, the following parts yellow: clypeus except lateral margins of lower half, sometimes undersurface of scape, pronotal lobe, outer part of median axillary sclerite, spots on bases of tibiae, that on fore tibia sometimes extending as band to middle of tibia. Remainder of median axillary sclerite brown, sometimes very light. The following parts reddish brown: labrum, scape (apical half dorsally sometimes infuscated), metasoma except lateral blackish areas on terga 2-4 to 2-6, those on more anterior terga small; ill-defined dusky basolateral spots on posterior terga absent to occupying entire lateral or on terga 5-6, ventrolateral parts of terga; sterna 4-6 also reddish brown to largely blackish. Tegula transparent testaceous. Legs reddish brown to black with tarsi, front tibia, and bases and apices of mid and hind tibiae light reddish brown. (13) Wings slightly brown, veins and stigma dark brown. (14) Dorsal hairs on terga 4-6 seen in profile dense, slender, blunt, slightly curved posteriorly, light brown. Hind tibia with hairs on apical half of outer margin denser and more robust than elsewhere, coppery, thus forming a feeble brush. (16) Clypeus with small punctures on a minutely roughened and somewhat dull ground, larger punctures present only along lower and lower lateral margins. (20) Interocellar distance distinctly less than ocellocular distance; ocelloccipital distance about equal to ocellar diameter. (25) Upper margin of clypeus strongly and uniformly concave. (27) Clypeoantennal distance slightly less than diameter of antennal socket. (29) Lower clypeocular distance about half width of scape, upper somewhat more than width of scape. (31) Genal area uniformly shining, with sparse and light punctures. (33) Malar area anteriorly about one-third as long as diameter of scape. (37) First flagellar segment about as wide as long, middle segments wider than long. (43-45) Wing venation as in *B. facialis.* (52) Basitibial plate defined posteriorly as in *B. facialis.* (55) Pygidial plate poorly defined, scarcely recognizable.

Distribution. West Africa. CAMEROON: Tingoh, Menchin River, near Wum, Western Province, 701 m. altitude. LIBERIA: Du River.

Variation. Of the few specimens seen by me, the holotype is the palest but the paratype at Tervuren is intermediate between the holotype and the relatively dark specimen from Cameroon.

Braunsapis leptozonia (Vachal)
Figures 4, 90-95, 104-108

Allodape leptozonia Vachal, 1909, p. 532. (Type ♀, Paris, from Lumbwa, Kenya. Placed in *Braunsapis* by Michener, 1971a.)
Allodape grandiceps Friese, 1914a, p. 150. (Type

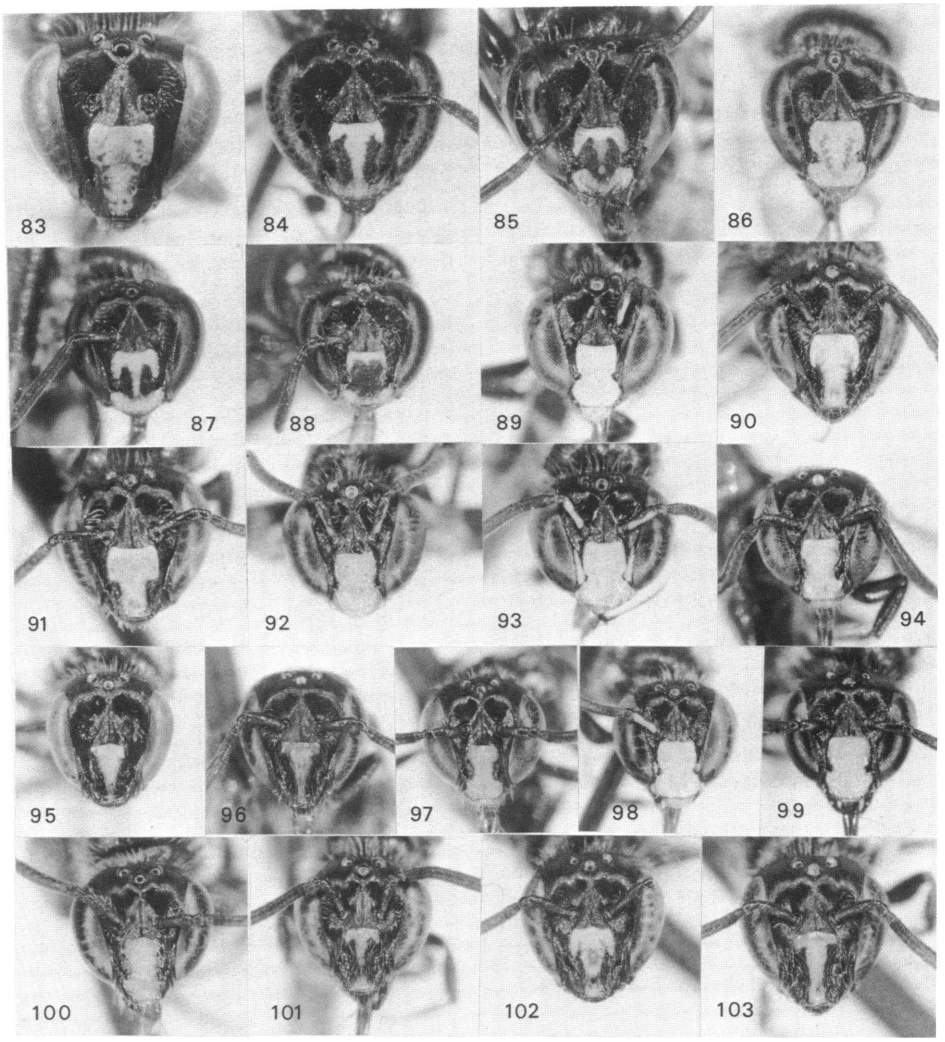


FIG. 83. *Braunsapis langenburgensis*, facial view, female holotype of *B. brunneiventris*, Moçambique, Mozambique.

FIGS. 84, 85. *Braunsapis nautica*, facial views of females. 84. Near Ibadan, Nigeria. 85. Kampala, Uganda.

FIGS. 86-89. *Braunsapis rolini*, facial views. 86. Female, 24 km. W of Luanza, Zaire. 87. Female, Nairobi, Kenya. 88. Female, Buea, Western Province, Cameroon. 89. Male, Lourenço Marques, Mozambique.

FIGS. 90-95. *Braunsapis leptozonia*, facial views. 90. Female, Pietermaritzburg, Natal. 91. Female, Kikuyu Summit near Nairobi, Kenya. 92. Male, Pietermaritzburg, Natal. 93. Male, St. Lucia Estuary, Natal. 94. Male, Timboroa, Kenya. 95. Female, Zimbabwe, Rhodesia, the holotype of *Allodapula antiquorum* Cockerell, a specimen with an unusually reduced clypeal mark.

FIGS. 96-98. *Braunsapis albitarsis*, facial views. 96, 97. Female and male, Timboroa, Kenya. 98. Male holotype, Eritrea.

FIGS. 99-103. *Braunsapis luapulana*, facial views. 99. Male, Karen near Nairobi, Kenya. 100, 101. Males, Kikuyu Summit near Nairobi, Kenya, the last an unusually dark individual. 102. Female, Karen near Nairobi, Kenya. 103. Female, Kikuyu Summit near Nairobi, Kenya.

♂, Berlin, from Lukuledi, Tanzania. Placed in *Braunsapis* by Michener, 1970a.)

Allodape nigeriae Strand, 1915, p. 56. (New synonym. Type ♀, Berlin, from "N. Nigeria, Otta.")

Allodape pembana Strand, 1915, p. 41. (New synonym. Type ♀, Berlin, from Pemba Island, Tanzania.)

Allodape paradoxa var. *albiceps* Friese, 1924, p. 80. (Head and thorax only, new synonym. Type ♀, consisting of head and thorax of *Braunsapis grandiceps* to which is glued a metasoma of *B. paradoxa*, Berlin, from Algoa Bay, Cape Province.)

Allodapula antiquorum Cockerell, 1936a, p. 3. (New synonym. Type ♀, AMNH, from Zimbabwe, Rhodesia; atypical in reduced clypeal mark, figure 95, and dark tegula and median axillary sclerite.)

Allodapula bukaviella Cockerell, 1936a, p. 4. (New synonym. Type ♀, AMNH, from Bukavu, Zaire; cotypes [= paratypes] in BM are a different species, in the *minutula* group.)

Allodapula bulbifera Cockerell, 1936a, p. 5. (New synonym. Type ♀, AMNH, from Vumba, Umtali, Rhodesia.)

Allodapula krugeri Cockerell, 1936a, p. 11. (New synonym. Type ♀, AMNH, from Kruger National Park, Transvaal.)

Allodapula niunzua Cockerell, 1936a, p. 17. (New synonym. Type ♀, AMNH, from Niunzu, District of Tanganyika Moero, Zaire; atypical in transparent tegula, wholly pale median axillary sclerite, and pale brown venation and stigma. It possibly represents another species.)

Allodapula pusilla Cockerell, 1936a, p. 22. (New synonym. Type ♀, AMNH, from Vumba, Umtali, Rhodesia.)

Description. Female. (1) Length 4-5.5 mm.; forewing length 3.5 mm. (2-12) Black, the following parts yellow: clypeal mark (see figures and Variation), rarely spot on base of scape, rarely small fleck on lateroclypeal carina, posterior lobe of pronotum, commonly outer half of median axillary sclerite. Flagellum dark brown beneath. Tegula brown to translucent. Legs black, small segments of tarsi reddish brown. Posterior margins of terga sometimes brownish. (13) Wings slightly brownish, veins and stigma dark brown. (14) Dorsal metasomal hairs slender, short, brown to whitish, tapering but blunt, not or slightly curved apically. (16) Clypeus with numerous small to moderate sized punctures, large punctures on lower part, especially marginally; ground between punctures shining but minutely roughened. (20) Interocellar distance slightly more to slightly less than ocellocular distance; ocelloccipital distance more than ocellar diameter. (25) Upper margin of clypeus somewhat concave with median convexity, to slightly convex. (27) Clypeoantennal distance less than diameter of antennal socket. (29) Lower clypeocular distance less than or equal to width of scape; upper clypeocular distance greater than and sometimes 1.5 times width of scape. (31) *Upper part of genal area with region of variable size that is hairy and rather densely punctured as compared with lower part of genal and hypostomal areas* (see Variation) (both sexes but less developed in males). (33) Malar area anteriorly about one-third as long as diameter of scape. (37) First flagellar segment nearly to fully as long as wide; middle segments wider than long. (43) Stigma shorter than costal margin of marginal cell, which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell separated from wing margin by about width of a vein. (45) Submarginal cells usual for genus. (52) Basitibial plate not defined (in one among numerous specimens presumably of this species from Karen, Nairobi, it is defined posteriorly as in *B. facialis*).

Male. Similar to female except as follows: (1m) Length 3-4.5 mm.; forewing length 3 mm. (2m-12m) Black, the following parts yellow: clypeus except sometimes lateral margins, sometimes mark in paraocular area, at least much of labrum, sometimes much of mandible, underside of scape (sometimes), pronotal lobe; tegular and axillary coloration as in female. Apex of mandible reddish brown. Legs colored as in female or more commonly basitarsi pale yellow, sometimes only hind basitarsus or hind and middle pale. (29m) Lower clypeocular distance less than half width of scape, upper less than width of scape. (33m) Malar area with length much less than half width of scape. (37m) First flagellar segment 1 to 1.5 times as wide as long; middle flagellar segments usually broader than long. (58) Front basitarsus somewhat longer than segments 2-4 together, mediotarsal segments slightly broadened, segments 2-3 slightly wider than distal part of basitarsus; middle and hind tarsi as

described for *B. facialis.* (59) Hind trochanter with apical and median tooth; hind femur with basal smooth excavated area on underside, surrounded by distinct ridge, ridge on posterior side bearing some rather long simple or nearly simple hairs, surface of femur near anterior side of concavity also with rather long hairs, but few hairs as long as femoral diameter, no hairs on either trochanter or femur extending much below lower surface of segment. (60) Membranous convexities of eighth tergum with even fewer wrinkles than in *B. facialis.* (61) Seventh sternum as in *B. facialis* but apical concavity feeble. (63) Ventroapical plate of gonocoxite with apical margin as in figure 107, its intermediate projection with three to six large, blunt setae arising dorsally near apex, its lateral projection bilobed and laterally flattened, inner lobe much below outer so that minor differences in viewpoint cause major changes in apparent shape. (64) Gonostylus longer than wide, rounded. (65) Penis valve broad with strong dorsolateral angle, without thickened or peglike setae.

Comparative Comments. This species has several close relatives. In Cameroon and Uganda is an unnamed species with very different genitalia, in which the male mandibles are yellow. It can be distinguished by this character from the local populations of *leptozonia* although elsewhere males of the latter also have yellow mandibles.

Several other closely similar species are known to me from the equatorial parts of Africa. They are distinguishable only or best by male genitalia, and in the absence of biological data there seems to be no special need to describe them from inadequate series of specimens and often without association of sexes. They do raise the question, however, of whether all the names listed in the synonymy above actually relate to *B. leptozonia.* Although *B. leptozonia* is the commonest and most widespread of the species of this group, the possibility exists that some of the female types belong to other species; I know of no way of determining this.

Distribution. Eastern Cape Province to Ethiopia, west to Angola and Senegal. Males from localities marked by asterisks in the following list have been dissected and the identification verified by examination of the genitalia. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); *Grahamstown; Sandflats, 280 m. altitude. *Natal*: 23 km. NE of Bulwer, 1190 m. altitude; Cathedral Peak Hotel, 45 km. SW of Winterton, 1430 m. altitude; Durban; Escombe; *Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; *Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; *Nagle Dam, 27 km. E of Pietermaritzburg; *Pietermaritzburg; 18 km. S and 8 km. NW of Pietermaritzburg; Richmond; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; *Scottburgh; 16 km. north of Ubombo; Umbilo, Durban; Umbumbulu; Umhlanga. *Transvaal*: Barberton; Kruger National Park; Louis Trichardt; 27 km. E of Nelspruit, 915 m. altitude; *47 km. W of Nelspruit, 990 m. altitude; Waterval-Onder. RHODESIA: Matopo Hills near Bulawayo; Munza Valley, 32°E, 18°S; Vumba, Umtali; Zimbabwe. MOZAMBIQUE: Guengere, Pungue Valley; vicinity of D'Andrada, Revue Valley. MALAWI: Blantyre; Kasungu, Central District; 80 km. N of Kasungu, Central District; Lilongwe; Limbe; Monkey Bay, Lake Malawi; Vipya Plateau, 19 km. NE of Mzimba, 1590 m. altitude. ANGOLA: 23 km. southeast of Hengue, 1720 m. altitude; 10 km. S of Quibola, 1230 m. altitude; Vila Flor, Huambo. ZAIRE: *Shaba* (= *Katanga*): Biano; Kando; Kapiri; Lubumbashi (= Elizabethville); Niunza, District of Tanganyika Moero; Tenke. *Bandundu*: Leverville, middle Kwilu; Lunda, Kasongo; Wombali. *Lower Zaire*: Benza Mazola; Kiniati-Zobe; Kisantu; Lemba; 10 km. N of Matadi. *Equator*: Mondombe. *Kivu*: Bukavu (= Costermansville); Irangi; Kabarazo; Kalonge, West Ruwenzori; Kasongo, Rutshuru; 48 km. N of Rutshuru; Sake. *Upper Zaire*: Aruwimi; Basoko; Eala; Gangala-na-Bodio, Uele; Isangi; Mahagi, Ituri; Moto, upper Uele; Paulis, upper Uele; Yangambi. BURUNDI: Cankuzo, Territory of Ruyigi; Makoronkwe, 1450 m. altitude. RWANDA: Kayove, Gisenyi, 2000 m. altitude. TANZANIA: Lukuledi; Ngurdoto National Park, near Arusha, 1430 m. altitude; Pemba Island; Tabora. UGANDA: *Kawanda, Kampala. KENYA: Karen, Nairobi, 1830 m. altitude; Kikuyu Summit, 2135 m. altitude; 48 km. S of Kitale; Lumbwa; Nairobi; 43 km. NW of Nairobi, 1770 m. altitude; Ngong Hills; *Timboroa, 64 km. SE of Eldoret, 2810 m. altitude. ETHIOPIA:

*NE of Lake Abayita, Shewa; 6 km. N of Welenchiti, Shewa. CHAD: Lower Chari, Fort Lamy; E of Fort Archambault. CAMEROON: Babadjou, Eastern Province; *Bambui, near Bamenda, Western Province, 1370 m. altitude; Bendiba, Betare-Oya, Eastern Province; Buea, Western Province; Tingoh, Menchin River, near Wum, Western Province, 701 m. altitude. NIGERIA: Benin; Ilorin; Lagos; Lokoja; Olokemeji, Ibadan. GHANA: near Kopomda; Legon, Accra. LIBERIA: *Cuttington College, Bong County; Monrovia; Roberts Field. SENEGAL: Bafoulape, Camp du Lion; Dakar; Fort de Sokone, Toubacouta; M'Bambey; Simenti.

Variation. Although this species is characterized by an area of short, dense hairs on the upper genae, this character varies considerably. In equatorial Africa most females have this area large, the hairs short and of uniform length so that a conspicuously differentiated area exists. In most females from South Africa the area is smaller, the hairs sparser, and although short near the eyes, become longer and rather ordinary in appearance posteriorly, on the occipital region.

The clypeal mark of the female is typically quite extensive above, occupying the whole clypeus above the tentorial pits, but it is sometimes reduced, as in the type of *antiquorum*, so that it extends across the summit of the clypeus but does not occupy the lateral areas above the tentorial pits. An occasional female has a yellowish spot on the underside of the scape at the base.

In the male, pale facial areas may be limited to the whole clypeus and most of the labrum. This is true of most specimens from equatorial Africa, although some have a little yellow lateral to the lower part of the clypeus, and some have the lateral margins of the clypeus broadly black so that the clypeal mark is a dumbbell-shaped area. Most but not all males from equatorial Africa also have blackish basitarsi.

In contrast, males from southern Africa have not only the whole clypeus and labrum pale, but usually also the mandible (at least a spot on it) and the underside of the scape, and often lateral face marks that may extend to a level more than halfway from the tentorial pits to the summit of the clypeus. In such populations the basitarsi are pale.

Specimens from equatorial Africa (and some south to Rhodesia) usually have the tegula translucent brown and often have the median axillary sclerite brown or blackish. Specimens from southern Africa usually have the tegula largely transparent and the median axillary sclerite less than half dark.

A few males have been dissected that have the median process of the ventroapical gonocoxal plate short and tapering, as in figure 108. These are from Roberts Field and Monrovia, Liberia; and Tingoh, Menchin River, near Wum, West Cameroon. Tentatively associated females from Tingoh agree with *B. leptozonia* except that the clypeal mark is reduced to a thick T, hamate dorsolaterally, as in *B. rhodesi.* It seems quite possible that these males and females represent another species, but they may be variants of *B. leptozonia.*

Braunsapis albitarsis (Friese)

Figures 96-98, 109-110

Allodape albitarsis Friese, 1924, p. 81 (Type ♂, Berlin, from Eritrea, now part of Ethiopia. Placed in *Braunsapis* by Michener, 1971a.)

Description. Female. Agrees with Kenya populations of *Braunsapis leptozonia* except as follows: (2-12) Clypeal mark T-shaped, not hamate, lower extremity narrow and weak. Yellow otherwise limited to pronotal lobe. Tegula brown. Small segments of tarsi blackish.

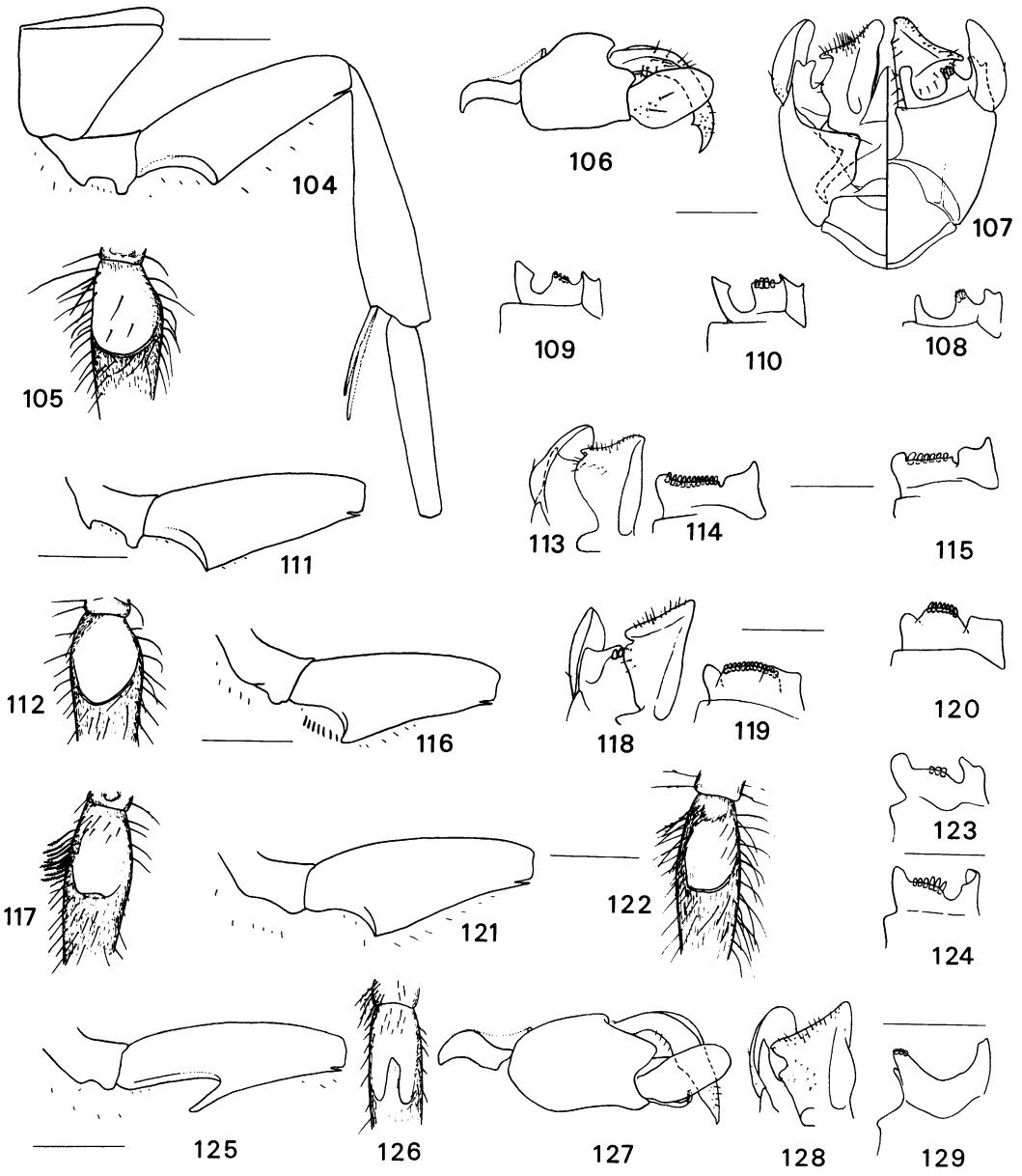
Male. Similar to *Braunsapis leptozonia* except as follows: (1m) Length 4 mm.; forewing length 3 mm. (2m-12m) Holotype with clypeus, small mark in paraocular area just above tentorial pit and another lateral to lower part of clypeus, labrum, underside of scape, pronotal lobe, spot on tegula, outer half of median axillary sclerite, and basitarsi yellowish white; specimen from Kenya with yellow limited to clypeus except lateral margins (pale area much constricted medially), most of labrum, pronotal lobe, and basitarsi. Tegula transparent with yellow spot (holotype) to all brown. Small tarsal segments brown (brownish white in holotype). (59) Structure of hind leg within range of variation for *B. leptozonia*, basal tooth of trochanter a little blunter and hairs a little longer than in figure 104. (63) Ventroapical plate of gonocoxite without the outer emargination of *B. leptozonia*, with oblique-

ly truncate inner lobe, sharp ventral carina ending in a dark acute point where the median and outer lobes of *B. leptozonia* appear to have fused (figs. 109, 110).

Comparative Comments. Braunsapis albitarsis might seem to be a northeastern form of the widespread *B. leptozonia*, but the ranges of the two forms overlap broadly. The punctate genal area is distinct in both sexes, as in many specimens of *B. leptozonia* from Kenya.

Distribution. Ethiopia and Kenya. KENYA: Timboroa, 64 km. SE of Eldoret, 2810 m. altitude. ETHIOPIA: Eritrea.

Only one male is available from Eritrea and one male and two females, all from one nest (2000, C. D. Michener), from Kenya. Other females from the Kenya locality but in different nests have the clypeal mark of *Braunsapis leptozonia*, or are intermediate, approaching *B. albitarsis.* Whether any of them are *albitarsis* can



only be learned by further associated males. Another female that agrees with that of *albitarsis* is from Vila Flor, Huambo, Angola. Males are needed to verify the identity of such females, as variation in clypeal markings of *B. leptozonia* is considerable and no other known differences exist; rare females of *B. leptozonia* may have clypeal marks as reduced as in the Kenya *B. albitarsis* and to judge by the well-marked male from Eritrea it seems likely that females from that area are also well marked. It is only on the basis of the genitalia that the Kenya specimens can be placed in *B. albitarsis*, and with the very meager material available the placement remains uncertain.

Braunsapis luapulana (Cockerell)
Figures 99-103, 111-115

Allodapula luapulana Cockerell, 1936a, p. 12. (Type ♂, AMNH, from Tenke, Shaba [= Katanga], Zaire; hind femora gone, although one trochanter remains; genitalia have been dissected and are clearly diagnostic. Placed in *Braunsapis* by Michener, 1971a.)

Allodapula convexa Cockerell, 1936a, p. 6. (New synonym. Type ♀, AMNH, from S of Bukavu, Zaire. Although this name has page priority over *A. luapulana*, it is not used because page priority is not binding and female characters are difficult and not diagnostic in this group.)

Description. Female. Similar to *Braunsapis leptozonia* except as follows: (2-12) Clypeal mark reduced, thick T-shaped, often hamate; no yellow on lateroclypeal carina; median axillary sclerite entirely or largely dark and tegula translucent brown (as in many *B. leptozonia*). Small segments of tarsi usually infuscated. (16) Lower half of clypeus commonly with more large depressions (punctures) than in *B. leptozonia*, ground between punctures commonly duller because of minute roughening. (25) Upper margin of clypeus more convex medially than in most specimens of *leptozonia* (both sexes). (27) Clypeoantennal distance sometimes equal to diameter of antennal socket although commonly somewhat less (both sexes). (31) Upper genal area scarcely more hairy than rest of area (both sexes). (33) Malar area about half as long as diameter of scape.

Male. Similar to *Braunsapis leptozonia* except as follows: (2m-12m) Yellow limited to clypeus

FIGS. 104-107. *Braunsapis leptozonia*, male. 104. Lateral view of hind leg, Nelspruit, Transvaal. 105. Underside of base of hind femur of same, outer side to the right. 106, 107. Lateral, dorsal, and ventral views of male genitalia, Grahamstown, Cape Province.

FIG. 108. Ventral view of left ventroapical plate of gonocoxite, *Braunsapis* near *leptozonia* Tingoh, Menchin River, near Wum, Western Province, Cameroon.

FIGS. 109, 110. *Braunsapis albitarsis*, male. 109. Ventral view of left ventroapical plate of gonocoxite of holotype, Eritrea, Ethiopia. 110. Same, Timboroa, Kenya.

FIGS. 111-115. *Braunsapis luapulana*, male. 111. Lateral view of hind trochanter and femur, Bambui, near Bamenda, Western Province, Cameroon. 112. Underside of base of hind femur of same, outer side to the right. 113. Dorsal view of left gonostylus and penis valve of same. 114. Ventral view of left ventroapical plate of gonocoxite of same. 115. Ventral view of left ventroapical plate of gonocoxite, Ngurdoto National Park, near Arusha, Tanzania.

FIGS. 116-120. *Braunsapis rhodesi*, male. 116. Lateral view of hind trochanter and femur, Hellahella, near Richmond, Natal. 117. Underside of base of hind femur of same, outer side to the right. 118. Dorsal view of left gonostylus and penis valve, Kasungu, Malawi. 119. Ventral view of left ventroapical plate of gonocoxite of same. 120. Same, but from Hellahella, near Richmond, Natal.

FIGS. 121-124. *Braunsapis draconis*, male. 121. Lateral view of hind trochanter and femur, Cathedral Peak Hotel, 45 km. S of Winterton, Natal. 122. Underside of base of hind femur of same, outer side to right. 123. Ventral view of left ventroapical plate of gonocoxite of same. 124. Same, but from 23 km. NE of Bulwer, Natal.

FIGS. 125-129. *Braunsapis stuckenbergorum*, male. 125. Lateral view of hind trochanter and femur, Richmond, Natal. 126. Underside of base of hind femur of same, outer side to the right. 127. Lateral view of genitalia, holotype, from Pietermaritzburg, Natal. 128. Dorsal view of left gonostylus and penis valve of same. 129. Ventral view of left ventroapical plate of gonocoxite of same.

All scale lines represent 0.25 mm. Separate lines serve for figures 104, 106-110, 111 and 112, 113-115, 116 and 117, 118-120, 121 and 122, 123 and 124, 125 and 126, 127-129.

(whole or sometimes only a median band, or a T as in female), usually part or most of labrum, usually large area on mandible, rarely small fleck on lateroclypeal carina, underside of scape (rarely), pronotal lobe. Legs dark as in female, rarely hind and middle basitarsi brownish yellow. (29m) Lower clypeocular distance half width of scape or slightly more, upper as wide as scape or slightly more. (58) Front tarsal segments 2-3 often noticeably wider than basitarsus, as compared to *B. leptozonia.* (59) Teeth of hind trochanter more widely separated than in *B. leptozonia* and without associated long hairs. (63) Ventroapical plate of gonocoxite as in figures 114, 115, number of peglike setae 6 to 11. (64) Gonostylus with basal bulge. (65) Penis valve with hairs shorter and sparser than in *B. leptozonia*, penis valve more highly arched basally in profile, seen from above constricted near base with transparent hairless lateral lamella extending distad from constriction, subapical tooth weaker than in *B. leptozonia.*

Distribution. Equatorial Africa from Nigeria and Zaire east to Kenya and Tanzania; a single specimen from Natal. Males from the localities marked below by asterisks have been dissected and identification made by genital characters. Other localities are subject to the difficulties of distinguishing females from those of related species. SOUTH AFRICA: *Natal*: *Richmond, 855 m. altitude. GABON: Libreville. ZAIRE: *Shaba* (= *Katanga*): Biano; Kapanga, Lulua; 29 km. W of Luanza, 1300 m. altitude; Lubumbashi (= Elizabethville); *Tenke. *Kivu*: Bukavu (= Costermansville); Rutshuru; 48 km. N of Rutshuru, 1050 m. altitude. BURUNDI: Cankuzo, Territory of Ruyigi. TANZANIA: *Ngurdoto National Park, near Arusha, 1430 m. altitude; Tabora. UGANDA: *Kawanda, Kampala; 35 km. W of Tororo. KENYA: *Karen, Nairobi, 1830 m. altitude; *Kikuyu Summit, 2135 m. altitude; 48 km. S of Kitale; Lake Naivasha; Nairobi, 1830 m. altitude; 43 km. NW of Nairobi, 1770 m. altitude. CAMEROON: *Bambui near Bamenda, Western Province, 1370 m. altitude. NIGERIA: *Ilorin. GHANA: Kopomdna.

Variation. The single male from Natal differs from the others in the somewhat larger and more sharply delimited concavity of the base of the hind femur, but otherwise it agrees with *B. luapulana.* No females are recognized from Natal; presumably they are intermixed with those of *draconis* or *rhodesi.* The single Natal specimen was collected by me but was not recognized in the field as distinct from *leptozonia*. I suppose the possibility of mislabeling exists but no other such problems have arisen in this material, and the somewhat distinctive femoral characters suggest that this specimen represents a population different from the others sampled.

The only area from which males with a greatly reduced clypeal mark, wholly dark labrum, and black mandibles are known is the Kenya highlands, especially Kikuyu Summit, but from the same localities there are males with the clypeus nearly all yellow, with a yellow area on the labrum, and large yellow areas on the mandibles, as well as intermediates. The most fully marked male specimen seen is the one from Ilorin, Nigeria, which has in addition to the other yellow areas, yellow on the underside of the scape. Also the tarsi of this specimen are light brown, the hind and middle basitarsi perhaps yellowish. In all other specimens, as in all specimens of *Braunsapis rhodesi*, the basitarsi are dark.

Braunsapis rhodesi (Cockerell)
Figures 116-120, 130-132

Allodapula rhodesi Cockerell, 1936a, p. 22. (Type ♀, AMNH, from Matopo Hills, near Bulawayo, Rhodesia. Placed in *Braunsapis* by Michener, 1971a.)

Description. Female. Agrees with *Braunsapis luapulana* except as follows: (2-12) Median axillary sclerite commonly with outer half pale yellow, tegula often transparent. (31) Upper genal area more punctured and hairy, often about as in the least punctured and least hairy individuals of *B. leptozonia.* (33) Malar area sometimes less than half as long as diameter of scape.

Male. Similar to *Braunsapis leptozonia* and *luapulana* except as follows: (2m-12m) Black, the following areas pale yellow: clypeus, sometimes small fleck on lateroclypeal carina, most of labrum, sometimes small mandibular spot, pronotal lobe, often small spot on transparent tegula, outer half of median axillary sclerite. Legs dark as in female. (29m) Clypeocular distances as in *B.*

luapulana. (58) Front tarsal segments 2-3 sometimes very slightly wider than apex of basitarsus. (59) Teeth of hind trochanter close together and low; hind femur with basal smooth area deeply concave, short, not margined with hairs on outer side but with long plumose hairs on mesal margin, concavity not well margined laterally, apical end high and overhanging. Genitalia similar to those of *B. luapulana* but (63) Margin of ventroapical plate of gonocoxite as in figures 119 and 120. (64) Gonostylus with basal bulge weak or absent. (65) Subapical tooth of penis valve weak.

Comparative Comments. The female is not distinguishable by any consistent characters from that of *Braunsapis luapulana.* The use of the specific name, based on a female type, is therefore a judgment based partly on distribution, although the type agrees excellently with other females that are associated with males.

Distribution. Natal to Malawi and Rhodesia. Males are available and genitalia have been examined from the localities marked with asterisks. No other localities can be considered as verified, since the characters of the females are inadequate for certain identification. SOUTH AFRICA: *Natal*: *Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; Nagle Dam, 27 km. E of Pietermaritzburg; Ndumu Reserve, Zululand; Pietermaritzburg; 8 km. NW of Pietermaritzburg; *Richmond, 855 m. altitude; *St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Tugela Mouth; Umbumbulu. *Transvaal*: 27 km. E of Nelspruit, 915 m. altitude. RHODESIA: Matopo Hills near Bulawayo. MALAWI: Blantyre; *Kasungu, Central District; *32 km. S of Kasungu, Central District; Lilongwe; Limbe.

Braunsapis draconis Michener
Figures 121-124, 133-135

Braunsapis draconis Michener, 1971a, p. 295. (Type ♂, AMNH, from Cathedral Peak Hotel, 45 km. S of Winterton, Natal, 1430 m. altitude.)

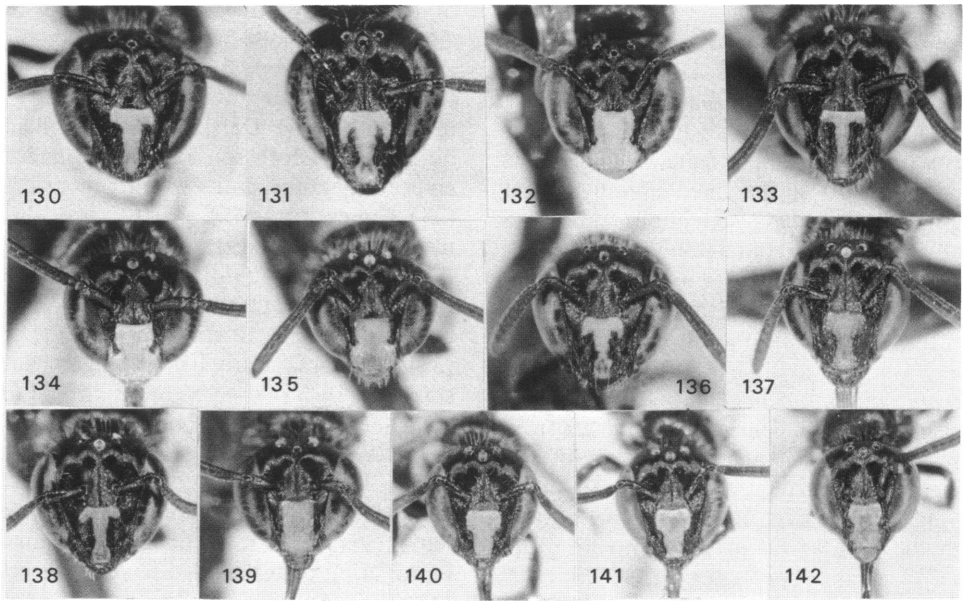
Description. Female. Similar to *Braunsapis leptozonia* except as follows: (1) Length 5-6 mm.; forewing length 3-4 mm. (2-12) Clypeal mark reduced, T-shaped, usually not hamate; otherwise no yellow markings (except occasionally pronotal lobe with small pale yellowish area); median axillary sclerite brownish black; tegula translucent brown. Small segments of tarsi infuscated. (14) Dorsal metasomal hairs often quite dusky (both sexes). (16) Ground between clypeal punctures duller with minute roughening. (25) Upper margin of clypeus scarcely convex medially (both sexes). (27) Clypeoantennal distance often equal to diameter of antennal socket (both sexes). (31) Upper genal area scarcely more hairy or punctate than rest of area (both sexes). (33) Malar area nearly half as long as diameter of scape.

Male. Similar to *Braunsapis leptozonia* except as follows: (1m) Length 4-5 mm.; forewing length 3.5-4 mm. (2m-12m) The following parts pale yellow: clypeus, labrum, often spot on mandible, lateral face mark not reaching much above tentorial pit (often limited to spot just below pit, sometimes absent), sometimes small pale area on pronotal lobe. Tarsi black, small segments slightly brownish. (29m) Upper clypeocular distance about width of scape. (37m) First flagellar segment about as wide as long; middle flagellar segments as long as wide or sometimes longer than wide. (59) Hind trochanter with teeth reduced to weak convexities; hind femur with concavity shorter than in *B. leptozonia*, not sharply margined on outer side, some rather long, nearly straight, and not or sparsely barbed hairs arising along inner margin. (63) Ventroapical plate of gonocoxite as shown in figures 123 and 124. (65) Hairs on penis valves somewhat sparser and shorter than in *B. leptozonia*, those on undersurface basally absent.

Comparative Comments. The female is most similar to *Braunsapis luapulana* from which it differs in the usually nonhamate clypeal mark, the usually black pronotal lobe, and the scarcely convex median upper clypeal margin.

Distribution. Natal, middle altitudes to the foot of the Drakensberg. SOUTH AFRICA: *Natal*: 23 km. NE of Bulwer, 1190 m. altitude; Cathedral Peak Hotel, 45 km. SW of Winterton, 1430 m. altitude; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Umbumbulu.

Variation. A male from the Bulwer locality has somewhat different genitalia, as shown in figure 124. In other respects it does not differ



FIGS. 130-132. *Braunsapis rhodesi*, facial views. 130. Female, St. Lucia Estuary, Natal. 131, 132. Female and male, Richmond, Natal.

FIGS. 133-135. *Braunsapis draconis*, facial views. 133, 134. Female and male, Umbumbulu, Natal. 135. Male, Cathedral Peak Hotel, 45 km. S of Winterton, Natal.

FIGS. 136-139. *Braunsapis stuckenbergorum*, facial views. 136. Allotype female, Pietermaritzburg, Natal. 137, 138. Paratype females, Richmond, Natal. 139. Holotype male, Pietermaritzburg, Natal.

FIGS. 140-142. *Braunsapis ghanae*, facial views, Legon, Accra, Ghana. 140. Allotype female. 141. Paratype female. 142. Holotype male.

from typical *Braunsapis draconis* and is presumably the same species.

Braunsapis stuckenbergorum Michener
Figures 125-129, 136-139

Braunsapis stuckenbergorum Michener, 1971a, p. 296. (Type ♂, AMNH, from 5 km. W of Pietermaritzburg, Natal.)

Description. Female. Similar to *Braunsapis leptozonia* except as follows: (1) Length 4-4.5 mm.; forewing length 3-3.5 mm. (2-12) Clypeal mark reduced, T-shaped, usually hamate; pronotal lobe yellow to black (even among individuals from one nest); outer half of median axillary sclerite usually yellow. Tegula transparent brown, usually with yellow spot. Small segments of tarsi infuscated. (16) Ground between clypeal punctures duller with minute roughening. (20) Ocelloccipital distance about equal to ocellar diameter. (25) Upper margin of clypeus concave, sometimes nearly straight, without median convexity (both sexes). (27) Clypeoantennal distance equal to diameter of antennal socket or somewhat less (both sexes). (31) Genal area without densely punctured area (both sexes).

Male. Similar to *Braunsapis leptozonia* except as follows: (1m) Length nearly 4 mm.; forewing length nearly 3 mm. (2m-12m) Yellow limited to clypeus (lateral margins variably dark) and much of labrum. (Probably some have yellow on pronotal tubercle, tegula, and median axillary sclerite but the three specimens available have these area dark.) Tarsi dark as in female. (29m) Lower clypeocular distance half or less than half width of scape, upper equal to or more than width of scape. (33m) Malar area almost linear, about one-

fourth as long as width of scape. (37m) First flagellar segment slightly longer than broad, middle flagellar segments slightly broader than long. (59) Hind trochanter with the two teeth low and close together; hind femur with enormous, basally directed, median tooth; underside of hind tibia with hairs on apical half that are as long as tibial spurs, with long branches that are blunt tipped. (63) Ventroapical plate of gonocoxite with only one major emargination (fig. 129), lateral projection not bilobed but relatively narrow and in lateral view truncate. (65) Penis valves rather narrow basally, lacking ventral basal hairs as well as subapical tooth.

Comparative Comments. The females are similar to those of *Braunsapis draconis*, which occurs in the same region, agreeing in the form of the clypeal mark and in the commonly dark pronotal tubercles. *Braunsapis stuckenbergorum* differs in its usually smaller size, the usually concave upper clypeal margin, the frequent presence of a pale spot on the tegula and the frequently pale outer part of the median axillary sclerite, and other features no one of which is completely diagnostic.

Distribution. Central Natal, perhaps Malawi. Localities marked by asterisks are those from which males are available. All other localities are doubtful. SOUTH AFRICA: *Natal*: Cathedral Peak Hotel, 45 km. SW of Winterton, 1430 m. altitude; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Nagle Dam, 27 km. E of Pietermaritzburg; 18 km. S, 8 km. NW, and *5 km. W of Pietermaritzburg; *Richmond, 855 m. altitude; 13 km. S of Richmond. MALAWI: Blantyre.

Braunsapis liliputana (Strand), new combination

Allodape liliputana Strand, 1915, p. 47. (Type ♀, Berlin, from "Delagoabai," Mozambique.)

The type is similar to *Braunsapis stuckenbergorum* and *draconis*, intermediate in size between the two, and agreeing with some specimens of each in the black pronotal tubercles. The head and thorax are somewhat more coarsely punctate than in either. The dorsum of the last three metasomal terga has black hair almost as conspicuous as in *B. facialis* although less dense. No other named small species with a T-shaped clypeal mark has such black hair.

Two specimens from the Vipya Plateau, 19 km. NE of Mzimba, Malawi, 1590 m. altitude (C. D. Michener), are of the proper size, with black abdominal hairs and a T-shaped clypeal mark (vertical line very short in one specimen), but the pronotal tubercles are yellow. They represent a species otherwise not known to me and might be *Braunsapis liliputana* with which, however, direct comparison has not been made. Although the tergal hair is black and blunt as in *B. facialis*, the hind tibiae lack the carina demarking the basitibial plate posteriorly that is characteristic of that species and its relatives.

Braunsapis minutula Group

This is a group of at least seven or eight small species, with females similar to *Braunsapis leptozonia* except for the smaller size and lack of an area of dense punctation and short hairs on the gena. The few available males nearly all differ from one another in characters of the hind trochanters and femora and in the genitalia and belong to different species. Since the types of the named species are females and not identifiable with any males, the application of specific names remains in doubt. Series available are mostly small and there does not seem to be an urgent need to name or identify most of the species. At Nairobi two species with like females but distinctive males were taken in small numbers. Their larvae were unfortunately mixed as I did not recognize the species as distinct until after leaving Kenya. Larvae and adequate material of both sexes are available for one species, *B. ghanae*, which is named below in view of the likelihood that it differs from all the three previously named forms.

Named species included in the group are: *Braunsapis rugosella*, *minutula*, *longula*, and *ghanae*, as listed below:

Braunsapis rugosella (Cockerell), new combination

Allodapula rugosella Cockerell, 1936a, p. 25. (Type ♀, AMNH, from Kabalo, Kivu, Zaire.)

Braunsapis minutula (Friese)

Allodape minutula Friese, 1914a, p. 150. (Placed in *Braunsapis* by Michener, 1971a.)

Allodape minuta Friese, 1924, pp. 70, 73. (Presumably a *lapsus* for *minutula*. Type ♀, Berlin, from Kigonsera, Tanzania. Friese's type is labeled *minuta*, which presumably explains his use of that name in 1924.)

Braunsapis longula (Friese), new combination

Allodape albipennis var. *longula* Friese, 1916, p. 436. (Type ♀, Berlin, from Windhoek, South West Africa. This female resembles *leptozonia* except for paler wings and stigma, lack of short, dense genal hairs, and slightly stronger punctation.)

Braunsapis ghanae, new species
Figures 140-146

Diagnosis. Minute and largely black like *Braunsapis minutula* and its allies. The male differs from similar forms strikingly in characters 59 and 63 listed below.

Description. Female. Similar to *Braunsapis leptozonia* except as follows: (1) Length 4 mm.; forewing length 2.7 mm. (2-12) Yellow limited to clypeal mark, pronotal lobe, spot on the otherwise transparent tegula, and outer half of median axillary sclerite. Small segments of tarsi infuscated. (16) Punctures on upper part of clypeus not noticeable because of dense roughening of ground between them, but ground nonetheless rather shining. (20) Interocellar distance equal to or less than ocellocular distance; ocelloccipital distance much less than ocellar diameter. (25) Upper margin of clypeus gently concave to gently convex (both sexes). (27) Clypeoantennal distance about equal to diameter of antennal socket (both sexes); malar area one-third to one-half as long as diameter of scape. (31) Genal area shining, without punctured area.

Male. Similar to *Braunsapis leptozonia* except as follows: (1m) Length 3.5 mm.; forewing length 2.5 mm. (2m-12m) No yellow on paraocular area or mandible. Basitarsi black. (29m) Lower clypeocular distance about one-third of width of scape, upper about equal to width of scape. (58) Front mediotarsal segments not broadened, segments 2-3 as wide as apex of basitarsus; hind basitarsus not much tapering, not or scarcely longer than remaining tarsal segments; middle basitarsus shorter than remaining tarsal segments together. (59) Hind femur with subbasal angle but no smooth, hairless, concave or flattened area on underside, area of angle compressed, hairless on outer side, hairy on inner side; trochanter with sparse branched hairs nearly as long as diameter of trochanter; underside of femur with only exceedingly short, sparse hairs. (60) Membranous convexities of eighth tergum with very few wrinkles (fig. 144). (63) Ventroapical plate of gonocoxite with single, large emargination, as in figure 146, lateral projection of this plate obliquely truncate, not emarginate in lateral view. (65) Penis valves broad but narrowed basally, hairs moderately numerous but not long, subapical tooth small and inconspicuous.

Distribution. West Africa.

Type Material. Holotype male, allotype female, and 37 paratypes: Legon, Accra, Ghana, March 11 and 12, 1969 (O. W. Richards, BM; paratypes at AMNH and KU). One male and two female paratypes: Lokoja, Nigeria, February 24-28, 1949 (Boris Malkin, CAS).

Etymology. Named after Ghana, the country from which most of the specimens were obtained.

Braunsapis paradoxa Group

The species *Braunsapis elizabethana*, *acuticauda*, and *paradoxa* constitute a little group recognizable by the enlarged hind legs of the male, the tridentate male mandibles, similar genitalia, reduced pale maculation, and in two of the species the elongate last sternum of the female. There is a possibility of some curious relationship among the three species, which are all sympatric. One nest contained an adult female of *acuticauda* but a pupa from it was reared and produced a female of *elizabethana*. Moreover, some pupae from a nest of *paradoxa* were *elizabethana*. On the other hand, various nests of each species were apparently unmixed. The possibility exists of errors in the field; on the other hand facultative parasitism or invasion of nests of related species are also possibilities.

Braunsapis elizabethana (Strand)
Figures 147-152, 162-167

Allodape elizabethana Strand, 1915, p. 47. (Type

♀, Berlin, from Algoa Bay, Cape Province; Strand described this form as *elizabethana* "Brauns i.l.," and mentioned only the female. I have marked the female in the Berlin museum, on a pin with a male and labeled in Brauns's hand as "*Al. Elizabethae m. i. l.*," as the type; it was presumably the only female available to Strand. Placed in *Braunsapis* by Michener, 1970a.)

Allodape elizabethana Friese, 1924, p. 81. (Lectotype ♀, Berlin, from Algoa Bay, Cape Province, here designated, the same specimen as the type of *elizabethana* Strand. A male from the same locality, on a different pin, bears the red Museum label as the type of *elizabethana* Friese, 1924, but the female was more fully described by Friese and should be the lectotype.)

Description. Female. (1) Length 4-5.5 mm.; forewing length 3-3.5 mm. (2-12) Black, clypeus with narrow, pale yellow T, sometimes represented only by cross bar, or entirely absent; outer part of median axillary sclerite in one specimen yellow but this sclerite usually all brownish black; mandible often dark red subapically; underside of flagellum brown; tegula translucent dark brown; small segments of tarsi brown; posterior margins of terga sometimes brown. (13) Wings slightly brown, veins and stigma dark brown. (14) Hairs of metasomal terga 4-6 rather long, somewhat curved, robust, blunt, brown, commonly dusky basally. (16) Clypeus with numerous punctures, rather small except along margins below, on shining, slightly roughened ground. (20) Interocellar distance about equal to ocellocular distance; ocelloccipital distance subequal to ocellar diameter. (25) Upper margin of clypeus weakly concave or straight. (27) Clypeoantennal distance at least as long as diameter of antennal socket. (29) Lower clypeocular distance two-thirds width of scape to nearly width of scape, upper approaching twice width of scape. (31) Genal area shining and with sparse hairs and punctures or upper half or three-fifths with rather dense hairs and punctures. (33) Malar area about half as long as diameter of antennal scape. (37) First flagellar segment distinctly longer than broad, middle segments slightly shorter than to slightly longer than broad. (43-45) Wing venation as in *B. facialis.* (52) Basitibial plate not defined. (57) Apex of last sternum rounded, apical tergum and sternum ordinary for the genus.

Male. Similar to female except as follows: (1m) Length 3.5-4.5 mm.; forewing length 3 mm. (2m-12m) Clypeus yellow, margins of lower part and around tentorial pit black; median axillary sclerite wholly dark; basitarsi dark brown. (29m) Lower clypeocular distance half to two-thirds width of scape; upper conspicuously greater than width of scape. (33m) Malar area about one-fourth as long as diameter of scape. (39m) *Mandibles tridentate.* (58) Front basitarsus longer than segments 2-4 together, mediotarsal segments only about as wide as basitarsus; hind basitarsus scarcely wider at base than elsewhere, about half as wide as tibia, shorter than tibia, less than half as wide as following segments, slightly longer than rest of tarsus; middle basitarsus also much shorter than tibia, slightly shorter than remaining tarsal segments together. (59) Hind trochanter thick but untoothed or with two feeble convexities separated by slight concavity; hind femur much thickened, shining, short ill-defined concavity at extreme base ventrally, rest of undersurface with flattened area against which tibia fits when flexed, this area sloping somewhat outward, with rounded ridge along outer margin and sharper ridge along inner margin; trochanter and base of femur with sparse hairs on undersurfaces at least as long as diameter of trochanter. Hind tibia roughly transverse at apex so that spurs arise nearer apex of tibia than usual. (60) Membranous convexities of eighth tergum similar to those of *Braunsapis facialis.* (61) Seventh sternum rounded apically, with strong upturned spiculum. (63) Ventroapical plate of gonocoxite with three lobes ending at the same level so that whole is broadly truncate (figs. 149, 150), outer and median lobes united at a carina, median and inner lobes with small emargination between them. (64) Gonostylus longer than wide, rounded apically. (65) Penis valve hairy, constricted near base, without peglike setae.

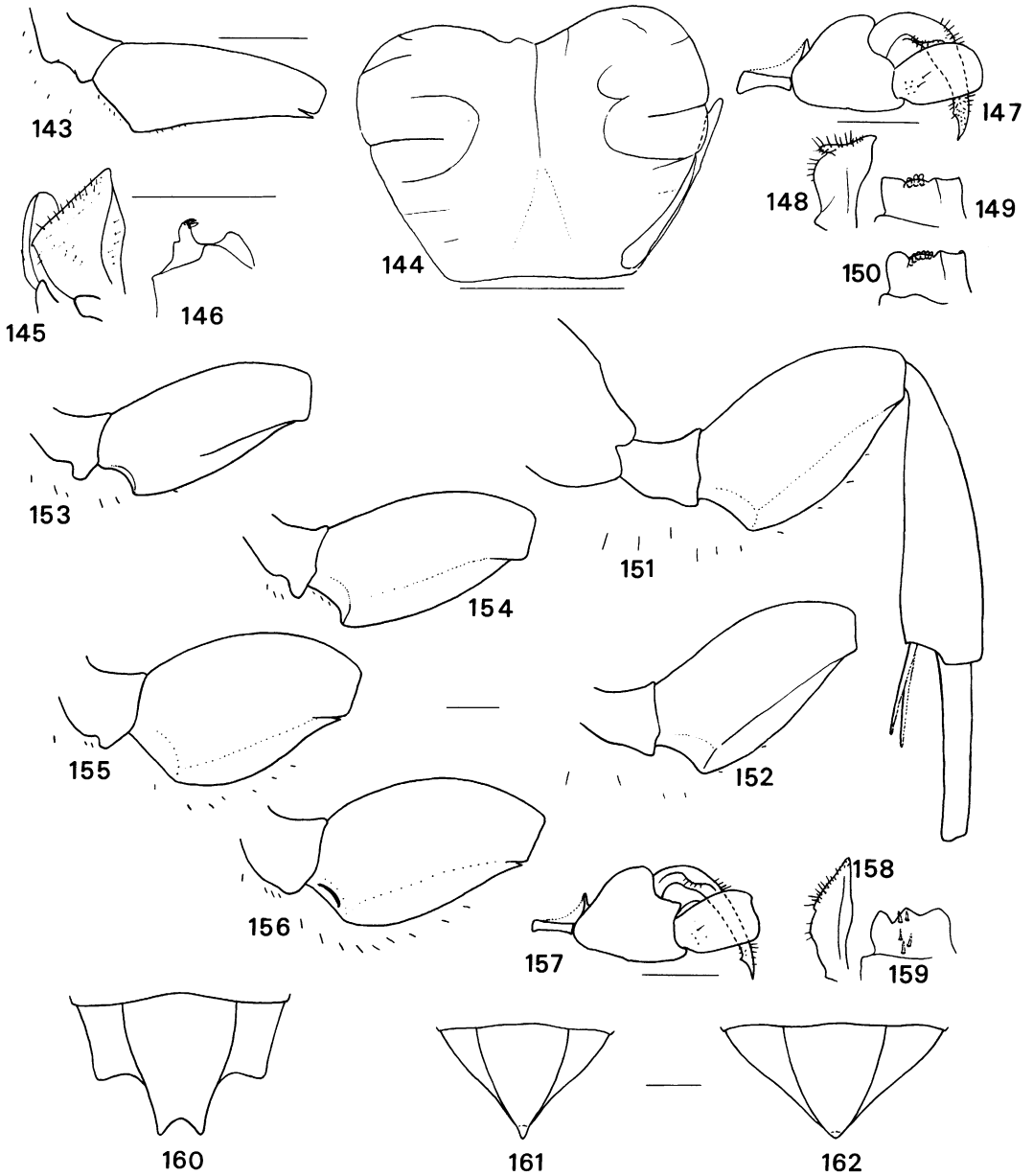
Distribution. Cape Province, in Cape macchia. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); Cape Nature Reserve, Cape Peninsula; Cape Town; Hout Bay; 64 km. E of Knysna; Kommetjie; Lamberts Bay; upper sources, Olifants River, Ceres; west side of Pakhuis Pass near Clanwilliam, 760 m. altitude;

Pearly Beach, Bredasdorp; Port Elizabeth; Uitenhage.

Variation. Differences in the clypeal mark of females are shown in the illustrations. Otherwise the most striking differences are those of genal punctation and vestiture indicated in the description. Specimens with the genal areas nearly smooth and only sparsely hairy may be a different species from those with the upper half or three-fifths strongly punctate and hairy. No other differences were found and the two types are both found in most of the localities listed. The type specimen of *Braunsapis elizabethana* has the upper part of the genal area punctate.

Braunsapis acuticauda Michener
Figures 153, 154, 161, 168-171

Braunsapis acuticauda Michener, 1971a, p. 297.



(Type ♀, AMNH, from Cape Nature Reserve, Cape Peninsula, Cape Province.)

Description. Female. Similar to *Braunsapis elizabethana* except as follows: (1) Length 4-6.5 mm.; forewing length 3-3.5 mm. Clypeus usually wholly black or with small median anterior submarginal spot or narrow pale T; median axillary sclerite wholly brownish black. (31) *Genal area almost entirely densely punctured and covered with short plumose hairs.* (57) *Apex of last sternum acutely pointed.*

Male. Similar to *Braunsapis elizabethana* except as follows: (1m) Length 4 mm.; forewing length 3 mm. (2m-12m) Clypeus sometimes more extensively black (fig. 171). (59) Hind trochanter with two teeth separated by distinct concavity; hind femur less robust (figs. 153, 154); ventral hairs on these segments often much shorter than in *B. elizabethana.*

Distribution. Western Cape Province, in Cape macchia. SOUTH AFRICA: *Cape Province*: Cape Nature Reserve, Cape Peninsula; Cape Town; Hout Bay; west side of Pakhuis Pass near Clanwilliam, 760 m. altitude.

Braunsapis paradoxa (Strand)
Figures 155-160, 172-176

Allodape paradoxa Strand, 1915, p. 58. (Described as *paradoxa* Brauns *in litt.* from the female only, from Algoa Bay, Cape Province; no appropriate type specimen was sent for study from Berlin, where the type should be located. Placed in *Braunsapis* by Michener, 1970a; the printer misspelled the name as *paradoza.*)

Allodape paradoxa Friese, 1924, p. 79. (Described first and in greater detail from the female [called male, probably by printers error], with comparative remarks based on the male; no appropriate female was sent from Berlin; it may be lost or destroyed. A male, the one cited by Friese as collected January 6, 1895, was marked as type in the Berlin museum but should not be accepted as the type until a further search is made for the female type, and cannot be accepted as the type of Strand's *paradoxa.*)

Allodape paradoxa var. *albiceps* Friese, 1924, p. 80 (abdomen only). (Type ♀, consisting of a head and thorax of *Braunsapis leptozonia* to which is glued the distinctive metasoma of *B. paradoxa*, Berlin, from Algoa Bay, Cape Province; since the head and thorax and the character indicated by the varietal name [presence of a pale clypeal mark] are those of *leptozonia*, *albiceps* is considered formally a synonym of that name and not of *paradoxa.*)

Description. Female. Similar to *Braunsapis elizabethana* except as follows: (1) Length 6-7 mm.; forewing length 4 mm. (2-12) Pale yellow T on clypeus more often reduced to median stem or spots or weak line across base of clypeus or commonly entirely absent; median axillary sclerite brownish black. (14) Dorsal hairs of terga 4-6

FIGS. 143-146. *Braunsapis ghanae*, male. 143. Lateral view of hind trochanter and femur, Legon, Accra, Ghana. 144. Eighth tergum and roof of male genital chamber, Lokoja, Nigeria. 145. Dorsal view of left gonostylus and penis valve, Legon, Accra, Ghana. 146. Ventral view of left ventroapical plate of gonocoxite of same.

FIGS. 147-152. *Braunsapis elizabethana*, male. 147. Lateral view of genitalia, Lamberts Bay, Cape Province. 148. Dorsal view of left penis valve of same. 149. Ventral view of left ventroapical plate of gonocoxite of same. 150. Same, but from Cape Nature Reserve, Cape Peninsula, Cape Province. 151. Lateral view of hind leg, Lamberts Bay, Cape Province. 152. Lateral view of hind trochanter and femur, Cape Town, Cape Province.

FIGS. 153, 154. *Braunsapis acuticauda*, male. Lateral view of hind trochanter and femur, west side of Pakhuis Pass, near Clanwilliam, Cape Province. 154. Same, Cape Nature Reserve, Cape Peninsula, Cape Province.

FIGS. 155-159. *Braunsapis paradoxa*, male. 155. Lateral view of hind trochanter and femur, Cape Nature Reserve, Cape Peninsula, Cape Province. 156. Same, Algoa Bay (Port Elizabeth), Cape Province. 157. Lateral view of genitalia, Cape Nature Reserve, Cape Peninsula, Cape Province. 158. Dorsal view of left penis valve of same. 159. Ventral view of left ventroapical plate of gonocoxite of same.

FIGS. 160-162. Ventral view of apices of metasomas of females. 160. *Braunsapis paradoxa.* 161. *Braunsapis acuticauda.* 162. *Braunsapis elizabethana.*

All scale lines represent 0.25 mm. Separate lines serve for figures 143, 144, 145 and 146, 147-150, 151-156, 157-159, 160-162.

very short, sparse, scarcely noticeable in profile, not forming dense apical covering posteriorly on sixth tergum; *sixth tergum with lateral shoulders strongly produced and elevated so that surface of tergum is broadly concave; median apex of sixth tergum notched more broadly than usual and unusual because median apical area is flat and hairless; sixth sternum produced to two apical teeth extending beyond tergum*, and along with produced shoulders of tergum giving apex of metasoma a quadridentate aspect. (25) Upper margin of clypeus weakly convex to weakly concave, when concave sometimes with weak median convexity (both sexes). (29) Lower clypeocular distance about width of scape, upper about twice width of scape. (31) Genal area with punctation and hairs sparse (both sexes). (33) Malar area more than half as long as diameter of scape.

Male. Similar to *Braunsapis elizabethana* except as follows: (1m) Length 5-5.5 mm.; forewing length 4 mm. (2m-12m) Clypeus black or with longitudinal median yellow band, occasionally broadened above and thus almost T-shaped. (14m) Dorsal hairs of terga 4-6 much as in *B. elizabethana* female, not reduced as in *B. paradoxa* female. (33m) Malar area at least one-third as long as diameter of scape. (58) Second and third front tarsal segments often seem slightly wider than basitarsus. (59) Hind trochanter with two weak convexities, about as in *B. acuticauda* but less prominent or sometimes almost absent; both trochanter and femur greatly swollen, ventrobasal beveled or concave area of femur sometimes with enormous deep pit; hairs on undersurfaces of trochanter and femur shorter than in *B. elizabethana*. (60, 61) Not studied. (63) Ventroapical plate of gonocoxite with one or two subapical pegs on dorsal side of median lobe and with two to four subbasal thick hairs or pegs, a feature unique in *Braunsapis*; ventral and lateral surfaces of this plate continuously rounded, not separated by a carina as in *B. elizabethana*. (64) Gonostylus may be rounded apically rather than truncated as in figure 157. (65) Penis valves unusually slender, lateral projection almost absent.

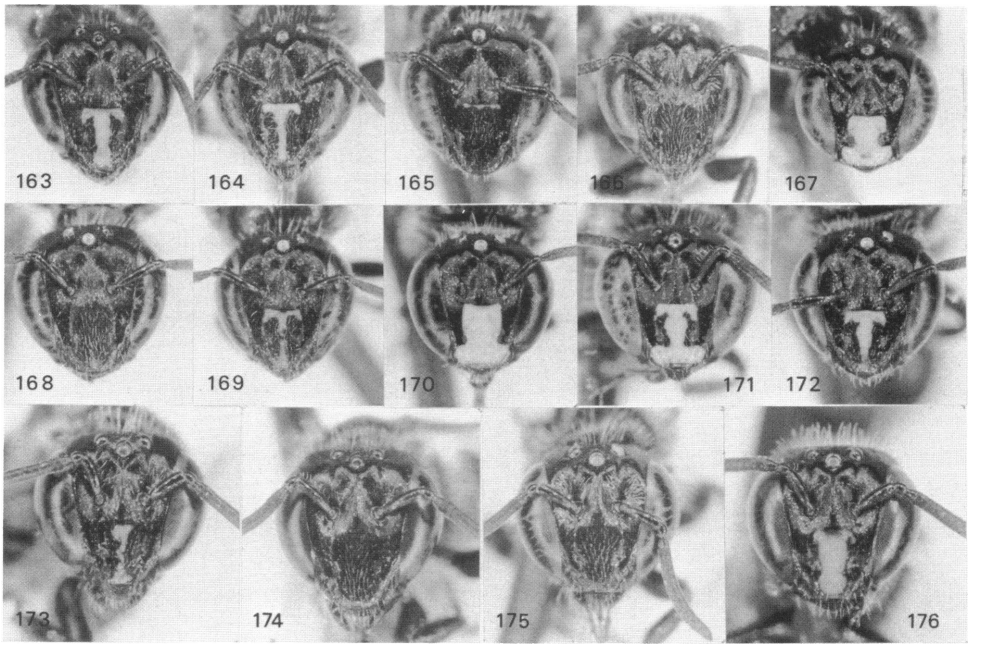
Distribution. Coastal parts of Cape Province, from near Clanwilliam to the Cape and thence eastward to near Port Elizabeth, in Cape macchia. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); Cape Nature Reserve, Cape Peninsula; Cape Town; west side of Pakhuis Pass near Clanwilliam, 760 m. altitude; Swellendam.

Variation. None of the variation, including that in the hind legs of males, is geographic so far as can be determined from the few specimens available. Males with and without the large hind femoral pit have been obtained from the same nest (1259, Cape Nature Reserve).

Braunsapis vitrea Group

This is a group of species of southern Africa. The genitalia seem essentially the same in all populations and species boundaries are difficult to determine. Nests and larvae are almost unknown. The included species as listed below are *Braunsapis vitrea*, *albipennis*, *otavica*, and *fuscinervis*. Because of the similarity of these species, the characters of the group are given below and only the differentiating characters under each of the four species. The characters common to the four species are as follows:

Description. Female (2-12) Black, with or without pale clypeal marks; pronotal lobe black or with limited pale area, sometimes fully yellowish, variable in all the species; small segments of tarsi partly or wholly brown; underside of flagellum usually brownish, noticeably brown in *Braunsapis albipennis*; tegula transparent, often with a yellowish spot, sometimes brownish; wing base pale, median axillary sclerite usually at least half pale, occasionally almost all dark in *B. fuscinervis*. Posterior margins of terga pallid or at least brownish. (13) *Wings clear, veins and stigma lighter brown than in most species, stigma relatively large and clear medially but with its posterior margin broadly dark*, the anterior margin often also darkened. (14) Hairs of terga 4-6 white or brownish, short, blunt, curved posteriorly. (16) Clypeus unusually flat, depressed, commonly more ordinary and slightly convex in *albipennis*, with numerous moderate-sized punctures and scattered larger ones near lower and lower lateral margins, surface between punctures minutely roughened and only moderately shining. (20) Interocellar distance greater than ocellocular distance; ocelloccipital distance less than or sometimes equal to ocellar diameter. (25) Upper margin of clypeus concave, sometimes with



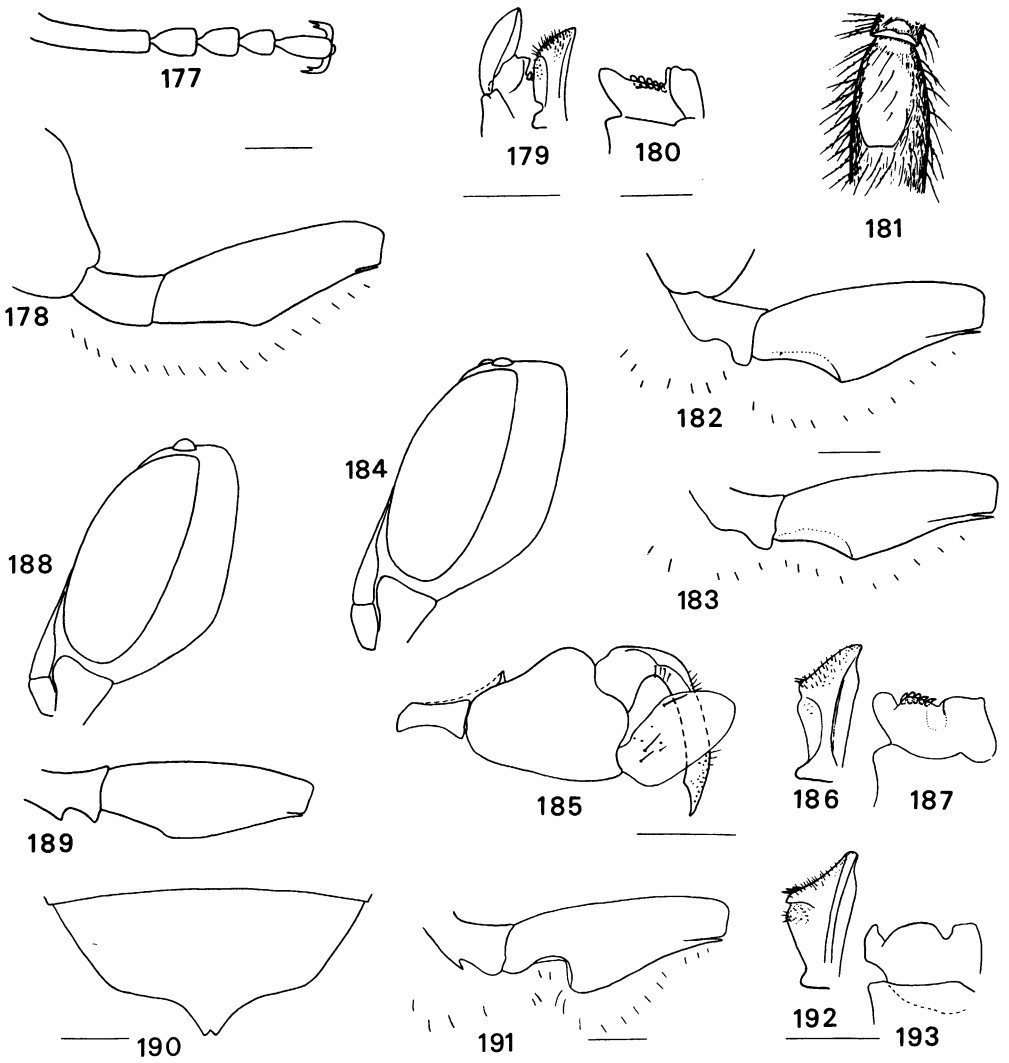
FIGS. 163-167. *Braunsapis elizabethana*, facial views. 163, 164. Females, Hout Bay, Cape Province. 165. Female, west side of Pakhuis Pass, near Clanwilliam, Cape Province. 166. Female, Cape Nature Reserve, Cape Peninsula, Cape Province. 167. Male, west side of Pakhuis Pass, near Clanwilliam, Cape Province.

FIGS. 168-171. *Braunsapis acuticauda*, facial views. 168. Female holotype, Cape Nature Reserve, Cape Peninsula, Cape Province. 169. Female, west side of Pakhuis Pass, near Clanwilliam, Cape Province. 170. Male, same locality. 171. Male, type locality.

FIGS. 172-176. *Braunsapis paradoxa*, facial views. 172. Female, Pakhuis Pass, near Clanwilliam, Cape Province. 173, 174. Females, Cape Nature Reserve, Cape Peninsula, Cape Province. 175, 176. Males, same locality.

median convexity, to straight or even slightly convex. (27) Clypeoantennal distance about equal to diameter of antennal socket. (29) Lower clypeocular distance two-thirds width of scape to equal to width of scape, upper one and one-half to two times width of scape. (31) Genal area shining with only sparse hairs and punctures. (33) Malar area half as long as width of scape to as long as width of scape. (37) First flagellar segment wider than long; middle flagellar segments slightly shorter to slightly longer than broad. (43-45) Wing venation as described for *B. facialis*, marginal cell longer and more slender than in most other species. (52) Basitibial plate often not defined but frequently faintly defined along posterior margin by a carina similar to that found in *B. facialis* but weaker, its apex sometimes not at all elevated.

Male. Similar to female except as follows: (2m-12m) Facial marks white to yellow, variable; hind basitarsus white to testaceous, other basitarsi similarly colored or partly or wholly fuscous; small segments of tarsi light to dark brown, sometimes partly whitish when basitarsi are white. (29m) Lower clypeocular distance one third to half width of scape, upper less than to more than width of scape. (33m) Malar area one-third or one-fourth as long as diameter of scape. (37m) First flagellar segment about twice as wide as long; middle flagellar segments as long as broad to distinctly longer than broad. (52m) Basitibial plate not defined. (58) Tarsi about as



FIGS. 177, 178. *Braunsapis vitrea*, male, 16 km. N of Ubombo, Natal. 177. Top view of front tarsus. 178. Lateral view of hind trochanter and femur.

FIGS. 179, 180. *Braunsapis fuscinervis*, male. 179. Dorsal view of left gonostylus and penis valve, 16 km. N of Grahamstown, Cape Province. 180. Ventral view of left ventroapical plate of gonocoxite of same.

FIGS. 181-187. *Braunsapis foveata*. 181. Underside of base of hind femur, male, from Nairobi, Kenya. 182, 183. Lateral views of hind trochanter and femur, male, from Nairobi, Kenya, and Bambui, near Bamenda, Western Province, Cameroon. 184. Lateral view of head, female, same locality. 185. Lateral view of male genitalia, same locality. 186. Dorsal view of left penis valve of same. 187. Ventral view of left ventroapical plate of gonocoxite of same.

FIG. 188. Lateral view of head of female of *Braunsapis facialis* from Legon, Accra, Ghana.

FIG. 189. *Braunsapis flavitarsis*, male. Hind trochanter and femur, based on sketch of holotype from Vanga, Kenya.

FIGS. 190-193. *Braunsapis angolensis*. 190. Dorsal view of sixth tergum of female. 191. Lateral view of hind trochanter and femur, male, Caconda, Huila, Angola. 192. Dorsal view of left penis valve of same. 193. Ventral view of left ventroapical plate of gonocoxite of same.

All scale lines represent 0.25 mm. Separate lines serve for figures 177 and 178, 179, 180, 181-183, 185-187, 190, 191, 192 and 193.

described for *Braunsapis facialis*, middle basitarsus shorter than to longer than remaining tarsal segments taken together. (59) Hind trochanter simple or with weak ventral convexity in rather sharp longitudinal ventral ridge; hind femur with weak angle before middle, surface somewhat excavated basal to angle; hind trochanter and femur with rather numerous ventral hairs, as long as or slightly shorter than diameters of segments. (60) Membranous convexities of eighth tergum with one or two more transverse wrinkles than usual in *B. facialis*. (61) Seventh sternum only feebly emarginate or straight medioapically. (63) Ventroapical plate of gonocoxite (fig. 180) with 4 to 6 pegs, carina separating ventral from lateral portions of plate curved as shown in figure. (64) Gonostylus longer than broad, rounded apically, rather strongly reticulate and roughened in most specimens. (65) Penis valve rather slender (fig. 180), without coarse or peglike setae.

Included species. The species of the group are two commoner small forms, *fuscinervis* and *albipennis*, and two less common large forms, *vitrea* and *otavica*. As in other cases where there are pairs of very similar forms distinguished principally by size, there are intermediates but most specimens can be placed by size. In color and morphology, *fuscinervis* and *vitrea* are almost alike, as are *albipennis* and *otavica*. Especially in Natal there are occasional intermediates between the morphological forms, both between the large species and the small ones. But in several localities where *fuscinervis* and *albipennis* occur together and two localities where *vitrea* and *otavica* occur together, and from which good series are available, every specimen is distinguishable.

To facilitate recognition of the species of the group, the principal characters are summarized in table 3.

TABLE 3
Summary of Characters of the Species of the *Braunsapis vitrea* Group

	vitrea	*fuscinervis*	*otavica*	*albipennis*
Length ♀ (mm.)	5-7.5	4-6	5-7.5	4-5.5
Forewing length ♀ (mm.)	4-4.5	3-<4	4-4.5	3-<4
Clypeus ♀	black to ill-defined pale T	pale T often expanded below, rarely mere line	well-defined pale T, upper part sometimes expanded, lower part sometimes absent	well-defined pale T, or cross bar only, rarely entirely black
Scutellum ♀ ♂	mostly dull	mostly dull	shining	shining
Length ♂ (mm.)	5-7	4-5	5-7	4-5
Forewing length ♂ (mm.)	4	3-3.5	4	3-3.5
Clypeus ♂	lower part, rarely whole clypeus, yellow	all yellow	all yellow-white	all yellow-white
Scape ♂	no yellow	no yellow	usually yellow beneath	black to pale beneath
Mandible ♂	black or with yellow spot	largely yellow	black	black or with yellow spot
Upper clypeocular distance ♂	> scape width	> scape width	= scape width	= or < scape width

Braunsapis vitrea (Vachal)
Figures 177, 178, 194-198

Allodape vitrea Vachal, 1903, p. 388. (Type ♀, Bruxelles, from Monteiro, Delagoa Bay, Mozambique. Placed in *Braunsapis* by Michener, 1970a).
Allodape planiceps Strand, 1915, p. 44 (New synonym. Type ♀, Berlin, from "Capland, Krebs S.")
Allodape nigriceps Friese, 1924, p. 73. (New synonym. Type ♀, Berlin, from Mfongosi, Zululand, Natal. This name appears not to have been formally proposed as new but is in Friese's key.)

Description. Female. Agrees with the description of the *vitrea* group. (1) Length 5-7.5 mm.; forewing length 4-4.5 mm. (2-12) Clypeus all black, with an ill-defined longitudinal white line, or occasionally with a weak T (figs. 194, 195). (14) Scutellum entirely or largely minutely roughened and dull. Dorsal hairs of metasomal terga 4-6 thickened apically.

Male. Agrees with description of *vitrea* group. (1m) Length 5-7 mm.; forewing length 4 mm. (2m-12m) Labrum yellow; anterior part of clypeus yellow, yellow usually at least extending up middle of clypeus, and rarely entire clypeus yellow; paraocular mark absent or occasionally very minute; scape without yellow; mandible entirely dark or with yellow spot. (29m) Upper clypeocular distance greater than width of scape.

Distribution. Natal, Mozambique, and Malawi to Angola. Good series are available only from Catuane, Ndumu, and Ubombo in Mozambique and Natal. Elsewhere the species seems to be scarce. SOUTH AFRICA: *Natal*: Mfongosi, Zululand; Nagle Dam, 27 km. E of Pietermaritzburg; Ndumu Reserve, Zululand; 16 km. N of Ubombo. *Transvaal*: Barberton; 13 km. S of Gollel; Retiefs Kloof. RHODESIA: Matopo Hills near Bulawayo. MOZAMBIQUE: Catuane, Lourenço Marques District; Lourenço Marques; Monteiro, Delagoa Bay; Nova Chupanga. MALAWI: Bilila, Southern District, 610 m. altitude. ANGOLA: 16 km. N of Chicuma.

Braunsapis fuscinervis (Cameron), new combination
Figures 179, 180, 199-205

Allodape fuscinervis Cameron, 1905b, p. 247. (Type ♀, Grahamstown, from Brak Kloof, near Grahamstown, Cape Province.)
Allodape albipes Cockerell, 1933a, p. 55. (New synonym. Type ♂, BM, from Graaff-Reinet, Cape Province.)

Description. Female. Similar to *Braunsapis vitrea* except for smaller size and usually more extensive yellow facial markings, as follows: (1) Length 4-6 mm.; forewing length 3 to nearly 4 mm. (2-12) Labrum of female often partly or largely yellowish; clypeus with usually ill-defined T-shaped mark of variable thickness nearly always expanded below, sometimes forming lower cross bar larger than top bar of T, lower ends of lower bar usually fading into red brown, ends of upper bar often weakly hamulate; a few specimens with only longitudinal yellowish clypeal line, none with clypeus all black as is common in *B. vitrea*.

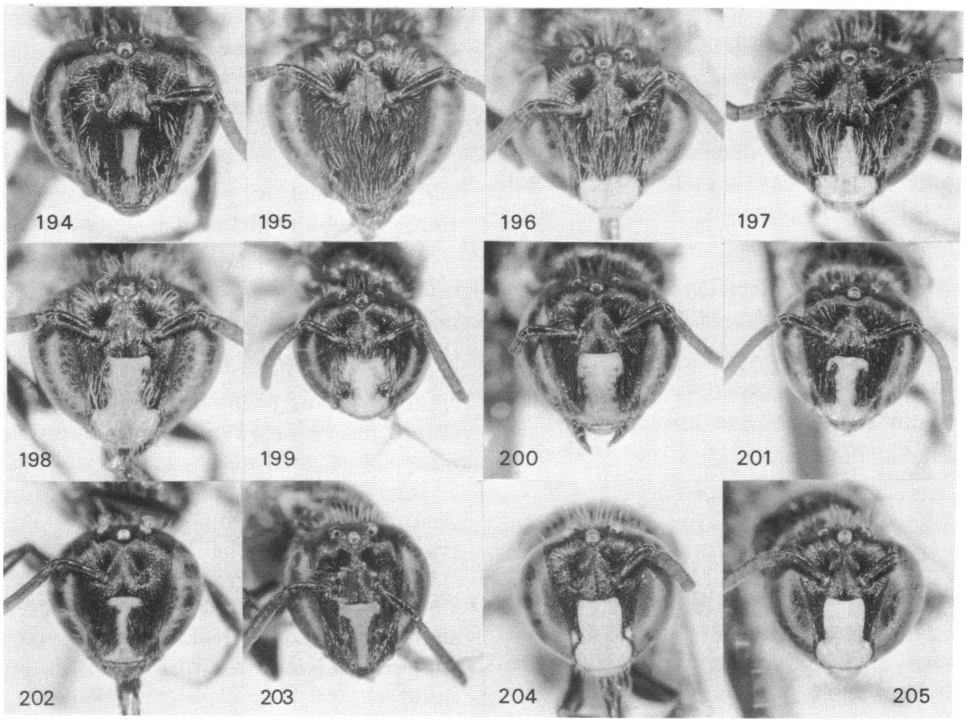
Male. Similar to *Braunsapis vitrea* except for smaller size and more extensive pale markings, as follows: (1m) Length 4-5 mm.; forewing length 3-3.5 mm. (2m-12m) Labrum usually yellowish but sometimes black; clypeus all yellow; paraocular marks absent to small, sometimes reaching halfway from level of tentorial pit to summit of clypeus; mandible largely yellow.

Distribution. Eastern Cape Province to Natal. SOUTH AFRICA: *Cape Province*: Beaufort West District; Brak Kloof near Grahamstown; Bushman's River, 48 km. SE of Grahamstown; Dikbome, Merweville, Koup; Graaff-Reinet; Grahamstown; 16 km. N and 18 km. NW of Grahamstown; Middelburg Division; Uniondale District; 16 km. SW of Willowmore. *Transkei*: Near Umtata. *Natal*: Mfongosi, Zululand; Nagle Dam, 27 km. E of Pietermaritzburg; St. Lucia Estuary, Zululand; 16 km. N of Ubombo. *Transvaal*: Ellisras; 13 km. S of Gollel.

Braunsapis otavica (Cockerell), new combination
Figures 206-211

Allodapula otavica Cockerell, 1939b, p. 38. (Type ♂, BM, from Otavi, South West Africa.)
Allodapula tuberculata Cockerell, 1939b, p. 41. (New synonym. Type ♂, BM, from Okahandya [= Okahandja], South West Africa.)

Description. Female. Agrees with description of *vitrea* group. (1) Length 4-7.5 mm.; forewing length 4-4.5 mm. (2-12) Clypeus with white or



FIGS. 194-198. *Braunsapis vitrea*, facial views. 194. Female, Nagle Dam, 27 km. E of Pietermaritzburg, Natal. 195. Female, Ndumu Reserve, Natal. 196, 197. Males, 16 km. N of Ubombo, Natal. 198. Male, Lourenço Marques, Mozambique.

FIGS. 199-205. *Braunsapis fuscinervis*, facial views. 199. Female, 13 km. S of Gollel, Transvaal. 200-202. Females, Grahamstown and vicinity, Cape Province. 203. Female, St. Lucia Estuary, Natal. 204, 205, Males, Grahamstown and vicinity.

yellowish T, cross bar usually hamate, lower half of stem of T sometimes absent; no red lateral to stem of T; pale clypeal area sometimes expanded almost to form of that of *Braunsapis facialis*; labrum not pale. (14) Scutellum shining (both sexes). Dorsal metasomal hairs blunt but slender (both sexes).

Male. Agrees with description of *vitrea* group. (1m) Length 4-7 mm.; forewing length 4 mm. Labrum and clypeus yellowish white; paraocular marks absent to small; scape black or usually with yellow on undersurface; mandible black. (29m) Upper clypeocular distance about equal to width of scape.

Distribution. Namaqualand and South West Africa to Natal and Mozambique. SOUTH AFRICA: *Cape Province*: Kamieskroon. *Natal*: 10 km. S of Kwambonambi; Ndumu Reserve, Zululand. SOUTH WEST AFRICA: Kamanyab; Koabendus; Okahandja; Otavi; Windhoek. MOZAMBIQUE: Catuane, Lourenço Marques District.

Variation. Specimens from South West Africa have more extensive pale marks, the pale area on the clypeus of the female nearly always reaching the lower margin and sometimes being expanded so that the T is not or scarcely hamate and occasionally the mark has nearly the form of that of *Braunsapis facialis*. In contrast, specimens from Natal are usually dark, the stem of the T being absent below.

Not all specimens from South West Africa can be clearly distinguished from sympatric material of *Braunsapis albipennis*. The problem is similar to that for the various other size pairs in allodapines.

Braunsapis albipennis (Friese), new combination
Figures 212-224

Allodape albipennis Friese, 1909, p. 205. (Lectotype ♀, Berlin, from Grootfontein, South West Africa. Friese did not designate a single type. A male was labeled as type in Berlin, but not so published; since the description is based on the female, with the male treated only comparatively, it seems best to select the female from Grootfontein as lectotype.)

Allodape lactipennis Friese, 1909, p. 205; 1924, p. 80. (New synonym. Lectotype ♀, Berlin, from Willowmore, Cape Province, on a pin with a male. This name was used in manuscript and on labels but not published by Brauns; it was published by Friese (twice) as "*lactipennis* Brauns i.l." The lectotype almost completely lacks clypeal markings.)

Allodape lacteipennis Strand, 1915, p. 47. (This name, an emendation of Brauns' manuscript name *lactipennis*, was published as "*lacteipennis* Brauns i.l." As Strand refers to the clypeal mark, he probably saw a different specimen than the lectotype of Friese's *lactipennis*.)

Allodape basizona Friese, 1924, p. 73. (New synonym. Type ♀, Berlin, from Willowmore, Cape Province; so far as I know, this name has not been formally proposed as new but the variant without any central pale line on the clypeus was keyed out under this name by Friese.)

Allodape lacteipennis vernayi Cockerell, 1935b, p. 89. (New synonym. Type ♀, location unknown, from Kuke Pan, Botswana.)

Allodapula debilitata Cockerell, 1936a, p. 6. (New synonym. Type ♀, AMNH, from Matopo Hills near Bulawayo, Rhodesia.)

Allodapula lucidula Cockerell, 1936a, p. 13. (New synonym. Type ♀, AMNH, from Van Rhyn's Pass, Cape Province.)

Allodapula paupercula Cockerell, 1936a, p. 18. (New synonym. Type ♂, AMNH, from Matopo Hills near Bulawayo, Rhodesia.)

Allodapula rufitarsis Cockerell, 1936a, p. 23. (New synonym. Type ♂, AMNH, from Matopo Hills near Bulawayo, Rhodesia.)

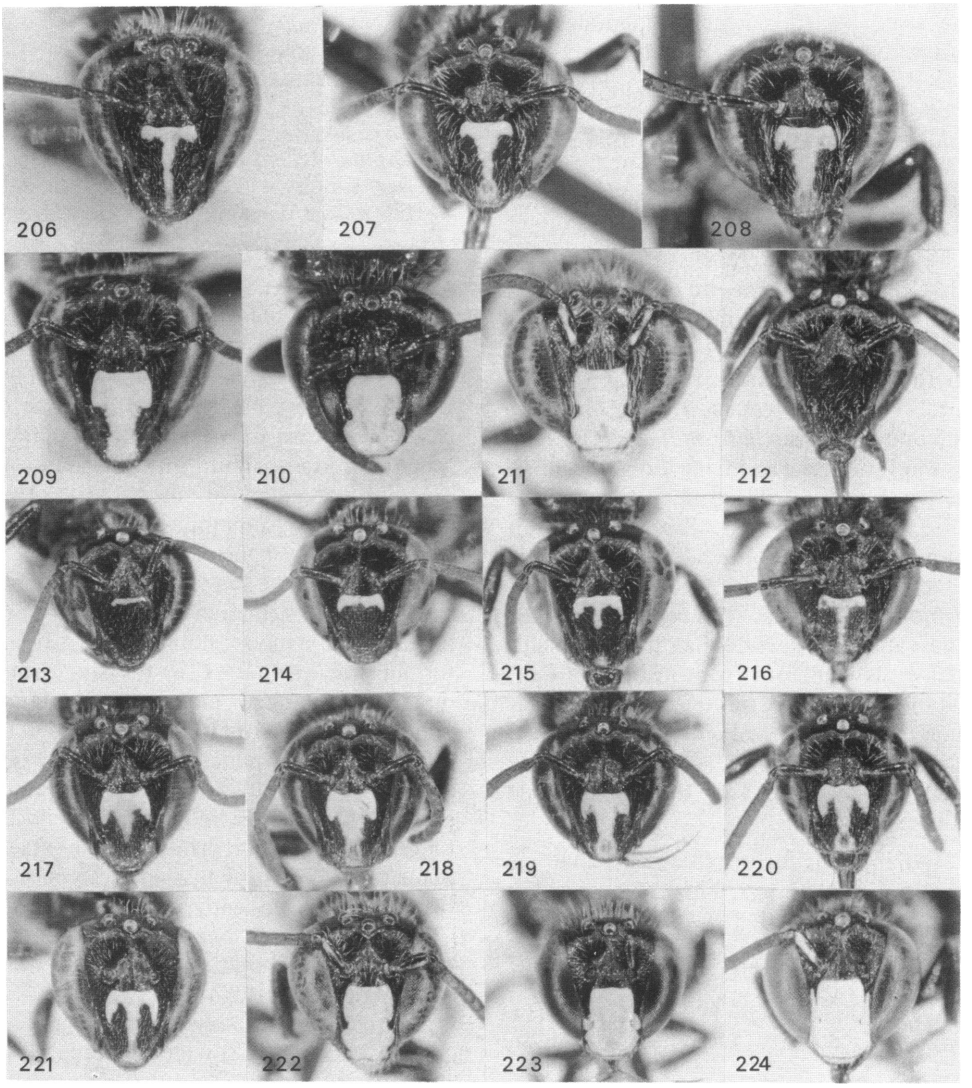
Allodapula arcana Cockerell, 1939b, p. 37. (New synonym. Type ♂, BM, from Nelspoort, Cape Province.)

Description. Female. Agrees with description of *vitrea* group. (1) Length 4-5.5 mm.; forewing length 3 to nearly 4 mm. (2-12) Clypeus rarely all black, usually with white or yellowish markings forming a T, the cross bar hamate, sometimes only the cross bar at summit of clypeus present; lower end of stem of T only rarely broadened, but area lateral to lower end often red. Labrum sometimes partly or largely yellowish. (14) Scutellum shining although sometimes with fine roughening (both sexes). Dorsal metasomal hairs blunt but slender (both sexes).

Male. Agrees with description of *vitrea* group. (1m) Length 4-5 mm.; forewing length 3-3.5 mm. (2m-12m) Labrum usually yellowish but sometimes black; clypeus all white or yellow; paraocular marks absent to large; scape black to white or yellow beneath; mandible variable as in *Braunsapis vitrea*. (29m) Upper clypeocular distance about equal to or less than width of scape.

Distribution. Eastern Cape Province to Natal, west and north through Rhodesia, Botswana, Bushmanland and the Karoo to Namaqualand and South West Africa. Although found in mesic areas, the species is most widespread and abundant in xeric regions, unlike most allodapines. SOUTH AFRICA: *Cape Province*: Beaufort West District; Bloukrans, near Calvinia; Bushman's River, Letjiesbosch; Constable; De Bos road, 48 km. E of Clanwilliam; Dikbome, Merweville, Koup; Fraserburg; Gamkaspoort; Garies; Gouph, Laingsburg District; Kakamas; Murraysburg District; Nelspoort; Onseepkans near Orange River, Bushmanland; 16 km. W of Prince Albert; Richmond District; Spingbok; Van Rhyn's Pass; Upington; Vioolsdrif, Orange River, Namaqualand; Vogelsfontein, Prince Albert Division; Willowmore. *Natal*: Kloof; Sordwana Bay, 80 km. E of Ubombo; 16 km. N of Ubombo. *Transvaal*: Ellisras; 13 km. S of Gollel; Louis Trichardt; Swartruggens. SOUTH WEST AFRICA: Cayimaeis, Warmbad; Fish River Canyon; Grootfontein; Kamanyab; 64 km. W of Klein Karas, 850 m. altitude; Otavi; Otjikondo; Otjituo; Phillips Ranch, 8 km. N of Usakos, 1100 m. altitude; 23 km. north of Rehoboth, 1500 m. altitude. BOTSWANA: Kuke Pan. RHODESIA: Matopo Hills near Bulawayo.

Variation. The two males from Ellisras and Swartruggens, Transvaal, both have the distance from the upper half of the clypeus to the eye slightly greater than the scape width, unlike most *Braunsapis albipennis*. One has the mandible and scape black, the other has limited yellow areas on each. A male from Louis Trichardt is like the



FIGS. 206-211. *Braunsapis otavica*, facial views. 206. Female, Otavi, South West Africa. 207, 208. Females, Ndumu Reserve, Natal. 209. Otavi, South West Africa. 210. Male, Kamieskroon, Cape Province. 211. Male, Ndumu Reserve, Natal.

FIGS. 212-224. *Braunsapis albipennis*, facial views. 212. Female, Ellisras, Transvaal. 213. Female, Springbok, Cape Province. 214. Female, Willowmore, Cape Province. 215. Female, Swartruggens, Transvaal. 216. Female, Matopo Hills, Rhodesia (holotype of *Allodapula debilitata* Cockerell). 217, 218. Females, Fish River Canyon, South West Africa. 219. Female, 13 km. S of Gollel, Transvaal. 220. Female, Ellisras, Transvaal. 221. Female, 16 km. N of Ubombo, Natal. 222, 223. Males, Matopo Hills, Rhodesia (holotypes of *Allodapula paupercula* and *rufitarsis*, respectively). 224. Male, Fish River Canyon, South West Africa.

second one mentioned but the upper clypeo-ocular distance is less than the width of the scape.

The only female from Rhodesia (type of *debilitata*) has the clypeal mark reduced to a slender T with dark red brown lateral to the stem (fig. 216). The labrum is dark. The two males

from the same place have dark mandibles but some yellow on the scape; paraocular marks are present in the type of *rufitarsis*, absent in that of *paupercula*. The scutellum in both sexes is shining although not necessarily without fine roughenings.

The form from the arid Karoo of South Africa and from Namaqualand and South West Africa usually has a T on the clypeus of the female, with red lateral to the lower end of the stem, but occasionally the pale coloration is broadened below and there may even be some pale coloration on the often reddish labrum. The stem of the clypeal T is often reduced or absent in the Karoo of South Africa (*basizona*) and the face may be wholly black (as in the only specimen from the De Bos Road 48 km. E of Clanwilliam and another from Van Rhyn's Pass). The scutellum is almost entirely smooth and shining except for the scattered punctures. I have seen few males from these areas. The one from Van Rhyn's Pass (type of *lucidula*) has dark scape and paraocular areas while one from Fish River Canyon in South West Africa has the scape and paraocular areas extensively marked (fig. 224). Both have dark mandibles and the distance from the upper half of the clypeus to the eye is about equal to the scape width.

Braunsapis foveata (Smith)
Figures 181-187, 225-234

Allodape foveata Smith, 1854, p. 229. (Type ♀, BM, from Sierra Leone. Placed in *Braunsapis* by Michener, 1970a).

Allodape nigricollis Vachal, 1903, p. 369. (New synonym. Lectotype ♀, Bruxelles, from Vista, Zaire.)

Allodape T-insignita Strand, 1912, p. 287. (New synonym. Type ♀, Berlin, from Uelleburg, Rio Muni.)

Allodape heveae Strand, 1914, p. 175. (New synonym. Lectotype ♂ here designated, Deutsche Ent. Inst. in Eberswalde, from Victoria, West Cameroon.)

?*Allodape albicincta* Friese, 1924, p. 76. (New synonym. Type ♀, Berlin, from Eritrea, Ethiopia.)

Allodape wilmattae Cockerell, 1933a, p. 56. (New synonym. Type ♀, AMNH, from Capeio, Angola.)

Allodape diloloensis Cockerell, 1933a, p. 58. (New synonym. Type ♀, BM, from Dilolo, Zaire.)

Allodapula hamatifera Cockerell, 1936a, p. 9. (New synonym. Type ♀, AMNH, from Vumba, Umtali, Rhodesia. A cotype [= paratype] at the British Museum is erroneously marked as the type.)

Allodapula melanosoma Cockerell, 1936a, p. 15. (New synonym. Type ♂, AMNH, from Matopo Hills near Bulawayo, Rhodesia.)

Description. Female. (1) Length 5-8 mm.; forewing length 3.5-5 mm. (2-12) Black, clypeus with T-shaped yellowish mark, sometimes hamate, often thin, rarely reduced to a median longitudinal line; pronotal lobe black, rarely partly yellowish or even entirely so; sclerites of wing base dark brown or blackish, tegula dark brown, sometimes transparent; small segments of tarsi brownish; margins of metasomal terga light brown or pallid, sometimes yellowish. (13) Wings slightly brown, veins and stigma dark brown. (14) Dorsal hairs on terga 4-6 white to light brown, rather slender, blunt, curved posteriorly, longest and densest along tergal margins, thus forming weak fringes. (16) Clypeus with numerous moderate-sized punctures, scattered large punctures along lower and lower lateral margins, surface between punctures minutely roughened and somewhat dull. (20) Interocellar distance equal to or slightly more than ocellocular distance; ocelloccipital distance more than ocellar diameter. (25) Upper margin of clypeus concave or straight, often with median convexity. (27) Clypeoantennal distance equal to or less than diameter or antennal socket. (29) Lower clypeocular distance two-thirds width of scape to equal to width of scape, upper clypeocular distance 1.7 to 2.0 times width of scape. (31) *Upper genal area behind summit of eye variably swollen*; upper half or third of genal area with punctures and hairs, especially posteriorly, in contrast to rest of area which is almost smooth. (33) Malar area more than half as long as width of scape. (37) First flagellar segment slightly broader than long to longer than broad; middle segments as broad as long to longer than broad. (43-45) Wing venation as described for *Braunsapis facialis*, stigma being relatively small and markedly shorter than marginal cell. (52) Basitibial plate often not at all defined, sometimes indicated on posterior margin by weak carina, rarely visible except in distal half of plate area.

Male. Similar to female except as follows:

(1m) Length 5-6.5 mm.; forewing length 4 mm. (2m-12m) Black, clypeus all yellow or usually with extensive lateral black areas; paraocular area black or with yellow area sometimes extending nearly to summit of clypeus; labrum yellow at least medially; mandible black, brown apically, to largely yellow; scape black to yellow beneath. Leg coloration as in female or tarsi sometimes whitish or brownish white. (29m) Lower clypeo-ocular distance half to nearly three-fourths width of scape, upper slightly less than to nearly 1.5 times width of scape. (33m) Malar area one-third or one-fourth as long as width of scape. (37m) First flagellar segment about as long as wide. (52m) Basitibial plate not defined. (58) Front basitarsus nearly as long as segments 2-5 together, mediotarsal segments flattened, segments 2-3 not or scarcely wider than basitarsus; other tarsi as described for *Braunsapis facialis* but hind basitarsus not or scarcely tapering. (59) Hind trochanter with two blunt angles on lower surface, the median one a longitudinal ridge; hind femur with angle on lower surface before middle and smooth shallow excavation basal to angle, toward outer surface of femur; hairs of undersurfaces of trochanter and femur sparse, briefly plumose, mostly somewhat shorter than diameters of these segments. (60) Membranous convexities of eighth tergum about as in *B. facialis*. (61) Seventh sternum as in *B. facialis*. (63) Ventroapical plate of gonocoxite with 4-6 pegs, broad emargination lateral to pegs emphasized by a faint line looping basally, as shown by dots in figure 187. (64) Gonostylus considerably longer than wide, strongly reticulate. (65) Penis valves rather slender, with only a few slightly thickened, bristlelike setae.

Distribution. Natal to Ethiopia west to Angola and Senegal. SOUTH AFRICA: *Natal*: Greytown; Nagle Dam, 27 km. E of Pietermaritzburg; 18 km. S of Pietermaritzburg; Richmond; 8 km. S of Richmond; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Tugela Mouth; Umbumbulu; Umhlali. *Transvaal*: 14 km. W of Kaapsekoop; 27 km. E of Nelspruit, 915 m. altitude. RHODESIA: Christmas Pass, Umtali; Matopo Hills near Bulawayo; Vumba, Umtali. MALAWI: Blantyre; Kasungu, Central District; Lilongwe; Limbe; Vipya Plateau, 19 km. NE of Mzimba, 1590 m. altitude. ANGOLA: Capeio; 23 km. SE of Hengue, 1720 m. altitude; 10 km. S of Quibala, 1230 m. altitude; Vila Flor, Huambo; 48 km. E of Xandel, 820 m. altitude. CONGO (BRAZZAVILLE): Brazzaville. ZAIRE: *Shaba* (= *Katanga*): Dilolo; 29 km. NW of Kabondo Dianda, 900 m. altitude; Kapanga, Lulua; 16 km. S of Kapona, 1570 m. altitude; 19 km. N of Kasaji, 1100 m. altitude; 56 km. E of Kolwezi, 1500 m. altitude; La Mofia; Lubumbashi (= Elizabethville); Lusinga, Upemba Park; 16 km. W of Mitwaba, 1570 m. altitude; Niunzu, District of Tanganyika Moero; Sakania; 6 km. S of Sampwe, 980 m. altitude; Tenke; 29 km. NW of Tshinsenda, 1330 m. altitude. *East Kasai*: Lankuru, Komi; Lodja, Sankuru. *Lower Zaire*: Kinshasa (= Leopoldville); Kisantu; Lemba; 10 km. N of Matadi; Vista. *Equator*: Mondombe. *Kivu*: Beni; 8 km. N of Bukavu, 1475 m. altitude; 24 km. NW of Bunyakiri, 800 m. altitude; Kabarazo; Mt. Ruwensori; Nyangwe; Rutshuru Region. *Upper Zaire*: Avakubi; Bambili; Eala; Madyu, La Moto, Ituri; Niarembe, Mohagi; Sesenge, Ituri; Tuku, upper Uele; Wamba; Yangambi. BURUNDI: Cankuzo, Territory of Ruyigi, 1650 m. altitude. RWANDA: Kinazl, Nyanza, 1600 m. altitude. TANZANIA: Kobonoto, Kilimanjaro, 1300-1900 m. altitude; Kogoma; Ngurdoto National Park, near Arusha, 1430 m. altitude; Tabora; Ujiji. UGANDA: northeast slope of Mt. Elgon, 2000 m. altitude; Kampala; Kawanda, Kampala; 35 km. W of Tororo. KENYA: 90 km. W of Eldoret; Karen, Nairobi, 1830 m. altitude; 48 km. S of Kitale; Lake Naivasha; Nairobi; 80 km. SE of Nairobi. ETHIOPIA: Eritrea; Harar. RIO MUNI: Uelleburg, Benito District. CAMEROON: Bambui, near Bamenda, Western Province, 1370 m. altitude; Victoria, Western Province; Babadjou, Eastern Province. NIGERIA: Lagos; Olokemeji, Ibadan. GHANA: Legon, Accra. IVORY COAST: 8 km. ESE of Touba, 800 m. altitude. LIBERIA: Cuttington College, Bong County; Monrovia; Roberts Field. SIERRA LEONE: no locality. SENEGAL: Dakar.

Variation. Although most individuals are large for a *Braunsapis*, slightly larger and noticeably broader than *B. facialis*, there is more marked size variation than in other species, there being rare notably small specimens and also unusually large ones. While in some other cases (e.g., *B. fuscinervis* and *vitrea*; *Allodape panurgoides* and *ceratinoides*) size has been taken as a meaningful

specific character, there is no evidence for this among forms here called *B. foveata*. In no case have populations of two sizes been found living in the same area; instead only occasional unusual sized specimens are taken in series of individuals of the usual size. Of course a small rare species, for example, is a possible explanation of the few small specimens, but it is not likely.

The name *albicincta* is based on females with the yellow restricted to a streak in the lower half of the clypeus. In addition to the type, one in the Berlin Museum is from Harar, Ethiopia. The northeastern populations of *B. foveata* may be characterized by this reduction in markings; no other Ethiopian specimens have been seen. One specimen in the large series of *B. foveata* from Bambui, near Bamenda, West Cameroon (C. D. Michener) has the clypeal mark equally reduced, and there are various intermediates. Several females in a series from Lake Naivasha, Kenya (H. V. Daly) have only a median pale line on the clypeus, although others have the crossbar of the pale T well developed.

The variation illustrated in the hind trochanters and femora of males (figs. 182, 183) occurs at various localities; a geographical relationship has not been noted.

Although the tarsi of males are usually dark, one of two from St. Lucia Estuary and those from Malawi, the type of *heveae* from coastal Cameroon, and those from Senegal (but not from intervening areas such as Uganda and upland Cameroon) have pale tarsi, sometimes with the basitarsi infuscated basally. The pronotal tubercles are usually black but in half of a series of six females from Tabora, Tanzania, and in some specimens from Zaire the tubercles are partly pale.

The face marks of the male vary greatly. Sometimes the yellow is restricted to a longitudinal median clypeal band, expanded at the two ends, and a yellow area on the labrum. In South African males, the minimum amount of pale marking is somewhat more extensive, nearly the whole clypeus being yellow and the underside of the scape having at least a small yellow spot. In all areas the mandibles are sometimes partly or largely yellow. Probably in all areas lateral face marks and the underside of the scape may be yellow although no such specimens are available among the few males from Uganda and Kenya. Maximal yellow is more common and more extensive in southern than in equatorial Africa, as in various other species.

Certain differences in larvae, to be described elsewhere, suggest that tropical populations (Liberia, Ghana, Cameroon, Uganda, and Kenya) differ from southern populations (Malawi and Natal) at a specific or subspecific level. If this is so, the name *foveata* is applicable to the tropical form and and *hamatifera* is probably applicable to the southern form.

Braunsapis flavitarsis (Gerstaecker), new combination
Figure 189

Allodape flavitarsis Gerstaecker, 1870, p. 350. (Type ♂, Berlin, from Vanga, Kenya.)

This species is similar to *Braunsapis foveata* but the trochanteral teeth of the male are stronger (fig. 189) and the tegula and axillary sclerites are entirely pale.

In the type the labrum and mandibles are largely pale; the clypeus is pale, except for the lateral parts of the lower half; a triangular lateral face mark is present, widely separated from the clypeus and extending up to a level about midway between the tentorial pit and the summit of the clypeus, and the underside of the scape is pale. In these respects *flavitarsis* resembles some but not all specimens of *foveata*.

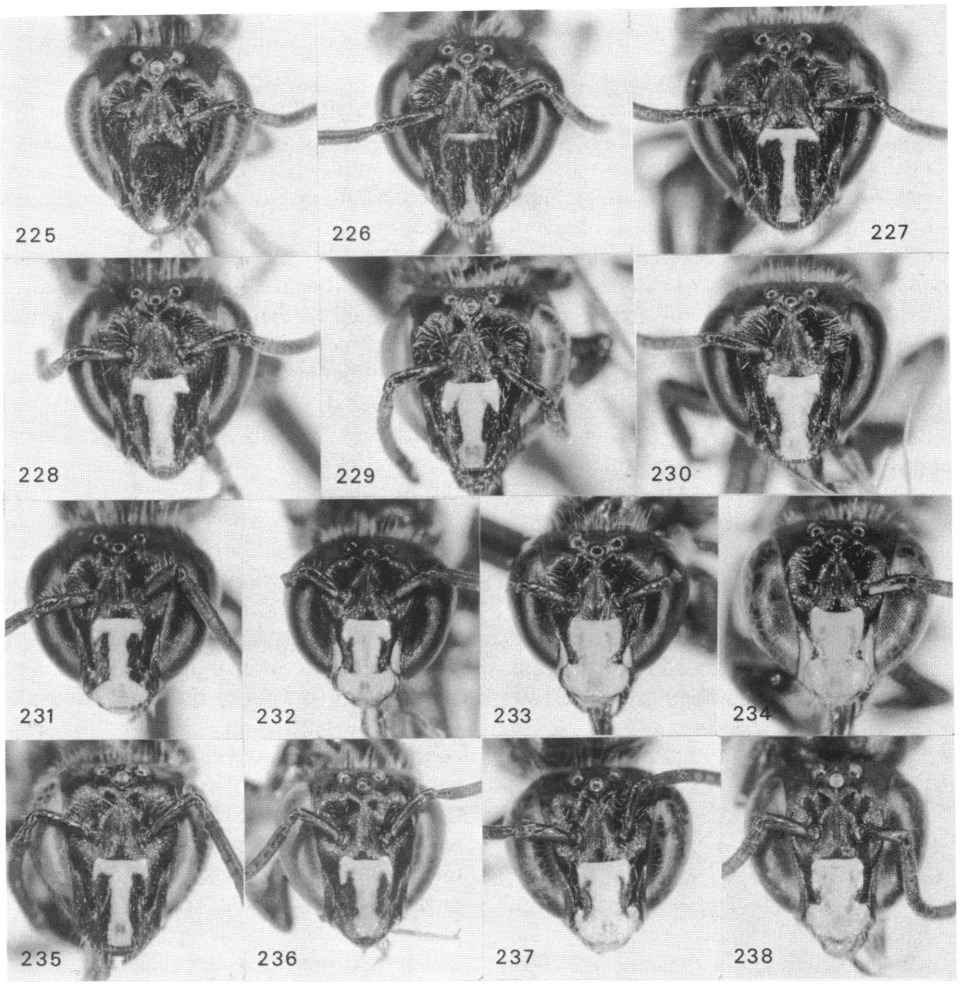
I have seen only the type specimen, and have not examined its genitalia. It could be an unusual specimen or represent an unusual population of *Braunsapis foveata*, or may be the male of *B. langenburgensis*. In the latter event, the name *flavitarsis* has priority.

Braunsapis angolensis (Cockerell), new combination
Figures 190-193, 235-238

Allodape angolensis Cockerell, 1933a, p. 57. (Type ♂, BM, from Capeio, Angola).

Allodapula rufipennis Cockerell, 1936a, p. 22. (New synonym. Type ♀, AMNH, from Tshibinda, Kivu District, Zaire.)

The association of sexes represented by the above names is based only on the small series of both sexes from Rutshuru in the museum at Tervuren, and on their similar size and ap-



FIGS. 225-234. *Braunsapis foveata*, facial views. 225-228. Females, Bambui, near Bamenda, Western Province, Cameroon. 229. Female, Tabora, Tanzania. 230. Female, Lagos, Nigeria. 231, 232. Males, Bambui, near Bamenda, Western Province, Cameroon. 233. Male, Lilongwe, Malawi. 234, Male, Dakar, Senegal.

FIGS. 235-238. *Braunsapis angolensis*, facial views. 235. Female, Vila Flor, Huambo, Angola. 236. Female, 16 km. S of Kapona, Zaire. 237. Male, Caconda, Huila, Angola. 238. Male, Lwiro River 47 km. N of Bukavu, Zaire.

pearance. Both sexes often have wings unusually dark, somewhat different from most *Braunsapis*.

Description. Female. Similar to *Braunsapis foveata* except as follows: (1) Length 6.5 mm.; forewing length 4.5 mm. (2-12) Clypeus with yellow T, more or less hamate; tegula translucent brown; small segments of tarsi brownish, tergal margins brown. (13) Wings rather strongly brown. (14) Hairs of metasomal terga 4-6 rather long, slender, blunt, only slightly curved, pale, not forming fringes. *Sixth metasomal sternum with upper surface broadly concave because of shoulderlike posterolateral margins* (fig. 190); median apex distinctly bidentate; surface in front of apex flat and hairless. Sixth sternum not modified. (25) Upper margin of clypeus slightly concave with median convexity, to nearly straight. (29) Lower ocellocular distance about equal to width of scape, upper about 1.5 times width of scape. (37) First flagellar segment

longer than broad, middle segments about as broad as long.

Male. Similar to *Braunsapis foveata* except as follows: (2m-12m) Scape and mandible black; tarsi blackish. Tergal margins less pallid than in most specimens of *foveata*. (59) Hind trochanter with two strong ventral angles (fig. 191); hind femur with angle on ventral surface near base and deep short emargination basal to angle (fig. 191); hairs of underside of trochanter nearly as long as diameter of trochanter, those of femur much shorter. (63) Ventroapical plate of gonocoxite of different shape and without pegs (fig. 193). (65) Penis valves broader and with some coarser, bristle-like setae laterally.

Comparative Comments. A specimen of a similar species from Vila Luso, Angola, is in the California Academy of Sciences. It has the broadly excavated, "shouldered" sixth tergum as in *Braunsapis angolensis* but the apex of this tergum is bluntly pointed rather than bidentate. Except for the presumably new species from Vila Luso, *B. angolensis* differs from all others except *B. paradoxa* in the modified apex of the female abdomen.

Distribution. Angola and Zaire to Kenya. ANGOLA: Caconda, Huila; Capeio; Vila Flor, Huambo. ZAIRE: *Shaba* (= *Katanga*): Kabongo, 1800 m. altitude; 16 km. S of Kapona, 1570 m. altitude. *Kivu*: Lwiro River, 47 km. N of Bukavu; Rutshuru; Sake; Tshibinda. *Upper Zaire*: Mahagi-Niarembe. BURUNDI: Makoronkwe, 1450 m. altitude. RWANDA: Kagogo, Ruhengeri, 1900 m. altitude; Kayove, Gisenyi, 2000 m. altitude. KENYA: Lake Naivasha.

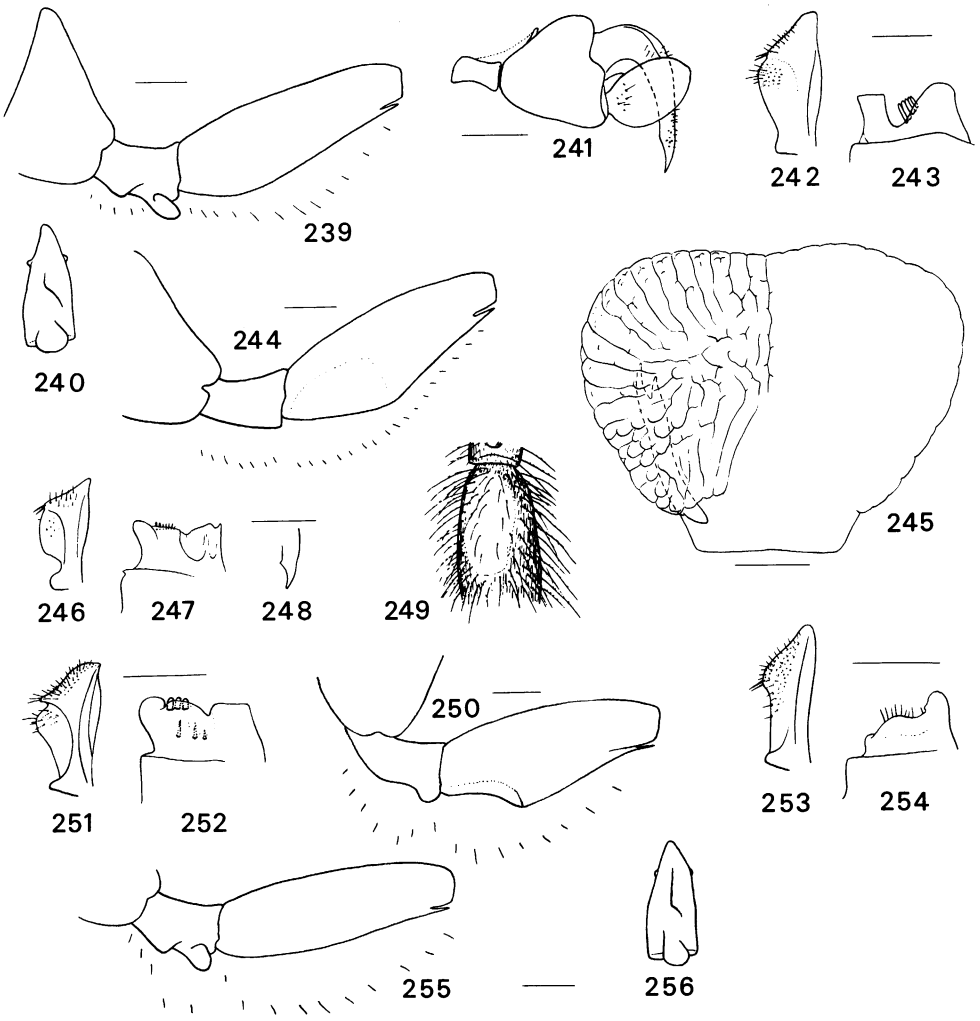
Braunsapis calidula (Cockerell), new combination
Figures 7, 239-243, 257-261

Dufourea (?) *calidula* Cockerell, 1908, p. 337. (Type ♀, BM, from Benguela hinterland, Angola.)

Allodape calidula: Cockerell, 1941, p. 166.

Description. Female. (1) Length 7-9 mm.; forewing length 5.5-6 mm. (2-12) Black, upper clypeal margin yellow, color usually extending down on lateral clypeal margins; labrum, apex of mandible, and small segments of tarsi variably brownish; tegula translucent brown; median axillary sclerite dark brown to black; margins of terga dark brown. (13) Wings brownish, veins and stigma dark brown. (14) Dorsal hairs on terga 4-6 slender, short, almost straight, blunt apically, brown to blackish. (16) Clypeus with minute punctures or almost impunctate medially above, larger punctures near margins especially below; surface minutely roughened, upper half dull. (20) Interocellar distance equal to ocellocular distance; ocelloccipital distance more than ocellar diameter. (25) Upper margin of clypeus straight or weakly concave. (27) Clypeoantennal distance about equal to diameter of antennal socket. (29) Lower clypeocular distance greater than width of scape, upper nearly 1.75 times width of scape. (31) Genal area with scattered punctures throughout, slightly coarser and denser above than below. (33) Malar area one-half to two-thirds as long as width of scape. (37) First flagellar segment somewhat broader than long to as long as broad; middle segments as long as broad to longer than broad. (43) Stigma distinctly shorter than costal margin of marginal cell which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell separated from wing margin by about the width of a vein. (45) First recurrent vein beyond first transverse cubital by distance equal to about one-third length of second submarginal cell and two or three times distance from second recurrent to second transverse cubital vein. (51) Anterior tarsus thick, basitarsus shorter than remaining tarsal segments taken together. (52) Basitibial plate demarked posteriorly by strong carina which is strongly elevated apically.

Male. Similar to female except as follows: (1m) Length 7 mm.; forewing length 5 mm. (2m-12m) Clypeus with longitudinal median yellow area, expanded laterally both above and below, sometimes hamate above; basitarsi black as in female. (29m) Lower clypeocular distance about three-fourths width of scape, upper about width of scape. (33m) Malar space about one-third as long as width of scape. (37m) First flagellar segment nearly twice as broad as long, middle segments much longer than broad. (39m) Mandible rounded as usual in genus (in contrast to similarly large species, *Braunsapis somatotheca*). (58) Front basitarsus about as long as segments 2-4 together, these segments or at least 2 and 3 wider than apex of basitarsus; hind basitarsus only slightly wider basally than apically, shorter than tibia, markedly longer than remain-



FIGS. 239-243. *Braunsapis calidula*, male, Mto Wa Mbu, Lake Manyara, Tanzania. 239. Lateral view of hind coxa, trochanter, and femur. 240. Ventral view of hind trochanter, outer side to the right. 241-243. Lateral view of genitalia, dorsal view of left penis valve, and ventral view of left ventroapical plate of gonocoxite.

FIGS. 244-248. *Braunsapis lyrata*, male, Eala, Zaire. 244. Lateral view of hind coxa, trochanter, and femur. 245. Eighth tergum and roof of genital chamber. 246-248. Dorsal view of left penis valve, ventral view of left ventroapical plate of gonocoxite, and lateral view of apex of penis valve.

FIGS. 249-252. *Braunsapis neavei*, male holotype, Mfungwa to Kayumbe, Zaire. 249. Underside of base of hind femur. 250. Lateral view of hind coxa, trochanter, and femur. 251, 252. Dorsal view of left penis valve and ventral view of left ventroapical plate of gonocoxite.

FIGS. 253-256. *Braunsapis aureoscopa*, male allotype, 29 km. W of Luanza, Zaire. 253, 254. Dorsal view of left penis valve and ventral veiw of left ventroapical plate of gonocoxite. 255. Lateral view of hind trochanter and femur. 256. Ventral view of hind trochanter, outer side to right.

All scale lines represent 0.25 mm. Separate lines serve for figures 239 and 240, 241, 242 and 243, 244, 245, 246-249, 250, 251 and 252, 253 and 254, 255 and 256.

ing tarsal segments taken together; mid-basitarsus also shorter than tibia and slightly longer than remaining tarsal segments together. (59) Hind trochanter with median oblique tooth and apical brown projection, the latter horizontally enlarged and rounded, closely resembling that of *B. trochanterata*; hind femur simple; hairs of undersides of these segments shorter than diameters of segments. (60) Eighth tergum similar in shape to that of *B. somatotheca*, the two "hemispheres" somewhat more convex than in that species and somewhat more closely folded. (61) Seventh sternum of usual form but with a conspicuous hair arising on each side of apical emargination. (63) Ventroapical plate of gonocoxite as shown in figure 243, with mesal truncate projection, lateral part curved gradually dorsad without carina separating ventral from lateral surfaces. (64) Gonostylus less than twice as long as broad, rounded, reticulate. (65) Penis valve somewhat broadened, without coarse or peglike setae.

Comparative Comments. This species resembles *Braunsapis lyrata* in large size and the *Allodape*-like wing venation. The yellow markings are less extensive than in *B. lyrata* but more meaningful characters are the dull upper half of the clypeus and the (usually) thickened fore tarsi, the basitarsus shorter than the other fore tarsal segments combined. Unlike *B. lyrata*, the genal area is not enlarged above and behind the eye.

Distribution. ANGOLA: Benguela hinterland. TANZANIA: Mto Wa Mbu, Lake Manyara.

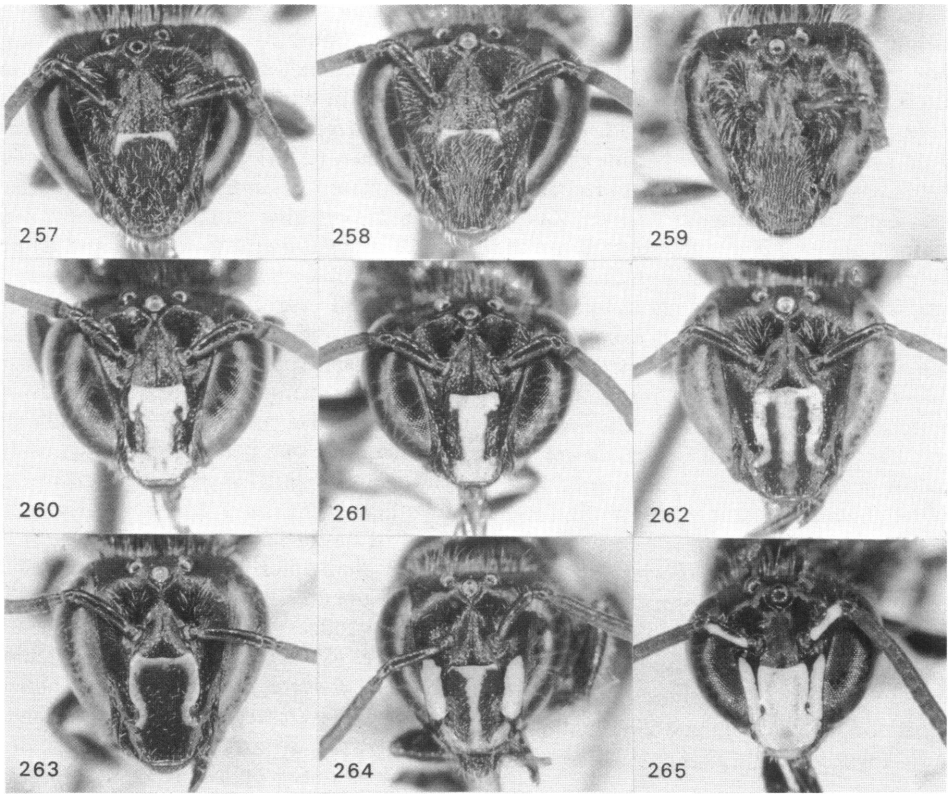
Variation: In the type from Angola the pale markings are reduced to a feeble line across the summit of clypeus; specimens with a wholly dark face are to be expected. The series from Tanzania always has the yellow distinct and extending down at least slightly along the sides of the clypeus. In the type the front tarsi are moderately slender, whereas in the females from Tanzania the mediotarsal segments are broadened almost as in some male *Braunsapis*. Also in the type the wing venation is less *Allodape*-like than in the Tanzanian series, that is, the distance from the first transverse cubital vein to the first recurrent is only about twice as long as the distance from the second recurrent to the second transverse cubital. In Tanzania the first distance is commonly about three times the second. These may be specific characters, but as the specimens from the two localities are very similar, they are tentatively left together. Only the type specimen is known from Angola, but I took a good series at Mto Wa Mbu.

Braunsapis lyrata (Cockerell), new combination
Figures 244-248, 262, 263

Allodape lyrata Cockerell, 1935a, p. 368 (Type ♀, Tervuren, from Lubumbashi, Zaire.)

Description. Female. Similar to *Braunsapis calidula* except as follows: (1) Length 7 mm.; forewing length 5 mm. (2-12) Clypeal mark more extensive, often (as in holotype) with longitudinal median line and with marginal lines extending below tentorial pits, all connected across summit; labrum and mandible black. (16) Clypeus shining or dull. (25) Upper margin of clypeus concave with median convexity. (27) Clypeoantennal distance less than diameter of antennal socket. (29) Lower clypeocular distance equal to or less than width of scape, upper 1.5 to nearly twice width of scape (greatest in form with dull clypeus). (31) Upper posterior parts of genal areas with hairs and punctures distinctly denser than below (both sexes), behind summits of eyes swollen almost as in *B. foveata* (both sexes). (33) Malar area two-thirds as long as width of scape. (44) Apex of marginal cell almost on wing margin. (51) Anterior tarsus with small segments small so that basitarsus longer than (or in some specimens, as long as) remaining segments together.

Male. Similar to *Braunsapis calidula* except as follows: (1m) Length 6-7 mm.; forewing length 5 mm. (2m-12m) Black with broad irregular yellow band extending full length of clypeus. Tarsi rufescent. Tegula dark brown, infuscated mesally; median axillary sclerite brownish black. (25m) Upper margin of clypeus nearly straight. (29m) Lower clypeocular distance about two-thirds width of scape. (33m) Malar area about one-fourth as long as diameter of scape. (37m) First flagellar segment over 1.5 times as wide as long; median flagellar segments slightly longer than broad. (39m) Mandibular apex not toothed but concave apically as in *B. neavei*. (52m) Basitibial plate not defined. (58) Front basitarsus shorter than remaining tarsal segments taken together



FIGS. 257-261. *Braunsapis calidula*, facial views. 257, 258. Females, Mto Wa Mbu, Lake Manyara, Tanzania. 259. Female holotype, Benguela hinterland, Angola. 260, 261. Males, Mto Wa Mbu, Lake Manyara, Tanzania.

FIGS. 262, 263. *Braunsapis lyrata*, Mfungwa, Zaire, facial views of females.

FIGS. 264, 265. *Braunsapis aureoscopa*, facial views, Luanza, Zaire. 264. Female holotype. 265. Male allotype.

but longer than segments 2-4 together, segments 2 and 3 slightly wider than apex of basitarsus; hind basitarsus almost parallel-sided, slightly longer than remaining tarsal segments taken together; mid-basitarsus distinctly shorter than remaining tarsal segments taken together. (59) Hind trochanter simple, femur in outline seen from side scarcely modified, that is, with only feeble rounded ventral angle two-fifths of length from base, but lower outer surface with broad shallow concavity basal to angle. (60) Eighth tergum much more finely wrinkled than usual in *Braunsapis*. (61) Eighth sternum with weak apical emargination. (63) Ventroapical plate of gonocoxite with row of slender apical setae, the mesal ones thickened. (64) Gonostylus of usual form, with several minute basal setae and no long setae. (65) Penis valve constricted basally but abruptly expanded beyond base.

Comparative Comments. This species is noteworthy for the curved yellow lines along the lateral margins of the upper part of the clypeus, giving the clypeal mark a lyrate form. The species is probably closest to *Braunsapis calidula*, which shows indications of similar markings.

Distribution. Zaire, Uganda, and Cameroon. ZAIRE: *Shaba* (= *Katanga*): Kabongo; Kapanga, Lulua; 16 km. S of Kapona, 1570 m. altitude; Lubumbashi (= Elizabethville); Lukonwolwa. *West Kasai*: Mfungwa to Kayumbe; Mfungwa.

Equator: Bumba. *Kivu*: 13 km. SW of Pweto, 1080 m. altitude. *Upper Zaire*: Eala; Paulis, upper Uele. UGANDA: 10 km. N of Entebbe; Kampala; Kawanda, Kampala. CAMEROON: Ngaoundere, 100 m. altitude.

Variation. The three specimens from Uganda, the one from Cameroon, one each from Kapanga, and Paulis, Zaire, and a series from Eala, Zaire, all differ from other Zaire material in the dull clypeus with its upper margin straighter, more as in *Braunsapis calidula.* In other characters, however, they are as in *B. lyrata.* All except those from Eala lack the longitudinal median pale clypeal band. In the absence of males of both types, it seems best to consider all this material as *lyrata.* The males placed in *B. lyrata* all belong to the form with the clypeus dull. It is possible that *B. neavei* is the male of the form with the shining clypeus, in which case the two forms are obviously different species and *lyrata* would become a synonym of *neavei*, and a new name would be needed for the form with a dull clypeus.

Braunsapis neavei (Vachal), new combination
Figures 249-252, 266

Allodape neavei Vachal, 1910, p. 323. (Type ♂, Tervuren, from Mfungwa to Kayumbe, West Kasai, Zaire; the description is supposed to be of a female, but this is an error as can be seen from Vachal's comments on the hind trochanter.)

The head of the type is glued onto a point beside the pin. There is no reason to doubt its correct association with the body, but the possibility exists that the head represents one species, the body another.

The lack in the description below of some characters listed for other species is due to the return of the type to Tervuren before those characters were recognized as useful.

Description. Male. (1m) Length 6.5 mm.; forewing length 5 mm. (2m-12m) Black, the following parts yellow: clypeus except area around tentorial pit, mark in lower paraocular area extending above level of tentorial pit, much of labrum, large spot on mandible, and line on underside of scape. Tarsi rufescent, margins of metasomal segments slightly so. Tegula and median axillary sclerite dark brown. (14m) Pubescence dull whitish, dorsal hairs on terga 4-6 slender but blunt, somewhat yellowish. (25m) Upper margin of clypeus with weak concavity on either side. (27m) Clypeoantennal distance equal to diameter of antennal socket. (31m) Upper genal area behind summit of eye swollen posteriorly as in *Braunsapis foveata* and *lyrata*; genal area shining with very scattered punctures below, upper half especially posteriorly with more punctures and hairs, as in *B. foveata* and *lyrata.* (33m) Malar space less than one-third as long as width of scape. (37m) Median flagellar segments about as broad as long. (39m) Mandibular apex not dentate but concave medially. (58) Front basitarsus as long as remaining segments taken together, segments 2 and 3 slightly wider than apex of basitarsus; hind basitarsus slightly wider basally than apically, slightly longer than remaining segments taken together; mid-basitarsus scarcely longer than remaining segments taken together. (59) Hind trochanter and femur much as in *B. foveata*, median angle of underside of trochanter even weaker. (60) Eighth tergum as in *B. foveata*, as are other terminal structures except as noted below. (63) Ventroapical plate of gonocoxite with two or three coarse, dorsal, discal, spinelike setae (three in a transverse row on one side; two, one in front of the other, on the other side), apical peglike setae 3. (64) Gonostylus with one or two more setae than shown in side view of *B. foveata.* (65) Penis valves without coarse setae; lateral view as in *B. foveata* but with one or two more setae on gonostylus.

Comparative Comments. This species, known from a single specimen, is possibly the male of the typical form of *Braunsapis lyrata.* There is agreement in size, the dorsoapically produced posterior lateral parts of the genal areas (even more than in *foveata*), the genal punctation, the entirely black thorax, the dark apices of the terga, and the color and form of the tergal hair. The clypeus is not so flat and smooth as in females of *B. lyrata*, but this could easily be a sexual difference.

Distribution. Known only from the type locality in Zaire indicated in the synonymy above.

Braunsapis aureoscopa, new species
Figures 253-256, 264, 265

Diagnosis. A large black *Braunsapis* differing from all others in the yellow on the paraocular areas of the female, yellow along outer ocular orbit near mandible, and the lack of pegs on the ventroapical plate of the male gonocoxite. From similarly large species like *B. trochanterata* and *calidula* it differs by having the first recurrent vein rather close to the first transverse cubital, as in most *Braunsapis*, such as *B. foveata.*

Description. Female. (1) Length 6.5 mm.; forewing length 5 mm. (varying to 4.5 mm. in paratype). (2-12) Black, the following parts yellow: longitudinal median clypeal line expanded above along upper clypeal margin and below to form a band along entire anterior clypeal margin; *lower paraocular areas*, yellow terminating bluntly just above level of upper edge of clypeus (or in two paratypes at level of antennal bases); large area on labrum in one paratype, not holotype; large (or small) spot on mandible; spot at base of underside of scape in paratypes only; small spot (weak in paratypes) behind lower end of eye; and posterior pronotal lobe. Apex of labrum and subapical zone of mandible brown. Underside of flagellum dark brown. Small segments of tarsi yellow brown; basitarsi brown in paratypes. Tegula transparent testaceous with small yellow spot in paratypes; median axillary sclerite brownish black. Posterior margins of metasomal segments conspicuously light brown. (13) Wings slightly brownish, veins and stigma brown, veins M + Cu and V of forewing and other veins near wing bases yellow brown. (14) Pubescence dull yellowish white, that of tibiae and tarsi, especially the large scopa, golden although yellow is scarcely noticeable on fore and mid-tibiae; dorsal hairs of terga 4 to 6 robust, blunt, slightly curved, golden, dusky in some lights. (16) Clypeus with scattered small punctures, larger ones near lower and lower lateral margins, ground shining. (20) Interocellar distance slightly greater than ocellocular distance, ocelloccipital distance about equal to ocellar diameter. (25) Upper margin of clypeus gently concave on either side of middle or (in one female paratype and in allotype) entirely concave. (27) Clypeoantennal distance about equal to diameter of antennal socket. (29) Lower paraocular area, where yellow, unusually convex and smooth; lower clypeocular distance slightly more than diameter of scape, upper less than twice diameter of scape. (31) Genal area with only scattered punctures and hairs, uniformly shining, upper part, behind upper end of eye, swollen as in *B. foveata* (more so in holotype than in paratype). (33) Malar area over half as long as diameter of scape. (37) First flagellar segment about as wide as long; middle flagellar segments about as wide as long. (43-45) Wing venation as described for *B. facialis*. (52) Basitibial plate demarked posteriorly by strong carina which is strongly elevated apically.

Male. Similar to female except as follows: (1m) Length 7 mm.; forewing length 5 mm. (2m-12m) The following parts yellow: clypeus, labrum except laterally; large area on mandible; lower paraocular area, yellow extending above level of upper end of clypeus; underside of scape; posterior pronotal lobe; and all basitarsi. Other tarsal segments yellowish brown. (29m) Lower clypeocular distance over half width of scape, upper about equal to width of scape. (31m) Genal area not or scarcely swollen behind upper part of eye. (33m) Malar area about one-third as long as diameter of scape. (37m) First flagellar segment about 1.5 times as wide as long; median flagellar segments longer than broad. (39m) Apex of mandible feebly trilobed. (58) Front basitarsus slightly longer than segments 2-4 together, these segments wider than apex of basitarsus; hind basitarsus only slightly wider basally than apically, shorter than tibia, longer than remaining tarsal segments taken together; mid-basitarsus shorter than tibia, slightly longer than remaining tarsal segments together. (59) Hind trochanter with strong postmedian tooth, which is an elevated longitudinal carina, and apical projection which is rather small but smooth, rounded (as in *Allodape, Braunsapis calidula,* and *B. trochanterata*), and yellow; hind femur simple; hairs on undersides of these segments about as long as diameters of segments. (60) Eighth tergum of usual form for *Braunsapis*, wrinkled about as in *B. facialis*. (61) Seventh and eighth sterna convex posteriorly (damaged and possibly abnormal).

(63) *Ventroapical plate of gonocoxite with marginal hairs, not pegs.* (64) Gonostylus longer than broad, rounded, reticulate. (65) Penis valve rather narrow, without pegs or coarse bristles, without lateral notch; lateral view of genitalia about as in *B. calidula* but upper surface of penis valve more hairy.

Comparative Comments. This is a rather large species similar to *Braunsapis calidula* and *lyrata* in size and form but remarkable for the yellow on the paraocular areas of the female and the hairs rather than pegs on the ventroapical plates of the gonocoxites of the male.

Distribution. Zaire, Nigeria.

Type Material. Holotype female and allotype male: 29 km. W of Luanza, Shaba (= Katanga), Zaire, 1300 m. altitude, January 16, 1958 (E. S. Ross, R. E. Leech; CAS). Two paratype females: Eala, Upper Zaire, Zaire, March, 1932 (H. J. Brédo; Tervuren). One paratype female: Olokemeji, Ibadan, Nigeria (Bridwell collection, NMNH).

Etymology. The name refers to the distinctive golden scopa.

Braunsapis somatotheca (Strand), new combination

Figures 6, 267-270, 274-279

Allodape somatotheca Strand, 1915, p. 51. (Type ♀, Berlin, from Tanzania.)

Description. Female. (1) Length 6-7 mm.; forewing length 5 mm. (2-12) Black, clypeus with T-shaped yellow mark (figs. 267, 268), sometimes broadened below; small segments of tarsi and usually posterior margins of metasomal terga brown to dark brown. Tegula translucent dark brown; median axillary sclerite and pronotal lobe black. (13) Wings slightly brownish, veins and stigma dark brown. (14) Hairs of face, vertex, and scutum dusky in some lights, of terga 4-6 rather short, slender, blunt, slightly curved, brown or usually dusky. (16) Clypeus with numerous punctures, rather small except below marginally, on minutely roughened and somewhat dull ground. (20) Interocellar distance equal to ocellocular distance; ocelloccipital distance more than ocellar diameter. (25) Upper margin of clypeus straight to slightly concave, commonly with weak median convexity. (27) Clypeoantennal distance about equal to width of antennal socket. (29) Lower clypeocular distance less than width of scape, upper 1.5 to nearly 2 times width of scape. (31) Genal area not enlarged above as in *Braunsapis foveata, lyrata, neavei,* and *aureoscopa,* punctures and hairs widely scattered on genal area, scarcely denser above than below. (33) Malar area less than half as long as width of scape. (37) First flagellar segment about as wide as long; middle segments as wide as long to longer than wide. (43) Stigma markedly shorter than costal margin of marginal cell, which is longer than distance from apex of cell to wing tip. (44) Apex of marginal cell separated from wing margin by about a vein width. (45) Submarginal cells as usual for genus but first recurrent beyond first transverse cubital by distance equal to one-fourth to more than one-third length of second submarginal cell. (52) Basitibial plate indicated by carina along posterior margin, about as in *B. facialis* but not elevated apically.

Male. Similar to female except as follows: (1m) Length 6-6.5 mm.; forewing length 5 mm. (2m-12m) Clypeus with longitudinal yellow band gradually broadened above and abruptly so below; labrum usually with yellow spot, mandible with small yellow spot in one specimen. Basitarsi dark as in female. (29m) Lower clypeocular distance less than one-third width of scape, upper less than width of scape. (33m) Malar area about one-fourth as long as width of scape. (37m) First flagellar segment about twice as wide as long, middle segments markedly longer than broad. (39m) Mandible with apex feebly truncate or usually weakly concave, hence bidentate. (52m) Basitibial plate not defined. (58) Front basitarsus shorter than remaining segments but longer than 2-4 together, segments 2-3 broader than apical width of basitarsus; hind basitarsus nearly parallel-sided, longer than remaining tarsal segments; mid-basitarsus subequal in length to remaining segments taken together. (59) Hind trochanter simple, the lower margin a rather sharp ridge, which is feebly, roundly angled medially; hind femur about as in *Braunsapis foveata*; hairs of undersurfaces of these segments somewhat longer than diameters of segments, not plumose or with only one or two branches. (60) Membranous convexities of eighth tergum with wrinkles roughly as in *B.*

facialis but with transverse pattern less evident (fig. 276). (61) Seventh sternum with apical margin convex, not emarginate. (63) Ventroapical plate of gonocoxite as shown in figure 279, with sharp carina separating ventral from lateral surface, latter broad and extending apically, irregularly rounded, but in ventral view appearing as narrow lateroapical projection (fig. 279). (64) Gonostylus longer than wide, rounded apically, reticulate. (65) Penis valve rather slender as seen from above, without pegs or coarse bristles.

Comparative Comments. This is a large species similar to *Braunsapis foveata* but the tergal margins are dark to blackish, not pallid, and the dorsal hairs are dusky; moreover, the first recurrent vein is generally well beyond the first transverse cubital, suggestive of the genus *Allodape*.

Distribution. Kenya, Tanzania, and Zaire. ZAIRE: *Kivu*: Irangi-Kivu. TANZANIA: Mto Wa Mou, Lake Manyara. KENYA: 21 km. S of Malindi.

Braunsapis trochanterata (Gerstaecker)

Figures 5, 271-273, 280-285

Allodape trochanterata Gerstaecker, 1870, p. 350. (Type ♂, Berlin, from Mombasa, Kenya. Placed in *Braunsapis* by Michener, 1970a.)

Allodape usambaricola Strand, 1915, p. 47. (New synonym. Type ♀, Berlin, from Usambara, hinterland of Tanga, Tanzania.)

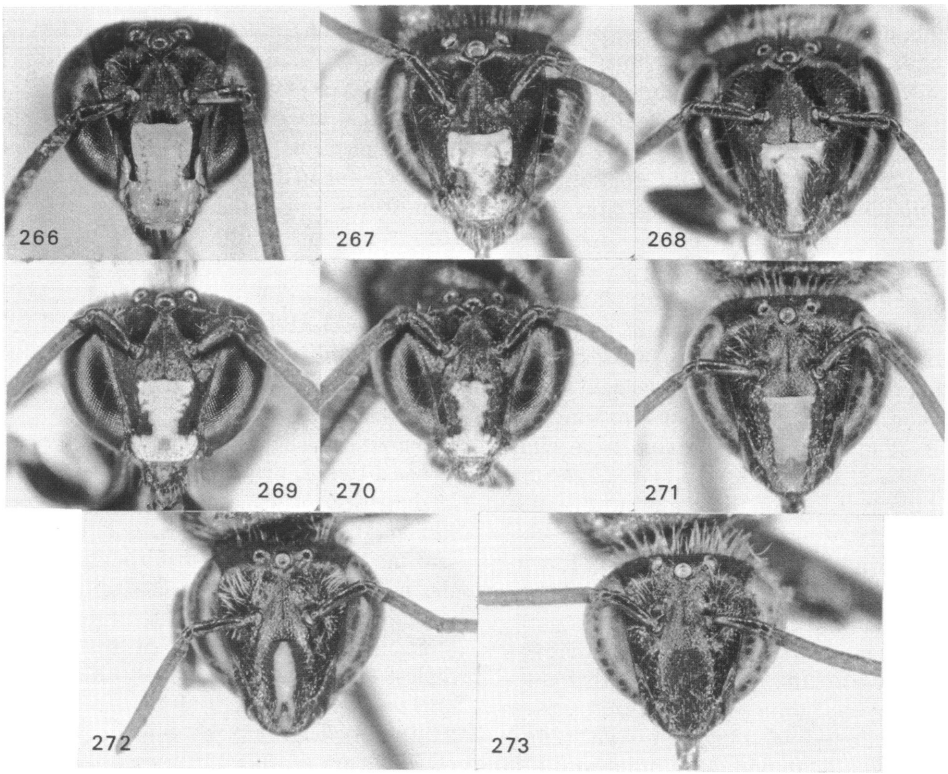


FIG. 266. *Braunsapis neavei*, facial view of male holotype, Mfungwa to Kayumbe, Zaire.

FIGS. 267-270. *Braunsapis somatotheca*, facial views, Mto Wa Mbu, Lake Manyara, Tanzania. 267, 268. Females. 269, 270. Males.

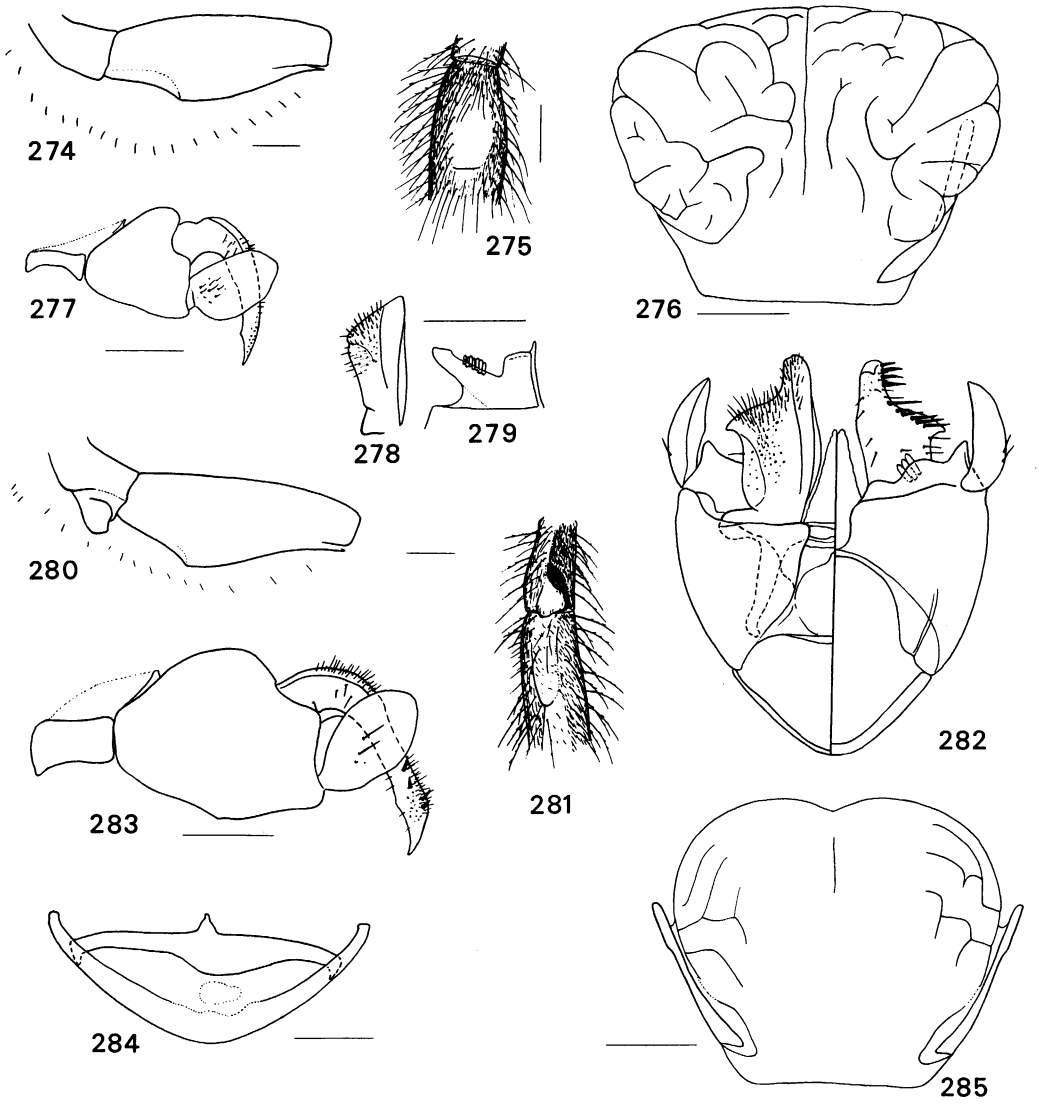
FIGS. 271-273. *Braunsapis trochanterata*, facial views. 271. Female, Morogoro, Tanzania. 272, 273. Female and male, Nairobi, Kenya.

Description. Female. (1) Length 6-8.5 mm.; forewing length 4.5-5 mm. (2-12) Black, clypeus with longitudinal median yellow band; tegula translucent dark brown; small segments of tarsi and posterior margins of metasomal segments brownish. (13) Wings slightly brownish, veins and stigma dark brown. (14) Dorsal hairs of terga 4-6 short, blunt, thick, slightly curved, appressed or nearly so, dull whitish to dusky, or those of pygidial fimbria yellowish. *Tibial brush recognizable*, yellowish white, rather small, base beyond middle of tibia. (16) Clypeus with minute punctures, only a few larger ones on lower part laterally; ground minutely roughened but shining or only slightly dull. (20) Interocellar distance subequal to or slightly greater than ocellocular distance; ocelloccipital distance more than ocellar diameter. (25) Upper margin of clypeus straight or slightly convex medially. (27) Clypeoantennal distance equal to diameter of antennal socket. (29) Lower clypeocular distance about 1.5 times width of scape, upper nearly twice width of scape. (31) Genal area with upper part behind summit of eye slightly swollen but not so much so as in *Braunsapis foveata*; genal area with widely scattered hairs and coarse punctures throughout. (33) *Malar area as long as width of scape.* (37) First flagellar segment about 1.5 times as wide as long; middle segments as wide as long to longer than wide. (43) Stigma distinctly shorter than costal margin of marginal cell, which is longer than distance from its apex to wing tip. (44) Apex of marginal cell separated from wing margin by about the width of a vein. (45) Submarginal cells as usual for the genus but distance from first recurrent vein to first transverse cubital one-third or more of length of second submarginal cell. (52) Basitibial plate delimited posteriorly by strong carina, elevated apically.

Male. Similar to female except as follows: (1m) Length 6-6.5 mm.; forewing length 5 mm. (2m-12m) Clypeus sometimes without yellow and small segment of tarsi lighter brown. (14m) Dorsal metasomal hairs perhaps more dusky, not yellowish. (20m) Interocellar distance greater than ocellocular distance. (29m) Lower clypeocular distance greater than width of scape. (33m) Malar area about two-thirds as long as width of scape. (39m) *Mandible bidentate.* (52m) Carina demarking posterior margin of basitibial plate not much elevated apically. Tibial brush scarcely discernible, white. (58) Front basitarsus subequal in length to segments 2-4 together, the latter somewhat enlarged, segments 2 and 3 more than twice as long as broad, 2 sometimes slightly wider than apex of basitarsus. Hind basitarsus slightly tapering apically, much longer than remaining tarsal segments; mid-basitarsus subequal in length to remaining segments; mid and hind basitarsi both shorter than tibiae. (59) Hind trochanter with median tooth formed from a sharp longitudinal ridge and apical projection, horizontally enlarged as usual in the genus *Allodape*; hind femur with premedian tooth, undersurface smooth and somewhat excavated basal to tooth much as in *Braunsapis foveata*; ventral hairs of trochanter and femur only sparsely branched, those of trochanter about as long as its diameter, those of femur much shorter than its diameter. (60) Eighth tergum rather flat and with only a few wrinkles (fig. 285). (61) Seventh sternum with apical margin convex, not emarginate. (63) Ventroapical plate of gonocoxite as shown in figure 282, medially with a few coarse pegs. (64) Gonostylus longer than wide, rounded apically. (65) Penis valve rather robust, with numerous coarse bristles.

Distribution. East Africa from Malawi to Kenya. MALAWI: Mlanje. TANZANIA: Dar es Salaam; Morogoro; Tabora; Tanga; Usambara, near Tanga. KENYA: 21 km. S of Malindi; Mombasa; Nairobi; Taita.

Variation. The type male of *Allodape trochanterata* differs somewhat from males from Nairobi in that it possesses a median yellow clypeal band similar to that of females, and has the mesoscutum dull due to minute roughening between the punctures. The latter character is somewhat variable among the females at hand, although none are so dull as the type of *trochanterata.* The dullest female is one from the Kenya coast (21 km. S of Malindi) near Mombasa, the type locality for *trochanterata.* Even if the presence of the clypeal mark of the male is a specific character, it is quite probable that *trochanterata* and *usambaricola* are the same species, being described from rather nearby lowland localities, and that my series of both sexes, with black-faced males, from Nairobi is a different (new) species, with females agreeing with the types of *usambaricola.*



FIGS. 274-279. *Braunsapis somatotheca*, male, Mto Wa Mbu, Lake Manyara, Tanzania. 274. Lateral view of hind trochanter and femur. 275. Underside of base of femur, outer surface to right. 276. Eighth tergum and roof of genital chamber. 277. Lateral view of genitalia. 278, 279. Dorsal view of left penis valve and ventral view of left ventroapical plate of gonocoxite.

FIGS. 280-285. *Braunsapis trochanterata*, male, Nairobi, Kenya. 280. Lateral view of hind trochanter and femur. 281. Underside of trochanter and base of femur. 282, 283. Dorsal, ventral, and lateral view of genitalia. 284. Seventh and eighth metasomal sterna. 285. Eighth tergum and roof of genital chamber.

All scale lines represent 0.25 mm. Separate lines serve for figures 274, 275, 276, 277, 278 and 279, 280 and 281, 282 and 283, 284, 285.

Since, for lack of material and especially of males from various localities, one cannot be sure of the application of the existing names to the Nairobi series, it seems best to use the name *trochan-*

terata tentatively for all the material. The differences are minor, less than those found in some other species, and in all probability only a single species is involved.

UNPLACED SPECIES OF *BRAUNSAPIS*

Braunsapis virilipicta (Strand), new combination

Allodape taita form *virilipicta* Strand, 1915, p. 51. (Type ♀, Berlin, labeled "Tanganyika-S.")

I was not able to recognize the type from Tanzania as belonging to any of the species otherwise known to me. It has the size and form of *Braunsapis foveata*, with pale tergal hairs and brownish tergal margins. The clypeal mark, however, is more like that of *facialis*, although the lower end is slightly expanded. The tegulae and axillary sclerites are dark.

Braunsapis affinissima (Gribodo), new combination

Allodape affinissima Gribodo, 1896, p. 120. (Type ♀, not seen by me, from Magnarra, Mozambique.)

This species is unrecognizable from the description, except that it is a rather large *Braunsapis*, 7 mm. in length. It could be a synonym of the common *B. facialis*.

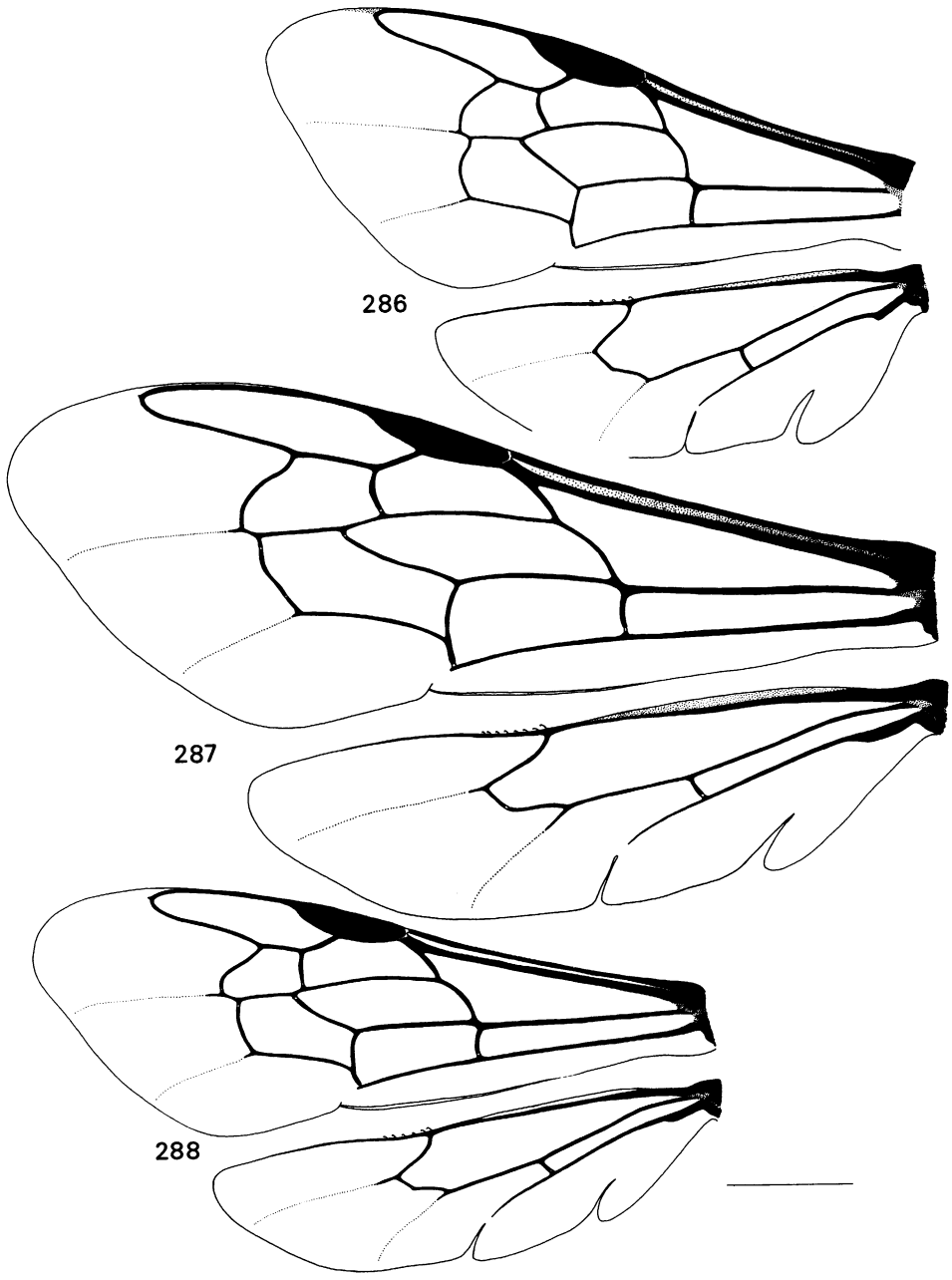
GENUS *ALLODAPE*

Allodape Lepeletier and Serville, 1825, p. 18. (Type species: *Allodape rufogastra* Lepeletier and Serville, monobasic.)
Allodapa Schulz, 1906, p. 244 (emendation).

This genus contains a group of medium-sized to large species found only in Africa. *Allodape* is closely related to *Braunsapis* and in certain characters of *B. calidula*, *aureoscopa*, *lyrata*, *somatotheca*, and especially *trochanterata*, the two genera intergrade. However, when the totality of the characters is considered, these species seem clearly to fall in *Braunsapis* with the possible exception of *trochanterata*, which has several characters of *Allodape* but also certain features of *Macrogalea*. The positions of these forms will be treated in greater detail later.

Description. Agrees with description of *Braunsapis* except as indicated below. (Parts of the *Braunsapis* description in parentheses should be disregarded in determining *Allodape* characters.)

Female. (1) Length 6.5-13 mm.; forewing length 5-9 mm. (2) Body black to highly maculate with yellow or brownish, metasoma sometimes red. (4, 5) *Lateral face marks and posterior orbital marks usually present, yellow or white.* (8) Pronotal collar and lobe sometimes yellow brown, yellow, or white. (10-12) Pterothorax, legs, and metasomal terga with or without yellow or white maculations and fasciae; ground color of legs sometimes red. (15, 17) Clypeus and lateroclypeal carina as in *Braunsapis* or, in *Allodape obscuripennis*, clypeus scarcely curved back at sides and lateroclypeal carina short, not approaching anterior tentorial pit. (18) Head shape as in *Braunsapis* but head often less elongate, in *A. obscuripennis* maximum interocular distance scarcely less than length of eye. (20) Vertex as described for *Braunsapis* but interocellar distance slightly to much less than ocellocular distance; ocelloccipital distance slightly more than to much less than ocellar diameter. (21) Preoccipital carina absent but dorsal part of preocciput rather sharp and thin in *A. mucronata* and *brachycephala*. (22) Frons as described for *Braunsapis* but frontal tubercle sometimes present. (25, 26) Upper clypeal margin straight to convex, slightly shorter to much longer than width of paraocular area. (27) Clypeoantennal distance equal to or slightly longer than diameter of antennal socket. (29) Lower clypeocular distance as wide as scape or wider; upper clypeocular distance twice as wide as scape or wider. (31) Genal area wider than eye in *A. obscuripennis*. (42) Maxillary palpus with 3-6 segments, about as long as basal width of galea to four or more times as long as basal width of galea; *galea without flattened hairs*. (43) Stigma broad to rather slender (broadest in *A. laeviceps* and *macula*, most slender in *A. mucronata* and *obscuripennis*), shorter than costal margin of marginal cell, the latter longer than distance from its apex to wing tip. (44) Apex of marginal cell rounded to pointed, on wing margin or separated from it by up to several vein widths. (45) Second sub-



FIGS. 286-288. Wings of *Allodape*. 286. *Allodape interrupta*. 287. *Allodape mucronata*. 288. *Allodape exoloma*.
Scale line represents 1.0 mm.

marginal cell typically much more than half as long as first but not or scarcely more than half length of first in *A. laeviceps* and *macula*; first recurrent vein usually far beyond first transverse cubital but near the latter in *A. laeviceps*, *macula*, *brachycephala*, *exoloma* and other small

species, and even in the large *A. rufogastra* and *obscuripennis*. (46) Basal vein and discal cell as in *Braunsapis* or basal vein variously more slanting and more gently curved and discal cell sometimes not petiolate. (48) Hamuli 5-9; hamular sinus wider than deep (*A. laeviceps* and *macula*) to deeper than wide (*A. obscuripennis*). (49) Hairs of fore basitarsus as in *Braunsapis* or not bent in *A. greatheadi*. (50) *Tibial brush present*; tibial spines 1 and 2 as in *Braunsapis*. (52) Basitibial plate absent (apex recognizable in *A. laeviceps*). (54) Scopa as in *Braunsapis*, or scopa reduced and brush at base of mid-femur and apex of mid-trochanter absent in *A. greatheadi*. (55, 56) Tergum 6 as in *Braunsapis* but the unusual species with sixth tergum excavated is *A. mucronata* in which pygidial plate is absent and apex of tergum is bluntly pointed rather than emarginate; see also *A. obscuripennis*. (57) Tergal graduli scarcely extending behind spiracles (*A. laeviceps*) to the condition of *Braunsapis* to conspicuously extending nearly to tergal margins on terga 2-5 (group of *A. interrupta*).

Male. Similar to female except as follows: (1m) Length 6.5-11 mm.; forewing length 5-9 mm. (3m) Clypeal color as in *Braunsapis*. (29m) Lower clypeocular distance equal to or less than width of scape; upper clypeocular distance 1.5-3 times width of scape. (30m) Mandibular axis behind or about the same as ocular axis. (31m) Genal area in *Allodape obscuripennis* about as wide as eye. (32m) Eye sometimes less than twice as long as wide. (33m) Malar area usually much shorter than width of scape, about equal to width of scape in *A. obscuripennis*. (37m) Flagellum as in *Braunsapis* or sometimes only second segment broader than long. (38m) Apical width of mandible less than half basal width except in *A. obscuripennis*, *brachycephala*, *macula*, etc. (39m) Apex of mandible usually rounded, edentate, but sometimes bidentate (*A. macula*) or tridentate (*A. obscuripennis*, *brachycephala*, *punctata*). (50m) Tibial brush represented by specialized and often distinctively colored hairs similar to those of female, hairs dense but little modified in *A. obscuripennis*. (57m) Graduli as in female but when maximally developed extending nearly to margins of terga 2-6 (*A. interrupta* group). (58) Front tarsus as in *Braunsapis* but basitarsus more nearly as long as tibia, segments 2-4 broadened only in *A. macula* and enormously elaborated in *A. mirabilis*. (59) Hind trochanter with ventral submedian and apical projections, the latter with a horizontally expanded, shining head; *hind femur with projection or angle at base* (weak in *brachycephala*) *so that, with trochanter, leg has three about equally spaced projections*. (60, 61) Eighth tergum and seventh and eighth sterna as in *Braunsapis*. (62) Gonobase sometimes more elongate, about as wide as long. (63) Gonocoxite with general form similar to that of *Braunsapis* but *ventroapical plate bearing strong sclerotized projection just mesal to gonostylus*; ventral apical plate often with setae but without pegs. (64) Gonostylus as in *Braunsapis* but often more elongate, sometimes more than twice as long as wide. (65) Penis valve as in *Braunsapis*.

KEY TO THE SPECIES OF *ALLODAPE*

FEMALES

1. Sixth metasomal tergum with dorsal surface broadly flattened or gently concave, lateral margins apically somewhat thin in cross section rather than rounded; pygidial plate absent (southern Africa) 2
   Sixth metasomal tergum with dorsal and lateral surfaces convexly rounded in cross section; pygidial plate recognizable but minute 3
2. Yellow lines along orbital margins; posterolateral margins of sixth tergum produced as shoulders (fig. 392) . . . . . *mucronata*
   Head without yellow markings; posterolateral margins of sixth tergum not produced as shoulders . . . . . *obscuripennis*
3. Gradulus of tergum 2 extending posteriorly far past spiracle; basal vein of forewing several vein widths beyond cu-v so that cell M has a petiole over half as long as cu-v; lateral face mark (except in *greatheadi*) broad below, gradually narrowed at about level of summit of clypeus to narrow line continuing upward along inner orbit (tropical) 4
   Gradulus of tergum 2 extending little if any past spiracles (except in *pernix*); basal vein closer to cu-v, petiole of cell M, if present, less than half as long as cu-v; lateral face marks not as above 5
4. Scopa reduced; lateral face marks tapering gradually to summits at level of antennal bases . . . . . *greatheadi*
   Scopa normal; lateral face marks as described in couplet 3 . . . . . .

. . . . . *interrupta, collaris, chapini*

5. Dorsal hairs of terga 3-6 tapered, pointed; apex of basitibial plate recognizable, slightly elevated; maxillary palpi 3-segmented (tropical) . . . . . *laeviceps*

Dorsal hairs of terga 3-6 at least partly ending bluntly; basitibial plate not recognizable; maxillary palpi with 5-6 segments . . 6

6. At least some and usually all of following areas yellow, white, or yellowish brown: spot on supraclypeal area, pronotal lobe, lateral margin of scutum, longitudinal band near middle of front of mesepisternum or extending across this sclerite; frontal tubercle absent (tropical) 7

Supraclypeal area, pronotal lobes, scutum, and mesepisternum black; frontal tubercle present except in *brachycephala*. . . 9

7. Distance from first transverse cubital to first recurrent vein short, sometimes no longer than distance from second recurrent vein to second transverse cubital . . . *macula*

Distance from first transverse cubital to first recurrent vein over one-third length of second submarginal cell and much longer than distance from second recurrent vein to second transverse cubital 8

8. Maxillary palpus 6-segmented; postpalpal part of galea as long as to slightly longer than head; apex of marginal cell 2-3 vein widths from wing margin. . . . . *derufata, mea*

Maxillary palpus 5-segmented; postpalpal part of galea about 1.5 times as long as head; apex of marginal cell 1-2 vein widths from wing margin . . . *dapa, nula*

9. Frontal tubercle absent but face slightly protuberant (seen in side view) at level of summit of clypeus; hamuli 5 (tropical) . . . . . *brachycephala*

Frontal tubercle present; face not protuberant at level of summit of clypeus; hamuli 6 or more (southern Africa) . . 10

10. First flagellar segment almost twice as long as broad; distance from first transverse cubital vein to first recurrent vein usually not much if any greater than distance from second recurrent vein to second transverse cubital; metasoma partially or wholly red . . . . . *rufogastra, exoloma*

First flagellar segment much less than twice as long as broad; distance from first transverse cubital vein to first recurrent much greater than distance from second recurrent to second transverse cubital; metasoma black, partially red in *skaifeorum* and sometimes in *pernix* 11

11. Tibial spurs blackish 12

Tibial spurs brown or testaceous 15

12. Scutellum and pronotum usually with yellow transverse bands; clypeus with strong longitudinal median yellow band . . . . . *quadrilineata*

Scutellum and pronotum black; clypeus wholly black except sometimes with a median band in *microsticta* 13

13. Tibial brush coppery or fulvous . . . . . *australissima*

Tibial brush blackish 14

14. Terga 4 and 5 with dorsal hairs black . *friesei*

Terga 4 and 5 with dorsal hairs whitish . . . . . *microsticta*

15. Lateral face marks reduced to narrow and often broken streaks along eye margins . . . . . *tridentipes*

Lateral face marks strong bands 16

16. Lateral face marks usually extended down, as disjunct spots, along and mesal to lateroclypeal carina, toward anterior clypeal margin; if not as above, scutellum with broad yellow band 17

Lateral face marks not extending down on clypeus; scutellum with or without broad yellow band 18

17. Gradulus of third tergum commonly extending about halfway from spiracle to posterior margin of tergum (eastern Cape Province to Mozambique) . . . . . *pernix*

Gradulus of third tergum commonly ending little behind spiracle (Cape Peninsula to Port Elizabeth) . . . . . *punctata*

18. Base of metasoma extensively red. . . . . *skaifeorum*

Metasoma black 19

19. Impunctate discal area of scutum extending beyond parapsidal line laterally . . . . . *stellarum, pictifrons*

Impunctate discal area of scutum extending laterally only to parapsidal line . . . . . *ceratinoides, panurgoides*

MALES[1]

1. Mandible tridentate, similar to that of female 2

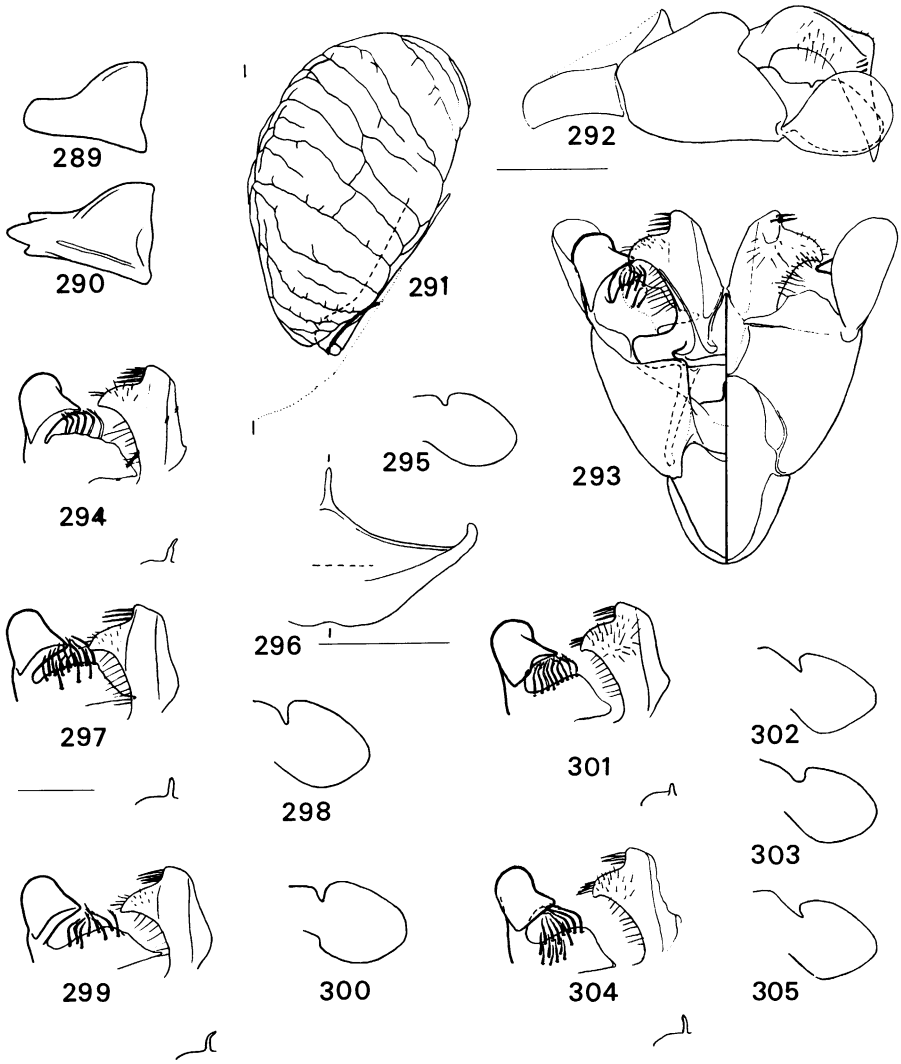
Apex of mandible rounded, rounded subtruncate, weakly bidentate, or sometimes very vaguely three-lobed 4

2. Clypeus largely or wholly black (tropical) . . . . . *brachycephala*

[1] *Allodape armatipes* is omitted from the key.

Clypeus largely or wholly yellow (southern Africa) 3

3. Lateral face marks not reaching summit of clypeus; summit of clypeus protuberant; frontal tubercle absent . . . *obscuripennis*
   Lateral face marks extending above summit of clypeus; summit of clypeus not protuberant; frontal tubercle strong . . . . . *punctata*
4. Gradulus of tergum 2 extending posteriorly far past spiracle; basal vein of forewing several vein widths beyond cu-v so that cell M has a petiole more than half as long as cu-v; lateral face mark broad below, gradually narrowed at about level of summit of clypeus to narrow line continuing upward along inner orbit (tropical) . . . . . *interrupta, collaris, chapini*
   Gradulus of tergum 2 extending little if any past spiracles (except in *pernix*); basal vein closer to cu-v, petiole of cell M, if present, less than half as long as cu-v; lateral face marks not as above (southern Africa) 5
5. Lateral face marks absent . . . . . *tridentipes*
   Lateral face marks present 6
6. Lateral face marks not reaching summit of clypeus . . . . . *mucronata*
   Lateral face marks extending above summit of clypeus 7
7. First flagellar segment over 1.5 times as long as broad; distance from first transverse



cubital vein to first recurrent vein usually not much if any greater than distance from second recurrent vein to second transverse cubital; metasoma partially or wholly red ..... *rufogastra, exoloma*

First flagellar segment little if any longer than broad; distance from first transverse cubital vein to first recurrent much greater than distance from second recurrent to second transverse cubital; metasoma black, partially red in *skaifeorum* and sometimes in *pernix* 8

8. Tibial spurs black or brownish black; metasoma black 9

Tibial spurs brown or testaceous, if dark or infuscated brown, then metasoma partly red 12

9. Clypeus yellow 10

Clypeus black or at least lateral upper parts black 11

10. Forewing length 5 mm. .... *australissima*

Forewing length 6 mm. .... *quadrilineata*

11. Terga 4-6 with dorsal hairs black or nearly so; clypeus wholly black ..... *friesei*

Terga 4-6 with dorsal hairs white; clypeus with yellow median apical spot or with thick inverted T so that upper lateral parts are black ..... *microsticta*

12. Mandible with yellow area ..... *pernix*

Mandible without yellow 13

13. Base of metasoma extensively red ..... *skaifeorum*

Metasoma black 14

14. Impunctate discal area of scutum extended beyond parapsidal line as sparsely punctate area ... *stellarum, pictifrons*[1]

Impunctate discal area of scutum extending not over a puncture width beyond parapsidal line, punctures dense lateral to that point ..... *ceratinoides, panurgoides*

Allodape ceratinoides Gribodo
Figures 289, 290, 306-310, 319

Allodape ceratinoides Gribodo, 1883, p. 269. (Type ♀, Genoa, from Port Elizabeth, Cape Province, not seen by me.)

Allodape triodontipus Cockerell, 1933a, p. 52. (New synonym. Type ♂, BM, from Oudtshoorn, Cape Province).

Description. Female. (1) Length 8.5-10 mm.; forewing length 6.5-7.5 mm. (2-12) Body black, yellow lines along inner and outer orbits and median yellowish line on clypeus, those along inner orbits sometimes considerably widened below; tegula translucent dark brown, front part usually pallid, often with yellowish spot; tergal

[1] *Allodape armatipes* probably runs here.

FIGS. 289, 290. *Allodape ceratinoides*, mandibles of male and female.

FIGS. 291-293. *Allodape panurgoides*, male, Cape Nature Reserve, Cape Peninsula, Cape Province. 291. Right half of eighth tergum and roof of genital chamber, midline indicated by dashes at left. 292, 293. Lateral, dorsal, and ventral views of male genitalia.

FIGS. 294-296. *Allodape tridentipes*, male, Hout Bay, Cape Province. 294. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of male genitalia. 295. Lateral view of process of ventroapical plate of gonocoxite. 296. Seventh and eighth metasomal sterna.

FIGS. 297-300. *Allodape friesei*, male. 297. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of male genitalia, Robertson, Cape Province. 298. Lateral view of process of ventroapical plate of gonocoxite of same. 299. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of male genitalia, 8 km. NE of Worcester, Cape Province. 300. Lateral view of process of ventroapical plate of gonocoxite of same.

FIGS. 301-303. *Allodape stellarum*, male, Pietermaritzburg, Natal. 301. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of male genitalia. 302, 303. Lateral views of process of ventroapical plate of gonocoxite of two specimens.

FIGS. 304, 305. *Allodape pictifrons*, male, Kirstenbosch Botanical Gardens, Cape Town, Cape Province. 304. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of male genitalia. 305. Lateral view of process of ventroapical plate of gonocoxite.

All scale lines represent 0.5 mm. Separate lines serve for figures 291-293 and 294-305 with the exception of 296 which has its own line.

margins sometimes dark brownish; tibial spurs brown. (13) Wings light grayish, veins and stigma dark brown. (14) Pubescence yellowish, that of metasoma largely white; tibial brush coppery, extending almost half length of tibia; dorsal metasomal hairs, as seen in profile, rather long, blunt, those of sixth tergum, usually fifth, and sometimes median apex of fourth fuscous or blackish. (20) Interocellar distance two-thirds to three-quarters of ocellocular distance; ocelloccipital distance somewhat greater than ocellar diameter; ocellocular area smooth and with only scattered punctures in contrast to well-punctured face and rest of vertex. (22) Frontal tubercle present. (25, 26) Upper clypeal margin convex at least medially, slightly greater to slightly less in length than width of paraocular area. (29) Lower clypeocular distance about as wide as scape, upper over 2.5 times as wide as scape. (31) Genal area rather closely punctate above, gradually more sparsely but rather coarsely punctate below. (37) First flagellar segment longer than broad; middle segments also longer than broad, only segments 2 and 3 distinctly broader than long. (42) Maxillary palpus six-segmented, about three times as long as galeal width. (43) Stigma rather slender, often less than half as wide as first submarginal cell. (44) Apex of marginal cell narrowly rounded, separated by one or two vein widths from wing margin. (45) Second submarginal cell and recurrent veins typical for the genus. (46) Basal vein curved but slanting, beyond cu-v if at all by only about the width of a vein so that discal cell is not or only briefly petiolate. (48) Hamuli 7 or 8; hamular sinus as deep as or slightly deeper than wide. (55, 56) Sixth tergum ordinary, the black pygidial fimbria not broken, hiding median apical part of tergum except for minute pygidial plate, apex of tergum with small emargination. (57) Graduli of terga 4 and 5 extending well back laterally but not to marginal smooth band, of 3 extending a little behind spiracle.

Male. Similar to female except as follows: (1m) Length 7.5-9 mm.; forewing length 6.5-7 mm. (2m-12m) As in female but clypeus, lateral face marks reaching far above summit of clypeus, rarely dot or narrow line on supraclypeal area just above clypeus, most of labrum, line along outer orbit, and spot on tegula yellow. (14m) Tibial brush smaller and yellow; dorsal hairs of apical terga more slender and less darkened, fringe of seventh tergum reddish fuscous. (19m) Interantennal distance little more than antennocular distance. (20m) Interocellar distance equal to or less than ocellocular distance. (29m) Lower clypeocular distance two-thirds or three-fourths width of scape, upper clypeocular distance about twice width of lower. (33m) Malar space about one-third or one-fourth as long as width of scape. (36m) Scape almost four times as long as wide. (37m) Flagellar segments 2-4 broader than long; median flagellar segments about as broad as long, sometimes slightly broader depending perhaps on antennal position. (39m) Apex of mandible rounded. (57m) Graduli less developed lateroposterially than in female, usually only that of tergum 5 reaching midpoint between spiracle and tergal margin. (58) Front basitarsus about as long as other fore tarsal segments taken together, second segment about twice as long as wide. (59) Teeth of hind trochanter and femur slightly stronger than in *Allodape mucronata*, trochanteral margin basal to apex of first tooth convex, femoral margin beyond tooth nearly straight. (60) Posterior margins of terga slightly flared; margin of sixth tergum feebly produced and gently convex medially; membranous convexities of eighth tergum with wrinkling predominantly transverse. (62) Gonobase about as wide as long. (63) Ventral apical plate of gonocoxite with large lateral process of "bird's head" shape, rest of plate irregularly convex apically with 8-15 scattered coarse hairs; sinus between lateral process and rest of plate rather broad, usually seeming broader in most positions than in specimen figured. (64) Gonostylus longer than wide. (65) Penis valve without pegs, with bristles only beyond lateral median projection; dorsal basal strap of penis valve, extending toward bridge of penis valves, much broader than in *A. mucronata*; mesal margin of penis valve with small angle near base.

Distribution. Southern Cape Province from the Cape Peninsula to Grahamstown, mostly in the Cape macchia. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); 5 km. S of Avontuur, 1070 m. altitude; Cape Nature Reserve, Cape Peninsula; Goedehoop, Heidelberg District; Grahamstown; Hex River; Hout Bay; Huguenot; Kirstenbosch Botanical Gardens, Cape Town; Kleinmond; 64 km. E of Knysna; Kom-

metjie; Lowerwaterkloof, Willowmore District; Mossel Bay; Noordhoek; Oakhurst, Tsitsikama Forest; Oudtshoorn; Paarl Mountain; 16 km. E of Paarl; Port Elizabeth; Rivierzonderend; Stellenbosch; Tradouw Pass, Swellendam District.

Variation. A few of the females from the Cape Nature Reserve and from Hout Bay have the clypeus more sparsely punctate than usual and the lateral face marks unusually broad submedially (fig. 307). They might represent another species but no corresponding male form has been found.

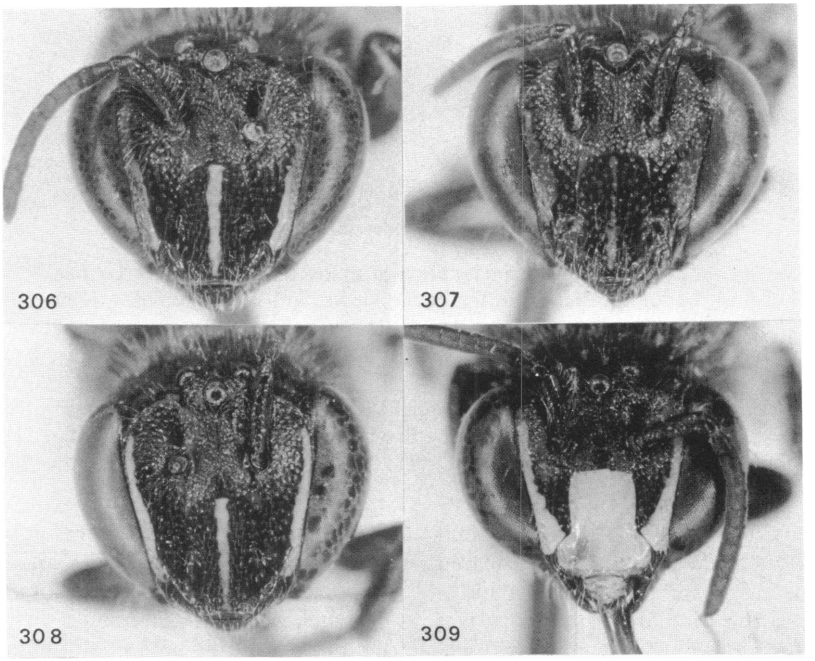
Allodape panurgoides Smith
Figures 311-314, 319

Allodape panurgoides Smith, 1854, p. 231. (Type ♀, BM, from "S. Afr.")

Allodape crinita Brauns MS, Friese, 1914a, p. 149. (Published only as a synonym of *panurgoides*, without description or types; in the Transvaal Museum are specimens, presumably never seen by Friese, both large (*ceratinoides*) and small (*panurgoides*), from Algoa Bay, Cape Province; one of them bears Brauns' identification label. The name *crinita* seems not to have been formally proposed and so far as I know no type exists; probably none is appropriate. The name appears in print, however, in Strand, 1915, pp. 35, 43, 44, and Cockerell, 1933a, 1934a, as well as in Friese, 1914a.)

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 7.5-9 mm.; forewing length 6-7 mm. (4) Yellow lines along inner orbits never broadened. (14) Dorsal hairs of fourth tergum sometimes largely fuscous, in other specimens those of fourth and fifth all pale. (37) Median flagellar segments sometimes as long as broad. (48) Hamuli 6 or 7 (usually 7 in both species).

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 6.5-7.5 mm.; forewing length 6-6.5 mm. (3m) Supraclypeal area without yellow above clypeus in any specimens seen. (25) Upper clypeal margin more commonly arched medially.



FIGS. 306-309. *Allodape ceratinoides*, facial views. 306, 307. Females, Cape Nature Reserve, Cape Peninsula, Cape Province. 308. Female, Mossel Bay, Cape Province. 309. Male, Cape Nature Reserve, Cape Peninsula, Cape Province.

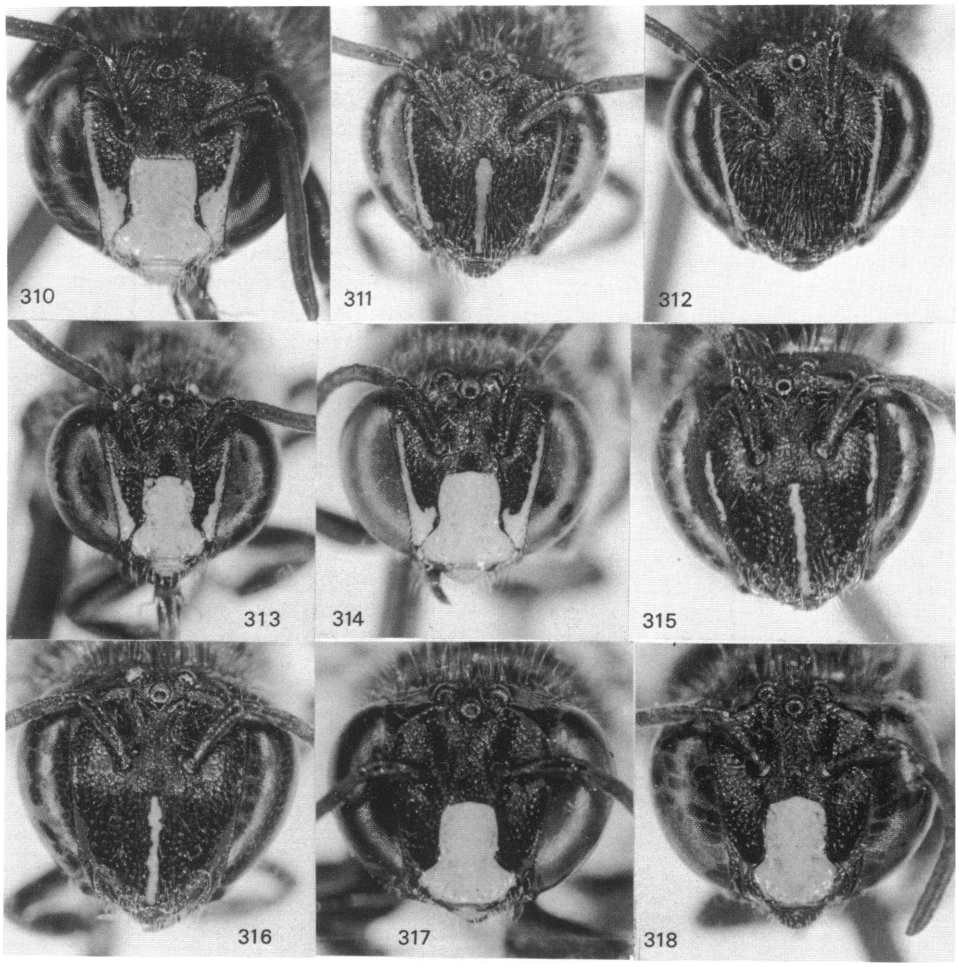


FIG. 310. *Allodape ceratinoides*, facial view of male, Knysna, Cape Province.

FIGS. 311-314. *Allodape panurgoides*, facial views. 311, 312. Females, Hout Bay, Cape Province. The specimen without a clypeal pale line was the only such individual seen. 313. Male, Hout Bay, Cape Province. 314. Male, Kirstenbosch Botanical Gardens, near Cape Town.

FIGS. 315-318. *Allodape tridentipes*, facial views. 315. Female, 64 km. E of Knysna, Cape Province. 316. Female, Hout Bay, Cape Province. 317. Male, same locality. 318. Male, Cape of Good Hope, Cape Province.

Comparative Comments. This species and *Allodape ceratinoides* have long been considered as a single form, highly variable in size. A histogram of head widths of pinned specimens was bimodal, suggesting the existence of two populations. When measurements of head widths and wing lengths of females were made in connection with biological studies, two separate groups were found (fig. 319), a finding that appears to justify recognition of two species. Most individuals can be identified at sight by the impression of size, although crude measurements such as are usually used in describing bees do not indicate the possibility of such recognition.

In all cases individuals reared from a given nest were all *Allodape panurgoides* or all *A. cera-*

tinoides, supporting the idea that two populations are involved. In most localities where one species was found, the other was also taken, except for those places from which only one or two specimens in total have been available. However, a good series from the top of Table Mountain, Cape Town, is exclusively *A. panurgoides*.

Distribution. Southern Cape Province from the Cape Peninsula to Port Elizabeth, mostly in Cape macchia flora. SOUTH AFRICA: *Cape*

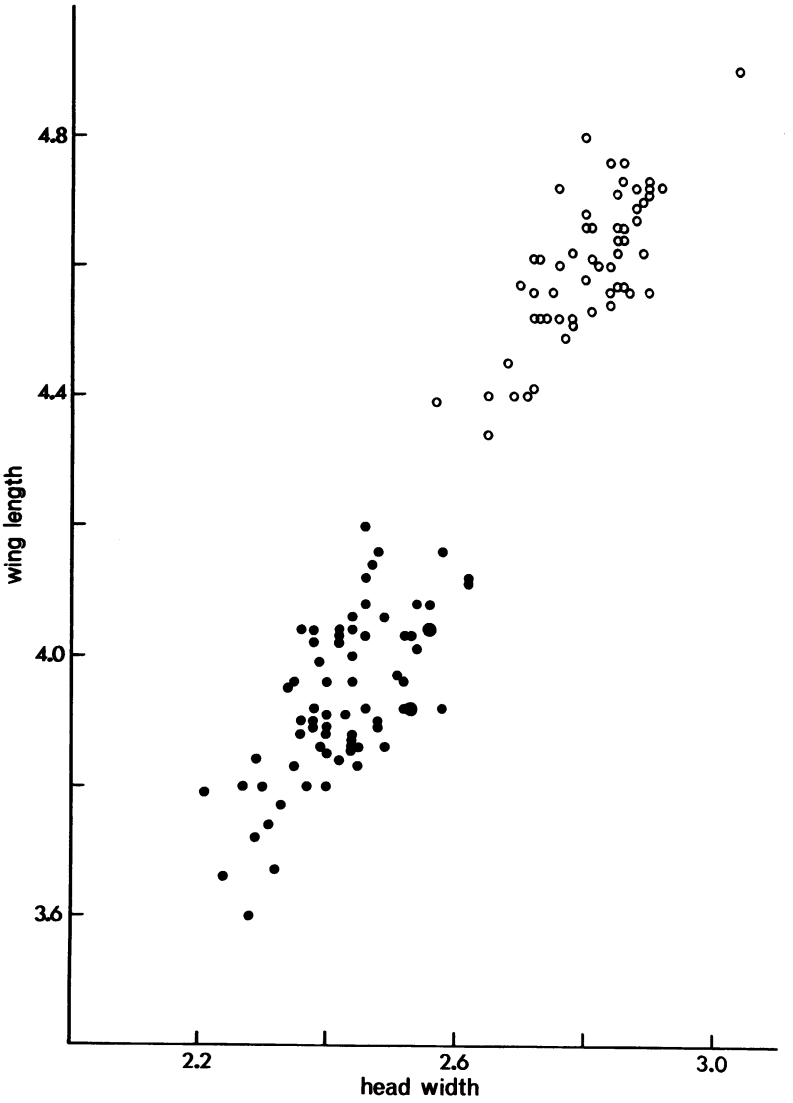


FIG. 319. *Allodape ceratinoides* and *panurgoides*. Scatter diagram of wing lengths (from base of cell first M to wing tip) and head widths in millimeters, based on data assembled for biological studies (Michener, 1971a). *A. panurgoides*, black dots, *A. ceratinoides*, circles. The size difference shown here is the only reliable character for distinguishing these sympatric forms.

Province: Albertinia; Algoa Bay (Port Elizabeth); 5 km. S of Avontuur, 1070 m. altitude; BoKouga, Uniondale District; Cape Nature Reserve, Cape Peninsula; Dutoitskloof, 700 m. altitude; George; Hout Bay; 13 km. W of Humansdorp; Kirstenbosch Botanical Gardens, Cape Town; 64 km. E of Knysna; Kommetjie; Montagu; Mossel Bay; Noordhoek; Paarl Mountain; 16 km. E of Paarl; Pearly Beach, Bredasdorp; Port Elizabeth; Rivierzonderend, 460 m. altitude; Silversand, 13 km. W of Kleinmond; Table Mountain, 915 m. altitude, Cape Town; 10 km. SW of Uitenhage.

Variation. There is minor variation in maculation as shown in the figures; only one specimen out of about 40 females had the clypeal line greatly reduced as in figure 312. One other female had the tibial brush yellowish white instead of rusty.

Allodape tridentipes Cockerell
Figures 294-296, 315-318

Allodape tridentipes Cockerell, 1933a, p. 53. (Type ♂, not located, from Doorn River, near Camfer, Cape Province.)

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 8-10 mm.; forewing length 6 to nearly 7 mm. (3-5) *Yellow lines along both inner and outer orbits reduced*, especially those on inner orbits often mere streaks; median clypeal line often similarly reduced. (13) Wing membrane rather dark brown (both sexes). (14) Hairs of legs and body, including metasomal sterna, more yellow or rusty in color than in *A. ceratinoides*; dorsal metasomal hairs, seen in profile, rather short, black on segments four to six, black or fuscous on three and often fuscous on two (both sexes). (20) Ocellocular area virtually impunctate (both sexes). (26) Upper clypeal margin shorter than width of paraocular area (both sexes). (42) Maxillary palpus about twice as long as galeal width (both sexes).

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 8-9 mm.; forewing length 6-6.5 mm. (3m-6m) *Yellow of head limited to clypeus and usually a spot on labrum*. (14m) Fringe of seventh tergum black. (26m) *Clypeus unusually small, narrow above* (see 26). (29m) Upper clypeocular distance about three times lower. (61) Seventh sternum with apical margin scarcely emarginate. (63) Ventroapical plate of gonocoxite broader and less tapered medially than in *A. ceratinoides* and *panurgoides*, with only six or eight very coarse, apically branched, marginal or nearly marginal hairs; sinus between main part of plate and lateral "bird's head" projection narrow. (65) Dorsal hairs of lateral medial projection of penis valve longer and more numerous than in *A. ceratinoides* and *panurgoides*, some over .05 mm. long.

Distribution. Cape Peninsula to east of Knysna; known principally from localities near the coast, in Cape macchia. SOUTH AFRICA: *Cape Province*: Camfer, Doorn River; Cape of Good Hope; Cape Nature Reserve, Cape Peninsula; Goedekoop, Heidelberg District; Great Brak River, Mossel Bay; Hout Bay; Kirstenbosch Botanical Gardens, Cape Town; 64 km. E of Knysna; Pearly Beach, Bredasdorp; Prince Alfreds Pass, Avontuurpoort; Van Stadens Mouth.

Allodape friesei Strand
Figures 297-300, 320-323

Allodape friesei Strand, 1915, p. 58. (Lectotype ♀, here designated, Berlin, from Willowmore, Cape Province.)

Allodape obscuripennis Strand, 1915, p. 43 (♂ only; the male "type," Berlin, labeled "Capland Krebs S." is not the same species as the female lectotype, which is *A. obscuripennis* proper).

Allodape friesei Friese, 1924, p. 78. (Lectotype ♀, here designated, Berlin, from Willowmore, Cape Province, same specimen as lectotype of *friesei* Strand. This species was recognized and named in manuscript by Brauns; specimens in Transvaal Museum labeled by Brauns and a pair marked as types were presumably not seen by Strand and Friese. The Berlin collection contains three females and one male; the latter was labeled by the Museum as the type but the name is indicated only by a Friese identification label and no type designation has been published. The female is the sex described first and in most detail by both Strand and Friese; therefore the one female that has a Brauns determination label is here designated as lectotype for both Strand's and Friese's *friesei*.)

Allodape tristis Cockerell, 1934a, p. 224. (New synonym. Type ♀, BM, Ceres, Cape Province.)

Allodape explanata Cockerell, 1934a, p. 225. (New synonym. Type ♀, BM, Mossel Bay, Cape Province.)

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 8-9 mm.; forewing length 6-7 mm. (2-12) *Clypeal line absent* (sometimes a dot); both anterior and posterior orbital lines reduced; yellow tegular spot absent; tergal margins not brownish; *tibial spurs black* (both sexes). (13) Wings often dark brown, sometimes almost as pale as in *A. ceratinoides* (both sexes). (14) Pubescence of head and thorax yellowish gray, hairs of lower part of face and labrum and usually outer surfaces of tibiae and basitarsi fuscous; tibial brush reddish fuscous (sometimes coppery) to black; dorsal metasomal hairs, as seen in profile, black on terga 4 to 6, sometimes fuscous or black on posterior part of 3 also. (43) Stigma more than half as wide as first submarginal cell. (48) Hamuli 6 or 7.

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 6.5-7.5 mm.; forewing length 6-6.5 mm. (4m-5m) *Head black except for narrow anterior and posterior orbital yellowish streaks* as in female. (14m) Pubescence of head, thorax, and legs somewhat paler than in female, yellowish gray, but some hairs of lower face, outer sides of tibiae, and sometimes basitarsi fuscous; dorsal hairs of terga black and of similar form to those of female; tibial brush yellowish to coppery or fuscous. (29m) Lower clypeocular distance about as wide as scape. (37m) Median flagellar segments longer than broad to broader than long. (57m) Graduli of terga 4 and 5 both reaching well behind spiracles. (63) Ventral apical plate of gonocoxite with lateral process having "beak" of "bird's head" shorter than in *A. ceratinoides*, apical margin of plate not irregularly convex but with one principal angle; sinus between lateral process and rest of plate variable. (65) Penis valve without angle on mesal margin near base.

Distribution. Southwestern Cape Province, both coastal regions and Karoo. SOUTH AFRICA: *Cape Province*: 5 km. S of Avontuur, 1070 m. altitude; Banhoek Valley, Stellenbosch Division; BoKouga, Uniondale District; Cape Nature Reserve, Cape Peninsula; Cape Town; Ceres; Constable; Dutoitskloof, 700 m. altitude; 5 km. N of Herold; Hout Bay; Kirstenbosch Botanical Gardens, Cape Town; Montagu; Mossel Bay; Noordhoek; 11 km. W of Robertson, 275 m. altitude; Seven Weeks Poort, Ladismith; Strandfontein; Willowmore; Wit River Valley, Bainskloof; Worcester, 305 m. altitude; 8 km. NE of Worcester.

Variation. Specimens from the Karoo (Ceres, Worcester, Robertson) seem to have on the average more infuscated wings than those from the Cape macchia although some from the latter are also quite dark. Specimens from the localities in the Karoo commonly also have the tibial brush and some of the hind tarsal hairs blackish; they are reddish in specimens from coastal areas. The type of *Allodape explanata* and one of several females from Robertson have the orbital pale marks broader than usual in the species.

The number of discal hairs on the ventroapical gonocoxal plates varies, even on the two sides of one specimen (1-3). When there are few discal hairs, or only one, most of the hairs are marginal and the pattern seems quite different from that of *A. ceratinoides*. In some specimens some of these hairs have apical branches.

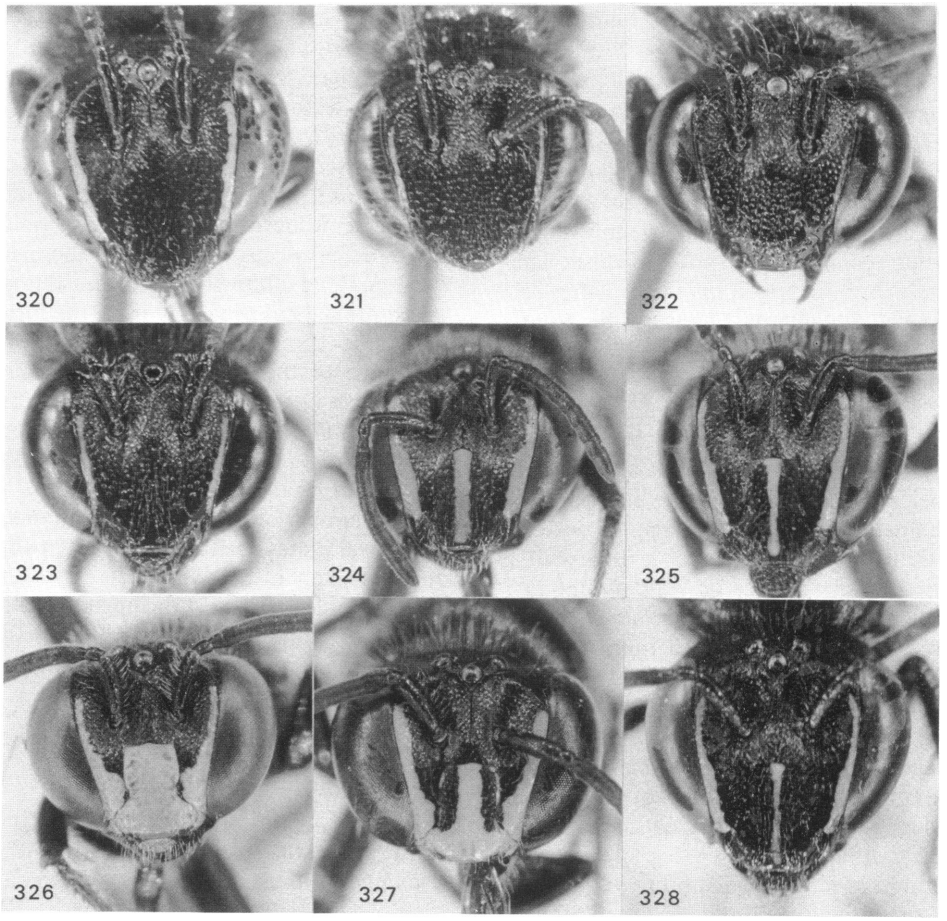
Allodape stellarum Cockerell
Figures 2, 301-303, 324-327

Allodape stellarum Cockerell, 1916, p. 195. (Type ♀, not located, from Umbilo, Natal.)

Allodape stellarum rhodoptera Cockerell, 1934a, p. 223. (New synonym. Type ♀, BM, from Van Reenen, Natal.)

Allodape communis Cockerell, 1934a, p. 229. (New synonym. Type ♀, BM, from Greytown, Natal.)

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 6-9 mm.; forewing length 5-6 mm. (3-5) Pale markings cream-colored (both sexes). (10) Scutellum sometimes with transverse pale yellow band. (14) Pubescence white, tibial brush ochraceous, not very different from white hairs of rest of legs and body; dorsal metasomal hairs, seen in profile, of moderate length, blunt, whitish except for tergum six on which they are black or fuscous, rarely a few fuscous hairs on five. (20) Ocellocular area almost impunctate (both sexes). (26) Upper clypeal margin as long as or usually shorter than width of paraocular area. (31) Punctures of lower genal area finer. (37) Median



FIGS. 320-323. *Allodape friesei*, facial views. 320. Female, Robertson, Cape Province. 321. Female, 8 km. NE of Worcester, Cape Province. 322. Female, Cape Nature Reserve, Cape Peninsula, Cape Province. 323. Male, Hout Bay, Cape Province.

FIGS. 324-327. *Allodape stellarum*, facial views, St. Lucia Estuary, Natal. 324, 325. Females. 326, 327. Males.

FIG. 328. *Allodape microsticta*, facial view of female, Malta Forest, northeastern Transvaal.

flagellar segments sometimes only as long as broad. (42) Maxillary palpus about twice as long as width of galea or somewhat more (both sexes). (48) Hamuli 6 or 7 (both sexes).

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 6-8 mm.; forewing length 5-6 mm. (2m-12m) No yellow above clypeus; upper lateral parts of clypeus often variably black, the lateral margins of upper part of clypeus often marked with yellow (fig. 327). Labrum often with only central area yellow. (14m) Pubescence, including that of metasomal terga and hind tibial brush, white; fringe of seventh tergum light red to reddish fuscous. (29m) Upper clypeocular distance more than twice lower distance. (33m) Malar space almost linear. (37m) First flagellar segment a little broader than long. (58) Front basitarsus subequal to or shorter than remaining tarsal segments together; second segment over twice as long as

broad. (59) Hind femoral prominence often stronger than in *A. ceratinoides* so that femoral margin beyond it is gently concave. (63) Ventroapical plate of gonocoxite with margin of main part smooth, convex, little tapered medially, with six to 10 coarse submarginal hairs with short branches apically, sometimes one of hairs well away from margin; *intercoxal plate with process short, often premarginal.* (65) Lateral median projection of penis valve hairy dorsally, some of hairs .055 mm. long; apex of projection, in front of angle, with a few coarse bristles.

Distribution. Eastern Cape Province to Natal and the eastern Transvaal. SOUTH AFRICA: *Cape Province*: East London; Goshen, near Cathcart; Katberg, 1220 m. altitude; Loerie; Port Elizabeth; Uitenhage. *Transkei*: Port St. Johns. *Natal*: Amanzimtoti; Balgowan, 40 km. NW of Pietermaritzburg, 1370 m. altitude; 23 km. SE of Bulwer, 1190 m. altitude; Durban; Eshowe; Greytown; 19 km. W of Greytown; Hattingspruit; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Illovo Beach, 27 km. S of Durban; Ingogo; 11 km. NE of Karkloof, 64 km. N of Pietermaritzburg; Kloof; Kranskop, 915 m. altitude; Nkandla Forest; Nagle Dam, 27 km. E of Pietermaritzburg; Pietermaritzburg; 18 km. S of Pietermaritzburg; Port Shepstone; 13 km. SE of Richmond; Salt Rock, 47 km. N of Durban; Scottburgh; St. Lucia Estuary, Zululand; Stranger; Tugela Mouth; Umbilo, Durban; Umbumbulu; Umhlanga Rocks; Umhloti; Van Reenen. *Transvaal*: Elandshoek; Louis Trichardt; Malta Forest; Montrose; Nelspruit; Sabie; Shilouvane (north Transvaal); Waterval-Onder.

Variation. As in *Allodape pictifrons*, every variation occurs in females from those with the scutellum all black to those with a broad scutellar band. In males the scutellum is black.

This form is probably an eastern subspecies of *Allodape pictifrons.* Unfortunately these bees are scarce in collections from the area where they may meet (Grahamstown, Port Elizabeth, Willowmore, etc.) and intergradation cannot yet be adequately documented, especially for males. Females from Katberg and one from East London seem typical of *A. stellarum.* A series from Uitenhage, Loerie, and Port Elizabeth differs in having the dorsal hairs of the fourth and fifth terga or at least the fifth fuscous or blackish, thus approaching *A. pictifrons.* A female from Willowmore has these hairs short and black as in *A. pictifrons.* In both the tibial brush is rusty, as in *A. pictifrons.* A male from the same locality has genitalia as in *A. pictifrons* except that the ventroapical plate of the coxite has the large hairs mostly submarginal, as in *A. stellarum.* More specimens and especially males from the intermediate region are needed but there is probably only one species involved. Willowmore females have narrow facial marks more suggestive of western than eastern individuals.

Two otherwise typical females from Port St. Johns, Transkei, have the tibial brushes black, suggestive of *Allodape microsticta* and *quadrilineata* from which they differ by the pallid tibial spurs.

For a discussion of probable intergradation with *Allodape microsticta*, see the discussion under that name. Specimens from Malta Forest, Nelspruit, and Sabie are involved.

Allodape microsticta Cockerell
Figures 328, 329

Allodape microsticta Cockerell, 1934a, p. 226. (Type ♀, BM, from Vumba, Umtali, Rhodesia.)

This is a little known form whose status remains uncertain. It agrees with *Allodape stellarum* except that the hind tibial brush in both sexes is black or blackish and the tibial spurs are blackish. The median clypeal pale line of the female, which is usually well developed in *A. stellarum*, may be absent. It is complete although narrow in the five Transvaal specimens, absent in those from Rhodesia. The clypeus of the males from Rhodesia is black except for a small yellow spot and the labrum is black; males from Transvaal have a broad median yellow clypeal band, much broadened below, and yellow on the labrum. Tegulae of both sexes lack yellow. The scutellum of the female is black, as in some specimens of *stellarum.* Black tergal hairs are limited to the apical half of the sixth tergum.

The first flagellar segment of the male is longer than broad as are the middle flagellar segments. The male genitalia are perhaps not distinguishable from those of *stellarum* although minor

differences exist between the one Rhodesian male of *microsticta* and the few *stellarum* dissected, as follows: lateral median projection of penis valve with hairs rather than bristles apically, these hairs not much thicker than comparable hairs elsewhere; intercoxal plate with process apical, although short as in *stellarum*.

It seems likely that *Allodape microsticta* grades into *A. stellarum* in the eastern Transvaal, although specimens from Shilouvane, Montrose, Waterval-Onder, etc., are typical *A. stellarum*. Even one from Louis Trichardt was so identified without question although it was not compared with *A. microsticta*. One of three females from Malta Forest and the two each from Nelspruit and Sabie are like *stellarum* but with blackish hind tibial spurs. Thus they are probably intergrades. Two females, seemingly of *A. stellarum*, from Port St. Johns, Transkei, have the tibial brush black; perhaps this *microsticta*-like attribute is widespread but rare in the *stellarum* population. The tibial spurs of these specimens are light brown, not black as in *A. microsticta*.

Distribution. Northern Transvaal and eastern Rhodesia. SOUTH AFRICA: *Transvaal*: Magoebaskloof (northern Transvaal) (2♀, 6♂, Empey collection); Malta Forest (northeastern Transvaal) (2♀, Empey collection); Zoutpansberg, Louis Trichardt (1♀, SAM). RHODESIA: Vumba and Vumba Mountains, Umtali (few females, 1♂, KU; 1♂, Tervuren).

Allodape pictifrons Smith
Figures 304, 305, 330-334

Allodape pictifrons Smith, 1854, p. 228. (Type ♀, BM, labelled "Cape G.H." [Cape of Good Hope]. The published locality is Sierra Leone but this must be an error; specimens serving as the basis of Smith's remark on scutellar variability are still in BM labeled "Cape.")

Allodape cordata Smith, 1879, p. 98. (New synonym. Type ♀, BM, from Cape of Good Hope, apparently inadvertently labeled by Smith as *cognata* Smith, a name that was never published.)

Prosopis 5-lineata Cameron, 1905b, p. 235. (New synonym. Type ♀, BM, from Stellenbosch, Cape Province.)

Allodape strigata Strand, 1915, p. 58. (New synonym. Lectotype ♀, here designated, Berlin, from Willowmore, Cape Province.)

Allodape strigata Friese, 1924, p. 79. (Lectotype ♀, here designated, Berlin, from Willowmore, Cape Province, the same specimen as the lectotype of *strigata* Strand. This species was named in manuscript by Brauns. A male and a female labeled as types in the Transvaal Museum were presumably never seen by Friese or Strand. In the Berlin museum are one male and one female; since the female was labeled by Brauns, as well as Friese, and since the female was first described by both Strand and Friese, the male being treated only comparatively, the female should be the lectotype and is so designated.)

Allodape bimaculata Cockerell, 1934a, p. 227. (New synonym. Type ♀, BM, from Stellenbosch, Cape Province.)

Allodape elegantipes Cockerell, 1934a, p. 227. (New synonym. Type ♂, BM, from Ceres, Cape Province.)

Allodape nigrilabris Cockerell, 1934a, p. 224. (New synonym. Type ♂, BM, from Ceres, Cape Province.)

Allodape strigata transcincta Cockerell, 1939b, p. 42. (New synonym. Type ♀, BM, from Bot River, Cape Province.)

This form differs from the description of *Allodape stellarum* only in the characters listed in table 4. The dorsal metasomal hair color (character 14) is the most reliable feature, and the tegular spot (9) distinguishes most specimens. The genitalic characters may be diagnostic but so few males of each form are available that one cannot be certain of their invariability. The other characters are only average differences, not very useful in distinguishing *A. pictifrons* from *stellarum*.

Distribution. Western and southern Cape Province, in Cape macchia and probably in karoo. SOUTH AFRICA: *Cape Province*: Bot River; Cape Nature Reserve, Cape Peninsula; Ceres; Graaff-Reinet; Hout Bay; Kirstenbosch Botanical Gardens, Cape Town; Kommetjie; Ladismith; Leipoltville to Eland's Bay; Noordhoek; Pakhuis Pass near Clanwilliam; Rivierzonderend; Seven Weeks Poort, Ladismith; Stellenbosch; Vlei, Cape Flats; Willowmore; Zeekoe.

Variation. The scutellum of the female may be entirely black or may have a broad cream band across it. All intermediates exist, as shown in the type series of *Allodape pictifrons*, the types of *A. bimaculata* and *A. transcincta*, and

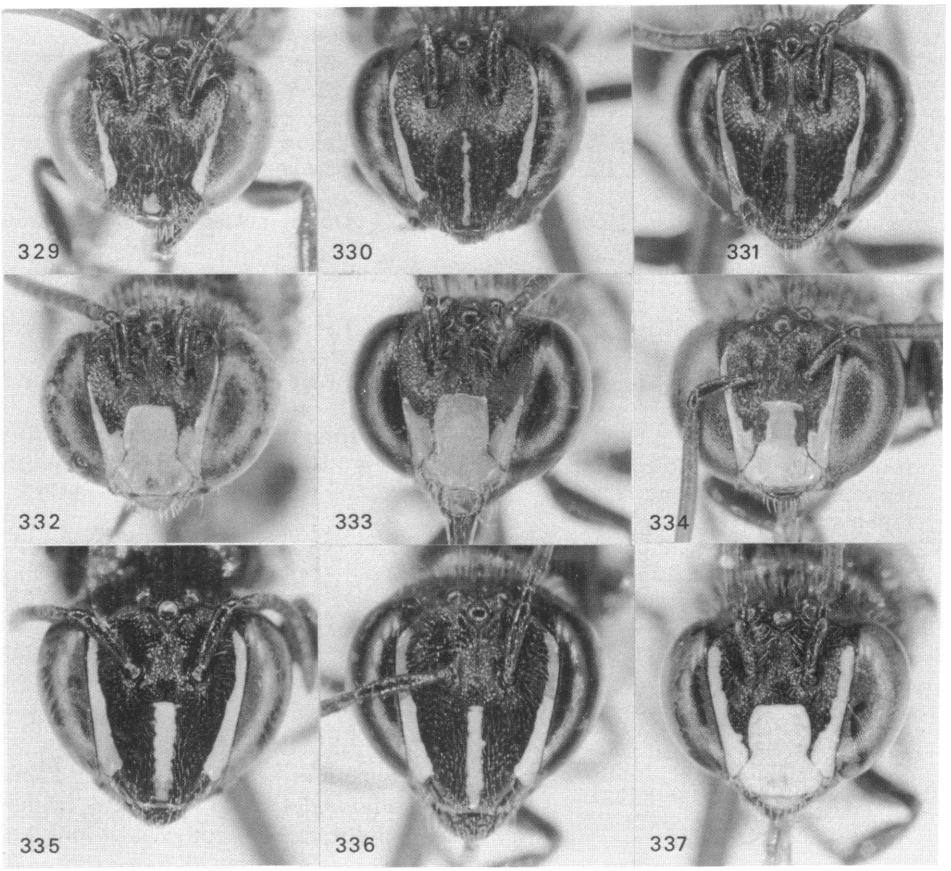


FIG. 329. *Allodape microsticta*, facial view of male. Vumba Mountains, Rhodesia.

FIGS. 330-334. *Allodape pictifrons*, facial views. 330, 331. Females, Hout Bay, Cape Province. 332. Male, Cape Town, Cape Province. 333. Male, Kirstenbosch Botanical Gardens, near Cape Town, Cape Province. 334. Male, Cape Nature Reserve, Cape Peninsula, Cape Province.

FIGS. 335-337. *Allodape quadrilineata,* facial views, vicinity of Grahamstown, Cape Province. 335, 336. Females. 337. Male.

other material although my material from localities on the Cape Peninsula shows no intermediates. The labrum of the female is ordinarily black but in the type of *elegantipes* it has a yellow dot. In the male the labrum varies from cream-colored except for the dark apical and lateral margins (Willowmore, Kirstenbosch) to black with a central cream spot or wholly black (Cape Nature Reserve). The clypeus of the male may be all yellow or the upper lateral parts black, as in specimens from the Cape Nature Reserve (but not Kirstenbosch). In one male from Cape Town the lateral face marks only reach to the level of the summit of the clypeus. The tibial brush is occasionally strongly rusty and in one of two specimens from Rivierzonderend it is partly blackish.

As indicated under *Allodape stellarum*, *A. pictifrons* may not be specifically distinct from that species, there being indications of intergradation in the specimens from the area where their ranges meet. Moreover, it seems likely that *A. microsticta* represents a further geographical variant of the same species.

TABLE 4
Comparison of *Allodape pictifrons* and *Allodape stellarum*

	pictifrons		*stellarum*
(3-4)	Yellow face marks of ♀ average smaller	(3-4)	Yellow face marks of ♀ average broader
(9)	Tegula usually without yellow spot (♂,♀)	(9)	Tegula with yellow spot (♂,♀)
(14)	Dorsal metasomal hairs of ♀ blackish and sometimes shorter on terga 4-6. Tibial brush usually ochraceous, hairs of body whitish	(14)	Dorsal metasomal hairs of ♀ pale and longer on terga 4-5. Tibial brush rusty, hairs of body whitish to ochraceous
(6m)	Labrum of male black or with large discal area yellow	(6m)	Labrum of male or at least discal area yellow
(58)	Front basitarsus ♂ slightly shorter than rest of tarsus	(58)	Front basitarsus ♂ slightly shorter than or as long as rest of tarsus
(59)	Hind trochanteral margin ♂ basal to tooth rather straight to convex, femoral margin beyond angle rather straight	(59)	Hind trochanteral margin ♂ basal to tooth convex, femoral margin beyond angle often concave
(63)	Ventroapical plate of ♂ gonocoxite with setae scattered, largely unbranched "Bird's head" process with beak short, dorsal shoulder on hood strong; intercoxal plate of ♂ with process normal, apical	(63)	Ventroapical plate of ♂ gonocoxite with setae nearly all submarginal, branched apically; "Bird's head" process with beak longer, dorsal shoulder weaker; intercoxal plate ♂ with process short, preapical

Allodape quadrilineata (Cameron)
Figures 335-337, 346, 347

Prosopis quadrilineata Cameron, 1905a, p. 197. (Type ♀, Grahamstown, from Brak Kloof, near Grahamstown, Cape Province.)

Allodape carbonaria Friese, 1924, p. 76. (New synonym. Type ♀, Berlin from Willowmore, Cape Province, labeled by Brauns as "*carbonaria* m. i. l.")

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 7.5-8.5 mm.; forewing length 6 mm. (3-5) Pale marks cream-colored (both sexes). (8) *Pronotal collar with broken cream-colored band*, sometimes reduced to spot on humeral angle and occasionally absent. (10) Scutellum with cream-colored band, sometimes reduced to transverse streak. *Tibial spurs black or blackish* (both sexes). (14) Pubescence yellowish white, *hind tibial brush black or blackish* (coppery to fuscous in male). (20) Ocellocular area almost impunctate (both sexes). (26) Upper clypeal margin as long as or usually shorter than width of paraocular area. (31) Punctures of lower genal area finer than in *A. ceratinoides*. (42) Maxillary palpus about twice as long as width of galea or somewhat more (both sexes). (48) Hamuli 6 or 7 (both sexes).

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 7-7.5 mm.; forewing length 6 mm. (3m) No yellow above clypeus. (10m) Scutellum with yellow spot in one of two available specimens. (37m) First flagellar segment broader than long, middle segments longer than broad. (58) Anterior basitarsus as long as or slightly longer than remaining tarsal segments together. (63) Ventroapical gonocoxal plate with hairs mostly marginal (sometimes one discal one), the inner extremity of the plate slender, sinus between main part of plate and "bird's head" process narrow. (65) Penis valve with two strong longitudinal dorsal carinae, median lateral projection with longer dorsal hairs and with apical bristles, unlike *A. ceratinoides*.

Comparative Comments. In various features this species is most like *Allodape stellarum* and *A. pictifrons*. The features italicized above distinguish *quadrilineata* from these species. From *stel-*

larum, which has similar genital chaetotaxy, the genitalia of *quadrilineata* differ by having the hairs of the ventroapical gonocoxal plate unbranched, by the slender rather than broad sinus separating the "bird's head" process from the rest of the ventroapical plate of the gonocoxite, as well as by the bicarinate penis valves.

Distribution. Southern and eastern Cape Province. SOUTH AFRICA: *Cape Province*: Boesmans River and Brak Kloof, near Grahamstown; Fort Beaufort; Fort Willshire, near Alice; 23 and 27 km. NW and 19 km. west of Grahamstown; Papiesfontein, Gamtoos Mouth; Pearly Beach, Bredasdorp; Uitenhage; Van Stadens Mouth; Willowmore.

Brauns's many years of collecting at Willowmore yielded very few specimens of this species.

Allodape armatipes Friese
Figures 344, 348, 349

Allodape armatipes Friese, 1924, p. 80. (Type ♂, Berlin, from "Shilouvane, N. Transvaal.")

This species is known to me only from the male type. The notes below, based on it, are not numbered to correspond to the other descriptions because formal comparison with all characters listed for *Allodape ceratinoides* was not made.

Description. Male. Length 7.5 mm.; forewing length 7 mm. Agrees with *Allodape ceratinoides* but clypeus broadly black laterally, labrum black, lateral face marks broad below (fig. 344). Summit of clypeus transverse. Dorsal metasomal hairs white. Genitalia with lateral median projection of penis valve with apical bristles; more of distal bristles of penis valve extraordinarily long; ventroapical plate of gonocoxite with apical margin nearly straight, sinus between this margin and lateral process broad, hairs with branches, fewer of hairs discal than in *A. ceratinoides*.

Comparative Comments. In size this species agrees with *Allodape ceratinoides* or *pernix*, and largely for distributional reasons I at one time regarded the type as a specimen of the latter with reduced face marks; the brownish tergal margins are rather conspicuous and suggestive of *A. pernix* proper. However, the completely white tergal hair and the genitalic characters distinguish the species clearly from both *A. ceratinoides* and *pernix* and the shorter antennae further distinguish it from *A. pernix*. A female from the type locality is somewhat smaller and appears to be *A. stellarum*.

Distribution. Known only from the type locality in northern Transvaal.

Allodape australissima, new species
Figures 338, 339

Diagnosis. A small black *Allodape* without pale markings on the clypeus of the female and with blackish hind tibial spurs.

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 7 mm.; forewing length 5.5 mm. (2-12) Pale markings cream-colored (both sexes), *limited to small streaks along anterior and posterior orbits* and a yellowish tegular spot; *clypeus all black. Tibial spurs blackish* (both sexes). (13) Wings rather dark brown. (14) Pubescence dull grayish white, yellow or reddish on hind tibia and tarsus, tibial brush coppery or fulvous, dorsal hairs of terga 4-6 black (to brown). (20) Ocelloccipital distance equal to ocellar diameter; ocellocular area almost impunctate (both sexes). (31) *Genal area shining with punctures widely separated, small*, finer below than above (both sexes). (37) Middle flagellar segments about as long as broad (or longer than broad). (42) Maxillary palpus less than three times as long as galeal width (both sexes). (48) Hamuli 6 (both sexes).

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 6.5 mm.; forewing length 5 mm. (2m-12m) No yellow above clypeus; labrum yellow only medially. (14m) Pubescence as described for female but that of hind leg pale grayish, tibial brush coppery. (37m) Median flagellar segments longer than broad. (59) Trochanteral margin basal to apex of first tooth scarcely convex. (60-65) Genitalia and hidden sterna and terga apparently not distinguishable from those of *A. ceratinoides* and *panurgoides*.

Comparative Comments. In its small size this species resembles *Allodape quadrilineata* and *pictifrons* or may even average slightly smaller. In lack of the clypeal yellow line of the female, it resembles only *A. friesei* in the South African group of species. It further resembles *A. friesei* as

well as *A. quadrilineata* and *microsticta* in the blackish tibial spurs. From *A. friesei* it differs in smaller size, finer and sparser punctation, and yellow clypeus of the male; from *A. quadrilineata* it differs in the black clypeus, pronotum and scutellum of the female; and from *A. microsticta* it differs in the rusty or fulvous tibial brush and dark dorsal hairs on terga 3-6. From all these species it differs in male genital structure, the ventroapical plates of the gonocoxites having thick, simple bristles both discally and marginally, the margin having two weak angles, these and other genital features being as in *A. panurgoides* and *ceratinoides*.

Distribution. Known only from the type locality near the southernmost point of Africa.

Type Material. Holotype female, allotype male, and three female paratypes: Pearly Beach, Bredasdorp, Cape Province, South Africa, December, 1958. One female paratype, same locality, September, 1959. (All in SAM except one paratype retained at KU.)

Etymology. Meaning the southernmost, because of the type locality.

Allodape pernix (Bingham)

Figures 340-343, 345, 350, 351

Prosopis pernix Bingham, 1903, p. 49. (Type ♀, BM, labeled as from Port Natal, which is Durban as given by Bingham.)

Allodape junodi Friese, 1914a, p. 149. (New synonym. Lectotype ♀, here designated, Berlin, from "Rikatla, Delagoa," Mozambique. In the Berlin collection a female from "Shilouvane, N. Transvaal" had been labeled as type; a male from that locality was questionably attributed to the species by Friese (1914a), but no female was recorded from there. It is clear that the Delagoa specimen should be type.)

Allodape rufocincta Friese, 1914a, p. 147. (New synonym. Type ♀, Berlin, from Cradock, Cape Province.)

Allodape retrorsa Strand, 1915, p. 37. (New synonym. Type ♀, Berlin, labeled "Capland, Krebs S.")

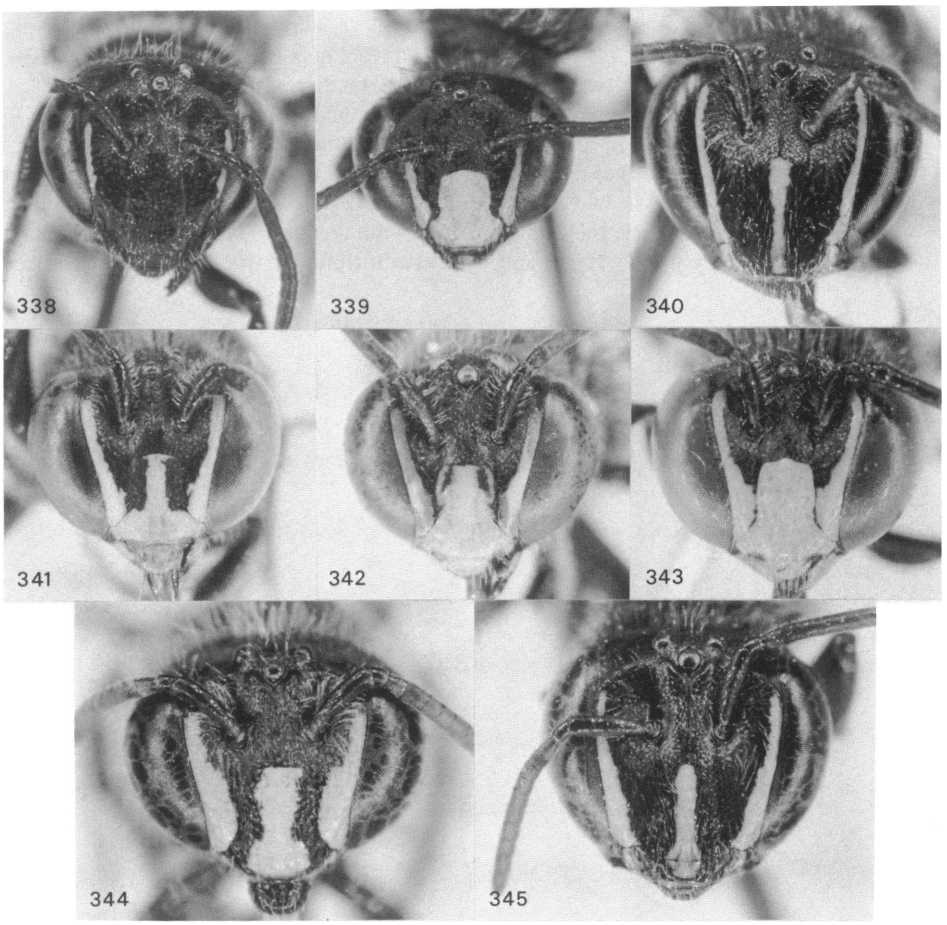
Allodape cordata rufipennis Cockerell, 1934a, p. 229. (New synonym. Type ♀, BM, from Port St. Johns, Transkei.)

Allodape cordata rubricans Cockerell, 1934a, p. 228. (New synonym. Type ♀, BM, from Port St. Johns, Transkei.)

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 7.5-10 mm.; forewing length 6-8 mm. (2-12) Yellow facial lines broader, *lateral ones extended onto lower lateral extremities of clypeus*; *labrum and mandibles usually with yellow spots*; scutellum with transverse yellow band (rarely reduced to two spots). Posterior margins of terga (both sexes) narrowly brown to broadly red brown, in some specimens whole apical half of metasoma and basal as well as apical bands on anterior terga red brown (both sexes). (14) Pubescence dull yellowish, more clearly yellowish on legs and sides of body; tibial brush coppery to black, often mixed or intermediate; dorsal metasomal hairs seen in profile pale, sometimes light fuscous on fifth tergum, black on sixth (both sexes; fringe of seventh tergum of male reddish fuscous). (20) Ocelloccipital area nearly impunctate (both sexes). (26) Upper clypeal margin shorter than width of paraocular area. (29) Lower clypeocular distance wider than scape. (31) Genal area shining with rather small, shallow, widely separated punctures (both sexes). (42) Maxillary palpus about two and a half times as long as galeal width (both sexes). (57) Gradulus of tergum 3 extending well behind spiracle, graduli of 4 and 5 strong, as described for *A. ceratinoides* (both sexes).

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 7.5-9 mm.; forewing length 6-7.5 mm. (2m-12m) No yellow above clypeus; upper lateral parts of clypeus often variably dark; labrum and most or part of mandible yellow. Scutellum sometimes with yellow band as in female (one of two available males of form *rufocincta*, none of the few males of *pernix* proper). (33m) Malar space almost linear. (37m) First flagellar segment as broad as or broader than long, *third and following segments all distinctly longer than broad.* (58) Front basitarsus a little shorter than other segments taken together; second segment over twice as long as broad. (59) Trochanteral margin basal to apex of first tooth only slightly convex; femoral margin beyond tooth concave. (60-65) Genitalia as in *A. stellarum* but "bird's head" process more round in lateral view (figs. 350, 351).

Comparative Comments. This species is most similar to *Allodape stellarum.* It differs in the



FIGS. 338, 339. *Allodape australissima*, facial views, Pearly Beach, Bredasdorp, Cape Province. 338. Holotype female. 339. Allotype male.

FIGS. 340-343. *Allodape pernix*, facial views. 340. Female, St. Lucia Estuary, Natal. 341. Male, same locality. 342. Male, Tugela Mouth, Natal. 343. Male, Port Alfred, Cape Province–a specimen of the color form *rugocincta*.

FIG. 344. *Allodape armaticeps*, facial view of male type, Shilouvane, Transvaal.

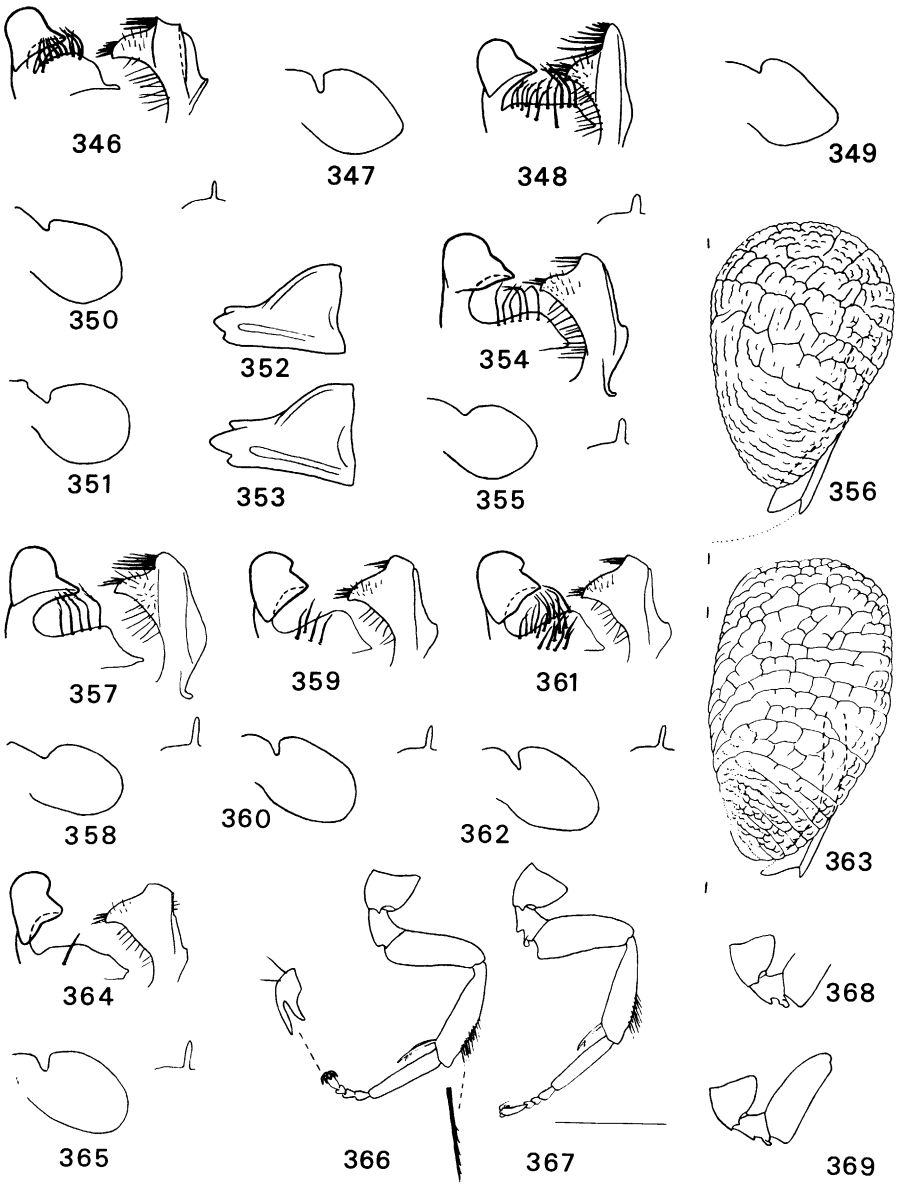
FIG. 345. *Allodape pernix*, facial view, female, Tugela Mouth, Natal.

larger size, the more extensive yellow head and mandibular marks, the consistent presence of yellow on the scutellum of females; the coppery (sometimes only ochreous) to blackish tibial brush in both sexes, and the slight genital difference indicated above.

Distribution. Known from eastern Cape Province, Transkei, Natal, through Zululand to southern Mozambique, inland, perhaps, to north Transvaal (see *Allodape armatipes*). Localities marked with one asterisk are for the form *rufocincta* (see below), those with two asterisks are for both forms, while unmarked localities are for the form *pernix*. SOUTH AFRICA: *Cape Province*: *Albany District; Alice; *Cradock; *East London; *Grahamstown; Humansdorp; *Katberg, 1220 m. altitude; *Port Alfred. *Transkei*: **Port St. Johns. *Natal*: *Amanzimtoti; *Doonside; **Durban; Eshowe; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; *Isipingo; 11 km. NE of Kranskop; *Pietermaritzburg; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Dur-

ban; **Scottburgh; *St. Michaels on Sea; Stranger; Tugela Mouth; *Umbilo, Durban; Umbogintwini; Umhlali; **Umhlanga Rocks; **Umtentwini; *Wydenham. MOZAMBIQUE: Inhambane; Rikatla, Delagoa.

Variation. The species occurs as two somewhat different looking forms which possibly are different species although they seem to intergrade. In the *pernix* form the abdominal terga are only narrowly margined with brown, whereas in the form called *rufocincta* (to which the names *retrorsa* and *rubricans* also apply) the apices and often also the bases of the terga are broadly red-brown and in some specimens the whole apical half of the metasoma is so colored. Such coloration is variable, however. One *pernix*-like female from St. Lucia Estuary has red-brown on the disc of the sixth tergum; some *rufocincta*-like specimens including the type of *retrorsa* have the sixth tergum black although it is red in most *rufocincta*. Thus, although in general two forms are distinguishable by the single character of abdominal color banding, intermediates exist. Distributions of the two forms seem to be the



same. The species is nowhere common and very few nests have been taken; all contained typical *pernix*.

Fully marked females have small yellow areas on the labrum, mandibles, and the lower lateral parts of the clypeus. Those on the labrum and mandibles may be absent, and those on the lateral extremities of the clypeus greatly reduced. One of three females from Umtentwini in the collection of H. N. Empey almost completely lacks the median clypeal pale line; in abdominal coloration it is of the form *rufocincta*.

The clypeus of the male usually has much black laterally but males in a single nest from Tugela Mouth vary from one with the clypeus almost all yellow to one with the upper lateral portions all black.

Allodape punctata (Lepeletier and Serville)
Figures 352-356, 370-373

Scrapter punctatus Lepeletier and Serville, 1825, p. 403. (Type ♀, Paris, from "Cafrerie" [= Cape Province E of Great Fish River].)

Allodape humeralis Lepeletier, 1845, pl. 13, fig. 1. (New synonym. Type ♀, location unknown, source unknown; possibly the same specimen as type of *A. punctata*. There was no description, or indication of the source of the specimen illustrated. It was large, 11 mm. long, and judging by the figure and the specific name, there was yellowish across pronotum and pronotal lobes, extensive yellow on the scutellum, grayish wings, and an apparently blackish metasoma. These characters all support the synonymy here indicated and show that Dalla Torre (1896) was wrong in synonymizing *A. humeralis* with *A. rufogastra*.)

FIGS. 346, 347. *Allodape quadrilineata*, male, 19 km. W of Grahamstown, Cape Province. 346. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia. 347. Lateral view of process of ventroapical plate of gonocoxite.

FIGS. 348, 349. *Allodape armaticeps*, male, Shilouvane, Transvaal. 348. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia. 349. Lateral view of process of ventroapical plate of gonocoxite.

FIGS. 350, 351. *Allodape pernix*, male. Lateral views of process of ventroapical plate of gonocoxite, Tugela Mouth, Natal, and Port Alfred, Cape Province. Latter specimen has red markings of color form *rufocincta*.

FIGS. 352-356. *Allodape punctata*. 352, 353. Mandibles of male and female. 354. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia. 355. Lateral view of process of ventroapical plate of gonocoxite of same. 356. Right half of eighth tergum and roof of genital chamber of same, midline indicated by dashes at left.

FIGS. 357, 358. *Allodape skaifeorum*, male allotype, Hout Bay, Cape Province. 357. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia. 358. Lateral view of process of ventroapical plate of gonocoxite.

FIGS. 359-363. *Allodape rufogastra*, male. 359. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia, Grahamstown, Cape Province. 360. Lateral view of process of ventroapical plate of gonocoxite of same. 361. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia, Kirstenbosch Botanical Gardens, near Cape Town, Cape Province. 362. Lateral view of process of ventroapical plate of gonocoxite of same. 363. Right half of eighth tergum and roof of genital chamber of same, midline indicated by dashes at left.

FIGS. 364, 365. *Allodape exoloma*, male, Richmond, Natal. 364. Dorsal view of left ventroapical plate of gonocoxite and penis valve and of median process of dorsal plate of genitalia, Grahamstown, Cape Province. 365. Lateral view of process of ventroapical plate of gonocoxite of same.

FIG. 366. Inner view of hind leg of *Allodape mucronata*, female, with enlargement of a claw and a hair of the tibial brush.

FIGS. 367-369. Inner views of hind legs of males. 367. *Allodape mucronata*. 368. *Allodape skaifeorum*, allotype. 369. *Allodape obscuripennis*.

Scale is approximately as for comparable illustrations, figures 289-305, except that figures 366-369 are enlarged much less as is shown by scale line, which represents 2.0 mm.

Allodape hirsuta Strand, 1915, p. 58. (Type ♀, Berlin, from Algoa Bay, Cape Province.)

Allodape hirsuta Friese, 1924, p. 75. (Lectotype ♀, here designated, Berlin, from Algoa Bay; same specimen as type of *hirsuta* Strand. Strand's comments concern only the female, and Friese's principal description is of the female. The species was recognized and named in manuscript by Brauns and the female in Berlin museum carries Brauns's label "*Allodape hirsuta m. i. l.*"; I have labeled this specimen type. The male in Berlin museum with the Museum's type label [not a published designation] is otherwise marked only by Friese's identification label; he did not regard it as the type nor could it have been the type of *hirsuta* Strand as that was based on the female only.)

Allodape hirsuta Brauns, 1926, p. 433. (Synonymy with *punctata* indicated by Cockerell, 1934a. Lectotype ♀, here designated, Pretoria, labeled "Algoa Bay, Capland, 26-2-96 Dr. Brauns," with Brauns's pink label "Type! Brauns," and Transvaal Museum type label "*Allodape hirsuta* Brauns Type 1030." Since Brauns frequently labeled various specimens as types [= syntypes], including in this case a male associated with the female, lectotype designation seems appropriate.)

Allodape punctata: Cockerell, 1932a, p. 10; 1934a, p. 228.

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 9.5-12 mm.; forewing length 7 mm. (2-12) Yellow facial marks usually broader than in *A. ceratinoides*, those along inner orbits commonly continued downward as a spot on both sides of lower lateral clypeal (epistomal) suture. Scutellum with broad transverse yellowish band (both sexes). (13) Wings darker brown than usual in *A. ceratinoides* (both sexes). (14) Pubescence yellow, particularly on sides of thorax and legs; tibial brush coppery, extending more than half length of tibia; dorsal metasomal hairs pallid to grayish yellow as seen in profile, rather short, blunt, curved, those of fifth and sixth terga black, of fourth black or fuscous, rarely pale like those of preceding terga (both sexes but tibial brush smaller in male). (26) Upper clypeal margin shorter than width of paraocular area. (29) Lower clypeocular distance somewhat greater than width of scape. (37) Flagellar segments mostly distinctly longer than broad, only second broader than long.

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 8-9 mm.; forewing length 6.5 mm. (2m-12m) No yellow above clypeus; labrum black; mandible with yellow patch, rarely a dot or absent; upper lateral parts of clypeus sometimes black. (26m) Upper clypeal margin slightly longer than paraocular width. (29m) Lower clypeocular distance nearly as great as scape width. (37m) Flagellar segments 2-3 broader than long, 4 slightly longer than broad, others all considerably longer than broad. (39m) *Apex of mandible tridentate more or less as in female.* (57m) Graduli not extending much behind spiracles on any terga. (60) Eighth tergum more finely and reticulately wrinkled than in related species. (63) Ventral apical plate of gonocoxite with *two to six slender submarginal hairs*; margin of main part of plate rather smoothly convex, separated from lateral "bird's head" process by broad sinus. (65) Penis valve with a few bristles on median lateral projection.

Distribution. Coastal area from the Cape Peninsula to Port Elizabeth, and somewhat farther east if the type locality, "Cafrerie," has the meaning attributed to it in the synonymy above. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); Buffelsbai, False Bay shore of Cape Peninsula; Cape of Good Hope; Cape Town; Cloete's Pass; Goedehoop, Heidelberg District; Kabeljousrivier, 16 km. E of Humansdorp; Kleinmond; near Knysna; 64 km. E of Knysna; Oakhurst, Tsitsikama Forest; Papiesfontein, Gamtoos Mouth; Stellenbosch; Tradouw Pass, Swellendam District; Ysterfontein, near Saldanha Bay.

Allodape skaifeorum, new species
Figures 357, 358, 368, 374-376

Diagnosis. A large species with a largely red metasoma, similar to *A. rufogastra* but differing by the widely separated first transverse cubital and first recurrent veins, the hairs of the ventroapical gonocoxal plate which are slender and all on the margin, and other characters.

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 10 mm., varying to 8 mm. among paratypes; forewing length 7 mm. (2-12) Scutellum sometimes (not in types) with yellow transverse band; first three metasomal terga and extreme base of fourth laterally and first two sterna, sometimes also the

third, dark red; posterior margins of remaining segments (except sixth) reddish brown. Tibial spurs brown. (13) Wings slightly darker. (14) Pubescence of head and thorax dusky yellowish, some fuscous hairs usually on lower part of face. Pubescence of hind tibia and tarsus and to a lesser degree of mid-tarsus yellow, tibial brush coppery to red-brown, extending along more than distal half of tibia. Metasomal pubescence mostly brownish, that of dorsum of last three terga as seen in profile short, curved, blunt, and black. (22) Frontal tubercle more prominent than in related species, often taking form of small, downward projecting spine. (26) Upper clypeal margin subequal to or shorter than width of paraocular area, strongly arched. (29) Lower clypeocular distance slightly greater than width of scape. (31) Genal area shining, sparsely and shallowly punctate, no great difference between upper and lower portions. (37) Middle flagellar segments varying to as long as broad.

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 8.5 mm.; forewing length 6.5 mm. (2m-12m) No yellow above clypeus; red of metasoma as in female. (14) Pubescence colored as in female. (26m) Upper clypeal margin subequal to width of paraocular area, strongly arched. (58) Front basitarsus slightly shorter than remaining segments taken together, second segment over twice as long as wide. (59) Margin of hind trochanter basal to first tooth only slightly convex; *apical process of trochanter with a shoulder on basal margin.* (60) Apical margin of sixth tergum strongly convex medially; membranous convexities of eighth tergum more like those of *A. mucronata* than those of *A. ceratinoides.* (63) Ventroapical plate of gonocoxite with hairs slender, 4 or 5 (on the two sides of the only specimen), marginal, branched apically, a broad sinus between this margin and "bird's head" process. (65) Penis valve with lateral median projection rather small, with long hairs, and with subapical row of bristles; apical part of penis valve with bristles longer than usual; inner (mesal) margin of penis valve without tooth.

Comparative Comments: The size and red basal part of the abdomen suggest *Allodape rufogastra* from which *A. skaifeorum* differs in the darker pubescence, the slender branched hairs on the margin only of the ventroapical gonocoxal plate, the shorter first flagellar segment of the female, and the widely separated first recurrent and first transverse cubital veins. The last character is in general very distinctive although an occasional specimen of *A. rufogastra* approaches the typical *Allodape* venation shown by *A. skaifeorum.*

Distribution. Coastal areas of southwestern Cape Province.

Type Material. Holotype female (AMNH), allotype male (AMNH), and 10 female paratypes (KU, BM): Near the foot of the mountain on the Noordhoek Estate, Noordhoek, near Hout Bay, Cape Province, South Africa, October 19, 1966 (C. D. Michener) and November 10, 1966 (B. J. and C. D. Michener). All are labeled Hout Bay. The holotype and allotype were taken on October 19. One female paratype, Kirstenbosch Botanical Gardens, Cape Town, Cape Province, South Africa, October 29, 1950 (Swedish South African Expedition, Brinck-Rudebeck; in the Zoological Institute, Lund, Sweden). Other material (not paratypes) all from Cape Province: Pearly Beach, Bredasdorp; Strandfontein.

Variation. The specimens from all locations except the type locality and Kirstenbosch have a yellow band across the scutellum, in one male reduced to a small yellow mark.

Etymology. This species is named for Dr. and Mrs. S. H. Skaife in recognition of their extensive help during my studies on the Cape Peninsula.

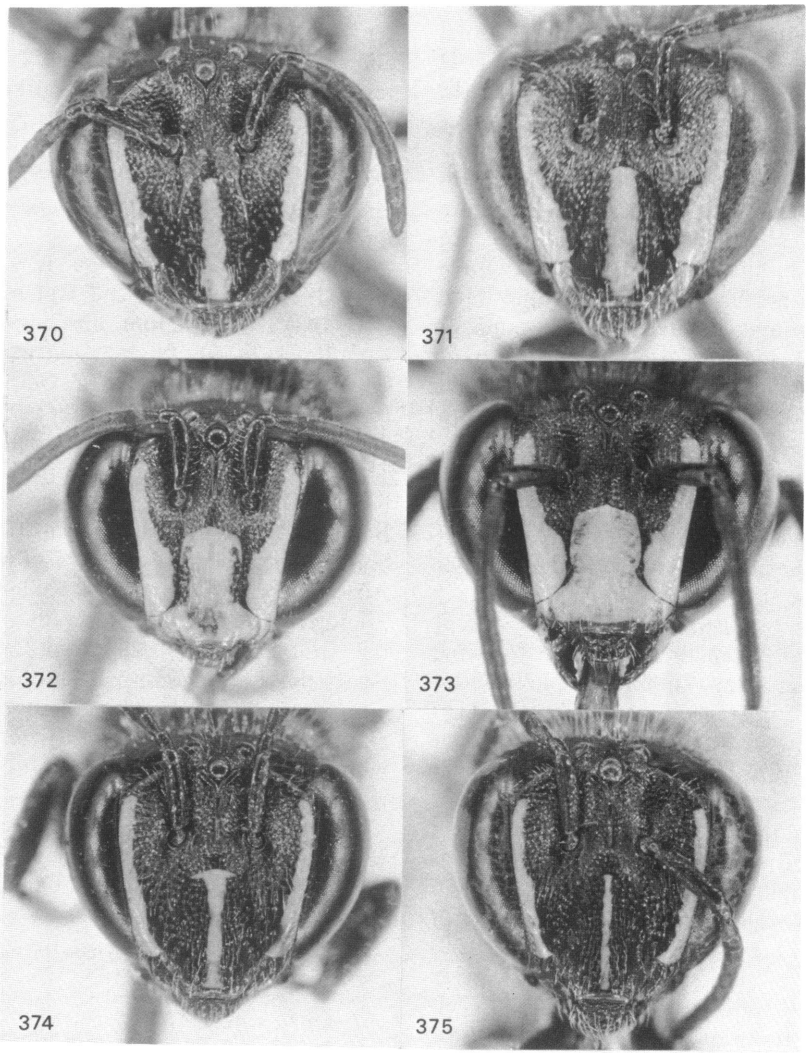
Allodape rufogastra Lepeletier and Serville
Figures 359-363, 377-383

Allodape rufogastra Lepeletier and Serville, 1825, p. 19. (Type ♀, ? Paris [not seen], from "Cafrerie" [= Cape Province E of Great Fish River.)

Allodape mediorufa Cockerell, 1916, p. 197. (New synonym. Type ♂, whereabouts unknown, from Umbilo, Natal; it is neither in the Durban Museum nor in the British Museum.)

?*Allodape marleyi* Cockerell, 1920, p. 306. (New synonym. Type ♂, whereabouts unknown, from Kranz Kloof, Natal; it is neither in the Durban Museum nor in the British Museum.)

Allodape vittaticeps Cockerell, 1920, p. 307. (New synonym. Type ♀, whereabouts unknown, from Ingwavuma, Zululand, Natal; neither in the Durban Museum nor in the British Museum.)



FIGS. 370-373. *Allodape punctata*, facial views. 370, 371. Females, 64 km. E of Knysna, Cape Province. 372. Male, same locality. 373. Male, Oakhurst, Tsitsikama Forest, Cape Province.

FIGS. 374, 375. *Allodape skaifeorum*, facial views, females, holotype and paratype, Hout Bay, Cape Province.

Allodape semirufa Cockerell, 1934a, p. 232. (New synonym. Type ♀, BM, from Port St. Johns, Transkei.)

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 8-11 mm.; forewing length 6.5-7 mm. (2-12) Scutellum (except in one female from Karkloof) with transverse yellowish band (both sexes); metasoma red basally except for black basal half of first tergum (both sexes); amount of red variable (see below). (14) Pubescence yellowish (western form) or whitish (eastern form), tibial brush rusty or reddish brown, sometimes infuscated, often occupying somewhat more than distal half of tibia (not in male), dorsal metasomal hairs variable in color

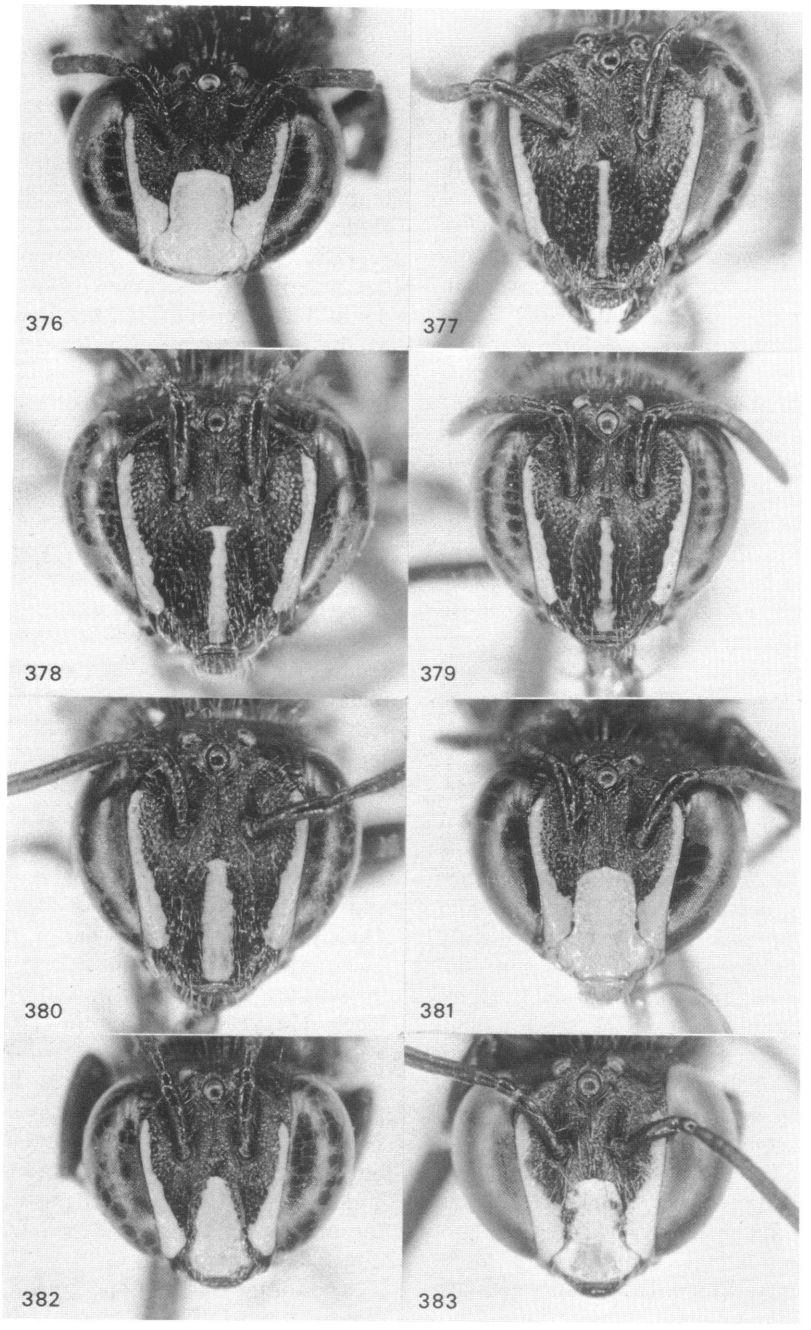


FIG. 376. *Allodape skaifeorum*, facial view, male allotype, Hout Bay, Cape Province.

FIGS. 377-383. *Allodape rufogastra*, facial views. 377, 378. Females, Cape of Good Hope, Cape Province. 379. Female, Karkloof, 64 km. N of Pietermaritzburg, Natal. 380. Female, Richmond, Natal. 381. Male, Grahamstown, Cape Province. 382, 383. Males, Kirstenbosch Botanical Gardens, near Cape Town, Cape Province.

(see below, both sexes). (26) Upper clypeal margin strongly convex, commonly angulate medially, distinctly shorter than to slightly longer than width of paraocular area (both sexes). (29) Lower clypeocular distance slightly wider than scape. (31) Genal area shining, rather sparsely and shallowly punctured, somewhat more sparsely so below than above. (37) *First flagellar segment almost twice as long as broad*, middle segments as broad as long or slightly longer than broad, segments 2-4 broader than long. (42) Maxillary palpus about twice as long as galeal width or somewhat more. (44) Apex of marginal cell rounded, extreme apex separated from wing margin by about three vein widths. (45) *Distance from first recurrent vein to first transverse cubital about equal to distance from second recurrent to second transverse cubital.* (48) Hamuli 6 or 7.

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 7.5-9.5 mm.; forewing length 6-6.5 mm. (2m-12m) No yellow above clypeus; lateral and anterior margins of clypeus sometimes black (western form); scutellar and metasomal coloration as in female. (14m) Fringe of seventh tergum light red. (29m) Lower clypeocular distance slightly less than width of scape. (36m) Scape over four times as long as wide. (37m) Flagellum as described for female but first segment less than twice as long as broad, middle segments sometimes broader than long. (58) Front tarsus as described for *A. ceratinoides* (eastern form) or basitarsus sometimes slightly shorter than remaining segments and second tarsal segment over twice as long as broad (western form). (60) Posterior margin of sixth tergum more strongly convex medially; eighth tergum rather elongate, finely reticulate in comparison to *A. ceratinoides* and *panurgoides.* (63) Ventral apical plate of gonocoxite with "forehead" of the "bird's head" process overhanging; hairs on main part of plate coarse, simple, discal and sometimes also marginal, very variable in number; sinus between lateral or "bird's head" process and rest of plate broad. (65) Penis valve with a few bristles on lateral median projection.

Distribution. Cape Peninsula to Natal, in the coastal zone. SOUTH AFRICA: *Cape Province*: Alice; Bathurst; Cango River, Oudtshoorn Division; Cape Point; East London; Grahamstown; Kirstenbosch Botanical Gardens, Cape Town; Mossel Bay; Noordhoek; Port Elizabeth; Uitenhage. *Transkei*: Port St. Johns. *Natal*: Durban; Estcourt; Ingwavuma, Zululand; Kloof; Kranz Kloof; 11 km. NE of Kranskop; Pietermaritzburg; 8 km. W of Pietermaritzburg; Richmond, 855 m. altitude; Umbilo, Durban; Umbumbulu. *Transvaal*: Mac-Mac Pools; Waterval-Onder

Variation. Part of the variation is indicated in the description. Specimens from Natal (and no doubt Transvaal and Transkei) have the red color of the metasoma more restricted than in other populations; it may occupy the posterior half of tergum 1, all of 2, and all or most of 3 or be limited to the posterior margin of tergum 1 and a broad band across 2. The dorsal metasomal hair of both sexes is whitish as seen in profile except for dusky hair on tergum 6 of the female. In the males the clypeus is entirely yellow and has a longitudinal median convexity, often medially scarcely punctate or impunctate.

Specimens from Grahamstown are like the reddest of those from Natal, except that in some males the fourth tergum also is largely or wholly red. In some specimens of both sexes the first tergum is largely red.

Specimens from Cape Town and the Cape Peninsula area differ more strikingly. In red markings they resemble Grahamstown material. Much of the dorsal metasomal hair of the fourth and following terga is dusky as seen in profile. The clypeus of the male is flatter, rarely with any longitudinal median impunctate zone, and its margins are usually broadly and often irregularly black. The yellow lines on the face of the female average narrower than in material from Natal.

In males from the Cape area the ventroapical plates of the gonocoxites have 7-18 coarse, simple hairs, some of them (usually six or more but sometimes only four) being marginal. In the eastern Cape Province (Grahamstown) and Natal the number of these hairs is 3 to 7, sometimes none of them marginal.

The form from the Cape Town-Cape Peninsula area may possibly be a species distinct from the eastern form. Unfortunately no series are available from the area between there and Grahamstown but complete intergradation is probable. For each character intergradation is already known in one or more individuals although with

the complex of characters nearly all specimens can be placed in one group or the other. All the names are based on the eastern form.

Allodape exoloma Strand
Figures 288, 364, 365, 384-387

Allodape exoloma Strand, 1915, p. 38. (Lectotype ♀, Berlin, from "Capland, Krebs S." The publication indicates that a female, so labeled, should be the type. Two such females are in the Berlin collection; the one labeled type is here designated lectotype; other specimens are marked cotypes. The type and cotype from Krebs's collection have only the last tergum and last two sterna black, the metasoma being otherwise red; in other features they resemble Grahamstown material. From the Knysna area are females with the metasoma all red as well as ones with more black than Krebs's *exoloma*; probably the type locality of *exoloma* is somewhere in the Knysna-Grahamstown region of Cape Province.)

Allodape abdominalis Strand, 1915, p. 39. (New synonym. Type ♀, Berlin, from Algoa Bay, Cape Province.)

Allodape centrimaculata Strand, 1915, p. 36. (New synonym. Lectotype ♂, here designated, Berlin, labeled "Capland, Krebs S." The hairs of fourth and fifth terga of a female associated with and labeled like the lectotype are largely pale, and those of the sixth are partly so; thus type material agrees with Natal series and probably originated there. The male was described before and more fully than the female and is therefore designated as lectotype.)

Allodape pyrifera Cockerell, 1916, p. 197. (New synonym. Type ♂, whereabouts unknown, from Umbilo, Durban, Natal. It is neither in the Durban Museum nor the British Museum, but a badly broken female "cotype" [= paratype, in this case probably the allotype] is in the Durban Museum.)

Allodape abdominalis Friese, 1924, p. 75. (Lectotype ♀, here designated, Berlin, from Algoa Bay. It is the same specimen as the type of *abdominalis* Strand; Strand's description agrees with type female only, which is therefore certainly holotype; Friese's description is of same specimen and of a male having his determination label. The name was proposed in manuscript by Brauns and the type female carries Brauns's label "*Allodape abdominalis m. i. l.*" "Types" of *abdominalis* Brauns *in litt.* in the Transvaal Museum were presumably never seen by Strand or Friese and are not genuine type material.)

Allodape abdominalis var. *badia* Friese, 1924, p. 75. (New synonym. Type ♀, Berlin, from Sundays River, Cape Province; labeled by Brauns as "*Allodape badia m. i. l.*," but the label crossed out by Brauns [presumably], who evidently recognized the synonymy with *abdominalis*. There are no specimens labeled *badia* in Brauns's collection in the Transvaal Museum. Friese, however, published the name but no one attached a type label to the specimen on which it was based until I did so on examining material from the Berlin museum.)

Allodape nigrothoracica Friese, 1924, p. 77. (New synonym. Type ♀, Berlin, from "Algoa Bay, Capland.")

Allodape haematura Cockerell, 1934a, p. 231. (New synonym. Type ♀, BM, from north of George, Cape Province.)

Allodape rufibasis Cockerell, 1934a, p. 230. (New synonym. Type ♀, BM, from Royal Natal National Park, Natal.)

Allodape rufibasis var. *rufozonata* Cockerell, 1934a, p. 233. (New synonym. Type ♀, BM, from Van Reenen, Drakensberg, Natal, 1685 m. altitude.)

The unpublished name *amoena* Brauns is attached to a series of *Allodape exoloma* in the Brauns collection in the Transvaal Museum, Pretoria.

This is a small equivalent of the eastern form of *Allodape rufogastra*, having a relation to *A. rufogastra* similar to that of *A. panurgoides* to *A. ceratinoides*, although *A. exoloma* is slightly more distinctive. The distinguishing features are shown in table 5. Of these characters 1, 1m, and 37 are most distinctive. The others are difficult to appreciate or do not apply to all specimens. Characters 3m-6m are as in the western, not the eastern, form of *A. rufogastra.*

Distribution. Cape Town to Natal, the eastern Transvaal, and possibly Tanzania. In South Africa the range is in the coastal zone, extending to the interior as far as Somerset East, Maseru, Cathedral Peak Hotel, and east Transvaal, and occurring as high as 1680 m. altitude. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); Bot River; Cape Town; Fort Beaufort; Fort Brown; George; Grahamstown; 16 km. and 13 km. NE of Grahamstown; Jeffreys Bay;

TABLE 5
Comparison of *Allodape exoloma* and the Eastern Form of *Allodape rufogastra*

	exoloma		*rufogastra*
(1)	Length 6.5-9 mm.; forewing length 5-6 mm.	(1)	Length 8-11 mm.; forewing length 6.5-7 mm.
(10)	Scutellum black, or with yellow spot or yellow band (both sexes)	(10)	Scutellum with yellow band (rarely absent in ♂)
(37)	First flagellar segment about 1.5 times as long as broad; middle segments broader than long	(37)	First flagellar segment nearly twice as long as broad; middle segments as long as broad or longer
(48)	Hamuli 6	(48)	Hamuli 6 or 7
(1m)	Length 6.5-7 mm.; forewing length 5-5.5 mm.	(1m)	Length 7.5-9.5 mm.; forewing length 6-6.5 mm.
(3m-6m)	Labrum and lower and lateral clypeal margins mostly black	(3m-6m)	Labrum and clypeus usually wholly yellow (not in western form)
(29m)	Lower clypeocular distance subequal to width of scape	(29m)	Lower clypeocular distance less than width of scape
(36m)	Scape about 4 times as long as wide	(36m)	Scape over 4 times as long as wide
(37m)	Middle flagellar segments consistently broader than long	(37m)	Middle flagellar segments sometimes broader than long
(59)	Margin basal to apex of first trochanteral tooth weakly convex	(59)	Margin basal to apex of first trochanteral tooth more strongly convex
(63)	Ventroapical gonocoxal plate with 1-4 bristles, none of them marginal	(63)	Ventroapical gonocoxal plate with 3-7 bristles, sometimes some marginal
(65)	Penis valve with even fewer bristles[a]	(65)	Penis valve with few bristles

[a]The problem of which setae are coarse enough to be called bristles makes this difficult to quantify.

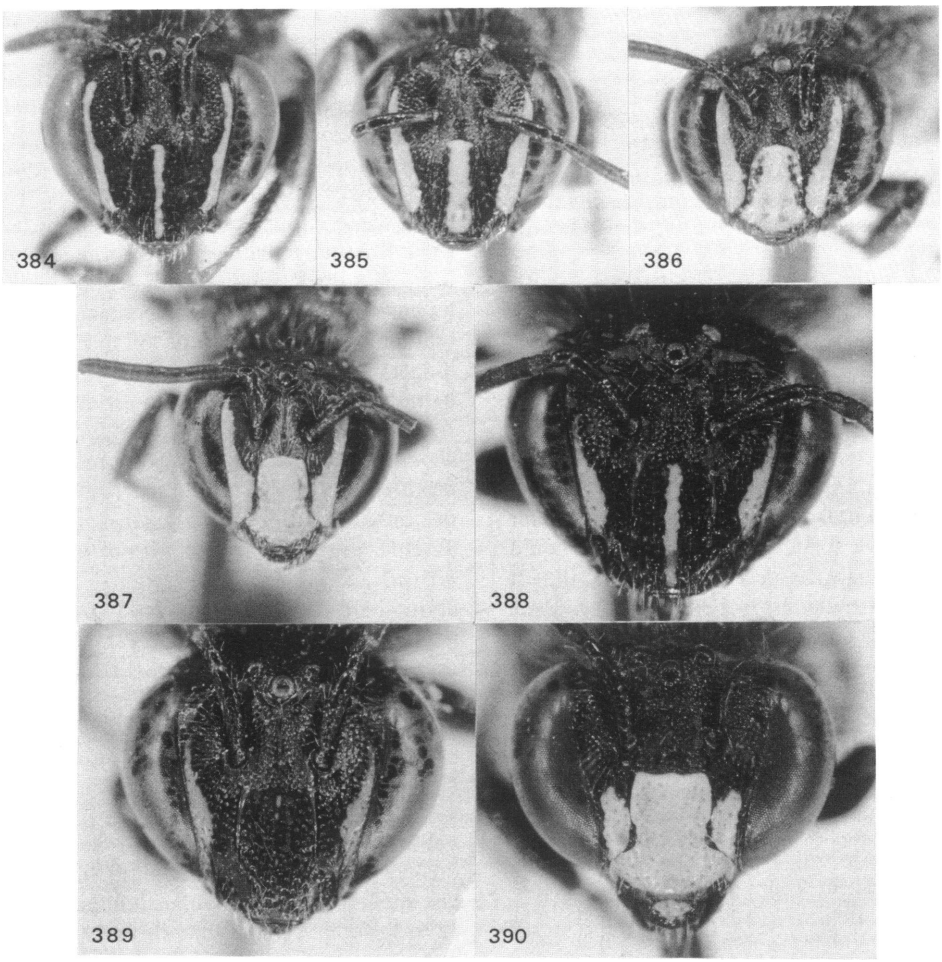
Katberg; Knysna; 27 km. NE and 64 km. E of Knysna; Loerie; Mossel Bay; Papiesfontein, Gamtoos Mouth; Port Elizabeth; Somerset East; Stellenbosch; Sundays River; Uitenhage; Van Stadens Mouth. *Natal*: 23 km. NE of Bulwer, 1190 m. altitude; Cathedral Peak Hotel, 45 km. SW of Winterton, 1430 m. altitude; Fort Mistake; Hattingspruit; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; 8 km. N of Howick; Illovo Beach, 34 km. S of Durban; Ingogo; Karkloof, 64 km. N of Pietermaritzburg, 1370 m. altitude; Kloof; Nagle Dam, 27 km. E of Pietermaritzburg; Pietermaritzburg; 18 km. S and 8 km. NW of Pietermaritzburg; Port Shepstone; Richmond, 855 m. altitude; 13 km. SE of Richmond; Royal Natal National Park; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Scottburgh; Umbilo, Durban; Umbumbulu; Van Reenen, Drakensberg. *Transvaal*: Graskop; 19 km. W of Klaserie, Drakensberg, 1275 m. altitude; Mac-Mac Falls; Mac-Mac Pools. LESOTHO (= Basutoland): Leribe; Maseru; Morija.

Only two specimens are available from Cape Town (NMNH) and none from elsewhere in the vicinity except one from Stellenbosch although E of George the species is rather common. The possible mislabeling of the Cape Town specimens should be considered.

One specimen, a cotype of *Allodape exoloma*, is labeled "Nyassa-See, Langenburg." This locality is Kilonda, Tanzania, at the northern end of Lake Malawi. The specimen is unusually large for the species but otherwise like specimens of *A. exoloma* from the eastern Cape Province; it seemed likely that the locality label was wrong, for the species is otherwise unknown from tropical Africa. A specimen of *Allodapula variegata* from the same locality was similarly considered as erroneously labeled, but a second specimen of the latter from another locality in Tanzania now suggests that these northern localities may be correct.

Variation. Specimens from Cape Town and the Knysna area have the yellow stripes on the face of the female unusually narrow (fig. 384)

and the dorsal hairs of the last three terga blackish as seen in profile. In the Grahamstown-Port Elizabeth area the facial stripes of the female are broader, as in material from Natal, and the dorsal pubescence of the metasoma is often nearly all pale, dark only at the apex of the sixth tergum, again as in specimens from Natal. The red coloration of the metasoma of females is, on the average, more extensive in western specimens. In the Knysna area some have the metasoma all red, whereas at the other extreme are individuals with the last three terga and most of the first black. The only two specimens from Cape Town have the last two terga black. At Grahamstown most specimens have the last three terga black while some have only the apical two and one-half black. In Natal some have the last three terga black, others have three and one-half black, and the first tergum is sometimes nearly all black, leaving only the second more or less fully red. The single specimen from Maseru, Lesotho, has the blackest metasoma of any available, there



FIGS. 384-387. *Allodape exoloma*, facial views. 384. Female, 64 km. E of Knysna, Cape Province. 385. Female, Grahamstown, Cape Province. 386. Male, same locality. 387. Male, 23 km. NE of Bulwer, Natal.

FIGS. 388-390. *Allodape mucronata*, facial views, Hout Bay, Cape Province. 388, 389. Females. 390. Male.

being only a reddish infusion on the apical two-thirds of the second tergum, and apical marginal red bands on terga 1-3. In Cape Province the scutellum has a broad cream-colored band. In Natal this band may be present or may be narrowed to an irregular line, a group of dots, a single dot, or may be lacking entirely. These statements about the scutellar coloration apply to both sexes.

If subspecific names were applied, *exoloma* proper would be applicable to the western form (Knysna-Grahamstown area) and *centrimaculata* to the eastern form (Natal).

Allodape mucronata Smith

Figures 287, 366, 367, 388-392, 395-398

Allodape mucronata Smith, 1854, p. 231. (Type ♀, BM, from the "Cape of Good Hope.")

Allodape luteipennis Friese, 1914a, p. 146. (New synonym. Type ♂, Berlin, from "Kapland.")

Allodape angulata Brauns, 1926, p. 427. (Lectotype ♀, here designated, SAM, labeled "Uniondale, Capland, 25-12-09, Dr. Brauns," with Brauns's pink type label "Type Br.," a label in Brauns's hand "*Allodape angulata* Brauns ♀♂," and my lectotype label.[1]

Allodape grandis Cockerell, 1934a, p. 226. (New synonym. Type ♀, BM, from Ceres, Cape Province.)

The brown abdomen of the type of *Allodape mucronata* differs from the black color of other material and live specimens. The old type could be faded, although the description shows that it was about the same color in 1854 as today. More likely the specimen was a teneral adult when collected and never became fully pigmented.

Description. Female. Similar to *Allodape ceratinoides* except as follows: (1) Length 10-13 mm.; forewing length 8-9 mm. (2-12) Median yellowish line on clypeus sometimes reduced to dots or absent; tegula dark brown. (13) Wings strongly brown. (14) Pubescence yellowish, more dusky yellowish white on metasoma; on mid and hind tibiae and basitarsi yellow to coppery; tibial brush coppery, extending almost half length of tibia; dorsal metasomal hairs, as seen in profile, short, blunt, those of fourth to sixth terga fuscous. (20) Ocellocular area impunctate or nearly so (both sexes); posterior margin of vertex slightly produced posteriorly and very narrowly rounded, almost forming a preoccipital carina (both sexes). (26) Statement about upper clypeal margin applies only to female of *A. mucronata.* (29) Lower clypeocular distance slightly wider than scape, upper over twice as wide as scape. (37) First flagellar segment about 1.5 times as long as broad, second wider than long, others longer than broad, middle flagellar segments markedly so. (46) Petiole of discal cell a little longer, 2 or 3 vein widths. (48) Hamuli 7-9; hamular sinus deeper than wide. (55) *Sixth tergum with lateral margins produced as distinct, shoulder-like carinae* (fig. 392), *apex of tergum produced to narrow upcurved apex which is not* or only minutely *emarginate*; pygidial plate absent; *pygidial fimbria interrupted medially, brown.* (57) Graduli of terga 4 and 5 ending about halfway from spiracles to tergal margins.

Male. Similar to *Allodape ceratinoides* except as follows: (1m) Length 8-11 mm.; forewing length 7.5-nearly 9 mm. (2m-12m) Clypeus, *small lateral face marks not reaching summit of clypeus*, spot on labrum, rarely small spots above clypeus, and sometimes line along outer orbit yellowish; tegula duller, less coppery; tibial brush yellow to coppery; fringe of seventh tergum dusky yellowish. (26m) Summit of clypeus convex medially, slightly wider than paraocular area. (29m) Upper clypeocular distance over twice as wide as lower. (37m) Flagellum with first segment less than one and a half times as long as broad. (39m) Apex of mandible rounded, the three teeth sometimes barely recognizable as weak marginal swellings. (59) Hind trochanteral margin basal to apex of first tooth straight;

[1]Since the Brauns collection is largely in the Transvaal Museum, it may seem curious that a lectotype of *Allodape angulata* is here selected from among specimens in the South African Museum. Indeed, a Transvaal Museum type label, no. 1026, was on a specimen in Pretoria and I erroneously placed a lectotype label on it. Cockerell (1938) said that the type locality "must be held to be Uniondale," thus presumably narrowing the specimens available for lectotype designation to those from that place. The "lectotype" in Pretoria is from Willowmore. Hence I have selected a specimen from Uniondale, also carrying Brauns's type (= syntype) label, as the genuine lectotype. This is of no nomenclatural importance, as both females are of the same species. It is important, however, that the lectotype be a female, the sex described first and in greatest detail by Brauns, for at least some of his male syntypes including one in the South African Museum are *A. obscuripennis.*

femoral margin beyond tooth straight or weakly concave. (63) Ventroapical gonocoxal plate irregular, margin variable, hairs marginal and slender; sinus between "bird's head" process and rest of plate narrow. (64) Penis valve with rather long hairs or slender bristles; dorsal basal strap extending toward bridge of penis valves slender.

Distribution. Areas occupied by the Cape macchia from the Cape Peninsula to Avontuur. SOUTH AFRICA: *Cape Province*: 5 km. S of Avontuur, 1070 m. altitude; 24 km. W of Barrydale; Cape Nature Reserve, Cape Peninsula; Cape Town; Ceres; Hex River; Hottentots, 64 km. from Cape Town; Hout Bay; Huguenot; Kirstenbosch Botanical Gardens, Cape Town; Kleinmond; Noordhoek; Stellenbosch; Tulbagh; Uniondale; Willowmore.

Specimens labeled from Willowmore, which is well into the Karoo, were collected by Brauns. My own observations, including a visit to Willowmore, suggest that the species does not occur in such arid places. Dr. A. J. Hesse of the South African Museum tells me that various forms labeled by Brauns as from Willowmore do not occur there but are found instead to the south, in more humid Cape vegetation near Uniondale and especially Avontuur. Brauns did collect at these localities and labeled some specimens accordingly. In view of his generally careful and competent work, one must ask if some species which formerly occurred near Willowmore may have been exterminated in such arid places by sheep grazing, so that they now occur only in moister regions.

Allodape obscuripennis Strand
Figures 369, 393, 394, 399-403

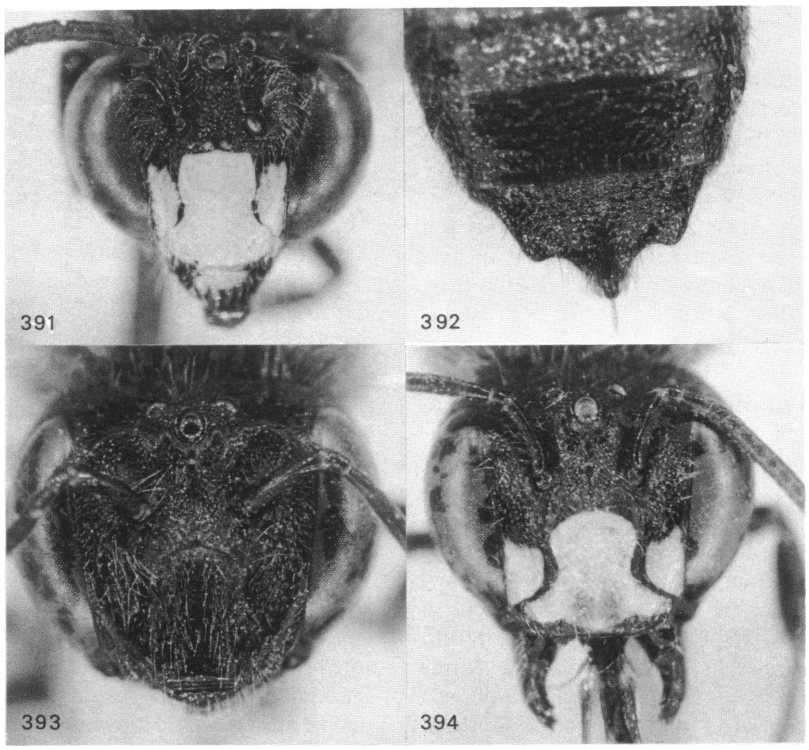
Allodape obscuripennis Strand, 1915, p. 43. (Female only. Lectotype ♀, here designated, Berlin, labeled "Capland Krebs S." The male "type" in the Berlin museum is *A. friesei.* Since Strand described the female in detail and the male only comparatively, and since Hedicke (1933) interpreted the species on the basis of the female, it is clearly desirable that the female be the lectotype.)

Allodape clypeata Strand, 1915, p. 43. (Type ♀, Berlin, from George, Cape Province.)

Allodape clypeata Friese, 1924, p. 78. (Type ♀, Berlin, from George, Cape Province, labeled in Brauns's hand "*Allodape clypeata* ♀ *m* type." It also carries the letter "*m*" on Friese's identification label, indicating that Friese considered that he was describing it as new, and the museum's red "Type" label; it is holotype for both Strand's and Friese's publication of the name. The types of *clypeata* Brauns *in litt.* in the Transvaal Museum were presumably never seen by the authors who published the name.)

It is open to some question whether the name *clypeata* was validated by Strand. It is a Brauns manuscript name that Strand mentioned, giving only two characters (length and tegular color). A description was not published under the name *clypeata* until that of Friese. However, even if *clypeata* is considered to have been validated in the same paper with *obscuripennis* in 1915, the latter name must be the valid one because it was utilized by Hedicke (1933), who noted the synonymy of *obscuripennis* and *clypeata* and must be considered first reviser.

Description. Female. (1) Length 12-13 mm.; forewing length 8.5-9 mm. (2-12) Black, no pale markings; posterior margins of metasomal segments brown, pallid toward extreme edges; tibial spurs brown. (13) Wings yellowish brown, veins and stigma dark brown. (14) Pubescence dull whitish, yellowish on face and vertex, golden on outer sides of tibiae and basitarsi, scopa golden; tibial brush coppery gold, extending over half length of tibia, of short dense hairs with numerous branches on one side; dorsal metasomal hairs very slender, pallid, short, longer near tergal margins, forming weak fasciae. (15) Clypeus flat, lateral parts not curved back except very near lower clypeal margin. *Clypeus rather short and broad, distance between tentorial pits much greater than distance from one of them to summit of clypeus.* (16) Clypeal punctures, especially along midline and apicolaterally, separated by much minutely roughened ground. (17) Lateroclypeal carina extending only about halfway from lower end to tentorial pit. (18) Head rather short and broad, maximum interorbital distance but little shorter than length of eye. (20) Interocellar distance about two-thirds of ocellocular distance; ocelloccipital distance equal to interocellar distance and over one and a half times ocellar diameter; ocellocular area smooth in contrast to well punctured face and rest of vertex. (22) Frontal tubercle absent but *region of*



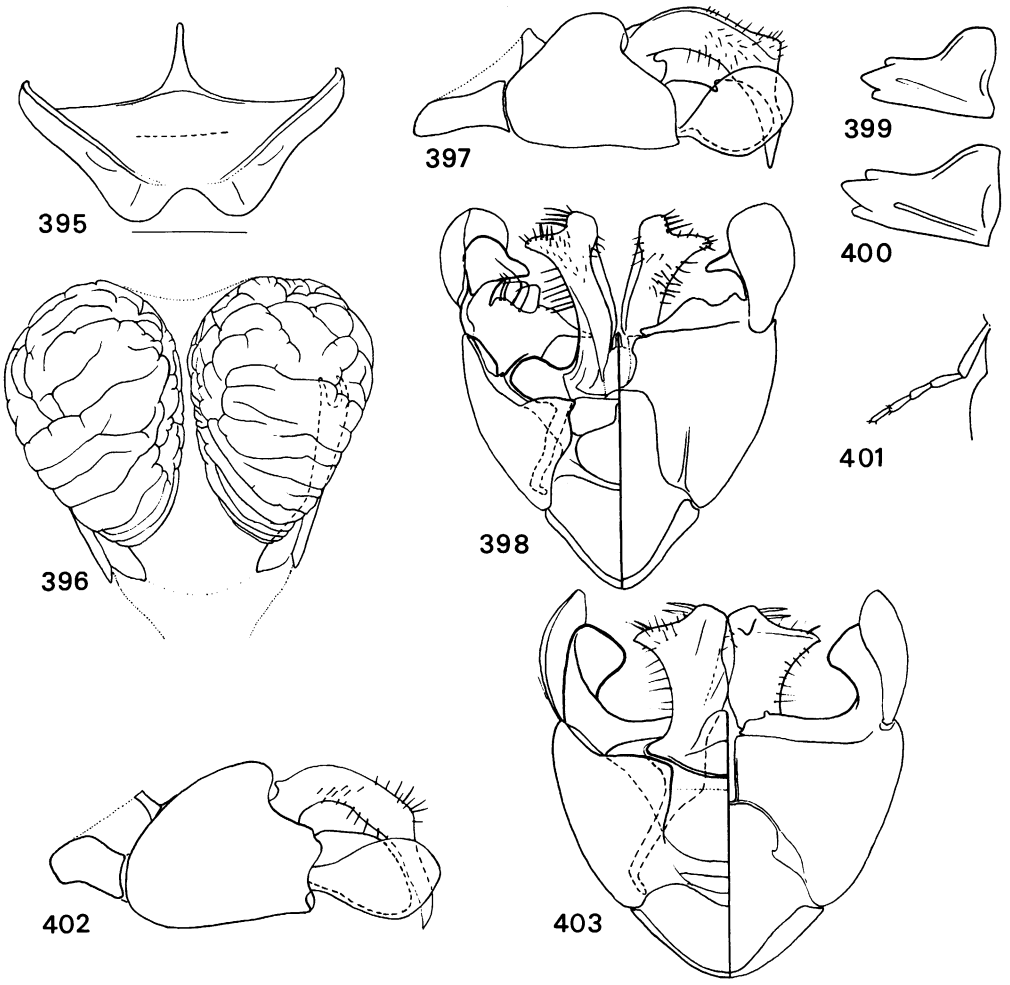
FIGS. 391, 392. *Allodape mucronata*, Hout Bay, Cape Province. 391. Facial view, male. 392. Dorsal view of apex of metasoma, female.

FIGS. 393, 394. *Allodape obscuripennis*, facial views. 393. Female, Avontuur, Cape Province. 394. Male, Mahlatsa, Lesotho.

clypeo-supraclypeal suture raised, somewhat protuberant. (25, 26) Upper clypeal margin strongly convex, nearly twice as long as width of paraocular area. (29) Lower clypeocular distance wider than antennal scape; upper clypeocular distance more than twice as wide as scape. (31) Genal area as wide as or slightly wider than eye, with well-separated punctures coarser and sparser below than above. (34) Labrum more uniformly convex in profile than in other species, roof-shaped rather than gently convex seen from front. (37) *First flagellar segment over twice as long as broad*; median segments about as long as broad. (41) *First segment of labial palpus nearly twice as long as second.* (42) Maxillary palpus five-segmented, almost twice as long as galeal width. (43) Stigma slender, about half as wide as first submarginal cell. (44) Apex of marginal cell rounded, separated by three or four vein widths from wing margin. (45) *Vein r arising about two-thirds of distance from base to apex of stigma*; second submarginal cell much over half as long as first; distance from first recurrent vein to first transverse cubital less than or not much more than distance from second transverse cubital to second recurrent. (46) Basal vein nearly straight, slanting, almost interstitial with cu-v or beyond it by about a vein width. (48) Hamuli 7-8; hamular sinus much deeper than wide. (55, 56) *Sixth tergum somewhat concave, posterior lateral margins thin and sharp but not produced to shoulders* as in *A. mucronata*; *apex upturned with small emargination, without pygidial plate*, pygidial fimbria brown, not interrupted medially. (57) Graduli not extending much behind spiracles on any tergum.

Male. Similar to female except as follows: (1m) Length 10-12 mm.; forewing length 8 mm.

(2m-12m) Clypeus and small lateral face marks not reaching summit of clypeus pale yellow. (14m) Hairs of legs largely whitish or yellowish, tibial brush sparser and its hairs rather ordinary, light yellowish; apical fringe of seventh tergum dull brownish white. (19m) Interantennal distance much more than antennocular distance. (33m) Malar space as long as width of scape. (39m) *Apex of mandible tridentate*, lower tooth exceeding upper. (58) Anterior basitarsus slightly longer than remaining tarsal segments together, second tarsal segment less than twice as long as broad. (59) Teeth of hind trochanter and base of femur smaller than in most *Allodape*, preapical



FIGS. 395-398. *Allodape mucronata*, male, Hout Bay, Cape Province. 395. Seventh and eighth metasomal sterna. 396. Eighth tergum and roof of genital chamber. 397, 398. Lateral, dorsal, and ventral views of male genitalia.

FIGS. 399-403. *Allodape obscuripennis*, Avontuur, Cape Province. 399, 400. Mandibles of male and female. 401. Maxillary palpus of male. 402, 403. Lateral, dorsal, and ventral views of male genitalia.

Scale line for figure 395 represents 0.5 mm. and is approximately applicable to the other structures of male terminalia.

trochanteral tooth especially reduced; trochanteral margin basal to apex of first tooth and femoral margin beyond tooth nearly straight. (60) Posterior margins of metasomal terga not flared, margin of sixth tergum feebly produced and convex medially; membranous convexities of eighth tergum finely wrinkled suggesting those of *A. rufogastra.* (62) Gonobase wider than long, whole genitalia relatively short and rounded. (63) Ventroapical plate of gonocoxite with large blunt lateral process not resembling a bird's head; rest of plate short, transverse, hairless. Intergonocoxal plate a transverse band without posterior median process. (64) Gonostylus considerably wider than long. (65) Penis valve without pegs, with bristles only beyond lateral median projection.

Distribution. Known only from three localities near the middle of the zone of Cape macchia that borders southernmost South Africa, and from a fourth locality in Lesotho. SOUTH AFRICA: *Cape Province*: Avontuur; George; Uniondale. LESOTHO (= Basutoland): Mahlatsa.

Allodape brachycephala Michener
Figures 404-408, 416, 417

Allodape brachycephala Michener, 1971a, p. 295. (Type ♀, CAS, from Lwiro River, 47 km. N of Bukavu, Zaire, 1650 m. altitude.)

Description. Female. (1) Length 7 mm.; forewing length 5 mm. (2-12) Black with the following parts pale yellow: sometimes median subapical clypeal spot; streak along inner orbit, widest at level of tentorial pits, and tapering upward to point at level of or a little above antennal bases; narrow streak extending most of length of posterior orbit. Flagellum with underside dark brown. Tegula dark brown; median axillary sclerite brownish black. Small segments of tarsi rufescent; *middle and hind tibial spurs black.* Margins of metasomal sterna brown and discs of sterna sometimes partly red brown but terga with margins almost as black as discs. (13) Wings light brownish, veins and stigma brownish black. (14) Pubescence dull whitish; dorsal metasomal hairs slender, blunt, rather short; tibial brush about one-third as long as tibia, its base at middle of tibia, hairs of tibial brush coarse, sparse, black; pygidial fimbria golden. (18) Face short and broad. (20) Interocellar distance about two-thirds of ocellocular distance; ocelloccipital distance equal to interocellar distance and about 1.5 times ocellar diameter; ocellocular area large and smooth, rest of vertex and upper part of face with punctation light and sparse. (22) Frontal tubercle absent. (25, 26) Upper clypeal margin convex, longer than width of paraocular area. (29) Lower clypeocular distance slightly wider than scape, upper slightly over twice width of scape. (31) Genal area with only widely separated punctures. (37) First flagellar segment longer than broad, all but first and last two segments broader than long. (42) Maxillary palpus five-segmented or (perhaps only in female) with last segment retaining partial division so that six segments are recognizable; palpus about twice as long as width of galea. Galea about 1.3 times as long as head. (43) Stigma more than half as wide as first submarginal cell. (44) Apex of marginal cell rounded, separated by almost two vein widths from wing margin. (45) Second submarginal cell nearly as long as first, distance from first transverse cubital vein to first recurrent not much if any greater than distance from second recurrent to second transverse cubital. (46) Basal vein strongly curved, basal part nearly transverse, beyond cu-v by less than width of a vein. (47) Jugal lobe not attaining level of cu-v. (48) Hamuli 5, hamular sinus about as deep as wide. (55, 56) Sixth tergum with pygidial fimbria not broken, rather small and sparse, golden; tergum otherwise about as in *Allodape ceratinoides.* (57) Graduli of terga 3 to 5 extending well back laterally, about halfway from spiracles to tergal margins.

Male. Similar to female except as follows: (2m-12m) Neither male seen has red-brown on sternal discs. (14m) Some infuscated hairs representing tibial brush on apical third or fourth of tibia; pygidial fimbria absent. (19m) Interantennal distance scarcely less than antennocular distance. (20m) Interocellar distance about half of ocellocular distance; ocelloccipital distance greater than interocellar distance and nearly twice ocellar diameter; vertex otherwise as in female. (29m) Lower clypeocular distance about equal to width of scape; upper about twice width of scape. (33m) Malar about one-fourth as long as width of scape. (37m) Flagellum

about as in female but middle segments about as long as broad. (39m) *Mandible tridentate*, lower tooth slightly exceeding upper. (57m) Gradulus of tergum 3 extending but little behind spiracle. (58) First basitarsus about as long as other tarsal segments taken together, second about two-thirds as wide as long. (59) Teeth of hind trochanter of moderate length, apical one only a small black rounded head; margin basal to apex of first tooth straight; hind femur with only a basal angle, not a tooth, margin beyond it nearly straight. (60) Posterior margins of terga not flared; sixth tergum with small but distinct median convexity on margin; membranous convexities of eighth tergum similar to those of *Allodape mucronata*. (62) Gonobase wider than long. (63) Ventral apical plate of gonocoxite with large lateral process possibly of a modified "bird's head" form suggestive of South African species but "beak" much exaggerated; rest of plate transverse, hairless. (64) Gonostylus longer than wide. (65) Penis valve without pegs or conspicuous bristles.

Distribution. Uganda, Rwanda, and eastern Zaire. ZAIRE: *Kivu*: Lwiro River, 47 km. N of Bukavu, 1650 m. and 1950 m. altitude. RWANDA: Kayove, Gisenyi, 2000 m. altitude; Rugege, Rutovu, 2350 m. altitude. UGANDA: Kawanda, Kampala.

Allodape derufata Strand
Figures 418, 419

Allodape mea var. *derufata* Strand, 1912, p. 292. (Type ♀, Berlin, from Uelleburg, Benito District, Rio Muni.)

Allodape basalis Friese, 1914b, p. 296. (New synonym. Type, not located, from Duala, Cameroon. A specimen erroneously labeled as the type, and agreeing reasonably well with the description, is in Berlin, from "Marienhof, Ukerewe" [Lake Victoria], Tanzania; no such specimen is mentioned in original description.)

Allodape langi Cockerell, 1932b, p. 13. (New synonym. Type ♀, AMNH, from Kisangani [= Stanleyville], Zaire.)

Allodape bequaerti Cockerell, 1933b, p. 272. (New synonym. Type ♀, Tervuren, from Mbandaka [= Coquilhatville], Zaire. This has reduced yellow marks for *derufata*, but every intergradation occurs, for example, in disappearance of the clypeal stripe. Basal yellow bands are present on terga 5 and 6 but were concealed by preceding terga in the type and hence were not described by Cockerell.)

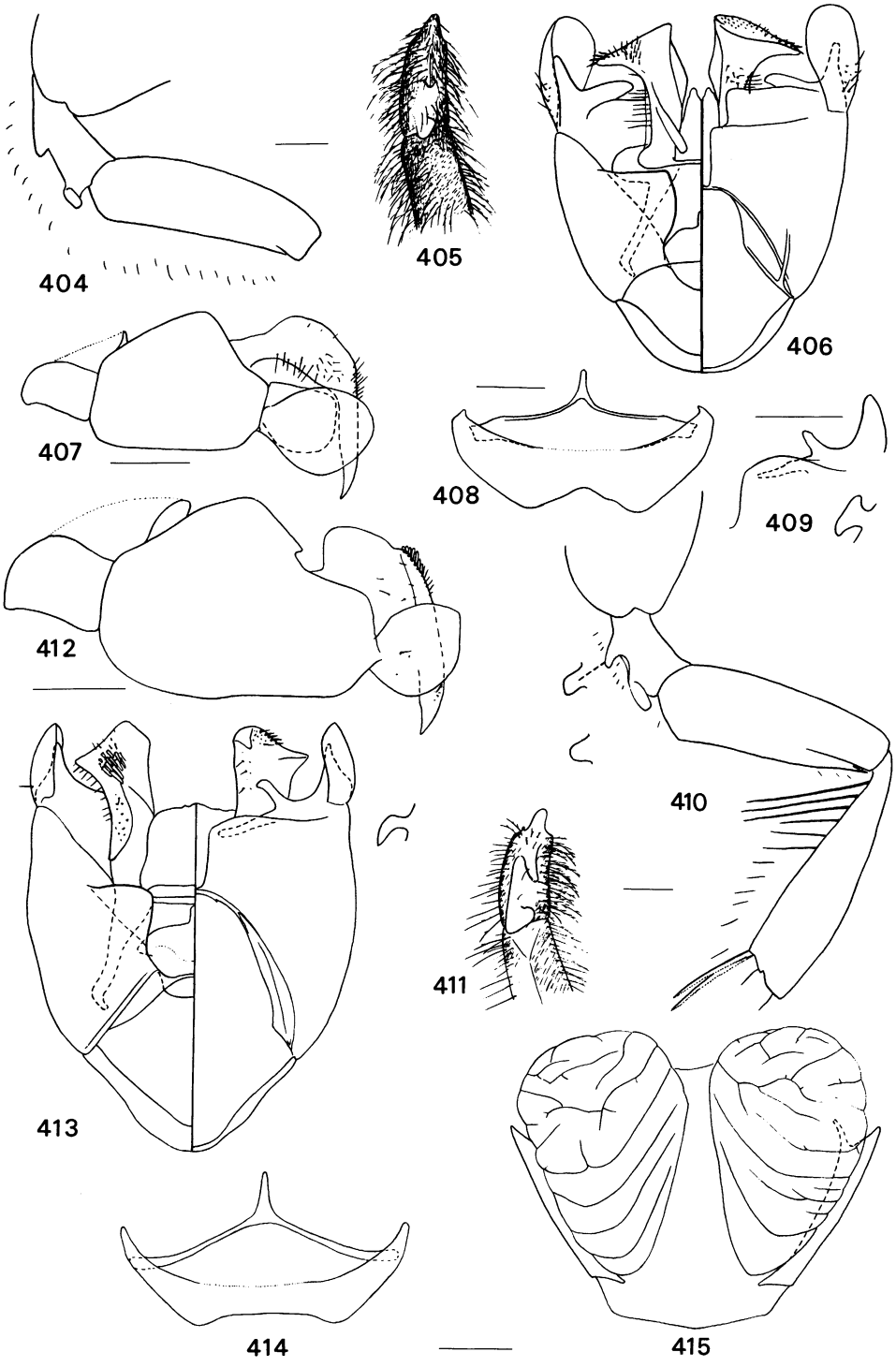
Allodape flavocincta Cockerell, 1933b, p. 271. (New synonym. Type ♀, Tervuren, from Malela, Zaire.)

Allodape ugandensis Cockerell, 1933b, p. 271. (New synonym. Type ♀, BM, from Kampala, Uganda.)

Allodape bequaerti mediopolita Cockerell, 1935a, p. 367. (New synonym. Type ♀, Tervuren, from Eala, Zaire.)

Allodape patruelis Cockerell, 1945, p. 807. (New synonym. Type ♀, BM, from Obuasi, Ashanti, Ghana.)

Description. Female. (1) Length 6.5-9 mm.; forewing length 6 mm. (2-12) Black (or metasoma reddish brown) with yellow marks as follows: median line on clypeus, sometimes broken, abbreviated, or absent; lateral apical marginal spots on clypeus, sometimes joining median line to form inverted T; small spot above clypeus; pair of small spots in front of anterior ocellus; bands along inner orbits converging above toward anterior ocellus; band along posterior orbit, nearly as long as eye; dot or transverse mark on hypostomal area behind mandible; large spot on mandible; broad band (broken medially) across pronotum, usually small area on pronotal lobe and small area on pronotum below lobe; two longitudinal discal lines on scutum, broadened posteriorly, not reaching scutoscutellar suture; lateral margin of scutum; spot on axilla; band across scutellum with anterior median angle, band sometimes broad enough to reach posterior scutellar margin; usually band across metanotum or whole metanotum; logitudinal band across mesepisternum or mark representing anterior part of this band; small spot at base of fore tibia often extending as line along outer face of tibia; transverse bands at the bases of terga 2-6 (the more apical ones often hidden by preceding terga), frequently somewhat medially produced to the rear; lateroapical part of tergum 1 sometimes with small yellow area. Labrum dark brown. Antenna black, flagellum dark brown to blackish beneath, scape with small brown or yellow basal spot on underside. Tegula transparent brown or yellow-brown; median sclerite brown, sometimes yellowish on outer half. Legs black or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dark brown, small segments of tarsi rufescent, underside of apex of fore femur yellow; outer side of fore tibia sometimes yellow-brown; tibial spurs light brown. Metasomal segments with margins red-brown, sometimes broadly so, and sometimes this color extending to entire background of metasoma. (13) Wings light yellowish brown, veins and stigma brown. (14) Pubescence dull yellowish white, that on outer sides of tibiae and basitarsi, including scopa, rather yellow, that on dorsum of terga 4-6 or sometimes only 6 infuscated, these hairs slender, blunt; tibial brush extending more than half length of tibia, coppery to coppery blackish in middle of tibia, yellowish toward apex. (20) Interocellar distance two-thirds to three-quarters of ocellocular distance; ocelloccipital distance a little less than ocellar diameter (depending on one's judgment as to location of edge of occiput); ocellocular area somewhat dull, impunctate; rest of vertex and upper part of face with only minute, shallow scattered punctures and hence not strongly contrasting with ocellocular area. (22) Frontal tubercle absent. (25, 26) Upper clypeal margin strongly convex medially, longer than width of paraocular area. (29) Lower clypeocular distance greater than width of scape, upper about 2.5 times width of scape. (31) Genal area with punctures sparse, inconspicuous above, somewhat coarser below. (33) Malar area about half as long as width of scape. (37) First flagellar segment as broad as long; median segments slightly broader than long to slightly longer than broad; only segments 2 to 3 or 4 distinctly broader than long. (42) Maxillary palpus six-segmented, about twice as long as basal width of galea; postpalpal length of galea about as long as to slightly longer than head. (43) Stigma elongate, distinctly more than half as wide as first submarginal cell. (44) Apex of marginal cell bluntly pointed, separated by two or three vein widths from wing margin. (45) Second submarginal cell over (but not greatly more than) half as long as first, distance between first recurrent vein and first transverse cubital greater than distance between second recurrent vein and second transverse cubital. (46) Basal vein curved, nearly transverse (posterior half completely so), one or two vein widths beyond cu-v. (48) Hamuli 6; hamular sinus about as wide as deep. (55, 56) Sixth tergum ordinary, as in *Allodape ceratinoides*, pygidial fimbria brown to black. (57) Graduli of terga 4 and 5 strong laterally and extending back nearly to impunctate marginal bands, of tergum 3 extending more than halfway from spiracle to tergal margin.

Distribution. Tanzania, Uganda, and Zaire (perhaps Angola, see Variation) to Ghana. GABON: Lambaréné, Moyen-Ogooué; between Sam-Quito and Ndjolé, Moyen-Ogooué. ZAIRE: *Shaba* (= *Katanga*): Kapanga, Lulua. *Lower Zaire*: Thysville. *Equator*: Mbandaka (= Coquilhatville). *Kivu*: Irangi; Malela. *Upper Zaire*: Eala; Kisangani (= Stanleyville). TANZANIA: Marienhof Island, Lake Victoria. UGANDA: Kampala; Kawanda, Kampala. RIO MUNI: Uelleburg, Benito District. CAMEROON: Douala, Eastern Province. NIGERIA: Olokemeji, Ibadan. GHANA: Obuasi, Ashanti; Takoradi.

Variation. The ground color of the abdomen

FIGS. 404-408. *Allodape brachycephala*, male paratype, Lwiro River, 47 km. N of Bukavu, Zaire. 404. Lateral view of hind trochanter and femur. 405. Underside of trochanter and base of femur, outer surface to right. 406, 407. Dorsal, ventral, and lateral views of genitalia. 408. Seventh and eighth metasomal sterna.

FIGS. 409-411. *Allodape interrupta*, male, Ekok, Cameroon. 409. Ventral view of left ventroapical plate of gonocoxite. Separate sketch below median process shows form of that process in lateral view. 410. Lateral view of hind leg with basal process of trochanter attached by broken line in view that maximizes width. Separate sketch below shows form of that process in *A. collaris*. 411. Underside of trochanter and base of femur.

FIGS. 412-415. *Allodape collaris*, male, Entebbe, Uganda. 412, 413. Lateral, dorsal, and ventral views of genitalia. Separate sketch at right shows median process of ventroapical plate of gonocoxite in lateral view. 414. Seventh and eighth metasomal sterna. 415. Eighth tergum and roof of genital chamber.

Scale lines represent 0.25 mm. Separate lines serve for figures 404 and 405, 406 and 407, 408, 409, 410 and 411, 412 and 413, 414 and 415.

varies from black to red, even in a single locality (Irangi, N. L. H. Krauss collector, KU). A peculiar specimen from 23 km. SE of Hengue, Angola (CAS) may represent a southwestern population of this species or a different species. Its pale markings are whitish. It has broad inverted T-shaped clypeal mark, no marks in front of the median ocellus, and no markings on the thorax except for a narrow broken band across the pronotum and lateral marginal bands on the scutum. On metasomal terga 2 and 3 there are large whitish areas lateroventrally, below the longitudinal parts of the graduli; in *Allodape derufata* these areas are dark. Otherwise, the pale areas of mandibles, orbital margins, foreleg, and terga are as in *A. derufata*. The hairs of the abdomen are dull whitish except for the reddish infuscated pygidial fimbria.

Allodape mea Strand
Figure 420

Allodape mea Strand, 1912, p. 292. (Type ♀, Berlin, from Uelleburg, Benito District, Rio Muni.)

Allodape langi ealana Cockerell, 1933b, p. 271. (New synonym. Type ♀, Tervuren, from Eala, Zaire.)

?*Allodape flavocincta ornatibasis* Cockerell, 1938, p. 371. (Type ♀, BM, from Entebbe, Uganda. It is the size of *A. mea* but lack of reddish coloration on the basal metasomal terga suggests *A. derufata*. It seems likely that some specimens properly attributed to *A. mea* lack such coloration; alternatively the specimen could be a large individual of *A. derufata*.)

Description. Female. Similar to *Allodape derufata* except as follows: (1) Length 9-10 mm.; forewing length 7 mm. (2-12) Median line of clypeus present in all specimens seen by me and connected to apical marginal line forming inverted T; yellow basal bands only on terga 2 and 3; median apical part of tergum 1 sometimes with yellow; fore tibia on outer side and sometimes area on mid-tibia yellowish brown, yellow at base of fore tibia often extending distally as yellow line separating brown from blackish areas, base of mid-tibia commonly with small yellow spot; ground color of first and usually much of second metasomal terga yellowish brown, in contrast to black ground color of remaining terga (see note under *ornatibasis* in synonymy). (14) Pubescence of terga 4-6 infuscated to black. (48) Hamuli 6 or 7.

Distribution. Zaire, Rio Muni, perhaps Uganda. ZAIRE: *Lower Zaire*: 10 km. E of Tshela. *Kivu*: Irangi. *Upper Zaire*: Eala. UGANDA: Entebbe (based on type of *ornatibasis*; see notes in synonymy above). RIO MUNI: Uelleburg, Benito District.

Allodape dapa Strand
Figure 421

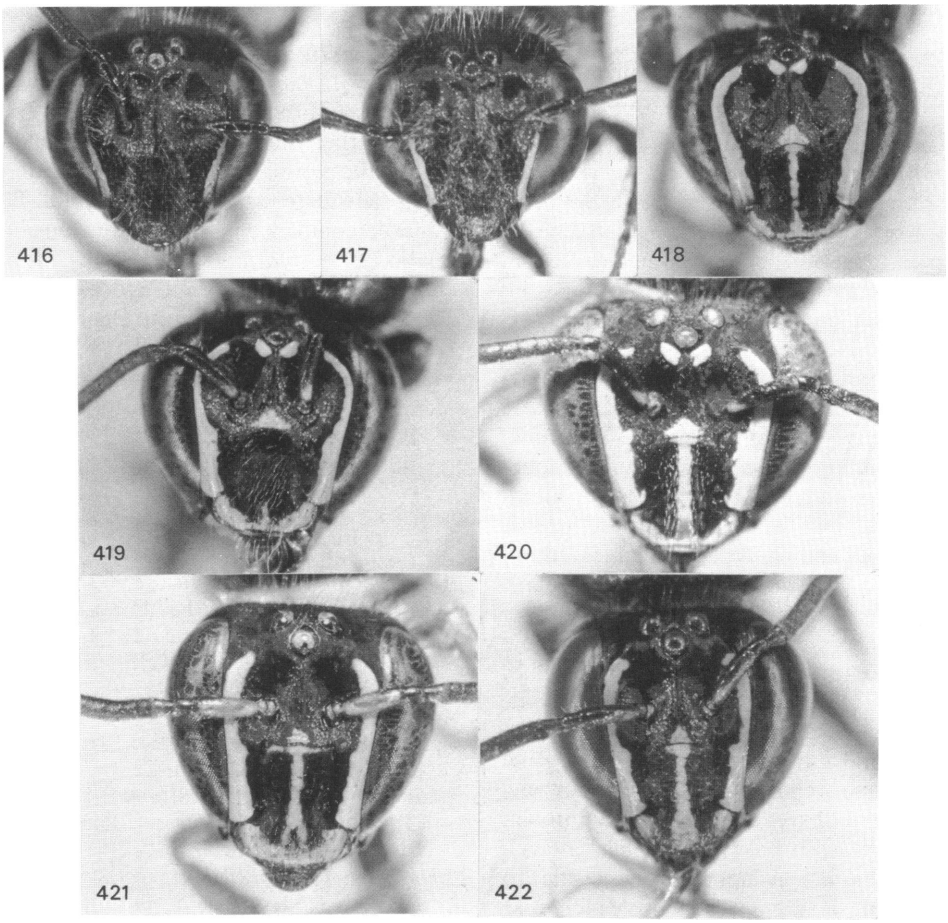
Allodape dapa Strand, 1912, p. 293 (Type ♀, Berlin, from Nkolentangan, Rio Muni.)

Description. Female. Similar to *Allodape derufata* except as follows: (1) Length 8-9 mm.; forewing length 7 mm. (2-12) Median line of clypeus present in all specimens seen by me and connected to apical marginal band forming inverted T; upper end of median line often expanded along upper clypeal margin; yellow spots in front of anterior ocellus and on hypostomal area absent; yellow band across pronotum unbroken and continuous with reddish yellow pronotal lobe, yellow on pronotum below lobe lacking but this area with considerable reddish, sometimes pronotum largely reddish; discal lines of scutum thin, not enlarged posteriorly, reddish brown (absent in type); lateral scutal bands reddish yellow (absent in type); entire scutellum (not black anteriorly as in *A. derufata*), axilla, and metanotum reddish yellow; mesepisternal yellow band limited to anterior half, absent in type; terga 2-6 without yellow bands behind graduli as in *A. derufata* but areas in front of graduli yellow-brown. Labrum brown. Scape light brown, yellow beneath. Anterior tibia and apical part of femur yellow-brown except for yellow areas; mid-tibia with yellow-brown area on outer surface or largely yellow-brown. Metasomal segments with posterior margins broadly yellowish brown, first segment (or only sides and basal half of tergum in type) and extreme sides of second yellow-brown. (14) Pubescence including tibial brush (which is concolorous with scopa) and dorsal metasomal hairs yellowish to reddish golden. (20) Interocellar distance little more than half to about two-thirds of ocellocular

distance. (29) Upper clypeocular distance little more than twice width of scape. (42) *Maxillary palpus five-segmented*; postpalpal length of galea nearly one and a half times head length. (44) Apex of marginal cell pointed, one or two vein widths from wing margin. (48) Hamuli 5, hamular sinus slightly broader than deep. (57) Gradulus of tergum 3 sometimes extending only halfway from spiracle to tergal margin.

Distribution. Uganda, Rio Muni. UGANDA: Kawanda, Kampala. RIO MUNI: Nkolentangan, Benito District.

Variation. In view of the features listed in the description by which the type differs from the three specimens from Uganda, the specimens from the two localities may represent different species, but probably do not. More specimens, and especially males, are needed to clarify the



FIGS. 416, 417. *Allodape brachycephala*, facial views. Lwiro River, 47 km. N of Bukavu, Zaire. 416. Female, holotype. 417. Male, allotype.

FIGS. 418. 419. *Allodape derufata*, facial views, females. 418. Irangi (Kivu), Zaire. 419. Eala, Zaire (holotype of *A. bequaerti mediopolita* Cockerell).

FIG. 420. *Allodape mea*, facial view, female, Eale, Zaire (holotype of *A. langi ealeana* Cockerell).

FIG. 421. *Allodape dapa*, facial view, female, Kawanda, Kampala, Uganda.

FIG. 422. *Allodape nula*, facial view, female, Ebolowa (Eastern Province), Cameroon.

situation. The description above was written without the type at hand.

Characters 20 and 29 are reflections of the fact that the head is more elongate than in *derufata*, presumably to accommodate the more elongate proboscis. The malar area is also slightly more elongate than in *derufata*.

Allodape nula Strand
Figure 422

Allodape nula Strand, 1912, p. 293. (Type ♀, Berlin, from Nkolentangan, Rio Muni; a second "type" in Berlin from Uelleburg, Rio Muni, is same species but not the type, as shown by original account.)

Description. Female. Similar to *Allodape derufata* except as follows: (1) Length 8-9 mm.; forewing length 7 mm. (2-12) Median line of clypeus present in all specimens seen by me and connected to apical marginal band forming inverted T; upper end of median line often expanded along upper clypeal margin; yellow spots in front of median ocellus and on hypostomal area absent; band across pronotum continuous or broken medially, sometimes reddish yellow, sometimes reaching reddish yellow pronotal lobe, yellow on pronotum below lobe absent; mesoscutum without pale markings or with reddish lateral marginal band in type; axilla, scutellum, and metanotum yellowish red or these parts dark except for diffuse yellowish red or reddish brown lateral areas on scutellum; mesepisternal yellow band limited to anterior half, reddish, sometimes scarcely differentiated; yellow on tibia absent; yellow bands on terga absent. Pronotum (except yellow areas) and sides of thorax brown in some specimens. Scape yellow or reddish yellow beneath. Median axillary sclerite wholly brown. Legs wholly yellowish brown (in which case yellow on front femur may not be recognizable) to dark brown or largely blackish in which case ventral apical or subapical yellow area on fore femur is distinct; anterior tibia, apical part of fore femur, and part of mid-tibia usually brown, not blackish. Metasoma reddish brown, sometimes with sublateral blackish areas on terga 1 and 2, 1-4, or 2-4, and sometimes with tergum 6 blackish. (14) Pubescence including tibial brush and dorsal metasomal hairs yellowish, infuscated on tergum 6. (20) Interocellar distance little more than half to two-thirds ocellocular distance. (29) Upper clypeocular distance little over twice width of scape. (42) *Maxillary palpus five-segmented*; postpalpal length of galea longer than head, intermediate between that of *A. derufata* and *A. dapa*. (44) Apex of marginal cell pointed, one or two vein widths from wing margin. (48) Hamuli 5, hamular sinus slightly broader than deep. (57) Gradulus of tergum 3 sometimes extending only halfway from spiracle to tergal margin.

Comparative Comments. This species is very close to *A. dapa*, differing in the wholly or largely red-brown metasoma together with certain other minor characters. It could well be within the normal range of variation of *A. dapa* when adequate series are available. To avoid multiple comparisons, the description above is in relation to *A. derufata*.

Distribution. Rio Muni and Cameroon. RIO MUNI: Nkolentangan, Benito District; Uelleburg, Benito District. CAMEROON: 11 km. S of Ebolowa, Eastern Province, 580 m. altitude; Tingoh, Menchin River, near Wum, Western Province, 700 m. altitude.

Allodape interrupta Vachal
Figures 286, 409-411, 423-428

Allodape interrupta Vachal, 1903, p. 386. (Lectotype ♀, Paris, from Rio Muni.)

Allodape bibundica Strand, 1912, p. 287. (New synonym. Type ♀, Berlin, from Bibundi, Cameroon.)

Allodape mimica Strand, 1912, p. 288. (New synonym. Type ♀, Berlin, from Uelleburg, Benito District, Rio Muni.)

?*Allodape picticorpus* Strand, 1912, p. 290. (Type ♀, Berlin, from Uelleburg, Benito District, Rio Muni.)

?*Allodape picticorpus* var. *claristigma* Strand, 1912, p. 291. (Type ♀, Berlin, from Nkolentangan, Benito District, Rio Muni.)

?*Allodape scutelligera* Strand, 1912, p. 291. (Type ♂, Berlin, from Alen, Benito District, Rio Muni.)

?*Allodape nitidicollis* Friese, 1921, p. 1108. (Type ♀, destroyed by fire in Hamburg in 1943, from Fort Possel to Fort Crampel, Central African Republic.)

Allodape longiceps Friese, 1921, p. 1109. (New

synonym. Type ♂, destroyed by fire in Hamburg in 1943, from Fort Possel to Fort Crampel, Central African Republic.)

?*Allodape bipunctata* Friese, 1924, p. 75. (Type ♀, Berlin, from "Marienhof, Insel im Ukerewe-See" [i.e., Lake Victoria], Tanzania.)

Allodape guineensis Friese, 1924, p. 81. (New synonym. Type ♂, Berlin, from Conakry, Guinea.)

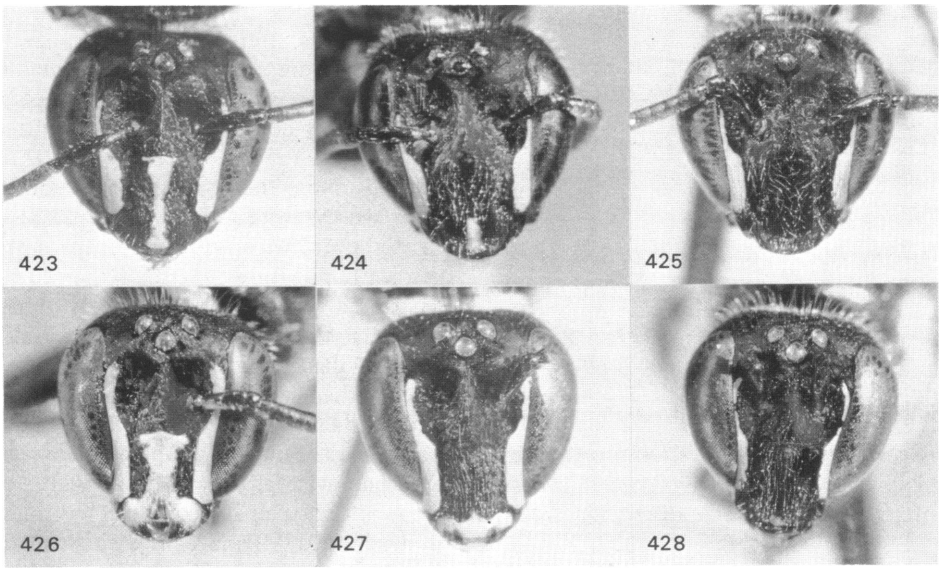
Allodape vicina Cockerell, 1934a, p. 234. (New synonym. Type ♂, Tervuren, from Lubumbashi [= Elizabethville], Zaire.)

Allodape rubribasis Cockerell, 1939a, p. 244. (New synonym. Type ♂, Tervuren, from Lubumbashi [= Elizabethville], Zaire.)

The names marked with question marks above are possibly synonyms of *Allodape collaris* instead of *A. interrupta*. For discussion see *A. collaris*.

Description. Female. (1) Length 7-8 mm.; forewing length 5-6 mm. (2-12) Black with the following yellow markings: median apical spot on clypeus, sometimes extending upward to middle of clypeus, sometimes median spot at summit of clypeus, rarely complete median longitudinal clypeal line; yellow on paraocular area which is broad below, rather abruptly narrowed at level of antennae, and continues upward as narrow orbital line; line along posterior orbit; sometimes yellow area on labrum; sometimes broad band, narrowly broken medially, across pronotum (but pronotal lobe black); broad band across scutellum, often reduced to small band or small spot, rarely absent. Underside of flagellum often dark brown. Tegula translucent brown, often with yellow spot; median axillary sclerite black or brown, sometimes light brown laterally. Small segments of tarsi rufescent; tibial spurs light brown. Margins of metasomal segments narrowly to rather broadly reddish brown, basal segments or entire metasoma red in some specimens especially from Shaba and Zambia. (13) Wings slightly grayish brown, veins and stigma dark brown. (14) Pubescence dull whitish or yellowish white, tibial brush usually yellowish, extending almost half length of tibia; dorsal hairs of terga 4-6 slender, blunt, black or nearly so. (20) Interocellar distance two-thirds to nearly as long as ocellocular distance; ocelloccipital distance often more than one and a half times ocellar diameter; ocellocular area shining, impunctate; rest of vertex with scattered punctures, upper part of face largely impunctate. (22) Frontal tubercle very weak or absent. (25, 26) Upper clypeal margin gently convex, longer than width of paraocular area. (29) Lower clypeocular distance distinctly more than one and a half times, sometimes nearly twice, width of scape, upper only slightly over twice width of scape. (31) Genal area with punctures sparse, rather coarse. (33) Malar area over half as long as width of scape. (37) First flagellar segment as broad as long or broader than long; median segments slightly broader than long to slightly longer than broad; only segments 2 and 3 or 4 distinctly broader than long. (42) Maxillary palpus five-segmented, less than twice as long as basal width of galea; galea with postpalpal length over 1.3 times length of head. (43) Stigma elongate, distinctly more than half as wide as first submarginal cell. (44) Apex of marginal cell pointed, separated from wing margin by one or two vein widths. (45) Second submarginal cell one-half to two-thirds as long as first, distance between first recurrent and first transverse cubital veins much greater than that between second recurrent and second transverse cubital. (46) Basal vein curved, slanting, *several vein widths beyond cu-v so that cell M has a petiole over half as long as cu-v*. (48) Hamuli 5, hamular sinus wider than deep. (55, 56) Sixth tergum about as in *A. ceratinoides*, pygidial fimbria not broken, not very dense, hairs blackish. (57) *Graduli of terga 2-5 extending posteriorly far past spiracles* but not to posterior impunctate bands.

Male. Similar to female except as follows: (1m) Length 6.5-7 mm.; forewing length 5-6 mm. (2m-12m) Yellow markings like those of female or sometimes more extensive because of yellow across lower end of clypeus forming inverted T, yellow on pronotal lobe, and ventroapical yellow area on fore femur. (Some males have yellow as limited as in least marked females.) (14m) Tibial brush not or scarcely recognizable; dorsal hairs of terga 4-6 fuscous; fringe of sixth tergum light brown. (19m) Interantennal distance about twice antennocular distance. (20m) Ocelloccipital distance sometimes little more than ocellar diameter. (26m) Upper clypeal margin about twice as long as width of paraocular area. (29m)



FIGS. 423-428. *Allodape interrupta*, facial views. 423. Female, Yangambi, Zaire. 424. Female, Bambui, Bamenda, Western Cameroon. 425. Female, Kawanda, Kampala, Uganda. 426, 427, 428. Males, Irangi (Kivu), Zaire.

Partly because of rather short, robust scape, the clypeocular distances appear shorter than in female, lower 1.5 or more, the upper nearly two times as wide as scape. (37m) First flagellar segment broader than long. (39m) Apex of mandible slanting, edentate, sometimes with weak emargination. (58) Front basitarsus about as long as other segments taken together, second front tarsal segment about twice as long as wide. (59) Teeth of hind trochanter strong, median one parallel-sided and subtruncate as seen from view that makes it appear broadest, apical one a large, rounded, brown head; hind femur with only a basal angle, not a tooth, although sometimes sharper than in figure 410 with a larger concavity distal to it; hind tibia with series of long simple bristles on undersurface, longest (more than half tibial length) at base of tibia, diminishing in length or absent apically. (60) Margins of terga not flared; margin of sixth tergum with strongly produced, rounded median apical projection; membranous convexities of eighth tergum with wrinkling rather coarse, generally oblique. (62) Gonobase about as wide as long. (63) Ventro-apical plate of gonocoxite hairless, lateral process rounded in side view, not shaped like bird's head, median process rather broad in side view, apex expanded upward as well as downward. (64) Gonostylus about as wide as long. (65) Penis valve without bristles, with clump of dense pegs mesal to lateral median projection.

Comparative Comments. Specimens very similar to *Allodape interrupta* that probably represent a distinct species are listed as *A. collaris* below. In *A. interrupta* the head is more elongate, the clypeus more produced, the anterior tentorial pits more often below its middle, and the proboscis more elongate than in *A. collaris*. The easiest way to recognize this group of characters is by measurements of the malar area. In *A. interrupta* males its minimum length is about half the diameter of the base of the third antennal segment or less, whereas in *A. collaris* it is under half the diameter of the base of that segment. In *A. interrupta* females the minimum length of the malar area is about equal to the diameter of the base of the third antennal segment, in *A. collaris* it is less. On the basis of these

characters, although the extremes of head shape and associated proboscis length are rather distinct, I would not have felt justified in separating the species because there is intergradation. However, associated with the long head is a rather elongate (longer than wide in the view that maximizes width), parallel-sided, median projection of the hind trochanter of the male, whereas associated with the short head of *collaris* is a broader trochanteral projection, broader than long in the view that maximizes width, its sides converging apically. Moreover, in the few specimens dissected (five *interrupta*, two *collaris*) there is a minor genitalic difference as indicated under *A. collaris* below and in figures 409 and 413.

Further suggestions as to the distinctness of the species come from color markings. In a long series from Ibadan, Nigeria (Bridwell collection, NMNH), all the *Allodape interrupta*, as recognized on the above characters, lack or have greatly reduced yellow areas on the pronotum, and the yellow of the scutellum is a narrow irregular band, a spot, or is absent. In the *A. collaris* from the same place, these areas are fully marked, as always in that species. This observation lends weight to the idea that the two forms are behaving as different populations at Ibadan.

Long series of both species from Irangi, Kivu (N. L. H. Krauss, KU) are nearly all fully marked, only a few individuals (three out of 47 specimens) of *Allodape interrupta* having reduced thoracic maculation. From the Kampala area of Uganda (C. D. Michener, J. Owen, KU; S. A. Neave, BM) 10 out of 19 specimens of *A. interrupta* have reduced thoracic maculation. Thus from these localities the thoracic markings provide no support for recognition of *A. interrupta* and *A. collaris* as separate species. The yellow face marks tend to be extensive when the thoracic marks are fully developed; for both species they are most extensive in the series from Irangi, Kivu.

Distribution. Zambia and Uganda to Guinea. ZAMBIA: Abercoro, 1600 m. altitude. ZAIRE: *Shaba* (= *Katanga*): Kalemie (= Albertville); Lubumbashi (= Elizabethville); Katompe, Lomani. *Lower Zaire*: Banana; Kisantu; Tshela, lower Congo. *Equator*: Bokuma. *Kivu*: 8 km. N of Bukavu, 1475 m. altitude; Irangi; 75 km. NE of Kamituga, 930 m. altitude; Lokandu; Rutshuru; 39 km. S of Walikale, 700 m. altitude. *Upper Zaire*: Abumombazi; Bambesa; Eala; Paulis and Moto, upper Uele; Yakoma; Yangambi. TANZANIA: Marienhof Island, Lake Victoria. UGANDA: 10 km. N of Entebbe; Kampala; Kawanda, Kampala; 35 km. W of Tororo. CENTRAL AFRICAN REPUBLIC: Fort Possel to Fort Crampel; Mbaiki. RIO MUNI: Alen, Benito District; Bata; Nkolentangan and Uelleburg, Benito District. FERNANDO POO ISLAND: Punta Frailes. CAMEROON: Bambui, near Bamenda, Western Province, 1370 m. altitude; Bibundi, Eastern Province; Ekok, 39 km. E of Tekmo, Eastern Province, 650 m. altitude; Mt. Febe, Yaounde, Eastern Province; 43 km. W of Nanga-Uboko, 580 m. altitude; Tingoh, Menchin River, near Wum, Western Province, 700 m. altitude; Yaounde, Eastern Province, 1050 m. altitude. NIGERIA: Olokemeji, Ibadan. GHANA: Ashanti. IVORY COAST: Danané (Fort Hittos). LIBERIA: Cuttington College, Bong County; Roberts Field. GUINEA: Conakry; Iles de Los.

Variation. From the southern part of the range of *Allodape interrupta* (where so far as I know *A. collaris* does not occur), varying amounts of red are found on the metasoma and legs. The male type of *A. rubribasis* has the legs and the first metasomal segment only dark red. It is from Lubumbashi. The type of *vicina*, also a male, from the same place has the metasoma entirely red, the legs largely black. Females from Lubumbashi and from Zambia have the metasoma wholly red or as little as the first three segments red. The legs are dark reddish brown to black.

In other areas of Zaire, although the metasoma is usually black, occasional specimens with red on the metasoma occur. Thus, of several specimens from Bokuma in Equator, one has the metasoma and legs red, whereas some others have a little red on the metasoma. A specimen with the metasoma red is from Tshela, Lower Zaire. A specimen with the first two and base of the third tergum red is from Katompe, Lomani, and one with the first three red is from Kalemie, both in Shaba.

Allodape collaris Vachal
Figures 410, 412-415, 429-432

Allodape interrupta var. *collaris* Vachal, 1903, p. 386. (Type ♀, Paris, from Sierra Leone.)

This form is very similar to and possibly not specifically different from *Allodape interrupta*. Each of the two sympatric forms is rather variable in color pattern, although *A. interrupta* is more variable than *A. collaris*. Specific identification is based on the minor morphological characters listed below. Original descriptions do not indicate these characters. I examined the types in Berlin and London before recognizing that two species are probably involved and did not record the morphological characters needed to discriminate between them. Several of the names are placed as synonyms of *A. interrupta* because of the reduced yellow maculations described. Such dark coloration is within the range of variation of *A. interrupta* but outside of that known for *A. collaris*. The names based on fully maculate specimens, however, cannot be placed as to species from the descriptions. These names are *picticorpus*, *claristigma*, *scutelligera*, *nitidicollis*, and *bipunctata*; they are listed with queries under the commoner and more widespread species, *A. interrupta*, but any of them could be a synonym of *A. collaris* instead.

Description. Female. Similar to *Allodape interrupta* except as follows: (2-12) Coloration like more fully maculate individuals of *A. interrupta*, a yellow pronotal band and complete scutellar band being present in all available specimens. (29) Lower clypeocular distance about one and a half times width of scape. (33) Malar area about one-third as long as width of scape.

Male. Similar to female and to male of *Allodape interrupta* except as follows: (29m) Lower clypeocular distance about equal to width of scape, upper one and a half times width of scape or less. (59) Median projection of hind trochanter broader than long in view that maximizes width, sides converging apically. Series of bristles on inner surface of hind tibia more often continued toward apex of tibia, in apical part bristles about as long as tibial diameter. (63) Ventral apical plate of gonocoxite with median process rather slender in side view, apex directed downward.

Comparative Comments. Characters 29, 33 and 29m reflect the shorter face and probably somewhat shorter proboscis of *Allodape collaris* as compared to *A. interrupta*. Another measure of the same character is the clypeal length, which in female *A. collaris* is as long as the distance from the upper edge of the clypeus to the upper edge of the anterior ocellus. In *A. interrupta* the clypeus is longer.

Distribution. Uganda and Zaire to Sierra Leone. GABON: Lambaréné, Moyen-Ogooué. ZAIRE: *East Kasei*: Komi, Sankuru. *Lower Zaire*: Kinshasa (= Leopoldville); Kisantu. *Equator*: Bokuma; Bomboma. *Kivu*: Irangi; Kibombo; Lokandu; Rutshuru. *Upper Zaire*: Eala; Paulis, upper Uele. UGANDA: Entebbe; Kampala; Kawanda, Kampala; Mabira Forest, Chagwe, 1070-1160 m. altitude; 35 km. W of Tororo. RIO MUNI: Uelleburg, Benito District. CAMEROON: Yaounde, Eastern Province, 1050 m. altitude. NIGERIA: Olokemeji, Ibadan. LIBERIA: Cuttington College, Bong County. SIERRA LEONE: No locality.

Allodape chapini Cockerell
Figures 433, 434

Allodape chapini Cockerell, 1932b, p. 13. (Type ♀, AMNH, from Malela, Zaire.)

Description. Female. Similar to fully marked individuals of *Allodape interrupta* except as follows: (1) Length 8-9 mm.; forewing length 6 mm. (2-12) Background color of head largely dark brown, of sides and venter of thorax brown to dark brown, and of scape, legs, and metasoma light brown; sixth tergum sometimes black. (Metasomal color distinctly yellower brown than the red-brown of some individuals of *A. interrupta*.) Clypeus without or almost without yellow on upper half in specimens seen. Yellow across pronotum sometimes unbroken; pronotal lobe reddish yellow; scutellar band occupying much of scutellum, sometimes reddish yellow, axilla sometimes with yellowish spot, background of axilla, scutellum, and metanotum yellowish red; median axillary sclerite yellow or yellow-brown laterally. Fore femur with yellow area ventroapically (absent in females of *A. interrupta*). (14) Dorsal hairs sometimes pale on terga 4 and 5.

Male. Similar to female and to fully marked males of *Allodape interrupta* except as follows: (1) Length 7 mm.; forewing length 6 mm. (2-12) Extensive brown and yellow-brown coloration like that of female. (59) Basal tooth of hind trochanter seemingly somewhat shorter than in *A. interrupta.*

Distribution. Zaire, Cameroon. ZAIRE: *Kivu*: Malela. CAMEROON: Matute, Tiko Plantation, Western Province.

Allodape greatheadi Michener

Allodape greatheadi Michener, 1970, p. 207. (Type ♀, temporary deposit at KU, from Kawanda, Kampala, Uganda.)

Description. Female. Similar to *Allodape interrupta* except as follows: (1) Length 7 mm. Forewing length 5.5 mm. (2-12) The following areas yellow: median yellow line on clypeus, widest at lower margin, tapering to upper margin; yellow of paraocular area broadest below, tapering to level of antennal bases and ending there; irregular area on underside of scape; line along posterior orbit; broad band across pronotum; pronotal lobe; broad band across scutellum; line, broadest distally, on underside of fore femur. Tegula transparent brownish with yellowish spot. Ground color of metasoma black. (14) Tibial brush dull orange, dense, distinctly less than half as long as tibia; scopa much reduced as are fore tarsal and mid-leg pollen handling brushes (see Michener, 1970b); dorsal hairs of metasoma light brownish except on tergum 6 where they are blackish. (15) Clypeus as well as rest of face quite flat. (16) Clypeus much more finely and closely punctate, with rather dense short hairs as seen in profile. (22) Frontal tubercle present, small. (25) Upper clypeal margin scarcely convex. (29) Lower clypeocular distance less than width of scape, upper about one and a half times width of scape. (33) Malar area about one-third as long as width of scape. (42) Galea with postpalpal length little more than length of head. (57) Gradulus of tergum 2 as in *A. interrupta* but those of remaining terga not extending so far back, not reaching midpoints between spiracles and tergal margins.

Distribution. Known only from the type specimen from Uganda.

This species is probably a parasite in nests of *Allodape interrupta* or possibly *A. collaris.* The only known specimen was taken in flight, but its size and appearance suggest parasitism on members of the *A. interrupta* group.

Allodape macula Strand
Figures 435-439, 442-446

Allodape macula Strand, 1912, p. 286. (Type ♀, Berlin, from Uelleburg, Benito District, Rio Muni.)

Allodape macula monroviana Cockerell, 1933b, p. 270. (New synonym. Type ♀, Tervuren, from Monrovia, Liberia.)

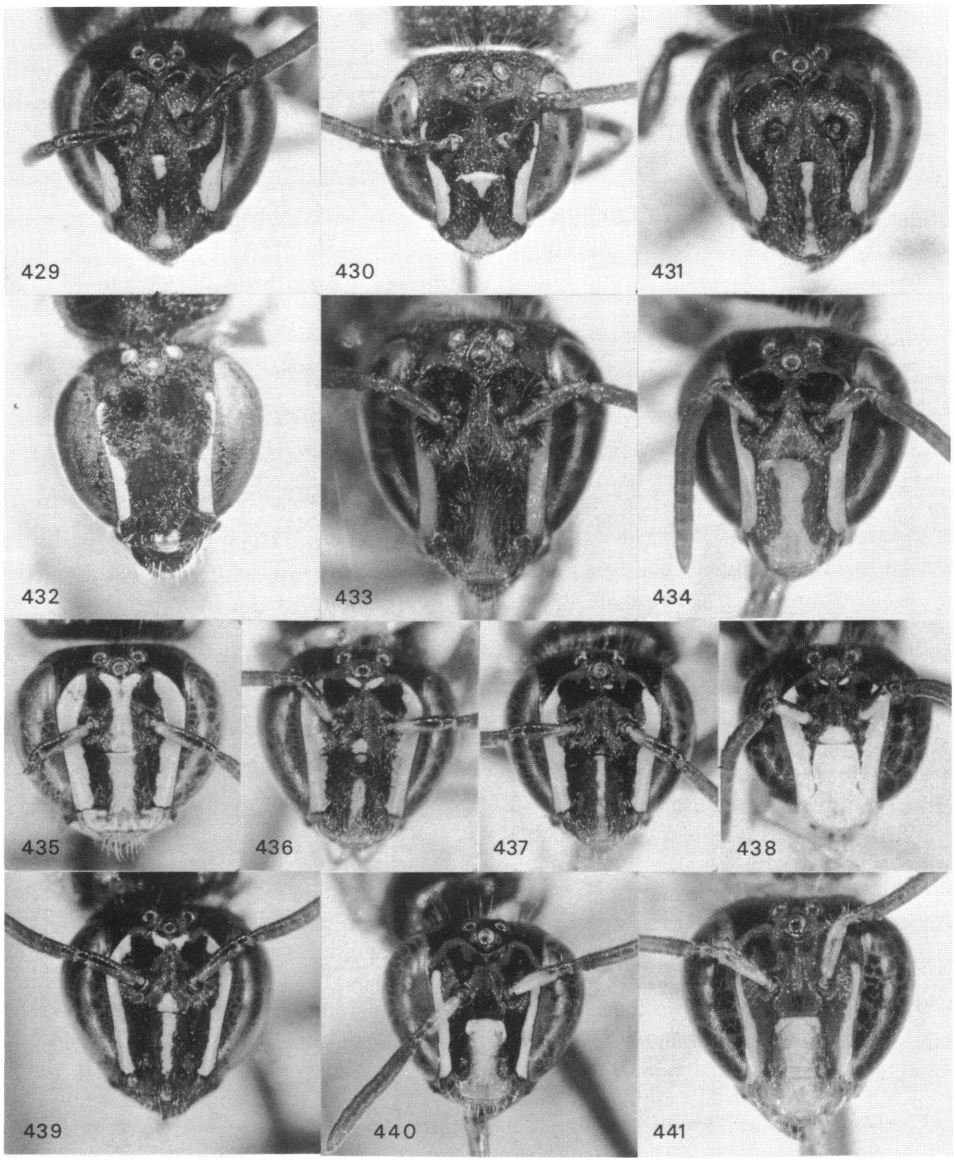
Allodape macula xanthaspis Cockerell, 1933b, p. 270. (New synonym. Type ♀, Tervuren, from Lesse, Zaire.)

Allodape macula xanthaspis var. *perflava* Cockerell, 1933b, p. 270. (New synonym. Type ♀, Tervuren, from between Irumu and Penge, Zaire; it lacks the head, which was therefore not described by Cockerell.)

Allodape macula burgeoni Cockerell, 1933b, p. 271. (New synonym. Type ♀, Tervuren, from Moto, upper Uele, Zaire.)

Allodape macula bilineata Cockerell, 1936b, p. 638. (New synonym. Type ♀, BM, from Biano, Zaire; it lacks the head, which was therefore not described by Cockerell.)

Description. Female. (1) Length 7-7.5 mm.; forewing length 5 mm. (2-12) Head and thorax black with extensive pattern of yellow to yellowish white, as follows: median line on clypeus, sometimes broadened along apical margin to form inverted T; usually small spot above clypeus and pair of small spots in front of anterior ocellus, sometimes these connected as yellow band from clypeus to ocellus; broad bands along inner orbits converging above toward anterior ocellus; broad bands along posterior orbits sometimes extending mesad from eyes above and approaching one another on posterior edge of vertex; sometimes ill-defined area on labrum; usually large area on mandible; band (sometimes narrowly broken medially) across pronotum sometimes connected with pronotal lobe; two longitudinal discal lines on scutum (linear to broad and nearly confluent posteriorly); usually lateral scutal margin, sometimes broad band; axilla or spot on it; scutellum or lateral area on it; some-



FIGS. 429-432. *Allodape collaris*, facial views. 429. Female, Kawanda, Kampala, Uganda. 430. Female, Ibadan, Nigeria. 431. Female, Irangi (Kivu), Zaire. 432. Male, same locality.

FIGS. 433, 434. *Allodape chapini*, facial views, female and male, Matute, Tiko Plantation, Western Province, Cameroon.

FIGS. 435-439. *Allodape macula*, facial views. 435. Female, Lesse, Zaire (holotype of *A. m. xanthaspis* Cockerell). 436. Female, Monrovia, Liberia (holotype of *A. m. monroviana* Cockerell). 437. Female, unknown locality (Zaire?). 438. Male, east of Muhavura, Rwanda. 439. Female, Moto, upper Uele, Zaire (holotype of *A. m. burgeoni* Cockerell).

FIGS. 440, 441. *Allodape laeviceps*, facial views. 440. Female, Walikale, Zaire (holotype of *A. picticauda* Cockerell). 441. Female, Tingoh, Menchin River, near Wum, Western Province, Cameroon.

times metanotum; longitudinal band across mesepisternum, sometimes expanded to include nearly all of lateral surface of mesepisternum; sometimes metepisternum; large lateral spots on basal area of propodeum, sometimes large lateral spots on posterior surface of propodeum, or entire propodeum except median black space on basal area. Antenna brown, flagellum blackish above, sometimes ill-defined small yellow area at base of underside of scape. Tegula transparent testaceous with yellow spot; median axillary sclerite brown, sometimes yellowish on outer half. Legs red-brown, sometimes yellowish on coxae, sometimes infuscated or blackish on coxae to femora and even mid- and hind tibiae; fore femur with ventroapical yellow or yellowish white area extending nearly to base; apices of mid- and hind femora and bases of tibiae sometimes with ill-defined yellow areas, sometimes extending basally along underside of mid-femur and apically as streak along outer side of front tibia; tibial spurs testaceous. Metasoma yellowish red often with infuscated basal dorsal lateral areas on terga 1, or 1 and 2, or 2 and 3, or 1-5; tergum 6 sometimes partly blackish; apical sterna often also infuscated. (13) Wings light yellowish brown, veins and stigma dark brown. (14) Pubescence yellowish testaceous; tibial brush yellowish brown, sometimes coppery, its hairs blackish except for apices in specimen from Kaponga, Lulua, Zaire; tibial brush less than one-third as long as tibia, base beyond middle of tibia; dorsal hairs of terga 3-6 tapering, blunt (length and density as in *Allodape exoloma*). (20) Interocellar distance about two-thirds of ocellocular distance; ocelloccipital distance about equal to an ocellar diameter; ocellocular area smooth, like upper part of face, rest of vertex also nearly smooth although with scattered hair bases. (22) Frontal tubercle absent. (25, 26) Upper clypeal margin convex, much longer than width of paraocular area. (29) Lower clypeocular distance a little narrower than scape, upper less than twice width of scape. (31) Genal area with widely separated rather weak punctures. (33) Malar area about half as long as width of scape or distinctly less. (37) First flagellar segment slightly longer than broad, middle flagellar segments slightly broader than long, only segments 2 to 4 distinctly so. (42) Maxillary palpus six-segmented; postpalpal length of galea slightly greater than length of head. (44) Apex of marginal cell pointed, separated from wing margin by about width of a vein. (45) Second submarginal cell short, little more than half length of first, distance from first transverse cubital to first recurrent vein short, sometimes no longer than distance from second recurrent to second transverse cubital. (46) Basal vein curved, its posterior part transverse, several vein widths beyond cu-v so that cell M has a petiole about half as long as cu-v. (48) Hamuli 5, hamular sinus wider than deep. (55, 56) Sixth tergum ordinary, pygidial fimbria not broken, as in *A. ceratinoides* except for pale color. (57) Gradulus of tergum 2 not extending behind spiracle, of tergum 3 extending more than halfway from spiracle to tergal margin, of terga 4-5 extending nearly to smoothish marginal zones of terga.

Male. Similar to female except as follows: (1m) Length 7 mm.; forewing length 5 mm. (2m-12m) Clypeus, labrum, and mandible almost entirely yellowish white; spot above clypeus rather large, spots below anterior ocellus minute; scutal lines slender, only a small yellow spot at side of scutum; axillar spot, lateral scutellar area, lateral spot on basal area of propodeum, and mesepisternal bands present, as in rather dark females; other pale areas found in paler females lacking in the one male specimen available. Underside of scape yellowish white. Median axillary sclerite brown with yellowish white on outer side. Legs as in those females with considerable infuscation, underside of hind trochanter including teeth yellowish testaceous. Metasoma as in female, with lateral blackish areas on terga 1 and 2 only, those of 1 joined. (14m) Tibial brush reddish yellow, rather sparse. (25m, 26m) Upper clypeal margin nearly straight, longer than width of paraocular area. (29m) Lower clypeocular distance less than width of scape, upper less than one and a half times width of scape. (33m) Malar area about one-fourth as long as width of scape. (37m) First flagellar segment broader than long. (57) Graduli of terga 3-6 extending about halfway from spiracles to posterior tergal margins. (58) Front basitarsus distinctly broader basally than apically, about two-thirds as long as tibia, longer than tarsal segments 2-4, second segment twice as long as broad,

second and third slightly broader than apex of basitarsus; middle basitarsus as long as segments 2-5; hind basitarsus longer than 2-5. (59) Hind trochanter with the two ventral teeth enormous, distal one with apex thin and pointed, not capitate; hind femur with basal ventral angle and short subbasal ventral longitudinal keel, beyond this smooth, concave, hairless; ventral surface of hind tibia convex, with only short hairs. (60) Sixth tergum with median apical projection gently emarginate; membranous convexities of eighth tergum with irregular wrinkles. (61) Seventh sternum with two apical projections. (62) Gonobase longer than wide. (63) Ventroapical plate of gonocoxite with large lateral apical process curved mesad and ventrally, not shaped like bird's head, rest of plate transverse with clump of simple setae. (64) Gonostylus more than twice as long as broad. (65) Penis valve with a few pegs on lateral median projection, without bristles.

The male is described from a single specimen from Rwanda in the collection at Tervuren. No females are available from the same locality; association of sexes is based on similarity only.

Comparative Comments. A single male of a related and apparently new species from Rwanda in the collection at Tervuren differs in the lack of pale thoracic maculation except on the prothorax, the exaggerated hind leg modifications, and especially the greatly lengthened and broadened anterior tarsal segments 2-4, these segments together longer than 1, each broader than 1, and 4 about as long as 5. It is possible that the name *bilineata* is applicable to this male and should not be included in the synonym of *Allodape macula.*

Distribution. Burundi, Rwanda, Zaire and Rio Muni to Liberia. GABON: between Sam-Quito and Ndjolé, Moyen-Ogooué. ZAIRE: *Shaba* (= *Katanga*): Biano; Kapanga, Lulua. *Lower Zaire*: Kinshasa (= Leopoldville). *Kivu*: Lesse, 0°20′N, 29°40′E. *Upper Zaire*: Eala; Irumu to Penge; Moto, upper Uele. BURUNDI: Bururi, Nyamurembe, 900 m. altitude. RWANDA: mountain east of Muhavura, 2100 m. altitude. RIO MUNI: Uelleburg, Benito District. LIBERIA: Monrovia.

Variation. This rare and variable species is known to me from few specimens, about half of them types. The extremely yellow *perflava* hardly seems the same species as the types of *burgeoni* or *macula.* However, *xanthaspis* is intermediate. The length of the malar area in the type of *xanthaspis* is least; it seems to be maximal in the darkest specimen (from Kinshasa) and intermediate in the others. Adequate series and male specimens might show the existence of two or more species, just as there appear to be in the *A. interrupta* group, but the evidence at hand does not justify recognition of separate species.

Allodape laeviceps Strand
Figures 440, 441

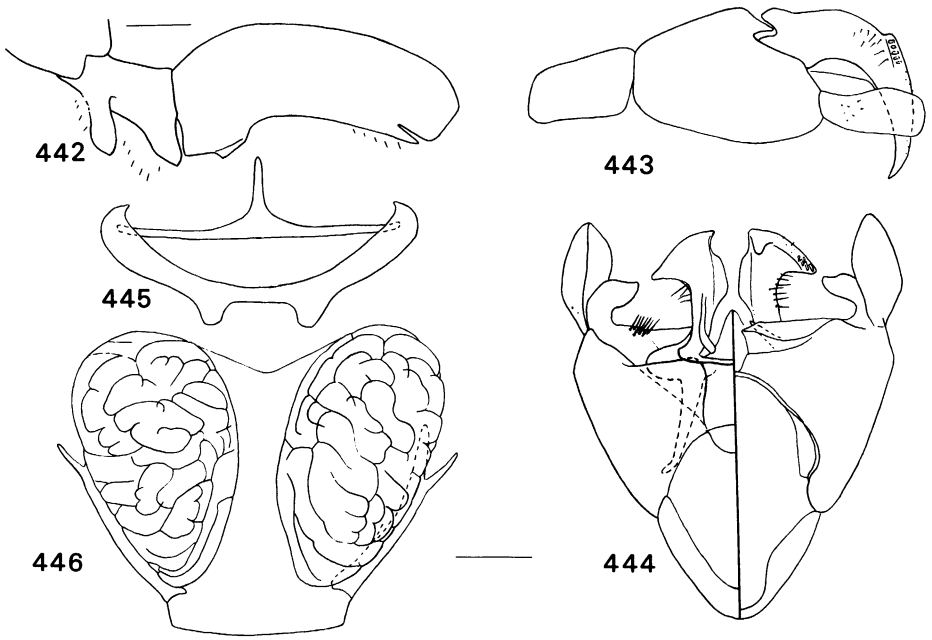
Allodape laeviceps Strand, 1912, p. 289. (Type ♀, Berlin, from Uelleburg, Benito District, Rio Muni.)

Allodape picticauda Cockerell, 1934a, p. 236. (Type ♀, Tervuren, from Walikale, Zaire.)

Description. Female. (1) Length 7 mm.; forewing length 5.5 mm. (2-12) Head black, the following parts yellowish white: clypeus except for lateral margins, narrow band along inner orbit, short streak along median part of outer orbit. Scape brownish white, browner or infuscated above at least apically; flagellum dark brown below, blackish above. Lateral margins of clypeus, labrum, and subapical mandibular zone light brown. Prothorax yellowish brown, sometimes with distinct broad transverse yellowish white band extending to posterior lobes, sometimes the two colors not distinguishable. Mesoscutum black. Scutellum and axilla yellowish brown, sometimes yellowish white laterally and on axilla, scutellum sometimes infuscated or black medially. Metanotum yellowish brown to black. Sides and venter of thorax yellowish brown or sides black, grading to dark brown on venter. Tegula transparent testaceous. Median axillary sclerite light brown. Legs yellowish brown, coxae and hind tibia sometimes infuscated. Metasoma yellowish brown, sometimes with large lateral dark areas, confluent medially, on terga 1 and 2 and small dark areas on tergum 3. (13) Wings light yellowish brown; veins and stigma dark brown. (14) Pubescence pale yellowish, sometimes infuscated on dorsum of metasoma; tibial brush brown, of rather sparse, long, coarse hairs arising along well over half of length

of tibia; *dorsal hairs of terga 3-6 slender, pointed*, yellowish to light brown. (20) *Interocellar distance less than half ocellocular distance*; ocelloccipital distance little greater than ocellar diameter; ocellocular area smooth like upper part of face, rest of vertex nearly smooth but with scattered hair bases. (22) Frontal tubercle absent. (25, 26) Upper clypeal margin straight or weakly convex medially, little longer than width of paraocular area. (29) Lower clypeocular distance as wide as scape, upper more than twice as wide. (31) Genal area smooth with only scattered minute punctures. (33) Malar area about half as long as width of scape. (37) First flagellar segment slightly longer than broad, middle segments slightly broader than long to slightly longer than broad, only segments 2-3 or 4 markedly broader than long. (42) *Maxillary palpus three-segmented*, first segment rather large but last two segments small and slender; palpus little longer than basal width of galea; postpalpal part of galea much longer than head. (44) Apex of marginal cell sharply pointed, almost on wing margin; *wings with long, relatively sparse hairs*, those in marginal cell nearly three times as long as width of adjacent veins. (45) Second submarginal cell short, not or little more than half length of first, distance from first transverse cubital to first recurrent vein short, sometimes no longer than distance from second recurrent to second transverse cubital. (46) Basal vein curved, its posterior part transverse, one to two vein widths beyond cu-v. (48) Hamuli 5; hamular sinus wider than deep. (52) *Apex of basitibial plate recognizable, slightly elevated.* (55, 56) *Apex of abdomen unusually sharply pointed, sides of sixth tergum seen from above forming acute angle*; pygidial fimbria not broken although rather weak, about as described for *A. ceratinoides* except for pale color. (57) Tergal graduli not or scarcely extending behind spiracles.

Distribution. Zaire, Rio Muni, Cameroon.



FIGS. 442-446. *Allodape macula*, male, E of Muhavura, Rwanda. 442. Lateral view of hind trochanter and femur. 443, 444. Lateral, dorsal, and ventral views of genitalia. 445. Seventh and eighth metasomal sterna. 446. Eighth tergum and roof of genital chamber.

Scale lines represent 0.25 mm. Separate lines serve for figures 442 and 443-446.

ZAIRE: *Kivu*: Walikale, 1°25'N, 28'E. RIO MUNI: Uelleburg and Nkolentangan, both in Benito District. CAMEROON: Makak, 90 km. SW of Yaoundé, Eastern Province, 650 m. altitude; Matute, Tiko Plantation, Western Province; Tingoh, Menchin River, near Wum, Western Province, 700 m. altitude.

Variation. In the above description the darkest alternatives are those of the type of *picticauda.* The specimens from Cameroon all have the whole sides of the thorax reddish or yellowish brown. The type of *laeviceps* is intermediate.

GENUS *ALLODAPULA*

Allodapula Cockerell, 1934a, p. 220. (Type species: *Allodape variegata* Smith, by original designation.)

Allodapulodes Michener, 1969a, p. 291. (Type species: *Allodape palliceps* Friese, by original designation.)

This genus consists of rather small and mostly slender bees common only in southern Africa. Although some forms, like *Allodape acutigera*, are black with very restricted pale markings like *Braunsapis*, most have the metasoma red and many have yellow on the scutellum.

The most noteworthy feature of the genus is that the larvae in a nest at any one time are of more or less the same age, form a clump which blocks the nest burrow, and feed from a common food mass (Michener, 1971a).

Allodapulodes was separated from *Allodapula* largely because of the hairy and nontuberculate mature larvae. It also has distinctive genitalia. However, there is at least one other equally distinctive group so far as adult structure is concerned, i.e., the group of *A. acutigera.* Recognition of subgenera of *Allodapula* seems reasonable, since there is much diversity, especially in male genitalia and in larval characters. The desirability of subgeneric names will be considered in a subsequent publication, after larval characters have been fully investigated. The following three groups are quite distinctive:

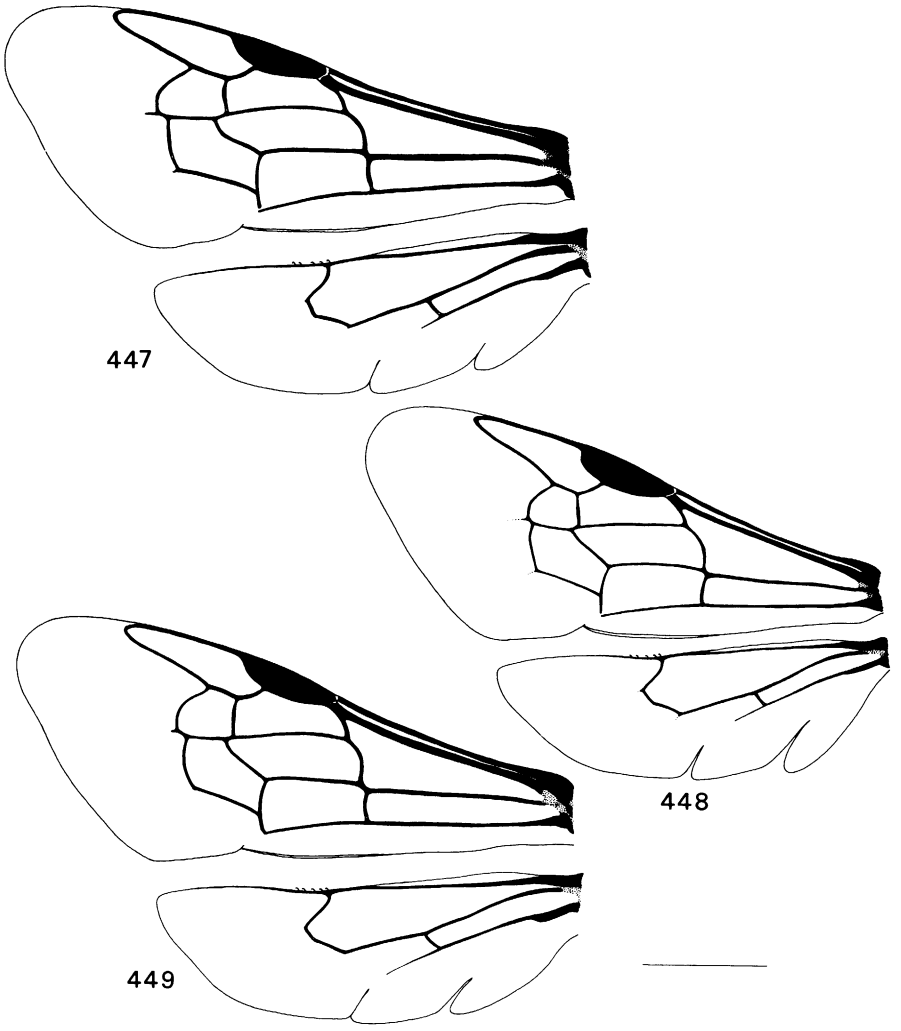
1. *Allodapula sensu stricto*: *empeyi, guillarmodi, jacunda, melanopus, monticola, ornaticeps, rozeni, turneri, variegata*
2. *Allodapulodes*: *hessei, maculithorax, palliceps, xerica*
3. Group of *A. acutigera*: *acutigera, dichroa*

Description. Agrees with description of *Braunsapis* except as indicated below. (Parts of the *Braunsapis* description in parentheses should be ignored in determining characters of *Allodapula.*)

Female. Length 4.5-9 mm.; forewing length 3.5-6 mm. (2) Head and thorax black, metasoma black or partly or wholly red. (4) Lateral face marks usually absent, rarely small streaks along eye margins or in *Allodapula ornaticeps* extending above antennal bases. (5) Posterior orbital marks absent except in *A. ornaticeps.* (8) Pronotal collar concolorous or yellow or white; pronotal lobe yellow or white. (10) Pterothorax without pale markings or scutellum with yellow. (11) Legs colored as in *Braunsapis* but yellow line on fore tibia in *A. dichroa*; yellow on underside of apex of fore femur in several species. (14) Pubescence as in *Braunsapis*, on tibiae and basitarsi sometimes fuscous or blackish. (19) Antennal bases at or slightly above middle of eyes; interantennal distance considerably more than but not twice antennocular distance. (20) Vertex behind ocelli flat or slightly convex as seen from front, interocellar distance equal to or slightly more than ocellocular distance; ocelloccipital distance difficult to determine because of declivity of surface but very roughly equal to ocellar diameter. (22) Frons not protuberant, depressed line extending from anterior ocellus to point at or above level of lower margins of antennal sockets where it ends on small frontal tubercle (which is absent in *A. ornaticeps*). (23) Antennal depressions not conspicuously closed above. (26) Upper clypeal margin less than twice as wide as paraocular area. (28) Tentorial pits below middle of clypeus in *A. ornaticeps.* (29) Lower clypeocular distance equal to or slightly greater than width of scape; upper clypeocular distance slightly greater than lower. (33) Malar area shorter than to as long as width of scape. (37) Flagellum as in *Braunsapis* but two or three segments broader than long. (38) Apical mandibular width less than half basal width. (41) First seg-

ment of labial palpus only slightly longer than second. (43, 44) Length of marginal cell on wing margin greater than distance from its apex to wing tip, apex of cell separated from wing margin by one or two vein widths. (45) Second submarginal cell less than half to slightly over half length of first; recurrent veins as usual in *Braunsapis*. (48) Hamuli 5-6; hamular sinus wider than deep or as wide as deep. (52) Basitibial plate absent. (55) Tergum 6 with upper surface rather flat in cross section, a little upturned apically in profile; extreme apex with small notch in which is usually a minute, slightly elevated pygidial plate, the whole commonly hidden by hairs of pygidial fimbria. (56) Posterior lateral margins of tergum 6 narrowly rounded in section, with rather abrupt change from dorsal to ventral vestiture. (57) Gradulus 5 reaching or approaching posterior tergal margin.

Male. Similar to female except as follows: (1m) Length 4.3-7 mm.; forewing length 4-5 mm. (3m) Clypeus yellow. (4m) Lateral face marks



FIGS. 447-449. Wings of *Allodapula*. 447. *Allodapula acutigera*. 448. *Allodapula melanopus*. 449. *Allodapula hessei*.
Scale line represents 1.0 mm.

present, commonly extending well above middle of clypeus and often to its summit. (6m) Labrum largely or wholly yellow; mandible often partly or largely yellow. (7m) Scape yellow at least beneath. (10m) Pterothorax colored as in female or rarely (*A. hessei*) scutum also partly yellow and small yellow spots even on sides of thorax. (11m) Leg colored as in female or with more yellow, sometimes legs entirely yellow. (17m) Lateroclypeal carina rounded, often a mere ridge. (19m) Interantennal distance twice or more than twice antennocular distance. (20m) Interocellar distance sometimes much more than ocellocular distance. (26m) Upper clypeal margin twice as wide as paraocular area. (29m) Lower clypeocular distance half as wide as scape to nearly width of scape; upper clypeocular distance slightly greater than to slightly less than width of scape. (33m) Malar area much shorter than width of scape. (36m) Scape over three to slightly more than four times as long as wide. (37m) Flagellum more than three to more than four times as long as scape, first segment broader than long, penultimate longer than broad, 3 segments broader than long. (38m) Apical width of mandible about half of basal width. (39m) Apex of mandible rounded, not toothed. (57m) Graduli of terga 4-6 extending back, approaching tergal margins; gradulus of tergum 3 extending little behind spiracle. (58) Front tarsus ordinary, undersides of segments 2-4 with vestiture of fine, rather short hairs; basitarsus much shorter than tibia, shorter than to slightly longer than remaining tarsal segments together; fourth segment a little longer than broad. (59) Hind trochanter and femur simple except in *A. acutigera* in which they are thickened, with areas of dense, long hairs. (60) Eighth tergum with two membranous convexities, wrinkled or not, with internal hair-like spicules. (61) Seventh sternum with apical margin subtruncate, nearly straight medially; eighth with strong spiculum; a very few hairs sometimes on margin of seventh. (62) Gonobase wider than long to longer than wide. (63) Gonocoxite somewhat longer than wide with strong dorsal apical mesal lobe; ventral apical plate well developed although sometimes fused in such a way as to be hard to recognize, with large process bearing hairs or pegs next to or fused with gonostylus. (64) Gonostylus free or fused to lateral process of ventroapical gonocoxal plate, often with a few small hairs, highly variable in shape. (65) Penis valves strongly or weakly downcurved, much exceeding gonostyli or not, with setae and commonly pegs on lateral median projection.

KEY TO THE SPECIES OF *ALLODAPULA*

FEMALES

1. Paraocular area with yellow line along inner orbit 2
   Paraocular area black, rarely with small yellow or reddish fleck along inner orbit . 3
2. Yellow of paraocular area below level of antennal bases; clypeus dull, epistomal suture between it and supraclypeal area distinct . . . . . *jucunda*
   Yellow of paraocular area extending well above level of antennal bases; clypeus shining and scarcely separated from supraclypeal area . . . . . *ornaticeps*
3. Front femur with apical yellow area on posterior surface, the yellow obliquely cut off basally . . . . . *variegata, rozeni*
   Front femur without such a yellow area . 4
4. Malar area about half as long as width of scape or less 5
   Malar area about two-thirds as long as width of scape or more 7
5. Scutellum with round, central, yellow spot; interocellar distance scarcely greater than ocellocular distance . . . . *maculithorax*
   Scutellum black; interocellar distance markedly greater than ocellocular distance. . 6
6. Yellow prothoracic band unbroken or nearly so . . . . . *hessei*
   Yellow prothoracic band absent or broadly broken . . . . . *xerica*
7. Scutellum nearly always yellow or with yellow area; punctures of upper half of clypeus minute and widely separated . 8
   Scutellum black; punctures of upper half of clypeus distinct 10
8. Scopa not fully developed . . . *guillarmodi*
   Scopa normal 9
9. Scopa whitish . . . . . *empeyi, monticola*
   Scopa dark, at least some dusky hairs on upper side of tibia . . . *melanopus, turneri*
10. Pronotum with medially broken yellow band . . . . . *dichroa*
    Pronotum black except for yellow posterior lobes . . . . . *acutigera*

MALES[1]

1. Hind leg thickened, femur with broad ventral basal keel forming rounded angle covered with dense, plumose, curled hairs on outer surface; mid-basitarsus thickened and nearly twice as long as remaining tarsal segments . . . . . *acutigera*
   Hind leg not thickened, femur of ordinary form; mid-basitarsus not thickened, much less than twice as long as remaining tarsal segments 2
2. Malar area linear, one-fifth or one-sixth as long as width of scape 3
   Malar area distinct, one-fourth to one-half as long as width of scape 6
3. Legs almost wholly yellow or reddish yellow 4
   Legs largely or wholly black or red 5
4. Scutum with yellow area laterally; scutellum with broad transverse yellow band. *hessei*
   Scutum and scutellum black . . . . . *xerica*
5. Scutellum black; underside of anterior femur not yellow apically . . . . . *dichroa*
   Scutellum with central yellow spot; underside of anterior femur yellow apically . . . . . *maculithorax*
6. Legs almost entirely yellow; clypeoantennal distance much less than half of diameter of antennal socket . . . . . *palliceps*
   Legs largely or wholly red or black; clypeoantennal distance roughly equal to diameter of antennal socket 7
7. Front femur with apical yellow area on posterior surface, the yellow obliquely cut off basally. *.variegata, rozeni, jucunda*
   Front femur without such yellow area . . . . . *melanopus*

Allodapula acutigera Cockerell
Figures 447, 450-456, 464-467

Allodapula acutigera Cockerell, 1936a, p. 1. (Type ♀, AMNH, from Huguenot, Cape Province.)

Allodapula rufosticta Cockerell, 1936a, p. 24. (New synonym. Type ♀, AMNH, from Montagu Pass, Cape Province, with lower extremity of clypeal mark long and broad, as in *A. dichroa*; such specimens are rare but one is available from 64 km. E of Knysna, fig. 464.)

[1]*A. brunnescens* is omitted from key as it is inadequately known.

Allodape halictoides Skaife, 1953, p. 12. (Type ♂, SAM, from Hout Bay, Cape Province. This name was proposed in manuscript by Brauns but there are no marked types, only a small identified series in Brauns's collection, Transvaal Museum.)

Description. Female. (1) Length 6-9 mm.; forewing length 5 mm. (2-12) Black; yellow clypeal mark nearly always tapering to a point or abbreviated below; pronotal lobe yellow; underside of flagellum sometimes brownish, always palest and sometimes yellowish on second and occasionally third flagellar segment; small tarsal segments rufescent. (13) Wings slightly brownish, veins and stigma brown. (14) Dorsal metasomal hairs dull whitish, those of last three terga strongly curved, thickened, blunt. (16) Clypeus shining, distinctly and rather closely punctured, with numerous short hairs, lower lateral parts often largely impunctate. (20) Interocellar distance usually slightly greater than ocellocular distance. (25) Upper margin of clypeus distinctly concave. (27) Clypeoantennal distance about half of diameter of antennal socket. (33) Malar area about three-fourths as long as width of scape. (37) First flagellar segment about as long as broad, middle segments slightly longer than broad. (55) Distal part of last sternum densely punctate with only narrow median impunctate keel.

Male. Similar to female except as follows: (1m) Length 4.5-6.5 mm.; forewing length 4-4.5 mm. (2m-12m) Black, the following parts pale yellow: clypeus, labrum, area on underside of apex of scape sometimes extending nearly to base, pronotal lobe, tarsi (small segments reddish brown), band along outer surface of fore tibia sometimes not reaching base or even confined to apical half or two-fifths, area at apex of middle tibia and small area at apex of hind tibia. Anterior surface of front tibia brown. *Underside of flagellum yellow-brown from segment 1 or 2 to base, middle, or apex of segment 8.* (14m) Hairs of terga 4 to 7 blackish, slender, marginal hairs of tergum 7 dusky yellowish. (29m) Lower clypeocular distance about one-third of scape width; upper about equal to scape width. (33m) Malar area about one-third as long as width of scape. (38m) *Mandible with protuberance bearing short*

hairs along upper margin about one-third distance from base to apex. (58) Anterior basitarsus distinctly shorter than remaining tarsal segments taken together, second to fourth segments rather large, nearly as broad as antennal scape, the second over twice as long as broad. *Middle basitarsus swollen, nearly twice as long as remaining tarsal segments taken together*, small segments broader than long. (59) Hind leg thickened; *trochanter on ventral side with fine, dense, plumose hairs and with large submedian rounded angle*; *body of femur thickest submedially but with broad basal keel* forming rounded subbasal angle covered with dense, curled, plumose hairs on outer surface but nearly bare and shining on inner surface; basitarsus more than twice thickness of remaining tarsal segments. (60) Eighth tergum with convexities between two and three times as long as broad, densely hairy but scarcely folded, not appearing brainlike. (61) *Sixth sternum produced, thickened apically, with broad emargination lined with small hairs between two conspicuous angles.* Seventh and eighth sterna as in figure 454, no apical emargination. (62) Gonobase enormous (fig. 453). (63) Ventroapical gonocoxal plate apically produced and elaborated, bearing numerous, adjacent, large, peglike setae on an apicodorsally directed process and no setae on an apicoventrally directed process. (64) Gonostylus reduced (fig. 452). (65) Penis valve with vertical band of large peglike setae on outer surface.

Distribution. Southernmost Cape Province in Cape macchia. SOUTH AFRICA: *Cape Province*: 5 km. S of Avontuur, 1080 m. altitude; 24 km. W of Calendon, 200 m. altitude; Cape Nature Reserve, Cape Peninsula; Constable; Grahamstown; Hout Bay; Huguenot; Kirstenbosch Botanical Gardens, Cape Town; Kleinmond; 64 km. E of Knysna; Montagu Pass; Noordhoek; Pakhuis Pass near Clanwilliam; Prince Alfreds Pass; Stellenbosch.

Allodapula dichroa (Strand)

Figures 457-463, 468-472

Allodape dichroa Strand, 1915, p. 39. (Type ♂, Berlin, from "Capland, Krebs S." The large size of the type and extremely reduced lateral face marks [mere line along ridge of paraocular area lateral to lower lateral extremity of clypeus], as well as the largely red abdomen, suggest that it is not from Grahamstown or eastward; the presence of a broken yellow band on the pronotum and the uniformly pale tibiae indicate that it is not from the Cape region. A series from east of Knysna contains specimens that match each of its characters although no one specimen agrees with it in all features. Placed in *Allodapula* by Cockerell, 1936b.)

Allodape malleifera Cockerell, 1916, p. 196. (New synonym. Type ♀, location unknown, from Kranz Kloof, Natal.)

Allodape nigricollis Friese, 1924, p. 77 (not Vachal, 1903). (New synonym. Lectotype ♀, here designated, Berlin, from Port Elizabeth, Cape Province. A male had been labeled as type in the Berlin collection, but this designation was never published, and since Friese described the female first and in detail, the male only comparatively, it is clear that the female should be the lectotype.)

Allodape megastigma Cockerell, 1934a, p. 235. (New synonym. Type ♀, BM, from Port St. John, Transkei, probably overtreated with cyanide so that yellow markings are reddish and normally yellow stripe on fore tibia is concolorous with rest of tibia.)

Allodape atricollis Cockerell, 1934b. p. 251. (New synonym. New name for *nigricollis* Friese, not Vachal.)

Allodapula poculifera Cockerell, 1936a, p. 19. (New synonym. Type ♀, AMNH, from Huguenot, Cape Province.)

Allodapula melanognatha Cockerell, 1936b, p. 637. (New synonym. Type ♂, BM, from Royal Natal National Park, Natal. The type lacks lateral face marks completely, an unusual feature in Natal populations of the species.)

Description. Female. (1) Length 6.5-9 mm.; forewing length 5-6 mm. (2-12) Black, the following parts yellow: clypeal mark occupying upper third or quarter of clypeus and extending down as broad band to apex of clypeus; pronotal collar (yellow broken medially), pronotal lobe; band or stripe, usually poorly defined, on outer side of fore tibia; usually yellowish area on outer side of base of middle tibia. Labrum brown, often infuscated, sometimes with small median yellow spot. Undersurface of antenna brown; sometimes apical part of undersurface of scape,

rarely streak full length of scape, yellow. Front tibia (except for yellow stripe) and all tarsi yellowish testaceous; mid- and hind tibiae with variable amounts of same color (see Variation). Metasoma black or usually with variable amounts of red. (13) Wings slightly brownish, veins and stigma brown. (14) Dorsal hairs of metasomal tergum 4 usually dusky or black, curved, thickened, blunt, larger than those of terga 5 and 6 which are pale brown, dusky in some individuals. (16) Clypeus as in *Allodapula acutigera*. (20) Interocellar distance about equal to or greater than ocellocular distance. (25) Upper margin of clypeus nearly straight, sometimes slightly concave, sometimes with small median convexity. (27) Clypeoantennal distance about half diameter of antennal socket. (33) Malar area about two-thirds as long as width of scape. (37) First flagellar segment somewhat broader than long, middle segments as long as broad or longer than broad.

Male. Similar to female except as follows: (1m) Length 4.3 to nearly 7 mm.; forewing length 4-5 mm. (2m-12m) Black, the following parts yellow: clypeus, labrum, entire undersurface of scape, sometimes a broken yellow band on pronotal collar (see Variation), and pronotal lobe; paraocular area with yellow absent to forming lateral face marks extending to upper fourth of clypeus; apex of mandible yellow to reddish; tibiae with yellow band or stripe, usually poorly defined, on outer side of each, those of middle and hind tibiae narrowed medially, sometimes broken, and sometimes reduced to apical area only. Front tibia yellowish testaceous except for yellow stripe and sometimes posterior median infuscated area; middle and hind tibiae yellowish testaceous, brown or blackish medially, to nearly wholly blackish except for bases and apices, or even base of hind tibia sometimes dark. Basitarsi yellow, small segments of tarsi reddish brown or distitarsi dusky. (14m) Dorsal hairs of terga 4 to 7 shaped as in female, dusky or those of 7 commonly pale, those of 6 sometimes light brown. (29m) Lower clypeocular distance about two-thirds of scape width, upper about equal to scape width. (33m) Malar area very short, one-fifth or one-sixth as long as width of scape, i.e., linear. (58) Tarsi slender, anterior basitarsus slightly longer than rest of tarsus, second to fourth fore tarsal segments normal, second about twice as long as broad; middle and hind tarsi similar, basitarsi a little longer than remaining segments taken together, second and third segments longer than broad. (59) Hind leg slender, unmodified. (60) Convexities of eighth tergum less elongate than in *acutigera*, but otherwise similar to those of that species. (61) Sixth sternum weakly biconvex, margin feebly and gently emarginately medially. Seventh and eighth sterna with longer lateral apodemes and spiculum than in *Allodapula acutigera*. (62) Gonobase moderate sized. (63) Ventroapical gonocoxal plate elaborated somewhat as in *acutigera* but apicoventrally and apicodorsally directed processes thicker, the latter much larger and longer. (64) Gonostylus reduced (fig. 459). (65) Penis valve and apicodorsally directed process of gonocoxal plate with peglike setae suggestive of those of *A. acutigera*.

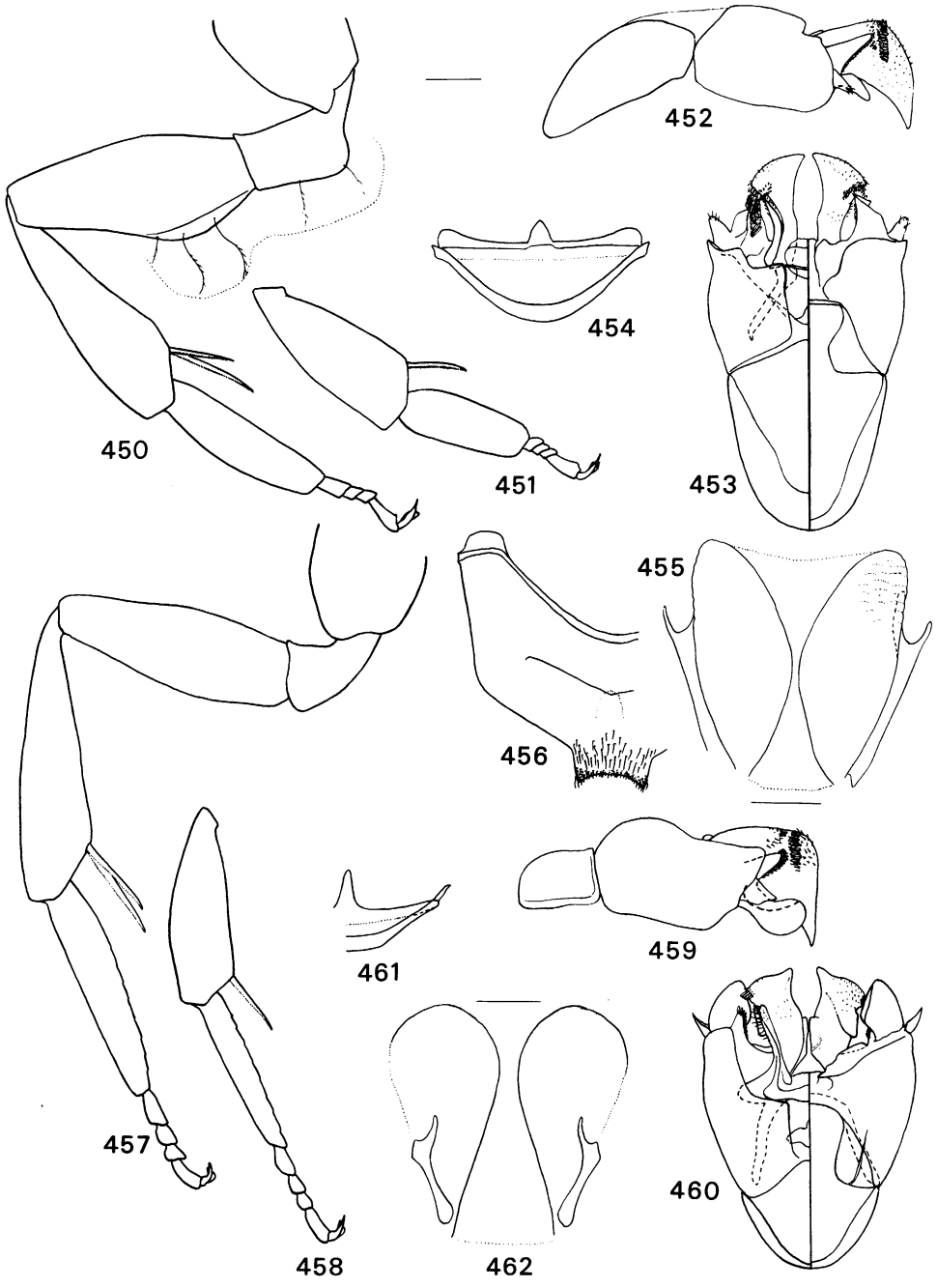
Distribution. The Cape to Zululand, in the west largely in the Cape macchia but extending into the Karoo at least as far as Worcester and Robertson. SOUTH AFRICA: *Cape Province*: 5 km. S of Avontuur, 1070 m. altitude; Cape Nature Reserve, Cape Peninsula; Ceres; Goedehoop, Heidelberg District; Grahamstown; Hout Bay; Huguenot; Kirstenbosch Botanical Gardens, Cape Town; King William's Town; 64 km. E of Knysna; Kommetjie; Pearly Beach, Bredasdorp; Port Elizabeth; 11 km. W of Robertson, 275 m. altitude; Swellendam; Worcester. *Transkei*: Port St. Johns. *Natal*: Balgowan, 40 km. NW of Pietermaritzburg, 1370 m. altitude; 23 km. NE of Bulwer, 1190 m. altitude; Cathedral Peak Hotel, 45 km. SW of Winterton, 1430 m. altitude; Eshowe; Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; Illovo Beach, 34 km. S of Durban; Karkloof, 64 km. N of Pietermaritzburg, 1370 m. altitude; Kranz Kloof; Kranzkop, 915 m. altitude; Nagle Dam, 27 km. E of Pietermaritzburg; Pietermaritzburg; 8 km. NW of Pietermaritzburg; Port Shepstone; 8 km. S of Richmond; Richmond, 855 m. altitude; Royal Natal National Park; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Scottburgh; Umbumbulu.

Variation. This is a highly variable species, not only at any given locality but geographically, as indicated below:

Size: Much larger from the Cape to Knysna and south of Avontuur than farther east (fig. 463).

Lateral face marks of male: Absent in Cape area proper, rarely present but minute as far west as Worcester and Knysna; variable from minute to well developed at Grahamstown, usually well developed but rarely absent in Natal.

Prothoracic yellow band of male: Absent in the western Cape region, rarely a narrow yellow line on each side near Knysna, such a line more common near Avontuur, and present on the only



two males from Mossel Bay. Specimens from Grahamstown and farther east consistently have a medially broken yellow band across the pronotum. (Females all have such a band.)

Tibial color in females: In the Cape area the mid- and hind tibiae are black with the apical fourths testaceous. In some specimens from Worcester the pale coloration extends up the front of the mid-tibia to the base leaving a dark median posterior area. Near Avontuur and Knysna the middle tibia is usually largely or wholly pale and the hind tibia is pale at the base as well as the apex. At Grahamstown and in Natal the tibiae are darker than at Knysna, the hind ones usually without pale at the bases.

Tibial color in males: In the Cape area the middle and hind tibiae always have dusky or black medial regions, rarely extending to the bases so that the yellow-testaceous coloration is limited to the apices, the dark medial regions often broken or nearly broken by the longitudinal yellow line on the outer side of the tibia connecting the basal and apical pale regions. In the Knysna and Avontuur area these tibiae may be wholly yellowish testaceous although there are often brown medial areas. In Grahamstown and Natal there is variation although usually there are brown median areas, each divided or nearly divided by a yellow line on the outer surface of the tibia.

Metasomal color (both sexes): Varies from black to largely red. In the Cape Province I found black females only near Avontuur, where a small sample suggests that nearly half the females are black. The type of *Allodapula poculifera* from Huguenot is of this sort. Near Avontuur a black female was found in a nest with a female with the metasoma red except for most of tergum 1 and terga 5 and 6, which were black. A female with the metasoma reddish black is from the Cape Nature Reserve, where females usually have the metasomal terga 2-6 wholly red, although some have terga 5 and 6 mostly black and medial blackish bands on terga 2 and 3. Near Knysna most females have metasomal terga 1, 5, and 6 largely black, the rest of the abdomen red. In Grahamstown the same is true or terga 5 and 6 are reddish; terga 2 and often 3 usually have a transverse median blackish band. The same is true of specimens from Natal, except that the banding is often more extensive and occasional individuals have the metasoma almost completely black.

In the male the metasoma is black in the western Cape Province, including Avontuur. Near Knysna and eastward, through Grahamstown to Natal, while males with black metasomas occur, most have the basal parts of terga 2 to 4 variably reddish. The dorsal hairs of terga 5 and 6 of the male are usually pallid but in occasional individuals from the western Cape Province they are fuscous.

If *Allodapula dichroa* were divided into subspecies, probably only two would be recognized, the small one occurring from Port Elizabeth eastward, the other from the Knysna area westward. The name *malleifera* (*megastigma*, *melanognatha*, *atricollis*) is applicable to the eastern form; *dichroa sensu stricto* (*poculifera*) to the western one.

Allodapula variegata (Smith)

Figures 475-485

Allodape variegata Smith, 1854, p. 229. (Type ♀, BM, from Port Natal [= Durban]. Placed in *Allodapula* at the genus level by Cockerell, 1936a.)

Allodape ambigua Gribodo, 1883, p. 269. (New synonym. The type material was from "Capo di Buona speranza" [Cape of Good Hope] and "Baia d'Algoa" [Algoa Bay on which is

FIGS. 450-456. *Allodapula acutigera*, male, Hout Bay, Cape Province. 450. Lateral view of hind leg. 451. Lateral view of mid-tibia and tarsus. 452, 453. Lateral, dorsal, and ventral views of genitalia. 454. Seventh and eighth metasomal sterna. 455. Eighth tergum and roof of genital chamber. 456. Sixth sternum.

FIGS. 457-462. *Allodapula dichroa*, male, Avontuur, Cape Province. 457. Lateral view of hind leg. 458. Lateral view of mid-tibia and tarsus. 459, 460. Lateral, dorsal, and ventral views of genitalia. 461. Seventh and eighth metasomal sterna. 462. Eighth tergum and roof of genital chamber.

Scale lines represent 0.25 mm. Same line (top center) is applicable to all figures except 455 and 462 which have their own scale lines.

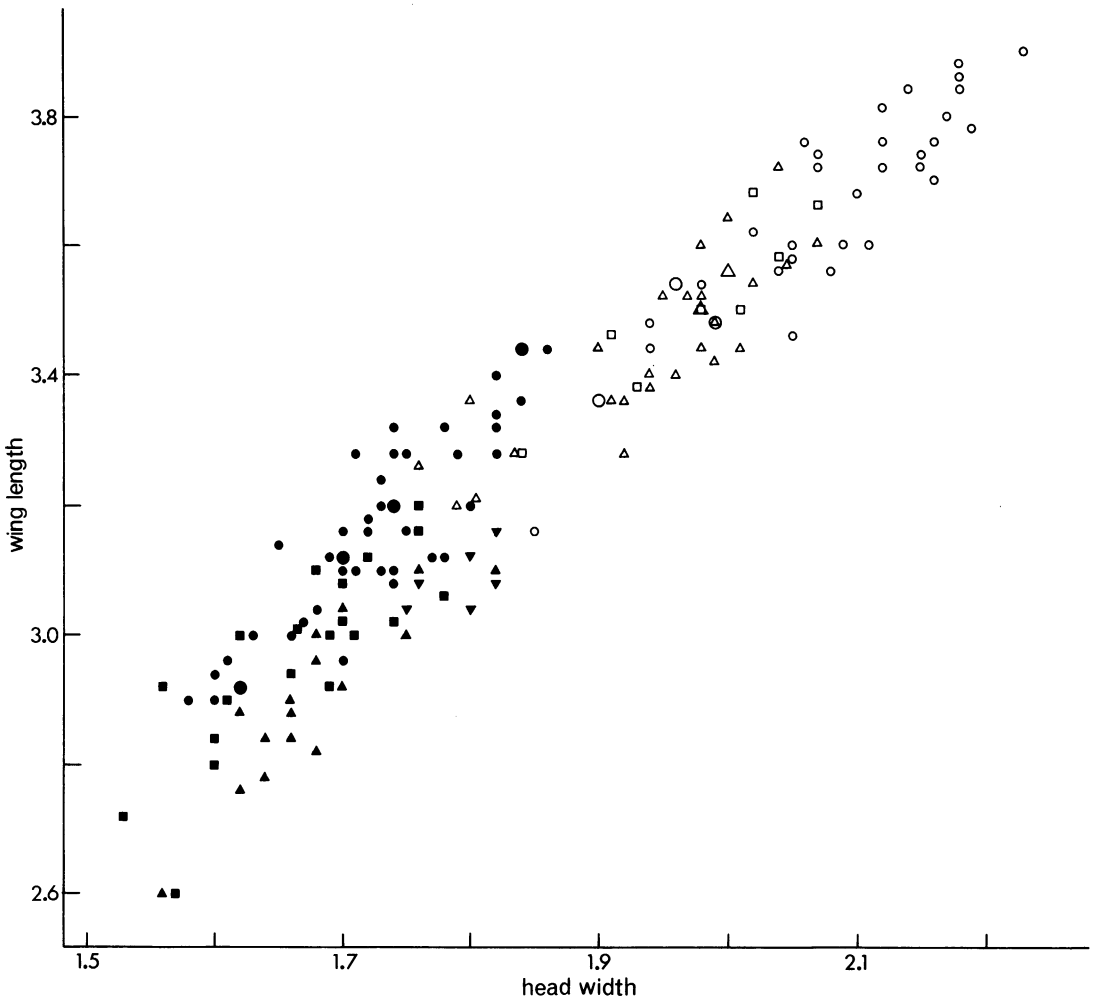


FIG. 463. *Allodapula dichroa*. Scatter diagram of wing lengths and head widths based on data assembled for biological studies (Michener, 1971a). The solid symbols represent the eastern populations, as follows: triangle pointed down, St. Lucia Estuary, Natal; triangle pointed up, Salt Rock, Natal; square, Pietermaritzburg, Natal; circle, Grahamstown, Cape Province. The open symbols represent western populations, as follows: triangle, 64 km. E of Knysna; square, Mossel Bay; circle, Cape Peninsula (all in Cape Province). Localities are given above in sequence from east to west and the scatter diagram shows evidence of a cline from smaller to larger as one progresses from east to west.

situated Port Elizabeth, Cape Province]; Dr. Delfa Guiglia of Museo Civico di Storia Naturale "Giacomo Doria," Genoa, kindly wrote that the only two specimens in the Gribodo collection are labeled Port Elizabeth and that one of them was marked by Gribodo as "Allodape ambigua Tipo." The use of the English locality label "Port Elizabeth" instead of Baia d'Algoa on the label may indicate that the specimens are not genuine types; Gribodo uses English locality names when appropriate in the same paper and would be unlikely to change a name completely, from Port Elizabeth to Baia d'Algoa, even though approximately the same place is indicated. It is simplest to consider Baia d'Algoa [= Port Eliza-

beth] as the type locality, however, and to regard the labeled type as the standard for the name *ambigua*. Photographs sent by Dr. Guiglia indicate that this specimen is *variegata*.)

Prosopis sandaracata Bingham, 1903, p. 49. (Synonymy with *B. variegata* shown by Cockerell, 1934a. Type ♀, BM, from "Natal"; the description specifies Durban.)

Allodape foveiscutis Cameron, 1905b, p. 245. (New synonym. Type ♂, BM, from Pearston, Cape Province.)

Allodape pringlei Cameron, 1905b, p. 246. (New synonym. Type ♂, BM, from Kokstad, Natal; a headless female in Albany Museum, Grahamstown, labeled as "type," is a cotype.)

Allodape dichroides Strand, 1915, p. 40. (New synonym. Type ♂, Berlin, from "N. Nyassa, Langenburg"; this locality is Kilonda, Tanzania, at the north end of Lake Malawi. The dark tegulae separate the type from most specimens of *A. variegata*, but a few from Natal have them infuscated.)

Allodape pungens Brauns MS, Cockerell, 1916, p. 197 (*nomen nudum*).

Allodape nigrescens: Friese, 1924, p. 77 (♂ only, marked "type" [Berlin], from Algoa Bay; the female lectotype is *Halterapis nigrinervis*).

Allodape pungens Friese, 1924, p. 66. (The manuscript name *pungens* Brauns was introduced, with larval characters, but also shown as a synonym of *variegata*, by Friese; Brauns, 1926, p. 421, listed *pungens* as a synonym of *pringlei*, which is *A. variegata*. There seems to be no type specimen.)

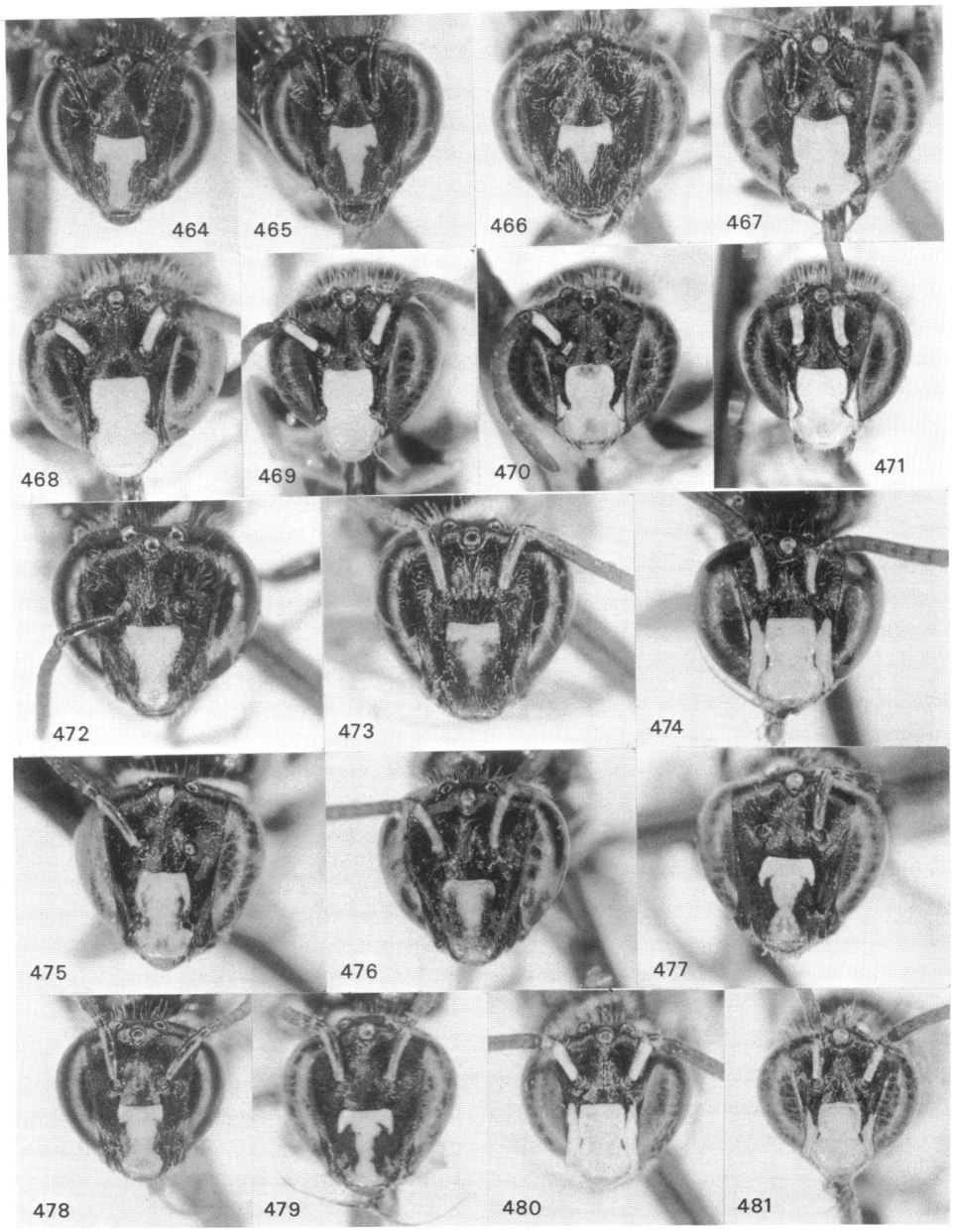
Allodape bihamata Cockerell, 1933a, p. 51. (New synonym. Type ♀, BM, from Port Elizabeth, Cape Province.)

Allodape pungens Cockerell, 1934a, p. 242; 1934b, p. 252. (Cockerell gave characters based on a male from Willowmore showing, I think, that the specimen was callow; also, it may have been *rozeni* or some other species. The name is a homonym of *pungens* Friese, and is best considered a synonym also since both Friese and Cockerell were utilizing Brauns's manuscript name; there is no type specimen.)

Allodape rufula Cockerell, 1934b, p. 254. (New synonym. Type ♂, BM, from Christmas Pass, Umtali, Rhodesia.)

Description. Female. (1) Length 5-7.5 mm.; forewing length 4-5 mm. (2-12) Black, the following parts yellow: clypeal mark, varying from almost entire clypeus except lower lateral margins to a mark of about the shape of that of *Allodapula dichroa*, but lower part usually somewhat broadened, upper part often with evidence of downward projecting lateral points (hamate), lower enlargement sometimes with upward projecting lateral points; broad, unbroken, sometimes medially notched posterior band across pronotum; pronotal lobe; transverse scutellar band, sometimes occupying most of scutellum. Very rarely, small yellowish or reddish fleck in paraocular area near inner orbit. Base of labrum often yellow; labrum otherwise yellowish or reddish brown, sometimes infuscated; mandible yellow or reddish brown, infuscated or black basally. Tibiae, tarsi, and apical parts of femora yellowish red (see Variation for amount of black on femora); *posterior surface of front femur with apical yellow area* obliquely cut off basally, the yellow sometimes reaching middle of femur or basal to that point on lower margin of femur. Undersurface of scape yellowish brown to yellow; undersurface of flagellum brownish black. Tegula transparent yellow-brown; wing base yellow-brown. Metasoma red, last two or three segments usually infuscated, often blackish laterally; first tergum usually with infuscated areas; dark patch at side of second tergum; more rarely other terga somewhat infuscated, there being sometimes broad dusky bands across bases of terga 2 to 4. (13) Wings clear or scarcely brownish, veins and stigma brown. (14) Dorsal hairs of metasomal terga 4 to 6 pallid, short, curved, thickened and blunt. (16) Clypeus shining with punctures and hairs sparse, the punctures minute and inconspicuous in upper half. (20) Interocellar distance subequal to ocellocular distance. (25) Upper margin of clypeus usually concave, usually but not always with small median convexity, this convexity sometimes so developed that it surpasses upper lateral angles of clypeus so that clypeal margin is not concave; upper margin of clypeus nearly always shorter than in *A. dichroa*. (27) Clypeoantennal distance equal to or greater than diameter of antennal socket. (33) Malar area three-fourths to four-fifths as long as width of scape. (37) First flagellar segment slightly broader than long to slightly longer than broad; middle segments slightly longer than broad.

Male. Similar to female except as follows:



FIGS. 464-467. *Alladapula acutigera*, facial views. 464-466. Females, 64 km. E of Knysna, Cape Province. 467. Male, Cape Nature Reserve, Cape Peninsula, Cape Province.

FIGS. 468-472. *Allodapula dichroa*, facial views. 468. Male, Worcester, Cape Province. 469. Male, Pietermartizburg, Natal. 470. Male, St. Lucia Estuary, Natal. 471. Male, Hluhluwe Reserve, Natal. 472. Female, Hout Bay, Cape Province.

FIGS. 473, 474. *Allodape rozeni*, facial views, female holotype, male allotype, 26 km. NE of Montagu, Cape Province.

FIGS. 475-481. *Allodapula variegata*, facial views. 475-477. Females, Grahamstown, Cape Province. 478. Female, Salt Rock, Natal. 479. Female, Port Elizabeth, Cape Province. 480. Male, Grahamstown, Cape Province. 481. Male, Salt Rock, Natal.

(1m) Length 5-6 mm.; forewing length 4-4.5 mm. (2m-12m) Black, the following parts yellow: clypeus, lateral face marks attaining at least summit of clypeus or nearly so, labrum, mandible except apex, underside of scape. Prothoracic and front femoral yellow areas as in female except prothoracic band usually broken; scutellum usually black, rarely with small yellow spot; reddish yellow coloration of legs as in female but black of mid and hind femora usually extending near apices. Metasomal coloration about as in female, perhaps on the average more infuscated, never entirely black as in some males of *Allodapula dichroa* but sometimes nearly black. (14m) Dorsal hairs of terga 4-7 shaped as in female but usually dusky, sometimes pallid but perhaps only in callow specimens. (29m) Upper and lower clypeocular distances about equal, slightly less than to equal to width of scape. (33m) Malar area one-third to one-half as long as width of scape. (58) Tarsi as described for *A. dichroa.* (59) Legs slender, even more so than in *A. dichroa*, rather sparse plumose hairs on undersides of hind trochanter and femur as long as diameters of these segments (shorter and sparser in *A. dichroa*). (60) Eighth tergum with specialized areas not merely setose convexities as in *A. acutigera* and *dichroa*, nor brainlike as in *Allodape*, but with several irregular coarse lobes. (61) Sixth sternum gently convex. Seventh and eighth sterna much as in *Allodapula dichroa*, with one to three subapical hairs, sometimes one far longer than in figure 484. (62) Gonobase short. (63) Ventroapical plate of gonocoxite hairless, with small mesal thornlike process (sometimes reduced or difficult to see because of sloping upward but evident in all specimens seen). (64) Gonostylus bearing long coarse hairs and exceeding penis valves. (65) Penis valves not strongly curved down, slender, without peglike hairs.

Distribution. The Little Karoo of Cape Province east to Natal, Transvaal, eastern Rhodesia and probably Tanzania. SOUTH AFRICA: *Cape Province*: Algoa Bay (Port Elizabeth); Bathurst; Bushmans River Mouth; Cookhouse; Fort Beaufort; Fort Brown; Gamtoos Mouth, Papiesfontein; Goshen, near Cathcart; Grahamstown; 16 km. N, 19 km. W, 23 and 27 km. NW of Grahamstown; Howiesons Poort; Kars River, 32 km. ENE of Bredasdorp; Katberg; King William's Town; Klaarstroom to Prince Albert; Knysna; 27 km. NE of Knysna; Loerie; 26 km. NE of Montagu; Mossel Bay; Pearston; Port Elizabeth; Somerset East; Uitenhage; Van Stadens Mouth; Waterloo Bay; Wilderness; Willowmore. *Transkei*: Port St. Johns. *Natal*: Balgowan, 40 km. NW of Pietermaritzburg, 1370 m. altitude; Cathedral Peak Hotel, 45 km. SW of Winterton, 1430 m. altitude; Dundee; Durban; Eshowe; Greytown; 19 km. N of Greytown; Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; Howick; Kokstad; 11 km. NE of Kranskop; Mfongosi, Zululand; Nagle Dam, 27 km. E of Pietermaritzburg; Pietermaritzburg; Port Shepstone; St. Lucia Estuary, Zululand; Salt Rock, 47 km. N of Durban; Scottburgh; Tugela Ferry; Tugela Mouth; Weenen. *Transvaal*: Barberton; Louis Trichardt; Nelspruit; 27 km. E of Nelspruit, 915 m. altitude; Waterval-Onder. RHODESIA: Christmas Pass and Vumba, Umtali; Muza Valley, 32° E, 18° S; Selukwe; Umtali Heights, 1420 m. altitude. TANZANIA: Kilonda; Tabora.

The records from Knysna and Mossel Bay are based on one or two individuals each and only one nest was found near Montagu. Obviously the species becomes rare to the westward. A single specimen in the Albany Museum is labeled "Cape (G. C. Clark)"; perhaps this is an error or means something other than Cape Town but the species may range rarely west to the Cape.

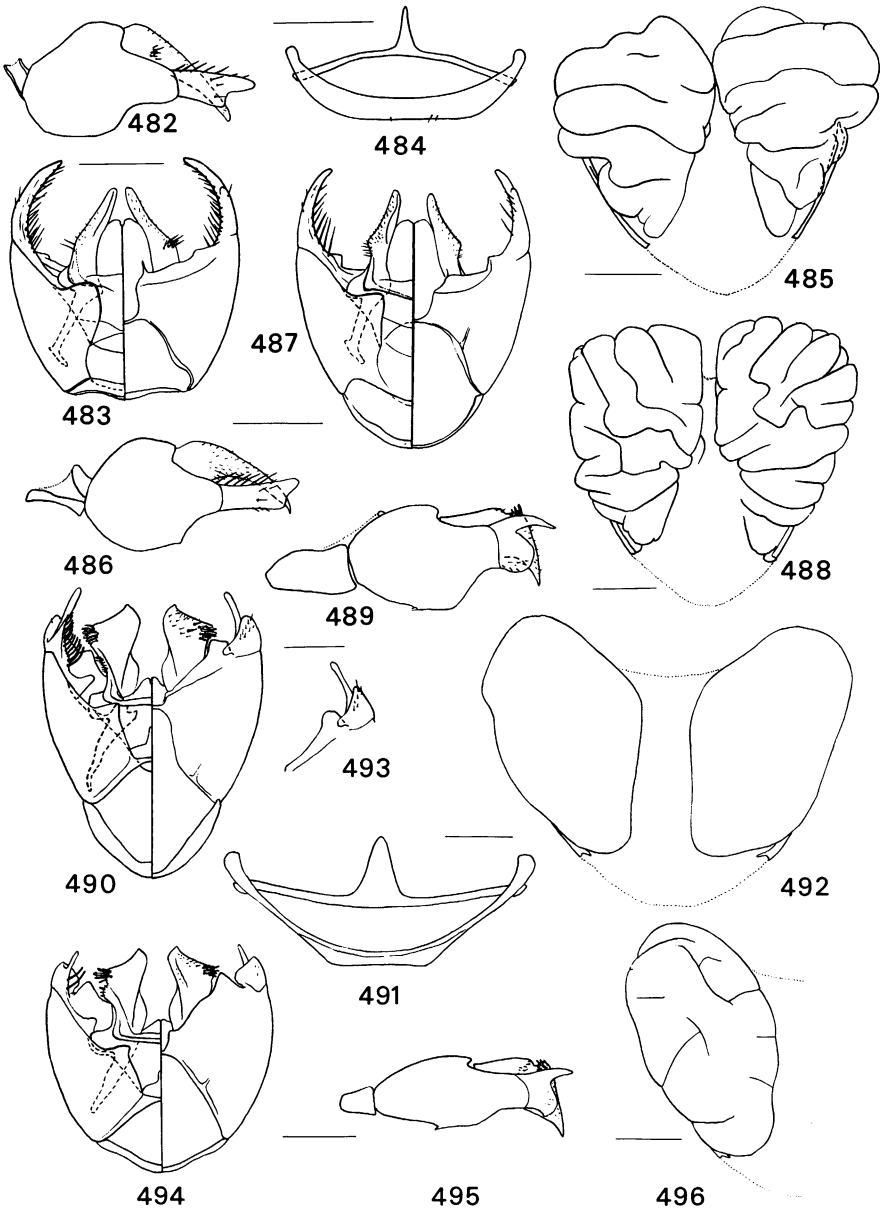
The two records for Tanzania are based on a single specimen each, one the type of *Allodapula dichroides*, the other a specimen in the University of Kansas collection taken in 1950 by W. E. Kerr. Each differs somewhat from ordinary populations of *A. variegata*, that from Kilonda by the dark tegulae, that from Tabora by the unusually broad yellow pronotal band. It therefore seems possible that the localities are genuine in spite of being far north of other known localities for the genus.

Variation. The most noteworthy variation that is not explained in the description is that of femoral color. Except for the posterior apical yellow region, the fore femora of the female can be wholly red or black, or red distally and black

basally. The black of the middle femora may be limited to the extreme bases or may extend beyond the middle. The black of the hind femora may be limited to the basal halves (rarely the extreme bases) or may extend nearly to the apices.

As shown in figure 497, specimens from Eastern Cape Province average larger than those from Natal but the difference is not conspicuous, like that between the specimens of *Allodapula dichroa* from the western Cape and those from Natal.

The type of *rufula* and some of the other specimens from Rhodesia have maximal red on the legs, only the bases of the femora being dark. In this character they approach *rozeni*, but the habitat is entirely different and the few other distinctive features of *rozeni* are not suggested by Rhodesian material.



Allodapula rozeni Michener
Figures 473, 474

Allodapula roffeni Michener, 1970a, p. 11 (*nomen nudum* and printer's error for *rozeni*).
Allodapula rozeni Michener, 1971a, p. 297. (Type ♀, AMNH, from 26 km. NE of Montagu, Cape Province.)

Description. Female. Similar to *Allodapula variegata* except as follows: (1) Length 6.5-7 mm.; forewing length 5 mm. (2-12) Clypeal mark tapering and fading away below so that lower part of clypeus is all or largely black; pronotal band broken medially; labrum and mandible brown, heavily infuscated, without yellow; legs red except for black coxae, infuscated mid and hind trochanters and base of hind femur, and yellow on apical part of posterior surface of fore femur. Underside of scape red-brown. Metasoma red, base of first tergum infuscated (both sexes). (25) Upper margin of clypeus concave without median convexity. (33) Malar area nearly as long as width of scape.

Male. Similar to *Allodapula variegata* except as follows: (1m) Length 7 mm.; forewing length 5 mm. (2m-12m) Prothoracic yellow band absent; coloration of legs as in female. (25m) Summit of clypeus about straight (true of some males of *A. variegata* also). (61) Seventh sternum broadly and feebly emarginate and hairless apically, very similar to that of some *A. variegata* which, however, have this sternum not or scarcely emarginate and bearing at least one hair in specimens dissected.

Comparative Comments. In many ways this form is so like large specimens of *Allodapula variegata* that it seems unjustified to consider it a distinct species. On the other hand, the types are outside of the known range of variation of *A. variegata* in a series of seemingly independent color characters. Moreover, typical *A. variegata* was taken at the same place, and also elsewhere in the Karroo, as at Willowmore.

Distribution. Known only from the type locality.

Allodapula empeyi, new species
Figures 498, 499

Diagnosis. A small *Allodapula* with metasoma red and a small yellow area on scutellum. Differs from *A. melanopus* in the pale scopa and the convex upper clypeal margin.

Description. Female. Similar to *Allodapula variegata* except as follows: (1) Length 5.5-7.5 mm.; forewing length 4.5-5 mm. (2-12) Clypeal mark pale yellow, sharply defined, T-shaped, somewhat hamate, not broadened below; pronotal band narrowly broken medially; scutellar yellow area small, not extending to lateral parts of scutellum; no yellow on paraocular area, labrum, or scape. Labrum and mandible largely black although with brown areas, lower margin of clypeus often brown. Tegula transparent brown, less yellowish than in *A. variegata*, *melanopus*, etc., and axillary sclerites infuscated. Extreme apices of femora, fore and mid-tibiae (the

FIGS. 482-485. *Allodapula variegata*, male. 482-483. Lateral, dorsal, and ventral views of genitalia of male, St. Lucia Estuary, Natal. 484. Seventh and eighth metasomal sterna, Grahamstown, Cape Province. 485. Eighth tergum and roof of genital chamber, St. Lucia Estuary, Natal.

FIGS. 486-488. *Allodapula melanopus*, male. 486, 487. Lateral, dorsal, and ventral views of genitalia, Cape Nature Reserve, Cape Peninsula, Cape Province. 488. Eighth tergum and roof of genital chamber, Grahamstown, Cape Province.

FIGS. 489-492. *Allodapula xerica*, paratype male, Robertson, Cape Province. 489, 490. Lateral, dorsal, and ventral view of genitalia. 491. Seventh and eighth metasomal sterna. 492. Eighth tergum and roof of genital chamber.

FIG. 493. *Allodapula hessei*, paratype male, Pakhuis Pass, near Clanwilliam, Cape Province, ventral view of gonostylus and ventroapical plate of gonocoxite.

FIGS. 494-496. *Allodapula palliceps*, male, Willowmore, Cape Province. 494, 495. Dorsal, ventral, and lateral views of genitalia. 496. Left half of eighth tergum and roof of genital chamber.

Scale lines represent 0.25 mm. Separate lines serve for figures 482 and 483, 484, 485, 486 and 487, 488, 489 and 490 and 493, 491 and 492, 494 and 495, 496.

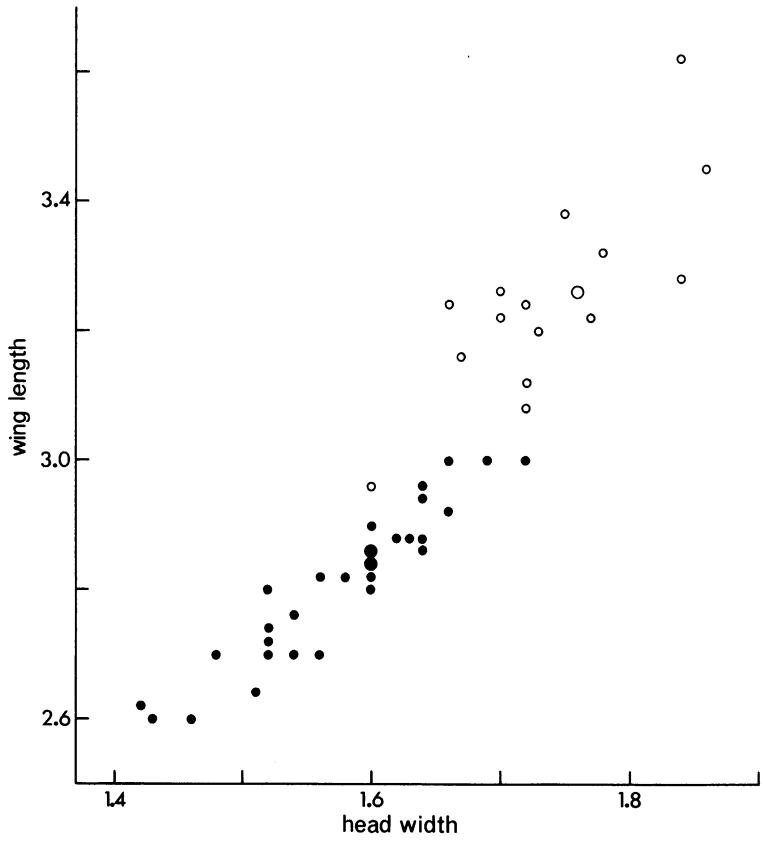


FIG. 497. *Allodapula variegata.* Scatter diagram of wing lengths and head widths (mm.) based on data assembled for biological studies (Michener, 1971a). The solid dots represent specimens from central Natal (Pietermaritzburg and vicinity) and the circles represent specimens from Grahamstown, Cape Province.

latter sometimes slightly infuscated medially), base and apex of hind tibia, and all tarsi red; fore femur without yellow. Undersurface of scape brown. Metasomal infuscation not so strong as in some *A. variegata*, dark areas limited to first tergum and sides of apical terga. (14) Dorsal hairs on tergum 4 partly fuscous. (25) *Upper margin of clypeus convex.* (33) Malar area as long as width of scape. (37) First flagellar segment about as broad as long, middle segments as long as or longer than broad.

Comparative Comments. The species is closer to *melanopus* than to *variegata.* It differs from *melanopus* in the pale scopal hairs, the convex upper clypeal margin, the shiny face, and other features indicated above.

Distribution. SOUTH AFRICA: *Transvaal.* Type material: Holotype female and six female paratypes: Strubens Valley, Florida, Transvaal, South Africa, September 12 and November 12, 1960, the type from a nest in "dry seed-pod of suikerbos" (*Protea*). One female paratype: Retiefs Kloof, Transvaal, August 28, 1961. All specimens were taken by H. N. Empey. The holotype has been placed in the Transvaal Museum by Mr. Empey; paratypes are in the collection of Mr.

Empey in Johannesburg, the British Museum, and the Snow Entomological Museum, The University of Kansas.

Etymology. The species is named in honor of its collector, Mr. H. N. Empey, hymenopterist of Johannesburg.

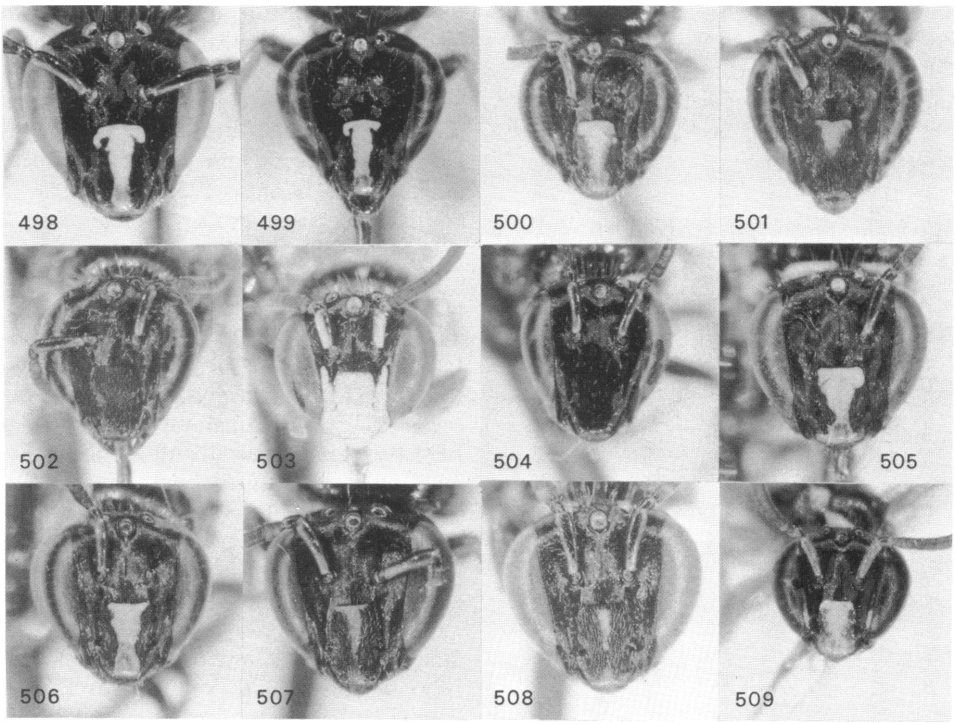
Allodapula melanopus (Cameron)
Figures 448, 486-488, 500-504, 510

Allodape melanopus Cameron, 1905b, p. 245. (Type ♀, BM, from Pearston, Cape Province.)
Allodape nigripes Friese, 1911, p. 673. (New synonym. Type ♀, Berlin, from Cape Town. Placed in *Allodapula* by Cockerell, 1936b.)
Allodape minutissima Cockerell, 1933a, p. 49. (New synonym. Type ♀, BM, Outdshoorn, Cape Province.)
Allodape ogilviei Cockerell, 1933a, p. 51. (New synonym. Type ♀, BM, from Port Elizabeth, Cape Province.)
Allodape rufescens Cockerell, 1933a, p. 50. (New synonym. Type ♀, location unknown, from Van Rhyn's Pass, Cape Province.)
Allodape nigripes var. *milneri* Cockerell, 1934a, p. 240. (New synonym. Type ♀, BM, from Milnerton, Cape Town.)
Allodape ogilviei var. *atrifrons* Cockerell, 1934a, p. 240. (New synonym. Type ♀, BM, from Mossel Bay, Cape Province, separately described, and with a separate type, from the next.)
Allodape variegata bihamata var. *atrifrons* Cockerell, 1934a, p. 240. (New synonym. Type ♀, BM, from Mossel Bay, Cape Province.)
Allodape latifrons Cockerell, 1934b, p. 253. (New synonym. Type ♂, BM, Mossel Bay, Cape Province.)

Description. Female. Similar to *Allodapula variegata* except as follows: (1) Length 4.5-7 mm.; forewing length 3.5-5 mm. (2-12) Clypeal mark absent, limited to upper part of clypeus or extending as a narrow band to lower part (see Variation), rarely hamate; pronotal yellow band broken; scutellar yellow area smaller than in *A. variegata*, not extending to lateral parts of scutellum, rarely absent. Labrum and mandible without yellow. Legs black with the tarsi and anterior side of fore tibia rufescent or with tibiae and tarsi and apices of femora all red (see Variation); no yellow on front femur. Undersurface of scape not yellow but sometimes yellow-brown. Hind tibia and tarsus with some scopal hairs which are black at least basally, in addition to pale ones. Metasoma red, sometimes quite dark, blackish on basal part of first tergum; infuscated regions, if present, in median dorsal parts of terga. (14) Dorsal hairs of tergum 4 usually in part dark, unlike the pallid ones of following terga, or those of fifth and rarely also sixth terga partly dark as seen in profile in western part of range. (16) Clypeus with ground duller, more roughened, than in *A. variegata*, punctures minute but more numerous, hairs short as in *A. acutigera.* (20) Interocellar distance greater than ocellocular distance. (25) Upper margin of clypeus gently concave, usually with small median convexity. (37) First flagellar segment slightly broader than long; middle segments usually about as long as broad.

Male. Similar to *Allodapula variegata* except as follows: (1m) Length 4-5.5 mm.; forewing length 4-4.5 mm. (2m-12m) Labrum sometimes dark laterally, yellow of paraocular areas commonly extending above level of clypeus; scutellum usually black but one specimen in a series from Worcester with yellow area as in female; legs as in female but averaging paler, red sometimes extending along upper surfaces of femora, even trochanters sometimes reddish. (37m) Middle flagellar segments as wide as long. (60) Eighth tergum more finely lobed than in *A. variegata.* (61) Seventh and eighth sterna about as in *A. variegata*, posterior margin feebly emarginate with a hair or two. (62) Gonobase not so short as in *A. variegata.* (63) Ventroapical plate of gonocoxite without mesal thornlike process.

Distribution. Cape Province in macchia, karoo, and Namaqualand semidesert. SOUTH AFRICA: *Cape Province*: 77 km. E of Barrydale; Beaufort West District; BoKouga, Uniondale District; Buffels River, Ladismith Division; Bushmans River Mouth; Cape of Good Hope; Cape Nature Reserve, Cape Peninsula; Cookhouse; Doorn River Falls; Dutoitskloof, 700 m. altitude; Fort Brown; George; Gouph, Laingsburg District; Grahamstown; 16 km. N, 19 km. W, and 27 km. NW of Grahamstown; Great Brak River, Mossel Bay; Hout Bay; Knysna; Kommetjie; Lamberts Bay; Merweville District; Milnerton, Cape Town; 18 and 26 km. NE of Montagu; Mossel Bay; Muizenberg; Murraysburg District; Nelspoort; Outdshoorn; W side of Pakhuis Pass, near Clan-



FIGS. 498, 499. *Allodapula empeyi*, facial view of females, holotype and paratype, Strubens Valley, Florida, Transvaal.

FIGS. 500-504. *Allodapula melanopus*, facial views. 500. Female, Grahamstown, Cape Province. 501. Female, Worcester, Cape Province. 502. Female, Lamberts Bay, Cape Province. 503. Male, Worcester, Cape Province. 504. Female, near *melanopus*, Springbok, Cape Province.

FIGS. 505-508. *Allodapula turneri*, facial views of females. 505. Hout Bay, Cape Province. 506. Kommetjie, Cape Province. 507, 508. Cape Nature Reserve, Cape Peninsula, Cape Province.

FIG. 509. *Allodapula jucunda*, facial view of female, Mossel Bay, Cape Province.

william, 760 m. altitude; Pearly Beach, Bredasdorp; Pearston; Port Elizabeth; Richmond District; Riversdale; 11 km. W of Robertson, 275 m. altitude; Rust en Vrede, Oudtshoorn District; Sandflats, 280 m. altitude; Seven Weeks Poort, Ladismith; Springbok; Sunland; Theekloof, Fraserburg District; 29 km. E of Touwsrivier toward Hondewater; Tradouw Pass, Swellendam District; Uitenhage; Van Rhyn's Pass; Van Stadens Mouth; Vanwyksdorp; Vogelfontein, Prince Albert Division; Wilderness; 16 km. SW of Willowmore; Witte River, Wellington, 460 m. altitude; Worcester, 305 m. altitude; 8 km. NE of Worcester.

Variation. The single female specimen from Springbok may be another species. It has a more shining face and a longer malar area (see discussion under *Allodapula monticola*). Elsewhere the species is rather uniform morphologically. A male from Grahamstown has the dark dorsobasal angles of the penis valves acute and more produced basally than males from the western part of the range. Occasional females (e.g., in the long series from Worcester) have the upper clypeal margin uniformly gently concave instead of with a median convexity (see discussion under *A. turneri*). In the southwestern part of the range and especially in the Cape area proper the upper part

of the clypeus is minutely roughened and duller than elsewhere and the punctation of this area is nearly absent.

On the Cape Peninsula the clypeus of the female is usually wholly dark, sometimes with a small median basal yellowish triangle. The tibiae are all black or the anterior ones partly or almost entirely red. The names *Allodapula nigripes* and *milneri* are based on such material. In the Karoo (Worcester, Robertson) 129 km. to the eastward, the clypeus often has a basal pale triangle, the point of which sometimes reaches the apex of the clypeus. The front tibiae are red or largely so; middle and hind tibiae vary from dusky to red, the hind pair often being dark except for red bases and apices. The apices of the femora are briefly red. At Grahamstown the clypeus almost always has a yellowish area; sometimes it is a spot or basal triangle but it commonly reaches the clypeal apex and may be hamate above and even below. Occasionally there are yellow flecks near the anterior orbits. The tibiae and tarsi are sometimes all red and the apices of the femora are red but the outer sides of the hind tibiae are often dusky except at bases and apices.

The scutellar yellow spot is smaller in females from the Cape Peninsula, rarely absent, while in those from farther east it is broader, a transverse band, although rarely as broad as in *Allodapula variegata*. The black hairs of the hind tibiae and basitarsi are more numerous and seem blacker in females from the western Cape Province than in those from Grahamstown; some individuals from the latter area have the tibial hairs mostly pale.

Allodapula turneri (Cockerell)
Figures 505-508, 510

Allodape turneri Cockerell, 1934b, p. 256. (Type ♀, BM, from Camps Bay, Cape Peninsula, Cape Province. Placed in *Allodapula* by Michener, 1971a.)

This name is probably a synonym of *Allodapula melanopus*. However, a series of relatively large (fig. 510) females with a somewhat distinctive pattern of variation was taken from locations on the Cape Peninsula (Cape of Good Hope, Cape Nature Reserve, Kommetjie, and Hout Bay) with specimens of *A. melanopus*; the possibility of similar sympatric species exists.

The principal distinctive feature of *Allodapula turneri* is the usually rather extensive yellow mark of the clypeus which is enlarged below as well as above. In this respect it resembles some specimens of *A. melanopus* from the eastern part of its range but differs from sympatric specimens of *A. melanopus*. In the few specimens of *A. turneri* in which the yellow is reduced, it forms a median line reaching the apex of the clypeus (figs. 507, 508) instead of being restricted to the upper end of the clypeus as in *A. melanopus*. The anterior tibia is usually red, or at least red on the anterior surface; it is usually dark in Cape populations of *A. melanopus*. In the dull upper half of the clypeus, almost without punctures, and in the abundant dark hair of the hind tibia and basitarsus, *A. turneri* resembles Cape populations of *A. melanopus*. The upper margin of the clypeus in *A. turneri* is gently concave, only occasionally with a median convexity such as is common, although not invariable, in *A. melanopus*.

By virtue of the characters mentioned above, the *melanopus*-like bees of the Cape area seemed divisible into two groups although an occasional specimen is difficult to place in one or the other. Evidence at hand is insufficient to justify either recognition of *Allodapula turneri* as a distinct species or synonymizing of that name with *A. melanopus*. It is treated separately here largely in order to encourage further work. Males associated with *A. turneri* are unknown, as are larvae.

Allodapula monticola (Cockerell), new combination

Allodape monticola Cockerell, 1933a, p. 54. (Type ♀, BM, from Calvinia, Cape Province.)

This may be a local variant of *Allodapula melanopus*, or a distinct species, perhaps conspecific with the specimen of (?) *A. melanopus* from Springbok, Cape Province. The type of *A. monticola* differs from most *A. melanopus* and agrees with the Springbok specimen in the relatively long face, with the malar area over one-third as long as the basal mandibular width and longer than the width of the scape. Distinctive features of *A. monticola* are the reddish black metasoma and the small yellow spot on the scutellum. The upper margin of the clypeus has a small median convexity as in most specimens of

A. melanopus. At least in the specimen from Springbok the clypeus is shining, not somewhat dull as is usual in *A. melanopus.* The fore and middle tibiae and tarsi are red, the hind ones reddish black. (A few specimens of *A. melanopus* from localities such as Worcester and near Montagu agree with this description of the legs although most have at least some infuscation on the middle tibiae and some, especially from the Cape Peninsula, have the tibiae wholly black.) The scopa is pale, without the dark hairs of *A. melanopus.*

Two females in the South African Museum from Ysterfontein, near Saldanha Bay, Cape Province, agree with *Allodapula monticola* in the small scutellar spot and other features listed above except that the middle and hind tibiae and basitarsi are black or largely so and the scopa is largely black, as in *A. melanopus.*

Allodapula guillarmodi Michener

Allodapula guillarmodi Michener, 1970b, p. 202. (Type ♂, temporarily at KU, from 16 km. N of Grahamstown, Cape Province.)

This species agrees with Grahamstown material of *Allodapula melanopus* except that the scopa is reduced with only a few dark hairs along the upper margin of the tibia. Details and illustrations are given by Michener (1970b).

This is presumed to be a parasite in nests of other *Allodapula.*

Allodapula jucunda (Smith), new combination
Figure 509

Allodape jucunda Smith, 1879, p. 98. (Type ♀, BM, from Zululand, Natal.)

Allodape coloratipes Cockerell, 1934b, p. 253. (New synonymy. Type ♂, BM, with metasoma, antennae, and hind legs beyond femora gone, from Mossel Bay, Cape Province; females in BM from same locality agree with type of *A. jucunda.*)

Allodapula ferreola Cockerell, 1945, p. 806. (New synonymy. Type ♀, BM, from Mossel Bay, Cape Province; it differs from *A. jucunda* by brownish testaceous instead of black background color of head and thorax and is probably a teneral specimen of *A. jucunda* as the data on the type are the same as on specimens of *A. jucunda.*)

Description. Female. Similar to *Allodapula variegata* except as follows: (1) Length 4.5-5 mm.; forewing length 3.5 mm. (2-12) Clypeal mark rather large (as in many specimens of *A. variegata*), enlarged both below and above but not hamate, sometimes occupying almost whole clypeus; *yellow line along inner orbit below level of antennal base* (rarely a mere fleck, usually absent, in *A. variegata*). Legs except for dark coxae (sometimes only bases) and middle of hind femur yellowish red, yellow on apex of posterior surface of front femur as in *A. variegata.* Scape yellow-brown, darker above; flagellum brown above, pale brown beneath. Metasoma almost wholly red, sides of apical terga slightly infuscated. (16) Clypeus with ground dull, punctures more numerous and conspicuous although fine, and hairs short as seen in profile, thus resembling *A. melanopus.* (25) Upper margin of clypeus straight or slightly concave.

Male. Known only from the badly damaged type of *Allodapula coloratipes.* Notes made at the British Museum indicate that it is like *A. variegata* but with the lateral face marks extending up to the lower margins of the antennal sockets; leg coloration as in female.

Distribution. Eastern Cape Province to Zululand; very rare. SOUTH AFRICA: *Cape Province*: Moneys Worth, near Kenton-on-Sea; Mossel Bay; Van Stadens Mouth. *Natal*: Zululand (no exact locality known).

Allodapula ornaticeps Michener
Figure 511

Allodapula ornaticeps Michener, 1971a, p. 297. (Type ♀, AMNH, from W side of Pakhuis Pass, near Clanwilliam, Cape Province.)

Description. Female. Similar to *Allodapula variegata* except as follows: (1) Length 6 mm.; forewing length 4.5 mm. (2-12) Clypeal yellow mark a longitudinal band, *not enlarged above*, sometimes almost absent above, vaguely spreading below; *broad bright yellow bands on paraocular areas and often a crescent below anterior ocellus*; sometimes yellow band or streak along posterior orbit; *yellow of pronotal band joining with yellow on pronotal lobe.* Labrum yellowish brown; *mandible black with large yellow patch*, reddish near apex. Legs yellowish red, coxae in-

fuscated except at apices, middle of hind femur infuscated, posterior surface of front femur yellow apically as in *A. variegata.* Scape yellow beneath, yellow-brown above; flagellum brown above, pale brown beneath. Metasoma red with weak infuscation on first tergum and sides of second and of apical terga. (16) Face shining, clypeus with minute punctures on polished ground. (20) Interocellar distance greater than ocellocular distance. (25) Upper margin of clypeus concave but suture demarking this margin very delicate and difficult to see. (33) Face rather elongate, malar area fully as long as width of scape. (37) First flagellar segment as long as or longer than width; middle flagellar segments about 1.5 times as long as wide.

Comparative Comments. In the extensive lateral face marks of the female this form differs from all other *Allodapula*, being approached only by *A. jucunda.* The yellow mandibular patch is also a unique feature in the genus *Allodapula.* The yellow area on the apex of the front femur is

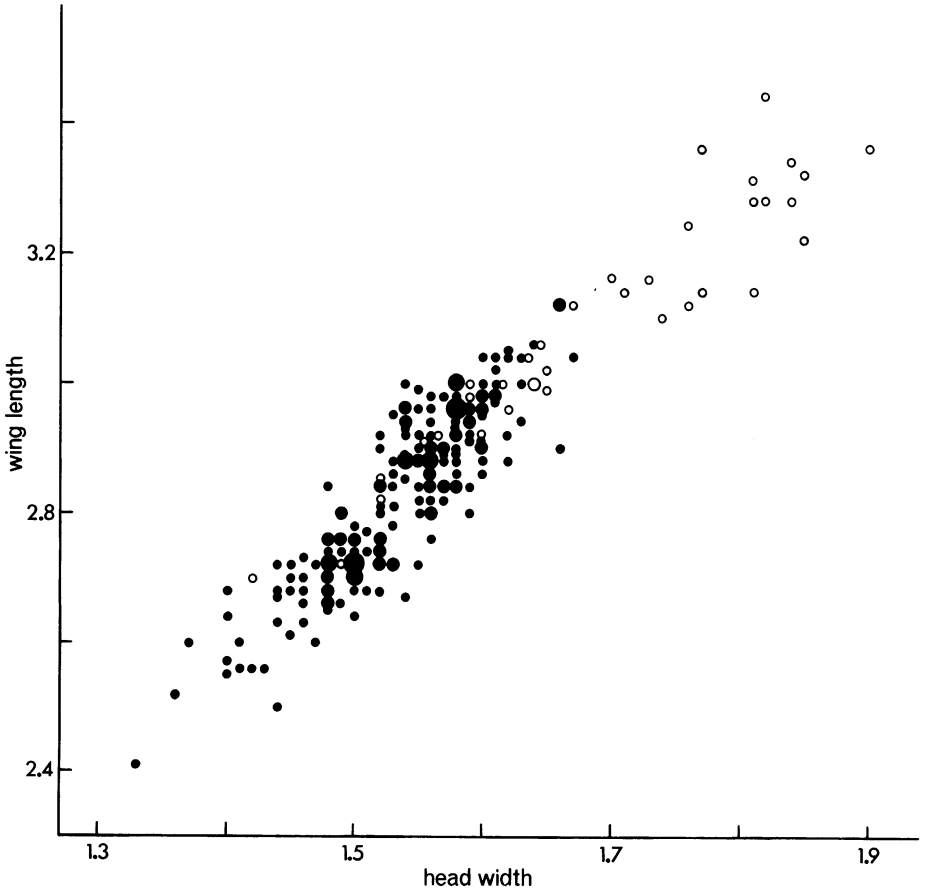


FIG. 510. *Allodapula melanopus* from western Cape Province and *A. turneri.* Scatter diagram of wing lengths and head widths (mm.) based on data assembled for biological studies (Michener, 1971a). *A. melanopus*, black dots, *A. turneri*, circles. A small symbol indicates the coordinates for a single specimen; progressively larger symbols indicate two, three, or four specimens having the same coordinates. The average size difference shown here strengthens the view that these two sympatric forms may be distinct species.

similar, not only in its presence but in its shape, in *A. variegata*, *rozeni*, *jucunda*, and *ornaticeps*.

In the original description emphasis was placed on the proximity of the clypeus to the antennal bases, but this was an error as the distance is but little less than in *Allodapula variegata* and others.

Distribution. Western to middle southern Cape Province. SOUTH AFRICA: *Cape Province*: Pakhuis Pass near Clanwilliam; Vogelfontein, Prince Albert Division.

Allodapula xerica Michener
Figures 489-492, 513-515

Allodapula xerica Michener, 1971a, p. 298. (Type ♀, AMNH, from 11 km. W of Robertson, Cape Province, 275 m. altitude.)

Description. Female. (1) Length 6-7 mm.; forewing length 4.5 to nearly 5 mm. (2-12) Black, the following parts pale yellow: broad band across upper part of clypeus extending downward medially as sharp point, large area on posterior pronotal lobe. Rest of pronotum black, or in some paratypes with transverse pale yellow streak on each dorsolateral angle, sometimes forming transverse pale yellow band, broken medially. Flagellum brown beneath. Tibiae and tarsi blackish brown or bases and apices of tibiae somewhat paler; anterior surface of anterior tibia brown to yellowish brown. Tegula translucent brown; median sclerite of wing base dark brown, in some with yellow streak. Metasoma largely red to reddish black. (13) Wings clear, veins and stigma brown. (14) Dorsal hairs of terga 4-6 short, curved, thickened, blunt, longer on 4 than on 5 and 6, dusky on 4, usually pale but sometimes dusky on 5 and 6. (16) Clypeus with numerous rather small punctures on slightly roughened to shining ground; hairs mostly short as seen in profile. (20) Interocellar distance distinctly greater than ocellocular distance. (25) Upper margin of clypeus distinctly concave. (27) Clypeoantennal distance less than half diameter of antennal socket. (33) Malar area about or slightly more than half as long as diameter of scape. (37) First flagellar segment slightly broader than long or as long as broad; middle flagellar segments about as long as broad or slightly longer than broad.

Male. Similar to female except as follows: (1m) Length 6 mm.; forewing length 5 mm. (2m-12m) Black, the following parts bright yellow: clypeus, labrum, mandible except rufescent apex, paraocular area up to level of middle of antennal socket, scape, underside of antennal pedicel, broken pronotal band, pronotal lobe, legs except coxae (or distal parts of coxae also yellow). Tegula transparent with yellow spot; median sclerite of wing base with yellow costal area, dark brown otherwise. Metasoma reddish brown, infuscated on segments 1 and 4-7. (29m) Lower clypeocular distance about two-thirds width of scape, upper about equal to width of scape. (33m) Malar area linear, about one-sixth as long as diameter of scape. (37m) First flagellar segment much broader than long. (58) Anterior basitarsus slightly longer than segments 2-4 together, these segments about as broad as basitarsus. Mid-basitarsus longer than or shorter than remaining tarsal segments together; hind basitarsus tapering almost throughout, less than three-fourths as long as tibia, small segments taken together over two-thirds as long as basitarsus. (59) Legs more robust than in *Allodapula dichroa*, the rather sparse plumose hairs on undersides of hind trochanter and femur as long as diameters of these segments. (60) Eighth tergum with convex areas not or scarcely convoluted. (61) Sixth sternum with surface biconvex. Seventh and eighth sterna probably much as in *hessei* but damaged in available specimens. (62) Gonobase long (fig. 490). (63) Ventroapical gonocoxal plate without setae (fig. 490). (64) Gonostylus seemingly pectinate because of numerous coarse blunt hairs, its basal (ventral) lobe with scattered hairs. (65) Penis valves with group of peglike hairs.

Distribution. Known only from the type locality.

Allodapula maculithorax Michener
Figures 516-519

Allodapula maculithorax Michener, 1971a, p. 299. (Type ♀, AMNH, from Hout Bay, Cape Province.)

Description. Female. Similar to *Allodapula xerica* except as follows: (1-12) Pronotum with medially broken pale yellow band (both sexes); scutellum with large, almost round or longitudinally elongate, median pale yellow spot (both

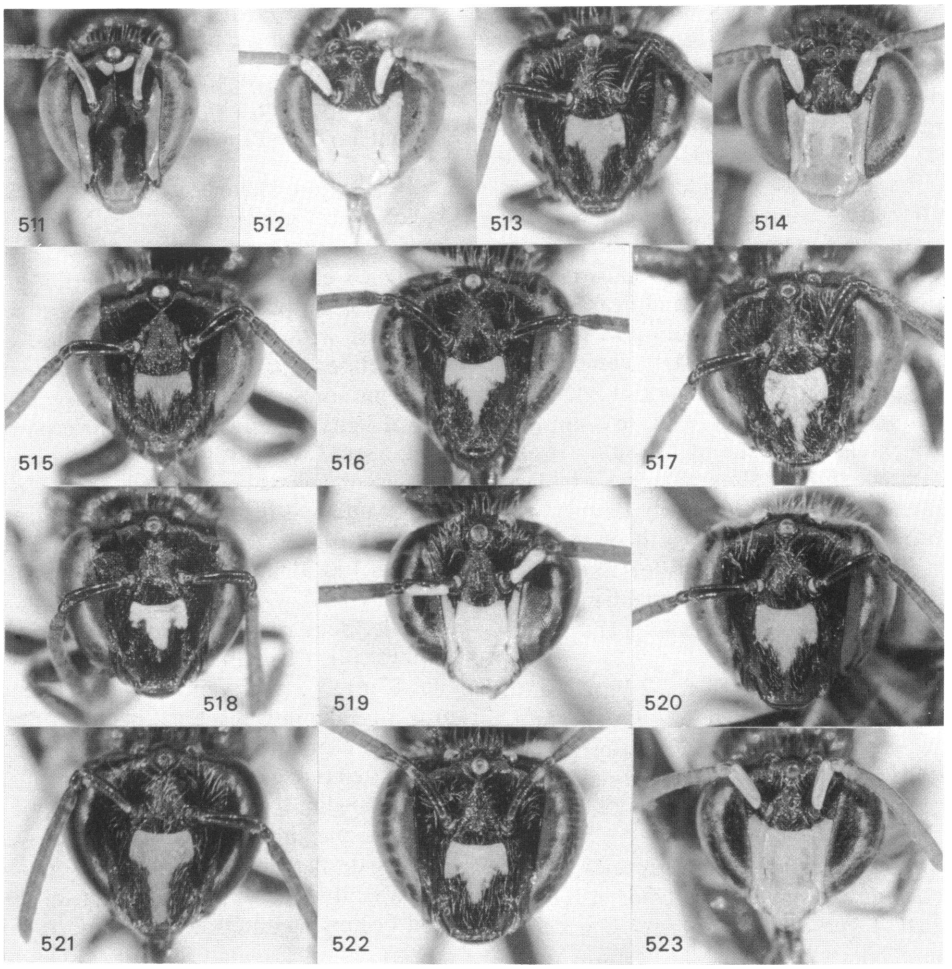


FIG. 511. *Allodapula ornaticeps*, facial view of female holotype, west side of Pakhuis Pass, near Clanwilliam, Cape Province.

FIG. 512. *Allodapula palliceps*, facial view of male, Willowmore, Cape Province.

FIGS. 513-515. *Allodapula xerica*, facial views, holotype female, allotype male, and paratype female, Robertson, Cape Province.

FIGS. 516-519. *Allodapula maculithorax*, facial views. 516. Holotype female, Hout Bay, Cape Province. 517, 518. Paratype females, Cape Town, Cape Province. 519. Allotype male, Cape Nature Reserve, Cape Peninsula, Cape Province.

FIGS. 520-523. *Allodapula hessei*, facial views, west side of Pakhuis Pass, near Clanwilliam, Cape Province. 520. Holotype, female. 521, 522. Paratype, females. 523. Allotype, male.

sexes). Flagellum brownish black throughout. Tibiae and basitarsi black, small segments of tarsi brownish black. Tegula blackish. Median axillary sclerite black. Metasoma darker red, terga more infuscated medially, or fully red as in *A. xerica* in specimens from Cape Town. (20) Interocellar distance but little greater than ocellocular distance. (37) Middle flagellar segments longer than broad.

Male. Similar to *Allodapula xerica* except as

follows: (2m-12m) Yellow areas pale yellow rather than bright yellow. Labrum infuscated laterally; mandible black with only small antero-basal yellow spot, distal half red-brown. Black extending down between upper margin of clypeus and yellow of paraocular area for some distance. Scape yellow on underside only. Legs black with the following areas pale yellow: apical area on posterior surface of front femur (shaped as in *A. variegata*), streak on undersurface of apical half of middle femur, outer apical areas on tibiae (that of front tibia sometimes extending basally nearly to middle of tibia), basitarsi. Small tarsal segments testaceous. Anterior sides of tibiae with red-brown, most extensive on fore tibia, least extensive or absent on hind. Tegula dark translucent brown. Metasoma reddish black to red. (29m) Upper and lower clypeocular distances both about two-thirds width of scape or the lower about half width of scape. (58) Middle tarsus with small segments taken together shorter than basitarsus. (60-65) Male genitalia and associated structures as in *A. hessei.*

Distribution. Southwestern Cape Province, in Cape macchia. SOUTH AFRICA: *Cape Province*: Cape Nature Reserve, Cape Peninsula; Cape Town; Hout Bay; Pearly Beach, Bredasdorp; Ysterfontein near Saldanha Bay; Zeekoevlei, Cape Flats.

Comparative Comments. This species differs from *Allodapula xerica* largely in color; it is quite possible that *A. maculithorax*, *hessei*, and *xerica* are a single species. However, they are quite different in spite of proximity of localities and are not known to intergrade. The only reasonable procedure at this time is to consider them separate species.

Five females in the South African Museum from Pakhuis Pass near Clanwilliam are similar to *maculithorax* except for the yellow underside of the scape, yellow median axillary sclerite, brown on the tibiae, and yellow on the underside of the apex of the fore femur. They presumably represent a new species but are of the *maculithorax-hessei-xerica* group. They were collected with specimens of *hessei*, with which they do not intergrade, a fact that supports the idea of specific distinctness for the members of this group.

Allodapula hessei Michener
Figures 449, 493, 520-523

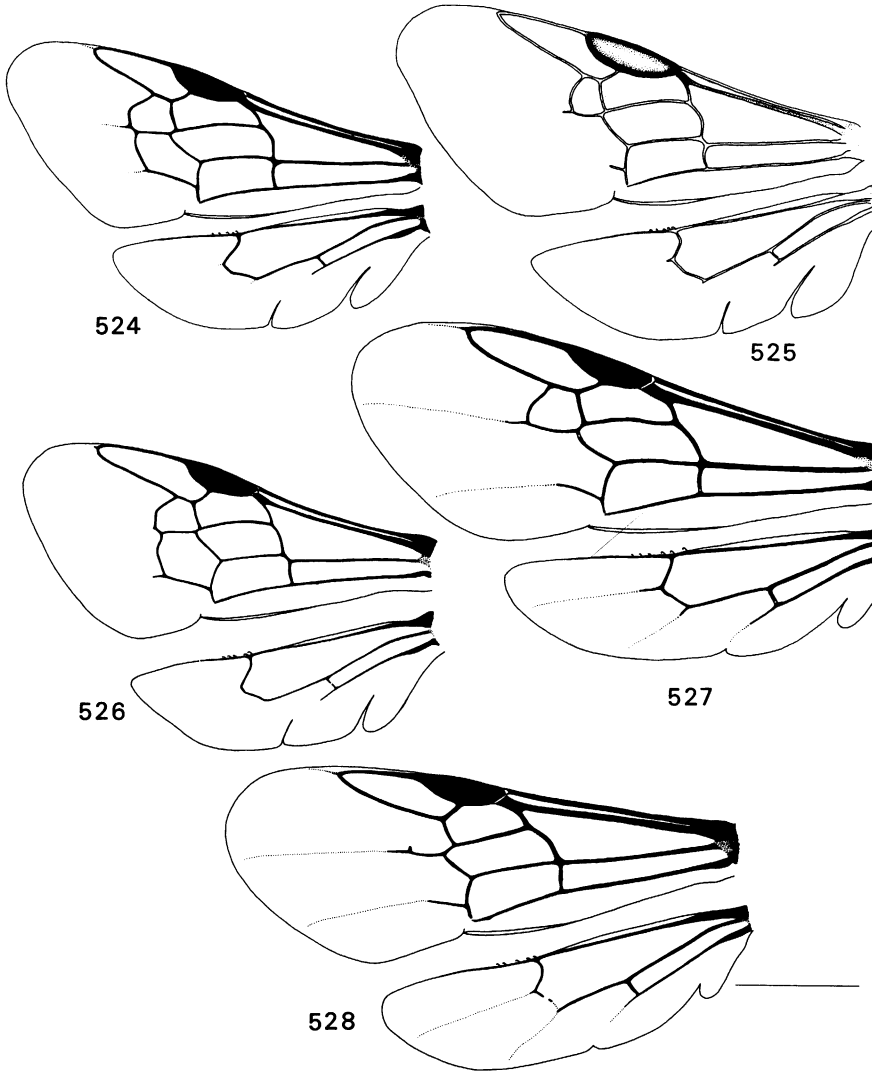
Allodapula hessei Michener, 1971a, p. 298. (Type ♀, AMNH, from Pakhuis Pass near Clanwilliam, Cape Province.)

Description. Female. Similar to *Allodapula xerica* except as follows: (2-12) Yellow pronotal band unbroken or nearly so. Tibiae black or nearly so except for brown anterior surface of front tibia in most specimens. Median sclerite of wing base with costal part often broadly yellowish. Metasoma black, sometimes with dark red suffusion on second and third segments. (14) Dorsal hairs on terga 5 and 6 pale on all specimens seen. (16) Clypeal punctures slightly coarser, almost as coarse as in *A. acutigera.* (27) Clypeoantennal distance about half diameter of antennal socket (both sexes.) (33) Malar area slightly less than half as long as diameter of scape.

Male. Similar to *Allodapula xerica* except as follows: (1m) Length 5 mm. (teneral specimens). (2m-12m) Pronotal yellow band broad and unbroken, laterally reaching yellow of pronotal lobe. Scutum with yellow laterally, in one specimen extending full length of lateral margin, in the other limited to area in front of tegula; posterior margin of scutum with transverse yellow band, narrowed medially, or two yellow spots. Scutellum with broad transverse yellow band occupying anterior half or more. Coxae (as well as rest of legs) largely yellow; median parts of tibiae and streak on upper posterior side of hind femur darkened. (The specimens are callow and the mature coloration is not certain but presumably these areas become infuscated.) Median sclerite of wing base yellow with dark median streak. Infuscation of metasoma doubtful, perhaps absent. (29m) Upper clypeocular distance less than width of scape. (58) Anterior basitarsus subequal in length to remaining segments of tarsus, taken together. (This is not a convincing character and I doubt that the tarsal proportions really differ from those of *xerica.*) Mid basitarsus longer than remaining segments taken together. (60-65) Genitalia and associated structure may not differ from those of *xerica* but the only two specimens differ from the single

dissected male of *xerica* in the rounded rather than truncate apical projection of the ventro-apical gonocoxal plate and in the longer sub-apical hairs on the basal lobe of the gonostylus.

Comparative Comments. This species is close to *xerica* and perhaps differs from it only in coloration, none of the morphological differences being either great or readily measurable. Additional material may show that *xerica* and *hessei* intergrade. Females are very similar to *acutigera* and differ principally by the pale pronotal band. The brown anterior surface of the



FIGS. 524-528. Wings. 524. *Halterapis nigrinervis.* 525. *Compsomelissa stigmoides.* 526. *Nasutapis straussorum.* 527. *Eucondylops konowi.* 528. *Eucondylops reducta.*

Scale line represents 1.0 mm.

front tibia which distinguished females of the type series is not evident in all females of a topotypic series in the South African Museum. If the pronotal band proves variable, some females of *hessei* may not be distinguishable from *acutigera.*

Distribution. SOUTH AFRICA: *Cape Province*: Liebendal, near Klawer; Pakhuis Pass near Clanwilliam.

The single specimen from Liebendal in the South African Museum is a female distinguishable from *acutigera* only by the pale pronotal band; in the absence of males the locality may be dubious.

Allodapula palliceps (Friese), new combination
Figures 494-496, 512

Allodape palliceps Friese, 1924, p. 74. (Type ♂, Berlin, from Willowmore, Cape Province.)

Description. Male. Similar to *Allodapula xerica* except as follows: (2m-12m) Base of mandible dark (brown in specimen before me but probably nearly black in fully colored specimen); pronotal yellow band broad and complete; apices of coxae yellow. Median sclerite of wing base all yellow. Flagellum brown above, light brown beneath. (29m) Face broader than in *A. xerica*, lower clypeocular distance fully as great as width of scape, upper about one and a half times width of scape. (33m) Malar area anteriorly over half as wide as diameter of antennal scape. (58) Front and middle tarsi with small segments taken together about as long as corresponding basitarsi. (59) Hairs of hind trochanter and especially femur shorter than diameters of these segments. (60) Eighth tergum with convex areas somewhat convoluted. (61) Sixth sternum apparently not biconvex. (62) Gonobase short. (64) Gonostylus short with only two or three long blunt hairs.

Comparative Comments. The wider face, the shorter gonostyli and other genitalic differences, and the complete pronotal band are the best evidence that this form is distinct from those of western Cape Province. Unfortunately the female is unknown, and the species has not been taken in recent years.

Distribution. Known only from the type locality.

Allodapula (?) *brunnescens* (Cockerell)

Allodape brunnescens Cockerell, 1934b, p. 252. (Type ♂, BM, Willowmore, Cape Province. Placed in *Allodapula* by Cockerell, 1936a.)

I have seen only the type of this species, which appears to belong to this group, although the genitalia have not been examined. The following comments are based on my notes made in London. The face marks are like those of *Allodapula xerica*, the clypeus, labrum, mandibles, and paraocular areas up to the antennae being yellow. The upper margin of the clypeus is not uniformly concave, being medially convex as in many specimens of *A. variegata.* More noticeable, the clypeoantennal distance is about as long as the diameter of the antennal socket, so that the clypeus does not closely approach the socket and the yellow of the paraocular area has a rather long mesal margin on the subantennal suture between the clypeus and the antenna. The scape is pale yellow beneath. The legs lack yellow, being black with the tibiae reddish brown, the posterior ones infuscated except apically, the tarsi reddish brown, the anterior ones testaceous.

GENUS *HALTERAPIS*

Halterapis Michener, 1969a, p. 289. (Type species: *Allodape nigrinervis* Cameron, by original designation.)

This small genus, confined to southern Africa, is so like *Braunsapis* and *Allodapula* in external adult characters that it would scarcely have been recognized except on the basis of the male genitalia or the unusual, mass provisioned larvae. It consists of minute species, one of which Brauns (1926) recorded without a specific name as a mass provisioner of nests rather than a progressive feeder.

Description. Agrees with description of *Braunsapis* except as indicated below. (Parts of the *Braunsapis* description in parentheses should be disregarded in determining Halterapis characters.)

Female. (1) Length 3.5-5 mm.; forewing length 3-4 mm. (2) Body black, metasoma sometimes red. (3, 4) Face marks as in *Braunsapis* but clypeus never wholly yellow or white and lateral face marks entirely absent. (6, 7) Labrum, mandible, and scape without yellow or white. (9) Tegula transparent pale brown, often with white spot; axillary sclerites pale brown or median one half yellow or white, half blackish. (11) Legs black or partly or wholly red. (12) Tergal margins concolorous or nearly so; terga without pale fasciae or maculation. (13) Wings rather clear, veins and stigma brown to blackish. (15) Clypeal form as in *Braunsapis* but lower lateral part of clypeus less strongly curved backward. (19) Antennal bases above level of middle of eyes; interantennal distance somewhat greater than antennocular distance. (20) Vertex behind ocelli slightly convex as seen from front; interocellar distance equal to or more than ocellocular distance; ocelloccipital distance less than ocellar diameter. (23) Antennal depression not always obviously delimited above, but to the extent that it is delimited, it is by the V-shaped elevation in front of median ocellus, not by ridge diverging from eye margin. (25) *Upper clypeal margin strongly concave, more strongly so than in sympatric species of* Braunsapis. (29) Lower clypeocular distance equal to or less than width of scape; upper clypeocular distance about one and a half to two times width of scape. (31) Genal area narrower than or equal to eye width, more declivous behind summit of eye than in most *Braunsapis.* (32) Eye twice as long as wide or longer. (33) Malar area about half as long as width of scape. (37) Flagellum over twice as long as scape, first and penultimate segments longer than broad, four to seven segments broader than long. (38) Apical width of mandible half or less than half of basal width. (42) Maxilla as in *Braunsapis* but *palpus almost six times as long as galeal width* (segments subequal in length). (43) Stigma as in *Braunsapis*, costal margin of marginal cell about as long as distance from apex of cell to wing tip. (46) Venation as in *Braunsapis* but *petiole of discal cell shorter.* (52) Basitibial plate as in *Braunsapis*, in *H. nigrinervis* fully defined at apex. (55) Tergum 6 flattened or gently convex in cross section, straight or upturned at apex in profile, *extreme apex smooth, shining, narrowly rounded, neither notched nor with pygidial plate.* (56) Posterior lateral margins of tergum 6 rounded (not broadly) in section, an abrupt change in vestiture from that of dorsum to that of venter along this margin. (57) Tergal graduli of the usual *Braunsapis* pattern, that of tergum 5 reaching nearly to tergal margin.

Male. Similar to female except as follows: (1m) Length 3.5-4.5 mm.; forewing length 3-3.5 mm. (3m) Clypeus wholly yellow or white. (4m) Lateral face marks often represented by small yellow area on lateroclypeal carina. (6m) Labrum white or yellow; mandible sometimes yellowish apically. (7m) Scape white or yellow beneath. (15m) Lower lateral part of clypeus only gently curved back. (19m) Antennal bases situated as in female but interantennal distance over twice antennocular distance. (20m) Vertex behind ocelli slightly concave (*H. nigrinervis*) to strongly convex (*H. angustula*) as seen from front; interocellar distance greater than, in *H. nigrinervis* twice, ocellocular distance; ocelloccipital distance less than ocellar diameter. (23m) Antennal depression as in female but V-shaped elevation in front of median ocellus stronger. (26m) Upper clypeal margin twice as wide as paraocular area or more. (27m) Clypeoantennal distance as in female or in *H. nigrinervis* much less than diameter of antennal socket. (28m) Anterior tentorial pits below level of middle of clypeus. (29m) Lower clypeocular distance less than width of scape; upper clypeocular distance about equal to width of scape. (31m) Genal area narrower than eye width, declivous behind summit of eye especially in *H. nigrinervis.* (32m) Eye less than twice as long as wide. (36m) Scape sometimes less than four times as long as wide. (37m) Flagellum three to more than four times as long as scape, first segment about as broad as long to broader than long, penultimate segment about as broad as long to longer than broad, 5 to 7 segments broader than long. (38m) Apical width of mandible less than half width at base. (39m) Apex of mandible rounded. (58) Front tarsus ordinary or slightly elongate, not broadened; undersides of segments 2-4 with vestiture of fine, short hairs; basitarsus shorter than tibia, equal to or shorter than remaining tarsal segments together; fourth segment longer than broad. (59) Hind trochanter simple or with a ventral median

prominence; hind femur rather hairy on underside basally, simple or with postmedian angle on underside. (61) Seventh and eighth sterna as usual in *Braunsapis* but sometimes with a hair or two on margin of seventh sternum. (62) Gonobase as in *Braunsapis*. (63) Gonocoxite somewhat longer than wide with strong dorsal apical mesal lobe; *ventral apical plate well developed, with long projection bearing blunt hairs just above gonostylus, and long thin mesal projection near inner edge of penis valve.* (64) *Gonostylus laterally flattened, over three times as long as wide, sometimes with one or two setae on outer surface.* (65) Penis valve moderately curved downward, extending to or beyond apices of gonostyli, with setae and sometimes with pegs on lateral median projection.

KEY TO THE SPECIES OF *HALTERAPIS*

1. Basitibial plate of female distinctly delimited by carina at apex; hind trochanter and femur of male without areas of dense hair 2
   Basitibial plate of female absent; distal half of hind trochanter and basal half of femur of male with rather dense white hairs on underside . . . . . *angustula*
2. Hind tibia of female red; genal area of female nearly as wide as eye . . . . . *quadratifera*
   Hind tibia black or largely so; genal area of female markedly narrower than eye . . . . . *nigrinervis* group

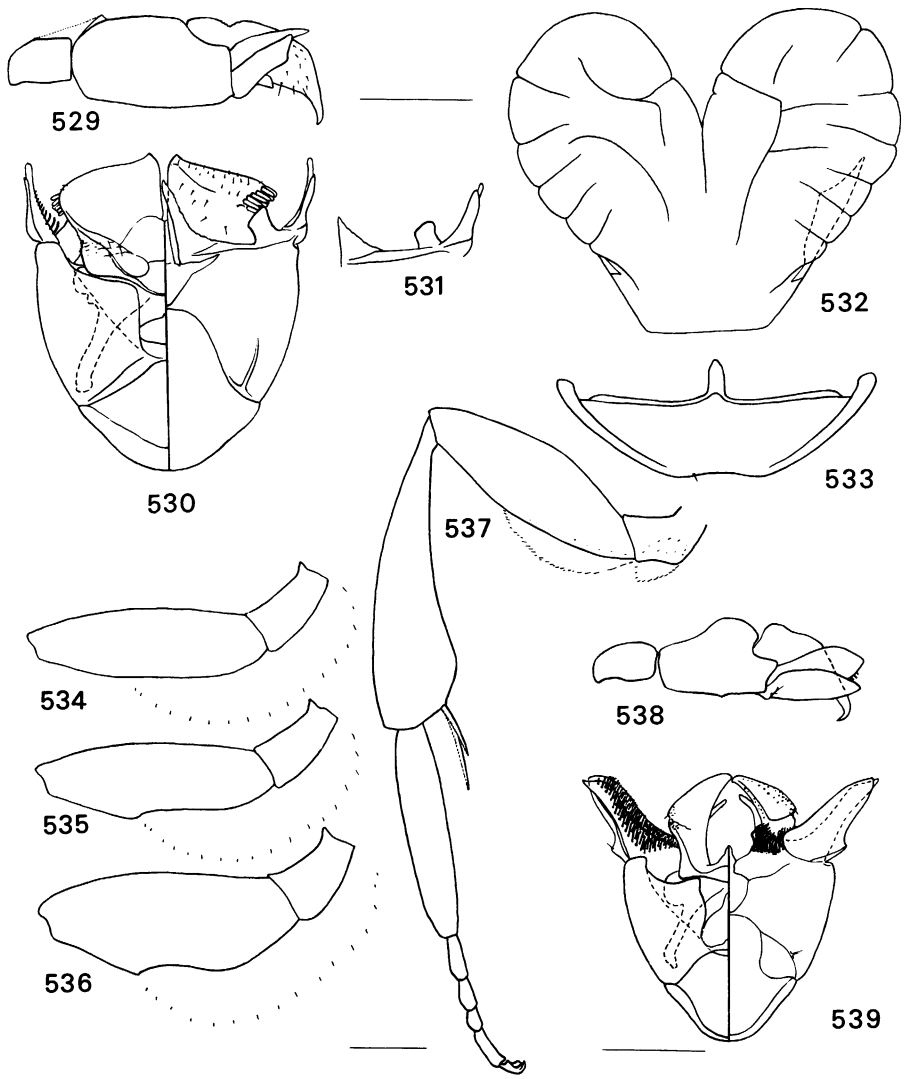
Halterapis nigrinervis (Cameron) Group
Figures 524, 529-536, 540-546

Because of certain characters of males noted in the discussion of variation below, it seems premature to decide that only one species is involved in the present account. Yet because most of the types are females not showing the possible specific characters, appropriate names for the two male forms cannot now be determined. Hence I use the expression "*nigrinervis* group" when referring to the one or two species involved. *Halterapis quadratifera* is a member of the same complex and quite possibly a synonym of *nigrinervis* but, since it is known from only one specimen which may be specifically distinct, it has been practical to treat it separately.

The following synonymy, then, quite possibly relates to two species rather than one.

Allodape nigrinervis Cameron, 1905b, p. 246. (Type ♀, BM, from Pearston, Cape Province. Placed in *Halterapis* by Michener, 1969a.)
Allodape pogonias Strand, 1915, p. 46. (Lectotype ♀, here designated, Berlin, labeled "Capland Krebs S.")
Allodape nigrescens Friese, 1924, p. 77. (Lectotype ♀, here designated, Berlin, from Grootfontein, Cape Province; male from Algoa Bay associated with lectotype by Friese is *Allodapula variegata*.)
Allodape aliceae Cockerell, 1933a, p. 49. (Type ♀, BM, from Uitenhage, Cape Province.)
Allodape luckhoffi Cockerell, 1933a, p. 56. (Type ♀, BM, from Graaff-Reinet, Cape Province.)
Allodape basipicta Cockerell, 1934b, p. 255. (Type ♂, BM, from Port St. Johns, Transkei.)
Allodape clarior Cockerell, 1934b, p. 258. (Type ♀, BM, from Port St. Johns, Transkei.)
Allodape obscurescens Cockerell, 1934b, p. 257. (Type ♀, BM, from Port St. Johns, Transkei.)
Allodapula flavolateralis Cockerell, 1936a, p. 8. (Type ♂, AMNH, from Uitenhage, Cape Province.)
Allodapula luckhoffi microsoma Cockerell, 1936a, p. 14. (Type ♀, AMNH, from Graaf-Reinet, Cape Province.)
Allodapula nigritula Cockerell, 1936a, p. 17. (Type ♀, AMNH, from Calvinia, Cape Province.)
Allodapula peratra Cockerell, 1936a, p. 18. (Type ♀, AMNH, from Oudtshoorn, Cape Province.)
Allodapula badeni Cockerell, 1939b, p. 40. (Type ♀, BM, from Mafeking, Cape Province.)
Allodapula powelli Cockerell, 1939b, p. 39. (Type ♂, BM, from Mafeking, Cape Province.)

Description. Female. (1) Length 3.5-5 mm.; forewing length 3-4 mm. (2-12) Black, the following parts yellow to whitish: clypeal mark (varying in form and rarely absent, see illustrations and Variation), posterior lobe of pronotum (varying to black), commonly spot on anterior part of tegula and part of median axillary sclerite. Flagellum dark brown beneath (both sexes). Tarsi dark brown, often infuscated. Metasoma sometimes red (both sexes, see Variation). (14) Dorsal hairs on terga 4-6 usually white, curved, thickened, blunt, rather short, more slender and



FIGS. 529-536. *Halterapis nigrinervis* group, male. 529, 530. Lateral, dorsal, and ventral views of genitalia, Pietermaritzburg, Natal. 531. Ventral view of ventroapical plate of gonocoxite, 16 km. N of Grahamstown, Cape Province. 532. Eighth tergum and roof of genital chamber. 533. Seventh and eighth metasomal sterna. 534-536. Lateral views of hind trochanters and femora, 16 km. N of Grahamstown, Cape Province; Hellahella, 21 km. SW of Richmond, Natal; and Nagle Dam, 27 km. E of Pietermaritzburg, Natal.

FIGS. 537-539. *Halterapis angustula*, male, 64 km. E of Knysna, Cape Province. 537. Lateral view of hind leg. 538, 539. Lateral, dorsal, and ventral views of genitalia.

Scale lines represent 0.25 mm. Separate lines serve for figures 529-533, 534-537, 538 and 539.

brown in material from the Cape Peninsula (both sexes). (27) Clypeoantennal distance about half diameter of antennal socket (both sexes, yellow in female usually separated from socket by distance nearly equal to diameter of socket). (51) Hind trochanter unmodified. (52) *Basitibial plate demarked by a strong carina*, carina highest at apex of plate.

Male. (1m) Length 3.5-4.5 mm.; forewing length 3 mm. (2m-12m) Black, the following parts yellow to whitish: clypeus, sharply constricted just below middle; usually small paraocular mark adjacent to lower part of clypeus; labrum; underside of scape; basitarsi (rarely brownish). Pronotal, tegular, and median axillary areas as in female. Distal part of mandible yellowish brown. Middle and distal segments rather light brown. (29m) Upper part of clypeus scarcely narrower than lower part and little farther from eye than lower part. (33m) Malar area less than half as long as width of scape. (37m) Middle flagellar segments as long as wide or slightly longer than wide. (58) Front basitarsus much shorter than tibia, slightly shorter than remaining tarsal segments taken together, the latter the same width as basitarsus. (59) Legs rather slender, hind trochanter simple, hind femur usually with postmedian angle on underside (figs. 535 and 536), undersides of these segments with sparse plumose hairs about as long as diameters of these segments; hind basitarsus about parallel-sided, more than half as wide as tibia, about 0.65 times length of tibia, twice as wide as following tarsal segments, slightly longer than rest of tarsus; middle basitarsus also much shorter than tibia, subequal to remaining tarsal segments taken together. (63) Ventroapical plate of gonocoxite with heavily sclerotized sublateral apical projection and thin mesal apical projection; lateral projection flat like gonostylus and bearing a series of mesally directed blunt hairs. (65) Penis valves large and thick, with large peglike setae.

Distribution. South Africa, nearly all areas except probably the driest ones, north to Rhodesia. SOUTH AFRICA: *Cape Province*: BoKouga, Uniondale District; Calvinia; Cape of Good Hope; Cape Town; East London; Fort Beaufort; Fort Brown; Graaff-Reinet; Grahamstown; 16 km. N and 27 km. NW of Grahamstown; Grootfontein; Hout Bay; Jeffreys Bay; Kenton-on-sea; 64 km. E of Knysna; Kommetjie; Loerie; Mafeking; Oudtshoorn; Papiesfontein, Gamtoos Mouth; Pearly Beach, Bredasdorp; Pearston; Perdepoort, 18 km. SE of Greystone, 500 m. altitude; Port Elizabeth; Resolution, Grahamstown; Sandflats, 280 m. altitude; Sundays River; Sunland; 29 km. SE of Touwsrivier; Uitenhage; Waterloo Bay; Willowmore; 16 km. SW of Willowmore; Worcester; Ysterfontein near Saldanha Bay. *Transkei*: Port St. Johns. *Natal*: Hellahella, 21 km. SW of Richmond on Umkomaas River, 730 m. altitude; Hluhluwe Wildlife Reserve, Zululand, 460 m. altitude; Nagle Dam, 27 km. E of Pietermaritzburg; Pietermaritzburg; 18 km. S of Pietermaritzburg; St. Lucia Estuary, Zululand. *Transvaal*: Magoebaskloof (northern Transvaal). RHODESIA: Matopo Hills near Bulawayo.

Variation. Although commonly black, the metasoma is red in some specimens from the Uniondale district to Port St. Johns. No such specimens were reared from nests with specimens having the metasoma black. The decision that specimens with red are probably not specifically different from those without red is based on the lack of other differences and the existence of a few (e.g., the type of *obscurescens*) with the metasoma dusky red. A series from Sandflats in eastern Cape Province contains specimens with black, intermediate, and fully red metasomas. Names based on specimens having red on the metasoma are *aliceae*, *basipicta*, *clarior*, *nigrescens*, and *obscurescens*.

The clypeal mark of the females varies greatly, being whiter in some (e.g., the type of *badeni*) than in others. In most specimens from Natal and the eastern Cape Province, the lower part of the clypeal mark is rather broad, but it is sometimes narrowed and even almost pointed below. In specimens from the western Cape Province it is almost always sharply pointed below; series from Willowmore and 64 km. W of Knysna have both types intermixed. In Cape Province the clypeal mark may be further reduced, limited to the upper part of the clypeus, represented by only flecks of yellow across the upper edge of the clypeus (as in type of *peratra*), or completely absent (as in type of *nigritula*, a specimen from 29 km. SE of Touwsrivier, and a few of the specimens from Willowmore). Such dark speci-

mens may be most abundant in arid areas of Cape Province.

The posterior lobes of the pronotum are yellow in Natal and most localities in eastern Cape Province and in a series (with red metasomas) from 64 km. E of Knysna. Series from Willowmore and another from Sandflats, eastern Cape Province, have these lobes yellow or partially yellow to entirely black. Most specimens from the western Cape Province have them black, but one male from Hout Bay on the Cape Peninsula has them largely yellow; they are black in other specimens from the same and nearby localities.

The tegulae and median axillary sclerites are darker, often wholly infuscated, in the west; paler, the tegulae usually translucent and with a yellow spot, the median axillary sclerite usually half white, in specimens from the eastern Cape Province and Natal. The Willowmore series contains specimens of the eastern type but most have infuscated tegulae, as do those from 64 km. E of Knysna. Dark tegulae as well as median axillary sclerites are found in specimens from Touwsrivier, Worcester, the Cape Peninsula, and the like.

The basitarsi of the male are ordinarily pale yellow but in one of the three males available from the Cape Peninsula they are brownish, like the remaining tarsal segments, and in another the anterior basitarsi are brownish.

The pale, blunt hairs of the dorsum of the apical terga of the female are broader and whiter in specimens from Natal and the eastern Cape Province, more slender and browner in specimens from Willowmore and Knysna westward, becoming most slender in those from the Cape Peninsula, Worcester, Calvinia, and other such localities.

The possibility that two or more species are included in this discussion led to the use of the expression "*nigrinervis* group." The characters listed below are those most suggestive of a composite group rather than a single species. Males have the hind femur with a distinct angle at or usually beyond the middle throughout the eastern part of the range, as well as at the following localities in the eastern or middle Cape Province: BoKouga in the Uniondale District; Fort Brown; Grahamstown; 64 km. E of Knysna; Loerie; Port Elizabeth; Resolution near Grahamstown; and Willowmore. All three males seen from the Cape Peninsula, the only male from Pearly Beach near Bredasdorp, and the only one from 16 km. N of Grahamstown have the femora simple. Associated with the simple femora is reduction of the long, mesoapical bladelike projection of the ventroapical plate of the gonocoxite (fig. 531). No associated female characters have been found. The series (1 ♂, 4 ♀) from 16 km. N of Grahamstown agrees with other material from eastern Cape Province, some of it with males of the other type, and not with material from the Cape Peninsula, in the color characters listed above. If two species are involved they appear to overlap broadly and their color variation seems to be parallel, not providing specific characters in the area of overlap. Males are scarce in collections, and since distinguishing features of the two possible species have been found only in males, the placement of numerous names based on females from Cape Province is currently not possible.

Even among males with the angle on the hind femur there is much variation in thickness of the femur (figs. 535, 536). Males with thick femora as in figure 536 are scarce but have been seen from localities as far apart as Nagle Dam, 27 km. E of Pietermaritzburg, Natal, and Port Elizabeth, Cape Province. No genitalic or other characters are known to be associated with this femoral feature which is therefore probably not a specific character.

Halterapis quadratifera (Cockerell), new combination

Allodape quadratifera Cockerell, 1934b, p. 257. (Type ♀, BM, from Port St. Johns, Transkei.)

This form is similar to and perhaps only an extreme variant of the *Halterapis nigrinervis* group. It is known only from the female type specimen. The metasoma is red, like some *H. nigrinervis* from the same locality, but unlike such specimens of *H. nigrinervis*, the tarsi, base and apex of the fore tibia, and the whole hind tibia are red. It also has an unusual amount of yellow on the clypeus, the entire upper half being yellow, and the band extending thence downward to the clypeal apex being very broad. The genal area is nearly as wide as the eye seen

from the side; it is variable but narrower in *H. nigrinervis*. The median axillary plate is wholly pale (partially to wholly dark in *H. nigrinervis*).

The species is placed in *Halterapis* because of its similarity to *H. nigrinervis*, including the concave upper margin of the clypeus and the evident apex of the basitibial plate.

Halterapis angustula (Cockerell)
Figures 537-539, 547-549

Allodape angustula Cockerell, 1934b, p. 256. (Type ♀, BM, from George, Cape Province, headless. Transferred to *Halterapis* by Michener, 1970a.)

Description. Female. (1) Length 4-5 mm.; forewing length 3.5-4 mm. (2-12) Head and thorax black, the following parts yellow: clypeal mark, posterior lobe of pronotum. Tegula transparent light brown (both sexes). Median axillary sclerite light brown (both sexes). Labrum brown, infuscated marginally. Base and apex of scape brown; flagellum dark brown or brownish black beneath (both sexes). Front tibia red, infuscated to black medially; middle tibia usually red basally and apically, otherwise black; tarsi reddish brown; hairs of upper surfaces of hind tibia and basitarsus infuscated, paler apically. Metasoma red, first segment largely black, dusky area at side of second, less commonly bases of second and third terga, or entire second and third terga except for testaceous apical margins, black. (14) Dorsal hairs of terga 4-6 black to light yellowish brown, blunt, curved, rather slender (both sexes). (27) Clypeoantennal distance as long as diameter of antennal socket (both sexes). (51) Inner surface of hind trochanter with weak, blunt angle just beyond middle. (52) *Basitibial plate not recognizable.*

Male. (1m) Length 4 mm.; forewing length 3.5 mm. (2m-12m) All specimens callow so that body is dark brown; in mature specimens probably black or metasoma with limited reddish suffusion rather than red as in female. The following parts yellow: clypeus, sometimes small paraocular mark adjacent to lower part of clypeus, labrum, apical third of mandible (perhaps reddish in mature specimens), underside of scape, pronotal lobe. Front tibia red, sometimes infuscated medially; mid- and hind tibiae red at bases and apices; tarsi light reddish brown. (29m) *Upper part of clypeus markedly narrower than lower part, more than twice as far from eye as lower part.* (33m) *Malar area linear.* (37m) Middle flagellar segments about as wide as long. (58) Front basitarsus about 0.72 times as long as tibia, subequal to remaining tarsal segments taken together, the latter the same width as basitarsus. (59) Legs rather slender; *hind trochanter with weak angle* near middle of lower surface; hind femur simple; *distal half of trochanter and basal half of femur with rather dense white hairs on undersides*, these hairs more than half as long as diameters of segments; *hind tibia noticeably longer than femur*, somewhat dilated apically; *hind basitarsus widest before middle and slightly tapered toward each end*, over half as wide as tibia, about 0.72 times as long as tibia, twice as wide as following tarsal segments, distinctly longer than remaining tarsal segments together; middle basitarsus about 0.85 times as long as tibia, subequal to remaining tarsal segments taken together. (63) *Ventroapical plate of gonocoxite with dense blunt hairs*, mesal ones longest and curved outward, a long, flat, slender, delicate, apically tattered projection arising from near prominence on which the longest hairs arise; lateral projection flat like gonostylus and densely covered on inner surface with blunt hairs. (65) *Penis valves without large peglike hairs.*

Comparative Comments. This species is conspicuously more slender than *Halterapis nigrinervis*, and differs particularly in the characters italicized above.

Distribution. Southern coast of Cape Province. SOUTH AFRICA: *Cape Province*: George; Hout Bay; 64 km. E of Knysna.

GENUS *COMPSOMELISSA*

Compsomelissa Alfken, 1924, p. 251. (Type species: *Compsomelissa borneri* Alfken [monobasic].)

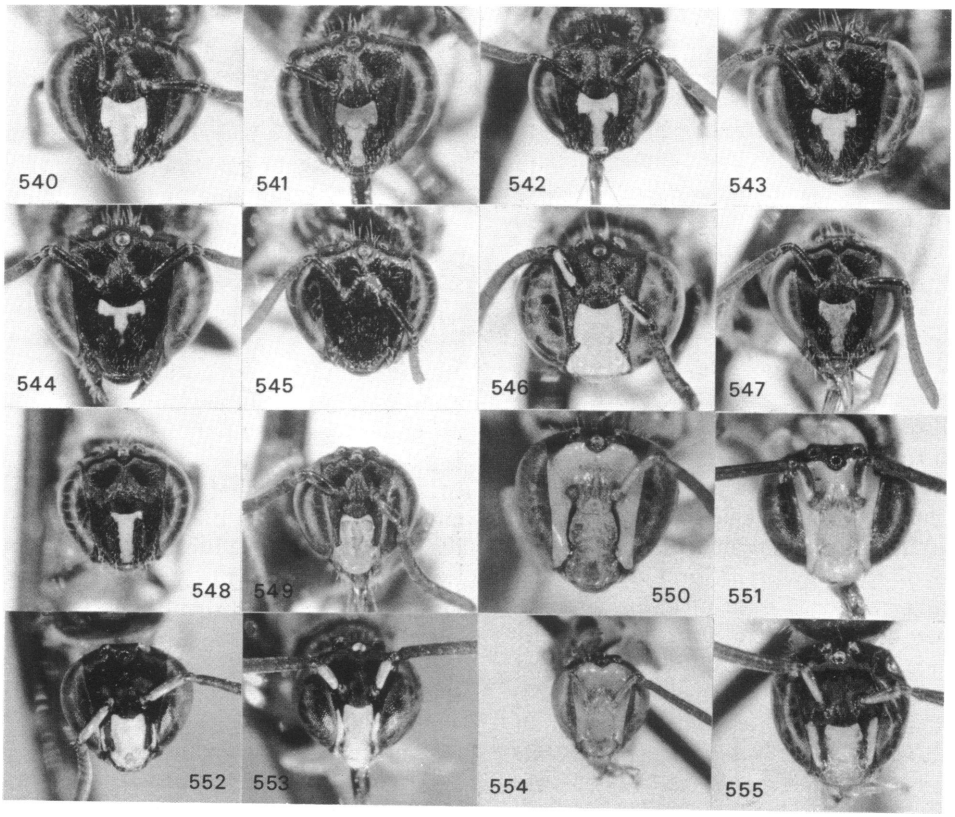
Exoneurula Michener, 1966, p. 573. (New synonym. Type species: *Exoneurula zavattarii* Michener = *Compsomelissa borneri* Alfken, by original designation.)

This is a small genus of small to minute bees with yellow markings, superficially suggesting

such genera as *Nomioides*, *Habralictus*, *Perdita*, and *Brachyhesma* in other families of Apoidea. It is found from South Africa to Nigeria and Ethiopia and into the Arabian Peninsula. To judge by the male genitalia and by larval characters *Compsomelissa* is most closely related to *Halterapis*.

Description. Agrees with description of *Braunsapis* except as indicated below. (Parts of the *Braunsapis* description in parentheses should be disregarded in determining characters of *Compsomelissa*.)

Female. (1) Length 4-6 mm.; forewing length 3-4 mm. (2) Body largely black to largely yellow with restricted black or dark brown markings. (3) Clypeus almost entirely yellow. (4) Lateral face marks present, in some species part of the wholly yellow face. (5) Posterior orbital yellow marks absent except when part of the largely yellow



FIGS. 540-546. *Halterapis nigrinervis* group, facial views. 540. Female, Hluhluwe Reserve, Natal. 541. Female, Hellahella, 21 km. SW of Richmond, Natal. 542. Female, 16 km. SW of Willowmore, Cape Province. 543, 544. Females, Worcester, Cape Province. 545. Female. 29 km. SE of Touwsrivier, Cape Province. 546. Male, Grahamstown, Cape Province.

FIGS. 547-549. *Halterapis angustula*, facial views. 547, 548. Females, Hout Bay, Cape Province. 549. Male, 64 km. E of Knysna, Cape Province.

FIGS. 550, 551. *Compsomelissa zaxantha*, facial views. 550. Female, Mafeking, Cape Province. 551. Male, Ndumu Game Reserve, Natal.

FIGS. 552, 553. *Compsomelissa stigmoides*, facial views. 552. Female paratype, Nairobi, Kenya. 553. Male allotype, same locality.

FIG. 554. *Compsomelissa borneri*, facial view of female, Olokemeji, Ibadan, Nigeria.

FIG. 555. *Allodape* (?) *albolineata*, facial view of female holotype, Walikale, Kivu, Zaire.

head. (6) Labrum and mandible largely or entirely yellow or brownish yellow. (7) Scape yellow, brown above. (8) Pronotum entirely yellow or with anterolateral portion yellowish brown. (9) Tegula yellowish transparent; axillary sclerities yellow or light yellow brown. (10) Pterothorax black with scutellum partly yellow, to entirely yellow except for limited brown or black areas on scutum, axilla, and dorsal and posterior surfaces of propodeum. (11) Legs reddish brown to yellow, ventroapical part of fore femur yellow. (12) Terga black with pallid margins and yellowish white basal areas on 5 and 6, to yellow with dark banding. (13) Wings very clear, veins and stigma light brown to almost transparent, stigma clear with dark posterior margin, hairs of basal half of wing few, minute, almost absent. (15) Clypeal form as in *Braunsapis* but lower lateral parts rather gently curved back. (16) *Clypeus without coarse punctures, like rest of body smooth and shining.* (17) Lateroclypeal carina weak, its crest rounded, fading out below or almost reaching anterior tentorial pit. (19) Antennal bases at or above level of middle of eye; interantennal distance nearly twice antennocular distance. (2) Vertex behind ocelli convex seen from front; interocellar distance more than ocellocular distance; ocelloccipital distance less than or equal to ocellar diameter. (23) Antennal depression feeble and not delimited above, no suggestion of ridge diverging from eye margin, sometimes convexity in front of median ocellus. (25) Upper clypeal margin strongly to rather weakly concave. (26) Upper clypeal margin less than twice as wide as paraocular area. (27) Clypeoantennal distance less than diameter of antennal socket. (28) *Anterior tentorial pits below level of middle of clypeus.* (29) Lower clypeocular distance about equal to width of scape; upper clypeocular distance wider than but less than twice as wide as scape. (31) Genal area narrower than eye, declivous rather close behind summit of eye. (32) Eye twice as long as wide or longer. (33) Malar area shorter than width of scape. (37) Flagellum much more than twice as long as scape; first two segments very short, much broader than long; penultimate segment longer than broad; three to five segments broader than long. (43) Stigma very broad, subequal in length to costal margin of marginal cell which is subequal to or shorter than distance from apex of cell to wing tip. (45) Second submarginal cell half as long as first or less; second recurrent vein and vein Cu_1 present or absent; first recurrent vein near first transverse cubital. (47) Jugal lobe extending slightly beyond cu-v. (48) Hamuli 5; hamular sinus much wider than deep. (52) Basitibial plate absent. (55) Tergum 6 with upper surface nearly flat in cross section, slightly upturned at apex in profile, extreme apex with small notch, no pygidial plate, pygidial fimbria very weakly developed. (56) Posterior lateral margins of tergum 6 narrowly rounded in section, a rather sharp contrast in vestiture between dorsal and ventral surfaces. (57) Graduli of terga 4 and 5 extending back laterally nearly to tergal margins, of tergum 3 extending somewhat behind spiracle.

Male. Similar to female except as follows: (19m) Interantennal distance more than twice antennocular distance. (20m) Ocelloccipital distance less than ocellar diameter. (26m) Upper clypeal margin about twice as wide as paraocular area. (29m) Lower clypeocular distance less than, sometimes less than half of, width of scape; upper clypeocular distance less than to slightly more than width of scape. (32m) Eye less than twice as long as wide. (33m) Malar area less than one-third as long as diameter of scape. (37m) Flagellum four to five times as long as scape; first two segments very short, much broader than long; penultimate segment longer than broad; two segments broader than long, middle segments longer than wide. (39m) Mandible with apex rounded, edentate. (57m) Graduli of terga 4-6 extending back nearly to tergal margins, of tergum 3 scarcely extending behind spiracle. (58) Front tarsus ordinary, segments not broadened, undersides of 2-4 with vestiture of fine, rather short hairs; basitarsus a little shorter than tibia and about as long as remaining tarsal segments together; fourth segment a little longer than broad. (59) Hind trochanter and femur simple. (60) Eighth tergum with two membranous convexities, wrinkled or scarcely so, with internal hairs. (61, 62) Seventh and eighth sterna and gonobase as in *Braunsapis*. (63) Gonocoxite considerably longer than broad with strong dorsal apical mesal lobe; ventral apical plate well developed, with large lateral projection fused to gono-

stylus and bearing coarse setae and with long, acute, irregularly serrate, mesal apical projection below inner margin of penis valve, as in *Halterapis*. (64) Gonostylus probably fused to ventral apical plate of gonocoxite, much as in some *Allodapula*, with a very few apical setae on outer side. (65) Penis valve slender, not much curved downward, extending little if any beyond apices of other structures, with a few setae and sometimes pegs on lateral median projection.

KEY TO THE SPECIES OF *COMPSOMELISSA*

1. Head and thorax largely black with limited yellow and white markings and sometimes red areas 2
   Body mostly yellow 3
2. Metasoma mostly black . . . . . *stigmoides*
   Metasoma mostly orange or red . . . . . *harveyi* and *stigma*
3. Vertex yellow; ocelli enlarged so that ocellocular distance about half on ocellar diameter . . . . . *ocellata* Michener, 1966, Arabian Peninsula
   Vertex with black band between summits of eyes including ocelli; ocellocular distance about equal to ocellar diameter 4
4. Second recurrent vein present . . . . *zaxantha*
   Second recurrent vein absent . . . . . *borneri*

Compsomelissa zaxantha (Cockerell), new combination
Figures 550, 551, 556-559

Allodape zaxantha Cockerell, 1934a, p. 241. (Type ♀, BM, from Weenen, Natal.)
Allodapula zaxantha: Michener, 1966, p. 573.

Description. Female. (1) Length 5.5-6 mm.; forewing length 4 mm. (2-12) Head yellow; broad brownish black band between summits of eyes, including ocelli; lateroclypeal and subantennal sutures black; apex of mandible reddish black; upper side of scape reddish yellow; flagellum dark brown beneath, blackish above. Thorax yellow; transverse sutures of dorsum black, especially inflexed zone along anterolateral part of scutum; notaulus linearly black; wedge-shaped zone between notaulus and parapsidal line colored as in *Compsomelissa borneri*; brown area between notauli, extending from front nearly to posterior margin of scutum, leaving two yellow longitudinal lines (behind or continuations of notauli) on scutum; axilla brown or black laterally; dorsolateral metanotal area brown; propodeal triangle black, posterior face of propodeum sometimes brown, blackish areas around metasomal articulation. Tegula transparent with yellow spot; axillary sclerites yellow testaceous, wing veins yellow-brown; wing including stigma clear. Legs yellow. Metasoma yellow; tergum 1 with sublateral, preapical dark brown area; terga 2-3 with median dark brown bands, sometimes broken medially; terga 4-6 with broad apical dark brown or blackish bands, extending forward along tergal margin on 6; areas in front of bands on terga 5 and 6 pale yellow and suggestive of basal yellow areas of *C. stigmoides*. (14) Hairs sparse, whitish or yellowish, scopa reddish yellow; dorsal hairs of terga 4-6 robust, curved posteriorly, blunt, those of tergum 4 markedly longer than those of 5 and 6, those of 4 and 5 reddish or infuscated, sometimes nearly black. (25) Upper margin of clypeus gently concave (both sexes). (27) Clypeoantennal distance little less than diameter of antennal socket (both sexes). (33) Malar area more than half as long as diameter of scape. (43) Marginal cell with apex narrowly rounded at wing margin, length on margin slightly greater than length of stigma (both sexes). (45) *Second recurrent vein and Cu_1 present*; second submarginal cell larger than in *C. borneri*, narrowed anteriorly, nearly half as long as first (both sexes).

Male. (1m) Length 5 mm.; forewing length 4 mm. (2m-12m) Coloration as in female. (14m) Pubescence as in female but less contrast between that of terga 4 and 5, terga 6 and 7 with hairs reddish or infuscated like those of 4 and 5. (58) Second segment of front tarsus about twice as long as wide, not wider than basitarsus. (59) Hind trochanter and femur simple, more robust and with more hairs than in *Compsomelissa stigmoides*, some hairs of each segment about as long as diameter of segment. (60) Eighth tergum with convexities coarsely wrinkled. (63) Ventral apical plate of gonocoxite with outer projection that is fused to gonostylus with hairs arising from transverse tubercles; another short but broad projection near gonostylus. (65) Penis valve with small group of bristles but no pegs on lateral median projection.

Distribution. Northeastern South Africa and adjacent Mozambique. SOUTH AFRICA: *Cape Province*: Mafeking. *Natal*: Mfongosi; Ndumu Reserve; Tugela Crossing; 16 km. N of Ubombo, 160 m. altitude; Weenen. MOZAMBIQUE: Lourenço Marques.

Compsomelissa borneri Alfken

Figure 554

Compsomelissa borneri Alfken, 1924, p. 251. (Type ♀, Wien, from Sennar, Sudan, not seen by me.)

Exoneurula zavattarii Michener, 1966, p. 574. (New synonym. Type ♀, Genoa, from Agordat, Ethiopia.)

Description. Female. (1) Length 4 mm.; forewing length under 3 mm. (2-12) Head yellow; broad dark brown band between summits of eyes, including ocelli; apex of mandible red-brown; scape brown along upper side; flagellum brown beneath, dark brown above. Thorax yellow; transverse sutures of dorsum black; notaulus linearly black; wedge-shaped zone between notaulus and parapsidal line brown, this zone broad and yellow brown anteriorly, progressively narrower and darker to posterior end of scutum; sometimes brown area at front of scutum between notauli; axilla and dorsolateral metanotal area partly or wholly brown; dorsum and posterior face of propodeum dark brown. Tegula transparent; axillary sclerites and wing veins yellowish testaceous; wing including stigma clear. Legs yellow, mid and hind tibiae often brownish medially, sometimes legs wholly brownish yellow. Metasoma yellow, terga 1-5 dark brown laterally and posteriorly. (14) Hairs sparse, whitish to yellowish; dorsal hairs of terga 4-6 rather slender but blunt, not much curved. (25) Upper margin of clypeus slightly concave. (27) Clypeoantennal distance less than diameter of antennal socket. (33) Malar area less than half as long as width of scape. (43) Marginal cell acutely pointed very near wing margin, length on wing margin less than length of stigma. (45) second recurrent vein and vein Cu_1 absent; second submarginal cell wider than long, little more than one-third as long as first.

Distribution. Ethiopia to Nigeria, probably widespread but little collected in a belt south of the Sahara. ETHIOPIA: Agordat, Eritrea. SUDAN: Sennar. NIGERIA: Olokemeji, Ibadan.

Compsomelissa stigmoides (Michener), new combination

Figures 525, 552, 553, 560-563

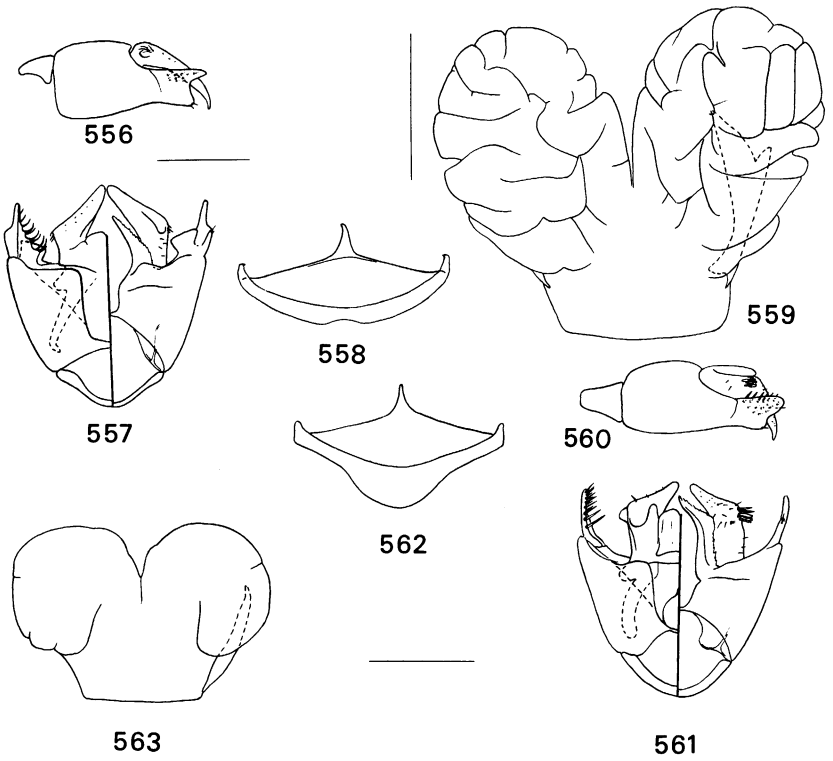
Exoneurula stigmoides Michener, 1971a, p. 299. (Type female, AMNH, from Nairobi, Kenya.)

This is a member of the group of *Compsomelissa stigma* and *harveyi* and may be conspecific with them. Each of those species is based on a single specimen, one male (*stigma*) and one headless female (*harveyi*), whereas the new species is based on specimens from a single locality. It is quite possible that the differences will be found to be geographical variations in a single species rather than specific characters when adequate material is available. *Compsomelissa stigmoides* lacks red on the metasoma, unlike *C. stigma* and *C. harveyi*. There are also striking differences in the yellow markings of the head and thorax.

Description. Female. (1) Length 4-5 mm.; forewing length 3.5-4 mm. (2-12) Black, the following parts yellow: clypeus except lower lateral parts; area on labrum; area on mandible (reddish yellow and sometimes absent); paraocular band along inner orbit not reaching level of summit of clypeus; lower surface of scape; broad band across pronotum, reaching and including pronotal lobe; most of scutellum mesal to axillae except posterior margin. Terga 5 and 6 with broad, basal, pale yellow bands, not reaching sides of terga, posterior margins irregularly convex. Tegula transparent with small yellow spot. Axillary sclerites testaceous to yellow. The following parts red or reddish brown: lower lateral part of clypeus (sometimes black); labrum except for ill-defined yellow area (sometimes black except for yellow area); upper side of scape; underside of first two flagellar segments (sometimes blackish); legs, anterior coxa sometimes yellowish red, other coxae infuscated basally. Underside of metasoma dark reddish brown, sometimes largely black. (14) Pubescence dull whitish, dorsal hairs of terga 4-6 robust, white, blunt, curved posteriorly (both sexes). (25) Upper margin of clypeus uniformly strongly concave (both sexes). (27) Clypeoantennal distance less than diameter of antennal socket (both sexes). (33) Malar area about one-third as long as diameter of scape. (43) Marginal cell acutely pointed near wing margin, length on wing margin

about equal to length of stigma (both sexes). (45) Second recurrent vein and Cu_1 absent; second submarginal cell almost as small as in *Compsomelissa borneri* (both sexes).

Male. (1m) Length 4.5 mm.; forewing length 3.5 mm. (2m-12m) Only known specimen somewhat callow, thorax and metasoma therefore brown, but coloration otherwise as described for female except labrum all yellow, mandible largely so; scutellum with round, central yellow spot; markings of metasoma limited to basal median transverse yellowish white area on tergum 6. Tegula translucent brownish without yellow spot; median axillary sclerite brown. Posterior ventral surface of fore femur largely whitish but not in sharp contrast perhaps because of callowness (a mature specimen would probably show this area pale yellow against reddish brown femoral color). (58) Second segment of front tarsus over twice as long as wide, not wider than basitarsus. (59) Hind legs simple, slender; ventral hairs of trochanter and femur very sparse, much shorter than diameters of these segments. (60) Eighth tergum with convexities almost unwrinkled. (63) Ventral apical plate of gonocoxite with outer projection that is fused to gonostylus with hairs not arising from tubercles, coarsest ones in a single row; no other process near gono-



FIGS. 556-559. *Compsomelissa zaxantha*, male, Ndumu Game Reserve, Natal. 556, 557. Lateral, dorsal, and ventral views of genitalia. 558. Seventh and eighth metasomal sterna. 559. Eighth metasomal tergum and roof of genital chamber.

FIGS. 560-563. *Compsomelissa stigmoides*, male allotype, Nairobi, Kenya. 560, 561. Lateral, dorsal, and ventral views of genitalia. 562. Seventh and eighth metasomal sterna. 563. Eighth metasomal tergum and roof of genital chamber.

Scale lines represent 0.25 mm. Separate lines serve for figures 556-558, 559, 560-563.

stylus. (65) Penis valve with pegs on weak lateral median projection.

Distribution. Known only from the type locality.

Compsomelissa stigma (Strand), new combination

Allodape stigma Strand, 1915, p. 42. (Type ♂, Berlin, from Motoachimu, Tanzania.)

The type and only known specimen is similar to the male of *Compsomelissa stigmoides* but differs in lacking white on the paraocular areas, on the scape (which is testaceous), and on the bases of the metasomal terga. The metasoma is largely orange, infuscated laterally and on the dorsa of terga 1 to 3. The scutellum is largely pale instead of having a central pale spot only, as in *C. stigmoides.*

Compsomelissa harveyi (Cockerell), new combination

Allodapula harveyi Cockerell, 1936b, p. 636. (Type ♀, headless, BM, from Matopo Hills near Bulawayo, Rhodesia.)

This may be conspecific with *Compsomelissa stigmoides* from which the female type differs in the slightly larger size, the red ground color of the metasoma and the venter and sides of the thorax, in the cream-colored sides of the scutum above and in front of the tegulae, and in the cream-colored area on the front of each mesepisternum. Since the head of the type and only known specimen is missing, and was missing when first described, no head characters are known.

GENUS *NASUTAPIS*

Nasutapis Michener, 1970b, p. 208. (Type species: *Nasutapis straussorum* Michener, original designation and monotypic.)

This parasitic genus and its single known species were described and illustrated by Michener (1970b). *Nasutapis* is clearly a derivative of *Braunsapis.* Its biology was described by Michener (1971a).

Description. Agrees with description of *Braunsapis* except as indicated below. (Parts of the *Braunsapis* description in parentheses should be disregarded in ascertaining the characters of *Nasutapis.*)

Female. (1) Length 4.5-5-5 mm.; forewing length 3.5-4.5 mm. (2) Body black or brownish black. (3) Clypeus largely yellowish white. (4) *Lateral face marks present, extending above antennal bases.* (6) Labrum and mandible largely light brown. (7) Scape black, brownish white on underside. (8) Pronotal collar concolorous, pronotal lobe white, swollen, nearly hairless. (9) Tegula yellowish transparent; axillary sclerites yellowish, median one infuscated mesally. (11) Legs brown. (12) Tergal margins brownish; no tergal fasciae or maculation. (13) Wings rather clear, veins and stigma dark brown. (15) *Clypeus little protuberant, scarcely extending below lower ends of eyes, lower lateral parts slanting but not curved back into longitudinal plane, anterior margin with median pointed snout.* (16) Clypeus shining, almost without coarse punctures. (17) Lateroclypeal carina weak, rounded, not approaching anterior tentorial pits. (18) Head rather broad, maximum interocular distance slightly greater than length of eye. (19) Antennae well above level of middle of eyes; interantennal distance nearly twice antennocular distance. (20) Vertex behind ocelli slightly convex as seen from front; interocellar distance slightly less than ocellocular distance; ocelloccipital distance less than ocellar diameter. (25, 26) Upper clypeal margin straight, nearly twice as wide as paraocular area. (29) Lower clypeocular distance about equal to width of scape; upper clypeocular distance about twice as wide as width of scape. (32) Eye less than twice as long as wide. (33) Malar space much shorter than width of scape. (34) *Labrum nearly flat,* less than twice as wide as long, *without coarse punctures.* (36) Scape nearly four times as long as wide. (37) Flagellum more than twice as long as scape, first and penultimate segments about as broad as long, seven segments broader than long. (39) Mandible tridentate but anterior tooth smaller than in most allodapines. (40) Prementum less than three

times as long as wide, without long bristles; mentum and submentum of usual shape. (41) *Labial palpi short*, segments cylindrical, *last two not projecting to one side*; first and second segments subequal. (42) *Maxillary palpi three-segmented*, less than twice as long as basal width of galea; galea without flattened hairs. (43) Stigma broad, about as long as costal margin of marginal cell, the latter longer than distance from its apex to wing tip. (44) Apex of marginal cell bluntly pointed, separated from wing margin by a vein width. (49) Hairs of fore basitarsus not bent apically. (51) Coxa 1 as described for *Braunsapis* but bulbous basally. (52) Basitibial plate absent. (54) Scopal hairs short; brush at base of mid-femur and apex of midtrochanter absent. (55) Sixth tergum as in ordinary *Braunsapis* but apex upturned in profile, without pygidial plate.

Male. Similar to female except as follows: (6m, 7m) Labrum, mandible, and underside of scape white. (26m) Upper clypeal margin more than twice as wide as paraocular area. (29m) Lower clypeocular distance less than width of scape; upper clypeocular distance slightly greater than width of scape. (36m) Scape about three times as long as wide. (37m) Flagellum more than three times as long as scape, first and penultimate segments slightly broader than long, ten segments broader than long. (39m) Apex of mandible rounded, edentate. (58) Front tarsi with segments 2-4 somewhat enlarged and flattened; undersides of these segments with a vestiture of fine, rather short hairs; basitarsus much shorter than tibia, about as long as segments 2-4 together; fourth segment a little longer than broad. (59) Hind trochanter simple, femur with longitudinal ventral ridge which forms rounded ventral angle before middle of femur; both segments almost bare ventrally. (60) Eighth tergum with two coarsely wrinkled convexities with internal hairs, as in most *Braunsapis*. (61) Seventh sternum convex apically, eighth with strong spiculum, both hairless. (62-65) Genitalia as in *Braunsapis*, gonostylus longer than wide, penis valve with lateral median projection weak, with hairs but no bristles or pegs.

Nasutapis straussorum Michener
Figure 526

As indicated by Michener (1970b) this species is known only from Natal, where it is found in nests of *Braunsapis facialis*.

GENUS *MACROGALEA*

Macrogalea Cockerell, 1930, p. 291 (Type species: *Allodape candida* Smith, 1879, by original designation.)

With the possible exception of *Eucondylops*, *Macrogalea* is the most atypical allodapine genus. *Eucondylops* is atypical primarily because of its adaptations to parasitic life. *Macrogalea* is not parasitic (except for one species); the reasons for its peculiarities are not obvious. The characters indicated in couplet 1 of the key to genera are some of its more distinctive features. Additional details and illustrations are contained in Michener (1971b).

The genus was reviewed and the species illustrated by Michener (1971b). Keys, specific synonymies, and descriptions are therefore omitted here. Three species are known, one from Madagascar and two from Africa. New distributional data for one of the African species are given below. Nests are described by Michener (1971a).

Description. Female. (1) Length 7-10 mm.; forewing length 6-7 mm. (2) Body black. (3) Clypeus commonly with with longitudinal median pale line or median spot, not expanded above. (4-8) Head and prothorax without other pale integumental markings. (9) Tegula translucent brown, median axillary sclerite brown to black. (10-12) Pterothorax, legs, and metasoma without pale markings, legs sometimes dark brown, posterior margins of terga brown. (13) Wings clear or nearly so, veins and stigma brown to blackish. (14) *Pubescence abundant, yellowish or grayish white*; *metasomal terga 3-5 with preapical, procurved bands of appressed plumose hairs*; terga 3-6 with short, blunt, often dark, posteriorly curved hairs, paler and less distinctive in *M. mombasae*. (15) Clypeus protuberant, lower lateral parts curved back obliquely at sides, anterior margin not modified. (16) Clypeus coarsely

to finely and rather closely punctate. (17) Lateroclypeal carina not reaching tentorial pit. (18) *Head broad, maximum interocular distance greater than length of eye.* (19) Antennal bases at level of middle of eyes; interantennal distance over twice antennocular distance. (20) *Vertex convex behind ocelli as seen from front*, interocellar distance slightly more than to slightly less than ocellocular distance; ocelloccipital distance nearly two to nearly three times ocellar diameter. (21) Preoccipital carina distinct or indicated by strong rounded ridge. (22) Frons not protuberant, upper half with depressed line, no frontal tubercle. (23) Antennal depression not demarked above but fading onto upper part of head. (24) Antennocellar triangle the same shape as ocellar triangle but larger. (25, 26) Upper clypeal margin convex, much longer than width of paraocular area. (27) Clypeoantennal distance much less than width of antennal socket. (28) Anterior tentorial pits slightly above to slightly below middle of clypeus. (29) Lower clypeocular distance 1.5-2 times width of scape; upper clypeocular distance two and half to three times width of scape. (30) Mandibular axis in front of ocular axis. (31) Genal area narrower than eye, declivous behind summit of eye, narrowed toward mandible. (32) Eye more than twice as long as wide. (33) Malar area as long as width of scape or nearly so. (34) Labrum convex, less than twice to about twice as wide as long. (35) Hypostomal area slightly convex. (36) Scape four times as long as wide or more. (37) *Flagellum thick*, less than to more than twice as long as scape, first segment variable, penultimate segment broader than long, five to nine segments broader than long. (38) Apical width of mandible much less than half basal width. (39) Apex of mandible tridentate or upper tooth obsolescent. (40) Prementum several times as long as wide, without long setae; mentum and submentum of usual shape. (41) Labial palpus with last two segments small and projecting to one side from greatly elongate, flattened, first two; *first segment much shorter than second.* (42) *Maxillary palpus three-segmented*, one to one and a half times as long as galeal width, first segment much longer than others; galeal margins with some long hairs or not, no flattened hairs. (43) *Stigma slender*, parallel-sided before vein r, little more than half as long as costal margin of marginal cell, the latter longer than distance from apex of cell to wing tip. (44) *Apex of marginal cell rounded, gradually bent away from wing margin*, apex separated from margin by about three vein widths. (45) Second submarginal cell more than half as long as first; second recurrent vein present, first near first transverse cubital. (46) Basal vein gently curved, oblique; discal cell long-petiolate. (47) *Jugal lobe of hind wing enormous*, broad, nearly eliminating vannal lobe. (48) Hamuli 7-9; hamular sinus deeper than wide. (49) Hairs of fore basitarsus straight or curved at apices. (50) Tibial brush absent; tibiae 1 and 2 with small apical spines. (51) Coxa 1 without apical spine; legs rather slender. (52) Basitibial plate defined by carina along posterior margin at least apically. (53) Arolia normal or reduced. (54) Scopa well developed or reduced; brush at base of mid-femur and apex of mid-trochanter well developed or absent. (55) Tergum 6 with upper surface broadly concave; apex upturned, weakly emarginate or notched; pygidial plate and fimbria absent. (56) Posterior lateral margins of tergum 6 produced, flattened, angulate, but basal part rounded laterally. (57) Graduli of terga 3-5 extending posteriorly nearly to tergal margins behind spiracles.

Male.[1] Similar to female except as follows: (3m) Clypeus without pale integumental markings. (14m) Pubescence long and abundant, forming especially dense, erect mass on clypeus; grayish white with much black; bands of plumose appressed hair absent or represented only on terga 5 and 6; dorsum of terga 2-6 with dense, erect, slender but blunt, largely black hair. (15m) Clypeus not protuberant, lower lateral parts not curved back, margin not modified. (16m) Clypeus finely and closely punctate. (17m) Lateroclypeal carina practically absent. (18m) Head broad, eyes swollen, maximum interocular distance about 0.7 times eye length; eyes closest medially. (20m) Vertex depressed and concave behind ocelli, interocellar distance equal to ocellocular distance; ocelloccipital distance about twice ocellar diameter. (21m) Preoccipital carina

[1]Based on two males of *M. candida* only.

absent. (22m) Frons concave, not punctate. (29m) Lower clypeocular distance scarcely greater than width of scape; upper clypeocular distance about twice width of scape but clypeal margin hard to see and measurement unsatisfactory. (32m) Eye swollen, less than twice as long as wide. (34m) Labrum rather flat, subtriangular, not much wider than long. (37m) Flagellum thick, less than twice as long as scape, first segment variable, penultimate much broader than long, eight to nine segments broader than long. (39m) Apex of mandible attenuate with tooth along upper margin. (41m) Proboscis much smaller than in female. (53m) Arolia rather small. (57m) Graduli of terga not exposed. (58) Front tarsi slender, elongate, basitarsus as long as tibia and as remaining tarsal segments together, fourth segment three times as long as wide. (59) Hind trochanter and femur slender, not modified. (60) Eighth tergum with two membranous convexities not overhanging lateral sclerotic bars, and not wrinkled, and lacking internal hairs; sclerotic bar enlarged to triangular area anteriorly. (61) Seventh sternum truncate, eighth with short, broad spiculum, both sterna hairless. (62) Gonobase small, much wider than long, much shorter than gonocoxite. (63) Gonocoxite wider than long if ventral apical plate is ignored, the latter plate with median apically produced acute angle and small mesal projection, without pegs or setae. (64) Gonostylus arising mesal to lateral apical angle of gonocoxite, straight, slender, directed dorsoapicad, with several bristles at end. (This structure was considered part of the gonocoxite by Michener, 1971b, but it now seems to be the gonostylus.) (65) Penis valves enormous, several times as long and as broad as gonostylus, only moderately down-curved, setose but without coarse bristles or pegs.

For illustrations of genitalia and other structures described briefly above, see Michener (1971b).

Macrogalea candida (Smith)

This species is widespread in tropical Africa except for West Africa from Zaire to Senegal, being known from Tanzania and South West Africa north to Sudan and Ethiopia. Localities not known to me when reviewing the genus (Michener, 1971b) are as follows: SOUTH WEST AFRICA: Otjiverongo. TANZANIA: Kibonoto, Kilimanjaro, 1300-1900 m. altitude; Mazi Moja, Zanzibar. KENYA: Fort Hall; Rabai; Voi; Uchiveni Forest near Witu; Lusinga Island, eastern part of Lake Victoria; Ngalana; road to Kilossa, Usagara District; Tanga; Lokitang, North Turkana, 850 m. altitude. ETHIOPIA: Diredawa; Higo Samula. SUDAN: Sennar.

Females from South West Africa and Angola lack the longitudinal median yellow line on the clypeus characteristic of specimens from other areas, or it is very weak. The name *otaviensis* Cockerell is available for this dark-faced form for those who might wish to recognize it as a subspecies (see synonymy in Michener, 1971b).

The four Zanzibar specimens, which are in the British Museum, are large with black hair in the outer side of the scopa. They appear to be intermediate between *Macrogalea ellioti* of Madagascar and *M. candida* as characterized by Michener (1971b). The median clypeal punctures are rounder than in *M. candida* but rather close; not so widely separated as in *M. ellioti*; the depression anterolateral to the antennal base is but little smoother than other areas of the face, about as in *candida*; the preoccipital carina is strong, as in *M. candida*; the pubescence of the head and the scopa is colored as in *M. ellioti* but the thoracic pubescence is all pale as in *M. candida.* The bands of pale tomentum on the terga are as in *M. candida.* The wing veins and stigma are somewhat dark, as in *M. ellioti.* In view of the variation of *M. ellioti* on Madagascar (Michener, 1971b), it now seems likely that the African and Madagascar forms may not be specifically different, as has hitherto been assumed.

Macrogalea mombasae Cockerell

This species, a parasite in nests of *Macrogalea candida*, is known from Tanzania and Kenya. Its features, especially those related to parasitism, are described by Michener (1970b) and its position in the genus is indicated by Michener (1971b). Although a rather specialized parasite, its females at least visit flowers, unlike those of *Eucondylops*, *Nasutapis*, and the Australian *Inquilina.*

GENUS *EUCONDYLOPS*

Eucondylops Brauns, 1902, p. 377. (Type species: *Eucondylops konowi* Brauns, 1902 [monobasic].)

This strange parasitic genus has been reviewed by Michener (1970b) who included illustrations, keys, synonymies, and descriptions for the two species, both of which are from South Africa. *Eucondylops* is probably a derivative of *Allodapula*. Specimens appear never to have been collected except in nests of the host bees.

As indicated in the paper cited, the reduction in the mouthparts, eyes, wing venation, and pollen collecting and carrying apparatus found in various parasitic allodapines is maximal in *Eucondylops*. What is known of the biology is indicated by Michener (1971a).

Description. Female. (1) Length 5.5-7 mm.; forewing length 3.5-4.5 mm. (2) Body dark brown, head and dorsum of thorax sometimes blackish. (3-8) Head and prothorax without pale markings except sometimes diffuse yellowish area on clypeus. (9) Tegula and axillary sclerites translucent brown. (10-12) Thorax, legs, and metasoma without pale markings, legs sometimes red, posterior margins of terga concolorous. (13) Wings light brown, veins and stigma dark brown. (14) Pubescence short and sparse, pallid; terga 3-6 with short, blunt, brown hairs, *without slender tapering hairs even laterally; undersurface of fore coxa densely hairy.* (15) *Clypeus retracted, in broad facial concavity, lateral parts not at all curved backward, anterior margin with broad concavity containing labrum.* (16) Clypeus with small to minute punctures and shining interspaces. (17) Lateroclypeal carina rudimentary, ending below tentorial pit. (18) *Head short and broad, minimum interocular distance at middle of face, greater than length of eye.* (19) *Antennal bases more than twice as far from clypeal margin as from top of head*; interantennal distance greater than antennocular distance. (20) *Vertex convex behind ocelli as seen from front*, interocellar distance greater than ocellocular and ocelloccipital distances. *Posterior ocelli obliquely elongate.* (21) Preoccipital carina absent. (22) *Frons with two separate or a single bilobed projection, directed anteriorly*; depressed line extending from anterior ocellus to level of lower edges of antennal socket where it ends in small or minute frontal tubercle. (23) Antennal depression limited mesally above by ridge extending laterally from base of frontal protuberance, not delimited near eye margin. (24) Antennocellar triangle same shape and size as ocellar triangle. (25, 26) Upper clypeal margin straight, subequal to or much shorter than width of paraocular area. (27) *Clypeoantennal distance about twice width of antennal socket, equal to or longer than length of upper clypeal margin.* (28) Anterior tentorial pits at or above middle of clypeus, lateral clypeal margins converging upward. (29) Lower clypeocular distance nearly twice width of scape; upper clypeocular distance more than twice to about three times width of scape. (30) *Mandibular axis far behind axis of eye.* (31) Genal area narrower than eye, *not or scarcely narrowed toward mandible.* (32) Eye less than twice as long as wide. (33) Malar area much longer than width of scape, bulging. (34) *Labrum flat, with only fine punctures, more than twice as wide as long.* (35) *Hypostomal area flat, slanting mesally, in plane not very different from that of occiput, proboscidial fossa being very reduced.* (36) *Scape less than to more than twice as long as wide.* (37) Flagellum several times as long as scape, first segment about as broad as long, penultimate segment variable, six to eight segments broader than long. (38) Apical width of mandible much less than half basal width. (39) Mandible bidentate, lower tooth seemingly missing. (40) *Prementum twice as long as wide, with long setae; mentum about as broad as long and submentum a transverse bar*, not V-shaped. (41) Labial palpus with segments cylindrical and on same axis; first segment longer than any others. (42) Maxillary palpus four-segmented, a little longer than width of short, robust galea; galeal margins without long or flattened hairs. (43) Stigma moderately broad, about as long as costal margin of marginal cell, the latter shorter to slightly longer than distance from apex of cell to wing tip. (44) Apex of marginal cell bluntly pointed, slightly bent away from wing margin by distance little more than width of a vein. (45) Second submarginal cell over half length of first, second transverse cubital sometimes partly miss-

ing; second recurrent vein absent, first near first transverse cubital. (46) Basal vein curved, oblique, interstitial with cu-v or nearly so. (47) Jugal lobe of hind wing small, not attaining level of vein cu-v. (48) Hamuli 4-7; hamular sinus about twice as wide as deep. (49) Hairs of fore basitarsus curved at apices. (50) Tibial brush absent; *tibiae 1 and 2 with large apical spines.* (51) Coxa 1 with apical hairy process or spine mesal to base of trochanter; legs robust. (52) Basitibial plate absent. (53) Arolia small. (54) Scopa represented by short but rather dense hairs; brush at base of mid femur and apex of mid trochanter absent. (55) Tergum 6 with upper surface convex; apex rounded, not upturned, rather densely hairy; pygidial plate absent. (56) Posterior lateral margins of tergum 6 simple, rounded in section. (57) Tergal graduli not bent back at sides, hence not exposed laterally behind spiracles.

Male.[1] Similar to female except as follows: (1m) Length 4.5-5 mm.; forewing length 3.5 to nearly 4 mm. (3m) Clypeus wholly brown in known specimens. (14m) Pubescence about as in female but longer and denser on lower part of face and mesosternum, and some long slender hairs on posterior part of metasoma laterally. (15m) Clypeal form as in female but no marked marginal clypeal concavity for reception of labrum. (20m) Posterior ocelli less elongate. (23m) Antennal depression open above. (29m) Lower clypeocular distance greater than width of scape; upper clypeocular distance less than twice width of scape. (33m) Malar area slightly longer than width of scape, bulging. (39m) Mandible as in female but the two teeth minute and close together. (58) Front tarsi ordinary, basitarsus much shorter than tibia, slightly longer than remaining tarsal segments together, fourth segment little longer than wide. (59) Hind trochanter and femur unmodified except for long hairs on former. (60) Eighth tergum with two large membranous convexities, wrinkled as in many allodapines and hairy on concave surface. (61) Seventh sternum rounded, with a few apical hairs; eighth with spiculum short and triangular. (62) Gonobase small, much wider than long, very much shorter than gonocoxite. (63) Gonocoxite longer than wide, more than twice as long as wide in side view, without recognizable ventroapical plate, without pegs. (64) *Gonostylus absent or reduced to small setose area* on apex of gonocoxite. (65) Penis valves rather slender, *nearly straight*, without coarse bristles or pegs.

For illustrations of genitalia and other structures described briefly above, see Michener (1970b).

Eucondylops konowi Brauns
Figure 527

This species is known from eastern Cape Province and from Natal. Although Brauns (1926) recorded it from nests of bees now placed in *Braunsapis*, my collections were all from nests of *Allodapula*, and it seems probable that *A. variegata* is its normal or exclusive host.

Eucondylops reducta Michener
Figure 528

This species is from western Cape Province, where it inhabits nests of *Allodapula melanopus.*

SPECIES OF UNKNOWN GENERIC POSITION

Allodape (?) *albolineata* Cockerell
Figure 555

Allodape albolineata Cockerell, 1934a, p. 235. (Type ♀, Tervuren, from Walikale, Kivu, Zaire, 1° 25′S, 28′E.)

Description. Female. (1) Length 5 mm.; forewing length 3.5 mm. (2-12) Head and thorax brown (probably black in fresh mature specimens), scutellum lighter brown and metanotum as well as lower part of clypeus and labrum yellowish brown, the following areas pale yellow: longitudinal band on clypeus occupying full width of clypeus above and narrowing gradually below; mark near inner orbit extending from below tentorial pit to above level of upper margin of clypeus; lower surface of scape; yellow band (possibly broken medially) across prono-

[1] Based on *E. raducta* only.

tum; posterior lobe of pronotum; and ventroapical part of posterior surface of fore femur. Flagellum lighter beneath than above. Tegula transparent testaceous. Median axillary sclerite and basal wing veins testaceous, veins distally becoming brown, like stigma. Metasoma reddish yellow, terga 2-6 with dorsolateral basal dark brown areas which are connected across bases of terga 2, 3, and especially 4. Legs reddish yellow, front coxa brown, tibial spurs yellow testaceous. (14) Pubescence dull whitish to yellowish brown, scopa and dorsal metasomal hairs yellowish brown; dorsal hairs of terga 4-6 slender but blunt, not much curved. (15-33) Genal area and rest of head as in *Allodapula melanopus* except as follows[1]: (25) Upper margin of clypeus concave; (27) clypeoantennal distance greater than diameter of antennal socket; (33) malar area less than half as long as width of scape. (37) Median flagellar segments slightly broader than long. (42) *Maxillary palpi five-segmented*; galea about as long as head, galeal vestiture apparently as in *Allodapula*. (43) Stigma large as in *Allodapula melanopus* but vein r arising only slightly beyond middle. (44) Marginal cell pointed on wing margin, distinctly more pointed than in *Allodapula* such as *melanopus* and *jucunda*. (45) Second submarginal cell about as in *Allodapula* but even shorter, less than half as long as first. (46) Relation of basal vein to cu-v in forewing about as in *Allodapula*, the distance between these veins slightly greater than in most individuals of *A. melanopus*. (49-54) Legs as in *Braunsapis* and *Allodapula*. Hind basitarsus much longer than segments 2-5; middle and front basitarsi about as long as segments 2-5 together. (55, 56) Sixth tergum of ordinary form, about as in *Allodape ceratinoides*; prepygidial fimbria represented by slender hairs not quite dense enough to obscure surface; pygidial plate minute, elevated, oval. (57) Graduli not extending behind spiracles except on fifth tergum and even there only extending about half distance from spiracle to tergal margin.

[1]Direct comparisons were not made for all the numbered characters between 15 and 33 since specimens of *albolineata* were not available when this description was being put in final form. Hence additional differences between heads of *Allodapula melanopus* and *albolineata* may be found.

Comparative Comments. The position of this species, known from two females only, is obscure and probably will remain so until males or larvae are known. It looks like an *Allodapula*, resembling *A. jucunda* in facial marks, the ventroapical yellow area on the posterior side of femur, and the largely red metasoma, as well as in its small size and slender form. It has no special resemblance to the species of *Allodape*, and it lacks the tibial brush characteristic of that genus. I have not transferred it to *Allodapula* because of its occurrence in the tropics, where *Allodapula* is not known, and especially because of the metasomal vestiture which does not include the very thick, apically bent dorsal hairs of *Allodapula*; moreover, there is a moderately dense pygidial fimbria of slender, straight hairs, a feature not found in *Allodapula*. There is also a distinct, minute elevated pygidial plate, unlike *Allodapula*, and the lateral margins of the sixth tergum are rounded rather than sharply folded, also a feature unlike *Allodapula*. It could best be considered a *Braunsapis* with lateral face marks and a red metasoma, for most of its other features agree rather well with those of that genus. It differs from *Braunsapis*, however, in the five-segmented maxillary palpi and the yellow band across the pronotum.

Distribution. ZAIRE: *Kivu*: Lesse, latitude 0°20′N, longitude 29°40′E; Walikale, latitude 1°25′N, longitude 28′E.

Allodape (?) *mirabilis* Schulz

Allodape mirabilis Schulz, 1906, p. 245. (Type ♀, "im Museum Strassburg," from Johann-Albrechts Summit, Cameroon. No information on the two specimens (1♂, 1♀) described by Schulz has been elicited from the Strassbourg Museum, and the specimens are probably lost.)

In size and rich yellow markings this species suggests a member of the group of *Allodape derufata*. No male of that group is known, and it at first seemed likely that the ornate male of *A. mirabilis* might represent that sex for the *derufata* group. However, the description by Schulz of the female of *A. mirabilis* does not agree with any known species. Differences from females of the *derufata* group are indicated by the following characters: proboscis black; mandible black

except for yellow-brown apex; clypeus black except for yellow spot in middle of anterior margin; scutellum with yellow band across anterior margin; metasomal terga with yellow-brown bands across posterior margins.

The male, described at great length by Schulz, has numerous remarkable features of which a few are listed below: clypeus with two nearby, parallel, longitudinal carinae extending its entire length; anterior leg extraordinarily elongated, coxa and trochanter elongate, each with apical brush of white hairs; front femur only one and one-third times as long as trochanter with small tooth in basal fourth; front tarsus as long as rest of leg, white, third segment on outer margin with four long radiating white hairs each ending in an oval black plate; posterior legs thickened; trochanter half as long as femur, with median and apical projections, the latter broad, shiny, club-like, amber yellow; femur swollen, obtusely angled on underside with fine styloid appendage near base; inner edge of tibia with eight long, stiff setae; anterior margin of forewing angularly stepped forward at end of stigma, base of radial cell much broadened. (The peculiarities of the wings are not found in the female although wings usually do not vary between sexes.)

Allodape (?) *pulla* Vachal

Allodape pulla Vachal, 1903, p. 388, also p. 400, "Nota". (Type ♀, not seen, from Chanchamayo, Peru.)

The present location of the type is unknown. Vachal originally attributed this species to Africa but later recognized the type locality as Peruvian. If the locality is correct, it is not an allodapine bee, since the group is not found in the Western Hemisphere. It might well be *Chilicola* or one of its relatives (family Colletidae). The lack of pale clypeal markings is unusual in allodapine bees, supporting the view that the species was seriously misplaced systematically by Vachal and that the locality given is probably correct.

Allodape (?) *syrphoides* Walker

Allodape syrphoides Walker, 1871, p. 50. (Type ♀, not seen, from Tadjura, French Somaliland; types of Walker, 1871, are said to have been destroyed in Cairo.)

The background color of the head and thorax is described as "aeneous-green." No allodapine so colored is known. It seems more likely to be a species of *Nomioides* (Halictidae).

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ADDENDUM

The following description was inadvertently omitted from the body of the text.

Braunsapis langenburgensis (Strand), new combination
Figure 83

Allodape taita ab. *langenburgensis* Strand, 1915, p. 51. (Type ♀, Berlin, from Langenburg, Lake Malawi, Tanzania).

Allodapula brunneiventris Cockerell, 1936a, p. 3. (New synonym. Type ♀, AMNH, from Moçambique, Mozambique. The metasoma of this specimen is dark reddish brown.)

This species is known from only the two type specimens. Cockerell's statement that the mandibles of *brunneiventris* are black is an error; the large yellow areas, unusual for a *Braunsapis* female, are present although brownish. There is a possibility that this species is the female of *flavitarsis* (Gerstaecker), known from a single male from the same general area.

Description (based on type of *brunneiventris*). Female. (1) Length 7.5 mm; wing length 4.75 mm. (2-12) Black, legs and metasoma dark brown (presumably black when fully pigmented), tarsi light brown, the following parts yellow: extensive clypeal mark (see fig. 83), *large area on mandible* (brownish in this specimen), pronotal lobe. Tegula transparent testaceous with small yellowish spot; median axillary sclerite pale testaceous, outer part yellowish. (13) Wings nearly clear, veins and stigma brown. (14) Dorsal hairs on terga 4-6 light fuscous, much smaller than in *facialis* but similarly robust, nearly straight. (16) Clypeus with rather large irregular punctures, surface *entirely minutely roughened and dull.* (20) Interocellar distance subequal to ocellocular distance; ocelloccipital distance about equal to ocellar diameter (but edge of occiput undefined, this distance therefore subjective). (25) Upper clypeal margin concave with median convexity. (27) Clypeoantennal distance slightly less than diameter of antennal socket. (29) Lower clypeocular distance more than half width of scape, upper more than width of scape (estimated since antennae missing). (31) *Genal area markedly narrowed above* so that at summit of eye its width is narrower than ocellar diameter seen in side view; surface dullish with widely scattered small punctures. (33) Malar space over half as long as diameter of scape (estimated). (37) Antennae missing. (43, 44) As in *B. facialis.* (45) Second submarginal cell less than half length of first. (52) Basitibial plate not evident.

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