

A REVISION OF THE NEOTROPICAL
GENUS *METAMASIUS*
(COLEOPTERA, CURCULIONIDAE,
RHYNCHOPHORINAE)

SPECIES GROUPS I AND II

PATRICIA VAURIE

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INTRODUCTION

Metamasius IS ONE OF THE 116 genera of the large weevil tribe Rhynchophorini, as listed in Junk's catalogue of the Coleoptera of the world (Csiki, 1936). This tribe, the species of which are characterized by having the pygidium exposed beyond the elytra and the elbowed antennae inserted at or near the base of the beak, includes the great majority of the genera of the subfamily Rhynchophorinae (previously called Calandrinae by many authors).¹ Species of this tribe are found on all the continents and on many islands, being most numerous in tropical regions, especially in the Americas and in the Indo-Pacific Region. In the New World, according to Blackwelder (1947), there are 27 genera in the tribe.

Species of the genus *Metamasius* are generally medium to large (from about 10 to 20 mm. in length), elongate, torpedo-shaped, or spindle-shaped (fusiform), black in ground color, but usually banded, spotted, or streaked with bright or dull red, orange, or yellow, the colors interchangeable with the black in many species; a few species are gray, with black velvety spots. In contrast to many weevils, these species have no scales or dorsal hairs, although several have a rather tomentose covering or coating. They are diurnal, as far as is known, and good fliers, except for three species with reduced wings (*cornurostris*, *fahraei*, *foveolatus*). In habits they are associated chiefly with orchids, bromeliads, palms, sugarcane, bananas, and cacti, but the ecology of more than half of the species has not been recorded. The life history of *Metamasius hemipterus* Linnaeus, however, is sufficiently well known, especially in the West Indies, where it even has a common name, i.e., the rotten stalk borer of sugarcane (Wolcott, 1948), or the West Indian sugarcane borer (Wyniger, 1962). Although injuries from this species do not occur primarily on healthy plants, those made by a

related species (*Rhabdoscelis obscura* Boisdual) from the South Pacific, imported into Hawaii in the 1850's, caused \$200,000 worth of damage a year on one plantation of sugarcane (Zimmerman, 1941, p. 99).

The entire genus has not been revised since its description by Horn in 1873. My revision was at first concerned only with the approximately 50 species placed in the genus by subsequent authors, but a survey of the literature and a preliminary examination of some of the types soon revealed that what one author regarded as *Metamasius* another regarded as *Cactophagus* LeConte, 1876 (16 species), or vice versa, and that one author described the same species (*sanguinipes*) in both genera. Confusion was found also between species assigned to *Cactophagus* and those to two other New World genera (*Eucactophagus* and *Phyllerythrurus*, each with 13 species), and between species of *Metamasius* and those of *Metamasiopsis* (seven). In all, there appeared to be as many synonyms as valid species.

The present paper includes observations



FIG. 1. Distribution of the genus *Metamasius*.

¹ Calandrinae, or Calendrinae, is invalid under Declaration 20 of the International Code of Zoological Nomenclature, because the name of its type genus, *Calandra*, was suppressed under the plenary powers (International Commission on Zoological Nomenclature, 1959).

on the taxonomy, anatomy, ecology, sexual dimorphism, and distribution of the 57 species of two species groups (*Metamasius*, *Paramasius*, and *Metamasiopsis* of most authors). The approximately 50 species of a third group (*Cactophagus*, *Eucactophagus*, *Phyllerythrus* of authors) will appear in a subsequent paper. The third group is not included here because some species of still another genus, *Rhodoabaenus*, may have to be included, and these have not yet been studied.

Approximately 3950 specimens of species groups I and II were examined, including the types of 61 forms. Lectotypes are designated for an additional 13 forms. The types of 16 forms were not available, because they were out on loan, were destroyed during the war, or simply could not be found. Eight new species are described, six from South America, one from Central and South America, and one from Puerto Rico. Some species were found to be very abundant (more than 100 specimens examined): *anceps*, *cinnamominus*, *dasyurus*, *ensirostris*, *hebetatus*, *hemipterus*, *inaequalis*, and *tuberculipectus*. A few species are represented by the type specimen only: *guentheri*, *scutiger*, *tibialis*, and *yunquensis*. One species (*hemipterus*) was found to be polytypic.

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SPECIES GROUPS

As explained below, the genera synonymized with *Metamasius* cannot be maintained because some of the species are intermediate or present a combination of "generic" characters. One could establish genera solely on the make-up of the genitalia of the males, but I believe that a classification based on a single character can be very misleading. Furthermore, even with the genitalia, there are exceptions in *Metamasius*. New genera, of course, could be erected for these exceptions or for the intermediate species, but such action would result in a multiplication of genera, many of which would be monotypic, and I agree with Rosen and Bailey (1963, p. 6) that "a classification consisting of too many small genera presents a major obstacle to . . . efforts at recognizing differences and similarities between related organisms." The modern trend of splitting large genera into smaller ones may emphasize the morphological differences between groups of species, but it also sets them apart from one another and thus may obscure their relationships. Grouping similar genera in tribes might be an answer to this problem in some instances, but with the huge number of weevils in the world, even the tribes would be enormous, which can only lead (as in the case of the Junk catalogue) to the erection of subtribes.

As for calling the agglomeration of species either subgenera or groups, Smit (1963, p. 108) wrote, "The neutral term 'group' is used to indicate a number of related taxonomic units or a single species which is markedly different from other species; it does not refer to a formal category and has therefore no nomenclatural significance . . . ; by assigning a subgeneric name and a type-species to a unit, one fixes its status more firmly than by referring to it as a species-group; any alteration in the concepts of units, if used as subgenera, may give rise to nomenclatural difficulties." In this opinion I concur. In the case of *Metamasius* there is so little concordance of characters that it seems preferable to use the more generalized terms of groups and subgroups rather than the more restricted category of subgenus. The problem of relationship of the intermediate species, it is true, remains the

same, but such species may be placed at the beginning or the end of a group, or even in a separate group, without being confined by a subgeneric name. The species of *Metamasius* are probably closely related, even though those with extreme modifications of some characters greatly differ from one another in appearance. They form, in my opinion, one large, variable genus, much like *Lixus* of the Cleonini. Perhaps, as Buchanan suggested (1941, p. 171), *Metamasius* is an ancient group, with wide gaps between strikingly different species which may represent relicts. (See further discussion of groups in the Systematic Section.)

The genera I synonymize with *Metamasius* were based either on relative characters (the separation of the front and middle coxae, the length or prominence of the prosternal process and of the metasternal projection, or the length or distinctness of the lateral line of the aedeagus), or on single characters that were later found in more than one "genus." Many of these "generic" characters are individually variable and therefore inadequate for the delimiting of genera. The comparison of extremes, such as the type species of *Metamasius* (*hemipterus*), which has very widely spaced front coxae and a long prosternal process, with the type species of *Phyllerythrus* (*sanguinolentus*), which has narrowly spaced coxae and a short process, poses no problem. There is here no mistake possible between "wide" and "narrow" or "long" and "short," but between the extremes are all the intermediate species with coxae less wide or less narrow, or the process longer, or shorter, and so on. Even within the same species, as in the type species of *Cactophagus* (*spinolae*), one individual may have wider coxae, for instance, than another. This blending of relative characters occurs in almost every external character except for some of the secondary sexual characters, which are definite and clear cut (see Sexual Dimorphism, below).

There is, however, an internal character that some authors consider of generic value and that separates *Metamasius* rather well into two large groups. Dr. G. Kuschel, who has studied many species of this subfamily, discovered (personal communication) that males of the species characterized by Horn



FIGS. 2, 3. Lateral view of aedeagus of *Metamasius*. 2. *M. inaequalis*, showing lateral line evanescent at base characteristic of species of group II. 3. *M. hemipterus*, showing entire lateral line characteristic of species of group I.

as *Metamasius* have a lateral line on the aedeagus separating the dorsal and ventral portions, whereas the species described as *Cactophagus*, *Eucactophagus*, *Phyllerythrurus*, and some of *Metamasiopsis* have no such dividing line, and that in *Paramasius* Kuschel the line tends to become obsolete at the base of the aedeagus (figs. 2, 3). Using this line as a criterion, I find that the species (except for the five or six of which no males are available) fall into two large groups which are fairly well separable on external characters: the so-called "typical" *Metamasius* of Horn (with widely spaced coxae and a strongly developed prosternal process that overlaps the mesosternum), and all the others, here called the *Cactophagus*-like species. At least six of the latter group (with no lateral line), however, do not agree with their congeners, for they have the distinctly wide-spaced coxae, long process, and so on of the *Metamasius* of Horn. Furthermore, of these six, only three are at all similar to one another on the basis of external characters. A few species of "typical" *Metamasius* (with the lateral line) have quite narrowly separated coxae as in the *Cactophagus*-like species. (See table 2.)

There are further differences among the species groups in respect to the genitalia. In the majority of species that possess the lateral line, the two long, forked apodemes at the base of the aedeagus are joined to the side of the base by a membrane, whereas in the species without the line or with a partial line, the apodemes are joined to the base dorsally and directly, without visible membrane. Fifteen species with the line, however, differ further by having the apodemes not at all

forked, but contiguous, and joined to the sides either with or without a visible membrane.

Kuschel considers this lateral line of the aedeagus significant and sufficient for the recognition of genera. I consider it sufficient, in conjunction with other characters, only for the recognition of species groups. I have therefore divided the 100-odd species of *Metamasius* into two large groups on the basis of the presence or absence of the lateral line, and a third, intermediate, group in which the line is partially present. Although the absence of the lateral line is readily ascertainable, its length and depth, when present, are not distinct in all specimens.

A further division into about a dozen or more subgroups is based on the shape and attachments of the apodemes of the genitalia of the male, and on other characters, such as the relative separation of the coxae, the size of the prosternal process, the presence or absence of a tumidity on the mesosternum or the front of the metasternum, the shape of the mesepimeron, femora, tibiae, and the peduncle of the postmentum, the arrangement of the hairs on the soles of the tarsi, and the distinctness and curvature of the basal pronotal margin. (See Anatomy, below, and discussion and comparison of the various subgroups in the Systematic Section.)

HISTORY

Horn (1873) contributed to the splitting up of the large genus *Sphenophorus* Schoenherr by proposing, in his review of the family Curculionidae of the United States, a new genus, *Metamasius*, for *sericeus* Olivier, which Schoenherr had transferred in 1838 from *Calandra* to *Sphenophorus*. Horn included only one species in his genus, but at least 30 additional species were subsequently transferred by various authors from *Sphenophorus* to *Metamasius*. Some of Chevrolat's species, described in 1882, for example, were placed in *Metamasius* by Champion (1910). It is curious that Chevrolat never mentioned *Metamasius*, although he must have known of it.

No new species were added to the genus until 1910 when Champion revised the species of Mexico and Central America. He included 21 species, 15 of which he described as new;

he mentioned also, as belonging in the genus, about 10 species from South America. He gave a key to the species and discussed the genus in relation to other genera of the region.

After 1910, isolated species were described by Champion (1913) from Costa Rica; by Marshall (1916), from Jamaica; and by Barber (1920) and by Buchanan (1941), from Cuba.

In 1932, Hustache reviewed the Curculionidae of the island of Guadeloupe, describing a variety of *Metamasius quadrisignatus* and giving characters of the genus. In 1936 and 1938 he described 14 new species and one variety from South America, but gave no discussion of the genus and no key to the species.

At about the same time in Germany, Günther, in 1935, 1936, and 1941, described four new forms from both Central and South America. He also gave no keys, but he discussed some aspects of related genera, mentioning that some species of *Cactophagus* LeConte combined features of *Cactophagus* and of *Metamasius*. In the 1941 paper he also brought up to date the Junk catalogue on synonymy and references in the literature from 1936 on for the subfamily Rhynchophorinae. Unfortunately, the information on Central and South America, including the description in 1941 of *Metamasius difficilis*, of *dimidiatipennis* var. *waehneri*, and of four species of *Cactophagus*, three of *Phyllerythrus*, and two of *Rhodobaenus*, did not appear in the Blackwelder checklist (1947) because of the interruption of World War II. This 1941 paper appears, however, in the *Zoological Record* for 1945.

In 1953 Voss, discussing his new species of *Cactophagus* from South America (*impressipectus*), made the reflection that *Cactophagus* might be combined with *Metamasius*. A year later his large paper on the curculionid fauna of Peru was published, in which he listed 11 species of *Metamasius* from Peru and erected the subgenus *Subphyllerythrus* for a species described by Hustache; he described also two new species and two new varieties. He gave no keys and only very brief discussions.

ECOLOGY

Although the life history and breeding or feeding habits of several members of groups

I and II, and the plant associations of others, are known, there is no information for more than half of the species of these groups.¹

The best-known species are the sugarcane and banana borer, *hemipterus* (from Mexico to Argentina and accidental in several parts of the world); the banana weevil, *ensirostris* (widespread in Brazil especially); the pineapple weevil, *ritchiei* (Jamaica); and the cactus or prickly pear weevil, *spinolae* (United States and Mexico). Actually, more species appear to be associated with various palms and bromeliads than with plants of economic importance to man (see list below).

Generally, these weevils are secondary pests, found in decaying or rotting stems or trunks and not in the living tissue, but they may transfer their attention to healthy plants. The larva of *hemipterus* bores into the stems of sugarcane, bananas, and occasionally in the sheaths of coconuts. In nearly every instance the plants or parts of them are in bad condition, but the larva damages them further by its galleries. The larvae of other species attack the leaf bases of bromeliads or orchids. Adults may be found in the juicy interior of cane or bananas lying on the ground or in or under the sheaths of palms on the ground. Many species have been collected at very high altitudes in the mountains; others, such as those in bananas or cane, at sea level, along rivers, and in valleys.

Most of the information given in the list below and under the species in the text is taken from notations on the labels of specimens, but various authors have contributed information. Among these are Wolcott (1948; 1955), for *M. hemipterus* in Puerto Rico; Wyniger (1962); Lepesme, Bourgoyne, and others (1947), on species in palms; Costa Lima (1956), on *hemipterus* and *ensirostris* in South America; Bruner and his co-authors (1945), on *hemipterus sericeus* in Cuba; Marshall (1916) and Reid (1956-1957), on *ritchiei* in Jamaica. Lepesme and Paulian (1941) gave an illustrated account of the adult, nymph,

¹ There are no ecological notes for the following species: *applicatus*, *basilaris*, *benoisti*, *cerasinus*, *ciliatus*, *cornurostris*, *crustosus*, *foveolatus*, *guentheri*, *laticrus*, *melancholicus*, *metamasioides*, *othonotatus*, *peruanus*, *puncticeps*, *rimoratus*, *sanguinipes*, *scutellatus*, *scutiger*, *signiventris*, *sulcirostris*, *tibialis*, *tuberculipectus*, *vicarius*, *vicinus*, and *yunguensis*.

and larva of *hemipterus sericeus* in west Africa where this subspecies seems now to be established. Pettey (1953) described all stages, as well as methods for rearing, of "*Cactophagus*" [= *Metamasius*] *spinolae* for the control of *Opuntia* in South Africa; Coquerel (1849) described the stages of a species from the Antilles (either *maurus* or *liratus*). Champion (1913) discussed some species in bromeliads. Several authors have described the cocoons of rhynchophorous weevils which are formed by the long fibers of the plant host wound about their bodies. In the Cameroons, however, the nymph may be nude (Lepesme and Paulian, 1941).

As far as I have investigated, some species of group III are found also in Musaceae and Palmae, and others in additional families (Araceae, Cactaceae, Orchidaceae, and Rubiaceae).

A list of the plant families and the species of *Metamasius* of groups I and II that have been associated with them follows:

BOMBACACEAE (*Bombax* FAMILY): *Metamasius inaequalis* with *Ceiba*.

BROMELIACEAE (*Bromelia* OR PINEAPPLE FAMILY): *Metamasius bromeliadicola*, *callizona*, *cinnatus*, *dimidiatipennis*, *fasciatus*, *flavopictus* (breeding), *hebetatus*, *mosieri*, *nudiiventris*, *quadri-lineatus*, *quadrisignatus*, *ritchiei* (breeding in *Ananas*), *rugipectus*, *sellatus*. Genera of this family mentioned are *Ananas*, *Bromelia*, and *Tillandsia*.

CANNACEAE (*Canna* FAMILY): *Metamasius liratus* with *Canna indica*, or "balisier."

GRAMINACEAE (GRASS FAMILY): *Metamasius anceps* (breeding), *canalipes*, *cinnamominus*, *hemipterus* (breeding). All are associated with sugarcane (*Saccharum*).

LEGUMINOSEAE (PEA OR PULSE FAMILY): *Metamasius submaculatus* with *Inga*.

MUSACEAE (BANANA FAMILY): *Metamasius anceps*, *bisbesignatus*, *callizona*, *difficilis*, *ensirostris* (breeding), *hebetatus*, *hemipterus* (breeding), *liratus*, *maurus* (breeding), *pygidialis*, *quadrisignatus*, *submaculatus* (breeding). All are associated with *Musa*; except for the last one, with *Heliconia*.

ORCHIDACEAE (ORCHID FAMILY): *Metamasius cinninnatus*.

PALMAE (PALM FAMILY): *Metamasius anceps*, *bruneri*, *canalipes*, *cinnamominus*, *dasyurus*, *ensirostris*, *flavopictus*, *hebetatus* (breeding in *Iriarte* and *Roystonea*), *hemipterus* (breeding in *Cocos*), *inaequalis*, *maculiventris*, *mosieri*, *pygidialis*, *sierrakowskyi*, *tectus*. Genera mentioned include *Asterogyne*, *Astrocaryum*, *Chamaedorea*, *Cocos*, *Iriarte*, *Jessenia*, and *Roystonea*.

STERCULIACEAE (*Sterculia* FAMILY): *Metamasius inaequalis* with *Sterculia*.

Some species are reported from plants of more than one family, as follows: *Metamasius anceps* from bananas, sugarcane, and palms; *callizona* from bananas and bromeliads; *canalipes* from sugarcane and palms; *cinnamominus* from bromeliads and orchids; *cinnamominus* from sugarcane and palms; *ensirostris* from bananas and palms; *flavopictus* from bromeliads and palms; *hebetatus* from bananas, bromeliads, and palms; *hemipterus* from bananas, bromeliads, sugarcane, and palms; *inaequalis* from *Ceiba*, *Sterculia*, and palms; *liratus* from bananas and *Canna indica*; *pygidialis* from bananas and palms; *quadrisignatus* from bananas and bromeliads; and *submaculatus* from bananas, bromeliads, and *Inga*.

DISTRIBUTION

The species of *Metamasius* are most abundant in South America, where 40 of the 57 species of groups I and II occur. The distribution of all three groups of the genus is shown in figure 1. The species of groups I and II do not occur regularly north of Mexico City or south of northern Argentina. No species are reported from Chile in the south or from Baja California in the north. I know of none in the Bahamas, but species occur in all of the Greater and in some of the Lesser Antilles, and in Trinidad.¹ In North America the number apparently decreases northward from Panama (20 species), to Costa Rica (17), to Nicaragua (11), to Mexico (10), a number of the species being shared in common. (There are six species in Guatemala, two in El Salvador, four in Honduras.)

In South America the northwestern countries of Ecuador, Colombia, and Peru have, respectively, 25, 23, and 16 species, some of which are shared, whereas Brazil, with a much greater land area, has no more than 16 (re-

¹ The approximately 50 species of group III, which have not yet been entirely studied, present about the same geographical picture. One species (*spinolae*) of group III, however, is more northern, ranging from southern Mexico north to southern California and southern Arizona, including Baja California; one species (*graphipterus*) has been taken in orchid houses in New Jersey; and there is no species in this group from the Antilles.

corded from 15 states, from Amapa in the northeast south to Rio Grande do Sul, and from Amazonas in the northwest south to Rondonia). Fifteen species are recorded from Bolivia, 12 from Venezuela, and 18 from the three Guianas. Only three species (*basilaris*, *ensirostris*, *hemipterus*) reach as far south as northern Argentina, two reach southern Paraguay (*bisbisignatus*, *ensirostris*), and one occurs in Uruguay (*hemipterus*).

Of the 40 species occurring in South America, 23 are endemic (seven being known from one country only and generally from few specimens), and the remaining 17 occur also in Central America (two continuing northward into Mexico). Central America and Mexico share eight species in common, three of which (*dasyurus*, *dimidiatipennis*, *hemipterus*) occur also in South America.

As to the 17 species found outside South America, eight are in the West Indies, of which six are endemic, and nine in Central America and Mexico, of which two in each region (*ciliatus* and *flavopictus* in Mexico, *scutiger* and *bromeliadicola* in Central America) are endemic (see table 1). In Mexico, the majority of species are found in the state of Veracruz, but some also occur in Tabasco and Chiapas to the south, and to the west in Guerrero and Colima, with three (*ciliatus*, *flavopictus*, *hemipterus*) in southern Puebla, and one (*ciliatus*) in Mexico City. *Metamasius ciliatus* is the only species recorded from the peninsula of Yucatan.

Of the non-endemic species of the Antilles, one (*quadrisignatus*) has been taken in Panama as well as in four of the Lesser Antilles; and one (*mosieri*), in southern Florida as well as in Cuba and the Dominican Republic. *Metamasius mosieri* is the only species of groups I and II recorded from the eastern United States, except for species intercepted at quarantine stations. The species of the Greater Antilles are *bruneri*, *hemipterus*, *mosieri*, *ritchiei*, and *yunquensis*; of the Lesser Antilles, *cornurostris*, *livatus*, *maurus*, and *quadrisignatus*. The widespread species *hemipterus* is accidental in the western United States, in California, having been taken in quarantine in bananas. It was reported by LeConte (LeConte and Horn, 1876) from Arizona also, but its presence there has not been confirmed since that time. It has been

TABLE 1
DISTRIBUTION OF SPECIES OF *Metamasius* OF
GROUPS I AND II

	Number of Species	Restricted to Zone
South America	40	23
Central America	24	2
Mexico	10	2
Antilles	9	6
United States	1	—

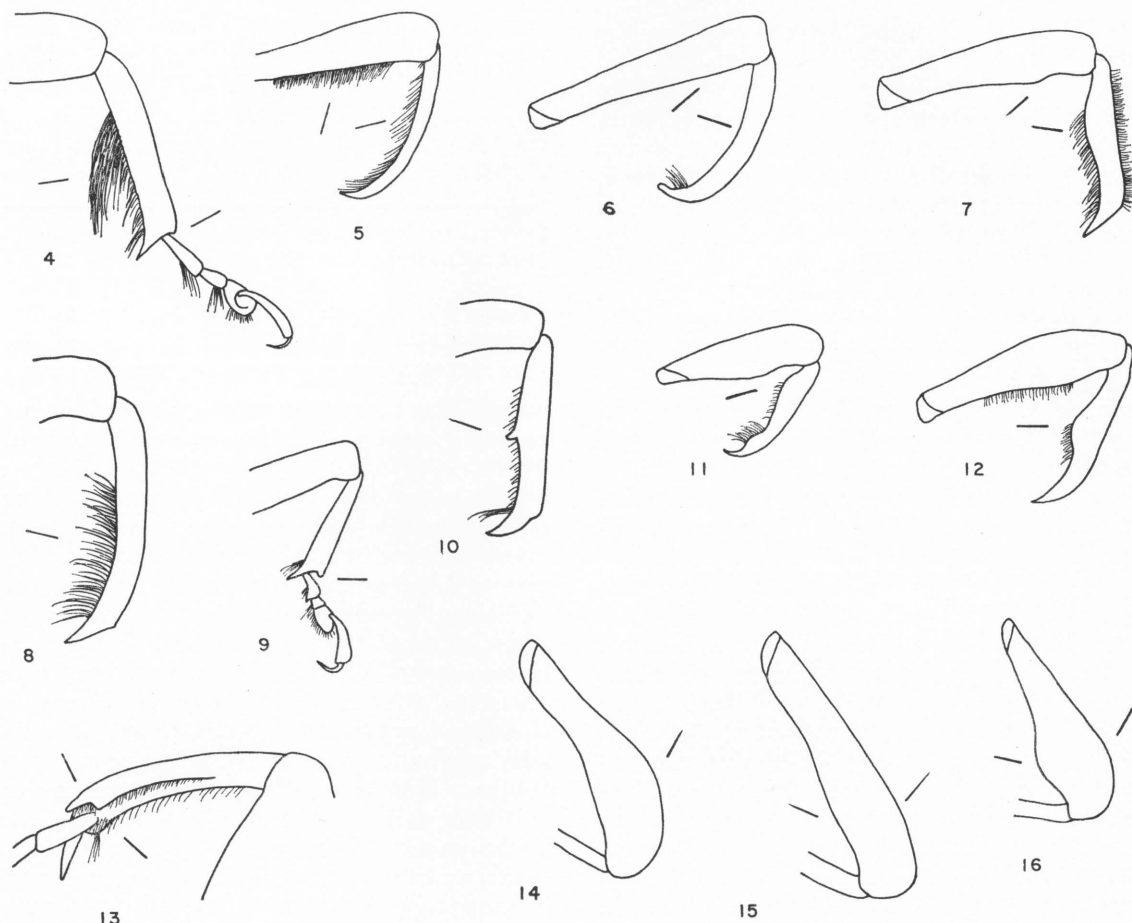
carried also to western Africa, where it is apparently established (Lepesme and Paulian, 1941).

The extensive range of the genus is due chiefly to the occurrence of *hemipterus* in every country from Mexico and the West Indies to Uruguay, except for Paraguay. Five additional species (*cinnamominus*, *dasyurus*, *dimidiatipennis*, *hebetatus*, and *inaequalis*) have nearly as extensive a range and are about as abundant as *hemipterus*. Some of their food or host plants (palms or bromeliads) are found throughout a great part of the Western Hemisphere, and others (sugarcane and bananas) are grown nearly everywhere in the tropical regions, in lowlands and highlands, on the coastal plains, along rivers, and in mountain settlements. Probably the only unlikely places for species of this genus are arid pampas where there is little cultivation, as in Argentina and the Gran Chaco and coastal Peru, or deserts, as in Chile. (See Appendix for complete distributional records.)

SEXUAL DIMORPHISM

Pertinent to the following discussion is the fact that some species are known from a unique male (*guentheri*, *scutiger*, *tibialis*, *yunquensis*) and that I have seen only males of *bromeliadicola*, *bruneri*, *laticrus*, and *sulcirostris* (the female of *bruneri*, however, is known). On the other hand, I have seen no males of *foveolatus* or *metamasioides*, although they have been described.

More than half of the species of groups I and II show secondary sexual differences, usually in the male. The most common trait of males is the presence, in at least 30 species, of long fringes or conspicuous tufts of hairs on the inner side of the fore or hind tibiae,



FIGS. 4-13. Legs of males of *Metamasius* (but of both sexes of *rugipectus*). 4. *M. cincinnatus*; characteristic also of *quadrilineatus*. 5. *M. dasyurus*. 6. *M. inaequalis*. 7. *M. crustosus*. 8. *M. basilaris*. 9. *M. rugipectus*; characteristic also of *M. flavopictus*. 10. *M. liratus*; characteristic also of *cinnamominus* and *maurus*. 11. *M. pygidialis*. 12. *M. laticrus*. 13. *M. rugipectus*, front tibia viewed from under side, and enlarged.

FIGS. 14-16. Hind femora of *Metamasius*. 14. *M. bisbisignatus*. 15. *M. ensirostris*, characteristic also of other species. 16. *M. maurus*.

more rarely on the middle tibiae (figs. 4-12). Males of *rimoratus* have exceedingly long front legs. Males of some species (*anceps*, *ensirostris*, *pygidialis*, *tibialis*, and others) have long hairy fringes on the femora, or patches or tufts on the apical segment of the abdomen (*ensirostris*, *sierrakowskyi*, and others). Some females also have hairs on the legs or at the apex of the abdomen, but these hairs either are shorter than those of males, or they form a different pattern. In males the base of the abdomen and part of the metasternum are generally somewhat hollowed out

or depressed longitudinally (here called the ventral depression), or hairy, whereas these parts are glabrous and either flat or convex in the majority of females. In most species there is a slight difference in the apices of the abdomen and of the pygidium, which are relatively more truncate and broader in males, more acuminate and narrower in females. The antennal insertion of males of some species is farther from the eye than that of the females. A small angle on the inner side of the hind tibia (fig. 10) is characteristic of males of *cinnamominus*, *liratus*, and *maurus*; the tib-

iae of males of other species may be enlarged, expanded, or slightly sinuate (*canalipes*, *crustosus*, *foveolatus*, *guentheri*, *laticrus*, *puncticeps*, *pygidialis*, *sierrakowskyi*, *tibialis*, *tuberculipectus*).

The beak is generally longer and more compressed in males, and has a stronger basal tooth in those species with such a tooth (*cinnamominus*, *cornurostris*, *dasyurus*, *liratus*, *maurus*, and others). The sides of the beak have short hairs in a small area in front of the scrobes in males of *anceps*, and the entire length of the beak in males of *peruanus*. In quite a few species (*basilaris*, *cinnamatus*, *cinnamominus*, *dasyurus*, *dimidiatipennis*, *laticrus*, *puncticeps*, *submaculatus*, *sulcirostris*, and *vicinus*) the beak of males is inferiorly sulcate at the middle (with or without hairs), or the sides are crenulate in profile view. Males of two species (*sanguinipes* and *tibialis*) have a slight angulation or kink on the lower edge of the beak (fig. 102).

The males of five species have apparently unique secondary sexual characters, as follows: a slight swelling medially near the front of the metasternum (*inaequalis*); the sides of the base of the elytra excavated (fig. 117) and the apex of the beak prolonged into a tooth (*maculiventris*); the sides of the pronotum (fig. 98) excavated (*scutellatus*); the sides or flanks of the front of the pronotum (fig. 97) asperate (*bruneri*); and a large ledge (fig. 101) between the front coxae (*tuberculipectus*).

The species of group III examined so far appear to have fewer secondary sexual characters. Only three or four species, for example, have long hairs on the tibiae of the males, and two species have the femora toothed within. The majority of species, however, show some sexual difference in the shape, length, or punctuation of the beak.

ANATOMY¹

EYES

The eyes are elongate-oval and vary slightly in size among the species. In many individuals, the eyes seem to blend into the surrounding integument in such a way that one is not certain where the dividing line is. The frons between the eyes is generally about equal in width to one-half of the width of the

beak at its extreme base. Some species have the eyes closer together, however, being from one-third to one-fourth of the width of the base of the beak, as in *cornurostris*, *mosieri*, and *rugipectus*. Other species have them slightly farther apart (most species of the *sierrakowskyi* subgroup, the *canalipes* subgroup, *sulcirostris* and *scutellatus* of the *fasciatus* subgroup, and *peruanus*).

ANTENNAE

The segments of the antennae are so variable in length that I do not use them in the descriptions. The first segment of the funicle is usually longer than the second, and both segments are usually longer than the following ones, but the third and fourth segments are unusually long in males of *bruneri* and *rimoratus*. Within the same species the four terminal segments of the funicle (before the club) may be longer than wide, but almost as wide as long in some individuals. The terminal segment of the funicle is transverse in a number of species, but not consistently so.

The antennae are inserted either at the base of the beak in front of the eye, or in front of the base at a distance from the eye of as much as the width of the antennal club (the distance measured from the posterior edge of the scrobe to the front of the eye). The antennal insertion is a fairly good specific character, but varies sexually in some species. In *pygidialis* and *tuberculipectus*, the insertion is much farther from the eye in males and closer to it in females. The antennal scrobes appear to differ in shape or size in some species (*peruanus*), but their vague outline makes definition or measurement difficult, so this character is not used in the formal descriptions.

The club of the antennae has a rather constant general shape within a species (quadrate with truncate apex, or elongate with more rounded apex and sides), but the useful part for the classification is the proportion of the length of the spongy or sensitive apical part to the chitinized, horny, basal part. The dividing line between these parts is straight as a rule if the spongy part is small, and arcuate if it is large (figs. 58–63). In a few species (*submaculatus*, *canalipes*, *cerasinus*, *crustosus*), the club is proportionately very small, and is more oval or conical, not so compressed

¹ See also Sexual Dimorphism, above, and table 2.

and flattened, as it is in the other species. A few long hairs at the apex of the club are apparently not significant.

LABIUM

According to Ting (1936, p. 102): "The majority of Coleoptera have the labium divided into three well-defined regions known as the submentum, mentum, and prementum whereas in the Rhynchophora, the mentum has become fused with the submentum . . . the postmentum and prementum. In the Calendridae [= Rhynchophorinae], however, only the postmentum is visible on the ventral side of the labium since the prementum, which is greatly reduced, has shifted posteriorly and lies on the apical, ental surface of the postmentum." The peduncle of this postmentum, which determines the shape of the apex of the beak, is, in profile, horizontal, angulate, or bisinuate, and in one species (*maculiventris*) is distinctly dentate. The peduncle is a good specific character (it was used as a generic character for "*Cactophagus*"), but allowance must be made for its wearing down; it varies also sexually. The longitudinal sulcus of the peduncle is worn flat in many individuals because it is shallow, but it is deeper in *difficilis*, *foveolatus*, *sanguinipes*, and *sierrakowskyi*, as well as in the majority of the species of group III (*Cactophagus* and *Phyllerythrurus* of authors).

BEAK

The rostrum or beak is a very important character, differing among species in its length, width, shape (cylindrical or compressed), vestiture, punctuation, and curvature. In the majority of species some or all of these attributes are sexually dimorphic. The males, when they differ, generally have the beak longer, wider, more compressed, more distinctly or densely punctate, more hairy, and less curved than that of females. A number of species (*canalipes*, *cerasinus*, *crustosus*, *difficilis*, *flavopictus*, *mosieri*, *ritchiei*, *rugipectus*, *scutellatus*) show virtually no sexual differences in the beak. The beak is very narrow in the majority of species, but proportionately rather stout in the six species of the *sierrakowskyi* subgroup and in *fasciatus*, *flavopictus*, *guentheri*, *rugipectus*, *scutellatus*, *sulcistrotris*, and *yunquensis*. It is generally nar-

rower at the apex in dorsal view than the front intercoxal space.

Additional features that are helpful for identification (and also sexually variable in some cases) are the relative length and breadth of the basal dilation, and the presence or absence of a basal, subrostral tooth and of an inferior sulcus. The base of the beak of most species is widened abruptly over the scrobes (viewed dorsally), and the distance from the dilated part to the actual base is usually longer than the width over the scrobes (fig. 20). In a few species the dilation is quite feeble and in a few the dilated part is as wide across the scrobes as the distance from the dilated part to the actual base ("basal dilation as wide as long"). In some species the dilation is as wide as long in females, but longer than wide in males (*pygidialis*, *tuberculipectus*); it is generally proportionately longer in males than in females. The subrostral tooth is a prolongation of the under sides of the scrobes and is thus actually double (a tooth on each side); some species have two double teeth or two small angles one in front of the other. The teeth of a given species are less strong in females than in males; they may be absent from some individuals of those species with rather feeble teeth. The inferior sulcus is either a deep, broad trench, or merely a double impressed line; it is often present in males only, but not in every male of a species. The under sides of the beak are crenulate or scalloped in males of some species.

At the base of the beak between the eyes is a short, median, impressed line extending forward from a small fovea. I do not use this character, as it is virtually the same in all species and subject also to obsolescence.

In the formal descriptions, the length of the beak is compared with the length of the pronotum, the beak being measured in profile from the apex to the fovea between the eyes, and the pronotum in profile from the apex to the middle of the base. (For discussion of the peduncle at the apex of the beak, see Labium, above.)

PRONOTUM

The pronotum of the majority of species is distinctly longer than wide, but the shape and proportions are variable within the species,

or vary sexually. Thus the sides, viewed dorsally, may be subparallel in the basal half of some individuals of a species, but in the basal three-quarters of others. The apical constriction or collar varies somewhat in distinctness between individuals. The punctuation, which is noted in the descriptions, is obscured in many individuals by the opacity of the surface. The entire pronotum is noticeably larger in males of some species (*cinamominus*, *tuberculipectus*).

Additional specific characters include the presence or absence of a basal depression (if the depression is feeble it may disappear in some individuals); the shape of the base, i.e., truncate, gently arcuate, or distinctly bisinuate; and the kind of basal margin. The base is considered to be "margined" where it has a rolled or raised edge which may or may not be bordered behind by a partial or entire groove or furrow of varying depth. The base may be margined in its center third only or entirely from side to side. Species of the *hebetatus* subgroup have both groove and margin strongly marked from side to side and visible in all specimens, but in some species (*hemipterus*, *fasciatus*, and others) the margin cannot be seen in all specimens, as the sides of the base are covered by a slight overlapping of the base of the elytra. The base is vaguely depressed in *scutiger* and either feebly or longitudinally depressed in *dasyurus*, *foveolatus*, *puncticeps*, *pygidialis*, *sanguinipes*, *sierrakowskyi*, *sulcirostris*, and *tuberculipectus*. It is not depressed in the remaining species of groups I and II.

The pattern is described in the descriptions of the species. The longitudinal black stripes present in many species are not raised above the surface as they are in many species of the genus *Sphenophorus*, and only a few species (*inaequalis*, *sulcirostris*) have rough or elevated areas.

SCUTELLUM

The scutellum is both a generic and specific character (figs. 42-45). It is useful in some parts of the classification, but varies individually in the relative width at its base. It is more or less triangular, but may be an elongate (isosceles) triangle, an equilateral triangle, or even scarcely triangular, with the sides scarcely convergent to the apex. In the

closely related *Sphenophorus*, the scutellum is more or less parallel-sided in some species, but triangular in others (Vaurie, 1951). A slight or distinct emargination of the front of the scutellum is characteristic of some species (*anceps*, *hemipterus*, *bisbisi*, *benoisti*). Many species show a tendency to a slight depression in the front. The species of the *sierrakowskyi* subgroup, with a few individual exceptions, have a nearly U-shaped scutellum. The surface, though shining in the majority of species, is coated over or pruinose in a few (*scutellatus*, *inaequalis*).

ELYTRA

The elytra possess a number of characters of specific or group importance. The inner intervals at the base curve inward slightly toward the scutellum in three species (*metamasioides*, *sanguinipes*, *scutellatus*), and are straight in other species. The sides of the elytra taper gently from the base to the apex in many species, but taper strongly in some (*bruneri*, *inaequalis*, *scutellatus*, *scutiger*, *sulcirostris*). The sides are subparallel in *applicatus*, *canalipes*, *cerasinus*, *crustosus*, *hebetatus*, *laticrus*, *octonotatus*, *ritchiei*, and *submaculatus*. The basal margin may be smooth and flat, or strongly margined; it is excavated in a curious way in males of *maculiventris* (fig. 117). The punctuation of the intervals and of the striae is recorded in the descriptions, but it is not very constant in all species. The shape of the apices (subtruncate or more or less separately rounded) is not used in the descriptions. The color pattern, where present, is amazingly similar among several species, but is quite distinct among others. A red C on the left elytron and reversed on the right elytron is common to a number of species. The colors (black and red) are reversible within some species, and portions of the pattern are reduced or expanded from the normal pattern in many individuals. The color varies from cherry red to dark red to bright red to orange. In most colored species, black individuals occur from time to time.

PYGIDIUM

Many species agree in the shape, punctuation, and vestiture of the pygidium, but many differ. Apical hairs, as a fringe or in two tufts, may be present, also a central ridge of

hairs (the hairs, unfortunately, are often worn off). By direct comparison, some species have a proportionately larger or smaller pygidium, and a rounded, truncate, or rather pointed apex (the apex is generally more pointed in females, more truncate in males).

PROSTERNUM

The prosternum is shining in most species, somewhat tomentose in several of the *hebetatus* and *canalipes* subgroups, and visibly hairy around the edges of the front coxae in six of the seven species of the *hemipterus* subgroup. There are distinct tumid rolls around the front edges of the front coxae in *maculiventris*, and less distinct, individually variable swellings in other species. One species (*tuberculipectus*) has a prominent ledge or tubercle medially in front of the coxae. The punctuation of the prosternum is a good specific character in some instances.

The prosternal process is rather truncate apically, but has a slight sinuation at the middle, or a partial dividing line; it is slightly or strongly tumid, or flat, and is usually strongly developed behind the coxae, overlapping the mesosternum. This prominent process was cited by Horn as one of the characters of his genus *Metamasius*, but actually it varies in width and prominence, presenting many gradations from strong to feeble.

MESEPIMERON AND METEPIMERON

The shape of the mesepimeron, like that of the scutellum, serves not only to differentiate some genera of the Rhynchophorinae (*Cosmopolites* from *Metamasius*), but also some groups of species (the *hemipterus* subgroup from the *hebetatus* subgroup). It is scarcely ever, however, exactly the same shape either within the species or among the species of the same genus. Such is true also of *Sphenophorus*, according to Vaurie (1951, p. 48). I have not used the character in the descriptions. The mesepimeron is proportionately longer at the middle in some species (some species of the *hemipterus* subgroup, also *inaequalis*), as shown in figure 50, and very short in others (*hebetatus* subgroup). In species of the latter group, it is about three times wider than long (fig. 49) and has the front border straight or arcuate, not sinuate, with its outer apex usually sharply acuminate. The kind of punctu-

ation is significant for a few species. The metepimeron, except for varying punctuation, appears similar in all species.

MESOSTERNUM AND METASTERNUM

The process of the mesosternum is cited in the descriptions as the distance between the middle coxae. In the species of groups I and II, the process is about as wide as the diameter of a coxa. It is more or less rectangular and flat, and where it meets the front of the metasternum it is rather truncate with a tiny, semicircular emargination at the middle. The emargination varies individually, however, in size and shape, and it is not used in the classification. In some individuals, it is shallow, in some deep, in some rather angulate as in species of *Sphenophorus*.

The metasternum is not mentioned in the formal descriptions, except for the two species (*cornurostris*, *foveolatus*) in which it is shortened because of short or much reduced wings, and except for the kind of punctuation. In contrast to the tumid metasternum of species of group III, the metasternum here is flat in front.

ABDOMEN

Aside from the punctuation of its sides and the shape and vestiture of the fifth or terminal segment, the abdomen seems to have no especially significant characters. The arrangement of the apical hairs and the presence or absence of an apical depression distinguish some species, as well as the sexes of some species. A slight or strong median depression is present at the base of the abdomen in males of the majority of species.

COXAE

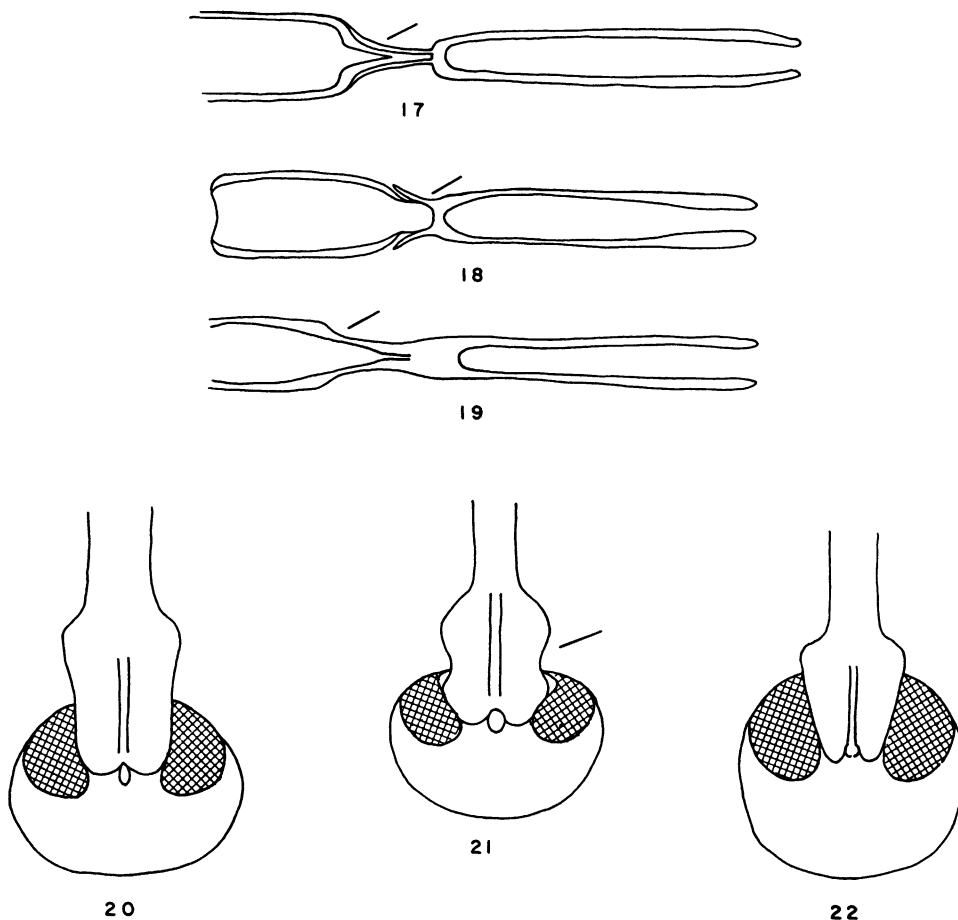
Although the spacing of the coxae is a generic and a group character, there is a wide range of variation among the species. In the descriptions the distances between the front or the middle coxae were established by my comparing them with the diameter of the coxae in question, or with the antennal funicle or antennal club. In groups I and II the distance between the front coxae is two or more times wider than the width of the antennal funicle in the great majority of species, but it is scarcely wider than the funicle in some (*bruneri*, one of two specimens; *cana-*

lipes, *cerasinus*, *crustosus*, *foveolatus*, *guentheri*, *maculiventris*, *peruanus*, *rugipectus*, *scutellatus*). As to the middle coxae, the distance between them equals the diameter of a coxa in about 30 species, is somewhat wider than the diameter in *hemipterus* and 22 other species, and is narrower in only four or five species (*bruneri*, one of two specimens; *foveolatus*, *metamasioides*, *peruanus*, *rugipectus*). The tufts of hair on the inner faces of these coxae are large and conspicuous in *hemipterus* and various other species, but are sparse or scarcely visible in *ritchiei* and several others, and lacking in *mosieri*. They are less conspicuous in the species of the *canalipes* sub-

group because the coxae are heavily tomentose.

LEGS

The femora and tibiae are important in the classification of the species, differing in relative length and width, in shape, and in the number and length of hairs. The hind femora are rather bulbous or clavate in the majority of species (figs. 7, 14, 16) but are gently widened in others (figs. 6, 15). In profile, they usually are shorter than, or reach to, the apex of the elytra, but in *inaequalis* and *tuberculipectus* they are longer, reaching to the apex of the abdomen. The tibiae are generally



FIGS. 17-19. Apodemes of male genitalia. 17. *M. hebetatus* subgroup, apodemes contiguous at base of aedeagus, attached laterally. 18. *M. basilaris*, apodemes forked at base, attached laterally; characteristic of most species of group I. 19. *M. melancholicus* and *M. inaequalis*, group II, apodemes attached dorsally to base of aedeagus.

FIGS. 20-22. Base of beak of *Metamasius*, dorsal view, showing proportions of basal dilation. 20. *M. vicarius*, type, male. 21. *M. applicatus*, female. 22. *M. rimoratus*, female.

straight but are distinctly curved inward in *inaequalis*, and slightly curved in *melancholicus* and several other species. The outer apical angle of the tibiae varies from appearing rounded off (as in *signiventris*), to being obtuse or right, to being actually toothed. It is vaguely unidentate in *cinnatus*, more evidently toothed in *flavopictus*, and distinctly bidentate in *rugipectus*. The outer face of the middle and hind tibiae has as a rule two longitudinal rows of hairs on a shining or, occasionally (*canalipes* subgroup, some members of *hebetatus* subgroup), a tomentose surface. A little tooth is present at the inner apex of the tibiae, but it is partially or entirely hidden by the tuft of hairs behind the apical mucro. This tooth is extremely tiny in *ciliatus*, *sierrakowskyi*, and *tibialis*, and not visible in all specimens of these species.

The legs show perhaps more secondary sexual characters than any other part of the anatomy, except for the beak. Some examples of the modifications of the tibiae of males (hairs, angles, expanded areas) are shown in figures 4–13.

Those species of the *canalipes* and *hebetatus* subgroups that have tomentose tibiae have generally dorsally tomentose tarsi also. There are individual differences in the relative length and breadth of the first two tarsal segments and a distinct specific difference in the species *signiventris* in its long, narrow, first segment (fig. 57). The third segment of all tarsi is characteristically abruptly wider than the preceding segments, but it is scarcely dilated on the hind tarsus of species of the *canalipes* subgroup (fig. 56) and is also rather narrow in some additional species of the *hebetatus* subgroup and in *inaequalis*. Spongy or abundantly hairy soles are present on the third segments of more than half of the species, either with or without a narrow median glabrous line, or a small glabrous area at base. Some species have nearly the center third glabrous, and some specimens have the soles so worn that their true nature cannot be told. The apex of the third segment may be more or less truncate, slightly sinuate, asymmetrical, or bilobed, but there is much individual variation.

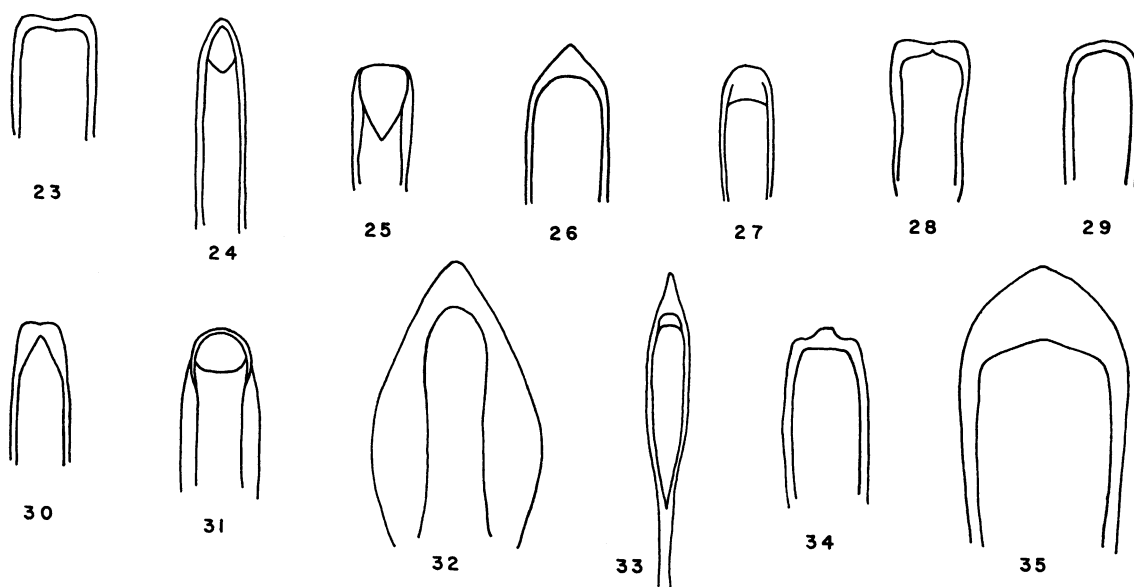
The claws, except for variations in length, appear quite stable in all species. The base of the claw segment is inserted either at the base or the middle of the third segment, but

in some species and some individual specimens it falls between the base and the middle.

GENITALIA

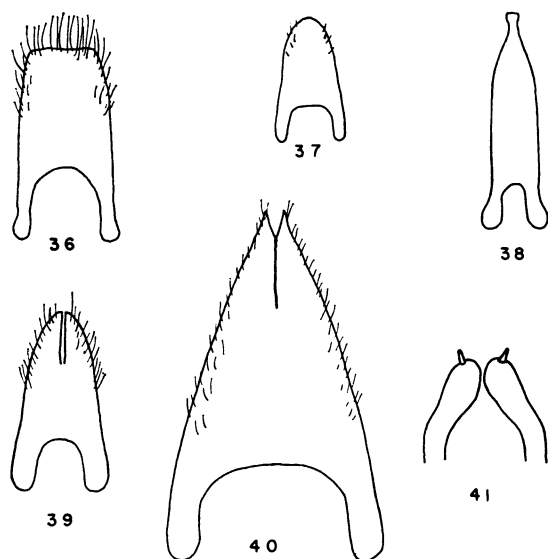
The female genitalia, which I examined in 49 of the 57 species, appear rather similar. They consist of two rather flat, diaphanous tubes with conspicuous or inconspicuous styli and numerous hairs apically. A composite figure of the genitalia and the eighth tergum, which envelops them, gives a general idea of their outline (figs. 39–41). The tergum varies slightly among species in its over-all shape (long and narrow, or short and wide), in the shape of the apices (more rounded, more truncate, more acuminate), and in the length or distinctness of the apical, dorsal slit. In two of the six species of the *sierrakowskyi* subgroup it differs from that of other species by having the apices noticeably acuminate and divergent (fig. 40). I have not used the female organs in the classification, because there are many species not represented by an adequate number of females for dissection, there is much individual variability, and the method of extraction influences the shape.

The aedeagus, on the other hand, as well as its paired apodemes or apophyses, are usually strongly chitinized, so do not suffer from extraction. They were examined for all but three species and have been used as a basis for the separation of the three principal species groups (see discussion, above, under Species Groups). Aside from the characters used for the species groups, the aedeagus differs among some species in the shape of its apex, the thickness of its chitinized borders, and the general curvature and length. For a few species (*inaequalis* and *melancholicus* together, *benoisti*, *guentheri*, *maculiventris*, *pygidialis*, *yunquensis*), the shape of the aedeagus or of its apex is species specific (figs. 30–35), and, although all these species (except *benoisti* and *yunquensis*) are quite distinct in other, external respects, the converse is not necessarily true. Some of the species that are most different externally (*anceps*, *peruanus*, *rugipectus*, *tuberculipectus*) do not have distinct genitalia. The majority of species have the apex of the aedeagus rounded or truncate or slightly emarginate, with the chitinized dorsal border relatively narrow in about half of the species and wide in the other half. There is some variability, however, as



FIGS. 23-35. Dorsal view of apex of aedeagus of *Metamasius*. 23. *M. basilaris*. 24. *M. canalipes*. 25. *M. cerasinus*. 26. *M. maurus*. 27. *M. tectus*. 28. *M. sulcirostris*. 29. *M. vicarius*. 30. *M. inaequalis* and *M. melancholicus*. 31. *M. maculiventris*. 32. *M. guentheri*. 33. *M. pygidialis*. 34. *M. benoisti*. 35. *M. yunquensis*.

the apex may appear rounded in one male of a species, almost truncate in another, or truncate in one male and just slightly emarginate



FIGS. 36-38. Eighth tergum of male. 36. *M. basilaris*. 37. *M. tectus*. 38. *M. pygidialis*.

FIGS. 39, 40. Eighth tergum of female. 39. *M. ensirostris*. 40. *M. sierrakowskyi*; characteristic also of *M. sanguinipes*.

FIG. 41. Apex of female genitalia.

in another. In nine species (*canalipes*, *guentheri*, *liratus*, *maurus*, *puncticeps*, *pygidialis*, *quadrilineatus*, *rimoratus*, *yunquensis*) the apex is slightly to strongly acuminate, and in five (*anceps*, *basilaris*, *ciliatus*, *difficilis*, *scutellatus*) it is distinctly emarginate. Two species have a little knob projecting from the apex, which is distinct in *benoisti*, but in *mosieri* it is slight in a male from Cuba, but absent from a male from Florida. Only the apex is shown in the illustrations of the aedeagus, as the latter is so strongly curved in most individuals that the middle and base cannot be seen at the same time as the apex.

The insertion and the shape of the apodemes at the base of the aedeagus, which I use for the separation of species groups and subgroups, are shown in figures 17 to 19. The typical forked apodemes without membrane, the most common kind, are illustrated for *basilaris*; the contiguous apodemes, for the *hebetatus* subgroup; and the dorsal direct, without membrane, is shown for the species of groups II and III.

The eighth tergum of males (figs. 36-38) is fairly uniform among the species, differing but slightly in shape. I mention it only for the species of the *canalipes*, *hebetatus*, and *sierrakowskyi* subgroups.

SYSTEMATIC SECTION

GENUS *METAMASIVS* HORN¹

Metamasius HORN, 1873, p. 410. Type species, by monotypy: *Calandra sericea* Olivier, 1807, a synonym of *Metamasius hemipterus* (Linnaeus).

Cactophagus LECONTE, 1876, p. 331. Type species, by monotypy: *Sphenophorus validus* LeConte, 1858, a synonym of *Metamasius spinolae* (Gyllenhal). New synonymy.

Odontorhynchus CHEVROLAT, 1880b, p. 316. Type species not designated, but two species given: *O. cornurostris* and *O. puncticollis*, both Chevrolat.

Phyllerythrurus CHEVROLAT, 1885, p. 92, footnote 2. Type species, by subsequent designation of Champion, 1910: *Curculio sanguinolentus* Olivier, 1790. New synonymy.

Eucactophagus CHAMPION, 1910, p. 96. Type species, by original designation: *Calandra aurofasciata* Brême, 1844. New synonymy.

Metamasiopsis CHAMPION, 1910, p. 100. Type species, by original designation: *Metamasiopsis rugipectus* Champion, 1910. New synonymy.

Odontomycter MARSHALL, 1943, p. 118, new name for *Odontorhynchus* Chevrolat, 1880, not Pelzeln, 1868 (Aves).

Subphyllerythrurus Voss, 1954, p. 333. Type species, by monotypy: *Metamasius tuberculipectus* Hustache, 1936. New synonymy.

Paramasius KUSCHEL, 1958, p. 750. Type species, by original designation: *Calandra distorta* Gemminger and Harold, 1871, new name for *inaequalis* Gyllenhal, preoccupied.

DIAGNOSIS OF GENUS

Very similar to a number of genera in both Eastern Hemisphere and Western Hemisphere, but differing from those of Western Hemisphere as follows: from *Cosmopolites* Chevrolat, *Phrynoides* Chevrolat,² *Melchus* Lacordaire, *Eucalandra* Faust, *Toxorhinus* Lacordaire by having mesepimeron not diamond-shaped (fig. 52) and scutellum not rounded; from *Scyphophorus* Schoenherr by having soles of third tarsal segments not fringed apically with transverse band of hairs and by having spongy part of antennal club not retracted; from *Belopoeus* Schoenherr by

having apices of elytra truncate or but feebly, not deeply, retracted at suture and by having elytra along suture much more than twice length of pygidium; from *Paradiaphorus* Chevrolat by having mesepimeron not shaped as shown in figure 51; from *Cactophagoides* Champion by having surface not verrucose or warty and prothorax not deeply excised on sides near apex; from *Sitophilus* Schoenherr and *Polytus* Faust by larger size (6 to 23 mm.), and by having scape of antennae two or more times longer than club; from *Sphenophorus* Schoenherr³ by having third tarsal segments either distinctly longer, or much wider at apex, than preceding segment, their soles usually virtually entirely spongy-hairy, and surface of pronotum without elevated, shining stripes or patches; from *Rhodobaenus* LeConte⁴ by having apex of claw segment not inferiorly excavate. Those of above genera most likely to be confused with *Metamasius* are *Paradiaphorus*, *Rhodobaenus*, and a few species of *Sphenophorus*.

GENERIC CHARACTERS

For the characters of the subfamily Rhynchophorinae or the family Curculionidae, see LeConte (1876) or Blatchley and Leng (1916).

Color black or dark red or dusty gray, with or without red (or orange, buffy, or yellow) longitudinal or transverse stripes, or round or irregular spots, or the reverse, i.e., red with black markings; surface polished or dull, without scales; in some species or individuals surface opaque, "velvety," pruinose, or tomentose, rarely encrusted with a glazed coating as in many species of *Sphenophorus*. Beak usually about as long as, or longer than, pronotum; antennae inserted at or near base of beak. Peduncle of postmentum⁵ of labium

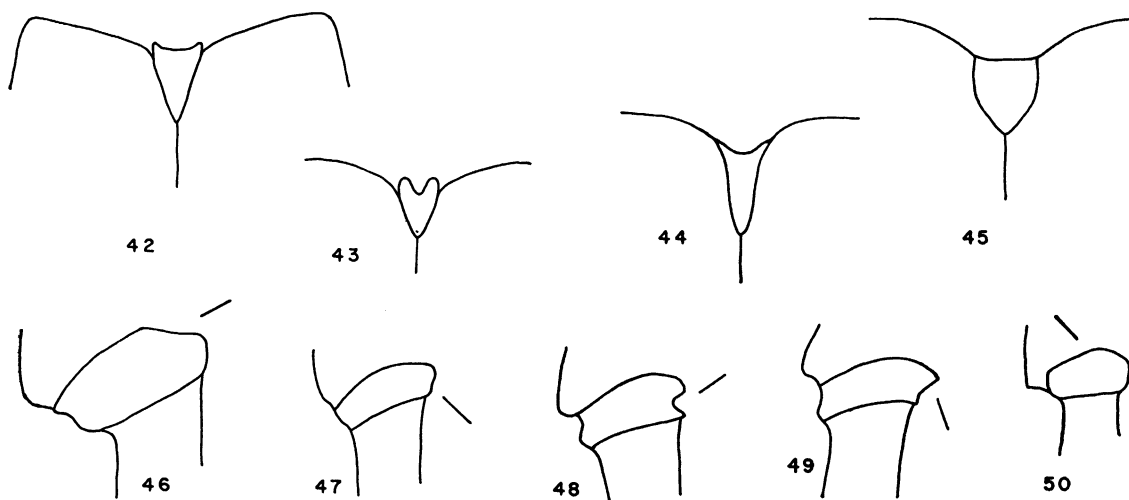
¹ *Merothricus* Chevrolat, 1885 (type, *Sphenophorus rusticus* Gyllenhal, Cayenne, examined), is a synonym of *Sphenophorus*. New synonymy.

² *Homalostylus* Chevrolat, 1885 (type, *Sphenophorus latiscapus* Kirsch, Colombia, not examined), is probably a synonym of *Rhodobaenus*.

³ Called "peduncle of submentum" by Lacordaire (1886, p. 267) and Champion (1910, p. 79); "peduncle of mentum" by Blatchley and Leng (*loc. cit.*); "peduncle

¹ The name of a form that was listed in Sturm's catalogue (1826) and carried in the synonymy of *sericeus* for more than 100 years is not mentioned in this paper, as it is a *nomen nudum*.

² *Phrynoides* may be no more than a synonym of *Melchus*, according to Heller (1927, p. 1).



FIGS. 42–45. The scutellum of *Metamasius*. 42. Slightly emarginate (*benoisti*, *hemipterus*). 43. Strongly emarginate, bilobed (*anceps*). 44. Very narrowly triangular (*ritchiei*). 45. Shield-shaped or U-shaped (*sierrakowskyi* subgroup).

FIGS. 46–50. The mesepimeron of *Metamasius*. 46. *M. spinolae*, species group III. 47. *M. validirostris*, species group III; characteristic also of some species of group I. 48. *M. hemipterus*, species group I. 49. *M. tuberculipectus*, species group I. 50. *M. inaequalis*, species group II.

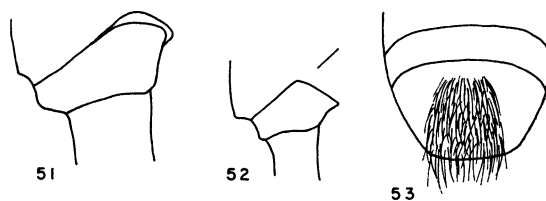
with sides subparallel or apparently divergent anteriorly; obsolete or feebly sulcate in about half of species; in the remainder either not sulcate and often with a tubercular prominence in front, or anteriorly deeply emarginate or vertically bilamellate; in profile horizontal, angulate, sinuate, or arcuate. Eyes oval, not contiguous above. Antennal club in most species securiform (hatchet- or wedge-shaped) and flattened, but in a few species rather oval or cone-shaped, not so flat; spongy or sensitive apex of club from one-third to two-thirds of length of entire club (shorter in one or two species); funicle segments variable, but first and second segments usually longer than remaining ones; scape about as long as funicle (shorter in one or two species).

Pronotum flat or slightly convex, in some species depressed at base medially, surface without elevated areas, basal margin subtruncate, arcuate, or bisinuate. Scutellum narrowly or broadly triangular, rarely U-shaped or shield-shaped. Elytra with nine

of postmentum" by Buchanan (1941, p. 169, footnote) and Ting (1936, p. 102); "gular peduncle" by LeConte (*loc. cit.*), Arnett (1962, p. 992), and Kissinger (1964, p. 88).

or 10 punctate striae separated by flat or elevated intervals (short tenth stria obsolete in several species); at middle line at least five times longer than pygidium. Pygidium convex or rather flat, vertical or horizontal, in some species feebly or strongly carinate from middle to apex, usually punctate and somewhat hairy.

Prosternum between front coxae with or without tubercle or projection; prosternal process strongly or weakly developed behind coxae. Front coxae narrowly, moderately, or widely separated. Intercostal process of middle legs flat or tumid at center, rarely narrower than one-half of diameter of coxa.



FIGS. 51, 52. Mesepimera. 51. *Paradiaphorus crenatus*. 52. *Cosmopolites sordidus*.

FIGS. 53. Last abdominal segment with dense hairs characteristic of *Metamasius ensirostris*, male, and *M. sierrakowskyi*, both sexes.

Front of metasternum flat, tumid, subconical, or with large projection. Coxae with or without hairs on inner face. Mesepimeron (figs. 46–50) at least twice wider than long, with or without sharp angle at outer corner in front; front border subtruncate or slightly arcuate, outer border subtruncate, emarginate, or oblique; hind border straight, either oblique or horizontal. Side pieces of metasternum narrow, at least six times longer than wide at base. Femora clavate and bulbous, or gradually widened to apex, toothed within in a few species.¹ Tibiae straight or slightly incurved; outer apical angle rounded, or sharp, or unidentate, or bidentate; inner apex with sharp spur or mucro, and smaller tooth behind mucro that is not visible in many individuals. Tarsi spongy-hairy beneath, third segment usually widely dilated, but, if only slightly dilated, then longer than second segment; dilated segment entirely hairy beneath, or hairy but with median line glabrous, or hairy with basal V-shaped or U-shaped area glabrous. Apex of claw segment inferiorly convex or flat, not bilamellate.

Aedeagus tubelike, partly chitinized, partly membranous; dorsal orifice near apex; laterally with or without dividing line between dorsal and ventral surfaces; at base, dorsally or laterally, two long, chitinized apodemes or rods, longer than aedeagus, inserted with or without visible connecting membrane; apodemes broadly forked at base of aedeagus (in shape of hourglass), or contiguous at base but forked behind (figs. 17–19).

Secondary sexual characters well marked in majority of species; parts modified sexually include beak, peduncle, club, pronotum, pygidium, prosternum, abdomen, femora, and tibiae (see Sexual Dimorphism in Introduction).

DISCUSSION OF SYNONYMY

Some of the synonyms of *Metamasius* given above would be considered genera or subgenera by some authors, and in fact I so considered *Cactophagus*, *Eucactophagus*, and *Phyllerythrurus* at the outset of the present study. However, as explained in the Introduction (p. 217), I have synonymized all the names, as I believe that subgenera or genera

linked by many intermediate forms are not very useful or meaningful categories, and further restriction of significant characters would only result in the need for many small genera.

With the exception of *Cactophagus*, none of the names synonymized has been widely used in the literature. Possibly the type species (*validus*, a synonym of *spinolae*) and one other species of *Cactophagus* (*fahraei*) form a separate genus because of differences found in the larval forms, as given by Anderson (1948), and because these two species are the only ones known that breed in cacti. If so, *Cactophagus* can be reinstated. Although the type species was described from the southwestern United States, subsequent species assigned to *Cactophagus* come from Mexico and farther south. These southern species, as is true also for the more southern species of *Metamasius*, are sufficiently variable in the "generic" characters as to be a source of confusion between the concepts of *Cactophagus* and *Metamasius*. Certain specimens of *validirostris* Gyllenhal might be classified in *Metamasius* or *Cactophagus*. The species *pulcherrimus* and *callizona* of Chevrolat, 1882, both of which were described as *Sphenophorus*, were considered later by Chevrolat (1885) as *Phyllerythrurus*, and by Champion (1910) as *Cactophagus* (for *pulcherrimus*) and as *Metamasius* (for *callizona*). Two authorities on the Curculionidae (Günther, 1941, and Voss, 1953) have already hinted that *Cactophagus* and *Metamasius* might be congeneric.

According to Champion (1910, p. 96), for his new genus, *Eucactophagus*, "the chief peculiarity of the typical members of the . . . genus" is "the protuberant antero-intercoxal process of the metasternum," but he admitted that one of the species he included (*aurocinctus* Champion) had this projection "reduced to a minimum." If *aurocinctus* should be removed from *Eucactophagus*, however, it is thus separated from *graphipterus* Champion with which it shares some common characters not found in others of the "genus." The type of *Eucactophagus* (*aurofasciatus* Brême) was considered as *Sphenophorus* by its author and as *Phyllerythrurus* by Chevrolat (1885).

Chevrolat gave no description of his genus

¹ Previous descriptions gave femora as "not toothed."

Phyllerythrurus, published posthumously, but he included five species in the genus, each with a red band at or near the base of the elytra. Four of these five species were considered as members of other genera by Champion (*loc. cit.*), who attempted to characterize the genus and to differentiate it from *Cactophagus*. The only differences he found from the latter were the triangular or conical, not broad and flat, intercoxal process of the metasternum and the general shape (rhomboidal or subfusiform), but neither of these characters, in my opinion, is sufficient basis for the "genus," especially as the "flat" metasternum of the type species of *Cactophagus* is not flat in all specimens.

Voss's monotypic subgenus *Subphyllerythrurus* was said to occupy a middle position between *Phyllerythrurus* and *Metamasius*, but Voss linked it with *Metamasius* (see *tuberculipectus* for further discussion).

As for Champion's *Metamasiospis*, its type species (*rugipectus* Champion) is rather aberrant because of its long pronotum, short beak, narrow scutellum, and bidentate apices of the tibiae, but it is not more different from other species than are *peruanus* or *scutiger* or *pygidialis* or *maculiventris*, other aberrant species. The two other species (*flavopictus*, *decempunctatus*) included by Champion (here considered conspecific) differ from the majority of species only by having the outer angles of the tibiae unidentate, but some individuals scarcely show the tooth, and at least one species (*cincinnatus*) assigned to *Metamasius* also has a slight tooth. The apices of the tibiae are bidentate also in a related genus, *Scyphophorus*. I do not consider this character by itself a valid basis for a genus.

Another genus of Chevrolat's, *Odontorhynchus*, was synonymized by Hustache (1932) in his revision of the species of Guadeloupe. He considered it a member of the genus *Sphenophorus* instead of *Metamasius*, probably because the front coxae are not so widely separated as those of *Metamasius hemipterus* or *M. quadrisignatus*, other species from the island. Chevrolat gave no generic characters, but the character that evidently gives the generic name to the two species (*cornurostris* and its synonym, *puncticollis*), i.e., the large subrostral tooth, is present also in a number of species assigned to *Metamasius*.

For *Paramasius* Kuschel, with two species (*inaequalis*, *melancholicus*), the only generic characters mentioned are the manner of insertion of the basal apophyses (or apodemes) of the genitalia of the male, and the tendency for the lateral line or side furrow of the aedeagus to be shortened or indistinct proximally. However, *M. cinnamominus* appears also to have the lateral line indefinite, at least in some individuals, and the "dorsal direct" insertion of the basal apodemes "without membrane" is characteristic of the majority of species of the *Cactophagus* of authors. As is stated below, I consider Kuschel's two species as belonging in a separate group which more or less links *Metamasius* and the *Cactophagus*-like species of group III.

SPECIES GROUPS AND SUBGROUPS

The three species groups are characterized in table 2 and discussed further in the Introduction (p. 217). A short summary of each of the eight subgroups is given below which includes the relationships, distribution, and ecology of the species, as well as the characters shared by the species. The division of the three species groups is based chiefly on the genitalia of the males, but characters other than the genitalia are used in the key to the species which follows the summaries of the subgroups. The aedeagus of three species (*foveolatus*, *metamasioides*, *scutiger*) was not examined, but it is almost certain to agree with that of the group.

A few other characters are not included in table 2 because they involve many exceptions. Generally speaking, species of group I have the middle and hind femora rather bulbous, but those of groups II and III have them gradually widened; in group I they are somewhat shorter, in the other groups very long. The pronotum has no basal depression and no strongly sinuate basal margin in the majority of species of group I, but has both in the majority of species of groups II and III.

The beak is generally narrower in species of groups I and II, and much narrower at its apex in dorsal view than the distance between the front coxae, but in nearly a dozen species either the beak and the intercoxal space are about equal or the beak is wider; in species of

TABLE 2
COMPARATIVE CHARACTERS IN THE SPECIES GROUPS OF *Metamasius*

	Species Group I 55 Species	Species Group II Two Species	Species Group III ^a 35-55 Species
Aedeagus	Lateral line entire	Lateral line shortened	Lateral line lacking
Apodemes of aedeagus	Attached laterally	Attached dorsally	Attached dorsally
Front of metasternum	Flat; not depressed around middle coxae ^b	Like that of group I	Feebly or strongly tumid, and depressed around middle coxae, but flat in several species
Process of mesosternum	Flat	Like that of group I	Tumid at middle, except for three or four species
Front coxae	Widely separated by width of antennal club, or by twice width of outer funicular segments ^c	Like those of group I	Narrowly separated by no more than width of outer funicular segments, but in about a dozen species by twice width of segments
Middle coxae	Widely separated by about diameter of coxae	Like those of group I	Narrowly separated by less than one-half of diameter of coxae, or widely separated like those of groups I and II
Inner face of front and middle coxae	With small or large tuft of hairs ^d	Like that of group I	Not hairy, except for several species
Shape of mesepimeron	As shown in figures 47-49	As shown in figure 50	As shown in figures 46, 47
Peduncle of postmentum	Feebly or narrowly sulcate, often worn smooth ^e	Like that of group I	Strongly, broadly sulcate; or vertically bilamellate at apex; or feebly sulcate as in groups I and II
Femora	Not toothed within	Like those of group I	Toothed within in two species
Outer apical angle of tibia	Not toothed ^f	Like that of group I	Toothed in two species
Process of prosternum	Large, prominent, long, overlapping front of mesosternum	Like that of group I	Proportionately smaller, shorter, and scarcely overlapping mesosternum, but in several species nearly like that of groups I and II
Prosternum between coxae	Not tuberculate ^g	Like that of group I	Tuberculate in many species

^a A discussion of these species will be given in a subsequent paper.

^b Except that metasternum is gently convex in *mosieri*, *nudiiventris*, *sellatus*, and in one specimen each of *bruneri*, *scutigera*, and *sulcirostris*.

^c Except that coxae are separated by scarcely more than width of funicular segments in *bruneri*, *canalipes*, *maculiventris*, *peruanus*, and *rugipectus*.

^d Except that no hairs are visible in *mosieri*, *rugipectus*, and *yunquensis*.

^e Except that peduncle is more strongly sulcate in *difficilis*, *foveolatus*, *sanguinipes*, and *sierrakowskyi*.

^f Except that outer angle is toothed, at least slightly, in *cinnamatus*, *flavopictus*, and *rugipectus*.

^g Except that it is tuberculate in *tuberculipectus*, especially the male.

group III the beak is wider in all but two species. Kissinger (1964, p. 87) used the proportion of the beak to the intercoxal space to distinguish *Metamasius* from "*Cactophagus*" in his key to the genera of Rhynchophorinae of the United States.

SPECIES GROUP I, *hemipterus*

SUBGROUP *hemipterus*

The seven species of this, the typical subgroup, which includes the type of the genus, have the front and middle coxae very widely

separated, the prosternal process very long and large, the antennal club and the third tarsal segments widely dilated (fig. 55), the beak of males and females quite different in shape or length, and the secondary sexual characters well marked. The prosternum is hairy, except in *basilaris*, and this character, in addition to the entirely hairy tarsal soles, distinguishes these species from those of the other groups. The aedeagus is of the same type as that of males of the *fasciatus* and *sierrakowskyi* subgroups. The front border of the mesepimeron (a character not used in the descriptions) is slightly arcuate, angulate on the outer side, and a little more than twice wider than long (fig. 48).

ECOLOGY: Information on habits is given for all species except *basilaris*, *benoisti*, and *vicinus*.

DISTRIBUTION: Except for *hemipterus*, and possibly *ensirostris*, the species of this section occur in South America but not in Central America or Mexico.

CHARACTERS OF SUBGROUP: The following characters are not repeated under the species, being similar in all: Frons between eyes about equal to one-half of width of beak at base, perhaps slightly less in *benoisti* and *ensirostris*. Beak with basal dilation distinctly longer than wide; base under scrobes sinuate or obsoletely toothed; peduncle of postmentum sulcate, but often worn smooth, in profile horizontal. Antennal club flattened, widely dilated, spongy apex quadrate (fig. 59). Pronotum longer than wide, apical constriction fairly strong; sides subparallel or slightly concave in basal half or basal three-fourths (in less than basal half in type of *basilaris*); basal depression lacking, but feebly present in some specimens of *bisbisignatus* and *vicinus*. Elytra, basal margin smooth, not elevated or strongly margined; sides gently tapering to apex; intervals straight at base; apices rather truncate in *anceps*, *basilaris*, and *vicinus*, in others separately rounded. Scutellum elongate-triangular, emarginate where stated. Prosternum hairy in front of coxae (except for *basilaris*), hairs may be worn in some individuals. Distance between front coxae about equal to width of antennal club or to one-half of diameter of coxa; distance between middle coxae slightly wider than diameter of coxa. Tibiae with two irregular rows of exceedingly fine,

scarcely visible punctures on each side of smooth space (except for front tibiae of *ensirostris*); hind tibiae straight, except in *basilaris*. Femora virtually impunctate. Tarsi with soles of third segment entirely hairy, except for narrow glabrous line at center in most individuals; dilated segments on hind legs rather asymmetrical; claw segment inserted neither at extreme base nor at exact middle, but somewhere in between; second segment of hind tarsus scarcely longer than wide, about one-third of length of first. Apodemes of aedeagus forked, attached by membrane.

SUBGROUP *scutiger*

A single tiny species, known from the type only, is placed provisionally in a separate subgroup, not only because the aedeagus was not examined, but because certain characters were not noted at the time it was examined. It differs from the majority of species of the *fasciatus* subgroup by having the tarsal soles entirely hairy, and from the majority of those of the *hemipterus* subgroup by having no hairs on the prosternum. The coxae are widely separated as in the subgroups mentioned and the venter is typical of the species group, although the metasternum has a slight general convexity. (For characters, ecology, and distribution, see the description of the species.)

SUBGROUP *fasciatus*

This is the largest subgroup, with 21 species, many of which could be considered in sections by themselves if one wished to subdivide the group further. Thus *bruneri*, *cinnamominus*, *cornurostris*, *mosieri*, *ritchiei*, *scutellatus*, or *sulcirostris*, for one reason or another, might be placed separately, but not necessarily with one another. The majority of characters of these species are the same as those of species of the subgroup *sierrakowskyi*, but the scutellum here is elongate-triangular and pointed apically, not broadly U-shaped (figs. 44, 45); in most species the femora are punctate, and some species have the beak rather compressed instead of cylindrical. Many species have the general facies of the *hemipterus* subgroup, from which they differ by having the tarsal soles glabrous at the base (except for *bruneri* and *ritchiei*), and no hairs on the prosternum, except for *cinnamominus*. The males of all species,

except *callizona*, *cornurostris*, *flavopictus*, *mosieri*, and *sulcirostris*, have at least one pair of tibiae modified either by long hairs or by an acute angulation.

ECOLOGY: Some notations are given for all species, except *ciliatus*, *cornurostris*, *scutellatus*, *sulcirostris*, and *yunquensis*.

DISTRIBUTION: All the species occur in Central America or Mexico, except for eight from the Antilles (*bruneri*, *cornurostris*, *liratus*, *maurus*, *mosieri*, *quadrisignatus*, *ritchiei*, and *yunquensis*); five from Central America continue into South America.

CHARACTERS OF SUBGROUP: Frons between eyes about equal to one-half of width of base of beak, but wider or narrower where stated. Peduncle of postmentum in profile with apex angulate and slightly sinuate except where stated otherwise. Antennal club individually variable, but generally flattened, dilated, more or less quadrate apically, except where stated. Pronotum distinctly longer than wide, except in *bruneri* and *mosieri*; apical constriction variable. Elytra, basal margin smooth, not elevated or strong; sides not strongly tapering to apex, except in *bruneri*, *scutellatus*, and *sulcirostris*; intervals at base straight except in *scutellatus*. Scutellum elongate-triangular, flat or rather concave in front. Prosternum not hairy, except in a few individuals of *cinnamominus*. Tibiae appearing impunctate in some species, but with two rows of punctures (outer row often double), alternating with smooth, non-punctate area. Hind tibia straight on outer side, except in *ritchiei*, *scutellatus*, and *sulcirostris*. Middle femur short, not reaching beyond base of metasternum, but long in *bruneri* and *cornurostris*. Third tarsal segment below glabrous at center of base in round or V-shaped areas, but hairy entirely in *bruneri* and *ritchiei*; dilated third segment on hind legs slightly or strongly asymmetrical; second segment of hind tarsus slightly longer than wide, and about one-half or less of length of first. Claw segment inserted somewhat nearer base than middle of third segment, but variable. Aedeagus with apodemes forked and attached by membrane.

SUBGROUP *rugipectus*

This single species of Mexico and Central America could be placed in the *fasciatus* sub-

group near *flavopictus* and *cinnatus*, which also have the apices of the tibiae toothed, but the apices in *rugipectus* are bidentate, not unidentate (they are bidentate also in species of the genus *Scyphophorus* and in *Metamasius transatlanticus*). In addition, the front coxae are quite narrowly separated in *rugipectus*, the scutellum is abnormally narrow, and the coxae have no hairs on the inner face, characters which do not agree very well with those of species of the *fasciatus* subgroup. The mesepimeron agrees with that of the *hebetatus* subgroup. (For characters and ecology, see the descriptions of the species.)

SUBGROUP *sierrakowskyi*

This is quite a homogeneous group. The six species are very similar to many of the *fasciatus* subgroup, but differ by having the scutellum rather U-shaped instead of triangular and acuminate (fig. 45) and the femora and tibiae virtually impunctate. Many species of both these subgroups have a short, stout, cylindrical beak, a basally lobed pronotum, and, in the male, long tibial hairs. One species (*tibialis*) is represented by a unique male, and I have seen only the female of *foveolatus* and *metamasioides*. With the exception of *difficilis*, these species were described as *Cactophagus*, or were so considered by Champion (1910).

ECOLOGY: Notations of ecology are given for two species only (*difficilis*, *sierrakowskyi*).

DISTRIBUTION: The species of this subgroup are found mostly in northern South America, but *difficilis* and *sierrakowskyi* occur also in Central America.

CHARACTERS OF SUBGROUP: Frons between eyes wider than one-half of width of beak at base, but perhaps slightly less in *difficilis* and *sierrakowskyi*. Beak shorter than pronotum, stout (in profile as wide as, or slightly wider than, base of front femur), cylindrical, gently arcuate; basal dilation longer than wide; scrobe with posterior edge separated from eye by width of scape, thus antennae inserted close to eye. Peduncle of postmentum in profile angulate in front, inferiorly deeply sulcate (unless worn smooth). Antennal club flattened, dilated. Base of pronotum varying individually from slightly to distinctly bisinuate or lobed at middle; sides parallel or slightly concave in basal

half; apical constriction distinct. Elytra, sides tapering gently to apex; intervals impunctate, virtually straight at base. Scutellum U-shaped, sides not strongly convergent (fig. 45), but some individuals of *difficilis*, *foveolatus*, and *sierrakowskyi* with apex rather pointed. Prosternum not hairy; flat or slightly depressed at middle, with vague swellings in front of each coxa; episternum of mesosternum and of metasternum impunctate. Tibiae appearing impunctate, but with two rows of very fine punctures; tibiae of males with long hairs or tufts. Femora impunctate. Claw segment of tarsus inserted at middle of third segment. Third tarsal segment below glabrous at center of base in V-shaped area, this area extending to apex in some individuals of *sierrakowskyi*. Hind tarsus with second segment slightly longer than wide and less than one-half of length of first. Apodemes of aedeagus forked, attached by membrane (but no males of *foveolatus* or *metamasioides* examined for this character). Eighth tergum of known males with long apical hairs.

SUBGROUP *peruanus*

The single species of this section (Peru, Bolivia) differs from all other species in its beak (figs. 99, 100). Otherwise it is very similar to some species of the *hebetatus* subgroup because of its narrow, subparallel shape, the shape of the mesepimeron, the narrow scutellum, and the strongly margined and grooved base of the pronotum. The aedeagus and the hairy posternum agree with those of species of the *hemipterus* subgroup, but the narrowly separated front coxae set it apart from species of that subgroup. (For characters, see the description of the species.)

SUBGROUP *canalipes*

The three species of this subgroup have rather narrowly separated front coxae as in the *peruanus* subgroup (above). They agree with some species of the *hebetatus* subgroup in having a narrow, subparallel shape, narrow scutellum, subtruncate base of the pronotum, and the front and middle coxae heavily tomentose. They differ from all species of that subgroup, however, in having the apodemes inserted laterally at the base of the aedeagus, not dorsally, and the apodemes forked, not contiguous. The male genitalia are of the

same type as those of previous subgroups. Externally, these species differ from those of the *hebetatus* subgroup and from those of most other subgroups in a combination of: beak appearing crusty with tomentose punctures, dorsally and laterally entirely punctate, and of the same shape and punctuation in both sexes, all the tibiae "fuzzy" with bronzy, tomentose hairs, the antennal club scarcely dilated (fig. 63), its spongy apex very short, the third tarsal segments not only dorsally tomentose with silky, blond hairs, but scarcely dilated and nearly parallel-sided (fig. 56) and the second tarsal segments transverse, about as wide as long, and dorsally tomentose. The intervals of the elytra, except where worn, are subcristate, with median lines of tiny, tomentose tufts, as in some specimens of the *inaequalis* group, but the intervals are of the same widths, not alternately wider as in the species of that group.

As there are only three species, no summary of characters is given; subsequent species are compared with the first species.

ECOLOGY: Notes are given for *canalipes* only.

DISTRIBUTION: The species occur from Bolivia and eastern Brazil north to Panama.

SUBGROUP *hebetatus*

Although there are species in this subgroup (*guentheri*, *laticrus*, *maculiventris*, *pygidialis*, *rimoratus*, *submaculatus*, and *tuberculipectus*) that might be considered in separate subgroups because of their unusual secondary sexual or other characters, they have all been kept together because of the similarity of the apodemes of the genitalia of the males, which differ from those of other groups and subgroups by being contiguous at the base of the aedeagus, not forked or X-shaped (fig. 17). The elytra are rather more parallel-sided than those of most other subgroups (figs. 106–111). The 15 species could, perhaps, be divided into two subgroups, as the first five species have the third segment of the tarsus quite narrow, whereas the remaining ones have it widely dilated. Other characters, however, apparently vary without correlation to the dilation of the third segment; therefore it seems best to keep the species in one subgroup. The mesepimeron in the majority of species appears to have the front

border more often straight than arcuate, the sides subparallel except for the sharp outer angle, and the width more than twice the length. No females are known of two species (*guentheri*, *laticrus*).

ECOLOGY: Notations on ecology are given for six species (*dasyurus*, *hebetatus*, *maculiventris*, *pygidialis*, *submaculatus*, and *tectus*).

DISTRIBUTION: All the species have been found in Ecuador, except *applicatus* and *octonotatus*, and all in Colombia, except *laticrus*, *maculiventris*, and *pygidialis*. A few species (*dasyurus*, *hebetatus*, *maculiventris*, *octonotatus*, and *pygidialis*) occur in Central America as well as South America.

CHARACTERS OF SUBGROUP: Frons between eyes about equal to one-half of width of beak at base, but in some species (*octonotatus*, *submaculatus*) appearing wider. Profile of head and base of beak forming more or less continuous line. Peduncle of postmentum sulcate, but often worn smooth, in profile horizontal (except for *maculiventris*, *guentheri*). Antennal club flattened, dilated, more or less quadrate apically, but individually variable. Pronotum with basal margin subtruncate or very slightly sinuate at middle, base strongly margined and deeply furrowed from side to side. Scutellum elongate-triangular, flat except where stated otherwise; tomentose where stated. Prosternum not hairy. Third tarsal segment below entirely hairy except where stated, that of hind legs narrower than usual in some species (*hebetatus*, *laticrus*, *maculiventris*, *puncticeps*, *signiventris*, and *tectus*). Aedeagus with apodemes contiguous, not forked or X-shaped at basal attachment.

SPECIES GROUP II, *inaequalis*

The two species of this group form a kind of link between the species of groups I and III. They have the paired apodemes of the genitalia of the male merged, without visible membrane, directly and dorsally to the base of the aedeagus (fig. 19), as in the majority of species of group III, but the aedeagus has at least a partial lateral line, usually toward the apex, as in species of group I. Kuschel (1958, p. 750), on the basis of the genitalic characters mentioned, gave the generic name *Paramasius* to these species (see Discussion of Synonymy above). The species differ from

those of other groups in having the base of the pronotum foveate laterally, and some intervals of the elytra, usually the alternate ones, wider than the others and more elevated. The scutellum, third tarsal segments, and elytra are narrow and rather subparallel, as they are also in some species of group I (the *hebetatus* and *canalipes* subgroups). Most of the species of other sections have the base of the pronotum subtruncate, not sinuate, and the apodemes of the genitalia of the males attached somewhat differently. The strongly curved tibiae of *inaequalis* are found elsewhere in the genus in two species of group I (*basilaris*, *scutellatus*), and in some of group III.

As there are only two species, no summary of characters is given, but *melancholicus* is compared with *inaequalis*. (For characters of the species groups, see table 2.)

ECOLOGY: Notes are given for *inaequalis* only.

DISTRIBUTION: Both species are known from South America, and *inaequalis* is known from Central America also.

KEY TO THE SPECIES OF GROUPS I AND II OF *METAMASIUS*¹

For differentiation of the sexes, see Sexual Dimorphism in the Introduction. In the key that follows, the color where given as red may be any shade of red, or even orange, yellow, or chestnut. The first interval of each elytron is the one adjacent to the sutural interval.

1. Species occurring in the Antilles or southern Florida, but not Trinidad . . . 2
- Species occurring in Trinidad and elsewhere than the Antilles or Florida . 10
- 2(1). Wings reduced; metasternum between middle and hind coxae scarcely longer than diameter of middle coxa; apex of middle femur overlapping base of hind femur; Lesser Antilles . . . *cornurostris*
- Wings normal; metasternum at least two and one-half times longer than diameter of middle coxa; apex of middle femur usually not reaching hind coxa . . . 3

¹ Species group III will be published separately, but five species of that group appear in the present key because they have external characters similar to those of species of groups I and II, i.e., very widely spaced front and middle coxae, and flat mesosternum and metasternum. (See table 2.)

- 3(2). Beak at base inferiorly angulate or toothed (tooth small in female, large in male); hind tibia of male angulate on inner side at center (fig. 10); Lesser Antilles . . . 4
Beak at base inferiorly not angulate or toothed; male with inner edge of hind tibia straight; Lesser or Greater Antilles, or Florida 5
- 4(3). Hind femur slightly clavate; pronotum usually impunctate at middle, its apical constriction strong *viratus*
Hind femur distinctly clavate and bulbous, two and one-half times wider before apex than at base (fig. 16); pronotum usually entirely punctate, apical constriction less marked . . . *maurus*
- 5(3). Prosternum hairy around front coxae *hemipterus* (in part)
Prosternum glabrous around front coxae 6
- 6(5). Small (6.5 to 8 mm.); elytra scarcely longer than pronotum; male with tiny hairs within tibiae; Florida, Cuba, Dominican Republic *mosieri*
Medium to large (9 to 22 mm.); elytra much longer than pronotum; male with long hairs within front and hind tibiae; Greater and Lesser Antilles 7
- 7(6). Base of pronotum strongly lobed in front of scutellum 8
Base of pronotum subtruncate or slightly arcuate 9
- 8(7). Pronotum flat, virtually impunctate; base of beak, viewed dorsally, scarcely dilated over scrobe; tarsi with second segment scarcely longer than wide; male with inner side of hind tibia sinuate and very hairy within; Jamaica, ?Cuba *ritchiei*
Pronotum depressed at middle of base, sides distinctly punctate; base of beak dilated abruptly to twice thickness of remainder of beak; tarsi with second segment twice longer than wide; male with hind tibia straight, minutely hairy; Cuba, ?Jamaica *bruneri*
- 9(7). Distance between front coxae almost twice width of apex of beak in dorsal view; beak uniformly arcuate; elytra black, with two or four large, red spots on each elytron; male with tibiae straight; Lesser Antilles
. *quadrisignatus* (in part)
Distance between front coxae less than width of apex of beak in dorsal view; beak virtually straight on top; elytra black, with red basal band; male with middle and hind tibiae sinuate within; Puerto Rico *yunqueensis*
- 10(1). Outer apical angles of middle and hind tibiae distinctly minutely toothed (fig. 9), tooth visible in profile 11
Outer apical angles of middle and hind tibiae rounded or obtusely angulate, tooth not visible in profile 14
- 11(10). Pronotum not margined at base; elytra with first interval usually not reaching base but enclosed by bases of adjacent intervals, short tenth or marginal stria usually lacking; male with femora toothed within before apex
. *transatlanticus*¹ and *lojanus*¹
Pronotum margined at center of base; elytra with first interval reaching basal margin, short tenth stria visible; femora not toothed 12
- 12(11). Under side, except for abdomen, virtually impunctate; male with beak inferiorly crenulate and with long curling tufts of hairs within hind tibia (figs. 4, 89) *cinnamatus*
Under side faintly or strongly, but distinctly punctate; male with beak inferiorly smooth, and with very short, if any, hairs within hind tibia 13
- 13(12). Distance between front coxae twice as wide as last segment of antennal funicle; apices of middle and hind tibiae with single tooth at outer angle *flavopictus*
Distance between front coxae no wider than last segment of antennal funicle; apices of middle and hind tibiae with two teeth at outer angle (but only one shows in profile view) . . . *rugipectus*
- 14(10). Scutellum narrowly bilobed, and distinctly emarginate in front (fig. 43) *anceps*
Scutellum not bilobed, but may be slightly emarginate in front 15
- 15(14). Sides of beak from base to near apex with median sulcus filled with short, abundant, tomentose hairs (figs. 99, 100) *peruanus*
Sides of beak not linearly sulcate and hairy 16
- 16(15). Elytral striae composed of large, deep, round, or elongate foveae as wide as intervals (fig. 116); metasternum no more than twice longer than diameter of middle coxa; wings short *foveolatus*
Elytral striae composed of punctures narrower than intervals; metasternum usually nearly three times longer than

¹ Species of group III which will appear in a subsequent paper.

- diameter of middle coxa; wings normal and long17
- 17(16). Elytral suture and even intervals (second, fourth, sixth) elevated and wider than other intervals, but third (odd) interval may be elevated at middle of its length18
- Elytral intervals either of approximately same height and width, or not exactly as stated above19
- 18(17). Pronotum foveate on each side in front of base, and sides of pronotum (viewed dorsally) slightly emarginate from base to beyond middle; surface of pronotum usually uneven, with many tomentose punctures; hind tibia strongly curved (fig. 6), but scarcely hairy within; first segment of hind tarsus not more than three times longer than second; male with double furrow under beak*inaequalis*
- Pronotum scarcely, if at all, foveate laterally, and sides (viewed dorsally) scarcely emarginate; surface of pronotum usually smooth, with few or no punctures; hind tibia scarcely curved, but with longer hairs than those of *inaequalis*; first segment of hind tarsus about four times longer than second; beak of male not furrowed*melancholicus*
- 19(17). Very small (6 mm.); pronotum mostly black, elytra mostly red; beak as long as pronotum, cylindrical, straight; known from type only; Panama*scutiger*
- Larger than 6 mm.; other characters various20
- 20(19). Middle or hind tibia on inner side distinctly, strongly expanded and sinuate (figs. 7, 11, 12, 119); males only . . .21
- Middle and hind tibiae not or scarcely perceptibly expanded and sinuate; males or females24
- 21(20). Tarsi tomentose dorsally; third tarsal segment on all legs scarcely wider than preceding segments and scarcely dilated (fig. 56)*crustosus* (in part)
- Tarsi shining, not tomentose dorsally; third tarsal segment much wider than preceding segments and widely dilated, at least on front and middle legs (fig. 55)22
- 22(21). Tibial expansion not at base (fig. 12); under sides of beak slightly crenulate; third segment of hind tarsus no wider than antennal club; claw segment inserted at middle of third segment*laticrus*

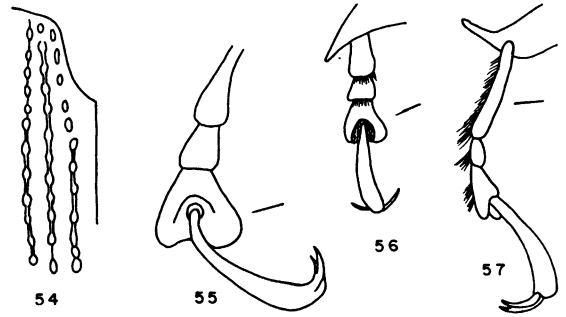


FIG. 54. Disc of left elytron of *Metamasius metasiodes*, showing strial punctures.

FIGS. 55-57. Hind tarsus of *Metamasius*. 55. Third segment widely dilated. 56. Third segment scarcely dilated (*crustosus* and *canalipes* subgroup). 57. First segment elongate (*signiventris*).

- Tibial expansion near or at base (figs. 11, 119); under sides of beak smooth; third segment of all tarsi distinctly wider than antennal club (half again as wide); claw segment inserted near base of third segment23
- 23(22). All tibiae expanded and sinuate; hind femur and tibia with very short hairs on inner side*guentheri*
- Middle tibiae only expanded and sinuate; hind femur and tibia with very long, curling hairs on inner side*pygidialis* (in part)
- 24(20).¹ Pronotum at base medially either virtually flat, or with a feeble longitudinal depression25
- Pronotum at base medially concave, with a transverse or round depression . . .71
- 25(24). Prosternum in front of coxae with ring of distinct yellow hairs (usually as long as one of apical segments of antennal funicle)26
- Prosternum in front of coxae without ring of hairs, but may be entirely tomentose31
- 26(25). Sides of body below virtually entirely densely, strongly punctate; tarsal soles with V-shaped glabrous area at base; male with large, forward-curving tooth at base of beak (fig. 84), tooth actually double*cinnamominus* (in part)
- Sides of body below, except abdomen, either impunctate or very feebly punctate; tarsal soles (except, perhaps, nar-

¹ Owing to individual variation, a number of species (*difficilis*, *sanguinipes*, *sierrakowskyi*, *sulcirostris*, *validirostris*) might agree with either part of this couplet; therefore they appear twice in the key.

- row glabrous line) entirely hairy; male without distinct tooth at base of beak, but may have feeble sinuation . . . 27
- 27(26). Scutellum slightly emarginate, sides in front somewhat bulbous or knobbed, and extending slightly beyond base of elytra (fig. 42); beak of female with divided patch of tomentose yellow hairs above insertion of antennae (fig. 78); last abdominal segment of male hairy across, or at sides of, apex . . . 28
- Scutellum truncate in front, sides usually flat, and not extending beyond base of elytra; beak of female without hairs on top; last abdominal segment of male either with hairy patch covering most of segment (fig. 53), or depressed near apex and with short hairs . . . 29
- 28(27). Beak, measured from apex to top of eye, about as long as pronotum; under surface entirely black in specimens from Mexico, Central America, or Goyaz in Brazil, elsewhere red and black; aedeagus truncate apically . . . 29
- *hemipterus* (in part)
- Beak, measured from apex to top of eye, at least one-fourth longer than pronotum; under surface entirely black in specimens from Ecuador where apparently restricted; aedeagus with blunt projection from apex . . . *benoisti*
- 29(27). Femora, especially hind ones, abruptly bulbous, slightly curved (fig. 14) . . . 30
- *bisbisignatus*
- Femora, especially hind ones, scarcely bulbous, gradually widened from base to apex, straight (fig. 15) . . . 30
- 30(29). Beak distinctly arcuate (fig. 77); male with oval patch of long hairs covering center of last abdominal segment and with hairs but no tufts on tibiae; female with beak no longer than pronotum . . . *ensirostris*
- Beak scarcely arcuate, nearly straight (fig. 80); male with extreme apex of abdomen depressed and tomentose and tibiae with long hairy tuft at middle within; female with beak longer than pronotum . . . *vicinus* (in part)
- 31(25). Pygidium from base to apex with high, bluntly keeled, tomentose swelling, in profile apically angulate (fig. 114); base of pronotum truncate . . . 32
- *pygidialis* (in part)
- Pygidium slightly convex or rather flat (fig. 115), or subcristate at center in apical half, but not as stated above; base of pronotum various . . . 32
- 32(31). Prosternum at front border of coxae swollen abruptly into tumid, punctate roll; male with base of elytra at fifth interval excavated (fig. 117), and apex of beak with long, drooping tooth (fig. 103) . . . *maculiventris*
- Prosternum at border of front coxae not swollen into tumid, punctate roll (but may be perceptibly convex in front of coxae); male with elytra and beak not as stated above . . . 33
- 33(32). Beak black but with contrasting red dorsal spot or patch of varying length at base; hind tibia of male incurved and fringed with long hairs (fig. 8) . . . 34
- *basilaris*
- Beak entirely black or entirely red, or at least without contrasting red patch at base; male with hind tibia not both incurved and hairy . . . 34
- 34(32). First segment of hind tarsus very elongate, scarcely widened at apex, nearly as long as claw segment and about four times longer than second segment (fig. 57); antennal club much larger than front third tarsal segment and twice as wide . . . *signiventris*
- First segment of hind tarsus stout, usually much wider at apex than at base, distinctly shorter than claw segment and no more than three times longer than second segment; antennal club usually not larger than front third tarsal segment . . . 35
- 35(34). Elytral intervals, especially in basal half, and sutural intervals filled from side to side with large, often longitudinally confluent punctures; beak, pronotum, and under side with same kind of dense punctures; beak of male crenulate below (fig. 89) . . . *submaculatus*
- Elytral intervals and suture with at most very fine, minute punctures; remainder various . . . 36
- 36(35).¹ Third tarsal segments with soles entirely hairy and spongy and sides widely dilated; antennal club usually widely dilated or with spongy apex more than one-third of club . . . 37
- Third tarsal segments with soles glabrous at base or at middle in narrow line, sides either widely dilated or nearly parallel; antennal club dilated or not, its apex various . . . 44
- 37(36). Antennal club scarcely compressed, more

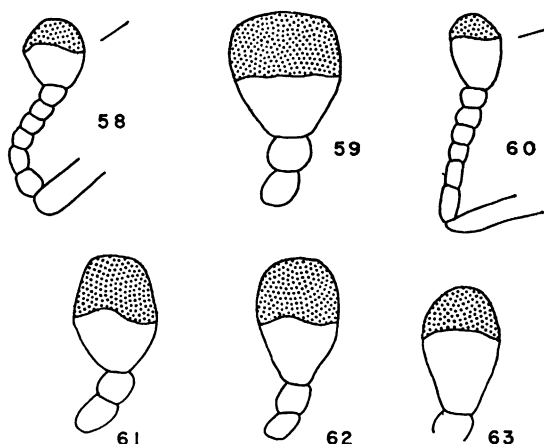
¹ A number of species appear twice in the key at this point.

- or less cylindrical; beak, measured from between eyes to apex, shorter than pronotum *octonotatus* (in part)
- Antennal club distinctly compressed, flattened; beak longer than pronotum or of same length 38
- 38(37). Tibiae with entire surface punctate; male with front femur as long as pronotum *rimoratus*
- Tibiae with one or two longitudinal lines of punctures, or at least not entirely punctate; front femur shorter than pronotum 39
- 39(38). Species with combination of pronotum sinuate at middle base, arcuate beak, prosternum not tumid, long femora (middle ones extending to hind trochanter, hind ones to apex of elytra), double tooth or double sinuation at base of beak on under side; range, from Mexico to Panama *validirostris* (in part)¹
- Species lacking one or more of characters given above 40
- 40(39). Basal margin of pronotum sinuate at middle; beak virtually straight *vicinus* (in part)
- Basal margin of pronotum subtruncate, but, if slightly sinuate, then beak distinctly arcuate 41
- 41(40). Base of beak sinuate or toothed under scrobes; claw segment of hind tarsus inserted at about middle of dilated third segment and latter with apex emarginate (fig. 55) *dasyurus* (in part)
- Base of beak smooth under scrobes; claw segment inserted near base of dilated segment, latter with apex subtruncate 42
- 42(41). Middle femur short, its apex not or scarcely reaching to base of metasternum; prosternum between and in front of coxae flat *vicarius*
- Middle femur long, its apex reaching to or beyond trochanter of hind legs; prosternum usually tumid or protruding in front of or between coxae 43
- 43(42). Prosternal swelling, if present, as punctate and shining as remainder of prosternum; front tibia of male fringed with very long hairs *applicatus*
- Prosternal swelling either huge and protruding or, if small, impunctate at center, contrasting with rather opaque sides and front of prosternum; front tibia of male with inner hairs scarcely emergent *tuberculipectus*
- 44(36). Base of pronotum strongly sinuate at middle 45²
- Base of pronotum subtruncate or very gently arcuate at middle 53
- 45(44). Species with combination of large size (21 to 24 mm.), last abdominal segment with long (as long as third tarsal segment), bronze, coarse hairs in apical half or two-thirds, and beak and femora virtually impunctate 46
- Species smaller than 21 mm. or, if nearly that size, either abdomen or punctuation not as given above 47
- 46(45). Hind femur distinctly clavate; male with sinuation of inner side of tibiae stronger, and closer to middle than to base of tibiae; beak of male angulate near middle on under side (fig. 102); known from unique type only; Colombia *tibialis*
- Hind femur gradually widened; male with sinuation of tibiae less strong, and closer to base than to middle; beak of male smooth on under side at middle *sierrakowskyi* (in part)
- 47(45). Spongy apex of antennal club larger than or equal to chitinated basal part; scutellum wide, in majority of specimens U-shaped (fig. 45) 48
- Spongy apex of club smaller than base (less than one-half of entire club); scutellum normally triangular 49
- 48(47). Male (known by long hairs within hind tibia) with beak angulate at middle of under side (fig. 102); female with round clump of long dense hairs at apex of abdomen *sanguinipes* (in part)
- Male (known by long hairs within hind tibia) with beak smooth at middle of under side; female with two tiny, narrow tufts of hairs at apex of abdomen *difficilis* (in part)
- 49(47). Base of beak coarsely, confluent punctate and with deep median impressed line *sulcirostris* (in part)
- Base of beak finely, if at all, punctate, and median impression feeble or indistinct 50
- 50(49). Disc of pronotum sparsely punctate; beak, in dorsal view, slightly wider at apex than at middle *nudiiventris* (in part)
- Disc of pronotum impunctate; beak, in

¹ A species of group III which will appear in a subsequent paper.

² Several species (*callizona*, *nudiiventris*, *sellatus*) agree with both parts of the couplet; they appear twice in the key.

- dorsal view, no wider at apex than at middle 51
- 51(50). Body in profile very thick at middle where more than twice as wide as apex of pronotum; metasternum gently swollen (fig. 113); base of pronotum virtually impunctate *sellatus* (in part)
- Body in profile less than twice as wide as apex of pronotum; metasternum more or less flat; base of pronotum narrowly punctate within margin 52
- 52(51). Transverse red or orange band, when present, situated behind middle of elytra; male with apex of abdomen depressed and with long hairs on inner edge of hind tibia *fasciatus*
- Transverse red or orange band situated in front of middle of elytra; male with abdomen not depressed at apex and no long hairs within tibia
- 53(44). Surface of femora or of base of beak obscured by dense, appressed, yellowish, tomentose hairs or glazed coating . . 54
- Surface of femora and beak shining, virtually without hairs, but may be muddy 60
- 54(53). Inner face of front coxae with scarcely visible, sparse hairs
- *octonotatus* (in part)
- Inner face of front coxae at base profusely, densely hairy-tomentose . . 55
- 55(54). Third segment of hind tarsus widely dilated, apex about three times wider than base (fig. 55)
- *dasyurus* (in part)
- Third segment of hind tarsus scarcely dilated, apex not more than twice wider than base (fig. 56) 56
- 56(55). Antennal club with spongy apical part forming only about one-third of whole (figs. 60, 63); beak with yellow tomentose hairs for most of its length and divided by glabrous median line; tarsi dorsally densely tomentose 57
- Antennal club with spongy apical part one-half or more of whole (figs. 59, 61, 62); beak tomentose, if at all, at base only; tarsi usually sparsely, if at all, tomentose dorsally 59
- 57(56). Second segment of abdomen red or reddish; elytra with apex usually red (fig. 107); Panama, Venezuela, probably Guianas *cerasinus*
- Abdomen entirely blackish or grayish; elytra usually with at least sutures at apex black (fig. 106); eastern Bolivia, Brazil, Peru 58



FIGS. 58-63. Antennal club of *Metamasius*. 58. *M. mosieri*, characteristic also of *M. rugipectus*. 59. Typical quadrate club of *M. ensirostris*. 60. Oval, narrow club of *M. submaculatus*. 61. Elongate club with spongy part about one-half of club (*liratus*). 62. Same type of club (*validirostris*). 63. Club with spongy apical part less than one-half of club.

- 58(57). Bolivia, Brazil *canalipes*
- Peru *crustosus* (in part)
- 59(56). Elytral marks, when visible,¹ in form of red C on left elytron and same reversed on right elytron (fig. 108), background mostly black; beak of female longer than pronotum and scarcely arcuate; venter of male (known by nearly straight beak) rather strongly concave and hairy; not known from Brazil *hebetatus*
- Elytral marks, when visible, in form of three black areas on each elytron on mostly red background, black areas usually connected longitudinally (fig. 109); beak of female shorter than pronotum and strongly arcuate; venter of male (known by nearly straight beak) virtually flat and not noticeably hairy; Brazil and elsewhere *tectus*
- 60(53). Species with combination of beak in profile thickened under scrobes by a large triangular tooth in male (fig. 84), or blunted tooth in female; hind tarsus with sides of third segment only slightly divergent from base to apex *cinnamominus* (in part)
- Beak in profile either not thickened under scrobes by any kind of tooth or, if so, hind tarsus with third segment widely

¹ Dabbing with wet brush brings out pattern momentarily.

- dilated, its apex almost three times wider than base61
- 61(60). Impressed line across base of pronotum as deep and distinct on extreme sides as medially; third tarsal segment below with narrow, median, glabrous line .62
- Impressed line at base of pronotum, if present, either evanescent on extreme sides, or at least not so impressed as at middle (sides may be covered by base of elytra); soles of third tarsal segment glabrous at center of base63
- 62(61). Pronotum densely punctate; beak strongly arcuate; basal subrostral tooth present; male with hairs of front tibia as long as tibia is wide . . . *dasyurus* (in part)
- Pronotum virtually impunctate; beak scarcely arcuate; basal subrostral teeth absent; male with very short hairs on front tibia *puncticeps*
- 63(61). Elytra with longitudinal streaks of black and bright yellow in definite pattern64
- Elytra with large red or black spots, or colored bands or half circles, or entire elytra or entire apex black65
- 64(63). Yellow stripes on fourth interval entire, not interrupted by black; antennal club with spongy apex one-half of whole; male with long, curling tuft of hair on hind tibia (fig. 4) . . . *quadrilineatus*
- Yellow stripe on fourth interval invaded by black at middle; antennal club with spongy apex only one-third of whole; male with fringe of long hairs on hind tibia *bromeliadicola* (in part)
- 65(63). Pronotum entirely impunctate except for few punctures on apical constriction66
- Pronotum punctate on sides, or middle of base, or on apical constriction . . .67
- 66(65). Mesepimeron and sides of metasternum virtually impunctate; prosternum punctate at middle *dimidiatipennis*
- Mesepimeron and sides of metasternum distinctly punctate; prosternum impunctate at middle
- *quadrisignatus* (in part)
- 67(65). Pronotum entirely but sparsely punctate *nudiventris* (in part)
- Pronotum punctate at sides or center only68
- 68(67). Large, 18 to 24 mm.; inner edge of hind femur straight *ciliatus*
- Smaller, 11 to 16 mm.; inner edge of hind femur bulbous and emarginate just before apex69
- 69(68). Metasternal sides and side pieces either impunctate or faintly punctate; metasternal region appearing swollen (fig. 113); elytra usually black, with two orange circles (fig. 92)
- *sellatus* (in part)
- Metasternal sides and side pieces deeply, distinctly punctate; metasternum usually flat; elytra black, with orange band at about basal third (*callizona*), or red, with vague black areas (*bromeliadicola*)70
- 70(69). Beak shorter than pronotum, arcuate; apex of abdomen not depressed or hairy *callizona* (in part)
- Beak longer than pronotum, nearly straight; apex of abdomen depressed and with long hairs; known from male only *bromeliadicola* (in part)
- 71(24). Beak stout, stubby, in profile not more than three or four times longer than wide, and at middle almost twice width of apex of middle femur
- *pulcherrimus*¹
- Beak elongate, or at least five times longer than wide, at middle in profile not or scarcely wider than apex of middle femur72
- 72(71). Distance between front coxae almost equal to diameter of coxa; beak in profile scarcely wider than front tibia, and virtually straight; front femur as long as pronotum *biguttatus*¹
- Distance between front coxae one-half or less than one-half of diameter of coxa; beak in profile wider than front tibia, and usually distinctly arcuate; front femur shorter than pronotum . . .73
- 73(72). Femora distinctly punctate74
- Femora virtually impunctate, or finely, sparsely punctate76
- 74(73). Second elytral interval at base turned toward scutellum; third interval at base wider than other intervals and advanced beyond them; male with sides of pronotum eroded where converging to apex (fig. 98) *scutellatus*
- Second and third intervals at base straight, not advanced, and of about equal width as other intervals; male with pronotal sides normal . . .75
- 75(74). Hind femur bulbous and emarginate within near apex; tarsal soles of third segment entirely hairy except for narrow, median, glabrous line; male with

¹ Each of these species belongs to group III. They will be discussed later in the paper that will deal with that group.

- long hairs on front tibia and antennae inserted a width of club from eye . . .
 *validirostris* (in part)¹
 Hind femur straight within, gradually widened to apex; tarsal soles of third segment with V-shaped glabrous area at base; male with very short hairs on front tibia and antennae inserted only a width of scape from eye
 *sulcirostris* (in part)
 76(73). Male (known by long hairs within hind tibia) with beak not angulate inferiorly; female with thin fringe or two tiny tufts of yellow hairs across extreme apex of abdomen
 *difficilis* (in part)
 Male (known by long hairs within hind tibia) with beak inferiorly angulate at base or near middle; female with patch of coarse, long, bronze hairs in apical fifth to apical half of last segment of abdomen 77
 77(76). Punctures of elytral striae on disc large and distinct, one-third or one-half of width of an interval (fig. 54)
 *metamasioides*
 Punctures of elytral striae on disc either tiny, scarcely, if at all, cutting into intervals or, if larger, sparser and separated longitudinally by about twice or more than twice their diameters . . 78
 78(77). Longer than 20 mm.; elytral pattern red, with large black marks, or black, with red oblique bands; male with under side of beak not angulate near middle; both sexes with last segment of abdomen coarsely hairy in apical third or more *sierrakowskyi* (in part)
 Length from 15 to about 17 mm.; elytral pattern black, with usually two to four red longitudinal stripes or short dashes; male with under side of beak angulate near middle (fig. 102); last segment of abdomen in male with fringe of short hairs across extreme apex, female with round, rather sunken patch of hairs in apical fourth or fifth
 *sanguinipes* (in part)

SPECIES GROUP I, *HEMIPTERUS*

SUBGROUP *hemipterus*

Metamasius anceps (Gyllenhal)

Figure 43

Sphenophorus anceps GYLLENHAL, 1838, p. 894,

¹ This species of group III will be discussed in a subsequent paper.

"America septentrionalis," error for "borealis" which appears on label of type, female, in Naturhistoriska Riksmuseum, Stockholm, examined.

Metamasius bilobus HUSTACHE, 1936, p. 99, Coroico, Bolivia; cotypes, male and female, in Muséum National d'Histoire Naturelle, Paris, examined. GÜNTHER, 1941, p. 43, fig. 6 (genitalia). New synonymy.

Metamasius bilobus var. *amplicollis* HUSTACHE, 1936, p. 100, Mera, Ecuador; type, female, in Muséum National d'Histoire Naturelle, Paris, examined. New synonymy.

DIAGNOSIS: Differing from other species of genus in having scutellum distinctly and strongly emarginate (or bilobed) in front (fig. 43), not feebly so as is that of *hemipterus* and *benoisti*.

RANGE: Colombia and northern Brazil south through Ecuador and Peru to Bolivia. (For data on the 159 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 15 mm. (two specimens only, 8 mm.). Beak about or nearly as long as pronotum, cylindrical; of male, in profile, straight basally, arcuate apically (in some specimens bulbous dorsally at apex); densely punctate; wider than that of female; hairy on each side in front of scrobe and also under scrobes (but worn short in many specimens); posterior edge of scrobe distant from eye by more than width of scape; beak of female, in profile, evenly arcuate, wider at base; virtually impunctate except for base; narrower than that of male; not hairy; edge of scrobe width of scape from eye, or less. Antennal club with spongy part equal to or shorter than basal part. Pronotum impunctate or finely punctate; basal margin gently arcuate, margined but not furrowed at center third, but in many specimens margin hidden by curving base of elytra and by protruding apices of scutellum. Elytra, striae punctures visible within striae; intervals impunctate or very finely punctate. Scutellum deeply emarginate. Pygidium apically with two full tufts of hair, hairs also laterally, at center line, and in all punctures.

Under surface densely punctate on prosternum and mesosternum, elsewhere impunctate or faintly punctate; venter (male) shallowly depressed, hairy; last segment of abdomen (male) with sparse, oval patch of short

hairs and shallow apical depression, (female) glabrous. Hind tibia scarcely hairy; front tibia (male) very hairy within (hairs as long as tibia is wide); middle tibia (male) with tuft of longer hairs at center; femora (male) hairy on inner side; femora (both sexes) clavate; middle femur long, reaching to base of metasternum; third tarsal segment of front legs (male) wider than antennal club, three times wider than preceding segments, (female) almost as wide as club. Aedeagus emarginate at apex.

Color black, with some red on dorsum or on venter. Pronotum entirely black, or black with greenish or grayish sheen or black velvety, or (as in *ensirostris*) black, with two lateral red oblique stripes and two short, basal, V-shaped stripes, the red interrupted or obsolete in varying degrees; elytra black, with three sets of red marks on each elytron at base, middle, and before apex, marks separated, or connected longitudinally, or middle ones connected laterally, thereby forming red C on left elytron (as in cotypes of "*bilobus*").

Of 13 specimens collected in Santa Cruz, Bolivia, 11 are red and black below, two are entirely black below, the latter being also more black on the elytra. In another series of 32 males and 14 females from this locality, all varieties of color of pronotum and elytra are present; the elytra in most specimens are black with orange, the orange often spreading to eliminate much of the black; no specimens in this series have an entirely green pronotum, but one or two have a greenish sheen; only one specimen has red below.

ECOLOGY: The specimens from Santa Cruz mentioned above were taken in August in sugarcane by Candia, as were also others collected by J. A. Munro in the same locality. Munro collected some also in banana "munk" in Chilumani, Bolivia. In Peru, according to Wille (1943), *anceps* has been taken, along with *hemipterus*, in sugarcane, platano, and occasionally in ornamental palms. According to R. E. Warner at the United States National Museum, it does a great deal of damage to sugarcane in Bolivia.

REMARKS: If one were to divide *Metamasius* into many genera, this species might be placed by itself because of the bilobed scutellum, but it is in all other characters typical of the genus, and even the scutellum is no more

than an exaggeration of that of *hemipterus* and *benoisti*. It is strange that Gyllenhal did not mention the scutellum, as it is distinctly present in his type specimen, which I have examined.

This species is not listed by Blackwelder (1947) in his catalogue of the more southern species of the New World, probably because of the locality given by Gyllenhal; *anceps* appears in Junk's catalogue (Csiki, 1936, p. 48), preceded by a question mark, as a synonym of *Rhodobaenus tredecim-punctatus*, a very different species.

The pattern of the dorsum and the shape and punctuation of the beak and pygidium of both sexes are like those of *ensirostris*, from which *anceps* differs, in addition to the shape of the scutellum, in having the aedeagus emarginate, not truncate, apically, and different secondary sexual characters (such as the hairs on the last segment of the abdomen and on the front and middle tibiae). The hairs present in the male on the under side of the beak and on its sides in front of the eye are worn off in many specimens.

Günther (1941, p. 42), who examined Hustache's types of *bilobus* and *amplicollis* and who illustrated the emarginate aedeagus of *bilobus*, considered them to be variants of the same species, an opinion with which I agree. The greenish pronotum of *amplicollis* (Ecuador) is larger than that of the majority of specimens, but similar specimens occur in other localities besides Ecuador. One male and one female were dissected.

***Metamasius ensirostris* (Germar)**

Figures 15, 39, 53, 59, 77, 78

Calandra ensirostris GERMAR, 1824, p. 296, Brazil; type not examined, probably in Halle.

Sphenophorus dispar GYLLENHAL, 1838, p. 892, Brazil; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined.

DIAGNOSIS: Most similar to *hemipterus* and *anceps*, but lacking any emargination or "knobs" on scutellum; male differing from male of *hemipterus* by having front tibia dotted with punctures, leaving no free space, and last segment of abdomen with distinct oval patch of long, erect hairs (fig. 53), not scattered, reclining hairs; female differing by lacking pale, tomentose basal patch on beak.

RANGE: Northern South America south to Paraguay, southern Brazil, and northern Ar-

gentina. Mexico? (For data on the 319 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 12 to 15 mm. Beak as long as pronotum, compressed, evenly arcuate; posterior edge of scrobe distant from eye by about one width (female) or two widths (male) of scape; beak of male, in profile, wider at base and again abruptly at apex where long peduncle on under side usually well defined, that of female narrower than that of male and of same width throughout except for widened base; (male) finely, densely punctate, (female) impunctate except over base. Antennal club with spongy apical part about as long as base. Pronotum impunctate except for center base in a few specimens; basal margin gently arcuate, but not visible in all specimens because possibly covered by elytra, margin punctate rather than furrowed, evanescent on sides. Elytra either distinctly or indistinctly punctate within striae; intervals impunctate. Scutellum flat, but slightly hollow in front in some specimens. Pygidium (male) with two tufts of hair at or behind apex, hairs merging and continuing to about center of pygidium; (female) with two smaller apical tufts and no center line, apex narrower, more pointed.

Under surface mostly impunctate, but some punctures on mesosternum and apex of abdomen, or sparse ones on sides of abdomen; venter (male) hairy and rather broadly, deeply hollowed down center; last segment of abdomen (male) with erect, dense, very long hairs (longer than second tarsal segment) in an oval, slightly depressed patch covering apical three-fourths or more of segment, (female) with two well-separated apical tufts of hair longer than hairs on pygidium. Front tibia (male and some females) densely punctate; middle tibia (male) faintly sinuous within; all tibiae (male) fringed within with hairs about one-third of width of tibia, (female) briefly hairy; middle femur slightly clavate, reaching about to base of metasternum; hind femur scarcely clavate; femora (male) hairy on inner side; front tarsus with third segment as wide as (female), or wider than (male), antennal club. Aedeagus truncate at apex.

Color black, except on dorsum where pronotum is either black, or black with red stripes as in *anceps*, i.e., two lateral oblique

stripes and two short, basal, V-shaped ones, all stripes may be interrupted or obsolete in varying degrees; elytra and scutellum black, or elytra black with four or more red, lineolate marks in front of and behind middle, in some specimens marks joined on sides to form red C on left elytron.

ECOLOGY: According to Costa Lima (1956, pp. 247-248), the larvae in southern Brazil bore in bananas, and the adults eventually attack them. Lepesme and his co-authors (1947) reported the species on *Cocos* in South America. Notations on specimens from Rio de Janeiro, Brazil, show that they were taken in banana stems.

REMARKS: This species and *hemipterus* have many characters in common, especially the female members which, in both species, have a virtually similar pygidium, abdomen, and shape of beak. The males differ as stated in the diagnosis, and further in the vestiture of the tibiae (fewer and shorter hairs in *ensirostris*) and in the shape of the beak (a longer peduncle in *ensirostris*). The under side is black in specimens of *ensirostris*, whereas the only specimens of *hemipterus* with the under side black either are from farther north, where *ensirostris* does not occur regularly (only three of 319 specimens have been seen from Mexico), or are occasional color variants (three of more than a thousand *hemipterus* from South America are black below). The dorsal pattern of coloration is in general not the same in these two species, but some other species have a pattern similar to that of *ensirostris* (*anceps*, *maculiventris*, *nudiventris*, *puncticeps*, some *signiventris*). This species, *hemipterus*, and *basilaris* are the only ones I have seen from as far south as northern Argentina.

The type of Gyllenhal's *dispar* has much red in the elytra, but is otherwise typically *ensirostris*; *dispar* was listed as a synonym by Gemminger and Harold (1871), as well as by Csiki (1936) and Blackwelder (1947).

Two specimens of each sex were dissected.

Metamasius bisbisignatus (Gyllenhal)

Figure 14

Sphenophorus bisbisignatus GYLLENHAL, 1838, p. 908, Rio de Janeiro, Brazil; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined.

DIAGNOSIS: Most similar to *ensirostris*, as

shown in description below, but differing from it and from other species of subgroup by having curved, stout, very bulbous femora (fig. 14), which are flattened and almost scooped out on inner edge.

RANGE: Most of Brazil, also Paraguay (one specimen), and Venezuela (one specimen). (For data on the 28 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 13 to 14 mm. Characters same as given for *ensirostris*, except as follows: beak scarcely curved; antennal club with spongy part shorter; pronotum in many specimens slightly depressed longitudinally at base in center; scutellum in some slightly emarginate in front; pygidium (female) without hairs; last segment of abdomen (male) with short hairs in oval patch, (female) not hairy or depressed; front tibia not entirely covered by punctures, other tibiae of male with shorter hairs than those of males of *ensirostris*; middle and hind femora exceedingly bulbous on outer sides, incurved on inner edge, curved also from base to apex; front tarsus of both sexes with third segment narrower than antennal club. Aedeagus with apex truncate.

Color black, or black with four lineolate red spots on elytral disc which would form red C on left elytron if connected on sides, and two tiny apical red spots; one specimen with red oblique stripes on pronotum.

ECOLOGY: This species, although apparently far less abundant than *anceps*, *ensirostris*, or *hemipterus*, is probably also a banana borer, as a male and female in the British Museum (Natural History), collected by Bondar in Brazil in 1937, have the notation on the labels "on banana."

REMARKS: For some inexplicable reason, this species appears in the Junk catalogue (Csiki, 1936, p. 40) with the genus *Metamasiopsis*, a procedure followed by Blackwelder (1947). Champion (1910, p. 114) mentioned *bisbisiagnatus* in connection with his new species, *Metamasius nudiventris*, but he did not link it in any way with his new genus *Metamasiopsis*, and it does not have the toothed tibiae characteristic of that "genus."

At first glance this species might be mistaken for dark or black specimens of *hemipterus*, but such specimens occur as a rule only

on the North American continent (*hemipterus carbonarius*), not in South America.

One specimen of each sex was dissected.

Rather similarly curved hind femora are found elsewhere in the genus in *pygidialis* Günther and *signiventris* Kirsch, but the femora are less bulbous in those species. The hind femora are exceedingly bulbous, but not curved, in *maurus* Gyllenhal.

Metamasius hemipterus

Figures 3, 42, 48, 64-78, 112

DIAGNOSIS OF SPECIES: Very similar to *benoisti* and *ensirostris* (see those species for further comparison). Color pattern, hairy prosternum, slightly emarginate scutellum, and tomentose patch on beak of female (fig. 78) same as in *benoisti*, but differing in other characters, including genitalia of both sexes.

RANGE OF SPECIES: From northern Argentina and Bolivia north to central Mexico (fig. 64). (For data on the 2000 or so specimens examined, see Appendix; for records of importations in Africa, United States, and elsewhere, see Ecology.)

DESCRIPTION OF SPECIES: (See also characters of subgroup). Length, 9 to 14 mm. Beak as long as pronotum, compressed, arcuate, posterior edge of scrobe distant from eye by slightly more than width of scape; (male) in profile wider at base, also abruptly wider before apex inferiorly where peduncle is long and well marked; finely, densely punctate; beak of female, in profile, narrower than that of male, of same width throughout except for widened base, virtually impunctate except at base, base above scrobes with elongate, tomentose patch of tiny appressed hairs on each side of median line. Antennal club with spongy part equal to or shorter than base. Pronotum impunctate except at center of base where 10 or more punctures present, basal margin gently arcuate (not visible in all specimens because covered at sides by elytra), edge of margin punctate rather than furrowed, obsolete on sides. Elytra with punctures distinct within striae, intervals impunctate. Scutellum in front slightly emarginate and concave, sides in front in most specimens with small "knobs" (fig. 42). Pygidium (male) with two tufts of hairs at or behind apex, hairs converging and continuing to about center of pygidium; (female) with

two smaller apical tufts and no center line of hairs; apex of pygidium (male) broader.

Under surface rather finely punctate throughout, some specimens with sides of body virtually impunctate; venter (male) hairy and rather broadly, deeply hollowed at center; last segment of abdomen (male) with fairly dense, reclining hairs at center in apical half or third of segment, (female) with two well-separated apical tufts. Middle tibia (male) sinuate within, front and middle tibiae (male) with inner hairs as long as tibiae are wide, usually longer in tufts at center, hind tibia (male) with hairs slightly shorter and not tufted at center; middle femora clavate, reaching about to or slightly beyond base of metasternum, hind femora scarcely clavate, femora (male) hairy within; front tarsus with third segment almost as wide as antennal club in female, and at least as wide in male. Aedeagus truncate at apex.

Color varying from entirely black in a few individuals to black with basal red band of varying extent on elytra, or elytra streaked with red and black longitudinally; pronotum and venter black or various combinations of red and black; femora red, red with black apices, or red with black bands or smudges (see key to subspecies).

DISCUSSION OF SPECIES: A number of authors have said or suggested that *hemipterus* Linnaeus, *sericeus* Olivier, and *carbonarius* Chevrolat were not separate species (such as Chevrolat, 1833; Champion, 1910; Hustache, 1932; Lapesme and Paulian, 1941; Blackwelder, 1947; Anderson, 1948; and Kuschel, 1956). After examining more than 2000 specimens, I am convinced that they are conspecific, as the secondary characters of both sexes are exactly similar, and I find no differences among the forms, except for the color pattern of the elytra, pronotum, or venter.

It may be argued that these three forms are not even subspecies, but only color varieties that are more or less segregated geographically. In the West Indies, however, virtually all the specimens from the Greater Antilles are readily separable from those of the Lesser Antilles, and from a pragmatic point of view, it seems best to accord subspecies recognition because their names are used so extensively in the economic literature.

I agree, therefore, with Kuschel (1956) in

recognizing three subspecies, although, since I do not share his morphological concepts, I must modify the ranges of these three subspecies.

Nominate *hemipterus* (type locality, "India"), ranges, in my opinion, from Puerto Rico and the Lesser Antilles south to Trinidad and eastern Venezuela, then south on the eastern coast of South America, skipping most of the northeast coast of Brazil, but is present sparingly from Pernambuco to Montevideo, to Misiones in northern Argentina. It occurs in parts of interior Brazil in the south (states of Goyaz and São Paulo) and is abundant in all Bolivia. In northern Brazil it ranges from the Atlantic coast up the Amazon and its tributaries to Bolivia and to the rivers and mountain valleys of northern Peru, Peru east of the Andes, southeastern Colombia, and eastern Ecuador. South of Ecuador on the coast the habitat becomes abruptly much more arid owing to the presence of the cold Peru (Humboldt) Current, and this virtually rainless region south to Chile is unfavorable to species of *Metamasius*. However, I have seen several specimens of nominate *hemipterus* from Huan on the northern coast of Peru and from Lima, which probably can be accounted for by "gallery" cultivation along the streams that flow down from the Andes.

The subspecies *sericeus* (type locality, Santo Domingo) ranges from Hispaniola westward to Cuba and Jamaica, across to eastern Nicaragua and south to Panama, then south to western Colombia and Ecuador. A few populations are found also in western and northern Venezuela (see below).

To the north of the preceding subspecies, we find *carbonarius* (type locality, Cosamaloapan, Veracruz, Mexico), ranging from Honduras where some mixed populations occur, north to southern and central Mexico. The color patterns that distinguish these subspecies are given in the key below and in the illustrations (figs. 65-76).

Thus, in general, one form (*hemipterus*) extends southward from the Lesser Antilles to eastern South America, and one (*sericeus*) southward from Central America to western South America. Evidently the eastern form has spread out all over the Guianas, southern Venezuela, and in Brazil up the Amazon and

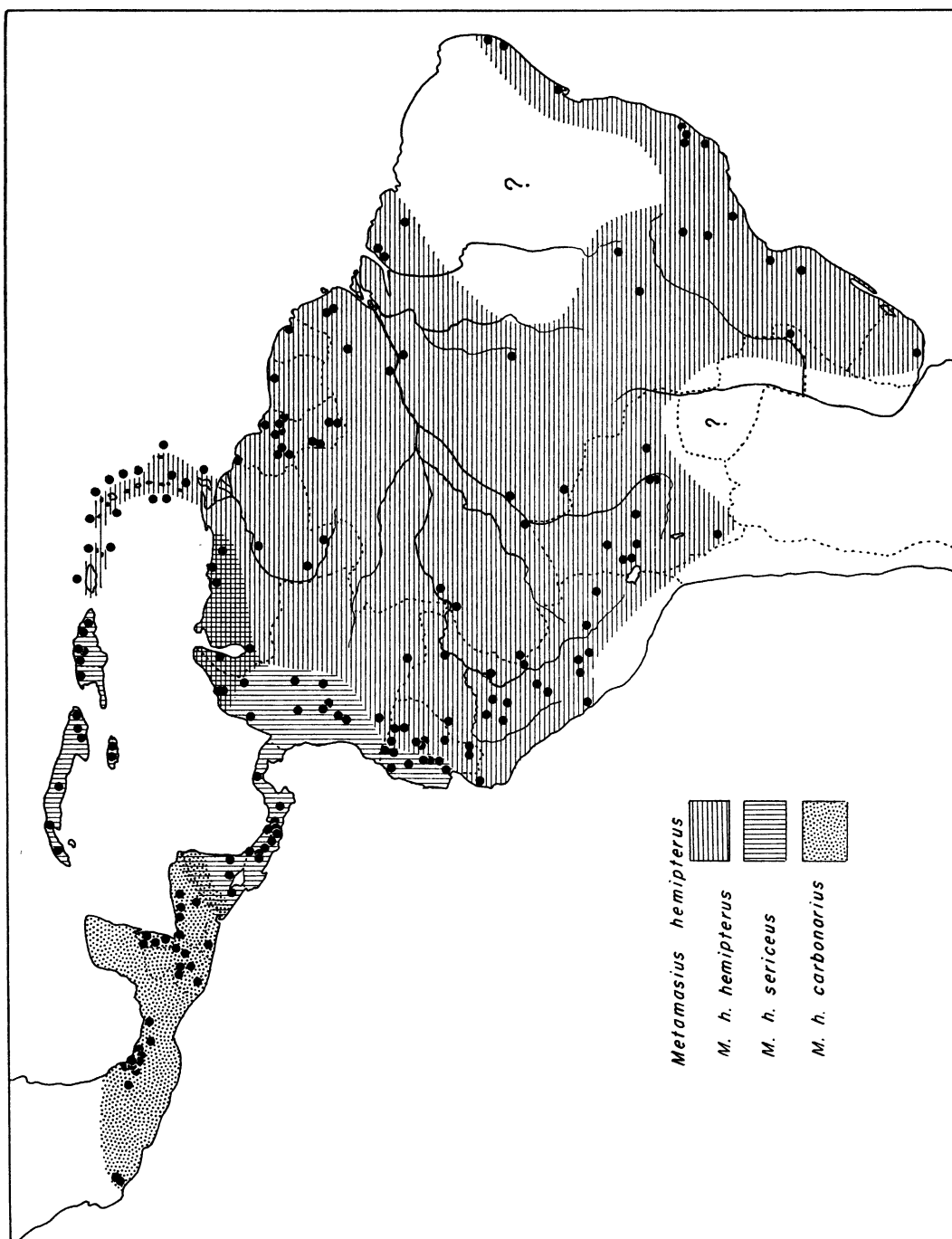


FIG. 64. Distribution of the subspecies of *Metamasius hemipterus*.

its tributaries into the large river valleys of northern Peru, eastern Ecuador, and south-eastern Colombia, and south to Bolivia, whereas *sericeus* has spread only to Colombia, western Ecuador, and parts of western Venezuela where it apparently meets nominate *hemipterus*, the two forms occurring in mixed colonies at some localities (see below). The original center of dispersion is a matter of speculation, but, since this insect is a pest of sugarcane, the center may have been in the Antilles where this plant was first cultivated intensively. At present, the well-differentiated form of the Greater Antilles (*sericeus*) has successfully invaded western Africa and has been found also in North America and Australia (see Ecology of Species, below).

Kuschel (*loc. cit.*) also found mixed populations in adjacent regions, but "doubtless with preponderant majority of one of the races." In the material examined by me from the northern coasts of Venezuela and Colombia, mixed populations contained the following phenotypes, going from east to west: at Caracas, six typical *sericeus*, one typical *hemipterus*; Maracay, six *hemipterus*; Merida, 18 *sericeus*, four *hemipterus*; Maracaibo, five *sericeus*; at Sevilla and Rio Frio, Colombia, 19 *hemipterus*; San Bernardo del Viento, one *sericeus*. These are small numbers, and perhaps larger populations would show a decided preponderance of one or the other form. Probably the two forms intergrade in this coastal area where they meet. Inland in Venezuela populations from three localities (180 individuals) are nominate *hemipterus*.

Taking a rough view of the number of color forms in the countries of South America, we have the breakdown given in table 3 which shows that in large areas there is certainly a majority of one of the races. More specimens have been examined than are shown in table 3, but many are not now available, and for many I did not note whether the shoulder area was black or not in those specimens of nominate *hemipterus* with black apices to the elytra.

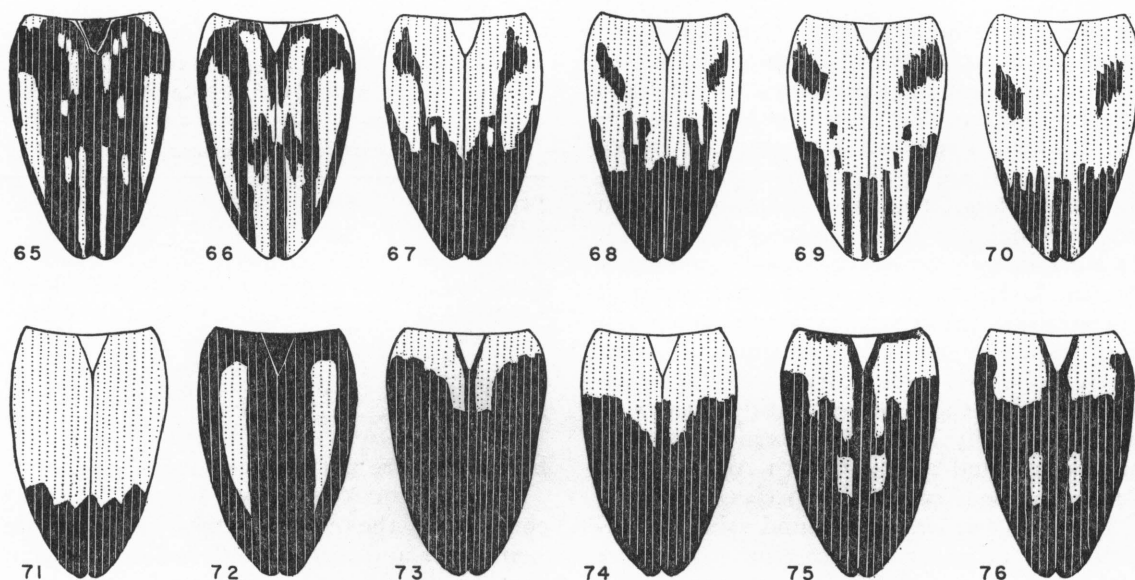
It is evident from table 3 that nominate *hemipterus* is far more abundant in South America than *sericeus*, but the latter occurs also in most of Central America (see table 4). The tabulation by countries gives only an approximate picture, of course, as national

TABLE 3
NUMBERS OF TWO SUBSPECIES OF *Metamasius*
IN SOUTH AMERICA

Country	<i>hemipterus</i>	<i>sericeus</i>	Total
Brazil	136	1	137
Bolivia	52	1	53
Peru	185	1	186
Ecuador	17	88	105
Colombia	39	85	124
Venezuela	202	37	239
Total	631	213	844

boundaries are not always natural ones.

GEOGRAPHIC VARIATION: Kuschel's (1956) concept of the color pattern of nominate *hemipterus* and *sericeus* differs from mine in that he considered examples with the hind half of the elytra black (with or without tiny red spots in the black area) and the base red as *sericeus*, and those with the elytra "*sehr bunt*" or variegated red and black and with the hind half invariably striped with red as nominate *hemipterus*. I believe that both *sericeus* and nominate *hemipterus* may have the elytral apices (or hind half) black (with or without red spots or stripes), but that nominate *hemipterus* (Lesser Antilles and most of South America) has a black shoulder patch or spot and a concomitant red "window" behind it on the outer intervals of each elytron which are lacking in *sericeus* (Greater Antilles, Central America from Nicaragua south to western Colombia and Ecuador). Some individuals of *sericeus* have black encroaching on the shoulder, but the outer intervals are entirely black, without red "windows" (fig. 73). It seems to me also that, in all specimens of *sericeus*, more than the apical half of the elytra is black (usually two-thirds), whereas those specimens of *hemipterus* that have black apices and are not characteristically striped or variegated have only the apical half, or less than half, of the elytra black (figs. 67-71). The more variegated examples of nominate *hemipterus*, with the elytral apices striped with red (figs. 65, 66), are more typical of the populations of the Lesser Antilles, whereas the majority of nominate *hemipterus* from South America have the elytra black apically (figs. 67-69) or with fewer



FIGS. 65-76. Diagrammatic elytral pattern of *Metamasius hemipterus*; blank areas represent red; black areas, black. 65-72. Nominate *hemipterus*. 65. Typical, with one red stripe to apex. 66. Typical, with two red stripes to apex. 67. Typical of South America, black apex connected with shoulder patch. 68. Typical of South America, black apex with shoulder patch disconnected. 69. Less common, black apex with red stripes. 70. Less common, black apex reduced and one red stripe to apex. 71. Less common, black apex much reduced, no shoulder patch. 72. Less common, black form from Goyaz, Brazil. 73-76. *M. hemipterus sericeus*, showing varying amounts of black; and black with red "windows."

or shorter red stripes. The variegated ones usually have the black shoulder patch connected to the black discal stripes, but most specimens from South America have it isolated or only tenuously connected. In the same manner *sericeus* tends to be more stable in color pattern in the Antilles and Central America, but in South America to have more or longer or larger red spots in the black apical area (figs. 75, 76). Some of these spots become stripes that reach to the apex, and such a variation approaches the color pattern of nominate *hemipterus*. Therefore, for determination, one must rely on the presence of the red "windows" at the base of the outer intervals behind the black shoulder patch.

Inland in Venezuela all individuals in a large series from Suapure on the Caura and Orinoco rivers are nominate *hemipterus*. They are variable, to be sure; 146 are typical variegated individuals with one or two red stripes to the apices of each elytron (figs. 65, 66), but one of these has the black shoulder patch disconnected from other black areas (fig. 69), and 24 have the apices as well as the

shoulder areas of the elytra black (figs. 67, 68). Three specimens from Mt. Duida and seven from Amazonas in southern Venezuela are also nominate *hemipterus*, one specimen having one red stripe to the apex of each elytron, the others having black apices, three of the latter having the black shoulder patch evanescent. Almost any large series of nominate *hemipterus* from South America shows a similar range of variation.

The majority of specimens examined from Colombia are from localities between 3° and 6° N. and between 74° and 76° W., and these, with the addition of 43 individuals with no other locality than "Colombia," are *sericeus*. From Bogota, however, I have seen two variegated specimens as well as five typical *sericeus*. Three individuals from the valley of the Cauca River and from an unidentified locality called Rio Aguatal have the elytra virtually black, with the base only reddish, as in specimens from Central America or Mexico. In southern Colombia east of the Andes or on its slopes, along the Rio Putumayo, two specimens from Mocoa and Caucaya are

nominate *hemipterus*, with black apices and black shoulders with red "windows" behind, as in specimens from the rivers of northern Peru.

The majority of specimens of *sericeus* that I have seen from Ecuador are from two localities only, Esmeraldas (53 specimens) and Santo Domingo de los Colorados (33), both of which are in the north on the western side of the Andes near the Pacific coast. All 86 specimens have the apical two-thirds or three-fourths of the elytra black, and 67 of them have some red spots or stripes in the black. The black covers part of the shoulder in all but a half dozen individuals, but only a very few have any red "windows" on the outer intervals behind the shoulder. Additional specimens from western Ecuador are listed in the Appendix.

From eastern Ecuador, small series of from one to four or five specimens from seven localities belong to nominate *hemipterus*, although one of five specimens from Quito resembles *sericeus*. It is logical that these specimens from the eastern slopes of the Andes should resemble those from the Amazon basin; larger series from eastern Ecuador are needed.

The color pattern of *carbonarius*, a less abundant form, appears less variable than that of the other two subspecies, probably because it is virtually entirely black. A series of 17 specimens from San Alejo on the northern coast of Honduras seems to show some intergradation with *sericeus*. Ten of the specimens are alike in having the pronotum and venter black and the elytra with a short basal red band, but seven have amounts of red on the pronotum, and four of these seven have some red on the venter. The geographic variation in Central America is shown by country in table 4.

ECOLOGY OF SPECIES: This species is sufficiently important economically to have received a common name, the West Indian sugarcane borer. In Puerto Rico, Wolcott (1955) called it the rotten stalk borer of sugarcane ("*el gorgojo de la caña podrida*"). The larva evolves (Lepesme and Paulian, 1941) in the stems of sugarcane, as well as in those of bananas, and more rarely in the sheaths of coconut palms. Almost always the plants attacked are overripe, rotting, partially broken,

or sick and weakened in some way, but the larval galleries, once begun in a damaged stem, are continued into the healthy part of the plant. Anderson (1948) reported larvae of "*sericeus*" in a banana stalk from Cuba, January 6, 1928, and in sugarcane from the Canal Zone, Panama, February 28, 1928, and larvae of "*hemipterus*" from La Merced, Peru, in sugarcane stalks, and in royal palm in Puerto Rico. Lepesme and Paulian (1941) wrote that there is no difference in the biology of, or the damage done by, these two forms. Costa Lima (1956) reported larvae of "*hemipterus*" in bananas in southern Brazil and in sugarcane in the northeast in Pernambuco. Six specimens of nominate *hemipterus* in the collection of G. d'Araujo e Silva, Rio de Janeiro, were reared from sugarcane at a sugar mill at Rio Largo, Alagoas (Usinas Leão and Santa Clotilde).

Wolcott (1955, p. 42) found all stages of development in some sugarcane that had been damaged by rats. He wrote that the female places her eggs in the damaged parts only, but that the larvae tunnel into the healthy parts, causing them to ferment. The larva feeds on the pith of the cane. When grown, it rolls itself into a kind of cocoon composed of the fibers of the cane. Many larvae are killed when the cane is ground, but damaged and rotting cane is often left in the fields so that the adults, when they emerge, then are able to infest more cane. Wolcott, in his discussion of the species in 1948 (p. 412), wrote, "exceptionally, larvae may occur also in the stems of live banana plants, and adults feed on many kinds of decaying juicy vegetation, such as rotten fruits of mamey, papaya, mango, maga, guava and pineapple."

Hustache (1932) found adults in rotten banana plants in the Lesser Antilles, and I have also taken adults from within the rain-soaked fibers of banana stalks rotting on the ground in Guadeloupe. Some specimens from Barbados were taken "inside rotting flower of Banana Palm"; others, from the Rio Solimões, Brazil, "in stumps of *Iriarteia ventricosa*," another palm; four specimens from Bartica-Potaro Road, British Guiana, were in *Jessenia bataua*, another of the palm family; from Lima, Peru, in the stems of bananas; from St. Croix, Virgin Islands, on coconut; and many other records. In Peru, according

to Wille (1943), the species occurs, along with *Metamasius anceps*, in sugarcane, platano, and occasionally in ornamental palms. The most southern record is a specimen taken in sugarcane in Montevideo.

This weevil is readily transported in banana stems or in fruits and has apparently even become established in west Africa. Lepesme and Paulian (1941) found adults, larvae, and nymphs of "*sericeus*" in the trunk of a banana near N'Kongsamba in the French Cameroons, and an adult on the southeastern slope of Mt. Cameroon. Voss (1954) mentioned *sericeus* from the island of Fernando Poo. In the museum in Paris there is a specimen from Lambaréné in Gabon, in London some specimens from Ekona in the Cameroons "on bananas," and I have seen a large series taken "in banana stems" in the British Cameroons in the collection of the California Academy of Sciences. Lepesme and Paulian (1941) reported that, in 1921 and 1922, *sericeus* was taken four times at ports of the United States with fruits or plants from the Antilles, and that in 1920 it was imported into Australia with banana plants from Jamaica. It has been intercepted also in San Pedro, California (two specimens "in quarantine on bananas"); at New York City docks, 1924 and 1925, on banana stems from Panama or Costa Rica; at Miami, Florida, in 1920 (one specimen "on palm") and at Miami, coming from Cuba (one specimen, 1940, on *Ananas comosus*). All these wanderers are the subspecies *sericeus*, with the exception of a female of typical nominate *hemipterus* which I saw in the collection of the British Museum (Natural History) which was labeled "Philippine Is. 1925." The only information relating specifically to *carbonarius* from northern Central America and southern Mexico is as follows: The larva was taken in Veracruz, Mexico, in fermenting cane by Urich at the Plantation Oaxaqueña, Santa Lucrecia (according to Anderson, 1948); and a specimen at the United States National Museum is marked as having been intercepted at San Antonio, Texas, in the stem of a palm (*Chamaedorea* sp.).

KEY TO THE SUBSPECIES OF
Metamasius hemipterus

1. Pronotum and under side usually black or virtually so; elytra usually mostly black

with, in some individuals, red basally; Mexico, from about latitude 20° N., south to Honduras *carbonarius*
Pronotum and under side usually black and red; elytra either as above, or longitudinally streaked or spotted with red and black (figs. 65-76), rarely entirely black; Nicaragua south to Uruguay and northern Argentina, including the Antilles 2

2. Elytra on outer intervals (disc is variable) red in basal third or less; if shoulder black, then sides behind it black also; remainder of elytra black, or black with red slits or spots (figs. 73-76); Greater Antilles, Nicaragua to Panama, most of Colombia, western Ecuador *sericeus*
Elytra on outer intervals either red in basal half or more, with or without black spot or patch diagonally from shoulder, or elytra streaked longitudinally with red and black, sides behind black shoulder patch with elongate, oval, red "window" on about sixth to eighth intervals; apex of elytra black or black with one or two red streaks to apex (figs. 65-72); Lesser Antilles, southern Venezuela, southeastern Colombia, eastern Ecuador, eastern Peru, Brazil, Bolivia to northern Argentina *hemipterus*

A tally of the specimens that do not agree with the statements given in the first couplet of the key above is as follows (exceptions in the second couplet are covered in the key): Of 440 specimens from Mexico south to Honduras (*carbonarius*), 90 (or 20 per cent) have the pronotum, and 78 (or 17 per cent) have the under side, red and black as in *sericeus*. Of 383 specimens from Nicaragua south to Panama (*sericeus*), seven have the pronotum and under side black and 22 have the elytra virtually black as in *carbonarius*. Of about 1700 specimens from South America (*sericeus* and nominate *hemipterus*), three have the pronotum and venter black and eight or 10 have the elytra black as in *carbonarius*.

Metamasius hemipterus
***hemipterus* (Linnaeus)**

Curculio hemipterus LINNAEUS, 1764, p. 44, "Habitat in India," error for West Indies; type locality here restricted to Lesser Antilles; type in Upsala, Sweden, not examined. HERBST, 1795, pl. 60, fig. 4. OLIVIER, 1808, no. 83, pl. 1, fig. 4, pl. 16, fig. 4b.

Curculio rufo-fasciatus DEGEER, 1775, p. 271, pl. 15, fig. 25, Surinam; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined.

Curculio variegatus PANZER, 1798, p. 57, pl. 37, fig. 24; no locality given, type not found.

Sphenophorus decoratus GYLLENHAL, 1838, p. 888, Guadeloupe; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus ambiguus GYLLENHAL, 1838, p. 889, Cayenne; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus hemipterus var. *inscripta* GYLLENHAL, 1838, p. 890; type locality not given, but type, female, from Guadeloupe, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus sacchari GYLLENHAL, 1838, p. 891, St. Vincent and Guadeloupe; type, male, from Guadeloupe, in Naturhistoriska Riksmuseum, Stockholm, examined.

DIAGNOSIS: Differing from other subspecies (*carbonarius*, *sericeus*) in color only. (For color, range, ecology, see discussion of the species and the key to the subspecies above; for data on the 1125 specimens examined, see Appendix.)

REMARKS: Gyllenhal (1838) synonymized three of the names listed above (*rufo-fasciatus*, *variegatus*, and *inscripta*), and Champion (1910) synonymized the others. Linnaeus' *hemipterus* and Panzer's *variegatus*, the types of which I have not seen, are unmistakably illustrated by Herbst, Olivier, and Panzer. These forms were based on color differences or slight individual differences.

***Metamasius hemipterus sericeus* (Olivier)**

Calandra sericea OLIVIER, 1807, p. 84; 1808, pl. 28, fig. 409, Saint-Domingue [Greater Antilles]; type not found. CHAMPION, 1910, pl. 5, figs. 8, 8a, 9, 9a. LEPESME AND PAULIAN, 1941, figs. 1-9.

DIAGNOSIS: Differing from nominate *hemipterus* and *carbonarius* in color only. (For color, range, ecology, see discussion of the species and the key to the subspecies above; for data on the 643 specimens examined, see Appendix.)

REMARKS: This form was given by Horn as the type of the genus, but he ascribed the name to Latreille, 1811, probably because that is the way Gyllenhal, 1838, gave the citation. Champion (1910), however, cited the name correctly as having been described by Olivier. As late as 1954, Voss considered *sericeus* as a separate species, but Kuschel two years later combined it with *hemipterus*, as a subspecies. The only specimen Horn had for his description of the genus was

from "California," where the species is known only as an importation.

The color variation in 383 specimens from Central America is shown in table 4. Specimens from the Greater Antilles would run about the same, although I do not remember having seen any with the pronotum or venter entirely black.

***Metamasius hemipterus carbonarius* (Chevrolat)**

Rhynchophorus carbonarius CHEVROLAT, 1833, no. 20, Cosamaloapan, [Veracruz], Mexico; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus nigerrimus GYLLENHAL, 1838, p. 915, "America meridionale"; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined.

DIAGNOSIS: Differing from two preceding subspecies in color only. (For color, range, ecology, see discussion of the species and the key to the subspecies above; for data on the 440 specimens examined, see Appendix.)

REMARKS: The type of *carbonarius* has a slight oblique red line on each elytron in front of the base; the type of *nigerrimus* is entirely black. Chevrolat thought his *carbonarius* might be a variety of *sericeus*, and Champion (1910) and Csiki (1936) subsequently so considered it. Kuschel (1956) was the first to consider it a subspecies of *hemipterus*. When Gyllenhal described *nigerrimus* he had not seen *carbonarius*; Champion (*loc. cit.*) and Csiki (*loc. cit.*) considered *nigerrimus* a synonym of *hemipterus*, and Blackwelder (1947) listed it under *sericeus*.

As shown in table 4, the color of the elytra in *carbonarius* appears to be less constant than that of the pronotum and venter. In comparing *sericeus* with nominate *hemipterus*, I use the color of the elytra only, however, as in those two subspecies the pronotum and venter usually are red and black in about the same proportions.

***Metamasius benoisti* Hustache**

Figures 34, 42, 81

Metamasius benoisti HUSTACHE, 1936, p. 93, San[to] Domingo, Ecuador; cotypes, male and female, in Muséum National d'Histoire Naturelle, Paris, examined.

DIAGNOSIS: Resembling *hemipterus*, which precedes, but beak longer and in male more

TABLE 4
GEOGRAPHIC VARIATION OF TWO SUBSPECIES OF *Metamasius hemipterus*

	Venter		Pronotum		Elytra	
	Black	Bicolored	Black	Bicolored	Virtually Black	Red Basal Band
<i>carbonarius</i>						
Mexico	157	3	157	3	152	8
Guatemala	74	20	49	36	35	59
British Honduras	35	2	35	2	24	13
El Salvador	—	5	—	5	—	5
Honduras	98	46	101	43	63	81
Total	364	76	342	89	274	166
<i>sericeus</i>						
Nicaragua	4	21	6	19	3	22
Costa Rica	—	120	—	120	7	113
Panama	—	238	1	237	12	226
Total	4	379	7	376	22	361

exaggeratedly bent (fig. 81), and aedeagus with slight knob or projection apically. Color of elytra about as in *hemipterus sericeus*, but differing from all color phases of *hemipterus* except for *carbonarius* from Mexico, Guatemala, and Honduras by having venter entirely black.

RANGE: Known only from type locality in Ecuador. (For data on the 14 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 12 to 15 mm. Beak longer than pronotum, slightly compressed; posterior edge of scrobe distant from eye by two or three times width of scape; beak of male, in profile, almost twice as wide as that of female, straight basally, abruptly arcuate at about apical third, feebly punctate, widened abruptly at apex inferiorly because of elongate peduncle; (female) slender, virtually impunctate, evenly arcuate, of same width throughout in profile except for widened base, base above scrobe on each side of central impressed line with elongate patch of short, tomentose hairs. Antennal club with apical spongy part about equal to or shorter than basal part. Pronotum impunctate; basal margin arcuate, margined and furrowed to sides. Elytra, striae punctures visible, intervals impunctate. Scutellum (fig. 42) flat, rather distinctly emarginate in front where

sides are produced forward. Pygidium apically with two full tufts of hair, and short hairs laterally and in double line at center, apex rather broader in male than that of female.

Under surface punctate densely on prosternum and mesosternum at center, finely on sides and apex of abdomen, remainder virtually impunctate; prosternum hairy in front of front coxae; venter (male) distinctly depressed on metasternum and first segment of abdomen, with hairs emerging from punctures; last segment of abdomen with stiff tuft of hairs on each side of apex, apex rather truncate (male) or pointed (female). All tibiae (male) with rather long hairs on inner side. Femora scarcely clavate, slightly hairy within; middle femur long, reaching nearly to base of metasternum; front tarsus with third segment about as wide as antennal club, three or four times wider than second segment. Aedeagus with blunt projection at apex (fig. 34).

Color black, except for dorsum where pronotum black in center and on apical constriction or "collar," narrowly and obliquely red on sides, or red with two small triangular black marks at base on each side of center; elytra and scutellum black, elytra with red transverse band at base of each elytron interrupted by black of suture; one specimen

with elytral band reduced to red spot on each humerus.

ECOLOGY: No information.

REMARKS: This species is very similar to *hemipterus sericeus*, but differs in some details. The basal red area of the elytra is usually more regular and less extensive in *benoisti*, and the scutellum is black instead of red. The pronotum, though variable, differs in general from that of *sericeus* by having the center black, not red with black elongate marks. Although the beak of the female has the same kind of yellowish tomentose patch at the base on top as that of *sericeus*, the beak is longer, as is also that of the male. Females of the two species have the same kind of tufts of hair on the apex of the abdomen, but males of *benoisti* have tufts at the apex whereas males of *hemipterus* have a mass of hairs in the apical half or third. Females of the closely related *ensirostris* differ by having no tomentose patch on the beak; males of that species have a large oval patch of hairs on the last segment of the abdomen. The dilated segment of the hind tarsus seems narrower than that of *hemipterus* or *ensirostris*, and the first segment seems proportionately longer and narrower. One of each sex was dissected.

***Metamasius vicinus* Hustache**

Figure 80

Metamasius vicinus HUSTACHE, 1936, p. 95, Marcapata, Peru; cotypes, male and female, in Muséum National d'Histoire Naturelle, Paris, examined.

DIAGNOSIS: Differing from five preceding species by having base of pronotum more sinuate at middle, hairs of prosternum apparently fewer and shorter (not visible in one female), and genitalia of female more elongate and narrow. Differing from all of subgroup except for *bisbignatus* by having beak nearly straight, not arcuate (fig. 80), and from *bisbignatus* by having hind femur slightly clavate, not strongly curved and bulbous.

RANGE: Bolivia and Peru. (For data on the nine specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup.) Length, 13 to 15 mm. Beak cylindrical, scarcely curved, only slightly wider at base; posterior edge of scrobe about one scape

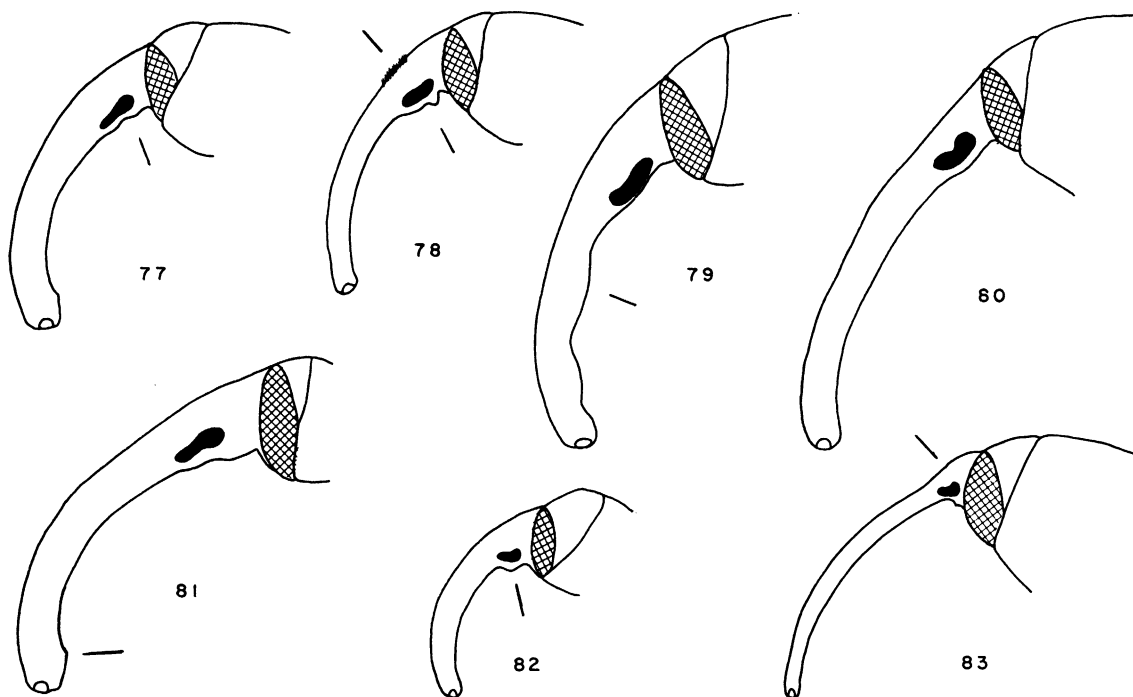
width from eye; (male) about as long as pronotum, feebly punctate, sulcate inferiorly, in profile very slightly bent down at apex; beak of female longer than pronotum, only one-half as wide as that of male, virtually impunctate. Antennal club with spongy part equal in length to or somewhat shorter than, basal part. Pronotum impunctate except for elongate punctate area at center base, where slightly depressed in some specimens; base margined and furrowed to sides, sinuate at middle. Elytra, striae punctures distinct, intervals impunctate. Scutellum flat, slightly hollowed in front. Pygidium with two apical tufts of hairs converging into central line of hairs, apex broader in male than in female.

Under surface feebly punctate, but sides of metasternum in some specimens impunctate; prosternum in front of coxae slightly hairy in one male (perhaps worn in other specimens); venter (male) scarcely depressed or hairy; last segment of abdomen more or less rounded at apex, (male) broader, slightly transversely depressed, short hairs in depression; (female) narrower, not depressed, slightly hairy. All tibiae within with (male) long tuft of hairs at center, as long as tibiae are wide, and tibiae slightly sinuate, (female) short hairs; femora clavate, middle femur reaching about to base of metasternum; front tarsus with third segment as wide as antennal club, about three times wider than second segment. Aedeagus with apex truncate.

Color black, except for faint, oblique lateral red stripes on pronotum of some individuals, and red C on left elytron formed by lineolate marks.

ECOLOGY: No information.

REMARKS: The color pattern of the elytra is similar to that of many specimens of *bisbignatus* and *ensirostris*. The beak of the female is longer than the pronotum and very slender, like that of females of *benoisti*, but it is not arcuate or compressed as in that species. The beak of the male, which is virtually straight like that of the female, resembles in length and shape the beak of the female of *bisbignatus*. Males of *vicinus* have long tufts of hairs on the inner side of all the tibiae, whereas males of other species of the subgroup have tufts on the first pairs of legs or have long hairs but not tufts, or, as in



FIGS. 77-83. Beak of *Metamasius*. 77. *M. hemipterus*, male; characteristic also of male of *M. ensirostris*. 78. *M. hemipterus*, female; characteristic also of female of *M. ensirostris*, but latter lacks dorsal patch of hairs. 79. *M. basilaris*, male. 80. *M. vicinus*, female. 81. *M. benoisti*, male. 82. *M. octonotatus*, female. 83. *M. rimoratus*, female.

bisbignatus, shorter hairs. One of each sex was dissected.

Hustache (1936, p. 95) said *vicinus* was related to *ensirostris*, but differed by having a longer, less arcuate, beak, more elongate elytra, and by being larger.

***Metamasius basilaris* Vaurie, new species**

Figures 8, 17, 23, 36, 79

TYPE MATERIAL: Type, male, Rio Vermelho, Santa Catarina, Brazil, October, 1945, A. Maller, collector, and five male and one female paratypes from same locality and by same collector, but taken on various dates from February, 1944, to February, 1949, in the American Museum of Natural History; three male paratypes, same data, to be deposited in the United States National Museum of the Smithsonian Institution, the California Academy of Sciences, and the Frey Museum, Munich; 14 paratypes from Brazil as follows: one female each from Rio de Janeiro, Zikan, collector, Rio Natal, December, 1945, Maller, collector, and Corupa, Decem-

ber, 1944, also two females, Cauna, December, 1945, Maller, collector, in the American Museum of Natural History; two males, Minas Gerais, Fry, collector, one female, Rio de Janeiro, Zikan, collector, and one male, Espirito Santo, all in British Museum (Natural History); one male, Guaira, Parana, October 23, 1910, and one female, São Bento, in Departamento de Zoologia, São Paulo; two males, "Brasil," in Humboldt Universität, Berlin; one male, Hansa Humboldt, Reitter, collector, in Zoologische Staatssammlung, Munich.

DIAGNOSIS: Lacking prosternal hairs of other species of subgroup, but otherwise quite similar to them. Differing from all species, however, by having red spot over scrobes at base of beak. Males distinguishable from other males of genus by combination of very strongly curved hind tibia (fig. 8) lined with long golden hairs, long hairs also on inner side of other tibiae and middle and hind femora, and lower side of beak irregularly sinuate and broadly, deeply sulcate.

RANGE: Northern Argentina, Brazil (mostly in the south), also Peru, Ecuador, and Colombia. (For data on nine additional specimens, see Appendix.)

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 15 mm. Beak as long as pronotum, compressed; in profile scarcely wider at base, as wide at middle as base of front femur, abruptly wider at apex in area of peduncle; inferiorly trisinate (fig. 79), broadly, deeply sulcate in apical two-thirds, narrowly sulcate under scrobe; finely, densely punctate; scrobe with posterior edge two widths of scape from eye. Antenal club with spongy part shorter than basal part. Pronotum, sides subparallel in less than basal half; impunctate except for scattered punctures at center in basal half; base margined and feebly furrowed to sides, sinuate at middle. Elytra, stria punctures distinct and dense, intervals impunctate. Scutellum flat. Pygidium gently narrowed to truncate apex, fringed with hairs on sides and on apex, those of apex interrupted at middle by hairless space, few hairs present behind apex.

Under surface, including legs, virtually impunctate, except for sides and apex of abdomen, mesosternal process, and first segment of abdomen; prosternum flat between coxae, not hairy; ventral depression wide and distinct on metasternum and first abdominal segment, latter hairy at middle; last segment of abdomen rounded-truncate, with long fringe of hairs at extreme apex and scattered hairs behind apex. Hind tibia strongly curved inner side from near base to apex with two rows of very long golden hairs almost twice as long as tibia is wide, same kind of long hairs on front and middle tibiae and on middle and hind femora; femora clavate; middle femur reaching at least to base of metasternum; third tarsal segment on front tarsus about as wide as antennal club, on middle and hind tarsi rather asymmetrical. Apex of aedeagus distinctly emarginate, deflexed (fig. 23).

COLOR OF TYPE: Head, beak, and venter black, except for red spot on top of beak at base and under beak at base, for red tibiae (apices black), and red hind femur at middle; pronotum red with five black marks; elytra black with red, lineolate marks forming circle

on each elytron, spreading to base; red mark also near apex of each elytron.

VARIATIONS FROM TYPE: The length of specimens ranges from 12 to 15 mm. Females differ by having the beak cylindrical, without inferior sulcus and without sinuations, wider at the base than elsewhere, the basal dilation shorter, the posterior edge of the scrobe only one scape width from the eye; the abdomen of females has two tufts of hairs at the apex, the hind tibia is straight, and all the femora and tibiae have only very short hairs within; the pygidium is more rapidly narrowed to the apex.

The sinuation of the lower part of the beak is less marked in some males, and in some is even stronger at the middle than that of the type. The pronota of some specimens have subparallel sides in the basal half; those of others are slightly concave. The base of the pronotum is more sinuate or lobed in some individuals, less so in others. The apical constriction is not so strong as that of the type. The elytral punctures of the striae are indistinct in some specimens. The front coxae are closer in one individual.

Differences in color include the fact that the head and beak are red in one specimen, and the pygidium in some specimens has a red stripe down the center. The red of the elytra increases in some so that all the red parts are connected; in other individuals the black increases, eliminating part of the red circle; two specimens have much more red than black, but the scutellum is black in all specimens. In two, the black of the pronotum has eliminated the red of the central part. All specimens, except for one female from Marcapata, Peru, in the museum in Dresden which has the beak entirely red, have red or a red spot at the base of the beak dorsally. Eight specimens have entirely black legs; the specimen from Marcapata just mentioned has them almost entirely red.

ECOLOGY: No information.

REMARKS: This species appears to be more closely related to the species of the *hemipterus* subgroup than to those of any other subgroup, even though it lacks the characteristic prosternal hairs. In another species of the subgroup (*vicinus*), however, these hairs are not regularly present. The color pattern of *basilaris* is most similar to that of *ensirostris*,

but usually is more red, less black, especially on the pronotum, and it is more complete and distinct. Females of these two species are very similar, but those of *basilaris* have, in addition to the characters given, rather longer middle femora, and the femora or tibiae at least partially red in the majority of specimens. Both these species, as well as *hemipterus*, occur in northern Argentina and southern Brazil, whereas the majority of *Metamasius* are more northern in distribution.

Males of *basilaris*, as stated in the diagnosis, are quite distinctive and readily identifiable. In fact, it is curious that such a colorful species had not heretofore been described. It was evidently known, however, as I have seen a male in the museum in Berlin and one in the British Museum, each with a different unpublished name on the label. It is possible that Panzer's *purpurascens*, 1798, discussed under *incertae sedis*, is this species; his colored plate shows an elytral pattern that could be the same as that of *basilaris* or *ensirostris*, but his description of one line makes no mention of distinctive characters.

In a number of other species, males have the under sides of the beak sinuate or crenulate or scalloped (*dasyurus*, *cincinnatus*, *dimidiatipennis*, *submaculatus*, *laticrus*, *octonotatus*, *puncticeps*, *quadrisignatus*), but not exactly as in *basilaris*. The one that approaches *basilaris* is *puncticeps*, but in that species the sinuation is so feeble that in some specimens it is not at all noticeable. Many males of the genus have long hairs on the hind tibia, but they differ from males of *basilaris* by having the tibia straight or the beak not scalloped below.

Four males, including the type, and one female were dissected.

SUBGROUP *scutiger*

Metamasius scutiger Champion

Metamasius scutiger CHAMPION, 1910, p. 110, pl. 5, figs. 17, 17a, Bugaba, Panama; type, male, in the British Museum (Natural History), examined.

DIAGNOSIS: Apparently smallest species of genus; differing from other quite small species (*mosieri*, *pulcherrimus*), which are also bicolored, by having long, narrow, nearly straight beak, and tapering, fusiform shape.

RANGE: Known only from the type locality.

DESCRIPTION OF TYPE, MALE: Length, 6 mm. Frons not noted. Beak as long as pronotum, cylindrical, narrow, nearly straight, coarsely punctate except at apex; in profile about same width throughout, except for widened basal portion (wider than base of front femur); inferiorly on each side sulcate; not toothed at base; basal dilation strong; peduncle not angulate; scrobe with posterior edge one scape width from eye. Antennal club elongate, rounded at apex, spongy part about one-half of whole. Pronotum longer than wide, sides subparallel (very slightly emarginate) in basal half; coarsely punctate except for central pruinose patch; apical constriction strong; no distinct basal depression; base feebly sinuate, margined and furrowed at center. Elytra, sides strongly tapering to apex; striae punctures distinct; intervals impunctate, virtually straight at base, second and fourth intervals slightly wider than others. Scutellum flat, triangular. Pygidium rounded-truncate, coarsely punctate.

Under surface and legs well punctate; prosternum and front of metasternum gently convex; distance between front coxae wider than antennal club or third tarsal segment, at least one-half of diameter of coxae; distance between middle coxae equal to diameter of coxae; ventral depression feeble; last segment of abdomen not depressed or hairy. Hind tibia straight, but slightly incurved at apex where outer edge rounded, not angulate; tibiae with two rows of fine punctures; femora more or less gradually widened, but middle and hind femora distinctly emarginate within before apex; middle femur of medium length, hind femur reaching to apex of abdomen; front third tarsal segment as wide as antennal club, more than twice width of second segment; third tarsal segment entirely hairy below, apparently symmetrical. Aedeagus not examined.

Color black, except for two faint reddish spots at base of pronotum and for elytra which, though black on all margins, are fulvous or orange in center, but with tiny black spot on each elytron in fourth interval in front of middle; pronotum pruinose at middle.

ECOLOGY: None reported.

REMARKS: As stated by Champion (1910,

p. 110), this species seems not to be related closely to any other species, but has all the characters to place it in the genus *Metamasius*. In size, general shape, and color pattern it somewhat resembles *Belopoeus carmelita* Germar (South America), but differs from it by having a wider scutellum, shorter beak, no hairs on the prosternal process, the antennal club and funicular segments less elongate, and the elytra longer. The gently swollen metasternum is similar to that of *Metamasius mosieri* and *nudiventris*. Some individuals of *M. inaequalis* are as small as *scutiger*, but they differ distinctly by having curved tibiae, an arcuate beak, and the elytra of uneven surface.

SUBGROUP *fasciatus*

Metamasius ciliatus (Champion)

Cactophagus ciliatus CHAMPION, 1910, p. 85, pl. 4, figs. 9, 9a. "Mexico, Mexico City, Temax"; lectotype, male, from Mexico City here designated from original series in the British Museum (Natural History), examined.

DIAGNOSIS: Differing from *fasciatus* as stated under that species, and is further generally bulkier than that species, less tapering, and has larger elytral punctures, more as in *yunquensis*. Similar to members of *sierrakowskyi* subgroup in many characters, but differing by having femora punctate, scutellum pointed, not U-shaped, and no hairs at apex of abdomen.

RANGE: From Mexico City to Veracruz and Yucatan. (For data on the seven specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 18 to 24 mm. Beak shorter than pronotum, stout (distinctly wider than antennal club), arcuate, virtually cylindrical; in profile, extreme base slightly wider (humped in type) than middle or apex; feebly punctate; basal dilation feeble, scarcely longer than wide; peduncle flat; scrobe with posterior edge only one scape width from eye; (male) inferiorly sulcate and base under scrobe with feeble double tooth. Antennal club elongate, with spongy part slightly shorter than base. Pronotum, sides subparallel in basal three-fourths; impunctate, or impunctate except for center of base and for apical constriction; base not depressed; base margined, grooved, and feebly arcuate at

center. Elytra, striae punctures distinct; intervals impunctate. Pygidium with short apical fringe of hairs and suggestion of central fringe; (male) broadly rounded; (female) narrowly rounded.

Under surface strongly punctate on prosternum, on sides and apex of abdomen, densely and finely punctate on mesepimeron, finely punctate on metasternum and femora; prosternum not depressed or hairy; distance between front coxae narrower than front third tarsal segment, but twice as wide as antennal funicle, about one-third or less of diameter of coxae; distance between middle coxae about equal to diameter of coxae; ventral depression (male) shallow; last segment of abdomen rounded apically, more broadly in male than in female, without visible hairs. All tibiae (male) with fringe of long hairs, and hairs on hind tibia dense and longer than tibia is wide. Femora scarcely clavate, but slightly emarginate before apex; front third tarsal segment wider than antennal club. Aedeagus with apex slightly emarginate.

Color black, or black with red on sides of pronotum and two red bands on elytra, one at base and one behind middle, but bands not extending onto suture, apical band appearing more like two large red spots.

ECOLOGY: None reported.

REMARKS: The front coxae are somewhat closer together in this species than in others of the subgroup which is probably why Champion considered it in the "genus" *Cactophagus*, but the prosternal process, aedeagus, and other characters are typically like those of the present subgroup.

The four specimens from the peninsula of Yucatan are entirely black, but more material is necessary to establish whether or not the color varies geographically.

One specimen of each sex was dissected.

Metamasius yunquensis Vaurie, new species

Figure 35

TYPE MATERIAL: Type, male, El Yunque, Puerto Rico, October 4, 1919, in the American Museum of Natural History.

DIAGNOSIS: Similar in size, general shape, sinuate base of pronotum, and hairy tibiae to males of *ciliatus*, *ritchiei*, and *fasciatus*, but differing by having beak nearly straight, not arcuate, and aedeagus triangularly pointed

(fig. 35). (See table 5 for comparison with other species from the Greater Antilles.)

RANGE: Known only from the type locality. El Yunque is the highest peak in Puerto Rico, about 3700 feet.

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 18 mm. Frons between eyes wider than one-half of width of beak at base. Beak shorter than pronotum, cylindrical, virtually straight, finely punctate; in profile wider than antennal club, slightly wider at base and apex than at middle; inferiorly not toothed or sulcate; basal dilation feeble, slightly longer than wide; scrobe with posterior edge less than a scape width from eye. Antennal club elongate, only gently dilated, spongy part shorter than basal part. Pronotum, sides subparallel or slightly emarginate from base to near apex where convergent to long, strong, apical constriction; impunctate; no basal depression; base slightly lobed at center, margined and deeply grooved at center third, margin becoming feeble toward sides. Elytra, striae punctures distinct within striae; intervals impunctate. Pygidium coarsely punctate, convex, evidently worn as only few hairs visible at apex.

Under surface well punctate on prosternum, sides of metasternum and of abdomen, last abdominal segment, and mesepimeron; prosternum between coxae slightly tumid; remainder impunctate; coxae without tufts of hair on inner face (perhaps worn?); distance between front coxae about same width as antennal club, or one-third of diameter of coxae; distance between middle coxae about equal to diameter of coxae; ventral depression feeble, not hairy; last segment of abdomen with small, transverse, apical depression filled with short hairs. All tibiae sinuate within and with long hairs in middle region (almost as long as tibiae are wide); appearing impunctate, but with rows of faint, tiny punctures; apex angulate; femora impunctate, scarcely bulbous; front third tarsal segment wider than antennal club, about four times width of second segment. Aedeagus with apex triangularly pointed.

Color black, except for red band across base of elytra from first interval to and including humerus, and for pronotum which is red with apical constriction black, and seven

black marks (two each at apex, at base, and on sides, and one at about center).

ECOLOGY: None reported.

REMARKS: No other species known has the apex of the aedeagus so distinctly and stoutly triangularly acuminate (fig. 35), although both *liratus* and *maurus* (Lesser Antilles) have rather pointed apices. Aside from *hemipterus*, no other species has been reported from Puerto Rico. For these reasons, and even though no female or no second male is available, I am describing this species as new. It appears to be more like mainland species than like those from the other islands of the Antilles, but it may be found to occur on Cuba, Jamaica, or Haiti. It resembles *ritchiei* Marshall (Cuba, Jamaica) in a number of details not given in table 5, such as the impunctate legs, stout beak with only feeble basal dilation, sinuate, angulate peduncle of the beak, the short spongy apex of the elongate antennal club, and the sinuate basal margin of the flat pronotum. It agrees with *bruneri* Buchanan (Cuba, Jamaica) only in the peduncle, the antennal club, and the sinuate base of the pronotum, of these characters.

The mountain of El Yunque has a high rainfall and many palms. Possibly this species breeds in palms, as do many of its congeners, but the area has not been well collected.

***Metamasius ritchiei* Marshall**

Figure 44

Metamasius ritchiei MARSHALL, 1916, p. 197, figs. 1a, 1b, 1c, "Above Rocks District" [St. Catherine Parish], Jamaica; type, male, in the British Museum (Natural History), examined.

DIAGNOSIS: Differing from others of subgroup (except *bruneri*) by having third tarsal segment entirely hairy below. Well characterized by large size, polished, flattened, impunctate pronotum with abrupt basal lobe impinging on retracted scutellum, proportionately long elytra with subparallel sides, and stout, arcuate beak. (See table 5 for comparison with *bruneri* and other species from the Greater Antilles.)

RANGE: Many parts of the island of Jamaica, and possibly Cuba. (For data on the 19 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 19 to 22 mm. Beak as long as pronotum, nearly cylindrical, gently arcuate,

TABLE 5

SOME SPECIFIC CHARACTERS OF *Metamasius* (SUBGROUP *fasciatus*) FROM THE GREATER ANTILLES^a

	<i>bruneri</i>	<i>ritchiei</i>	<i>yunquensis</i>	<i>mosieri</i>
Range	Cuba (Jamaica?)	(Cuba?), Jamaica	Puerto Rico	Cuba, Dominican Republic, Florida
Length	15 to 16 mm.	19 to 22 mm.	18 mm.	6 to 9 mm.
Frons between eyes	Narrow	Medium	Wide	Narrow
Pronotum	Punctate, subquadrate; excised in front	Impunctate, longer than wide; not excised	Impunctate, longer than wide; not excised	Impunctate, scarcely longer than wide; not excised
Base of pronotum	Entirely margined	Margined at center	Margined at center	Margined at center
Sides of elytra	Tapering to apex	Subparallel	Tapering to apex	Tapering to apex
Beak	Straight, as long as pronotum	Arcuate, as long as pronotum	Straight, shorter than pronotum	Arcuate, shorter than pronotum
Basal dilation of beak	Sharp	Feeble	Feeble	Feeble
Soles of third tarsal segment	Entirely hairy	Entirely hairy	Glabrous at base	Glabrous at base
Males	Long hairs on front tibia	Long hairs on hind tibia	Long hairs on all tibiae	Short hairs on all tibiae

^a The well-known *hemipterus* (subgroup *hemipterus*) occurs also throughout the Antilles; see that species for diagnosis.

virtually impunctate; in profile wider than antennal club, about same width throughout, perhaps slightly wider at base over scrobes; inferiorly at base not toothed; basal dilation feeble, longer than wide; scrobe with posterior edge less than a scape width from eye; inferiorly (male) feebly sulcate; (female) smooth. Antennal club elongate, only gently dilated, spongy part shorter than basal part. Pronotum, sides subparallel or slightly emarginate in basal half, strongly rounded to distinct apical constriction; appearing impunctate (punctures exceedingly fine); no basal depression; base margined and grooved at center only, where strongly lobed in front of scutellum. Elytra at base sinuate owing to retraction of scutellum (fig. 44); striae punctures not visible except on outer striae; intervals filled with minute punctures, appearing impunctate in some specimens. Pygidium finely, densely punctate, with obsolete median carina, no apical hairs; (male) broadly, (female) narrowly, rounded-truncate.

Under surface punctate on sides of prosternum and of abdomen and on last segment of abdomen, remainder virtually impunctate; prosternum flat or slightly concave between

coxae; distance between front coxae wider than antennal club, nearly one-half of width of coxae; distance between middle coxae wider than diameter of coxae; ventral depression (male) feeble; last segment of abdomen shallowly depressed at apex; (male) fringe of short, stiff hairs at extreme apex, apex rounded; (female) no hairs, apex narrowly rounded. Hind tibia (male) within near base sinuate and with long tuft of hairs on under side (hairs as long as tibia is wide); front and middle tibiae very slightly sinuate and fringed with hairs, hairs longer on front tibia; (female) hind tibia rather bent inward at middle of outer side, all tibiae (female) with very short hairs; tibiae of both sexes apically right-angled, appearing impunctate, but with rows of faint, tiny punctures; femora very bulbous; front tarsus with third segment almost twice width of antennal club, four times wider than second segment; third tarsal segment entirely hairy below. Aedeagus with apex truncate-rounded.

Color black or dull red.

ECOLOGY: According to Marshall (1916, p. 197) this species caused "serious damage to pine apples" in Jamaica. According to a more

recent study, however, it does not appear to be a very serious pest of commercial pineapples. Reid (1956-1957) showed that only a few restricted areas of Jamaica were infested, that "infestation was generally found in fields where cultural practices were poor and where the plants were covered with weeds or bush or were heavily shaded by overhanging trees." He wrote also that *ritchiei* is a poor flier and needs protection from the direct rays of the sun, as under rather dense vegetation. Commercial crops are probably only a secondary choice for this species, as Thomas Farr of the Institute of Jamaica tells me (in a letter) that "the bromeliads from which some of the specimens were taken were not pineapples but wild bromeliads, called wild pines in Jamaica."

The larvae bore into the root stock, hollow out the fruit stalk, or attack the junction of the fruit and stalk. Wyniger (1962, p. 222) wrote that the fruit stalks may be broken, the zone of rupture being traversed by mines which harbor "white, footless larvae," and the fruits are also mined. "The female lays its eggs singly in the fruit stalk where the larvae hatch after 8-10 days and start tunneling in the fruit stalk or in the fruit itself. The larval development requires 8-10 weeks. Pupation takes place inside the feeding galleries. Period of pupal stages: 3-4 weeks."

A male and a female specimen were captured in the mountains of Portland District, Jamaica, by R. Bengry in November, and by W. Lynn in July, "Ex Bromeliad," and a male from St. Ann District was taken by G. Proctor in August in the same plant.

REMARKS: Marshall (1916, p. 198) wrote that, although this species has a rather different appearance from that of any other species of *Metamasius*, "it presents all the essential characters of the genus." He said that it lacks the "torpedo-like" shape of many species, and that the restriction of the basal margin of the pronotum to the center is a peculiar feature. In general, these remarks are correct, as the elytra are less convergent behind than are those of most species, and the strong basal margin of the pronotum does not extend to the sides. A number of species, however, do have the basal margin restricted to at least the center third.

In its large size and polished black exterior,

this species might be mistaken for *lojanus* Heller (Ecuador), but the general shape and many details differ considerably. *Metamasius ritchiei* might be considered a member of the *hemipterus* subgroup because of the hairy tarsal soles and the widely spaced coxae, but it shares with the present (*fasciatus*) subgroup the stout, cylindrical beak, angular peduncle, glabrous prosternum, and hairy tufts on the tibia in the male. One of each sex was dissected.

It is possible that this species occurs also in Cuba, as I have a photograph taken by Fernando de Zayas of Cuba of what seems to be a female of this species which was collected by Zayas at La Breña, Moa, Oriente Province, in 1954. Zayas has another specimen collected by Feich in western Cuba, in Viñales, Pinar del Rio Province, July 7, 1957, in *Bromelia*, which he says (in a letter) is not *bruneri*, of which he has the paratype. One or both of these specimens may be *ritchiei*, or an undescribed species.

Metamasius bruneri Buchanan

Figure 97

Metamasius bruneri BUCHANAN, 1941, p. 169, pl. 12, Loma del Gato, Sierra del Cobre, Oriente Province, Cuba; type, male, in the United States National Museum, examined.

DIAGNOSIS: Male differing from that of all other species by having sides of nearly quadrate pronotum abruptly excised in front, where toothed or asperate (fig. 97); further characterized by angular basal lobe of pronotum, basal depression on pronotum, concave scutellum, long second tarsal segment, long third antennal segment, and very long red hairs within front tibia. Female not examined. (See table 5 for comparison with other species of the Greater Antilles.)

RANGE: Three specimens, all males, have been examined: the type, from Loma del Gato in the Sierra Maestra Mountains of eastern Cuba, collected in 1940 by León; another male from the same locality collected May 26-28, 1959, by Milton W. Sanderson, now in the American Museum of Natural History; and a male labeled simply "Jamaica" in the British Museum (Natural History). A female paratopotype is said to be in Cuba (see Remarks below).

DESCRIPTION OF MALE: (See also charac-

ters of subgroup). Length, 15 to 16 mm. Frons between eyes no wider than one-half of width of beak at base. Beak as long as pronotum, subcylindrical, scarcely curved, finely punctate; in profile no wider than antennal club, about same width throughout although slightly wider at base; inferiorly shallowly sulcate, not toothed, under scrobes; basal dilation sharp, longer than wide; peduncle angulate, not sulcate (but horizontal in male from Jamaica); scrobe for antennae with posterior edge one scape width from eye. Antennal club compressed, elongate, only gently dilated, spongy part less than one-half of whole. Pronotum scarcely longer than wide, almost quadrate, excised at right angles on sides behind strong apical constriction, excised part with edges of punctures asperate, appearing toothed; sides subparallel for most of their length, sides and front densely, even confluent punctate, center at base punctate in depressed area (but in male from Jamaica pronotum opaque, scarcely punctate on disc, base not depressed or punctate); base margined and grooved to sides, strongly angularly sinuate at middle. Elytra, sides strongly tapering to apex; striae punctures distinct (indistinct in male from Jamaica); intervals finely punctate, with shiny, overlaid stripes becoming successively shorter on each interval from suture to humerus (but no overlay in male from Jamaica which has all intervals opaque and flat). Scutellum concave and emarginate in front and slightly knobbed on sides of front (but not emarginate in male from Jamaica). Pygidium convex, rounded at apex, center with slightly hairy ridge.

Under surface punctate, except for partially impunctate femora, punctures deeper and larger on prosternum, sides of metasternum, and on last segment of abdomen, very fine on tibiae where scattered, not in regular rows, and on center of abdomen and metasternum (front of metasternum slightly tumid in male from Jamaica); distance between front coxae wider than antennal club, about one-half of diameter of coxae (but scarcely more than width of funicle and only one-fifth of diameter of coxae in male from Jamaica); distance between middle coxae equal to diameter of coxae (somewhat less than that in male from Jamaica); ventral trough shallow;

last segment of abdomen slightly depressed at extreme apex, not hairy (but not depressed in male from Jamaica). Middle and hind tibiae fringed with short red hairs, front tibia with long reddish hairs almost twice width of tibia (but in male from Jamaica only twice length of hairs on other tibiae); all femora clavate, bulbous, front and middle femora with short hairs, middle femur long, reaching to middle of hind coxa; front third tarsal segment almost twice width of antennal club; third tarsal segment entirely hairy below; claw segment inserted at extreme base of third segment; second segment very long, three-fourths of length of first. Aedeagus with apex truncate.

Color black, shining or opaque.

ECOLOGY: The type was found "*en palma manaca*" by Brother León of the La Salle School in Havana.

REMARKS: Buchanan had only two specimens, and he returned the female paratype to Bruner in Cuba. According to his description, the female differs from the male by having the beak somewhat more slender, virtually impunctate, its basal dilation as wide as long, the pronotum less abruptly excised, not asperate on the flanks of the excision, the femora with fewer hairs, and the front tibia with short hairs only.

A specimen labeled "Jamaica" on a tiny round label, in the collection of the British Museum (Natural History), differs in a few details from the Cuban males, as noted in the description above, but whether the differences are specific or individual is difficult to determine with so few specimens. The fourth known specimen of the species was kindly donated to the American Museum by the collector, Dr. Milton W. Sanderson of the Illinois Natural History Survey.

Sanderson's specimen and the male from Jamaica were dissected.

A few of the characters that Buchanan considered unique in *bruneri* I have found in other species. Thus the slender and very long third segment of the antennal funicle and of the second segment of the tarsus are present in *rimoratus* Gyllenhal (*hebetatus* subgroup). The basal impression of the pronotum and its lobed base with "depressed gutter," of which Buchanan gave an excellent illustration, are present in a number of species. The short,

wide basal dilation of the beak of the female occurs in *rimoratus*, *applicatus* Hustache, *tuberculipectus* Hustache, and *semirubripes* Hustache; and a sexual difference in the shape of the pronotum, in *cinnamominus* Perty and *peruanus* Hustache. The excised pronotum is found in still more exaggerated form in two species (*gibberosus*, *verrucosus*) of a closely allied calandrine genus, *Cactophagoides* Champion, which differ by having a strongly warty, verrucose dorsal surface.

Buchanan refrained from naming a new genus for *bruneri*, but he remarked (1941, p. 172) that "in a revisional study, however, a subgeneric group for this unusual species might be found convenient, as indicating its structural distinctiveness, and more particularly its geographic isolation from the main branch of *Metamasius*." He evidently had not seen *ritchiei* (Jamaica), as he made no mention of it, but it resembles *bruneri* in its large size, black coloration, basally lobed pronotum, concave scutellum, very wide tarsi with hairy soles, and aedeagus; the two species differ as shown in table 5. There are only four other species in the Greater Antilles (*hemipterus*, *mosieri*, *ritchiei*, *yunquensis*), of which only the first two occur also on the mainland.

Metamasius fasciatus (Olivier)

Figure 90

Curculio fasciatus OLIVIER, 1790, p. 474; 1808, pl. 11, fig. 136, type locality not designated, type not found. HERBST, 1795, pl. 61, fig. 7, "country unknown." CHAMPION, 1910, pl. 5, figs. 16, 16a.

Metamasius ochreofasciatus CHAMPION, 1910, p. 113, pl. 5, figs. 23, 23a, Azahar de Cartago, Costa Rica; type, female, in the British Museum (Natural History), examined. New synonymy.

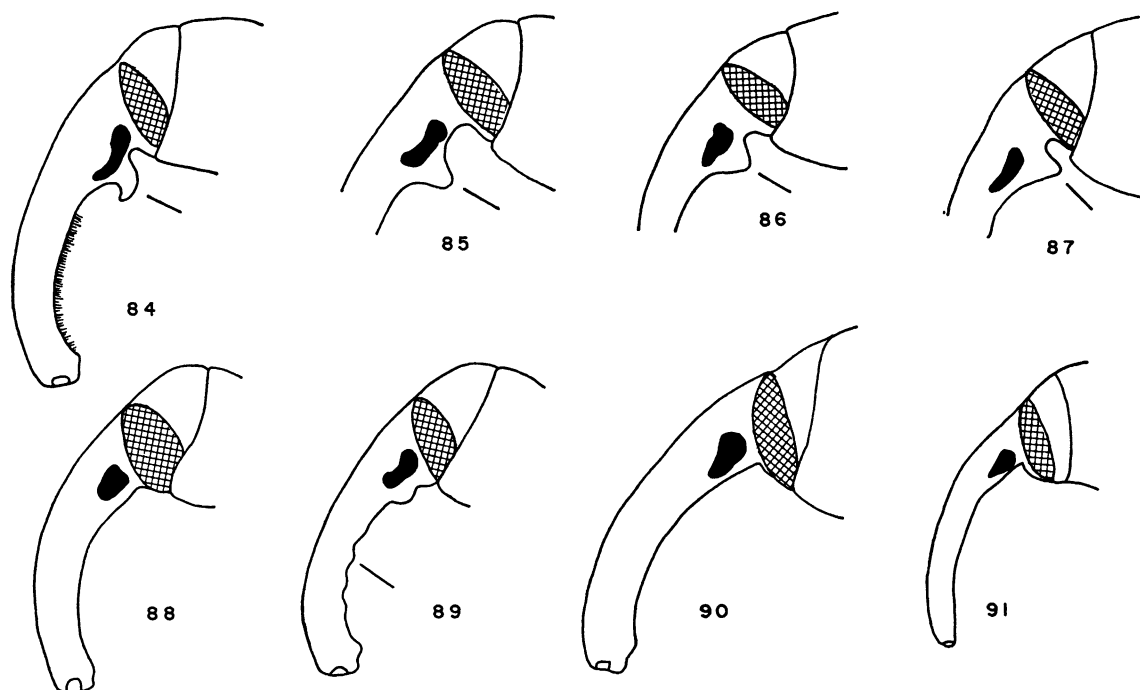
DIAGNOSIS: Almost identical with *calizona*, which follows, but differing as stated under that species. Differing from *ciliatus* by having a colored band, not four large spots, on elytra, and no red on pronotum, but black phases of both species occur; differing further by having coxae more widely separated, and male with long hairs on hind tibia only, not on all tibiae as in *ciliatus*.

RANGE: Costa Rica, Panama, and Venezuela. (For data on the 12 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 15 to 20 mm. Beak (fig. 90) shorter than pronotum, stout (wider than antennal club), cylindrical, arcuate, punctate feebly; in profile somewhat thicker at base; base under scrobes not toothed; inferiorly shallowly sulcate toward apex; basal dilation feeble, scarcely longer than wide; scrobe for antennae with posterior edge distant from eye by one scape width or less; beak of female slightly longer and less punctate than that of male. Antennal club with spongy part shorter than base. Pronotum, sides in basal half or three-fourths subparallel; punctate feebly or impunctate at center with sides and center of base punctate; base not depressed; basal margin at center feebly or strongly sinuate, margined and grooved at center, margin extending to sides in some specimens. Elytra, stria punctures visible, but small; intervals impunctate. Pygidium with short apical and lateral hairs, and line of short hairs at center; (male) broadly rounded-truncate; (female) narrowly rounded.

Under surface coarsely, densely punctate, except for nearly impunctate centers of metasternum and first few abdominal segments; prosternum rather concave between coxae, with vague swellings in front of each coxa; distance between front coxae equal to width of antennal club, more than one-third of diameter of coxae; distance between middle coxae greater than diameter of coxae; venter of male shallowly depressed; last segment of abdomen (male) apically depressed and with long, fine hairs at center from near base to apex; (female) not depressed or hairy, more narrowly rounded than that of male. Hind tibia (male) with long tuft of hairs at middle third (as long as tibia is wide), other tibiae of male and tibiae of female with very short hairs; femora rather strongly punctate, middle and hind femora clavate, inner side emarginate before apex; front tarsus with third segment as wide as or wider than antennal club, about three times wider than second segment. Aedeagus at apex truncate and slightly deflexed.

Color black, but red spot on sides of some or all segments of abdomen, or as stated, but with addition of red or orange color on elytra in a transverse, lineolate, irregular band behind middle of elytra and extending from



FIGS. 84-91. Beak of males of *Metamasius*. 84. *M. cinnamominus*. 85. *M. cornurostris*, detail. 86. *M. maurus*, detail. 87. *M. liratus*, detail. 88. *M. sulcirostris*. 89. *M. cincinnatus*; characteristic also of *M. submaculatus* and *M. dimidiatipennis*. 90. *M. callizona*; characteristic also of *M. fasciatus* and *M. quadrisignatus*. 91. *M. nudiventris*.

first to fourth interval, or first to sixth, or reduced to spot on one interval.

ECOLOGY: Champion (1913) found this species in bromeliads in Orosi, Costa Rica, along with *cincinnatus* Champion and *hebetatus* Gyllenhal. Some specimens of both sexes (in the United States National Museum) were taken also in or on Bromeliaceae in Costa Rica in March, September, and November.

REMARKS: According to material available, this species does not occur so far north as does either *callizona* or *ciliatus*. Possibly, however, it is conspecific with *callizona* (see that species for discussion). Other species in the present subgroup with orange bands across the elytra (*nudiventris*, *sellatus*) differ from *fasciatus* by having two bands, which, when complete, form an orange or reddish circle around a black central spot. The elytral band in *fasciatus* varies in length and width, but in most specimens does not extend to the sides of the elytra; it is lacking in a female from Orosi and is represented by but a single

dot on each elytron in a male from Cartago.

Although Champion (1910, p. 114) gave a number of differences between his *ochreofasciatus* (Cartago) and *fasciatus*, these seem to be either individual differences or differences owing to the larger size of his type and its sex (female). I have compared two dissected males identified by Champion as, respectively, *ochreofasciatus* (Orosi, Costa Rica) and *fasciatus* (Chiriqui, Panama), but find no specific differences.

One of each sex was dissected.

In the catalogue of Gemminger and Harold (1871) this species was given as having come from "North America." It has been considered in various genera, *Curculio*, *Calandra*, *Rhynchophorus*, *Sphenophorus*, and *Metamasius*.

Metamasius callizona (Chevrolat)

Figure 90

Sphenophorus callizona CHEVROLAT, 1882, p. 578, Mexico; type, male, in the Naturhistoriska

Riksmuseum, Stockholm, examined. CHAMPION, 1910, pl. 5, figs. 22, 22a.

DIAGNOSIS: Very similar to *fasciatus* (see short description below), but differing by having transverse colored band of elytra situated in front of middle, not behind middle, and band usually wider and more distinct.

RANGE: Mexico, mostly in the south, Guatemala, and (one specimen) western Panama. (For data on the 20 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 11 to 16 mm. Beak, antennae, pronotum, and elytra as described for *fasciatus* (which precedes), but base of pronotum less sinuate in some specimens, and intervals of elytra with fine punctures in some (but no punctures visible in type). Pygidium and punctuation of under surface as given for *fasciatus*. Prosternum not hairy, either concave or convex between coxae, and with vague swellings in front of each coxa; coxal widths and venter of male as given for *fasciatus*; last segment of abdomen not depressed or hairy (but see Remarks below), narrower in female than in male. Hind tibiae in both sexes with fringe of short hairs within (but see Remarks below); front and middle tibiae with shorter fringe; femora bulbous, emarginate before apex, feebly or strongly punctate; front tarsus with third segment wider than antennal club. Aedeagus with apex truncate.

Color black with red spot on sides of apex of abdomen, and elytra with transverse, lineolate, irregular band of orange or red in front of middle, extending from first or second to ninth interval, in some specimens an additional spot of color on first or fourth interval behind middle.

ECOLOGY: Notations on specimens in the United States National Museum and in the British Museum (Natural History) show that this species occurs on bromeliad plants (a specimen from Fortin, Veracruz, Mexico, December, 1957, intercepted at Laredo, Texas, and one from Chiapas, Mexico, June, 1959, intercepted at Brownsville, Texas); "in pineapple plant" at Amatlan, near Cordoba, Mexico, February, 1947 (two females collected by N. L. H. Kraus); also "on pineapples" intercepted at Laredo in May, 1941; and "in banana debris" from Mexico, inter-

cepted at New Orleans, Louisiana, April 1936.

REMARKS: This species may prove to be conspecific with *fasciatus* Olivier, as the differences between them include only the color pattern, general size, and the presence or absence of long hairs on the tibiae and abdomen of males. When larger series of both forms are available, these characters may be less constant than apparent at present. Even in the material at hand, the size in *callizona* varies from 11 mm. to 16 mm. The color bands of the elytra are variable in both forms, and the differences may be due to a reduction of the front or of the rear band. In the Zoologisches Museum in Berlin I saw a male of *callizona* from Mexico with the elytral band in front of the middle as in other *callizona*, but with a tuft of longer hairs on the hind tibia and long hairs on the apex of the abdomen as in *fasciatus* (other males of *callizona* examined have short hairs on the tibia and no hairs on the abdomen). Both forms occur in bromeliads and both have been found in western Panama, but I have not seen any specimens of *callizona* from South America, nor any of *fasciatus* from Mexico. One male and two females were dissected; their genitalia appear to be similar.

This is one of the five original species included by Chevrolat in 1885 in his genus *Phyllerythrurus*, which was based on the red band of the elytra. Champion (1910) subsequently considered three of these in other genera (*callizona* in *Metamasius*, *pulcherrimus* in *Cactophagus*, and *orizabaensis* in *Eucactophagus*), leaving only *sanguinolentus* Olivier and *aurofasciatus* Brême of the original five.

Metamasius flavopictus (Champion)

Figure 9

Metamasiopsis flavopictus CHAMPION, 1910, p. 102, pl. 5, figs. 6, 6a, Omilteme, Guerrero, Mexico; type, male, in the British Museum (Natural History), examined.

Metamasiopsis decempunctatus CHAMPION, 1910, p. 102, pl. 5, figs. 7, 7a, Cinco Señores and Jalapa, Mexico; female, Cinco Señores [Puebla], here designated as lectotype from original male and female specimens in the British Museum (Natural History), examined. New synonymy.

DIAGNOSIS: Distinguishable from all members of subgroup except *cinnatus*, by

having distinct, small tooth at apex of outer angle of tibiae (*cincinnatus* is larger, has different characters in male, and is not known from north of Nicaragua). If tibial teeth worn, resembling *callizona*, also from Mexico, but differing from that species by having impunctate femora and tibiae, less regular elytral fasciae with fewer orange spots, and proportionately longer elytra.

RANGE: Southern Mexico, from Jalapa in the east, south and southwest to the state of Guerrero. (For data on the 10 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 12 to 15 mm. Beak distinctly shorter than pronotum, cylindrical, stout, in profile wider than antennal club, nearly straight, feebly arcuate, impunctate; basal dilation fairly sharp, scarcely longer than wide; beak in profile about same width throughout; inferiorly not toothed, but sulcate in some specimens; scrobe with posterior edge separated from eye by less than a scape width. Antennal club somewhat elongate, spongy part less than one-half of whole. Pronotum, sides subparallel in more than basal half, virtually impunctate; base not depressed, scarcely arcuate, margined and grooved at middle only. Elytra, stria punctures visible; intervals impunctate. Pygidium with short central ridge near apex and a few hairs on ridge, no hairs elsewhere in five specimens, but may be worn off; apex (male) broadly, (female) narrowly, rounded.

Under surface lightly punctate on prosternum, sides of metasternum, sides and apex of abdomen; remainder virtually impunctate; prosternum flat between coxae; distance between front coxae about equal to width of antennal club, or about one-third or more of diameter of coxae; distance between middle coxae equal to diameter of coxae; ventral depression of male shallow; last segment of abdomen (male) very shallowly depressed and with sparse, long hairs; (female) depressed transversely at extreme apex and with dense, short hairs. All tibiae at outer apical angle minutely toothed (one tooth), front tibia with additional tooth on outer side behind apical tooth (fig. 13); femora impunctate, bulbous, emarginate before apex; front tarsus with third segment as wide as antennal club, about three times wider than apex of second seg-

ment; hind tarsus with second segment about as wide as long. Aedeagus truncate at apex.

Color black except for vague red spots in some specimens at base of pronotum laterally or medially, and for red or orange, lineolate spots on elytra in two transverse, incomplete or interrupted bands before and behind middle, spots lacking in some specimens on any intervals between second and sixth (as in lectotype of *decempunctatus*), or present on all from second to sixth (as in type of *flavopictus*).

ECOLOGY: Notations on specimens from Mexico at the United States National Museum give the following information: a male taken in bromeliad, January, 1952; a female, on or in *Tillandsia* (Bromeliaceae) in December, 1951; a male in a stem of *Chamaedorea oblongata* (Palmae) in December; a female "alive in pupal cell in Bromeliaceae," intercepted in San Francisco, California, in March, 1938.

REMARKS: As Champion himself surmised (1910, p. 103), his *decempunctatus* is no more than a color variety of his *flavopictus*, the types of the two forms being the same, except for the fact that *flavopictus* has a few additional colored spots on the elytra which are evanescent in *decempunctatus*, and has the outer angles of the tibiae more evidently toothed. These "teeth" or small spines are not very noticeable in some specimens (fig. 9), but they formed the basis of Champion's genus *Metamasiopsis*. His type of the genus (*rugipectus*), however, differs in a number of ways from *flavopictus* (see that species for comparisons).

One difference between *flavopictus* and other species of the subgroup is that there appears to be no sexual difference in the beak.

One specimen of each sex was dissected.

The locality of the lectotype of *decempunctatus* (Cinco Señores) is 4 to 8 kilometers northwest of Tehuacan, Puebla; that of the type of *flavopictus* (Omiteme) is 16 kilometers southwest of Chilpancingo, Guerrero (Selander and Vaurie, 1962).

***Metamasius sellatus* Champion**

Figures 92, 93, 113

Metamasius sellatus CHAMPION, 1910, p. 108, pl. 5 figs. 15, 15a; type locality not specified; lectotype, male, Chontales, Nicaragua, here desig-

nated from original series from Nicaragua and Panama, in the British Museum (Natural History), examined.

DIAGNOSIS: Differing from four preceding species by having metasternal region smoothly convex, not flat, especially toward front (profile as shown in fig. 113), beak longer and narrower, and glabrous area on third tarsal segments more extensive. Differing scarcely at all from *nudiventris* (see table 6 for comparison).

RANGE: Mexico in the south, and Central America (Guatemala, British Honduras, Nicaragua, Costa Rica, Panama). (For data on the 36 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 13 to 16 mm. (one specimen, 8 mm.). Beak cylindrical, in profile as wide as antennal club; not toothed or sulcate inferiorly; basal dilation feeble, not at all sharp, scarcely longer than wide; scrobe for antennae with posterior edge virtually opening onto eye; peduncle not angulate or sinuate; beak (male) shorter than pronotum, scarcely arcuate, in profile slightly wider at base and tapering to apex, lightly punctate; (female) as long as or longer than pronotum, evenly arcuate, in profile of same width throughout, virtually impunctate. Antennal club elongate, spongy part shorter than basal part. Pronotum, sides subparallel in basal three-fourths; punctate on sides only, but one specimen having five or six punctures at middle base; base not depressed; basal margin slightly sinuate at middle, margined, but not actually grooved, at center; sides of base covered by base of elytra in most specimens. Elytra, stria punctures not distinct; inter-

vals impunctate. Pygidium with short fringe of apical and lateral hairs and same kind of hairs at center; of male slightly wider than that of female and less tapering.

Under surface rather coarsely punctate on prosternum and abdomen, feebly elsewhere, mesosternal process and center of metasternum virtually impunctate; prosternum between and in front of coxae convex; metasternum vaguely convex; distance between front coxae wider than antennal club or third tarsal segment, more than one-half of diameter of coxae; distance between middle coxae wider than diameter of coxae; male with no visible ventral depression; last segment of abdomen broadly rounded, not depressed; that of male more truncate than that of female and with sparse apical hairs. Hind tibia (male) with hairs somewhat longer than those on other tibiae, but not so long as tibia is wide; femora lightly punctate, distinctly bulbous, emarginate before apex; front tarsus with third segment wider than antennal club, apex three or four times wider than apex of second segment. Aedeagus, apex slightly emarginate.

Color of most specimens, including type, black with orange or reddish elytral band of irregular shapes, usually enclosing small or large black circular mark or "eye" on each elytron (fig. 92) and pronotum black with some red at base; in a few specimens beak black with reddish base and apex, pronotum red with five black marks, legs red and black, under side black at middle but with some red on sides, these few specimens having additional red on elytra along base, on humerus, and at sides of apex (fig. 93).



FIGS. 92-96. Diagrammatic elytral pattern of some *Metamasius*; blank areas represent red or orange color; black areas, black. 92. *M. sellatus*, typical pattern. 93. *M. sellatus*, variation (Mexico, Guatemala). 94. *M. nudiventris*, dark specimen. 95. *M. nudiventris*, reddish specimen. 96. *M. inaequalis*.

ECOLOGY: A specimen from Cordoba, Mexico, in the United States National Museum was marked "*Bromelia*."

REMARKS: This and the following species (*nudiventris*, *quadrilineatus*, *bromeliadicola*) are very similar, but *sellatus* and *nudiventris* are more similar than the others. These two species are rather more heavy-set and thicker, both dorsally and in profile, and many individuals have a very narrowly triangular scutellum, narrower than in most species. All specimens of *sellatus* examined have the prosternum swollen or tumid between or in front of the coxae, but only a few individuals of *nudiventris* have it tumid. No specimens of *nudiventris* have been seen with the exact elytral pattern of *sellatus*, but some (such as the type of *scutatus*, a synonym of *nudiventris*) present a variation that is very close to the *sellatus* pattern of three specimens of *sellatus* from Mexico and Guatemala (fig. 93).

Two males and one female were dissected.

***Metamasius nudiventris* Champion**

Figures 91, 94, 95

Metamasius nudiventris CHAMPION, 1910, p. 114, pl. 5, figs. 24, 24a; type locality not specified; lectotype, male, "Nicaragua," here designated from original series from Nicaragua in the British Museum (Natural History), examined.

Metamasius scutatus CHAMPION, 1910, p. 114, pl. 5, figs. 25, 25a, Boca de Limon [Limon Province], Costa Rica; type, male, in the British Museum (Natural History), examined. New synonymy.

DIAGNOSIS: Differing very little from *sellatus* (see table 6). Similar also to *bromeliadicola*

and *quadrilineatus*, differing from former by having shorter beak with wider apex (viewed dorsally), males by having smaller, more rounded, less squared-off pygidium, and only a few, not numerous, hairs on last segment of abdomen; differing from *quadrilineatus* in elytral pattern, and absence, in males, of long tuft of hair on hind tibia.

RANGE: Mexico and Central America (Nicaragua, Costa Rica, and Panama). (For data on the 37 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 11 to 13 mm. Beak (fig. 91) as described for *sellatus*, but dorsal apex wider and in male somewhat more punctate than in that species. Antennal club and pronotum as described for *sellatus*, but pronotum sparsely punctate throughout. Elytra as described for *sellatus*, but pattern of color different (figs. 94, 95). Pygidium as described for *sellatus*, but no hairs or ridge at center. Under surface, punctuation as described for *sellatus*; prosternum between front coxae slightly tumid in one or two specimens; metasternum vaguely convex; distance between front coxae as wide as or wider than antennal club, almost or about one-half of diameter of coxae; distance between middle coxae equal to diameter of coxae; male with no visible ventral depression; last segment of abdomen broadly rounded; (male) with apical patch of sparse hairs. Tibiae, femora, and tarsi as described for *sellatus*. Aedeagus truncate apically.

Color of 10 specimens: five black with two irregular, somewhat curving orange or red bands across elytra, bands, where con-

TABLE 6

SOME SPECIFIC DIFFERENCES BETWEEN *Metamasius sellatus* AND *Metamasius nudiventris*

	<i>sellatus</i>	<i>nudiventris</i>
Number of specimens	12	18
Apex of aedeagus	Emarginate	Truncate
Apex of beak, viewed dorsally	Same width as remainder of beak, excluding base	Gently wider than remainder of beak
Pronotum	Virtually impunctate, at least on disc	Entirely sparsely punctate
Prosternal space between front coxae	More than one-half of diameter of coxae; distinctly convex	One-half or less of diameter of coxae; not or but feebly convex as a rule
Pygidium	With median ridge of stiff hairs	Without ridge of hairs
Mesepimeron	Proportionately larger and longer	Proportionately shorter and smaller
Elytral pattern	As shown in figures 92, 93	As shown in figures 94, 95

nected, forming large colored circle around central black area; five specimens a mixture of red and black as follows: head black, beak black, but with median red area in one, pronotum red with five black areas (at center, laterally at base, laterally in front), elytra with black and red areas and with orange bands across middle area, legs black or black and red, under surface black with red on sides of abdomen and of metasternum and prosternum.

ECOLOGY: All the notations on specimens refer to their having been found on or in bromeliads: one specimen, Costa Rica, in March, four specimens, Coronado and Estrella, Costa Rica, in March and September. Günther (1936, p. 192) reported the species also "in *Bromelia*."

REMARKS: Although Champion placed *scutatus* directly after *nudiiventris* in his classification, he did not compare them with each other, but compared *scutatus* with *quadrilineatus*, and *nudiiventris* with *ensirostris* Germar and *bisbesignatus* Gyllenhal, species I place in the *hemipterus* subgroup. I have examined Champion's types and original specimens and consider *scutatus* a synonym of *nudiiventris*, differing in coloration only. The predominantly black specimens agree with the lectotype and six syntypes of *nudiiventris*, whereas those with red above and below agree with the unique type of *scutatus*.

Four males and one female were dissected.

In addition to the differences between this species and *sellatus* given in table 6, the eighth tergum of the female of *nudiiventris* appears to have two tiny sharp points apically which are lacking in the rounded apices of *sellatus*.

***Metamasius bromeliadicola* Champion**

Metamasius bromeliadicola CHAMPION, 1913, p. 5, La Estrella, Costa Rica; type, male, in the British Museum (Natural History), examined.

DIAGNOSIS: Female not known, but male differing from males of *sellatus*, *nudiiventris*, and *quadrilineatus* in proportionately larger, more square pygidium, larger aedeagus, longer beak, larger depression and more hairs at apex of abdomen, and hind tibia with longer hairs than those of *sellatus* and *nudiiventris*, but not in one long tuft like those of *quadrilineatus*.

RANGE: Known only from the type locality, Estrella, Costa Rica, from which in September, at 2000 meters, the type and another male were collected by C. Picado. Estrella is presumably the village in the Cordillera de Talamanca south of Cartago. The second specimen is in the United States National Museum.

DESCRIPTION OF MALE: (See also characters of subgroup). Length, 12 mm. Beak as long as pronotum, cylindrical, nearly straight, feebly punctate, in profile as wide as antennal club, narrowing gradually to apex from slightly thickened base; basal dilation feeble, longer than wide; inferiorly not sulcate or toothed; peduncle not sinuate or angulate; scrobe with posterior edge one scape width from eye. Antennal club elongate, spongy part shorter than base. Pronotum, sides subparallel in basal half; impunctate except for coarse punctures at middle base; base not depressed, its margin slightly sinuate, margined but not actually grooved at center, evanescent at sides. Elytra, striae punctures distinct; intervals impunctate. Pygidium with short fringe of apical and lateral hairs and same kind of hairs at center where slight ridge visible; apex broadly truncate.

Under surface strongly punctate on prosternum, sides of abdomen, mesepimeron, sides of metasternum, but virtually impunctate on mesepisternum, and center of abdomen; prosternum flat between front coxae; distance between front coxae about as wide as antennal club or third tarsal segment, more than one-third of diameter of coxae; distance between middle coxae equal to diameter of coxae; ventral depression deep (type) or shallow; last segment of abdomen with large, shallow, hairy depression nearly as large as one-half of segment, hairs as long as tibia is wide. Inner edge of hind tibia fringed with hairs at least as long as tibia is wide; femora virtually impunctate, distinctly bulbous, emarginate before apex; front tarsus with third segment as wide as antennal club, about three times wider than apex of second segment. Aedeagus with apex truncate, but appearing slightly emarginate because of deflection.

Color, head and beak black, pronotum red with five black areas that tend to merge,

forming black M on red background, elytra reddish with black spot at center formed by short, lineolate black marks on second, third, and fourth intervals; fourth interval minutely bright red or yellow before and behind this black central area; center of all intervals in basal half of elytra with narrow black stripes; legs red and black; venter black with red stripe on sides of prosternum and sides of abdomen.

ECOLOGY: The type and second specimen were both found in bromeliads.

REMARKS: The type and second specimen bear the same data on their labels as a male of *nudiiventris* in the collection of the United States National Museum, and possibly these will prove to be the same species when more specimens and the other sex of *bromeliadicola* become known. Both *nudiiventris* and *sellatus* are quite variable, and perhaps *bromeliadicola* is also. If the size of the pygidium is constant, however, *bromeliadicola* is surely a distinct species. The sides of the elytra appear more parallel-sided in *nudiiventris* and *bromeliadicola* than those of *sellatus*.

The second male of *bromeliadicola* was dissected.

***Metamasius quadrilineatus* Champion**

Figure 4

Metamasius quadrilineatus CHAMPION, 1910, p. 107, pl. 5, figs. 11, 11a; lectotype, male, Purula [Purulha], Baja Verapaz, Guatemala, here designated from two original males from Guatemala and Mexico in the British Museum (Natural History), examined.

DIAGNOSIS: Distinguishable from very similar preceding species (*bromeliadicola*, *nudiiventris*, *sellatus*) by having narrower, more acuminate pygidium in both sexes, longer spongy part of antennal club, stronger basal dilation of beak, elytral pattern of two distinct, yellow (usually bright), longitudinal stripes of unequal length, and male with long, curling tufts of hairs within hind tibia, not merely a fringe.

RANGE: Southern Mexico and adjacent Guatemala and El Salvador. (For data on the five specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 11 to 12 mm. Frons between eyes narrower than one-half of width of beak at base. Beak shorter than pronotum, cylin-

drical, in profile nearly as wide as antennal club, narrowing gradually to apex from slightly thickened base, not sulcate or toothed inferiorly; basal dilation rather distinct, slightly longer than wide; peduncle not sinuate or angulate; scrobe with posterior edge one scape width from eye; beak (male) scarcely arcuate, lightly punctate; (female) evenly arcuate, virtually impunctate. Antennal club elongate, spongy part as long as basal part. Pronotum, sides subparallel in basal half, impunctate or with few punctures on sides or at middle base; base gently arcuate, not depressed, margined and grooved at center, less so at sides. Elytra, striae punctures distinct on outer striae only; intervals impunctate. Pygidium in both sexes strongly narrowed to apex, with short apical hairs, subcristate apically.

Under surface well punctate on prosternum, abdomen, mesepimeron, and sides of metasternum; center, except for apex of abdomen, impunctate; prosternum flat between coxae; distance between front coxae about equal to width of antennal club, about one-half of diameter of coxae; distance between middle coxae about equal to diameter of coxae; ventral depression of male feeble; last segment of abdomen (male) hairy and narrowly depressed near apex, hairs very short; (female) not noticeably depressed or hairy. Inner edge of hind tibia (male) with long, curling hairs in middle third, hairs nearly twice longer than tibia is wide, and other hairs becoming gradually shorter from middle to apex (fig. 4); (female) with fringe of short hairs; femora lightly punctate, distinctly bulbous, emarginate before apex; front tarsus with third segment as wide as antennal club, about three times wider than second segment. Aedeagus slightly emarginate apically.

Color, head and beak black, pronotum red with five black marks (at center, laterally at base, laterally in front), elytra streaked and lineolate, their intervals red overlain with black stripes, fourth interval bright yellow (or red) from near base to beyond middle, second interval bright yellow subapically, but only one-half of length of fourth, legs black with some red, under side black, except for red hourglass mark on first and second segments of abdomen, red stripe on sides of

prosternum, red on sides of abdomen and part of sides of metasternum.

ECOLOGY: A male in the collection of the United States National Museum was intercepted at Brownsville, Texas, "on Bromeliads" coming from Chiapas, Mexico.

REMARKS: The black and yellow lineolate pattern of the elytra appears to be constant in the few specimens examined, although the specimen from Chiapas has the usually yellow stripes red and the sides of the elytra more black than those of other individuals. The long, yellow hairs of the hind tibia of the male may appear more clustered or tufted in some specimens, but they do not form a regular fringe in any individuals, as they do in males of preceding species.

One male and one female were dissected.

The eyes seem rather closer together on top of the head than usual. The outer apical angles of the tibiae are sharp, almost toothed, in the type specimen. The species that follows (*cincinnatus*) is twice the size of *quadrilineatus*, but is similar by having almost toothed tibial apices as well as long tufts of curling hairs on the hind tibia of males. These species differ widely in elytral pattern.

***Metamasius cincinnatus* Champion**

Figures 4, 89

Metamasius cincinnatus CHAMPION, 1910, p. 110, pl. 5, figs. 18, 18a, Chontales, Nicaragua; type, male, in the British Museum (Natural History), examined.

DIAGNOSIS: Extremely similar to *dimidiatipennis* in size, beak, elytral pattern, and long tibial hairs of male, but differing by having apices of tibiae minutely toothed, prosternum and sides of metasternum impunctate, antennal scape longer and thinner, and hairs of hind tibia of male twice as long as those of *dimidiatipennis*, in cluster near base, not evenly distributed throughout. Differing from *quadrisignatus* (Lesser Antilles) as stated in Remarks below.

RANGE: Central America in Nicaragua, Costa Rica, and Panama, and Ecuador in South America. (For data on the nine specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 12 to 18 mm. Beak shorter than pronotum, slightly compressed, in profile as wide as antennal club, impunctate

except for extreme base; basal dilation not sharp, slightly longer than wide; scrobe with posterior edge one scape width from eye; (male) scarcely arcuate, in profile wider at base and at apex where peduncle angulate, inferiorly broadly sulcate between crenulate or scalloped sides (fig. 89); (female) more arcuate, in profile only slightly wider at apex where peduncle sinuate, inferiorly smooth throughout. Antennal club, spongy part longer than base. Pronotum, sides subparallel in basal half; impunctate; base subtruncate, not depressed, margined and grooved at middle, margin evanescent at sides. Elytra, stria punctures visible; intervals impunctate. Pygidium with apical hairs longer than lateral hairs and with stout hairs in center; (male) broadly rounded; (female) narrowly rounded.

Under surface virtually impunctate, except for sides and apex of abdomen; prosternum flat between coxae, in some specimens two vague swellings in front of coxae; distance between front coxae equal to width of antennal club, about one-half of width of coxae; distance between middle coxae equal to or greater than diameter of coxae; ventral depression of male distinct; last segment of abdomen rounded-truncate, not depressed or hairy. Inner edge of hind tibia near base (male) with long, curled tuft of yellow hairs longer than twice width of tibia (fig. 4), sparse hairs continuing to apex; (female) with fringe of short hairs; other tibiae (male) with fringe of hairs about one-half of width of tibia. All tibiae minutely toothed at outer apical angle, front tibia with additional sharp angle on sides behind apical angle (fig. 13); femora lightly punctate, feebly bulbous, emarginate before apex; front tarsus with third segment wider than antennal club, widely dilated to four or five times width of second segment; hairs on soles of first two tarsal segments very long. Aedeagus apically more or less truncate and deflexed.

Color of eight specimens: head, beak, legs, and under side black in seven, beak, legs and large areas of under side red in one specimen (a second male described by Champion in 1913); pronotum black in two, red with black stripes from apex to middle in six (including type), stripe forked in five; elytra black with four large reddish orange spots in

three (Panama, Ecuador), these spots expanded in five specimens to apex and to base in varying degrees, forming at base a flat, short, red X (even more red present at base in type).

ECOLOGY: Champion (1913) reported receiving *cincinnatus*, *hebetatus* Gyllenhal, and *ochreofasciatus* Champion (a synonym of *fasciatus* Olivier) from the collector, Picado, who found them in bromeliads at Orosi, Costa Rica, at an altitude of 1300 meters. Notations on specimens in the United States National Museum give the same kind of data, "on Bromeliad," "on leaf Bromeliad," "on Bromelia epiphytes," at Orosi and Estrella, Costa Rica, in February, May, and September, and in the Canal Zone, Panama, in January. A male was taken on Orchidaceae in Panama in April. One of the specimens from Estrella (September), 2000 meters, has the same data on the label as a specimen of *nudiventris* and of *bromeliadicola*.

REMARKS: In addition to the differences given above between this species and *dimidiatipennis*, the latter has a much wider distribution in South America. Two other species quite similar to *cincinnatus* are *flavopictus* (Mexico), and *quadrisignatus* (Lesser Antilles, Panama). The former resembles the dark form of *cincinnatus*, but has the elytral spots lineolate and disconnected, the spongy part of the antennal club shorter than the base, not longer; *quadrisignatus* has almost exactly the same elytral pattern as the dark form of *cincinnatus*, but differs by having the disc of the pronotum completely flat, not convex, and the sides of the under surface distinctly punctate.

The golden tibial hairs of males of this species are longer than those of any other males of the genus. They are more extensive and fanlike in the males examined from Costa Rica and Ecuador than those in the type from Nicaragua, which are matted together in a narrow tuft; shorter hairs are present on each side of the tuft or the fan, but they may be worn off in some specimens. The hairs on the first two tarsal segments are markedly long in this species.

In both *cincinnatus* and *flavopictus* the tibiae are distinctly though minutely toothed at the outer apices, and in *dimidiatipennis* and *quadrisignatus* there is a trace of the

tooth in some specimens. The toothed tibiae were the basis of Champion's genus *Metamasiopsis*, but he did not include *cincinnatus* in that "genus." He did include *transatlanticus* Kirsch which is superficially similar to *cincinnatus* in the beak and under surface and narrow pronotum, but which differs in the kind of aedeagus, the toothed femora, and other characters.

One of each sex was dissected.

***Metamasius dimidiatipennis* (Jekel)**

Figure 89

Sphenophorus dimidiatipennis JEKEL, 1858, p. 359, "Pacific shore of Central America"; type, female, "West Coast of America," in the British Museum (Natural History), examined. CHAMPION, 1910, pl. 5, figs. 10, 10a, GÜNTHER, 1941, p. 43, fig. 7 (genitalia).

Metamasius connexus CHAMPION, 1910, p. 111, pl. 5, figs. 19, 19a, type locality not specified; lectotype, male, San Isidro [Guatemala], here designated from original series from Guatemala and Mexico, in the British Museum (Natural History), examined. New synonymy.

Cactophagus consularis HUSTACHE, 1936, p. 89, French Guiana; cotypes, male and female, St. Laurent du Maroni, French Guiana, in Muséum National d'Histoire Naturelle, Paris, examined. GÜNTHER, 1941, p. 43, fig. 8 (genitalia).

Metamasius dimidiatipennis waehneri GÜNTHER, 1941, p. 44, type locality not specified; localities given: São Pablo [Paulo] de Olivença, Amazonas, Brazil; Sarayacu, Ecuador; and "Peru"; type not found in Staatliches Museum für Tierkunde, Dresden, or elsewhere.

Metamasius nigromaculatus Voss, 1954, p. 331, type locality not specified; localities given: Satipo, Peru, and "Brazil"; type not found.

Metamasius nigromaculatus congener Voss, 1954, p. 331, Quevedo, Ecuador; type probably destroyed. New synonymy.

DIAGNOSIS: Differing from *cincinnatus* as stated under that species. Similar to *quadrisignatus* (Lesser Antilles, Panama), which has same kind of flat, impunctate pronotum, and, in male, same long fringe of hairs on hind tibia, and slightly crenulate under sides of beak (figs. 8, 89), but differing in usually larger size, virtually impunctate sides of metasternum and mesosternum (in majority of specimens), punctate center of prosternum, and proportionately shorter, thicker antennal scape.

RANGE: From southern Mexico south

through Central America to the Guianas and northern Brazil, and on the west coast of South America to Peru. (For data on the 70 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 14 to 20 mm. Beak shorter than pronotum, slightly compressed; in profile as wide as antennal club; basal dilation fairly sharp, slightly longer than wide; scrobe with posterior edge one scape width from eye; beak of male slightly arcuate, finely punctate, in profile wider at base where under side of scrobe is sinuate or feebly toothed; inferiorly broadly sulcate between feebly crenulate or scalloped sides; beak of female distinctly arcuate, virtually impunctate; in profile slightly wider at base where obsoletely sinuate under scrobe; inferiorly smooth, apex of peduncle more sharply angled than that of male. Antennal club, spongy part longer than base. Pronotum, sides subparallel in more than basal half; impunctate; base subtruncate or at middle feebly sinuate, margined and grooved almost to sides. Elytra (except for color pattern) and pygidium as described for *cinnatus*.

Under surface well punctate on prosternum and sides and apex of abdomen, in some specimens also on sides of metasternum, remainder virtually impunctate; prosternum flat between coxae; distance between front coxae equal to width of antennal club, about or nearly one-half of width of coxae; distance between middle coxae wider than diameter of coxae; male with feeble ventral depression; last segment of abdomen (male) at apex shallowly depressed and with long, sparse hairs at center of segment; (female) no hairs, apex flattened, but no true depression. Inner edge of hind tibia (male) with long fringe of yellow hair (longer than or as long as tibia is wide), other tibiae of male and tibiae of female with fringe of short hairs, apices of tibiae decidedly angulate; femora virtually impunctate, feebly bulbous, emarginate before apex; front tarsus with third segment wider than antennal club, three or four times wider than second segment; hairs on soles of first and second tarsal segments very long. Aedeagus truncate at apex.

Color, head black; beak black, red, or red with apex or base black; pronotum black, or black with red on sides, or red, or red with

from one to five small black marks (at sides, at base, or at center); elytra red at base, black in apical half and black spot behind shoulder, or black except for red shoulders, or apical black area invaded by red in varying amounts, forming two black spots at center of elytra, spots may be joined together, and apical sutural black area which may be joined to central spots; under surface black or black with red; legs red, or red with black.

ECOLOGY: This species was captured at Juan Viñas, Costa Rica, by P. P. Calvert, in October, 1909, "in bromeliad on tree trunk," and on Taboga Island, Panama, by T. D. Fullaway and Zetek on or from pineapples, and "on fruit pineapple" in Costa Rica.

REMARKS: The extensive synonymy given above for this species is an indication of its variability. I consider all these forms color phases or individual variants. There are more names, however, than phases, as the majority of names are referable to the same "spotted" phase (predominantly red but with black spots), i.e., *connexus*, *consularis*, *dimidiatipennis*, *waehneri*, *nigromaculatus*, and *nigromaculatus congener*.¹ The second variety listed by Champion (1910, p. 106) from eastern Mexico, which he did not name, is also the spotted or red phase. The type specimens of these forms are from localities in Guatemala, French Guiana, Brazil, Ecuador, and Peru; I have seen specimens from these areas and of the same phase from Mexico and British Guiana.

In the type of *dimidiatipennis* the black spots in the apical half of the elytra are fused into one black mass, and this dark phase is from Central America, but also (three specimens) from Colombia. Champion's variety "a" from Nicaragua and Panama is this phase, and his third variety, from Costa Rica, is almost entirely black.

Günther (1941), Voss (1954), and Kuschel (1955) have mentioned one or more of the above names as subspecies of *dimidiatipennis*, but I cannot agree that such subspecific allo-

¹ This form is entirely black, but Voss (personal communication) tells me that it differs from his nominate form in color only; the types of both forms are evidently lost. Kuschel (1955) synonymized *nigromaculatus* with *consularis*.

cation is warranted by the material that I have examined. The so-called Central American dark form occurs within the range of the South American red form, as the latter is found also in Guatemala and Mexico. I have examined about 70 specimens from 10 countries, but noted the exact color differences for only about one-half of the specimens, as I found various combinations of red and black individuals from some of the same localities. Champion had seen 17 specimens; Günther, 14. Voss and Kuschel gave no figures. The color of the pronotum and of the under side varies from red to black, but is not necessarily correlated with the color of the elytra.

Jekel said that *dimidiatipennis* showed "a striking resemblance to *Sphn. sericeus* in the coloration of the upper side." Actually, in *hemipterus sericeus* the black shoulder patch, if present, is connected with the black apical half, not separated from it as in *dimidiatipennis*. The shape of the mesepimeron with its sinuate front margin and long outer side in many specimens of this species and of *cinnatus* is not unlike that present in *Paradiaphorus crenatus* Billberg, a monotypic genus (fig. 51).

At the British Museum (Natural History) I examined two specimens labeled "Java, in argan-planten, Goot, 20/4/23, *Sphenophorus* sp.," which are black with some red at the base of the elytra, as in Champion's third variety from Costa Rica.

Two males and one female were dissected.

***Metamasius quadrisignatus* (Gyllenhal)**

Figure 90

Sphenophorus quadrisignatus GYLLENHAL, 1838, p. 907, "*Americes meridionalis insulae*," restricted here to Guadeloupe, Lesser Antilles; type, male, in the Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus tetraspilosus CHEVROLAT, 1880a, p. xxxii, Camp Jacob, Guadeloupe; cotype not found in the museum in Stockholm.

Sphenophorus tetraspilotus: CHEVROLAT, 1880b, p. 315, typographical error for *S. tetraspilosus* Chevrolat, 1880a.

Metamasius quadrispilotus "Chevrolat" CSIKI, 1936, p. 42, error for *tetraspilosus* Chevrolat.

Metamasius quadrisignatus var. *bisignatus* HUSTACHE, 1932, p. 130, Gourbeyre, Guadeloupe; type (?not so labeled), female, in Muséum National d'Histoire Naturelle, Paris, examined.

DIAGNOSIS: Differing from other species from the Lesser Antilles as shown in table 7. Resembling strongly both *dimidiatipennis* and *cinnatus*, but differing from former by having sides of metasternum and mesosternum punctate, but center of prosternum impunctate; from latter by having sides of metasternum and of prosternum punctate; and from both by having apex of aedeagus rounded and broadly bordered, not truncate and narrowly bordered.

RANGE: The islands of Montserrat, Dominica, Martinique, and Guadeloupe in the Lesser Antilles, and (one specimen) the Canal Zone, Panama. (For data on the 38 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 13 to 15 mm. Beak shorter than pronotum, slightly compressed, arcuate; in profile as wide as antennal club; impunctate; basal dilation fairly sharp, longer than wide; scrobe with posterior edge one scape width from eye; (male) in profile wider at base where under side of scrobe is feebly sinuate; inferiorly narrowly sulcate and sides very feebly crenulate, appearing smooth in one male; (female) in profile about same width throughout; not sulcate or crenulate inferiorly. Antennal club, spongy part same length as, or slightly longer than, base. Pronotum, sides subparallel in more than basal half; impunctate except for basal margin which is also margined and grooved at middle, not at sides; base subtruncate, not depressed. Elytra (except for color pattern) and pygidium as described for *cinnatus*, but stria punctures distinct.

Under surface at center impunctate except for apex of abdomen; sides well punctate; prosternum flat between coxae; distance between front coxae wider than antennal club, one-half of diameter of coxae; distance between middle coxae wider than diameter of coxae; ventral depression of male distinct; last segment of abdomen (male) at apex shallowly depressed and with sparse hairs in depression; (female) no hairs or depression. Inner edge of hind tibia (male) with long hairs as long as tibia is wide and of front tibia one-half as long; apices of tibiae angulate, almost toothed in some specimens; femora impunctate, slightly bulbous, emarginate before apex; front tarsus with third

segment wider than antennal club, three or four times wider than second segment; hairs on soles of first two tarsal segments very long. Aedeagus rounded at apex, with wide border.

Color black with two or four large, evenly spaced, red spots on elytra, one specimen with red spot on center of metasternum and on prosternal process.

ECOLOGY: Two specimens from the island of Montserrat were collected by Hubbard in March, 1923, "in crowns *Tillandsia*" (Bromeliaceae), and a male from Ancon, Canal Zone, Panama, was intercepted at quarantine in Laredo, Texas, February 26, 1953, "on Bromeliad." Hustache (1932) reported his variety, *bisignatus*, as having been taken by the collector, Vitrac, in rotting banana plants at Pointe-à-Pitre, Guadeloupe.

REMARKS: The beak is essentially similar in both sexes of this species. In the other species from the Lesser Antilles (*hemipterus*, *liratus*, *maurus*, *cornurostris*), the beak of one sex is quite different from that of the other.

I did not find the cotypes of Chevrolat's *tetraspilosus* in Stockholm, but Hustache, according to a label on one of his specimens of *quadrisignatus* in the museum in Paris, had compared the specimen with "2 types" of *tetraspilosus* in the Chevrolat collection in Stockholm, and he found them similar. I also found no type of Hustache's variety *bisignatus*, but found a female in the Hustache collection in Paris which is probably the type, as it has the two, instead of four, red spots on the elytra and a label, in Hustache's writing, "var. bis. mihi." Of the 33 specimens of *quadrisignatus* examined, only two have two spots, although Hustache (1936, p. 130) had 29 specimens of the two-spotted variety from Camp Jacob, Pointe-à-Pitre, and Gourbeyre, Guadeloupe.

One of each sex was dissected.

***Metamasius cinnamominus* (Perty)**

Figures 10, 84

Calandra cinnamomina PERTY, 1830, p. 82, pl. 16, fig. 13, Brazil; type, female, in Zoologische Staatssammlung, Munich, examined. CHAMPION, 1910, pl. 9, figs. 1, 1a. GÜNTHER, 1941, fig. 9 (aedeagus).

Sphenophorus obsoletus GYLLENHAL, 1838, p. 895, "Cayenne et Brasilia"; type, male, Cayenne, French Guiana, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus spadiceus GYLLENHAL, 1838, p. 906, Cayenne [French Guiana]; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined. New synonymy.

Metamasius cinnamomeus: GEMMINGER AND HAROLD, 1871, p. 2647; error in spelling.

DIAGNOSIS: Distinguishable from other species in male by combination of line of tomentose hairs in deep sulcus under beak, large, hooked, subrostral tooth (fig. 84), sharp angulation of hind tibia at middle of inner edge, long hairs on all legs, and pronotum as wide as base of elytra; female characterized by long, narrow, nearly straight beak with subrostral thickening at base. Both sexes have base of pronotum margined and grooved from side to side, hind third tarsal segment quite narrow, pygidium strongly narrowed to apex, and femora short, bulbous.

RANGE: Honduras in Central America (one specimen); Trinidad and northern South America south to Peru and Bolivia in the west and to eastern Brazil. (For data on the 132 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 14 to 16 mm. Beak compressed, lightly punctate, scrobe with posterior edge one scape width from eye; beak of male shorter than pronotum, in profile wider than antennal club, and slightly widened at apex where peduncle obtusely angled, and at base where large, double, toothlike projection under scrobe curves forward, beak nearly straight to apical third or fourth, thence curved downward; basal dilation not sharp, longer than wide; inferiorly broadly sulcate and with yellow tomentose fringe along middle from tooth to near apex; beak of female as long as pronotum, only one-half of width of that of male, scarcely arcuate, in profile twice as wide in area of scrobe because of angulate or rounded projection (obsolete tooth) present under scrobe; basal dilation in female sharper than that of male, somewhat shorter proportionately; inferiorly not sulcate or hairy; peduncle flat. Antennal club, spongy part shorter than base, about one-third of whole. Pronotum, sides subparallel in more than basal half; finely, sparsely punctate, or impunctate except for sides and for large punctures at middle of base where some specimens have slight longitudinal depression; base furrowed and margined to sides, sub-

truncate. Elytra, striae punctures distinct; intervals and suture finely punctate. Pygidium strongly narrowed, hairs at apex more or less in tufts, hairs at sides; that of female somewhat more narrowed than that of male.

Under surface rather densely punctate throughout, except for legs and mesepisternum; prosternum flat or concave between coxae and with hairs or setae around coxae in some specimens; distance between front coxae narrower than antennal club, about one-third of diameter of coxae (in some specimens more than one-third); distance between middle coxae slightly greater than diameter of coxae; ventral depression of male deeply depressed; last segment of abdomen with transverse brush of stiff hairs at extreme tip, apex (male) rounded, (female) narrowly acuminate. Hind tibia of male with inner edge at middle angulate (fig. 10), angle half hidden in long fringe of hairs as long as about one-half of width of tibia, and tufted at middle and apex; other tibiae and middle and front femora (male) with long hairs almost as long as tibiae are wide; femora lightly punctate, extremely stout and bulbous; front tarsus with third segment narrower than club, about twice wider than apex of second segment; hind tarsus with second segment as wide as long. Aedeagus rounded-truncate at apex, with large apical border, lateral margins at base obsolete, not sclerotized.

Color, head and beak red or dark red, black in a few specimens; pronotum black, or usually red with five black areas (at middle, sides of front, sides of base); elytra red with large black spots around scutellum, on shoulders, at center (where often merged), at apex and sides of apex; color in most individuals dull, and black and red areas ill defined, blurred; below, black and red on sides and center, femora and tibiae mostly red with black apices, or legs and venter entirely black or piceous.

ECOLOGY: In Santa Cruz, Bolivia, two specimens were collected in a Motacu palm, and two in sugarcane by D. Candia. Some individuals from the island of Trinidad were found on coconut palm. A male in the British Museum (Natural History) from Bartica Triangle, British Guiana, has a label that reads "*Ex Astrocaryum tucuma*," a Brazilian palm. Lepesme and his co-authors (1947,

p. 619) wrote that it occurs on *Cocos* in South America.

REMARKS: This species is about as widespread geographically as *dimidiatipennis* and occurs in some of the same localities in the Guianas, Peru, and Brazil. In contrast to that species, it has not been broken up into subspecies, probably because the color is so dull that the pattern and its slight variations do not catch the eye. The type is a small female which either has become bleached with time or is a teneral specimen, being pale yellowish buff, with darker pronotal markings.

In addition to the characters given above, the aedeagus of this species is somewhat different from that of most others of the group, being much thicker, more curved, and with the margins near the base obsolete; the lateral margins are obsolete also on the aedeagus of *liratus*, *maurus*, and *cornurostris*. Males of these three species, which are restricted to the Lesser Antilles, have the same type of subrostral tooth as males of *cinnamominus*, but it is not curved forward; *liratus* and *maurus* have also the same angulation on the hind tibia as that of *cinnamominus*.

Two males and one female were dissected.

The subtruncate, strongly grooved base of the pronotum and the narrow third tarsal segment are present in a number of the species of the *hebetatus* subgroup, but those species have the tarsi entirely hairy and the apodemes of the male genitalia attached differently. The hairs on the prosternum, when present, are not so distinct as those in the species of the *hemipterus* subgroup.

Gyllenhal's *obsoletus* was synonymized in 1871 by Gemminger and Harold, and both Champion (1910) and Günther (1941) kept it in synonymy. I have examined the type and also the entirely black type of Gyllenhal's *spadiceus* and find them both to be synonyms of *cinnamominus*.

***Metamasius liratus* (Gyllenhal)**

Figures 10, 61, 87

Sphenophorus liratus GYLLENHAL, 1838, p. 914, island of Guadeloupe; type, female, in Naturhistoriska Riksmuseet, Stockholm, examined.

DIAGNOSIS: Resembling *cinnamominus* in two characters of male (subrostral tooth at base of beak and angulation within hind tibia), but beak longer in *liratus* and tooth

farther back, and antennal club more elongate, with longer spongy area. Scarcely distinguishable from *maurus* (see table 7 for comparison).

RANGE: The islands of Guadeloupe, Dominica, and Martinique in the Lesser Antilles. (For data on the 45 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 14 mm. Beak as long as pronotum, compressed; basal dilation sharp, distinctly longer than wide; (male) distinctly punctate, curved strongly downward in apical half or third, sides near apex slightly creased; in profile as wide as antennal club; peduncle obtusely angulate; base with large, triangular double tooth (fig. 87) directed backward behind insertion of antennae; inferiorly broadly sulcate, sides slightly crenulate (but not visible in profile); scrobe with posterior edge almost two widths of scape from eye; (female) less punctate, evenly arcuate, in profile narrower than antennal club, except for base where under side of scrobe slightly thickened with obsolete tooth; scrobe with posterior edge one scape width from eye; peduncle rounded or flat; inferiorly smooth. Antennal club elongate, spongy part appearing longer than base. Pronotum, sides subparallel in more than basal half, virtually impunctate except for sides, apical constriction, and middle of base where double row of punctures; no basal depression; base slightly sinuate at middle, margined and grooved to sides. Elytra, striae punctures distinct, breaking somewhat into sides of intervals; intervals with one or two rows of minute punctures, shiny black overlay stripes becoming attenuated from middle to apex of elytra. Pygidium with apical hairs more or less in tufts, hairs also at center; pygidium of female narrower than that of male.

Under surface densely punctate except for virtually impunctate mesepisternum and legs; prosternum between coxae slightly concave; distance between front coxae narrower than antennal club, but twice as wide as an antennal funicle, and about one-third to one-half of diameter of coxae; distance between middle coxae equal to or greater than diameter of coxae; (male) ventral depression shallow, hairy; last segment of abdomen (male) truncate, flattened, and narrowly tomentose

at apex; (female) convex, at apex narrowly rounded, minutely tomentose. Tibiae as described for *cinnamominus* (fig. 10); femora virtually impunctate, slightly bulbous, hind femur at widest part narrower than combined length of third and fourth abdominal segments; front tarsus with third segment as wide as antennal club, three times wider than second segment. Aedeagus pointed at apex, lateral margins at base not sclerotized.

Color black, apex of beak in some specimens dull reddish.

ECOLOGY: A specimen from Trois Rivières, Guadeloupe, in the museum in Paris has a notation on the label (perhaps by the collector, Dufau, or by Hustache) that it is common on "balisiers" (*Canna indica*) but is rarely found in banana plants. Nevertheless I collected a series of five specimens at Matouba, Guadeloupe, in rain-soaked trunks of banana on the ground; *Metamasius h. hemipterus* was far more abundant in these same plants. Specimens from Guadeloupe reported by Hustache (1932, p. 126) came from a dead balisier and from rotting wood near a waterfall. Coquerel (1849) described and illustrated the supposed larva of *liratus* from the island of Martinique, but he probably had *maurus*, not *liratus* (see that species).

REMARKS: Although this species was correctly regarded by Günther (1941, p. 53) as belonging in the genus *Metamasius*, it appears under the name *Calendra* (which is now *Sphenophorus*) in the check list by Blackwelder (1947, p. 915). Probably Günther's paper was not received by Blackwelder because of the war, as many of Günther's species are also lacking from the catalogue. Neither Csiki (1936, p. 58) nor Hustache (1932, p. 126) considered *liratus* as belonging to *Metamasius*, but I agree with Günther that it does. A number of additional names have remained in the check lists or catalogues under the genus *Sphenophorus*, which belong properly with *Metamasius*: *fossor* Gyllenhal (a synonym of *maurus* Gyllenhal), *maurus*, *spadiceus* Gyllenhal (a synonym of *cinnamominus* Perty), and *tetraspilatus* Chevrolat (a synonym of *quadrisignatus* Gyllenhal). These species, except for *cinnamominus*, occur in the Lesser Antilles and as such were not included by Champion (1910) in his review of *Metamasius*. Although the front coxae

in these species are rather closer together than are those of some species of *Metamasius*, they are considerably wider apart than are those of the species of *Sphenophorus* that I know.

A male and a female were dissected. The aedeagus is acuminate, as in *maurus* and *yunquensis*, but it lacks the heavily sclerotized apex and broad border of *yunquensis*.

***Metamasius maurus* (Gyllenhal)**

Figures 10, 16, 26, 86

Sphenophorus maurus GYLLENHAL, 1838, p. 912, Martinique; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus fossor GYLLENHAL, 1838, p. 909, St. Vincent; type in Naturhistoriska Riksmuseum, Stockholm. New synonymy.

DIAGNOSIS: Very similar to *liratus*, differing principally by having exceedingly bulbous hind femur (fig. 16), subrostral tooth directly under scrobes, not pointing backward, and

elytral intervals entirely flat, without extra stripes. (See table 7 for comparison with other species from the Antilles.)

RANGE: Lesser Antilles (St. Croix, Dominica, Martinique, and St. Vincent). (For the 33 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 9.5 to 14 mm. Beak as described for *liratus*, but that of male shorter than pronotum, more evenly curved, subrostral tooth directly under scrobes (fig. 86), and beak of female less arcuate than that of male or than that of female of *liratus*; as long as pronotum; both sexes with posterior edge of scrobe one scape width from eye. Antennal club and pronotum as described for *liratus*, except for some specimens that have disc of pronotum punctate (as in type). Elytra, stria punctures distinct, breaking into intervals in some specimens; intervals with single row of punctures, flat, no overlaid

TABLE 7

SOME SPECIFIC CHARACTERS OF *Metamasius* (SUBGROUP *fasciatus*) FROM THE LESSER ANTILLES^a

	<i>maurus</i>	<i>liratus</i>	<i>quadrisignatus</i>	<i>cornurostris</i>
Range	St. Vincent, Martinique, Dominica, St. Croix	Martinique, Dominica, Guadeloupe	Martinique, Dominica, Guadeloupe, Montserrat	Guadeloupe
Hind femur	Very bulbous (fig. 16)	Scarcely bulbous	Scarcely bulbous	Bulbous
Pronotum	Disc punctate in six specimens, but same as <i>liratus</i> in four	Punctate on sides and middle of base	Impunctate	Densely punctate
Venter	Punctate throughout	Punctate throughout	Punctate at apex	Punctate throughout
Apex of aedeagus	Pointed (fig. 26)	Pointed	Rounded	Truncate
Beak of male	Subrostral teeth directly under scrobes (fig. 86)	Subrostral teeth directed behind scrobes (fig. 87)	No subrostral teeth (fig. 90)	Subrostral teeth directed slightly in front of scrobes (fig. 85)
Beak of female	Slight subrostral teeth	Slight subrostral teeth	No subrostral teeth	Short subrostral teeth
Metasternum	Normal length	Normal length	Normal length	Very short ^b
Hind tibia, male	Finely punctate; hairy, angulate (fig. 10)	Finely punctate; hairy, angulate (fig. 10)	Finely punctate; hairy, not angulate	Coarsely punctate; not hairy, not angulate

^a The well-known *hemipterus* (subgroup *hemipterus*) occurs also throughout the Antilles; see the diagnosis of that species.

^b The metasternum between the middle and hind coxae is only about one and one-fourth times the diameter of a middle coxa.

stripes. Pygidium as described for *liratus*.

Under surface as described for *liratus*, but prosternum flat. Tibiae as described for *liratus* and *cinnamominus*; femora virtually impunctate, more bulbous than those of *liratus*, especially hind femur, which at widest part equals combined length of third and fourth abdominal segments; front tarsus as described for *liratus*. Aedeagus pointed sharply at apex, lateral margins at base not sclerotized.

Color black with legs or beak dull reddish in some specimens, or black with faint red on sides of pronotum and two incomplete red bands across elytra (St. Vincent).

ECOLOGY: Three specimens from St. Pierre, Martinique, were taken from the rotting trunks of banana plants in 1901. Possibly the account by Coquerel in 1849 of the larvae and habits of "*Sphenophorus liratus*" refers instead to *maurus*, as a specimen in the museum in Paris has a label in Hustache's writing saying that it is *liratus* but "nec Coq." Coquerel found many larvae and cocoons in rotten banana trunks on the ground near the Pitons (peaks) on the island of Martinique. He searched for, but never found, larvae in healthy trunks, and suggested that these weevils could be considered useful instead of noxious because they hastened the decomposition of old trunks. He described and illustrated the larvae and pupal case, which are similar to those of *hemipterus* and other calandrine weevils.

REMARKS: It is interesting that two species of the *hemipterus* subgroup (*bisbignatus* and *ensirostris*) are, like *liratus* and *maurus*, scarcely separable morphologically except for the more bulbous hind femur of one of the species.

Although I have not seen the type of *fossor* Gyllenhal from St. Vincent, I have seen a specimen compared with the type by Champion, and two additional specimens from that island in the United States National Museum; all three specimens have red on the elytra. A note in the box of the Fleutiaux collection in the museum in Paris gives some particulars of the type of *fossor* that were communicated by the museum in Stockholm to the writer of the note (Fleutiaux?). The size is given as 9.5 mm.; the pronotum is said to be punctate strongly

in front of the scutellum and very lightly on the rest of its surface; the elytra are strongly striate, the striae densely punctate, the intervals convex, finely punctate with a single longitudinal row in the middle; a sentence on the antennae and tarsi is not legible, but finally the elytra are said to be furnished each with two red spots. This notation agrees quite well with the specimen identified by Champion as *fossor*, and this specimen, which I have examined, does not differ specifically, in my opinion, from other specimens of *maurus*. Possibly *Sphenophorus atricolor* Chevrolat (Martinique) is also synonymous with *maurus* (but see *Incertae Sedis*, below).

The type of *maurus* has the pronotum punctate, except for the center line. The wing, dissected from a specimen in the American Museum of Natural History, from the island of Dominica, is fully formed and long. One male was dissected. Although *maurus* has not been reported from Guadeloupe, it occurs on Martinique and Dominica together with *liratus*. F. Gates Clarke collected both species from the same locality in Dominica (Castle Bruce) on March 20, 1956.

***Metamasius cornurostris* (Chevrolat)**

Figure 85

Odontorhynchus cornurostris CHEVROLAT, 1880b, p. 316, Guadeloupe; type, male, in Naturhistoriska Riksmuseet, Stockholm, examined.

Odontorhynchus puncticollis CHEVROLAT, 1880b, p. 316, Guadeloupe; type, male, in Naturhistoriska Riksmuseet, Stockholm, examined.

DIAGNOSIS: Very similar to *liratus*, *maurus*, and *cinnamominus*, but differing from them by having very reduced wings, therefore very short metasternum and obsolete humeri. Eyes very narrowly separated above, as in *mosieri* and *quadrilineatus*. (See table 7 for comparison with other species from the Antilles.)

RANGE: The island of Guadeloupe. (For data on the 23 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 14 mm. Inner wings reduced. Frons between eyes narrower than one-half of width of beak at base. Beak shorter than pronotum, compressed, gently arcuate, at base strongly punctate, less strongly on remainder of beak; basal dilation

sharp, longer than wide; scrobe with posterior edge about one and one-half of scape width from eye; peduncle flat; (male) in profile wider than antennal club, twice wider at base where large, triangular tooth slightly in front of scrobe (fig. 85); inferiorly apparently not sulcate or crenulate; beak of female, sides near apex slightly creased; in profile narrower than antennal club, only one-half of width of beak of male, basal tooth triangular, but much smaller than that of male; inferiorly smooth. Antennal club elongate, spongy part equal to or longer than basal part. Pronotum, sides subparallel in more than basal half or in basal half; entirely punctate, except for impunctate longitudinal space at middle; no basal depression; base subtruncate, margin obscured by many punctures. Elytra (male) narrower than pronotum; (female) of same width as pronotum; strial punctures distinct, widely separated by impressed line, and breaking one-third or one-half of distance into intervals in some specimens; intervals with one or two rows of dense punctures that are usually tomentose within. Pygidium tomentose, truncate, in female narrower than in male.

Under surface densely, coarsely punctate except for impunctate metepisternum, many punctures larger than those on pronotum; metasternum very short because of reduced wings, only one and one-half times longer than diameter of middle coxae; prosternum flat between coxae; distance between front coxae equal to width of antennal club, one-third or one-half of width of coxae; distance between middle coxae equal to diameter of coxae; male with shallow ventral depression; last segment of abdomen truncate; (male) slight oval depression and short hairs in apical third; (female) no depression, but hairs across extreme apex. Tibiae with very short hairs on inner side; surface almost entirely coarsely punctate and tomentose, with only narrow smooth space; femora distinctly punctate, bulbous, middle femur extending well beyond hind coxae; front tarsus with third segment as wide as antennal club, about three or four times wider than second. Aedeagus truncate at apex; lateral margins at base not sclerotized.

Color black.

ECOLOGY: None reported.

REMARKS: I see no reason for placing this species in a separate genus. The large subrostral tooth of the male, on which Chevrolat evidently based his generic name *Odontorhynchus* is present also in *cinnamominus*, *liratus*, and *maurus*, and smaller teeth occur in other species of *Metamasius* (*dasyurus*, *submaculatus*). Hustache (1932, p. 127), having seen Chevrolat's types, synonymized *puncticollis* with *cornurostirs*, but he regarded the species as belonging in *Sphenophorus*.

This species has been mentioned rarely in the literature, and no previous mention has been made of the vestigial inner wings. These, which I dissected on one specimen, are only about one-half of the length of the elytra, and about the same length as, but much narrower than, the epimeron of the metasternum. Two other species (*fahraei*, *foveolatus*) have reduced wings, but they are at least as long as the elytra. Fully winged species have wings as long as the pronotum and elytra combined. The characters that cause *cornurostirs* to appear different from other species are those that usually accompany the loss or partial loss of inner wings in beetles. Thus the humeri and the subapical calluses of the elytra are obsolete, not tumid; the elytra are proportionately shorter and narrower (in males narrower than the pronotum); and the metasternum and epimeron of the mesosternum are short. The sides of the elytra, as also in the fully winged *liratus* and *maurus* from the Lesser Antilles, are subparallel for most of their length. These two species and *cinnamominus* (Trinidad and South America) agree with *cornurostis* in the male sex by having a large tooth under the beak, but they differ by having an angle on the inner edge of the hind tibia.

The type of *cornurostis* lacks the abdomen and a great part of the antennae.

One male and one female were dissected.

When Marshall (1943) changed *Odontorhynchus* to *Odontomycter* because the former name was preoccupied by a genus of birds, he spelled it "*Odontorrhynchus*" with two "r's" although Chevrolat used but one "r."

Metamasius mosieri Barber

Figure 58

Metamasius mosieri BARBER, 1920, p. 151, pl. 8,

Paradise Key, Florida; type, female, Royal Palm Park [Paradise Key], in the United States National Museum, examined.

DIAGNOSIS: Characterized by small size (less than 9 mm.); stocky form; narrowly separated eyes; short, stout, cylindrical beak; elytral pattern half red, half black; rather convex metasternum; wide second segment of hind tarsus; nearly quadrate pronotum; very widely spaced front coxae; sexes very similar. (See table 5 for comparison with other species from the Greater Antilles.)

RANGE: Cuba, the Dominican Republic, and extreme southern Florida in Collier County on the west coast, and in Dade County at latitude 25° 24' N., longitude 80° 38' W., 37 miles directly southwest of Miami in the Everglades. (For data on the six specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 6.5 to 9 mm. Frons between eyes narrower than one-half of width of beak at base. Beak shorter than pronotum, virtually cylindrical, slightly arcuate, stout, in profile wider than antennal club and scarcely wider at base than at apex; basal dilation feeble, scarcely longer than wide; inferiorly not toothed or sulcate; scrobe with posterior edge opening on to eye; (male) distinctly punctate; (female) virtually impunctate. Antennal club not elongate, in profile more or less circular (fig. 58), spongy part somewhat shorter than base. Pronotum scarcely longer than wide, sides subparallel in basal half; punctures, if visible, widely spaced, fine; base not depressed, base margined and grooved at center only, where also feebly sinuate in front of retracted scutellum. Elytra, base sinuate because second and third intervals slightly advanced toward pronotum (but not sinuate in type); striae punctures small, distinct; intervals impunctate. Pygidium rather flat, no hairs visible, apical margin thickened; (male) much broader and more truncate; (female) narrower.

Under surface well punctate on sides of prosternum and sides and apex of abdomen, remainder lightly punctate or impunctate; prosternum slightly convex in front of coxae or (in two specimens) transversely tumid; metasternum vaguely convex; coxae without hairs on inner face; distance between front coxae distinctly wider than antennal club,

from one-third (paratype) to one-half (type) or more than one-half of diameter of coxae; distance between middle coxae equal to diameter of coxae; venter of male slightly depressed; last segment of abdomen without hairs; (male) rounded; (female) somewhat acuminate. Tibiae in some specimens appearing slightly curved because of rounded apical angle, but angle almost acute in type and paratype; femora lightly punctate or virtually impunctate, very bulbous; front tarsus with third segment slightly narrower than, or equal to, width of antennal club, two and one-half times wider than second segment; hind tarsus with second segment nearly as wide as long and only one-half of length of first. Aedeagus truncate, or with blunt, tiny projection at middle of apex.

Color, head and beak black; pronotum black, or red with black borders, or (type) red with transverse, sinuous, black basal area, or (paratype) red; elytra red basally, black apically, or (type and one paratype) as stated, but with black spot on each elytron at edge of black; under surface and legs black (Dominican Republic), or (type) black with red on metasternum and metepisternum, or (paratype) black with red on metasternum and sides of pronotum.

ECOLOGY: Of the specimens collected by Barber and C. A. Mosier, in Florida, according to Barber (1920, p. 152), one was beaten from a fern growth near the crown of a cabbage palmetto, and one was found high in an oak tree. Barber wrote, "The multitude of Orchids, Bromeliads, and other epiphytic plants on the branches of the hammock trees offers a difficult problem in the determination of the breeding habits of this beautiful little species, and all our attempts were futile with the possible exception that the old dead basal core of one of the large Bromeliads (probably *Tillandsia utriculata*) was found displaying such exit hole and larval gallery as should be expected for this species, but no fragments of larval skin could be found." Paradise Key, the type locality, is an island in the Everglades; according to Safford (1917) it is subtropical jungle and in striking contrast to the keys along the coast.

REMARKS: Although described from the United States, *mosieri* is probably a native of the West Indies. Barber (1920, p. 150) said

that "the most interesting part of the beetle fauna of the Everglade Keys and the Outer Keys [Florida] is identical with that of the West Indies." At any rate there are no other species of *Metamasius* described from the eastern United States. This small, stout species might be considered in a subgroup of its own (as are *scutiger* and *rugipectus*) because it does not fully agree with the species of its present subgroup. It has the pronotum scarcely longer than wide, the front and middle coxae without hairs on the inner face, and the eyes extremely close together across the frons (the latter character is shared by *cornurostris*). Superficially, except for the bright red color, it resembles some of the smaller, "chunky" species of *Sphenophorus* from the United States, but differs from them principally by having the front coxae very widely separated, not contiguous, and the third tarsal segments dilated, not narrow, and mostly hairy below. In size and color, it is also reminiscent of the well-known *Rhodobaenus tredecimpunctatus* Illiger. Barber (1920, p. 151) did not compare his species with any others directly, but said that "among its congeners in the National Collection the present species is remarkable for its small size, brilliant color, and absence of any external sexual character usual in the genus." The only species smaller than *mosieri* is *scutiger* Champion (6 mm.), from Panama, which is also red and black, but of a different general shape, more fusiform, with a narrow, nearly straight beak, narrower hind femora, and the tarsal soles entirely hairy.

The only other species with the apex of the aedeagus "knobbed" medially is *benoisti* (*hemipterus* subgroup), a quite different species.

One female and both males were dissected.

***Metamasius sulcirostris* Champion**

Figures 28, 88

Metamasius sulcirostris CHAMPION, 1910, p. 110, type locality not designated; lectotype, male, "Guatemala," here designated from two original specimens from Nicaragua and Guatemala, in the British Museum (Natural History), examined.

DIAGNOSIS: Differing (male only) from other species of subgroup except for *scutellatus* by having following combination of characters: basal dilation of beak coarsely

punctate, flattened on top, with deep, broad, central, impressed line; basal depression of pronotum distinct, base of pronotum sinuate or lobed at middle; sides of elytra strongly tapering to apex; femora gradually widened, not bulbous. Differing from *scutellatus* by having base of elytral intervals straight, all intervals of about equal width at base, and no long tibial hairs. Female not recognized.

RANGE: Central America (Guatemala, Nicaragua, Panama), and possibly Ecuador. (For data on the four specimens examined, see Appendix.)

DESCRIPTION OF MALES: (See also characters of subgroup). Length, 13 mm. Frons between eyes wider than one-half of width of beak at base. Beak shorter than pronotum, arcuate, cylindrical (fig. 88), stout; in profile distinctly wider than antennal club, and at base slightly wider than remainder of beak because of slight sinuation on lower edge of scrobe; densely punctate at base, virtually impunctate in apical half; basal dilation sharp, longer than wide, flattened and coarsely punctate, deeply impressed medially; inferiorly broadly sulcate; scrobe with posterior edge about one scape width from eye. Antennal club in profile rather round, spongy part shorter than base. Pronotum, sides subparallel in basal half; sparsely, finely punctate; depressed at center of base; base distinctly sinuate or lobed at middle, margined and grooved to sides. Elytra, sides tapering strongly to apex, striae punctures tiny but distinct, regularly spaced; intervals impunctate. Pygidium tomentose, with short hairs apically and medially, rounded-truncate.

Under surface, including legs, strongly punctate, except for virtually impunctate center of metasternum and of mesosternum; prosternum slightly depressed between coxae and with tumid swellings in front of each coxa; distance between front coxae slightly narrower than third tarsal segment or antennal club, about one-third or one-half of diameter of coxae; distance between middle coxae about equal to diameter of coxae; male ventral depression shallow and feebly hairy; last segment of abdomen rounded-truncate, sparsely hairy near apex. Hind tibia very slightly curved; femora coarsely punctate, gradually widened, not bulbous; middle

femur extending to front of hind coxa, but not overlapping it; femora and tibiae with short hairs within, tibiae with tomentose lines of punctures; front tarsus with third segment narrower than antennal club, nearly three times wider than second segment. Aedeagus slightly emarginate and deflexed at apex (fig. 28).

Color, head and beak black, beak with reddish tip; pronotum opaque gray with two oblique red stripes and two short, V-shaped basal red stripes (not entirely visible unless wet); elytra appearing gray, but, when wet, revealing red, lineolate, short stripes on fourth interval at base and on suture, first and second intervals at or near apex; legs and under side black.

ECOLOGY: None reported.

REMARKS: In this species and in *scutellatus*, which follows, the frons appears somewhat wider than one-half of the width of the beak at its base, as in species of the *sierrakowskyi* subgroup. Neither species agrees very well with the majority of their subgroup.

Champion, when he described *sulcirostris*, noticed the faint red marks on the pronotum and surmised that more rufescently marked forms might occur; actually both his specimens, when wet with a brush, reveal red marks.

A fourth male (Rio Jatun Yacu, Ecuador), which may be the present species, differs from the two syntypes in a number of ways: by having the sulcus under the beak very narrow and the basal angulation absent; the antennal club elongate; the pronotum narrower, less bulky, with a tumidity on the disc in front of the basal impression; the striae punctures of the elytra larger, as well as the punctures on the under side, the latter entirely punctate; the front coxae closer together, separated by about one-third of their diameter; the middle coxae separated by less than the diameter of a coxa; the mesosternal process and the front of the metasternum slightly tumid; the hind tibia straight; the third segment of the hind tarsus as wide as the antennal club; and the aedeagus truncate, not emarginate or deflexed. In color, the pronotum is the same, but the elytra are red, except for a round black spot on each elytron on the humerus, on the center of the disc, and on the subapical callus; there are

black lineolate marks at the apex of the suture and of the first interval; the femora are red basally, black apically, the tibiae red medially, black at both ends; the prosternum is reddish on the sides, and there is a red spot on the metasternum and on the epimeron of the metasternum.

Whether this specimen is conspecific with the *sulcirostris* of Champion depends on how much of the differences given are due to individual variation or geographical variation. It is also similar to *semirubripes* Hustache (Chanchamayo, Peru), known from one female, and to a female illustrated by Günther (1941, p. 30, fig. 3) from Pacayacu, Ecuador, the same region as Jatun Yacu. Perhaps examination of adequate material will solve the question.

Metamasius scutellatus Hustache

Figure 98

Metamasius scutellatus HUSTACHE, 1936, p. 101, Nouveau Chantier, French Guiana; type, male, in Muséum National d'Histoire Naturelle, Paris, examined.

Cactophagus hustachei GÜNTHER, 1941, p. 31, Cayenne, [French Guiana]; type, male, not found in museum in Dresden.

DIAGNOSIS: Differing from other species

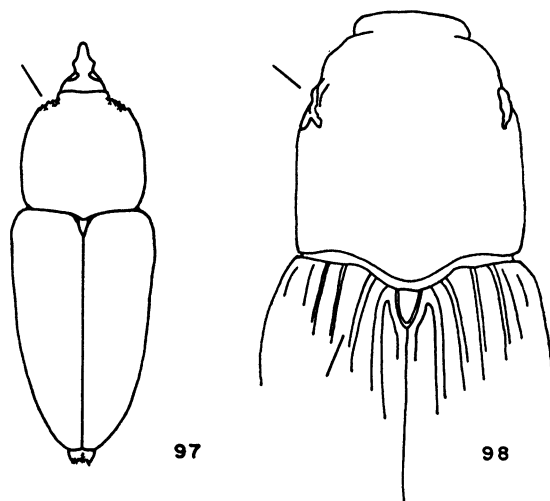


FIG. 97. *Metamasius bruneri*, male (after Buchanan, 1941).

FIG. 98. Pronotum and base of elytra of *M. scutellatus*, showing lateral erosion of pronotum of male, and wide third interval of elytra.

of subgroup by having third interval of elytra distinctly widened at base, and projected forward onto base of pronotum, second and third intervals rather incurved toward scutellum; males apparently unique in having sides of pronotum in front of middle tumid, eroded, and somewhat jagged (fig. 98). Differing further from *sulcirostris* as stated in the description of that species.

RANGE: French Guiana, Ecuador, Bolivia, and (doubtfully) Nicaragua. (For data on the nine specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 11 to 13 mm. Frons and beak as described for *sulcirostris*, but beak without any basal angulation under scrobe, impressed line on basal dilation narrower, beak inferiorly narrowly, not broadly, sulcate, and female with three-fourths of beak virtually impunctate. Antennal club somewhat elongate, spongy part slightly shorter than base. Pronotum, sides parallel in more than basal half, finely, sparsely punctate; base depressed at middle, basal margin strong, grooved to sides, distinctly sinuate or lobed at middle; (male) tumidity or ledge or flattish tubercle present on each side where side margin converges to apex. Elytra, sides strongly tapering to apex, basal line bisinuate, sinuation occurring on each elytron at base of third interval which is wider than base of other intervals and causes second interval to bend inward toward scutellum. Scutellum (type) rather U-shaped, probably owing to heavy tomentosity obscuring true shape, one specimen having two basal pits or impressions. Pygidium tomentose, with two apical tufts of short hairs and subapical hairy tubercle.

Under surface, including legs, strongly punctate, but less strongly in some specimens at middle of metasternum; prosternum with slight tubercle in male from Ecuador and female from Bolivia (in type, tubercle was piece of extraneous material); distance between front coxae narrower than antennal club or front third tarsal segment, about one-third or one-fourth of diameter of coxae (in male from Cayenne only slightly wider than antennal funicle); distance between middle coxae about equal to diameter of coxae; ventral depression of male shallow, scarcely hairy; last segment of abdomen truncate; (male) with apical depression and long, sparse

hairs within and behind depression; (female) no depression, short hairs transversely at extreme apex. Hind tibia (male) at center with tuft of long hairs as long as tibia is wide; (female) all tibiae slightly curved; in both sexes tibiae appearing carinate because of alternating tomentose lines and smooth area; femora densely, coarsely punctate, gradually widened, not bulbous; middle femur extending almost to hind trochanter; front tarsus with third segment narrower than antennal club, apex about three times wider than that of second segment. Aedeagus slightly emarginate at apex.

Color, head and beak red; pronotum red or orange with five black marks (median stripe, two basal short stripes, two lateral marks near apex); scutellum covered with yellow tomentosity; elytra red or orange with black lineolate stripes at middle on second and third intervals or on both, at apex on suture and first interval, or on first interval only, on subapical calluses and on sides near base and apex (in one specimen on first interval at base); under side black with some indeterminate red areas; legs indistinctly red and black.

ECOLOGY: None reported.

REMARKS: Günther (1941), in describing the male of *hustachei*, mentioned the lateral tumidity of the pronotum (fig. 98), but he evidently did not know that *scutellatus* Hustache also had this tumidity in the male. Hustache (1936) unfortunately did not mention the tumidity although it is present on his type specimen, which I have examined. Kuschel (1955, p. 281) synonymized these two forms.

This species resembles in appearance species of group III—the *Cactophagus*-like species (and Günther considered it in *Cactophagus*)—because of the wide pronotum with its distinct basal depression and bisinuate basal margin, and its rather closely placed front coxae. Other characters, however, including the aedeagus and the tibial tufts of the male, agree with those of species of the present subgroup. The striped orange and black, lineolate elytral pattern resembles that of *Metamasius inaequalis*, *melancholicus*, *quadrilineatus*, and *venezolensis*. The latter species, described as *Cactophagus*, differs from *scutellatus* by having the

tarsal soles entirely hairy and the aedeagus without a lateral line.

One male was dissected.

An old specimen in the Chevrolat collection, Stockholm, is labeled "Nicaragua," but possibly in error.

SUBGROUP *rugipectus*

***Metamasius rugipectus* (Champion)**

Figures 9, 13, 58

Metamasiopsis rugipectus CHAMPION, 1910, p. 101, pl. 5, figs. 5, 5a, 5b, Cerro de Palmas [Veracruz], Mexico; type, female, "Cerro de Plumas," in the British Museum (Natural History), examined.

DIAGNOSIS: Differing from other species by following combination of characters: two tiny teeth at outer apex of middle and hind tibiae (fig. 9), pronotum nearly as long as elytra, beak only one-half of length of pronotum, scutellum very narrow, males and females virtually similar externally. Elytral pattern and beak similar to those of *flavopictus* (*fasciatus* subgroup), but that species has only one tibial tooth, proportionately longer elytra, longer beak, wider scutellum, and more widely spaced coxae.

RANGE: Mexico in the south, Costa Rica, and Panama. (For data on the five specimens examined, see Appendix.)

DESCRIPTION: Length, 12 to 13 mm. Frons between eyes narrower than one-half of beak at base. Beak about one-half of length of pronotum, cylindrical, stout; in profile wider than antennal club, nearly straight on upper edge, but arcuate on lower edge, feebly punctate; basal dilation fairly sharp, longer than wide; beak in profile and dorsally wider at base and apex than at middle; peduncle sinuate and angulate; beak inferiorly sulcate in two specimens, not toothed at base; scrobe with posterior edge opening directly onto eye. Antennal club dilated, somewhat circular (fig. 58), truncate, its spongy part less than one-half of whole. Pronotum distinctly longer than wide, sides virtually subparallel, surface rather convex, minutely, sparsely punctate, more coarsely at base in some specimens; basal depression lacking; base subtruncate, at middle third margined, but not grooved. Elytra scarcely longer than pronotum; base not strongly margined; striae punctures distinct, deep, regularly placed; intervals impunctate, straight at base. Scutellum extremely narrowly triangular, in some specimens hollowed in front, or (type) with line of punctures, or (one specimen) with longitudinal depression. Pygidium coarsely punctate, (male) broadly rounded, no hairs (worn?), (female) narrowly rounded, with short apical hairs and hairs on central ridge. Under surface, prosternum and sides of abdomen well punctate, mesosternal and metasternal regions sparsely, finely punctate, or impunctate; prosternum flat between coxae; center of prosternum (in type and in two of three females) punctate very densely and punctures and spaces filled with brown tomentosity or setae; distance between front coxae narrower than antennal club or third tarsal segment, but wider than antennal funicle (in two specimens scarcely wider), about one-fourth or less of diameter of coxae; distance between middle coxae slightly less than diameter of coxae; coxae apparently without hairs on inner face; ventral depression of male distinct; last abdominal segment more or less rounded-truncate, (male) apical depression with short hairs within, (female) not depressed or hairy. Middle and hind tibiae straight, outer apical angles with two minute teeth, front tibia with additional tooth on outer edge near apical one (fig. 13); femora finely punctate, strongly bulbous, emarginate before apex, short, middle ones not at all reaching base of metasternum, hind ones not reaching apex of abdomen; front tarsus with third segment narrower than antennal club, more than twice width of second segment; second segment more than one-half of length of first; third tarsal segment with short glabrous space at middle base, appearing symmetrical; claw segment inserted nearer to base than to apex of third segment. Aedeagus with apodemes forked and attached by membrane, aedeagus at apex truncate and deflexed.

Color black, but apex of beak reddish in two specimens, pygidium red in three, and elytra with yellow or red, lineolate, short marks as follows: in two incomplete subtransverse bands in front of and behind middle on intervals from two to eight or any part thereof, subapical band usually narrower, and present on three intervals only.

Color black, but apex of beak reddish in two specimens, pygidium red in three, and elytra with yellow or red, lineolate, short marks as follows: in two incomplete subtransverse bands in front of and behind middle on intervals from two to eight or any part thereof, subapical band usually narrower, and present on three intervals only.

Color black, but apex of beak reddish in two specimens, pygidium red in three, and elytra with yellow or red, lineolate, short marks as follows: in two incomplete subtransverse bands in front of and behind middle on intervals from two to eight or any part thereof, subapical band usually narrower, and present on three intervals only.

ECOLOGY: In the United States National Museum there is a specimen that was intercepted at Laredo, Texas, in July, on a bromeliad coming from Mexico, and one at Brownsville, Texas, "in base Bromeliad stem," coming from Costa Rica; two specimens are marked "on *Tillandsia*," also an epiphyte, one in January, 1952, from Mexico, and one in April, 1950, from Taboga Island, Panama.

REMARKS: This species is the type of the genus *Metamasiopsis* Champion, which I have synonymized with *Metamasius*. Champion included *flavopictus* also in his new genus, but that species (and also *cinnatus*) have only one apical tooth on the middle and hind tibiae, not two teeth as in *rugipectus*. In profile, only one tooth is visible in any case, and Champion mentioned and figured only one. One of the two species of the *transatlanticus* subgroup also has two teeth, and Heller (1912) considered these as *Metamasiopsis*, but they differ in other characters (the basal margin of the pronotum obsolete, the front coxae very widely separated, the third tarsal segments entirely hairy below, the femora toothed in males, the aedeagus without a lateral line). Double apical teeth are present also in the two species of the genus *Scyphophorus* Schoenherr which differ distinctly from *Metamasius* in the antennal club and tarsal soles. The single species of the genus *Paradiaphorus* (*crenatus*) has one apical tooth. Thus the armature of the tibiae probably represents convergence and is not, in my opinion, sufficient basis for a genus, and *rugipectus* does not differ from other species of *Metamasius* in any significant way.

The rough appearance of the chest, described by Champion as "prosternum transversely rugose and set with minute hair-like scales" is present in the type and in two other females (Mexico, Panama), but is absent from a female from Costa Rica and a male from Mexico. The individuals without the scaly-tomentose effect have dense punctures on the presternum, and each puncture has a seta in it, but the spaces between the punctures are smooth, not rugose, tomentose, or setose. Possibly on some occasions the juice or coagulated fibers of vegetation may adhere to the surface of the prosternum, for I was able to scrape off a layer of tomentosity with a pin on the female from Taboga Island, Panama.

In the British Museum (Natural History) I saw a specimen of *Odoiporus longicollis sulcicollis* Günther from Malaya with a similar "scaly" prosternum, but series of *O. l. longicollis* from Hong Kong in the American Museum of Natural History show no such rugosities, and Günther's description of *sulcicollis* makes no mention of them.

One male and two females of *rugipectus* were dissected.

According to Selander and Vaurie (1962), the type locality, Cerro de Palmas, is in the state of Veracruz, but it was not found on any maps available to them. Champion explained (1910, p. 101, footnote) that Cerro de "Plumas" was incorrectly written on many labels, including the label on the type of *rugipectus*.

SUBGROUP *sierrakowskyi*

***Metamasius sierrakowskyi* (Gyllenhal)**

Figures 40, 53

Sphenophorus sierrakowskyi GYLLENHAL, 1838, p. 887, Antioquia, Colombia; type, female, in Naturhistoriska Riksmuseet, Stockholm, examined. CHAMPION, 1910, pl. 4, figs. 13, 13a, 14.

Cactophagus rufocinctus CHAMPION, 1910, p. 86, pl. 4, figs. 10, 10a, Carillo, Costa Rica; type, male, in the United States National Museum, examined. New synonymy.

Cactophagus rufomaculatus CHAMPION, 1910, p. 86, pl. 4, figs. 11, 11a, Chiriqui, Panama; type, male, in the British Museum (Natural History), examined. New synonymy.

Cactophagus cirratus CHAMPION, 1910, p. 87, pl. 4, figs. 12, 12a, Chontales, Nicaragua; type, male, in the British Museum (Natural History), examined. New synonymy.

DIAGNOSIS: Differing from others of subgroup by having more extensive patch of long hairs on last segment of abdomen in both sexes, patch covering at least apical half at center (fig. 53). Largest species of group and one of largest of genus; color pattern in red phase virtually same as that of *tibialis* (see that species), but differing in legs and abdominal hairs.

RANGE: Northern South America (Colombia) and southern Central America (Panama, Costa Rica, Nicaragua). (For data on the 17 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 21 to 24 mm. Beak scarcely

punctate, in profile about same width throughout in female, but in male base wider because of inferior angle; base continuous with head, but slightly flat in front of median fovea in some specimens; inferiorly sulcate; basal dilation feeble. Antennal club, spongy part equal to, or slightly shorter than, basal part. Pronotum punctate at apical constriction and at center of base in shallow, rather elongate depression, depression vague and round in one specimen; basal margin and groove not extending to sides in all specimens. Scutellum broadly triangular, almost U-shaped. Elytra, strial punctures distinct but tiny. Pygidium rather pointed in female, more rounded-truncate in male, punctate in both sexes, apex fringed with hairs, also line of hairs at center in apical half.

Under surface virtually impunctate, except, in few specimens, for metasternum and sides of abdomen, some specimens with mesepimeron, prosternum, and some segments of abdomen punctate; distance between front coxae less than width of antennal club, but twice width of funicle, and nearly one-third of diameter of coxae; distance between middle coxae almost equal to diameter of coxae; venter slightly depressed in both sexes; last segment of abdomen (male) with oval patch of long, bronzy hairs (as long as hairs of hind tibia) covering central third of segment from near base to apex, (female) with round patch of similar hairs in apical half, usually sunk in depression. Front and middle femora with sparse, long hairs; tibiae (female) straight and with only short hairs, (male) slightly sinuate on inner side and with long hairs, those on hind tibia as long as tibia is wide and in most specimens concentrated in a broad tuft; femora not clavate, middle femur short (not reaching base of metasternum); front tarsus with third segment wider than antennal club and three or four times wider at apex than second segment. Aedeagus feebly emarginate apically.

Color, beak red or black; head black; venter and legs usually entirely black, but in some specimens red with black; pronotum black with varying shapes and sizes of red stripes, bands, or marks, or (type of *sierrakowskyi*) red with five black marks, or (type of *cirratus*) mostly red; elytra pre-

dominantly black with oblique dark red bands behind middle (types of *rufocinctus*, *rufomaculatus*, *cirratus* from Nicaragua, Costa Rica, and Panama, as well as females from the same countries, and a male from Colombia), or elytra predominantly red, but with black spots or large marks (type of *sierrakowskyi* from Colombia, also three females from Chiriqui, Panama, and from Peralta, Costa Rica, and three males from Costa Rica).

ECOLOGY: A male in the collection of the United States National Museum was taken on the leaf of a fan palm at Hamburg Farm, Costa Rica, in August, 1929.

REMARKS: Gyllenhal did not give the sex of his type. Champion (1910, p. 87) saw the type and thought it was a male. Kuschel labeled it as female. I have seen and partly dissected it, and it is a female. The types of the other forms described from Central America and synonymized above are males, but they agree in all essential characters with the female type of *sierrakowskyi* and with another male from Colombia. Even *tibialis* Waterhouse (unique type from Medellin, Colombia) may prove to be a synonym of *sierrakowskyi*. Champion, in fact, said (1910, p. 86) that "*rufocinctus*" was "a form of the Colombian *C.[actophagus] tibialis* (Waterh.)," and that his *rufocinctus*, *rufomaculatus*, and *cirratus* (of which he had only one specimen each) were all very similar, differing in size or color pattern or the size of the tibial tufts of the male, or in the punctuation or the depth of the depression of the pronotum. Additional material shows that these are in truth but individual variations. The variations in color, red on black or black on red in all sorts of combinations and gradations, is not geographical (see above). Champion (1910) listed four color varieties and illustrated three of them in color. One of these, which I have examined, appears to be a different species (*difficilis* Günther). Three females and two males were dissected. The apex of the aedeagus is not so truncate as that of *sanguinipes*, but not so emarginate as that of *difficilis*. The eighth tergum of the female (fig. 40) has two sharp angular points apically, as found also in the female of *sanguinipes*.

The scutellum is nearly as broad at the

apex as at the base, but in some specimens it is rounded apically and in others rather acuminate.

Champion (*loc. cit.*) considered this species and *tibialis* to belong to the genus *Cactophagus*.

***Metamasius tibialis* (Waterhouse)**

Figure 102

Sphenophorus tibialis WATERHOUSE, 1879, p. 246, Medellin, Colombia; type, male, in the British Museum (Natural History), examined.

DIAGNOSIS: Differing from other species of subgroup by having hind femur distinctly clavate, not gradually widened, tibiae of male more strongly sinuate on inner edge, with sinuation closer to middle of tibia than to base, and long hairs of apex of abdomen in parallel rows with clear space between.

RANGE: Known only from the type locality.

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 22 mm. Beak scarcely punctate, in profile of same width throughout, except for projecting angle of basal inferior tooth; base not continuous with head; inferiorly sulcate in basal half and with very slight angle on sides of beak (fig. 102) at termination of sulcus (as in male of *sanguinipes*); basal dilation feeble. Antennal club, spongy part shorter than base. Pronotum punctate at center of base, but not noticeably depressed, basal margin entire. Elytra, stria punctures distinct. Pygidium encrusted, but apical and central fringe of hairs visible.

Under surface punctate on prosternum, sides of abdomen, sides of metasternum, on mesepimeron; remainder virtually impunctate; distance between front coxae slightly less than width of antennal club, about one-third of diameter of coxae; distance between middle coxae almost as wide as diameter of coxae; mesosternal process slightly raised at middle; ventral depression distinct on metasternum and first segment of abdomen; last segment of abdomen with two parallel rows of very long hairs (longer than hairs at apex of pygidium) from middle of segment to apex, with distinct space between rows. Femora distinctly clavate, femora and tibiae fringed

with long hairs on inner side, those on tibiae longest, and emerging from distinct sinuation at middle of tibia in tufts as long as tibia is wide; middle femur short; front tarsi lacking.

Color, beak red; legs red, but apices of femora black; pronotum red with black fusiform mark at center and four lateral black marks; elytra velvety red with large, ill-defined, black spots as follows: on each elytron behind humerus, near scutellum, at center near suture, on suture at apex, subapically, and on sides of apex.

ECOLOGY: No information.

REMARKS: The unique type of this species may be an individual variant of *sierrakowskyi*, but the distinctly clavate femur of *tibialis* seems to point otherwise. The femoral character separates some other closely related species (*maurus* from *liratus*, *bisbisignatus* from *ensirostris*) so that it may be of specific importance here.

The type specimen was partially dissected, sufficiently to reveal that the lateral groove was present.

***Metamasius difficilis* Günther**

Metamasius difficilis GÜNTHER, 1941, p. 45, fig. 10, Latacunga, Ecuador; type, male, in Staatliches Museum für Tierkunde, Dresden, examined.

DIAGNOSIS: Very similar to *sanguinipes*, which follows, but elytral pattern, when present, different, and male lacking inferior angulation of beak present in that species. Differing from *foveolatus* and *metamasioides* by having very small stria punctures on elytra, from *tibialis* and *sierrakowskyi* in being of smaller size. Females differing from known females of subgroup (except *foveolatus*) by having apical tufts of hair on abdomen instead of larger patch of hairs.

RANGE: Ecuador, Honduras, and Costa Rica. (For data on the seven specimens examined, see Appendix.)

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 16 mm. Beak scarcely punctate, in profile wider at base, but base not noticeably toothed inferiorly; not continuous with head; basal dilation sharp; peduncle worn smooth, not visibly sulcate. Antennal club, spongy part about equal to basal part. Pronotum im-

punctate, except for transverse rows of punctures at extreme base medially; basal depression lacking, basal margin not grooved or extending to sides. Scutellum broadly triangular, almost U-shaped. Elytra, striae punctures visible, but tiny. Pygidium densely, finely punctate, without hairs (or worn?).

Under surface punctate on sides of metasternum, sides of abdomen, and on last segment of abdomen, remainder virtually impunctate; distance between front coxae less than width of antennal club, but more than width of funicle, about one-fourth of diameter of coxae; distance between middle coxae nearly equal to diameter of coxae; venter slightly depressed; last segment of abdomen in apical third with long bronze hairs as long as width of third tarsal segment, set in two parallel rows with a space between. Hind tibia straight, all tibiae with long hairs at center third within (as long as tibiae are wide); femora not hairy, hind femur gradually widened, not clavate; middle femur clavate, medium in length (not reaching beyond base of metasternum); front tarsus with third segment narrower than antennal club. Aedeagus deeply emarginate apically.

Color of type: Head black; beak, femora, and tibiae red with apices black; front of prosternum, metasternum except sides and base, first, second, and fifth ventral segments red; pronotum red with five large, black marks (or black with red lines); elytra black with red humerus, red middle and apical spots, and narrow red circle at center.

Color of other specimens: None exactly like type, except for color of under side of two males and one female from Costa Rica and a male from Honduras; a male and female from Ecuador (Paramba) are black below, but have red spot or spots at center, and red tibiae; above they are similarly marked with red beak, black head, black pronotum with two red oblique stripes, black elytra with broken red pattern corresponding to that of the type, but incomplete.

The male from Honduras has the same color of elytra as the two specimens from Ecuador, but has the head red and the pronotum with five black areas on red, as in the type. The males and female from Costa Rica also have the same pronotum, but in the fe-

male the black areas are much reduced; in one male the elytra are colored about as in the type, but in the other and in the female they are mostly red with three black spots on each elytron. The scutellum is black in all specimens.

ECOLOGY: A male from Costa Rica, in the United States National Museum, was taken in New York City in March, 1935, "in banana debris."

REMARKS: I redescribe the type separately above because the six additional specimens I refer to this species possibly do not belong to it. The differences between these six on the one hand and the type on the other may be merely individual variations, as in the color pattern (see above), or the shape of the aedeagus (see below), or they may be due to the fresher condition of the six specimens and to the worn condition of the type; or they may be specific differences. The four males differ from the type by having only a few hairs in two separate tufts at the middle of the last segment of the abdomen, the peduncle and under side of the beak sulcate, long hairs at the apex of the pygidium, and the hairs of the hind tibia in long tufts instead of a fringe. (The tufts are not the same on all four males, however, there being only one tuft on the tibia of the male from Honduras, but on the other males one tuft on the inner edge and one behind it on the inner face of the tibia.) These differences, as well as the fact that two of the males and the type have no noticeable basal teeth under the beak, whereas two do have them, might be explained by wear. The placement and arrangement of hairs are generally good characters for the separation of species, but, with only a few specimens, one must consider the problem of the wearing off of hairs.

I dissected all the specimens (the type was already dissected, probably by Günther, who illustrated the aedeagus), and the apex of the aedeagus is truncate in two males, slightly emarginate in two (Honduras, and Guapiles, Costa Rica), and distinctly emarginate in the type. In the six specimens the base of the pronotum is distinctly grooved and margined in its entire length (although obsolete at the corners in the female from Costa Rica), whereas in the type, the margin and groove are lacking. A shallow, punctate median de-

pression is present at the base of the pronotum in the six specimens, but not in the type which differs further by having some concentrated punctures at the extreme edge at the middle. The suctellum is distinctly U-shaped in the three specimens from Central America, but rather pointed at the apex in the three from Ecuador.

The two females examined (Ecuador, Costa Rica) differ from the males by having two tufts of hairs at the extreme apex of the abdomen and by having no long hairs or tufts on the tibiae. The female from Miravalles, Costa Rica, was figured and identified by Champion as a variety of "*Cactophagus*" *sierrakowskyi*, but it is much smaller (only 15 mm.) than that species, lacks the abundant apical hairs on the abdomen, and has no sharp apices on the eighth tergum. Günther (1941) reported a female from the type lo-

cality, but it is no longer in the museum in Dresden, nor does Günther know its whereabouts (personal communication). He compared *difficilis* with *cinnamominus* Perty, which has a large and distinct subrostral tooth, but the "*stumpfer Hocker*" he mentioned for *difficilis* under the rostrum was a piece of dirt.

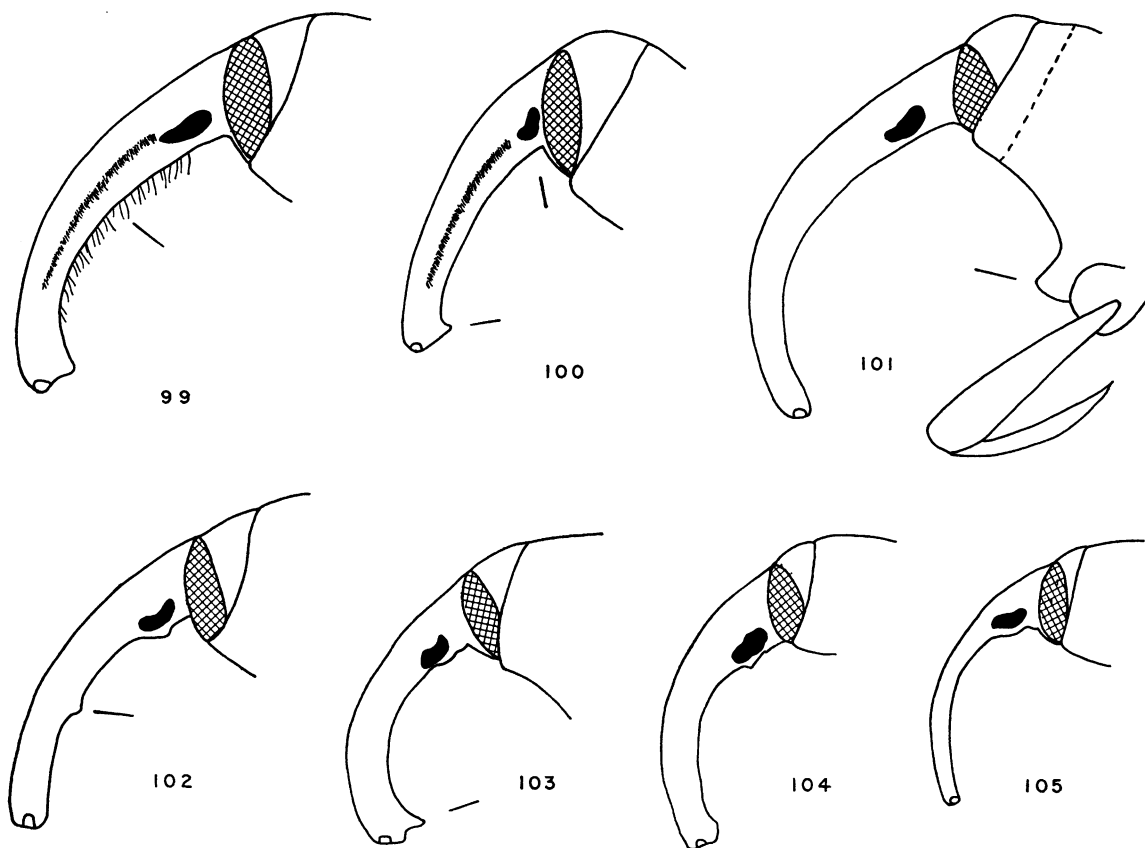
***Metamasius sanguinipes* (Hustache)**

Figures 40, 102

Cactophagus sanguinipes HUSTACHE, 1936, p. 88, Mera, Ecuador; type, male, in Muséum National d'Histoire Naturelle, Paris, examined.

Metamasius fractelineatus HUSTACHE, 1936, p. 100, St. Laurent, French Guiana; type, female, in Muséum National d'Histoire Naturelle, Paris, examined. New synonymy.

DIAGNOSIS: Male, known by long tibial hairs, differing from other males of subgroup



FIGS. 99-105. Beak of *Metamasius*. 99. *M. peruanus*, male. 100. *M. peruanus*, female. 101. *M. tuberculipectus*, male, showing also prosternal ledge. 102. *M. sanguinipes*, male; characteristic also of male of *M. tibialis*. 103. *M. maculiventris*, male. 104. *M. dasyurus*, male. 105. *M. dasyurus*, female.

(except for *tibialis*, which differs by having clavate, not gradually widened hind femur) by having protruding angle at about middle of beak on under side (fig. 102). Female agreeing with female of *metamasioides*, which follows, but differing from other females by having dense tuft of hairs in apical fourth of last segment of abdomen, not a large patch in apical half as in *sierrakowskyi*, or tiny tufts at extreme apex as in *difficilis*.

RANGE: Northern South America from French Guiana and Colombia to Amazonas in Brazil and to Ecuador and Peru in the west. (For data on the 11 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 15 to 17 mm. Beak lightly punctate, in profile about same width throughout; base continuous with head, but in male rather flattened in front of median fovea; basal dilation rather sharp; (male) under side broadly sulcate from base to beyond middle where side margins slightly dilated to form, in profile, a small angle, base toothed inferiorly; (female) not sulcate, angulate, or toothed. Antennal club, spongy part of same length as basal part, or slightly longer. Pronotum rather densely punctate at apical constriction and at center of base, where shallowly, longitudinally depressed; basal margin and groove entire, extending to sides. Elytra, stria punctures as large as those on base of pronotum, and separated longitudinally on disc by twice or more their diameters; interval 3, possibly 4, at base wider than other intervals, and slightly incurved toward scutellum in some specimens. Pygidium more or less rounded (male), more pointed (female), in both sexes densely punctate, with central tuft at apex.

Under surface punctate on prosternum, on sides of metasternum, sides of abdomen, last abdominal segment; distance between front coxae about equal to width of antennal club, about one-third of width of coxae; prosternum between front coxae slightly tumid in few specimens; distance between middle coxae equal to diameter of coxae; venter shallowly depressed in male; last segment of abdomen (male) with scattered hairs near apex, (female) with thick, bristly tuft of bronze hairs in about apical fourth in depression. All femora and tibiae (male) fringed with hairs

as long as one-half of width of tibia, those on hind tibia longer and more or less in tuft behind middle; tibiae (female) with short hairs within. Hind tibia straight; femora not clavate; middle femur long, extending to about middle of hind coxa; third segment of front tarsus as wide as antennal club, of hind tarsus slightly narrower. Aedeagus truncate apically.

Color, beak, tibiae, femora red or red with apices black; venter mostly black; head red; pronotum either black with large red spot on each side near front and red dash in center (type of *sanguinipes*), or with alternating black and red longitudinal stripes (type and paratype of *fractelineatus*), or with two red oblique stripes; elytra black with red longitudinal dashes or dots at base on first, second, third, or fourth intervals, and on humerus; or (complete pattern) red stripes on second interval in apical third, and on fourth interval in basal two-thirds, stripes connected by spot on third interval.

ECOLOGY: No information.

REMARKS: The two descriptions of this species illustrate well the confusion of the "genera" *Cactophagus* and *Metamasius*, as the species was described twice in the same paper by the same author in different genera. The types of the two forms differ in color and pattern, as do some of the other specimens examined, but the red part of the pattern of the type of *sanguinipes* is merely a reduction of the red pattern present in "*fractelineatus*." In his description of the latter species, Hustache mentioned the angle or dilation of the sides of the beak in his male, but, curiously enough, he did not mention this character for *sanguinipes* even though the type, which I have examined, has the angle. Hustache was not certain of the sex of the type of *sanguinipes*.

The stria punctures of the elytra are larger than those of *difficilis*, *tibialis*, and *sierrakowskyi*, but smaller than those of *foveolatus* and *metamasioides*. The lineolate elytral pattern, when entire, is quite different from the pattern of large, oblique bands in specimens of *sierrakowskyi*, or from that of large red areas surrounding black spots in the type of *tibialis*, in some *sierrakowskyi*, and some *difficilis*. The red stripes are not broken into zigzags as they are in some specimens of *difficilis* and

metamasioides. The eighth tergum of the female has very acuminate apices as in *sierakowskyi* (fig. 40). The aedeagus of these two species is much the same also, the apex being actually nearly straight and less emarginate in males of *sanguinipes*.

One male and one female were dissected.

***Metamasius metamasioides* (Günther)**

Figure 54

Cactophagus metamasioides GÜNTHER, 1941, p. 35, Tal des Rio Agua, Colombia; type, female, "Rio Agua-tal," in Staatliches Museum für Tierkunde, Dresden, examined.

Cactophagus impressipectus Voss, 1953, p. 26, locality given in title of paper, i.e., Colombia or Bolivia; type, female, "Rio Aguacatal, Colombia," in Zoologisches Museum, Hamburg, examined.

DIAGNOSIS: Differing from others of subgroup (except *foveolatus*) by having very large and dense stria punctures on elytra; differing from *foveolatus* by having stria punctures smaller (figs. 54, 116), metasternum long and inner wings normal, not reduced. Very similar in pattern and punctuation to some specimens of *sanguinipes*, but more elongate, with more hairs at apex of abdomen of female, no angle or "kink" in beak of male, and basal dilation of beak quite feeble.

RANGE: Known only from the two types from western Colombia, and a male of "*impressipectus*" reported by Voss from either Colombia or Bolivia.

DESCRIPTION OF FEMALE: (See also characters of subgroup). Length, 20 to 21 mm. Beak lightly punctate, in profile about same width throughout; base not continuous with head; under side not sulcate or toothed or angled; basal dilation scarcely marked. Antennal club, spongy part slightly shorter than basal part. Pronotum impunctate, except for center of base where shallowly depressed and punctate; base margined and grooved to sides. Elytra, stria punctures very large, their diameters on disc about one-half of width of intervals, punctures separated longitudinally by their diameters or less; second interval (in type) turned slightly toward scutellum. Pygidium punctate, rather pointed, apex fringed with long hairs, also line of hairs at middle near apex.

Under surface punctate on sides of pro-

sternum, sides of metasternum, sides of abdomen, on last abdominal segment; remainder impunctate; distance between front coxae almost equal to width of antennal club, about twice width of funicle, and one-third of diameter of coxae; distance between middle coxae a little less than diameter of coxae; last segment of abdomen with tuft of long (slightly longer than hairs of pygidium), bronze hairs in center of apical third in shallow depression. Hind tibia straight, with short hairs within; middle femur slightly clavate, short, not reaching base of metasternum; hind femur not clavate or hairy; front tarsus with third segment as wide as antennal club, hind tarsus with it slightly narrower.

Color, head, beak, basal two-thirds of tibia red, also part of hind femur, center of last abdominal segment, and spot on epimeron of metasternum; pronotum black with red M; elytra black with longitudinal red lines or dashes in zigzag pattern.

ECOLOGY: No information.

REMARKS: Kuschel (1955, p. 280) synonymized Voss's *impressipectus* with Günther's *metamasioides*. No other species has exactly the kind of elytral punctuation as is present in the types of both forms. The type specimens are probably from the same locality in Colombia (Aguacatal is a small stream just east of Manizales) and were collected by the same man, Fassl, at the same altitude, 2000 meters. I am grateful to Dr. R. Hertel of the museum in Dresden and to Dr. H. Weidner of the museum of Hamburg for kindly sending me for examination the types, respectively, of *metamasioides* and *impressipectus*.

I have not seen males of this species, nor had Günther when he described *metamasioides*, but he surmised correctly that the male when found would have the long tibial hairs characteristic of other species of the *sierakowskyi* subgroup. I find from Voss's description that the male of "*impressipectus*" has long red hairs on the hind tibia. Voss, however, reversed the sexes, as his male (with the long red hairs) is described at length under the sign "♀," and his type, a female, which I have before me, agrees with his short description of the "♂." The type has the pronotum distinctly narrower than long, whereas the male (Voss's "female") is said

to have it as wide as long. The male is said to have long, reddish hairs also on the last segment of the abdomen, such as are found in males of other species of the group (I have not seen the male of *foveolatus*), but Voss does not specify how much of the segment is hairy.

Günther (1941, p. 38) stated that his *Cactophagus foveolatus* and *metamasioides*, as well as Hustache's *Cactophagus consularis* [a synonym of *Metamasius dimidiatipennis*], agreed better with the genus *Metamasius* in the strongly developed prosternal process or "*Prosternallappen*" than they did with the type species of the genus *Cactophagus* (*spinolae*). Voss remarked (1953, p. 27) that, if *Cactophagus* were returned to *Metamasius*, "*impressipectus*" seemed closer to *Metamasius* than was the case with either *rufocinctus* or *rufomaculatus* [synonyms of *sierrakowskyi* and described by Champion in *Cactophagus*].

The eighth tergum of the female resembles that of *foveolatus*, and is not so sharply pointed as that of *difficilis*, *sanguinipes*, and *sierrakowskyi*.

***Metamasius foveolatus* (Günther)**

Figure 116

Cactophagus foveolatus GÜNTHER, 1941, p. 34, Colombia; lectotype, female, Santa Margarita, Colombia, here designated from cotype in Staatliches Museum für Tierkunde, Dresden, examined.

DIAGNOSIS: Differing from foregoing species of group by having elytral striae so strongly foveate with large, subconfluent punctures that interspaces narrowed to half their widths (fig. 116) where punctures cut into them, and by having surface of elytra transversely sinuous or wavy. Differing from most species by having short inner wings, consequently short metasternum.

RANGE: Colombia. Only the lectotype has been examined, a female, Santa Margarita, 2000 meters, October, 1908, collected by Fassl. A male syntype, Tal des Rio Agua, 1200 meters, same date and collector, is no longer in the museum in Dresden. Neither locality was found.

DESCRIPTION OF LECTOTYPE, FEMALE: (See also characters of subgroup). Length, 16 mm. Inner wings short, no longer than

elytra. Beak virtually impunctate, in profile slightly wider at base than at middle or apex; base not continuous with head; inferiorly not sulcate; basally only obsoletely toothed; basal dilation abrupt, sharp. Antennal club, spongy part about one-half of whole. Pronotum almost as long as elytra, punctate densely at center near base where depressed longitudinally; basal margin and groove extending nearly to sides. Scutellum broadly triangular, almost U-shaped. Elytra scarcely wider than pronotum, striae punctures nearly as wide as intervals; surface sinuous, uneven. Pygidium rather pointed, densely, finely punctate, with short apical hairs.

Under surface punctate on sides of metasternum, sides of first and all of fifth segment of abdomen; remainder impunctate; distance between front coxae less than width of antennal club, but twice width of funicle, about one-fourth of diameter of coxae; distance between middle coxae nearly equal to diameter of coxae; last abdominal segment without hairs. Middle and hind tibiae straight on outer side, but slightly sinuate within near base, inner hairs very short; femora glabrous, bulbous, and emarginate before apex; middle femur long, reaching at least to trochanter of hind femur; front tarsus with third segment narrower than antennal club, at least twice wider at apex than second segment; hind tarsus with third segment narrower still; third segments asymmetrical.

Color black, but tibiae and beak reddish.

ECOLOGY: No information.

REMARKS: The inner wings appear to be too short for flight as they are no longer than the elytra, with the part folded under very small. Rather similar shortened wings are present in some of the populations of *fahraei* Gyllenhal (of species group III), which also has large punctures on the elytra as in *foveolatus*, but usually narrower and deeper.

The male "cotype," according to Günther (1941, p. 35), is 19 mm. in length, has the elytra no wider than the pronotum, the femora with short hairs, and the tibiae, as in other males of this subgroup, furnished with a long tuft of hairs at the middle, the hairs growing shorter to the apex. Although he placed his species in *Cactophagus*, Günther

stated that in the overlapping prosternal process, *foveolatus* was more like typical *Metamasius* than like the type of *Cactophagus* (*spinolae*).

The eighth tergum of the female has rather blunt apices as in *metamasioides*, not sharply pointed as in females of *sanguinipes* and *sierrakowskyi*.

SUBGROUP *peruanus*

Metamasius peruanus Hustache

Figures 99, 100

Metamasius peruanus HUSTACHE, 1936, p. 96, Marcapata, Peru; type, male, in Muséum National d'Histoire Naturelle, Paris, examined.

DIAGNOSIS: Differing from all species by having in both sexes an embedded, curving line of short hairs on sides of beak from near base to near apex (figs. 99, 100); males having long, sparse hairs under beak also.

RANGE: Peru and Bolivia. (For data on the 17 specimens examined, see Appendix.)

DESCRIPTION: Length, 13 to 20 mm. Frons between eyes wider than one-half of beak at base. Beak shorter than pronotum, compressed, stout, in profile as wide at base as widest part of front femur, thence gradually narrowing to before apex where wider at peduncle; sides with embedded, median line of dense, tomentose hairs extending from in front of scrobe to near apex of beak; base continuous with head; peduncle of postmentum sharply angulate in profile; scrobe very small, a mere hole; (male) arcuate, finely punctate; basal dilation fairly sharp, much longer than wide; inferiorly with two rows of long, sparse hairs as long as about one-half of width of beak; under side at base slightly sinuate; scrobe with posterior edge about one scape width from eye; (female) scarcely arcuate, virtually impunctate; basal dilation fairly sharp, scarcely longer than wide; inferiorly smooth, glabrous; top of beak flattened at middle; scrobe opening onto eye. Antennal club flattened, truncate at apex, spongy part smaller than base, about one-third of whole. Pronotum longer than wide, sides parallel in basal half; apical constriction strong; impunctate except for concentrated punctures at base; center of base not or just perceptibly depressed; base strongly

marginated, but not grooved, margin evanescent at extreme sides, distinctly sinuate at center in front of scutellum. Elytra strongly marginated at base; striae punctures visible within striae; intervals impunctate, straight at base; apices separately rounded. Scutellum elongate-triangular, but apex not sharp, sides appearing subparallel because of pruinose patch at center. Pygidium truncate, hairs on sides, center, and in two tufts at apex, somewhat narrower in female.

Under surface, prosternum and abdomen faintly punctate, remainder, including legs, virtually impunctate; prosternum at middle in front of coxae slightly tumid (female), with small tubercle (male); around edge of coxae slightly hairy (female), with long hairs (male); distance between front coxae narrower than antennal club, and scarcely, if at all, wider than antennal funicle, about one-fifth or one-sixth of diameter of coxae; distance between middle coxae nearly equal to diameter of coxae; front and middle coxae hairy within; ventral depression of male shallow, not hairy; last segment of abdomen (male) with large, oval patch of long, sparse hairs as long as tibial hairs, (female) with transverse, long, hairy fringe at apex. All tibiae straight; middle and front tibiae on inner side (male) with hairs as long as tibiae are wide (but in type in tuft at center), (female) without hairs. Femora virtually impunctate, not clavate; middle femur short, not reaching base of metasternum, front and middle femora of male with long hairs as on tibiae. Front tarsus with third segment distinctly wider than antennal club, three or four times wider than apex of second segment, and entirely hairy below; claw segment inserted slightly nearer to base than to middle of third segment; hind tarsus with third segment very asymmetrical, widely dilated. Aedeagus truncate and deflexed at apex, its apodemes forked and attached by membrane.

Color, two phases, one black, but with red stripes on sides of prosternum, red marks on pronotum (two oblique, short lines from apex, two subparallel long lines at center base, two red spots laterally at base), and red on elytra (spot on humeri, incomplete red C on left elytron and reversed on right, red extending on several intervals to apex, or

red areas much reduced); one phase red, but with black on sides of prosternum, on mesosternal region, center of metasternum and most of abdomen, on apices of femora; pronotum red with five black marks (long mark at center, two short lateral marks from base, two on sides of front); elytra mostly red but with black marks on humerus, at middle near apex, and in region of suture from base to apex.

ECOLOGY: No information.

REMARKS: The tomentose lines on the sides of the beak are unique in the genus, and certain other characters of this species are rather unusual. Therefore I consider it as a subgroup by itself although, as will be seen below, it appears to be more similar to species of the *hebetatus* subgroup. Additional features of the beak are the very small size of the antennal scrobe of the female (fig. 100), the long, angulate, backward-pointing peduncle (found, however, in *maculiventris* and in several other species of the *hebetatus* subgroup), the long hairs under the beak of males (short hairs are present in males of *cinnamominus*), and the short, wide basal dilation of females (present also in *bruneri*, *rimoratus*, and others).

The elytra have subparallel sides and strongly margined base as in most species of the *hebetatus* subgroup, and the pronotum in some males is wider than the elytra (as in males of *cinnamominus*); the tomentose or pruinose patch on the scutellum is found in species of the *canalipes* and *inaequalis* subgroups. The third tarsal segments are markedly asymmetrical, like those of *dasyurus*, *maculiventris*, and *tuberculipectus* of the *hebetatus* subgroup. The aedeagus, however, is like that of the other large subgroups (*hemipterus*, *fasciatus*, *sierrakowskyi*). This is the only species in which males have long hairs on the first two pairs of tibiae, but not on the last pair.

The color phases (see above) are not sexual or geographic. I have seen both pale and dark forms from Yungas de la Paz, Bolivia, and both forms in both sexes. The type is a dark specimen. Günther (1941, p. 46) reported a male from Huamba [= Huambo], Peru, and a male and three females from "Peru," two of the latter being the pale form.

Two males and one female were dissected.

SUBGROUP *canalipes*

Metamasius canalipes (Gyllenhal)

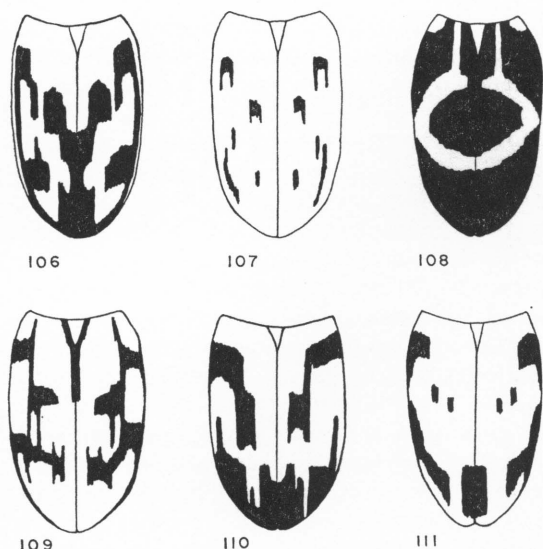
Figures 24, 56, 106

Sphenophorus canalipes GYLLENHAL, 1838, p. 927, "Patria?"; type male, "Ind. [error] or ?," in Naturhistoriska Riksmuseum, Stockholm, examined. Bolivia is suggested herein as the type locality.

DIAGNOSIS: Differing from other two species of subgroup chiefly by having apex of aedeagus either acuminate or rounded, but not truncate. Differing further from *cerasinus* by having abdomen, and most of suture and apex of elytra, black (fig. 106), and from *crustosus*, in male, by having hind tibiae straight, not sinuate, and with short, sparser hairs on inner sides.

RANGE: Lowlands of eastern Bolivia and eastern Brazil. (For data on the 42 specimens examined, see Appendix.)

DESCRIPTION: Length, 9 to 13 mm. Frons between eyes wider than one-half of width of base of beak. Beak as long as pronotum, slightly compressed, scarcely arcuate, covered with dense, yellowish, tomentose coat extending dorsally to near apex with exception of glabrous median line; in profile rather humped over scrobe, narrowed gently to apex, at middle as wide as, or slightly wider than, antennal club; under side of scrobe sinuate; surface distinctly, rather densely punctate to apex; basal dilation distinct, much longer than wide; scrobe with posterior edge one and one-half to two widths of scape from eye; base not continuous with head; peduncle flat, sulcate; inferiorly (male) narrowly sulcate with sides crenulate (best seen from below and with high magnification), (female) smooth or scarcely sulcate. Antennal club elongate-oval, scarcely dilated (fig. 63), feebly flattened, spongy part shorter than base, about one-third of entire club. Pronotum distinctly longer than wide, sides subparallel in basal half, apical constriction strong; irregularly, rather sparsely punctate, some punctures appearing asperate because filled with emergent tomentosity; base subtruncate, margined and furrowed to sides, no basal depression. Elytra feebly margined at base, sides subparallel; striae punctures distinct; intervals with feeble center keel of tomentose punctures. Scutellum nar-



FIGS. 106–111. Diagrammatic elytral pattern of some *Metamasius*; blank areas represent red or reddish; black areas, black. 106. *M. canalipes*. 107. *M. cerasinus*. 108. *M. hebetatus*. 109. *M. tectus*, type. 110. *M. vicarius*, type. 111. *M. vicarius*, paratype.

rowly elongate-triangular, sides barely convergent to apex. Pygidium convex, vertical, with short, dense hairs apically, laterally, and medially, apex rounded-truncate.

Under surface punctate sparsely, coarsely, punctures filled with tomentose tufts; front and middle coxae extremely tomentose and hairy; distance between front coxae narrower than antennal club, but slightly wider than antennal funicle, about one-fourth of width of coxa; distance between middle coxae equal to or slightly wider than diameter of coxa; ventral depression of male shallow, hairy; last segment of abdomen more or less rounded, and tomentose or hairy at apex. All tibiae straight on outer side but front and middle tibiae slightly sinuate on inner side, all tibiae dorsally and ventrally tomentose, hind and middle tibiae with two dorsal, longitudinal lines of longer hairs and longer hairs also on inner and outer edges; femora clavate, hind ones less so, well punctate, but surface in most specimens covered with tomentose glaze; middle femur short, not reaching base of metasternum; front tarsus with third segment narrower than antennal club, hind tarsus with it even narrower (only

slightly wider than second segment) and somewhat asymmetrical (fig. 56), second segment rather transverse, one-half of length of first, all tarsi with claw segments inserted near middle of third segment, third segment below glabrous at base or middle (worn?), tarsi dorsally tomentose. Aedeagus scarcely curved, its forked apodemes attached by membrane; apex acuminate to narrowly rounded, not truncate. Eighth tergum of male hairy and slightly emarginate at apex.

Color, head and beak dark red, beak covered with golden tomentosity; pronotum red with five black markings (one long mark medially, other shorter ones laterally at apex and base); elytra reddish with black lineolate marks forming on each elytron a spot behind humerus and another of same size on outer intervals subapically, a spot on disc at center near suture and one on suture and on two adjacent intervals to apex, discal and apical spots connected in some specimens; legs black or red, glazed with tomentosity in most specimens; under side red in one, but in most individuals black with a little red on sides of prosternum and on sides of metasternum, or (in eight of 15) entirely blackish; abdomen black.

ECOLOGY: Notations on the labels of two males and a female from Portachuelo, Santa Cruz, Bolivia, say "Motacu" which is a palm; these specimens were collected in August, 1960, by Candia. The same collector in the following year took a series of eight males and three females on or in sugarcane.

REMARKS: This species was described in the genus *Sphenophorus* without locality, but a yellow label in the box with the type in Stockholm gives "Ind. or ?." Chevrolat (1885, p. 101) gave the locality as "India or." and included the species with some species from New Guinea and the Solomon Islands in the genus *Trochorhopalus* Kirsch (Chevrolat misspelled it *Trachorhopalon*). It is true that the crusty exterior with the keeled, tomentose elytral intervals, and the shape and vestiture of the beak and legs, are remarkably similar to these characters in the species of that genus, but other significant characters are quite different in shape, i.e., the aedeagus, antennal club and scrobe, mesepimeron, and scutellum. In the Junk catalogue (Csiki, 1936, p. 64) *canalipes* ap-

pears also under *Trochorhopalus*, with the locality, "Brit. Indien," and in Blackwelder's catalogue for the New World (1947) it does not appear at all.

This species resembles also some species of the African genus *Temnoschoita* in the beak and antennae (short scape), but differs from them in the pygidium, which is exceedingly large and protruding in *Temnoschoita*, by having narrow, not dilated, third tarsal segments, more approximate front coxae, and acute, not rounded apex to the scutellum. One species of that genus, however (*basipennis*), although differing also in the shape of the scutellum, resembles *canalipes* by having velvety, ribbed elytral intervals, small pygidium, and narrow tarsi and antennal club. This African genus was reviewed by Marshall (1938).

The above discussion applies equally to the two species that follow (*cerasinus* and *crustosus*), except for the question of locality. All three species are very similar. The aedeagus of *canalipes* differs from that of the other species not only in the shape of the apex, but also by having the chitinized sides (dorsal view) of the same width from the base to the apex, not wider in front and at the middle (fig. 24).

***Metamasius cerasinus* Vaurie, new species**

Figures 25, 56, 107

TYPE MATERIAL: Type, male, Suapure, Caura River, Venezuela, April 12, 1899, E. A. Klages, collector, and four male and two female paratopotypes, also seven female paratypes with same data except for different dates (March 15, 16, 21, 24), in Cornell University, Ithaca; three male and one female paratypes with same data as type in the American Museum of Natural History; one male paratype, Mayaro, island of Trinidad, March 15, 1911, F. W. Urich, collector, in the United States National Museum.

DIAGNOSIS: Differing from *canalipes* and *crustosus* by having more red, less black, on elytra, and second abdominal segment red, not black. Males differing further by having either truncate aedeagus (not rounded or acuminate like that of *canalipes*), or virtually straight hind tibia with shorter hairs (not sinuate and with long, dense hairs like those of *crustosus*).

RANGE: From Suapure at about the junc-

tion of the Caura and Orinoco rivers north to Trinidad and to Panama. Possibly also French Guiana. (For data on four additional specimens, see Appendix.)

DESCRIPTION OF TYPE, MALE: Length, 10 mm. Frons, beak, antennae, pronotum, elytra, scutellum, pygidium as described for *canalipes*, except for beak which at middle in profile is wider than antennal club. Under surface and legs as described for *canalipes*. Aedeagus curved, its forked apodemes attached by membrane; apex truncate (fig. 25). Eighth tergum as described for *canalipes*.

Color of type: Head, beak, pronotum as described for *canalipes*; elytra more red than those of *canalipes*, apex red, not black, pattern as shown in figure 107 (the discal black spot covers the second, third, and fourth intervals); legs glazed over; under side black with second abdominal segment cherry red, red also on sides of prosternum and of metasternum.

VARIATIONS FROM TYPE: Several of the specimens apparently have all or part of the first, in addition to the second, abdominal segment red, but the abdomen is rather encrusted with dirt. Dorsally, some of the paratypes have smaller or larger black areas, or the outer spots of the elytra connected, but all have the black on the elytra in the places indicated in figure 107, with three exceptions: one of the topotypes lacks the subapical line on the second interval, and two females from Panama are more extensively black, as described for *canalipes* (fig. 106); the red in these two specimens can be seen only by tipping the specimen, otherwise the entire dorsum appears grayish to tawny with slightly darker areas. The length varies from 9 to 13 mm.

ECOLOGY: No information.

REMARKS: Possibly this species and *crustosus* are conspecific; at present they are distinguished only by the color or by characters of the male alone. (See Remarks under *crustosus*.) The type series of *cerasinus* is quite constant in all characters; it remains to be seen whether a series of *crustosus* would show the distinctive characters now assigned to its type and two paratypes.

Eight males and three of the females were dissected.

A male and a female from French Guiana

were examined at the museum in Paris before I separated *cerasinus* from *canalipes*; I think from the locality, which is north of the Amazon, that they would most likely go with *cerasinus*.

***Metamasius crustosus* Vaurie, new species**

Figures 7, 56

TYPE MATERIAL: Type, male, Yurimaguas, Loreto], Peru, in the British Museum (Natural History); one paratype, female, Tingo Maria, Huanuco, Peru, 2200 feet, December 30, 1946, J. C. Pallister, collector, Frank Johnson, donor, in the American Museum of Natural History, and one paratype, female, Pucallpa [Loreto], Peru, February, 1948, in the collection of C. Campos Seabra, Rio de Janeiro, Brazil.

DIAGNOSIS: Male differing from males of two preceding species (*canalipes*, *cerasinus*) by having hind tibia (fig. 7) distinctly sinuate on inner side and fringed with very long, dense, coarse hairs, and apex of abdomen depressed. Female differing from female of *cerasinus* by having elytra more black and abdomen entirely black, but scarcely distinguishable from female of *canalipes*.

RANGE: Central and northern Peru. The type locality, Yurimaguas, is in the lowlands on the Rio Huallaga in the north. Pucallpa is farther south on the Rio Ucayali which runs somewhat parallel to the Huallaga, and Tingo Maria is not far to the west of Pucallpa, but across the Cordillera Azul. Tingo Maria is at a higher altitude but is also in the river valley of the Huallaga.

DESCRIPTION OF TYPE, MALE: Length, 12 mm. Frons, beak, antennae, pronotum, elytra, scutellum, pygidium as described for *canalipes*, except for beak which at middle in profile is wider than antennal club, scrobal area not humped, and peduncle of postmentum worn smooth. Under surface as described for *canalipes*, but distance between front coxae as wide as antennal club, about one-third of diameter of coxa, and last segment of abdomen with oval depression near apex. All tibiae straight on outer side, but widened at basal third within and distinctly sinuate on inner side where double fringe of very dense hairs follows sinuosity, hairs on hind tibia longer than on other tibiae, about one-half as wide as tibia; femora, tarsi, and aedeagus as described for *canalipes*, but tarsal

soles less worn at middle, and apex of aedeagus truncate. Eighth tergum of male distinctly emarginate and hairy.

Color of type entirely blackish with yellow tomentosity on parts of pronotum, elytra, beak, and legs, pattern of pronotum and elytra indicated by slightly darker areas, pattern as described for *canalipes*.

VARIATIONS FROM TYPE: The paratype from Tingo Maria shows a faint black and red pattern and has some red on the sides of the prosternum; it has the hairs on the slightly sinuate hind tibia only one-half of the length of those on the type, but the hairs and sinuation on the other tibiae are about the same as those on the type. The hind tibia of the other paratype seem somewhat less sinuate. In both females the distance between the front coxae is rather narrower than the width of the antennal club, the last segment of the abdomen is not depressed, the under side of the beak is not or but slightly (at base) sulcate, not at all crenulate, and the peduncle is sulcate.

ECOLOGY: No information.

REMARKS: I first considered this species to be no more than an exaggerated or extreme form of *cerasinus*, perhaps a subspecies, with slight color differences. However, as *canalipes* is very similar to both *cerasinus* and to *crustosus*, yet is distinct because of the different shape of the aedeagus, it seems best to treat all three species as distinct until additional material proves otherwise. In addition, although the characters of the female of *crustosus* are virtually similar to those of females of *cerasinus*, except for color, the characters of the unique male are not found in any of the eight males of *cerasinus* examined. A series of males of *crustosus* might show the extent of variation of the species.

The type and one of the females were dissected.

SUBGROUP *hebetatus*

***Metamasius signiventris* (Kirsch)**

Figure 57

Sphenophorus signiventris KIRSCH, 1889, p. 36, pl. 3, figs. 68, 68a, [Cordillera de] Huamboya, Ecuador, 1000–2000 meters; type, male, in Staatliches Museum für Tierkunde, Dresden, examined.

Metamasius signiventris rubrum Voss, 1954, p.

333, Ecuador or Peru; type not examined, probably lost. New synonymy.

DIAGNOSIS: Distinguishable from all species by combination of exceedingly long first tarsal segment (fig. 57), large red or orange spot or spots on side of metasternum (lacking in occasional specimen), narrow hind tarsus, rather bowed hind femur, especially in male, and very large antennal club (about five times wider than antennal funicle). Middle and hind femora more slender than those of *hebetatus*, not bulbous or tomentose.

RANGE: The Guianas and northern South America south on the west coast to Bolivia. (For data on the 38 specimens examined, see Appendix.) The type locality is a ridge in central Ecuador.

DESCRIPTION: (See also characters of subgroup). Length, 10 to 12 mm. Beak as long as, or longer than, pronotum, about as wide in profile as base of front femur; basal dilation sharp, longer than wide; scrobe with posterior edge nearly two widths of scape from eye; (male) rather compressed, punctate (more densely at base), nearly straight except for arcuate apex; inferiorly sulcate; in profile wider at base where obsolete teeth under scrobe, (female) evenly arcuate, less punctate, more cylindrical. Antennal club, spongy part longer than basal part. Pronotum distinctly narrower than base of elytra, sides subparallel for most of their length; apical constriction not strong; impunctate or with few punctures at base medially; base not depressed, basal margin slightly sinuate at middle. Elytra margined at base; striae punctures indistinct; intervals impunctate. Pygidium, both sexes, convex, broadly rounded-truncate; central ridge hairy, apex with fringe of dense hairs in more or less of tuft.

Under surface finely punctate, more densely on legs; prosternum between coxae more or less flat; distance between front coxae narrower than antennal club, but three times wider than funicle, about one-third of diameter of coxae; distance between middle coxae at least as wide as diameter of coxae; ventral depression of male deep, hairy; last segment of abdomen (male) with fine, sparse hairs covering most of segment as well as fringe of hairs at apex, (female) with apical fringe only. Hind tibia straight, rather opaque, punctures indistinct; all tibiae of

male with short fringe of hairs; femora gradually widened, not bulbous; middle femur short; hind femur slightly curved on inner side toward base, more so in male, with fringe of fine hairs within; third segment of front tarsus narrower than antennal club, but about twice wider than apex of second segment, of hind tarsus even narrower and asymmetrical; first segment of hind tarsus very long, about as long as claw segment and four times longer than second segment, which is elongate; claw segment inserted at middle of third segment; soles of tarsus worn smooth at base in many specimens. Aedeagus very short and strongly curved (as in *laticrus*), apex truncate, apodemes attached directly to sides; eighth tergum of male fringed with short, dense hairs.

Color, head and beak black, latter with red tip; venter black, but red or orange spot on sides of metasternum in majority of specimens; legs black, occasionally red; in red form, pronotum red or orange, except for central black elongate mark, elytra red at base and center, with black on sides and apex; in less red form, more black invading pronotum and elytra, elytra black at center on suture and on first interval and spreading to humeri, forming pattern of red "windows" on black; in black form, pronotum black with two narrow, oblique, red stripes, elytra mostly black, with only round red spots remaining (three to six spots on each elytron).

ECOLOGY: The type was collected in "*regione silvarum*" at 1000 to 2000 meters.

REMARKS: This species is very variable in its color and color pattern, but apparently not in a geographical sense. The type specimen has a black pronotum with oblique red stripes, black elytra with red "windows," and a red spot on the metasternum. The front and middle tarsi and a claw of the hind tarsus are lacking.

The pronotum appears narrower in relation to the base of the elytra than it is in related species. The rather "bowed" hind femur is reminiscent of that of *pygidialis*, but in the latter species the femur has very long inner hairs, and the pygidium is distinctive. The elytral pattern of some individuals is similar to that of some individuals of *hemipterus*, and a few specimens have been found in collections mixed with *hemipterus*. The long

first tarsal segment occurs also in *melancholicus* of the *inaequalis* subgroup.

Voss's red form ("*rubrum*") is represented in the material that I have examined by five specimens from Chinchao, Peru; it appears to be a color variety and coexists with the black form.

Two males and two females were dissected.

The eighth tergum of the female is stout with the apex rounded, not acuminate.

***Metamasius hebetatus* (Gyllenhal)**

Figures 108, 115

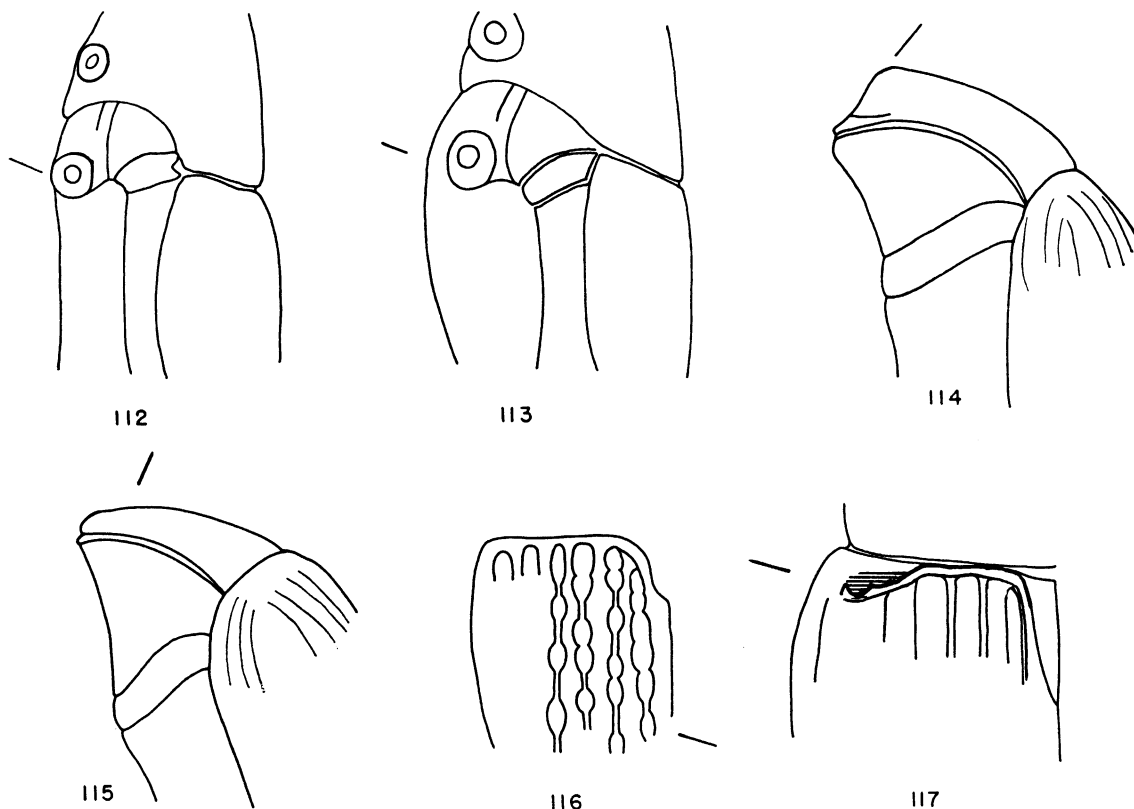
Sphenophorus hebetatus GYLLENHAL, 1838, p. 919, Antioquia, Colombia; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined. CHAMPION, 1910, pl. 5, figs. 27, 27a.

Metamasius conicicollis HUSTACHE, 1936, p. 98, Chanchamayo, Peru; type, female, in Muséum National d'Histoire Naturelle, Paris, examined.

DIAGNOSIS: Differing from most species of subgroup by having tomentose femora and narrow tarsi, especially hind tarsi. Agreeing in these characters with *laticrus* and *tectus*, but former (known from male only) has expanded, sinuate hind tibia, and latter has different elytral pattern and heavily tomentose base of beak.

RANGE: Central America (Nicaragua, Costa Rica, Panama) and northern South America south to Bolivia in the west. (For data on the 118 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 12 mm. Beak longer than pronotum, of same width throughout in profile, except for wider base with its obsolete teeth under scrobe; as wide at middle in profile as base of front femur; scarcely punctate except for base; basal dilation strong,



FIGS. 112, 113. Metasternum of *Metamasius*, profile view. 112. *M. hemipterus*. 113. *M. sellatus*.

FIGS. 114, 115. Apex of pygidium of *Metamasius*, profile view. 114. *M. pygidialis*, female. 115. *M. hebetatus*.

FIGS. 116, 117. Detail of base of elytra, dorsal view. 116. *Metamasius foveolatus*, showing large punctures of striae. 117. *M. maculiventris*, showing basal excavation of male.

longer than wide; inferiorly sulcate; scrobe with posterior edge distant from eye by more than width of scape; (male) rather compressed, scarcely curved except near apex, (female) more cylindrical, evenly arcuate. Antennal club, spongy apex longer than basal part. Pronotum, sides subparallel in basal half, apical constriction strong; sparsely, not too finely punctate (where coating worn off, punctures seem to be larger); base with small median depression in some specimens. Elytra feebly margined at base, striae punctures distinct in most specimens; intervals apparently impunctate, but shining specimens showing row of minute punctures in center. Scutellum tomentose in some individuals. Pygidium truncate, with short apical hairs and hairs at sides and center, (male) more convex, vertical, broader.

Under surface with large punctures throughout, legs and sides of abdomen in many specimens pruinose or tomentose; prosternum flat between coxae; distance between front coxae less than width of antennal club, but wider than front tarsus, about one-third of diameter of coxae; distance between middle coxae equal to diameter of coxae; venter (male) hairy and deeply concave; last segment of abdomen in both sexes truncate, but broader at apex in male. Hind tibia straight on outer side, slightly sinuate on inner; tibiae carinate and tomentose; femora tomentose, bulbous; middle femur short, not reaching base of metasternum; front tarsus, third segment narrower and much smaller than antennal club, hind tarsus with it even narrower (at apex scarcely twice width of second segment); hind tarsus with second segment not elongate, about one-half of length of first; claw segment inserted at middle of third segment; tarsal soles worn glabrous at base in many specimens. Aedeagus sinuous in profile, apex rounded; apodemes attached to sides directly. Eighth tergum of male fringed at apex with dense, short hairs.

Color of pruinose or of shining individuals, head black; beak red; venter black or black with faint red, occasional specimen with red spot on sides of metasternum; pronotum black with or without two oblique red stripes, or pronotum with opaque, buffy, or greenish gray coating, or dusty (type) with red marks showing through faintly; elytra black or with greenish gray coating, with or without lineo-

late red marks that form red C on left elytron and C reversed on right elytron (no red visible on elytra of type).

ECOLOGY: Champion (1913, pp. 2-6) found this species in bromeliads in Costa Rica, as well as *bromeliadicola*, *cinnatus*, *dimidiatipennis*, and *fasciatus*. Notations on specimens show a female at Tenguel, Ecuador, "feeding in banana rhizomes," collected by A. Roberts; a male "in root of banana tree, *Musa* sp." at Bogota, Colombia; females "in Banana fruit" in November, at San Domingo, Ecuador; a male "in Plantain," collected by Gallego in Medellin Valley, Colombia; and a male from Hamburg Farm, Reventazon, Costa Rica, September, 1935, on leaves of the palm *Iriarte*, which had fallen on the ground. The larva is reported by Anderson (1948) from a leaf sheath of *Iriarte* from the same locality, in November, 1933.

REMARKS: Although the majority of specimens seen have a dusty dull coat, a few specimens are bright and shining. Hustache's *conicicollis* (Chanchamayo, Peru), is one of the shining ones; it was synonymized by Kuschel (1955, p. 281). Hustache mentioned only a male specimen, but his type is actually a female; perhaps he confused the sexes because they are not externally very different in this species. The male, however, has a deep, very hairy, ventral depression, whereas the female has the venter flat and hairless, and the male has a somewhat more compressed, less arcuate beak.

This species is quite similar to *canalipes* Gyllenhal, although the apodemes of the aedeagus are attached differently. Externally, *hebetatus* differs from *canalipes* by having a much larger antennal club with a longer spongy part, more glabrous, less punctate, beak without so much heavy tomentose covering, and a different elytral pattern (figs. 106, 108). In some specimens of *hebetatus* the scutellum appears to have subparallel instead of convergent sides, as in species of the oriental genus *Rhabdoscelis*, but the subparallel sides are only the edges of the superimposed glazed or tomentose coating.

One male and two females were dissected.

Metamasius tectus Vaurie, new species

Figures 27, 37, 109

TYPE MATERIAL: Type, male, upper Rio Tapiche, Peru, March, 1928, Bassler, collec-

tor, and four male and two female paratypes with same data in the American Museum of Natural History; 14 paratypes from Peru, as follows: two males, one from Marcapata, one from Huanuco, to be deposited in Staatliches Museum für Tierkunde, Dresden; (remainder collected by Bassler), one female, Rio Tapiche, March 1928, in the California Academy of Sciences; two males, two females, Rio Marañon, October 8, 1924, in the British Museum (Natural History), United States National Museum, Museum G. Frey, and Zoologische Staatssammlung, Munich; two males, one female, Rio Santiago, November 11, 1924, and three males, one female, middle Rio Ucayali, November 20, 1923, in the American Museum of Natural History.

DIAGNOSIS: Differing from two of other species with narrow hind tarsus (*hebetatus*, *laticrus*) by having different elytral pattern: center of disc and most of elytra red in *tectus* (fig. 109), center black with red C in others. Differing from *puncticeps* in much smaller size, from *signiventris* by having short, not long, first tarsal segment on hind legs, and from all of subgroup by having yellowish, tomentose coating at base of beak.

RANGE: Northern South America south to Bahia in the east and to Bolivia in the west. (For data on the 26 specimens examined in addition to the paratypes, see Appendix.)

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 9 mm. Beak of same length as pronotum, feebly curved, its base on top and on both sides of antennal insertion with an opaque, yellowish, tomentose covering of fine hairs; in profile of same width throughout, except for slightly thickened base and slightly narrowed extreme apex, at middle wider than base of front femur; feebly punctate; basal dilation feeble, distinctly longer than wide; inferiorly sulcate, at base slightly sinuate under scrobe, but not truly toothed; scrobe with posterior edge about one and one-half width of scape from eye. Antennal club, spongy part slightly longer than base. Pronotum, sides subparallel from base to near apex; apical constriction strong; regularly punctate, punctures denser at sides; base not depressed. Elytra feebly margined at base; striae punctures distinct; intervals with faint line of punctures. Scutellum tomentose. Pygidium convex, vertical, tomentose, apex rather truncate and hairy,

also line of hairs medially.

Under surface entirely punctate, femora and sides of abdomen tomentose, prosternum slightly depressed between coxae; distance between front coxae equal to width of antennal club, more than one-third of diameter of coxae; distance between middle coxae about equal to diameter of coxae; venter shallowly depressed, not hairy; last abdominal segment rounded-truncate, tomentose toward apex. Hind tibia straight, all tibiae carinate and tomentose; femora tomentose, very clavate, especially front and middle femora; middle femur short, not reaching base of metasternum; front tarsus with third segment narrower and smaller than antennal club; hind tarsus with third segment even narrower, not much more than twice width of second segment, rather asymmetrical, second segment not elongate, about one-half of length of first; claw segment on all tarsi inserted near middle of third segment. Aedeagus (fig. 27), apex rounded, broadly margined; apodemes attached to sides by membrane. Eighth tergum (fig. 37) with short, sparse, apical fringe of hairs.

Color of type: Head, beak, legs, and parts of venter dull reddish, remainder of venter black; pronotum and elytra dull red, former with a black median stripe from base to apex and two lateral stripes in basal half; elytra with black, lineolate markings that form, on each elytron, three vague but connecting spots near base, at middle, and behind middle, also area around scutellum black.

VARIATIONS FROM TYPE: The female differs from the male by having the beak distinctly arcuate, more cylindrical, virtually impunctate, and, in some specimens, slightly shorter than the pronotum, the pygidium narrower, more pointed, and the venter flat. Some specimens of both sexes differ from the type by having more or fewer black lineolate marks on the elytra (one specimen has the apex entirely red, one has it entirely black), or more black on the pronotum. In general the color is quite uniform, being dull and velvety or opaque, seldom strongly contrasting or shining. A few specimens have a vague red spot on the metasternum. The punctuation of the pronotum and the striae of the elytra vary in size and spacing; the elytral intervals appear impunctate in some individuals. The scutellum is not tomentose in all individuals. The

distance between the front coxae may be slightly less in some paratypes than in the type. The size range is from 9 to 11 mm.

ECOLOGY: A female from Bartica-Potaro Road, British Guiana, in the British Museum (Natural History), was collected on a palm, *Jessenia bataua*, by D. J. Atkinson.

REMARKS: This species is most similar to *hebetatus*, which precedes, having the same kind of bulbous and tomentose femora, the same dusty surface, short middle femur, and female genitalia, but differs as stated in the Diagnosis above, and further by having a more arcuate beak in the female, a more narrowly rounded apex on the aedeagus, and the apodemes attached by a membrane. It is similar in a number of characters (size, coating, color pattern, tomentose femora) also to *canalipes*, which is in another subgroup, because of the forked apodemes of the aedeagus, but *tectus* differs by having a larger, dilated antennal club with a longer spongy part, the beak of the female much more curved, the beak of both sexes less punctate, and the upper surface of the third tarsal segments shining, not tomentose. Another dusty, reddish species which has also been collected in a number of the same localities in Brazil and Peru, is *inaequalis*, but it differs not only in the aedeagus, but by having alternate intervals of the elytra raised and the pronotum trifoate at the base.

Four males, including the type, and one female were dissected.

***Metamasius laticrus* Vaurie, new species**

Figure 12

TYPE MATERIAL: Type, male, "Above Chimbo," Ecuador, August, 1897, Rosenberg, collector, in the British Museum (Natural History); two male paratypes, same data, one in the British Museum, one in the American Museum of Natural History, and one male paratype from Quito, Ecuador, in the British Museum.

DIAGNOSIS: Similar in shape and color pattern to some others of subgroup, but male differs from all males known by having exaggerated, sinuate, expanded area on inner side of hind tibia (fig. 12), its inflated part not occurring near base as in *guentheri*, but at middle. Female not known.

RANGE: Known only from the type series

from western Ecuador. The locality, Chimbo, according to Brown (1941, p. 822) is "a region called Puente de Chimbo in the valley of the Rio Chin-chan in the western foothills of the Andes near the railroad station of Bucay."

DESCRIPTION OF TYPE MALE: (See also characters of subgroup). Length, 11 mm. Beak slightly shorter than pronotum, compressed, evenly arcuate; in profile of same width throughout, except for slightly thickened apex and base; stout (a little wider in profile than base of front femur), punctate feebly in apical half, densely and strongly in basal half; basal dilation abrupt, twice width of remainder of beak when viewed from above, slightly longer than wide; inferiorly sulcate, sides of sulcus feebly scalloped; base slightly sinuate under scrobe; peduncle not visibly sulcate; scrobe with posterior edge about one scape width from eye. Antennal club elongate, spongy part about equal in length to basal part, but appearing longer. Pronotum, apical constriction strong; sides subparallel in basal half; regularly, rather densely punctate; slight longitudinal depression medially at base; base subtruncate, slightly sinuate medially. Elytra, base somewhat margined, striae punctures distinct but tiny; intervals faintly punctate. Pygidium convex, vertical, apex rounded-truncate with fringe of hairs, also line of hairs medially.

Under surface distinctly punctate, except for center of metasternum and for mesepisternum and tibiae; legs and sides of abdomen pruinose; prosternum flat between coxae; distance between front coxae a little wider than antennal club, almost one-half of width of coxae; distance between middle coxae wider than diameter of coxae; venter not at all depressed or hairy; last segment of abdomen rounded-truncate, tomentose, apex at sides and center with fine, depressed, yellow hairs. Hind tibia on inner side widened and sinuate at median third and with short, tomentose hairs and a few longer, coarser, but depressed hairs; front and middle tibiae at base slightly wider than at apex; femora pruinose, either tomentose or sparsely hairy on inner side; middle femur bulbous, of medium length, reaching about to base of metasternum; hind femur gradually widened; front tarsus with third segment slightly wider

than antennal club; hind tarsus with it more elongate, narrower than segments on other tarsi, and rather asymmetrical; second segment of hind tarsus longer than wide, less than one-half of length of first; claw segment of all tarsi inserted at middle of third segment. Aedeagus very short and strongly curved (as in *signiventris*), apex rounded, broadly margined; apodemes attached directly to sides. Eighth tergum with scarcely visible apical hairs.

Color of type: Head, beak, under surface black with red marks on sides of prosternum and on apical constriction; pronotum black with narrow, oblique red stripes laterally which branch at middle to reach base at center; elytra black but apical fourth red, and red lineolate marks at base, on humerus, at middle, forming vague red C.

VARIATIONS FROM TYPE: The three paratypes have the same coloration as the type, but are dusty in appearance, not brilliant. The paratype from Quito has the pronotum black; when wet, the red becomes visible. The apical part of the beak appears virtually impunctate in the paratypes.

ECOLOGY: No information.

REMARKS: The Chimbo specimens, although collected 69 years ago, are in fairly good condition, only a tarsus and part of a leg being missing on one or two of them.

Two specimens, including the type, were dissected.

In addition to the male character of the expanded hind tibia, *laticrus* differs from the rather similar *hebatatus* and *tectus* by having gradually widened, not bulbous, hind femora; it differs from these species and *signiventris* by having longer middle femora. Males of the much larger *puncticeps* have the hind tibia only perceptibly expanded; males of *guentheri* have all the tibiae strongly expanded, and differ further from *laticrus* by having wide, not narrow, third tarsal segments. Although the majority of males of this subgroup have a fringe of hairs at the apex of the eighth tergum, males of *laticrus*, *guentheri*, and *tectus* have scarcely visible or extremely sparse hairs.

Metamasius puncticeps Hustache

Metamasius puncticeps HUSTACHE, 1936, p. 97, Cauca, Colombia; type, male, in Muséum Na-

tional d'Histoire Naturelle, Paris. examined. GÜNTHER, 1941, p. 47, fig. 11 (aedeagus).

DIAGNOSIS: Larger (15 to 20 mm.) than others of subgroup, except for *rimoratus* and *tuberculipectus*. Differing from *dasyurus* by having pronotum impunctate at least on disc, pygidium without central subapical tuft of hairs, hind third tarsal segment narrower, and male with short, not long hairs on front tibia, and no subrostral tooth. General shape of *maculiventris*.

RANGE: Colombia, Ecuador, and Bolivia. (For data on the 18 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 15 to 20 mm. Beak nearly as long as pronotum, stout, about as wide as base of front femur; in profile widest at base, narrowed just before widened apex; compressed; basal dilation sharp, longer than wide; sides near apex in certain light somewhat "creased"; subrostral tooth obsolete; scrobe with posterior edge distant from eye by width of scape; (male) feebly punctate except for base where strongly punctate, scarcely arcuate, below narrowly sulcate, sides inferiorly perceptibly sinuous; (female) more arcuate, less punctate, sides smooth below. Antennal club with spongy part longer than basal part. Pronotum, sides parallel in basal half, apical constriction strong, disc flat in some specimens, depressed longitudinally near base in others; punctate at sides, apex, and base only; basal margin subtruncate, but slightly sinuate at middle. Elytra not strongly margined at base, striae punctures tiny; intervals impunctate, Scutellum slightly concave in front. Pygidium strongly narrowed to truncate apex which has hairy-tomentose fringe that overhangs edge in some specimens; sides hairy.

Under surface punctate on prosternum, sides of abdomen, and legs, in some specimens also on center of abdomen; entirely punctate below in a specimen from Colombia; prosternum flat or feebly depressed at middle, with vague swellings in front of each coxa; distance between front coxae narrower than antennal club or third tarsal segment, but at least twice as wide as funicle, and one-third (in one specimen one-fourth) of diameter of coxae; distance between middle coxae equal to diameter of coxae; ventral depression of

male shallow, hairy; last segment of abdomen apparently not hairy, (male) rounded, (female) rather pointed. Hind tibia straight in female, but in male expanded very slightly on inner side; all tibiae (male) with double fringe of short hairs, somewhat longer on front tibia; (both sexes) with outer (or upper) face of tibiae divided by rows of tomentose punctures alternating with glabrous lines; femora on inner side hairy-tomentose, emarginate near apex; middle femur short, not reaching to base of metasternum; front tarsus, third segment narrower than antennal club, but more than twice as wide at apex as apex of second segment; hind tarsus narrower than other tarsi, its second segment elongate, about one-half of length of first; third segment on all tarsi notably asymmetrical; claw segment inserted at middle of third segment. Aedeagus rounded at apex; apodemes attached to sides directly. Eighth tergum of male hairy at apex.

Color (as noted for 10 males and females), head and beak red or red with some black; pronotum mostly black with two red, oblique, lateral stripes (type), some specimens also with basal red stripes or wider stripes, elytra (five specimens) mostly red but with three sets of black marks on each elytron at base, middle, and apex; (four specimens, including type) black with narrow, red, longitudinal marks, forming faint red C on left elytron; (one specimen) virtually black with traces of red; femora red basally, black apically in all specimens; tibiae mostly red; metasternum black in four specimens, black with a red lateral spot in five, and entirely red in one specimen.

ECOLOGY: No information.

REMARKS: This species has rather negative or slight characters, and it therefore resembles a number of species, even some species in other groups. It has the general appearance and size and pattern of *cinnamominus* Perty (*fasciatus* subgroup), but differs from that species by having no subrostral tooth, the femora punctate, and the spongy part of the antennal club larger. The male agrees with males of *laticrus* and *dasyurus* by having a strongly compressed beak that is inferiorly sulcate and slightly crenulate; the slightly expanded tibiae of the male are not nearly so marked as they are in males of *guentheri* and

laticrus. The second segment of the hind tarsus is narrow and elongate as in *laticrus*, *maculiventris*, and *rimoratus*.

Three males and one female were dissected.

***Metamasius maculiventris* Champion**

Figures 31, 103, 117

Metamasius maculiventris CHAMPION, 1910, p. 115, pl. 5, figs. 26, 26a; type locality not specified, lectotype, male, Chontales, Nicaragua, here designated from original series from Nicaragua and Costa Rica in the British Museum (Natural History), examined.

Metamasius dentirostris HUSTACHE, 1936, p. 96, San[to] Domingo, Ecuador; type, male, in Muséum National d'Histoire Naturelle, Paris, examined. New synonymy.

DIAGNOSIS: Males differ from other males of genus by having long, peduncular tooth under apex of beak (fig. 103) and base of elytra on sides excavated, almost toothed (fig. 117). Females not unlike females of *puncticeps* in size and shape, but differing by having beak shorter, more curved, and proportionately wider third tarsal segments. Tumid roll around front coxae stronger than that of any other species.

RANGE: Central America (Costa Rica, Nicaragua) and western South America (Ecuador). (For data on the eight specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 12 to 16 mm. Beak stout (as wide as front femur at middle), very strongly compressed, strongly arcuate, feebly punctate except for base; basal dilation much longer than wide, especially in male; not sulcate inferiorly; base not toothed under scrobe; (male) longer than pronotum, wider at apex, under side of apex angulate (lectotype of *maculiventris*), or with long tooth; (female) beak shorter than pronotum, in profile narrowing to apical fourth; scrobe for antennae with posterior edge distant from eye by (female) at least width of scape, (male) by two or three times width of scape. Antennal club with spongy apex distinctly longer than base. Pronotum, sides subparallel in basal half; apical constriction strong; finely punctate; base subtruncate, without basal depression. Elytra at base strongly margined; striae punctures distinct; intervals impunctate; in male, base of fourth and fifth, or only fifth, interval

with two tiny, jagged teeth overhanging a depression; in female, fifth interval shining and margined flatly where depression is in male. Pygidium (both sexes) narrow, pointed, hairy on median ridge, and long hairs at apex.

Under surface and femora strongly punctate, but not mesepimeron and mesepisternum (or center of abdomen in type of *dentirostris*); prosternum with swelling or tubular roll along front edge of each coxa; distance between front coxae narrower than either antennal club or front third tarsal segment, but wider than funicle, about one-quarter of diameter of coxa; distance between middle coxae at least equal to diameter of coxa; venter (male) hairy, scarcely depressed; last segment of abdomen (both sexes) rather pointed, densely punctate, punctures with depressed hairs. Hind tibia straight; tibiae carinate and tomentose; middle femur slightly bulbous, short, not reaching base of metasternum; hind femur gradually widened, but emarginate before apex; (type of *dentirostris* has all tibiae and front and middle femora fringed with thick hairs nearly as long as one-half of width of tibiae); front tarsus, third segment narrower than antennal club, about three times wider than apex of second segment; second segment of hind tarsus elongate, about one-half of length of first; third segment on all tarsi distinctly asymmetrical; claw segment inserted at middle of third segment; tarsal soles with glabrous basal area or narrow line present in many specimens (hairs worn?). Aedeagus at apex narrowed but rounded; apodemes attached by membrane. Eighth tergum of male with long apical hairs.

Color of head, beak, venter, and legs usually black or dark red, with distinct red or orange spot on sides of metasternum (lacking in one or two specimens); femora red basally in type of *dentirostris*; pronotum black with two oblique colored stripes, or with two additional short, basal stripes, or (type of *dentirostris*) with red M; elytra black with lineolate red marks at base, middle, and behind middle; middle spot, when present on sides of elytra, forming vague red C on left elytron.

ECOLOGY: A specimen in the United States National Museum is marked as having been collected "an gärenden Pflanzensaft Palme" (fermenting juice of palm) at Hamburg Farm, Reventazon, Costa Rica.

REMARKS: This species possesses a number of unusual characters in the male, as stated in the Diagnosis. Even the aedeagus (fig. 31) differs slightly from that of other males by having a rather cup-shaped apex, and by having the lateral line, though normal at the base, apparently passing ventrally toward the apex where it seems to undercut the aedeagus.

Four males, including the lectotype of *maculiventris* and the type of *dentirostris*, and one female were dissected.

Possibly *dentirostris* Hustache is a separate species and not a synonym of *maculiventris* Champion, but in my opinion the evidence points to synonymy. The unique type (Ecuador) agrees with the lectotype of *maculiventris* (Nicaragua) in the aedeagus and in the elytral character mentioned, also by having a tubular roll on the prosternum, a red spot on the metasternum, and a strongly flattened, almost knifelike, compressed beak. The lectotype of *maculiventris*, however, has only a small angle under the beak at the apex, not a long tooth, and it lacks the long, dense hairs within the tibiae, such as are present in the type of *dentirostris*. Three additional males (two from Costa Rica, one with no locality) have the beak tooth distinctly longer and sharper than that of the lectotype of *maculiventris*, but not so long as that of the type of *dentirostris*. One of these males has rather long tibial hairs (not so long as those of *dentirostris*), but the other two have only short hairs. The presence of these hairs seems insufficient basis for keeping *dentirostris* as a separate species, especially as they become worn at times. One of the many males examined of *dasyurus* has the hairs of the front tibia worn short, and in *bruneri* Buchanan (Cuba), two males from the type locality have long hairs on the front tibia, but a male from Jamaica has them short. The fact that *dentirostris* is from Ecuador and the other specimens are from Central America is not unusual in the genus, as many species occur in both regions. If, however, many additional males are found without tibial hairs, *dentirostris* may have to be reinstated.

The toothed excavation at the base of the elytra of males was not mentioned by either Hustache or Champion. Hustache compared his "*dentirostris*" (1936, p. 96) to *cinnamo-*

minus Perty, which I do not find very similar. Champion (1910, p. 115) compared *maculiventris* with *signiventris* and placed it near *hebetatus* and *octonotatus*.

***Metamasius pygidialis* Günther**

Figures 11, 33, 38, 114

Metamasius pygidialis GÜNTHER, 1935, p. 223, fig. 4 [on p. 210], Hamburg Farm, Ebene [Plain of] Limon, Costa Rica; type, female, in Staatliches Museum für Tierkunde, Dresden, not examined.

Metamasius dasyncnemis GÜNTHER, 1936, p. 192, figs. 2, 3 [p. 190], Hamburg Farm, Ebene [Plain of] Limon, Costa Rica; type, male, in Staatliches Museum für Tierkunde, Dresden, not examined. New synonymy.

DIAGNOSIS: Distinguishable from all species by having sinuately expanded middle tibia (fig. 11), but not hind tibia. "Humped" pygidium of female, and exceedingly long pygidium, aedeagus, and eighth tergum of male unique.

RANGE: Costa Rica, Panama, and Ecuador. (For data on the 21 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 12 mm. Beak about as long as pronotum, slightly compressed; in profile of same width throughout except for wider base; not sulcate or toothed inferiorly; (male) less arcuate, as wide as base of front femur; finely, densely punctate; basal dilation longer than wide; (female) more arcuate, less wide than base of front femur; virtually impunctate except for base which is densely punctate and rather humped over antennal scrobe; basal dilation in female more abrupt than in male, about as wide as long. Antennal scrobe with posterior edge (male) separated from eye by more than width of scape, (female) opening right onto eye. Antennal club elongate, spongy apical part more than one-half of whole. Pronotum, sides subparallel nearly to apex; apical constriction strong; densely punctate except for short, glabrous, center line; basal depression shallow or deep, apex also depressed at middle in some specimens, base with slight median sinuation. Elytra strongly margined at base; stria punctures rather distinct; intervals feebly punctate or impunctate; apices separately rounded, not truncate. Pygidium

(male) very elongate and convex, with fringe of short apical hairs, (female) with high, elongate, tomentose, median swelling (fig. 114) that is sharp and apically angulate, and with two small tufts of hairs at apex.

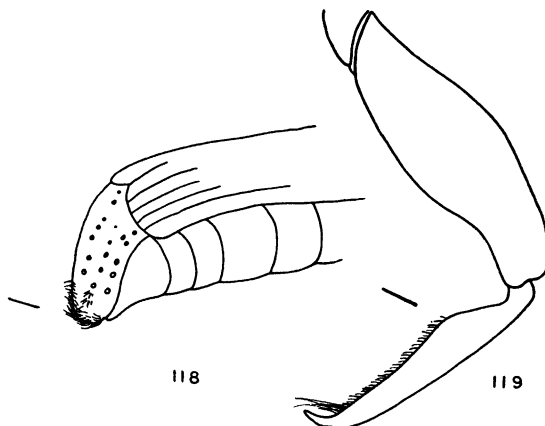
Under surface densely and strongly punctate on prosternum, less so on other parts, including femora; virtually impunctate on center of metasternum; prosternum and sides of venter rather tomentose, prosternum flat between coxae; distance between front coxae as wide as antennal club, but narrower than third tarsal segment, from one-third to one-half of diameter of coxae; distance between middle coxae wider than diameter of coxae; male without ventral depression; last segment of abdomen (male) elongate, very pointed and narrow, slightly tomentose and swollen medially, with fringe of apical hairs, (female) rounded, with transverse patch of tomentosity at extreme apex. Hind tibia (male) slightly curved to apex, sinuate within where inner edge furnished with abundant, long hairs as long as tibia is wide, middle tibia also strongly sinuate, widened basally, with short hairs, (female) all tibiae with short hairs, middle tibia slightly sinuate; hind femur (male) with same kind of long, curling hairs as hind tibia; (both sexes) middle and hind femora clavate, middle femur short, not reaching base of metasternum, hind femur rather flattened within; tibiae rather tomentose, slightly carinate; front tarsus with third segment at least one and one-half times wider than antennal club, three times wider than apex of second segment, hind tarsus with it slightly narrower and slightly asymmetrical; second segment of hind tarsus not elongate, one-half or one-third of length of first; claw segment inserted at base of third segment. Aedeagus extremely narrowed at apex to needle-like point (fig. 33); apodemes very long, attached by membrane. Eighth tergum of male also very elongate, shaped apically like a fish tail (fig. 38).

Color, head black, beak red, venter mostly black, femora red at center, black at both ends; pronotum black with two red oblique stripes, some specimens with red spot at base medially; elytra black with red or orange, lineolate marks at base, middle, and apex, middle ones forming irregular, curving, more or less transverse band.

ECOLOGY: Numerous specimens from Costa Rica (including all the cotypes, according to Günther) were collected by Nevermann on the sheaths of the "stilt palm" (*Iriartea exorrhiza*) on the ground, or of another palm (*Euterpe*), some fallen on the ground; specimens of *dasyurus* were collected with *pygidialis*. One specimen was found on rotting fruits on the ground, and a specimen from Panama was intercepted in New York in September, 1959, "with bananas and Plantain."

REMARKS: In some other groups of beetles, this species might be considered sufficiently distinct to be placed in a monotypic genus, but in *Metamasius* I think such action is not warranted, as there are many species that are "unique" in one character, or perhaps two, but are otherwise typical of the genus. This species agrees with other species in many characters; it is, in fact, very similar in dorsal color and shape and in its over-all dense punctuation to *submaculatus* Champion. The short, wide, basal dilation of the beak of the female, the huge tarsi of both sexes, the elongate club with its long spongy area, and the separately rounded elytral apices are similar to those of females of *rimoratus* Gyllenhal. The expanded, sinuate tibiae resemble those of males of *guentheri* (figs. 11, 119). The sexual difference in the placement of the antennal scrobe occurs also in *tuberculipectus* Hustache, and in species in other subgroups. The long golden hairs on the hind tibia and femur of the male and his incurved hind tibia are more or less duplicated in the male of an otherwise different species (*basilaris* Vaurie, new species). On the other hand, no such elongate male organ has been seen in other species.

I was unable to see the types of either *pygidialis* or *dasycnemis*, but I have examined "cotypes" of both forms, and find that *pygidialis* is the female and *dasycnemis* the male of one species. Günther had five "cotypes" of each form, but his five "females" of *dasycnemis*, in spite of their long, narrow, female-appearing pygidium, proved, on dissection, to be five males, as shown also by the long hairs on the hind legs, usually a character of males, and his five females of *pygidialis* are truly females. The type of *dasycnemis* must also be a male.



FIGS. 118, 119. *Metamasius guentheri*, new species. 118. Apex of pygidium, showing curling hairs. 119. Hind tibia.

Three males (including a cotype of *dasycnemis*) and two females were dissected.

***Metamasius guentheri* Vaurie, new species**

Figures 32, 118, 119

TYPE MATERIAL: Type, male, Balzapamba, Ecuador, R. Haensch, collector, in the Zoologisches Museum, Hamburg.

DIAGNOSIS: Larger than related species, except for some examples of *puncticeps*. Characterized, at least in male, by having broad femora, sinuate, expanded tibiae (fig. 119), wide tarsi, narrowly separated front coxae, hairy venter, separately rounded elytral apices, long curling hairs at apex of pygidium (fig. 118), small antennal club, and acuminate aedeagus. Female not known.

RANGE: Known only from the type locality in the humid tropical forest in the western foothills of the Cordilleras (Brown, 1941, p. 818), about 55 miles northeast of Guayaquil.

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 17 mm. Beak of about same length as pronotum, strongly compressed, scarcely arcuate except for deflexed apex, stout (in profile as wide as base of front femur); finely, densely punctate; in profile about same width throughout; basal dilation sharp; inferiorly shallowly sulcate, not toothed at base under scrobe; peduncle angulate in profile; scrobe with posterior edge about one scape width from eye. Antennal club not more than twice width of

last segment of funicle, spongy part slightly shorter than basal part. Pronotum velvety, apical constriction strong; sides subparallel in basal half; virtually impunctate; basal depression absent; base at middle very feebly sinuate. Elytra, base with strong tumid margin from scutellum to humerus; striae and intervals apparently impunctate. Scutellum twice as long as wide at base, base feebly concave. Pygidium very elongate, convex, vertical, apex curled backward (or upward) and fringed with long hairs, also short hairs medially at apex.

Under surface punctate finely on sides of prosternum and of abdomen, and along center, elsewhere virtually impunctate; prosternum depressed between coxae, with vague swellings in front of each coxa; distance between front coxae narrower than width of antennal club, but slightly wider than funicle, less than one-fourth of diameter of coxa; distance between middle coxae equal to diameter of coxae; venter abundantly hairy and depressed on metasternum and on first segment of abdomen; last segment of abdomen broadly rounded, sparsely hairy, hairs more numerous toward apex. All tibiae strongly expanded and sinuate within near base, front tibia also with long hairs within (hairs as long as tibia is wide); middle and hind tibiae with short hairs; all femora distinctly clavate, flattened, wider than middle part of metepisternum, front and middle femora tomentose within and with short hairs, middle femur extending to base of metasternum; front tarsus with third segment very widely dilated (one and one-half times wider than antennal club and four times wider than second segment); claw segment inserted near base of third segment. Aedeagus strongly pointed at apex; sclerotized apodemes attached laterally by membrane; eighth tergum not hairy at apex, but hairs emerging from a few large punctures on dorsal surface behind apex.

Color black, except for reddish tinge on tarsi, on apical constriction of pronotum, on antennae, and for bright red mark on prosternal process; elytra black with bright red, elongate, lineolate marks behind middle on intervals 2 to 6 of each elytron, these marks forming an irregular red spot.

ECOLOGY: No information.

REMARKS: I take pleasure in naming this

species for Dr. Klaus Günther, of the Zoologische Institut, Berlin-Dahlem, who has written extensively on *Metamasius*, *Cactophagus*, *Rhodobaenus*, and *Phyllerythrus* from the New World, as well as on many other calandrids from other parts of the world.

This is the only species (except for one of the *canalipes* group which differs by having very narrow third tarsal segments) in which males have all the tibiae expanded on the inner side, not merely the hind tibia as in males of *laticrus*, or the middle tibia as in males of *pygidialis*. Superficially *guentheri* resembles large specimens of *ensirostris* Germar (*hemipterus* subgroup), having somewhat the same shape of body and beak, but differing in the tibiae, the aedeagus, and other characters. It differs from *puncticeps* by having the third tarsal segment very widely dilated, and the claw segment inserted at the base, not at the middle, of the third segment.

Metamasius guentheri is one of the few species with the apex of the aedeagus acuminate (fig. 32); the others are *liratus*, *maurus*, and *yunquensis* of the *fasciatus* subgroup and *pygidialis* of the present subgroup. The rolled-over sides on the dorsal side of the aedeagus are sinuate in outline, not straight as in the majority of species.

Metamasius dasyurus Champion

Figures 5, 104, 105

Metamasius dasyurus CHAMPION, 1910, p. 111, pl. 5, figs. 20, 20a; type locality not specified; lectotype, male, Volcan de Chiriqui [Panama], here designated from original series from Panama, Costa Rica, and Ecuador in the British Museum (Natural History), examined.

Metamasius alternans HUSTACHE, 1936, p. 104, Mera, Ecuador; type, male, in Muséum National d'Histoire Naturelle, Paris, examined.

DIAGNOSIS: Very similar to *octonotatus* and *submaculatus*, which follow, but distinguishable from them by large, subapical tuft of hairs on pygidium behind two apical tufts, and in male long hairs on inside of front tibiae and femora. Agreeing with *applicatus* and *rimoratus* in wide tarsi and long tibial hairs of male, but differing by having shorter, wider beak with subrostral teeth at base, claw segment inserted at middle, not base, of third tarsal segment, and female with basal dilation of beak distinctly longer than wide.

RANGE: Central America (Costa Rica,

Honduras, Panama), and South America from French Guiana, Venezuela, and Colombia south to Bolivia. Mexico? (For data on the 106 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 17 mm. Beak as long as pronotum, strongly arcuate, at base strongly punctate; basal dilation sharp, much longer than wide; scrobe with posterior edge one scape width from eye; beak of male compressed, in profile same width except for base and as wide as base of front femur; inferiorly sulcate, sides below slightly scalloped or crenulate, at base four projecting, toothlike angles under scrobe; beak of female more cylindrical, narrower (one-half of width of that of male; fig. 105), not sulcate below, but with four angles at base, basal dilation even sharper in female than in male because of narrowness of beak. Antennal club elongate, spongy part much longer than base. Pronotum, sides subparallel in basal half or three-fourths; apical constriction strong; entirely punctate, more densely in some specimens than others; base slightly depressed longitudinally, basal margin slightly sinuate in some specimens at middle. Elytra, base strongly margined; striae punctures small, dense; intervals with line of fine punctures in some specimens. Pygidium very narrow in both sexes, with tuft of hairs at center just behind apex as large as two apical tufts.

Under surface well punctate, including femora, but mesepisternum and mesepimeron impunctate in some specimens; in some specimens femora tomentose and prosternum slightly depressed medially; distance between front coxae almost as wide as antennal club and as third tarsal segment, nearly one-half of diameter of coxae; distance between middle coxae at least equal to diameter of coxae; ventral depression of male deep, hairy; last segment of abdomen (male) convex and with long hairs at middle, apex slightly depressed, (female) with short, tomentose hairs laterally. Front tibia (male) with long, dense hairs as long as tibia is wide (fig. 5). Hind tibia slightly curved to apex, tomentose and carinate; hind femur more or less gradually widened; middle femur somewhat bulbous, short; all femora (male) with dense, tomentose hairs; front tarsus with third segment wider than antennal club, two and one-half

times wider than apex of second segment, hind tarsus with it asymmetrical (fig. 55), and second segment not elongate, about one-third to one-half of length of first; claw segment inserted at middle of third segment; tarsal soles in some specimens showing middle glabrous line. Aedeagus rounded-truncate at apex; apodemes attached directly to sides; eighth tergum of male fringed with dense hairs.

Color, head black, beak black or red, dark specimens with venter and legs black (some with red stripe on prosternal sides), red specimens with legs red and venter red and black (red spot on sides of metasternum); pronotum red with five black marks or black invading red at middle, or entirely black (one specimen entirely red); elytra black with red lineolate marks at base or before and behind middle, or both, middle in many specimens forming curving band as part of red C, or red parts invading black until elytra appear red with three connecting or separated black spots; one specimen with elytra entirely red.

ECOLOGY: This species and *pygidialis* have been taken (in some instances together) in Costa Rica on the fermenting juices of palms and on the ground on cuttings or sheaths of fallen palms (*Iriarte* and *Euterpe*). A male and female in the collection of the United States National Museum were collected in the flower of "cabecito" palm in Buenaventura, Colombia, by O. Cook, May 18, 1926.

REMARKS: The color (see above) is extremely variable in this species. Champion (1910) listed three color varieties in his description, remarking that the extreme forms occurred in the same localities in both Costa Rica and Panama. He had also a specimen from Ecuador.

The type of Hustache's *alternans* (Ecuador) is quite a large specimen (as is a specimen examined from Honduras) and appears to be no more than a color variant of *dasyurus*.

On the basis of the male genitalia, *dasyurus* and *cinnamominus* (*fasciatus* subgroup) belong in separate subgroups. They are quite similar, however, especially the females, but the female of *dasyurus* has much narrower tibiae than that of *cinnamominus* and a wider third tarsal segment. The third segment of the hind tarsus of *dasyurus* is markedly asym-

metrical and seems to be more deeply lobed at the apex than that of many species. The crenulations of the under sides of the beak of males (fig. 104) are scarcely visible in some individuals.

Three males and one female were dissected.

***Metamasius octonotatus* Champion**

Figure 82

Metamasius octonotatus CHAMPION, 1910, p. 116, pl. 5, figs. 28, 28a, Volcan de Chiriqui, Panama; lectotype, female, here designated from two female specimens of original series in British Museum (Natural History), examined.

DIAGNOSIS: Agreeing with *submaculatus*, which follows, in many characters, but differing by having elytral intervals and suture virtually impunctate, beak proportionately shorter, stouter, that of male with only faint crenulations below, that of female (fig. 82) more arcuate, punctate at base only, not throughout, and pygidium (in fresh specimens) with two apical tufts of hair, not an apical fringe. Differing from *dasyurus* by lacking central tuft of hairs medially on pygidium, and having no long hairs within front tibia of male.

RANGE: Central America (Costa Rica, Panama) and South America (Colombia, Peru). (For data on the 15 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 8.5 to 11 mm. Frons appearing wider than one-half of width of beak at base. Beak shorter than pronotum, stout, in profile wider than base of front femur, under side of scrobe forming slight double tooth; basal dilation sharp, slightly longer than wide; scrobe with posterior edge distant from eye by one scape width; (male) scarcely arcuate; compressed; punctate densely at base, faintly or not at all toward apex; in profile slightly wider at apex than at base; inferiorly sulcate, and with sides obsoletely crenulate; (female) strongly arcuate, nearly cylindrical, nearly half of a semicircle; punctate at base only; in profile slightly wider at base. Antennal club less flattened than usual, almost cylindrical, spongy apical part about or nearly one-half of whole. Pronotum very narrow, sides subparallel in basal half; apical constriction strong; entirely densely punctate, but in some specimens (lectotype) with im-

punctate areas; base not or scarcely depressed. Elytra, base not notably margined; sides subparallel; stria punctures tiny but distinct; intervals impunctate. Scutellum tomentose in some individuals. Pygidium tomentose, with two apical tufts of hairs divided at middle.

Under surface, including femora, entirely densely punctate except for mesepisternum; prosternum slightly depressed at middle; femora and sides of abdomen and metasternum pruinose; distance between front coxae at least equal to width of antennal club and nearly one-half of diameter of coxae; distance between middle coxae equal to diameter of coxae; venter of male scarcely depressed or hairy; last segment of abdomen more or less rounded in both sexes, tomentose apically. Hind tibia straight, with slight tooth at outer apex, all tibiae with short hairs within, tomentose and carinate on anterior face; middle femur short, nearly reaching to base of metasternum, hind femur gradually widened; front tarsus with third segment wider than antennal club; hind tarsus with second segment not elongate, one-third to one-half of length of first; claw segment inserted at middle or slightly behind middle of third segment; soles of tarsi in some individuals with narrow glabrous line at center; tarsi dorsally tomentose. Aedeagus rounded at apex; apodemes attached by membrane; eighth tergum of male with short apical hairs.

Color, head black, beak red, legs and venter red and black or legs entirely red; pronotum entirely red, or red with three black stripes (one long stripe at middle, two short stripes at sides), or generally piceous; elytra red with from two to eight black spots, two of these at center of disc.

ECOLOGY: No information.

REMARKS: Of the other species of the subgroup that have widely dilated tarsi, only *submaculatus* and *dasyurus* might be confused with *octonotatus*. All three species have about the same distribution (both Central and South America), a similar elytral pattern in some specimens, at least a vestige of subrostral teeth at the base of the beak, in males crenulations under the beak, in females strongly arcuate beaks. They differ as stated in the Diagnosis, and also in the antennal club, which is less flattened or compressed in

octonotatus and *submaculatus*. The variability in the shape and size of the club in these two species caused me at first to consider them synonymous. In *octonotatus* the spongy apical part is generally larger (one-half of the club) and the dividing line arcuate, whereas in *submaculatus* it is one-third of the club with the dividing line straight, but one or two specimens of *octonotatus* have the spongy part much smaller and some specimens of *submaculatus* have it slightly larger. The punctuation of the pronotum varies also. Champion stated that it was less regular in *octonotatus*, but subsequent specimens do not seem to differ from *submaculatus* in the punctuation of the pronotum.

A number of individuals of both species have dorsally tomentose tarsal segments as in the species of the *canalipes* subgroup, but the third tarsal segments are quite narrow, not widely dilated, in that subgroup. Both species have tiny teeth at the apex of the outer angle of the middle and hind tibiae, but the teeth are obscured by abundant setae. Both species apparently have the frons somewhat wider than that of other species.

Three males and one female of *octonotatus* were dissected.

***Metamasius submaculatus* Champion**

Figures 60, 89

Metamasius submaculatus CHAMPION, 1910, p. 112, pl. 5, figs. 21, 21a; type locality not specified, lectotype, male, San Jose, Costa Rica, here designated from original series from Costa Rica, Nicaragua, and Colombia in British Museum (Natural History), examined.

DIAGNOSIS: Most similar to *octonotatus*, which precedes, but differing from it and other species of subgroup by having smaller, less dilated antennal club, with spongy apical part only one-third of club (fig. 60), elytral intervals and suture studded with large punctures, and beak entirely densely punctate in both sexes.

RANGE: Central America (Costa Rica, Panama, Nicaragua) and South America (Colombia, Venezuela, Ecuador). (For data on the 45 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 9 to 11 mm. Frons appearing wider than one-half of width of beak at base. Beak shorter than pronotum, stout, in pro-

file equal in width to base of front femur, under side of scrobe forming slight double tooth; entirely densely punctate; basal dilation sharp, slightly longer than wide; scrobe with posterior edge one scape width from eye; beak of male compressed, same width throughout or slightly wider at apex, rather straight except for apical four-fifths where bent downward; inferiorly sulcate, and with sides strongly crenulate with five or more small tubercles; beak of female nearly cylindrical, much narrower than that of male; evenly, strongly arcuate; not sulcate or crenulate inferiorly. Antennal club elongate, less flattened than usual, almost cylindrical, spongy part shorter than base (about one-third of whole). Pronotum very narrow, slightly wider at middle than at base, sides gently arcuate from base to strong apical constriction; coarsely, densely punctate, at middle base confluent punctate, center area impunctate in some specimens. Elytra, base not notably margined, sides subparallel; striae punctures distinct, confluent in some specimens; intervals and suture with single (usually) or double row of large, dense punctures as wide as interval, punctures not necessarily visible on velvety-coated specimens. Pygidium tomentose, rather rounded-truncate with short fringe of hairs at apex, no tufts.

Under surface, including femora, densely, coarsely punctate (mesepisternum excluded in a few specimens), femora tomentose apically; prosternum flat or depressed at middle; distance between front coxae wider than antennal club or third tarsal segment, about one-half of diameter of coxae; middle coxae separated by at least diameter of coxae; male venter scarcely depressed, not hairy; last segment of abdomen in both sexes broadly rounded or truncate, tomentose apically. Hind tibia straight, with slight tooth at outer apex, all tibiae with short hairs within, tomentose and carinate on anterior face; hind femur gradually widened; middle femur short; front tarsus with third segment wider than antennal club, hind tarsus with second segment not elongate; claw segment inserted at middle of third segment; soles of tarsi in some individuals with narrow, glabrous center line; tarsi dorsally tomentose. Aedeagus rounded and broadly margined at apex; apo-

demes attached by membrane; eighth tergum of male with short hairs apically.

Color, head black, beak black or dark red, venter black, femora and tibiae red or black, pronotum actually red with five black marks, but usually appearing piceus; elytra red with black lineolate marks along suture, on shoulders, and on sides of apex, forming large black spot at center of elytra on each side of suture, color of elytra usually dull, obscure, rarely bright.

ECOLOGY: This species is associated with bananas and banana-like plants. Many specimens from Costa Rica were taken from bananas, five males and four females in the collection of the United States National Museum in their fermenting juice at Hamburg Farm in November, 1934, one on a banana stump. At an altitude of 1100 meters in the mountain forest of Rancho Grande, Venezuela, H. E. Box in July, 1947, collected and reared a larva from the banana-like *Heliconia bihai* (wild plantain, Musaceae). T. Snyder in February, 1924, collected two specimens on the flowers of *Heliconia* at Las Cascadas, Canal Zone, Panama. C. Ballou collected a specimen at Tres Rios, Costa Rica, in April, 1937, on *Inga* sp. (tropical shrubs of the Leguminosae).

REMARKS: This small, flattish, narrow, subparallel-sided species is readily recognizable from the characters given in the Diagnosis. In addition, males differ from those of other species with the beak crenulate inferiorly (*dasyurus*, *laticrus*, *octonotatus*, *puncticeps*) by having the crenulations larger, more marked, and distinctly visible (fig. 89). The beak of the female is almost as arcuate as that of the female of *tectus*, a species that differs, among other characters, by having a narrower hind tarsus. (See *octonotatus* for further comparison.)

The coarse punctures of the pronotum and elytra, filled usually with dirt or coating, give a dull finish to the surface which may be brightened momentarily by wetting it with a brush.

Five males and two females were dissected.

***Metamasius applicatus* Hustache**

Figure 21

Metamasius applicatus HUSTACHE, 1938, p. 231; Venezuela, type, male, in Deutsches Entomologisches Institut, Berlin, examined.

DIAGNOSIS: Male differing from males of *vicarius* and *tuberculipectus*, which follow, by having long fringe of hairs on inside of front tibia, female from females of those species by having basal dilation of beak as wide as long, its sides abruptly constricted emarginate, and not parallel, behind dilation (fig. 21). Under side generally polished; tarsi extremely large.

RANGE: Venezuela, Colombia, Brazil, and Bolivia, but very few exact localities reported; a specimen from "Mexico" is probably mislabeled. (For data on the 22 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 10 to 13 mm. (one specimen, 17 mm.). Beak as long as or longer than pronotum, in profile of about same width as front tibia and of same width throughout except for slightly widened base; impunctate except for base; basal dilation abrupt, dilated in front, constricted behind, as wide across scrobes as long, and twice as wide (seen from above) as remainder of beak; inferiorly not sulcate or toothed; scrobe with posterior edge scarcely one scape width from eye; (male) rather straight to near apex where turned down, rather compressed; (female) evenly arcuate, virtually cylindrical. Antennal club rather elongate, spongy part equal to or slightly shorter than base. Pronotum very flat, sides subparallel in basal half; apical constriction strong; faintly or strongly punctate; basal depression lacking. Elytra with base strongly margined, sides scarcely tapering, almost parallel; striae punctures distinct or indistinct; intervals impunctate. Pygidium rounded-truncate, entirely ringed with hairs (hairs often partially worn), and with subcristate, hairy, median ridge.

Under surface feebly punctate, but more deeply and strongly on prosternum and femora; mesepisternum and mesepimeron virtually impunctate, tibiae with two rows of punctures; prosternum at middle flat or slightly tumid, some specimens with two additional swellings in front of coxae; distance between front coxae wider than antennal club, nearly one-half of diameter of coxae; distance between middle coxae greater than diameter of coxae; venter of male depressed and hairy; last segment of abdomen more or less truncate in both sexes, sparsely hairy, and with hairy tufts at sides of apex. Front tibia (male) with long hairs as long as or long-

er than width of tibia. Hind tibia straight; hind femur gradually widened; middle femur long, reaching about to hind coxae; front tarsus with third segment about one and one-half times wider than antennal club; claw segment inserted at extreme base of third segment. Aedeagus with apex rounded; apodemes attached directly to sides; eighth tergum of male fringed with hairs.

Color, head black; beak black or reddish; pronotum black or black with reddish oblique stripes forked to base; elytra black with short, lineolate, red marks at base, two marks on each elytron at middle, two at apex, or (one specimen) red parts expanded so as to make elytra more red than black.

ECOLOGY: No information.

REMARKS: Males are readily recognizable by the following combination of characters (males of *rimoratus* have the same characters, but differ by having entirely punctate tibiae and very long front legs): long hairs on the front tibia; rather short, wide, basal dilation of the beak; narrow, virtually straight beak with no trace of subrostral teeth; and apodemes of the aedeagus attached directly. Females are not so readily distinguishable from those of allied species. In general, they differ from females of *tuberculipectus* by having the prosternum flat and the basal dilation of the beak no longer than wide, from females of *rimoratus* by having the tibiae virtually impunctate, from females of *vicarius* as stated in the Diagnosis and discussion of that species. The differences among the females, however, are rather inconstant and relative, so that it is difficult in many instances to relate specimens to the correct species.

Four males and two females were dissected.

In this species and the three that follow, the third segment of the front and hind tarsi is as wide as, or wider than, the widths of the respective femora.

***Metamasius vicarius* Vaurie, new species**

Figures 20, 29, 110, 111

TYPE MATERIAL: Type, male, Cochabamba [=Cochabamba] Chapare, Alto Palmar, Bolivia, 1100 meters, September to November, 1960, F. H. Walz, collector, in the American Museum of Natural History, and four paratypes as follows: a female with same data as type in collection of Charles O'Brien, University of California, Berkeley; a female,

Puyo Oriente, Ecuador, 1000 meters, October 14, 1937, Clark-MacIntyre, collector, in the American Museum of Natural History; a male, Yungas de la Paz, Bolivia, Brancsik, collector, in Museum G. Frey, Munich; a female, "Colombia," in British Museum (Natural History).

DIAGNOSIS: Very similar to *applicatus*, *rimoratus*, and *tuberculipectus*, but differing from them by having short, not long, middle femur, narrower tarsi, and front coxae less widely separated. Differing further from *tuberculipectus* by having beak shorter, prosternum flat, not at all tumid at middle, elytra with far more red than black, and apodemes of aedeagus attached differently.

RANGE: Colombia, and tropical region in west central Ecuador east of the Andes in the hills above the Rio Puyo, a tributary of the Rio Pastaza, and on the eastern slopes of the Andes in Bolivia (Brown, 1941, pp. 840, 842).

DESCRIPTION OF TYPE, MALE: (See also characters of subgroup). Length, 12 mm. Beak slightly shorter than pronotum, in profile wider than front tibia and of same width throughout except for slightly wider base; punctate strongly at base, finely elsewhere; slightly compressed, gently arcuate; inferiorly sulcate, not toothed at base; basal dilation (fig. 20) abrupt, only slightly longer than wide, its sides straight behind; scrobe with posterior edge scarcely a scape width from eye. Antennal club elongate, spongy part at least equal to basal part. Pronotum, sides subparallel in basal half; apical constriction strong, abrupt; faintly punctate on sides, impunctate on disc; basal depression lacking. Elytra, base strongly margined; striae punctures distinct within striae; intervals impunctate. Pygidium elongate, pointed, very dense apical hairs becoming less dense laterally, dense hairs subapically along central ridge.

Under surface, entire prosternum, and first and last segments of abdomen densely, regularly punctate; mesepisternum and mesepimeron opaque, appearing impunctate; tibiae with two rows of punctures, but rather opaque; femora sparsely punctate. Prosternum at middle flat; distance between front coxae narrower than antennal club, about one-third of diameter of coxae; distance between middle coxae about equal to diameter of coxae; venter slightly depressed, not hairy;

last segment of abdomen more or less truncate, tomentose at apex. Hind tibia slightly curved to apex, all tibiae with short hairs; femora without visible hairs, hind femur gradually widened, middle femur short, not reaching to base of metasternum; front tarsus with third segment slightly wider than antennal club; hind tarsus with second segment not elongate, from one-third to one-half of length of first; claw segment inserted at base of third segment. Aedeagus with apex rounded; apodemes attached directly to sides; eighth tergum of male with dense, short hairs at apex, apical third black and coarsely punctate.

Color of type: Head black, beak red, venter black except for red stripes on metasternum and on sides of prosternum; femora black with some red; tibiae red at center; pronotum red with five black stripes or marks (long median stripe, two short basal stripes, two oblique marks in front laterally); elytra red with black, lineolate, short stripes on sides behind shoulder and near apex, at middle on disc (third, fourth, and fifth intervals), apically on both sides of suture (fig. 110); scutellum black.

VARIATIONS FROM TYPE: The females differ from the male type by having the beak somewhat longer and narrower, impunctate except on the basal dilation, inferiorly smooth, not sulcate, and the basal dilation as wide as long. The color of the legs in the female from Cochabamba is the same as that of the type, but the three other paratypes have the femora red basally and black apically, and the tibiae in great part red. The paratype from Ecuador has punctures visible on the mesepimeron; the paratype from Bolivia is only 10 mm. long. The spongy part of the antennal club is slightly shorter than the base in one paratype; the punctuation of the ventral side varies somewhat, but the prosternum is densely punctate in all specimens. The elytra have less black in two paratypes (fig. 111).

ECOLOGY: No information. The date and locality on the labels of the type and one of the paratypes read exactly the same as those of four specimens of the well-known *M. h. hemipterus* which is associated with bananas, sugarcane, and various palms.

REMARKS: One might think that this species was a variation of the variable *tuberculipectus*, but the five specimens examined

from four different localities have constant characters that differ from those of *tuberculipectus*: the aedeagus, the narrow front coxal space, the flat prosternum, the redder color pattern, and the short middle femur. The aedeagus (fig. 29) and its apodemes are similar to those of *applicatus*, which precedes, but males of *applicatus* have long tibial hairs, long middle femur, and wider coxal space. The basal dilation of the beak is short in the females of both species, but the sides behind the dilated part are parallel in *vicarius* and usually oblique in *applicatus*. The basal dilation of females of *tuberculipectus*, on the other hand, is somewhat longer than wide.

The type specimen, originally in the collection of Charles O'Brien, of the University of California, was kindly donated by him to the American Museum.

One female and both males were dissected.

Metamasius tuberculipectus Hustache

Figure 101

Metamasius tuberculipectus HUSTACHE, 1936, p. 102, St. Laurent du Maroni, French Guiana; type, male, "Guyane française," in Muséum National d'Histoire Naturelle, Paris, examined. GÜNTHER, 1941, p. 48, figs. 12, 13 (aedeagus).

Metamasius brevinasus HUSTACHE, 1936, p. 103, Marcapata, Peru; lectotype, male, here designated from male and female syntypes in Muséum National d'Histoire Naturelle, Paris, examined. New synonymy.

M.[etamasius] Subphyllerythrurus tuberculipectus f. n. *consimilis* Voss, 1954, p. 334, Peru, and Esmeraldo [= Esmeralda or Esmeraldas], Colombia; no type designated, type not found. New synonymy.

M.[etamasius] hoppi Voss, 1954, p. 334, footnote, Mocoa, Putumayo Mountains, Colombia; type destroyed. New synonymy.

DIAGNOSIS: Males immediately recognizable by unique, large, transverse ledge protruding from middle of prosternum (fig. 101), but ledge in some specimens worn down to swelling or tubercle; females having feeble prosternal tubercle in same spot, and abrupt basal dilation of beak, beak very narrow, arcuate, and long, resembling that of females of *applicatus*, *rimoratus*, and *vicarius*.

RANGE: Northern South America south in the west to Bolivia. (For data on the 105 specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 9 to 17 mm. Beak as long as

or longer than pronotum, not toothed inferiorly; (male) in profile rather straight at base, but bent downward at middle or at apical third or fifth, wider than front tibia, of nearly same width throughout or narrowing gradually to apex; compressed; well punctate at base; basal dilation sharp, much longer than wide; inferiorly feebly sulcate in basal portion; scrobe with posterior edge from one to three widths of scape from eye; (female) strongly arcuate; in profile no wider than front tibia, in some specimens narrower, of same width throughout except for widened base; feebly compressed; impunctate except for base; basal dilation abrupt, only slightly longer than wide, its sides straight; scrobe with posterior edge scarcely one scape width from eye. Antennal club elongate, spongy part equal to or longer than base. Pronotum, sides subparallel in basal half; apical constriction moderate to strong; well punctate but in opaque specimens appearing impunctate at center; base at middle shallowly or longitudinally depressed, basal margin slightly sinuate at middle. Elytra, base strongly margined; stria punctures distinct or indistinct; intervals impunctate or finely punctate. Pygidium rounded-truncate, somewhat narrower in female than in male, with hairs at center and sides and tuft of hairs apically; in some specimens covered with very dense and bushy hairs.

Under surface punctate in most specimens, especially on prosternum, but mesepisternum and mesepimeron impunctate in some specimens; tibiae with two rows of faint punctures. Prosternum at middle (male) with large, protuberant "shelf," triangular when viewed from front and from above, worn down to round or flattened tubercle in five or six specimens; (female) with feeble, flattish tubercle. Distance between front coxae equal to or wider than antennal club, about one-third to one-half of diameter of coxae; distance between middle coxae at least as great as diameter of coxae; ventral depression of male shallow, hairy; last segment of abdomen more or less truncate, sparsely hairy in apical region. Hind tibia straight, fringed within with short, bronzy hairs, in some males slightly expanded near base within (as in males of *puncticeps*); femora scarcely bulbous, with short inner hairs; middle femur long, reaching to base of hind femur; front tarsus with

third segment distinctly wider than antennal club, four times wider than apex of second segment; hind tarsus with second segment not elongate, from one-third to one-half of length of first; claw segment inserted at base of third segment. Aedeagus with apex narrowly rounded or rather pointed; apodemes attached by membrane; eighth tergum of male with long apical hairs.

Color, head black; beak black, red, reddish, or red and black; most specimens black ventrally, but some with red stripe on sides of prosternum or of metasternum; legs reddish black, or red and black; pronotum black in most specimens, or with two oblique red stripes often forked to base; elytra mostly black with varying lineolate red marks at base, middle, and apex, or any part, a few specimens with as much red as black, some specimens with red on sides at middle forming vague red C on left elytron.

ECOLOGY: No information.

REMARKS: Voss's reasons (1954) for erecting the subgenus *Subphyllerythrurus* for this species were that *tuberculipectus* combines some characters of "the genus *Phyllerythrurus*" (i.e., protuberant prosternum, strongly arcuate beak) with some of *Metamasius* (i.e., a narrow, not widely channeled peduncle of the postmentum). This much is true, but the protuberance of *tuberculipectus* is a broad ledge or "shelf" quite different from the tuberculate, more conical protuberance of "*Phyllerythrurus*" species (although both kinds may become worn down to a flat swelling), and I consider *Phyllerythrurus* in any case a synonym of *Metamasius*. The present species is not more different from other *Metamasius* than are a number of unusual species of the genus; the females, in fact, are scarcely separable from some females of *applicatus* and *rimoratus*.

I have not seen the types of the two forms described by Voss (1954) and synonymized above, but his short descriptions do not involve any characteristics that cannot be explained by individual variation. At any rate he tells me (personal communication) that the type of "*hoppi*" was destroyed, and that he now considers "*consimilis*" only a color variety.

This species presents one of the most difficult problems of the genus, and possibly my solution (that *brevinasus* is a synonym of

tuberculipectus) is not the correct one. Unfortunately, we have no adequate series of males associated with females by exact locality and date, although we do have eight males and eight females from "Peru," six males and seven females from "Ecuador," the latter series collected by the same person, the lectotype and syntype of *brevinasus* from Marcapata, Peru, and a presumed pair from the upper Orinoco River in extreme southeastern Venezuela. The question is whether there are two species, or, as I believe, only one. Hustache described two: *tuberculipectus* (type locality, St. Laurent du Maroni, French Guiana) and *brevinasus* (type locality, Marcapata, Peru), but he had the former also from Colombia, and the latter also from St. Laurent du Maroni and from Mera, Ecuador. All the females I have seen have a small, flattish tumidity on the prosternum in the place where the males have the large, transverse ledge described above (in spite of Hustache's listing of females, all his original specimens of *tuberculipectus* are males). All males have the ledge except for six or seven, including the lectotype of *brevinasus*, which have it much reduced in size, or rather shapeless; one male (upper Rio Orinoco, Venezuela) has it emarginate at the middle instead of angulate. I assume that these non-typical protuberances are no more than the result of wear, so that in this respect the males are surely the same species. There is another character, however, for which *brevinasus* was named, and that is the "short nose" or short basal dilation of the beak (see figs. 20-22). Hustache thought this was unique and therefore diagnostic of the species, but it occurs in a number of species, in some (*applicatus rimoratus*, *vicarius*) in both sexes, in others (*bruneri*, *pygidialis*, and apparently *tuberculipectus*) in the female only. The length of the basal dilation varies individually and tends also to be more exaggerated in larger specimens. Thus in some of the smaller males of *tuberculipectus* (the lectotype of "*brevinasus*," two specimens from middle Rio Ucayali, Peru, one from Satipo, Peru, one each from "Colombia," San Borja, Bolivia, and Mera, Ecuador), the basal dilation is not markedly longer than wide, whereas in larger males it is much longer than wide. In seven or eight females from "Ecuador," which are larger

than the smaller males just mentioned, the basal dilation is either slightly longer than wide or about as long as wide. The length of the dilated part corresponds with the distance from the eye of the antennal scrobe or opening; in a profile view a "short-nosed" specimen has the opening almost touching the eye, whereas a "long-nosed" one has it as far away as nearly the width of the antennal club.

Other characters of this species vary also (color, the shape of the pygidium, length of the body, and the length, width, punctuation, and curvature of the beak of males), so that certain specimens seem very dissimilar. Even the aedeagus is not constant. It is slightly pointed apically instead of being rounded in the lectotype of "*brevinasus*" and in a small male from San Borja, Bolivia (both of which have the prosternal tubercle reduced in size), but also in two large, nearly identical males from the Rio Perene Valley, Peru, a large male from the upper Rio Orinoco, Venezuela, and another from Chinchao, Huanuco, Peru. The male from Venezuela differs from the others by having the prosternal ledge emarginate.

Many specimens of both sexes were dissected.

***Metamasius rimoratus* (Gyllenhal)**

Figures 22, 83

Sphenophorus rimoratus GYLLENHAL, 1838, p. 893, Antioquia, Colombia; type, female, in Naturhistoriska Riksmuseet, Stockholm, examined.

DIAGNOSIS. Differing from others of subgroup by having tibiae densely, distinctly punctate on entire anterior face. Tibiae, femora, beak, antennal segments exceedingly long; front legs of male longer than those of any other species of genus except *biguttatus* Champion (species group III).

RANGE: Colombia and Ecuador. (For data on the five specimens examined, see Appendix.)

DESCRIPTION: (See also characters of subgroup). Length, 12 to 15 mm. Beak longer than pronotum, slender, not toothed inferiorly, in profile of same width throughout except where humped abruptly over scrobes; virtually impunctate, except for base; basal dilation very abrupt, as wide as long, its sides oblique to base (fig. 22), twice as wide (seen

from above) as remainder of beak; beak of male nearly one-third longer than pronotum, feebly arcuate, compressed; in profile of same width as front tibia; inferiorly shallowly sulcate and sides very faintly crenulate; scrobe with posterior edge scarcely a scape width from eye; beak of female more arcuate, almost cylindrical, in profile narrower than width of front tibia, more humped at base than that of male (fig. 83); not sulcate or crenulate inferiorly; scrobe with posterior edge touching eye. Antennal club elongate, spongy part equal to or slightly longer than basal part, all funicle segments longer than wide. Pronotum, sides subparallel in basal half in female, rather evenly rounded from base to apex in male; apical constriction strong; lightly punctate, disc impunctate in some specimens; basal impression, if present, very shallow, basal margin with slight median sinuation. Elytra, base strongly margined; stria punctures indistinct within striae; intervals impunctate. Pygidium with central, lateral, and apical fringe of hair, (male) narrowly rounded, (female) rather pointed.

Under surface virtually impunctate or feebly punctate, except for prosternum and mesosternum and legs (tibiae densely, even confluent punctate on entire outer, or upper, surface); prosternum flat or slightly depressed at middle, without swellings in front of coxae; distance between front coxae as wide as antennal club, about one-third of diameter of coxae; distance between middle coxae greater than diameter of coxae; venter of male scarcely depressed; last segment of abdomen (male) more or less truncate and not hairy, (female) more pointed, with tuft of hairs on sides of apex in type (hairs apparently worn off in two other females). Legs (male), front tibia and all femora very long, femora as long as pronotum, gradually widened, middle femur reaching beyond trochanter of hind femur, femora with short fringe of hairs, front and hind tibiae with hairs as long near apex as tibiae are wide, (female) tibiae and femora less long, less hairy, middle femur slightly bulbous. Front tarsus with third segment twice as wide as antennal club; hind tarsus with second segment elongate, one-half of length of first; claw segment inserted at extreme base of third segment. Aedeagus pointed slightly at

apex, with feeble projection; apodemes attached directly to sides; eighth tergum of male fringed with dense hairs apically.

Color, head and base of beak black or latter reddish; venter and legs black or reddish, in some specimens femora red basally and tibiae red apically; pronotum black with red M or black with two long red stripes each side of center and two short red stripes laterally; elytra black with red lineolate marks at base, behind middle, and apically, also laterally in some specimens (these marks, if joined, would make a red C on left elytron).

ECOLOGY: No information.

REMARKS: Although this species was described from the female as long ago as 1838, it is only now that the male is described. The male has gone unnoticed probably because no one attached importance to the diagnostic punctuation of the tibiae, and also because the male has such exceedingly long legs that it might well be thought to belong in another genus. Both Kuschel (1955, p. 281) and I (on a visit to Stockholm and Berlin) thought the type of *applicatus* Hustache, 1938, was the male of *rimoratus*. They are not the same, however, as both sexes of *rimoratus* have the tibiae densely and entirely punctate, whereas *applicatus* and allied species have them scarcely if at all punctate. A large male in the museum in Paris, marked, perhaps in Hustache's handwriting, "*rimoratus* non-typique," gave me a clue, and a subsequent re-examination of the type of *rimoratus* through the kindness of Dr. Hedqvist of Stockholm settled the question for me. These two species have, it is true, a number of similarities. The beak of the females is long and narrow and, seen dorsally, has a wide, short basal dilation and the antennae inserted very close to the eyes (the base is more "humped" in *rimoratus*). In both sexes of *rimoratus* the sides of this dilation are oblique so that, when seen from above, this part is wider in front than behind (fig. 22), whereas only the female and an occasional male of *applicatus* have the sides oblique. The males of both species have long, thin beaks, long legs, and long fringes of hair on the front tibiae, but the femur of *rimoratus* is longer, the front one being as long as the pronotum, and the middle one extending beyond the trochanter of the hind femur. The aedeagus of

rimoratus is acuminate apically; that of *ap-plicatus* is rounded or truncate.

In the list of specimens examined in the Appendix, I do not include specimens of these two species that I examined previous to my discovery of the importance of the punctate tibiae. The only specimens of *rimoratus* I record, in addition to the female type, are a male and female in the collection of the California Academy of Sciences, a female in the zoological museum in East Berlin, and the large male mentioned from the museum in Paris. Both males and one of the females were dissected.

SPECIES GROUP II, *INAEQUALIS*

Metamasius inaequalis (Gyllenhal)

Figures 2, 6, 19, 30, 96

Sphenophorus inaequalis GYLLENHAL, 1838, p. 926, "Cayennae et in Brasilia," type, female, Cayenne [French Guiana], in Naturhistoriska Riksmuseum, Stockholm, examined. CHAMPION, 1910, pl. 5, figs. 12, 12a [under name of *polygrammus*].

Sphenophorus distortus GEMMINGER AND HAROLD, 1871, p. 2648, new name for *Sphenophorus inaequalis* Gyllenhal, 1838, preoccupied by *Rhynchophorus inaequalis* Say, 1831, if *inaequalis* Say is placed in genus *Sphenophorus*. This action is unnecessary as *inaequalis* Gyllenhal is now in *Metamasius*.

DIAGNOSIS: Extremely similar to *melancholicus*, but differing by having basal depression at center of pronotum as well as laterally, pronotal surface uneven and rough as a rule, lateral margins of pronotum broadly, shallowly emarginate in basal half (seen from above) and (seen from sides) strongly arcuate and swollen, causing distinct concavity on sides of prosternum, tibiae strongly curved as a rule, first tarsal segment on hind legs shorter, middle femora longer. Majority of males having slight swelling on metasternum in front of middle, lacking in males of *melancholicus*.

RANGE: Most of Brazil, also Peru and all of northern South America, and Panama, Costa Rica, and Nicaragua in Central America. (For data on the 161 specimens examined, see Appendix.)

DESCRIPTION: Length, 8.5 to 12 mm. Frons between eyes slightly wider than one-half of width of beak at base. Beak slightly shorter

than pronotum, virtually cylindrical, tomentose at base where also tumid and humped over antennal insertion, thickened at base under scrobe; basal dilation distinct, much longer than wide; scrobe with posterior edge nearly two widths of scape from eye; peduncle of postmentum flat, obsoletely sulcate; beak of male, in profile, at least as wide as antennal club (in some instances wider), gently arcuate, inferiorly tomentose and furrowed, furrow becoming double toward apex, well punctate, punctures often tomentose; beak of female, in profile, narrower than antennal club, much narrower than that of male, strongly arcuate, scarcely punctate except for base, inferiorly glabrous. Antennal club dilated, flattened (but rather conical in several specimens), spongy part slightly shorter than, or in type equal to, basal part. Pronotum distinctly longer than wide, punctate irregularly, in most specimens additional punctures at middle base; sides, in more than basal half, concave or subparallel, tumid and arcuate when viewed laterally; surface uneven, in some specimens humped at middle; apical constriction strong; base with three deep or shallow foveae, one at center and one each laterally, base margined and furrowed to sides, but in many specimens hidden under base of elytra, base at middle gently sinuate. Elytra, base strongly margined, but margin not evident in tomentose specimens; sides strongly convergent to apex; alternate intervals (suture, second, fourth, sixth) raised above others, subcostate and centrally tomentose in some specimens, but third interval for short space in front of middle raised also, second and fourth intervals wider than others, especially second at base where slightly turned toward scutellum and slightly advanced onto pronotum in some specimens; striae punctures large, but obscured by coating or tomentosity in some individuals; intervals apparently impunctate. Scutellum narrowly elongate and nearly parallel, or elongate-triangular with sides convergent to apex, depressed in front but appearing flat when coated over. Pygidium tomentose and narrowly pointed in both sexes, fringed with hairs at apex or in long lateral tufts, also long tuft of hair on short, tubercular, central ridge.

Under surface well punctate, except, in

some individuals, for impunctate sides of prosternum and sides of mesosternal region; distance between front coxae narrower than antennal club, but twice as wide as antennal funicle, about one-third diameter of coxa; distance between middle coxae slightly wider than diameter of coxa; front and middle coxae hairy behind; ventral depression of male distinct, hairy; in front of center of metasternum (male) slight hump or flattish tubercle; last segment of abdomen in both sexes narrow, well punctate, slightly hairy near apex. Front and middle tibiae slightly, and hind tibiae strongly, curved (fig. 6); femora strongly punctate, front femur curved, front and middle femora bulbous, hind femur gradually widened, middle femur reaching to base of metasternum, hind femur nearly to apex of abdomen; front tarsus with third segment narrower than antennal club, but distinctly wider than second segment; third segment of hind tarsus more elongate, scarcely dilated, very variable; soles of tarsi glabrous at middle or at middle base; claw segment inserted at middle or near apex of third segment; first segment of hind tarsus not more than three times length of second. Aedeagus (fig. 2) with lateral line in some specimens evanescent toward base; apodemes joined to aedeagus dorsally without visible membrane; aedeagus truncate at apex, apical third narrower than remainder (fig. 30).

Color fuscous, opaque, velvety, or shining; head and beak reddish; pronotum red or purple or orange or grayish, with three longitudinal, black, usually velvety-appearing, stripes, lateral ones short in some specimens; elytra (fig. 96) red, reddish, or gray, with elevated, lineolate, velvety black stripes on second interval in more than basal half and at apex, on third and fourth intervals in front of middle, on fourth interval also at base and near apex, on sixth interval throughout, on seventh at base, on eighth and ninth almost throughout, on suture reddish or partly black, but stripes in some specimens only vaguely visible; legs black or red or mixture of both; under side mostly black with some indefinite red areas.

ECOLOGY: Specimens from Bahia, collected by Bondar in 1936 and 1937 and deposited in the British Museum (Natural History), were taken "in branches of kapok"

or *Ceiba*, family Bombacaceae, and "on fruit of *Sterculia* sp.," the Sterculiaceae, or chocolate family. Some individuals have little pieces of the fiber caught between their legs. A female from Hamburg Farm, Costa Rica, was taken on the leaves of *Asterogyne* sp., a palm, in June, 1933. A female taken in the month of January, 1936, probably in Bahia (a Bondar specimen), has the notation "*sobre fruta Bacurari verdadeiro*."

REMARKS: Günther (1941, p. 53) was the first to consider this species in the genus *Metamasius*, but his notation to that effect was evidently not received by Blackwelder, who lists the species in his catalogue (1947) under the genus *Calendra* (now *Sphenophorus*), and with the emended name given by Gemminger and Harold (*distorta*), which is no longer applicable (see citation above). Kuschel (1958, p. 750) also used the name *distortus* in his new combination *Paramasius distortus*, but he too evidently overlooked Günther's placing of *inaequalis* in *Metamasius*, as Kuschel gave the preoccupied name as *Calendra inaequalis* Gyllenhal.

This widespread species is extremely variable in its sculpture, and several specimens from Peru could therefore be mistaken for a different species. The principal variations include the distinctness of the concavity of the prosternal sides and the arcuate, emarginate sides of the pronotum, as well as the depth of the dorsal depressions of the pronotum, the sculpture of the elytra, and the size and shape of the antennal club. In a few specimens the pronotum not only has very deep basal depressions, but it is bent downward toward the front. In other specimens the pronotum and the sides of the prosternum are almost as smooth as those of *melancholicus*. In several specimens the surface of the elytra is very uneven. The curvature of the tibiae and of the front femora varies also individually. Many specimens have a scabrous appearance caused by tufts of brown tomentosity in the punctures of the pronotum; similar punctures are found in specimens of *canalipes*. The type is a roughly sculptured individual with a deep concavity on the prosternum and the pronotum bent forward.

I have four specimens from northern Peru (Rio Santiago and Peru-Brazil frontier) and northern Brazil (Manaus and Benjamin

Constant in Amazonas) which may be extreme variations of *inaequalis* or may be a distinct species. At first view these specimens differ from other specimens by having the humerus and the even intervals of the elytra sharply cristate in short, tomentose, interrupted keels, but some individuals of "typical" *inaequalis* also have tomentose keels, although they are feeble and not interrupted. The four individuals mentioned differ further by having the antennal club narrower, less dilated, more cylindrical, with the spongy part smaller; the third tarsal segment less dilated; and the front of the metasternum not tumid in the three males. The tibiae of at least two of the four specimens appear somewhat less curved than is normal. Other characters, including the aedeagus, agree with those of the majority of individuals, and in view of the great variability present in the species, I am not describing these specimens as a new species.

Five males and two females were dissected.

***Metamasius melancholicus* (Gyllenhal)**

Figures 19, 30

Sphenophorus melancholicus GYLLENHAL, 1838, p. 917, Brazil; type, male, Espirito Santo, Brazil, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sphenophorus polygrammus GYLLENHAL, 1838, p. 918, Brazil; type in Naturhistoriska Riksmuseum, Stockholm.

DIAGNOSIS: Scarcely distinguishable from some individuals of *inaequalis* (only other species in group), but surface generally smooth, not uneven, pronotum with very faint lateral depressions at base and no median depression, margins of pronotum not sinusously swollen, and hind tibia scarcely curved.

RANGE: Brazil and (one specimen) Peru. (For data on the 31 specimens examined, see Appendix.)

DESCRIPTION: Length, 10 to 13 mm. Frons and beak as described for *inaequalis*, but beak not quite so tumid or tomentose at base over antennal insertion, in profile narrower than antennal club, and (male) inferiorly with single, not double, furrow. Antennal club slightly wider than that of *inaequalis*, spongy part equal to or longer than base.

Pronotum distinctly longer than wide, finely punctate or impunctate, many specimens with additional punctures at middle base; sides in basal half subparallel or slightly concave; surface smooth, not humped; apical constriction strong; base not depressed at middle, but shallowly depressed at sides in some specimens; base margined and furrowed to sides and gently sinuate at middle as in *inaequalis*. Elytra, scutellum, and pygidium as described for *inaequalis*, but pygidium less strongly cristate, and elytral intervals not at all cristate.

Under surface as described for *inaequalis*, but male with metasternum flat, not tumid, both sexes with tibiae scarcely curved, middle femur shorter, not reaching base of metasternum, and first segment of hind tarsus four times length of second. Aedeagus as described for *inaequalis* (fig. 30).

Color, head and beak red; pronotum red with three long, longitudinal, black stripes; elytra red or purplish with elevated, lineolate, black stripes in same pattern as described for *inaequalis*; under side and legs as described for *inaequalis*.

ECOLOGY: No information.

REMARKS: This species appears to be far less abundant than *inaequalis*, although the two species occur in some of the same places in Brazil (Espirito Santo at Tijuco Preto; Rio de Janeiro; São Paulo; Bahia; and Santa Catarina at Corupa). It is not only similar to *inaequalis* (as can be seen in the description above), but also to some species of other groups (*hebetatus*, *tectus*, *canalipes*) in its size, in its narrow, subparallel shape, dusty coloration, and its elongate basal dilation of the beak which causes the antennae to be inserted rather far from the base of the beak. The species mentioned differ from *melancholicus* and *inaequalis* by having the pronotum subtruncate, not sinuate at the base, the elytral intervals on the same plane, not alternating in height, the tibiae not at all curved, and the aedeagus of different shape. The beak of *canalipes* is virtually the same in both sexes, but, in the other species mentioned, that of the female is generally more arcuate and narrower than that of the male.

Four males of *melancholicus* were dissected.

The type specimen is a velvety, smooth-surfaced male with the elytra more piceous

than red and the pronotum an indeterminate red. The type of *polygrammus* (Brazil) I have not seen, as it was out on loan at the time of my visits to the Riksmuseum in Stockholm, but Kuschel saw it and synonymized it (1958, p. 751) with *melancholicus*. The dozen or so specimens that Champion (1910) identified as *polygrammus*, which I have examined, are not *polygrammus* or *melancholicus*, but *inaequalis*. This is evident from Champion's illustration (pl. 5, fig. 12a) of the sinuously swollen margins of the thorax and from his mention of the trifoveate base of the pronotum, both characters of *inaequalis*.

INCERTAE SEDIS

Curculio purpurascens PANZER, 1798, p. 52, pl. 36, fig. 11, no locality given; no type found.

In the Junk catalogue, Csiki (1936, p. 41) regarded this form, with a question mark, as a synonym of *ensirostris* Germar, 1824, and Blackwelder (1947) evidently followed Csiki, but removed the query. If these names are synonymous, however, *purpurascens* has priority. Panzer's colored illustration of *purpurascens* shows an elytral pattern that could belong to a number of species (to *ensirostris*, *anceps* Gyllenhal, *basilaris* Vaurie, new species, and others), a red C on the left elytron, reversed on the right, and red extensions to the base and apex of the elytra. This color pattern is not sufficient for identification of the species, and Panzer's one-sentence description adds nothing except for the state-

ment that his species seems similar to *hemipterus*. The type of another of Panzer's forms, *variegatus*, a synonym of *hemipterus*, also has never been found.

Sphenophorus atricolor CHEVROLAT, 1880c, p. 198, Martinique; type, female, said to be in Naturhistoriska Riksmuseum, Stockholm.

This may be a synonym of *Metamasius maurus* Gyllenhal or of *liratus* Gyllenhal, both of which occur in Martinique, but I have not seen the type and Chevrolat does not mention any characters that would help one to identify it. The writer of a note in a box of specimens in the Muséum National d'Histoire Naturelle in Paris said that he saw the "types" of *atricolor* in Stockholm and that they were the same species as *maurus*, but *maurus* and *liratus* are readily confused, and *atricolor* might be either species. Chevrolat gave the length as 25 mm., which is surely an error as the other species are no more than 14 mm. (Chevrolat made the same kind of error in describing his *cornurostris* from Guadeloupe, giving its length as 18 mm., whereas it is only 14 or 15 mm.).

The citation for *atricolor* in the catalogues (Csiki, 1936; Blackwelder, 1947) appears to be incorrect, as I found no page CXCVIII in the *Annales de la Société Entomologique de France*, 1880, but did find the same page in roman numerals, 198, in *Le Naturaliste*, 1880. In both catalogues, *atricolor* is listed with the species of *Calendra* or *Calandra* [now *Sphenophorus*], instead of with *Metamasius*.

APPENDIX: SPECIMENS EXAMINED

FOR CONVENIENCE, the species, as well as the countries under each species, are listed alphabetically, except for the polytypic species *M. hemipterus*. The names in parentheses are those of the collector or collectors. All the species are listed.

Metamasius anceps (Gyllenhal)

Bolivia: 4; Chilumani, 1952 (Munro), 1 ♂; Coroico, 9 ♂, 4 ♀ (including cotypes of *bilobus*); Huachi, Rio Beni (Harrington), 1; Santa Cruz, Aug., 1961 (Candia), 32 ♂, 14 ♀; Aug., 1955 (Zischka), 1, Aug., 1952, Feb., 1953 (Munro), 5 ♂, 4 ♀; Santa Cruz de la Sierra, Prov. Sara, 500 m., Apr., 1904 (Steinbach), 6; Yapacane, Feb., 1961 (Candia), 3 ♂, 2 ♀; Yungas, 2; La Paz, May, 1925 (Harrington), 1. *Brazil*: 2 ♂; Amazonas: Benjamin Constant, Oct., 1945 (Praetorius), 2 ♂; Para, 1 ♂. *Colombia*: 2 ♂, 1 ♀; Bogota, 1 ♂. *Ecuador*: Guayaquil (Goding), 3; Jatun Yacu, Rio Napo watershed, Mar., 1937 (Clark-MacIntyre), 1 ♂, 1 ♀; Macas (Bottcher), 1 ♀; Mera, 1 ♀ (type of var. *ampliocollis*), 1 ♀ ("cotype" of *bilobus*), 8; Quito, 1 ♀; Sarayacu, 1 ♀. *Peru*: 13; Casapalca, 14,000 ft. (Bandelier), 1 ♀; Chanchamayo, Dec., 2 ♂; 1927–1928 (Wolcott), 3 ♂, 2 ♀; 6 ♂, 2 ♀; Huan, 1 ♂; Rio Abujao, July, 1929 (Bassler), 1 ♀; Rio Napo, July (Parish), 1; Rio Ucayali, Jan., 1927 (Bassler), 1 ♂; Rio Toro, 7; Satipo, Jauja Prov., Mar., 1945 (Paprzycky), 1 ♂; Tingo Maria, Huanuco, May, 1947, 2200 ft. (Pallister), 1 ♀; Vaca-Poza, San Martin, 830 m., Feb., 1947 (Woytkowski), 1 ♂.

Metamasius applicatus Hustache

Bolivia: Rio Bopi, Dept. La Paz, May, 1925 (Harrington), 1 ♀. *Brazil*: 3 ♂ (including syntype of *applicatus*), 2 ♀. *Colombia*: 6 ♂ (including syntype of *applicatus*), 2 ♀. *Colombia or Brazil*: 2 ♂. *Venezuela*: 3 ♂ (including type of *applicatus*); Caracas, 1 ♂, 1 ♀. Mexico [error in locality?], 1 ♂.

Metamasius basilaris Vaurie, new species

In addition to the type and paratypes from Brazil, the following specimens have been seen:

Argentina: Bemberg, Misiones, Jan., 1945 (Hayward, Willink, Goldbach), 1 ♀. *Brazil*: 2 ♂, 1 ♀. *Colombia*: 1 ♀. *Ecuador*: Sarayacu, 1 ♂. *Peru*: Marcapata, 1 ♀. "N. Freib." (?), 1 ♂. *No locality*: 1 ♂.

Metamasius benoisti Hustache

Ecuador: San[to] Domingo, 400 m. (Benoist), 7 ♂, 6 ♀ (including cotypes); Santo Domingo, Nov., 1956 (Portman), 1 ♂.

Metamasius bisbisignatus (Gyllenhal)

Brazil: 4 ♂, 4 ♀; Bahia, 1 ♀; Espirito Santo, 3 ♂, 1 ♀; Affonso Claudio, Espirito Santo, Mar., 1954, 4 ♂, 1 ♀; Jatahy, Goyaz, 1 ♀; Minas Gerais, 1897 (Fruhstorfer, Kraatz), 1 ♂; Rio de Janeiro, 1 ♂ (type), 1 ♀ (allotype); Santa Catarina: Corupa, 1 ♀, Feb., 1946, 1 ♀; São Paulo: 1 ♀, Ribeirão Preto, Fazenda Dumont, Dec., 1927, 1 ♂. *Paraguay*: 1 ♀. *Venezuela*: (Kraatz), 1 ♀.

Metamasius bromeliadiocola Champion

Costa Rica: (See under the species in the text).

Metamasius bruneri Buchanan

Cuba; ? *Jamaica*: (See under the species in the text).

Metamasius callizona (Chevrolat)

Guatemala: San Juan, Alta Verapaz (Champion), 1 ♂. *Mexico*: 4 ♂ (including type), 3 ♀. Chiapas: June, 1959, 1. Puebla: Acatlan, Feb., 1903, 1 ♀. Veracruz: Amatlan, Feb., 1947 (Kraus), 2 ♀; Cordoba, 2 ♀; Fortin, Dec., 1957, 1; Metlac, Dec., 1940 (Hobbs), 1 ♀; Rio Metlac near El Fortin, Dec., 1948 (Leech), 1 ♀; Toxpam (Salle), 1 ♂, 1 ♀. *Panama*: Potrerillos, Dec., 1935 (Brown), 1 ♀.

Metamasius canalipes (Gyllenhal)

Bolivia: Santa Cruz (Candia), 3 ♂, 1 ♀, Aug., 1961 (Candia), 8 ♂, 3 ♀; Portachuelo, Santa Cruz, Aug., 1960 (Candia), 2 ♂, 1 ♀. *Brazil*: 1 ♀; (Bondar Collection), 7 ♂, 3 ♀; Bahia, 1 ♀. Para: Para, 1 ♂; Belem-Para, 1934 (Silva), 2; Mangabeira, Mocajuba, July, 1953, 1 ♀. Rio de Janeiro: Terezopolis, Dec., 1957, 1 ♀; Corcovado, Dec., 1961 (Alvarenga), 1 ♀. São Paulo: Bertioga, Jan., 1956, 1 ♀. Espirito Santo, 3 ♂, 1. El Nacional [not located], 1 ♂. "Ind. or?": 1 ♂ (type).

Metamasius cerasinus Vaurie, new species

In addition to the type and paratypes from Venezuela and the island of Trinidad, the following specimens have been seen:

Panama: Ciricito, Canal Zone, July, 1931, 2 ♀. *French Guiana* [this species or *canalipes*?]: Kourou, 1 ♂; Cayenne, 1 ♀.

Metamasius ciliatus (Champion)

Mexico: 1 ♀; Mexico City (Hoegel), 1 ♂ (lectotype). Veracruz: Cotaxtla Experiment Station, June, 1962 (Janzen), 1 ♀. Yucatan: Temax, 1 ♂, 3 ♀.

***Metamasius cinnamatus* Champion**

Costa Rica: Estrella, 1250 m., May, 1 ♂, 2000 m., Sept., 1 ♀; Orosi, 1300 m. (Picado), 1 ♂, 1 ♀, Mar., 1932, (Kupper), 1 ♀. *Ecuador*: Paramba (Fry), 1 ♂. *Nicaragua*: Chontales, 1 ♂ (type). *Panama*: Apr., 1953, 1 ♂; Canal Zone, Jan., 1958, 1 ♀.

***Metamasius cinnamominus* (Perty)**

Bolivia: Coroico, 1 ♂; Santa Cruz, 2 ♂, 4 ♀. *Brazil*: 3 ♀ (including type of *cinnamominus*); Bahia, 1 ♂; Orinoco, 5; Lower Amazon, Forest Santarem, 1 ♂; "Amazons"? Barreiras das Aroras, Rio Solimões, 1 ♂, 1 ♀; Tacana, 1 ♂, 1 ♀. *Amazonas*: Manaus, Aug., 1962 (Lenko), 1 ♂; Benjamin Constant, Rio Javary, Feb.-Mar., 1942 (Rabaut), 1 ♀. *Amapa*: Serra Navio, Sept., 1 ♀. *Goyaz*: Jatahy, 4. *Mato Grosso*: Correntes, 1 ♀. *Para*: Belem, 1922 (Costa Lima), 6 ♂, 5 ♀; Cachimbo, Oct., 1955 (Pereira), 1 ♀. *British Guiana*: Bartica Triangle, 1948-1949 (Atkinson), 2 ♂, 1 ♀; Bartica-Potaro Road, Mile 24, 1948-1949 (Atkinson), 1 ♂; Essequibo R[iver], Moraballi Creek, Sept.-Oct., 1929, Oxford Univ. Expedition, 1 ♂, 1 ♀; Kaieteur, Aug., 1911, 1 ♂. *Colombia*: 3 ♂ (including paratype of *obsoletus*), 2 ♀; Villaviciencio, June, 1 ♀. *Ecuador*: Coca, 1 ♀; Quito, 1 ♀. *French Guiana*: Cayenne, 1 ♂ (type of *obsoletus*), 5 ♀ (including type of *spadiceus*); Guatimala, Kourou River, 3; Gourdonville, Kourou River, 1; Nouveau Chantier, 1; Pariacabo, Kourou River, 1; St. Jean du Maroni, 1; St. Laurent du Maroni, 11. *Honduras*: 1 ♂. *Peru*: 1 ♀; Iquitos, Oct., Nov., 1927, 2 ♂; middle Rio Ucayali, Jan., 1927, 2 ♀; Rio Ucayali, Dec., 1926, 1 ♀; Satipo, Jauja Prov., Nov., 1945 (Maller), 1 ♀, Nov., 1948 (Paprzycki), 1 ♀. *Trinidad*: Central Research Station, 1960, 1 ♂, 1 ♀; Coparo, Mar., 1910, 1 ♂, 1 ♀; Mayaro (Urich), 2 ♂, 1 ♀, Sept., 1924 (Neave), 1 ♀. *Venezuela*: Mt. Duida, Dec., 1928, 1 ♂, 1 ♀; Suapure, Caura River, Mar., Apr., 1899 (Klages), 22 ♂, 11 ♀.

***Metamasius cornurostris* (Chevrolat)**

Guadeloupe: 2 ♂ (types of *cornurostris* and *puncticollis*); 6 ♂, 7 ♀; Gourbeyre (Dufau), 4 ♂, 1 ♀; Trois Rivières, 1901. 2 ♂. *No locality*: 1 ♀ (paratype of *puncticollis*).

***Metamasius crustosus* Vaurie, new species**

Peru: (See under the species in the text).

***Metamasius dasyurus* Champion**

Bolivia: Chuma La Paz, Nov., 1935 (Mexia), 1 ♂. *Brazil*: 1 ♀. *Colombia*: Bueneventura, May, 1926 (Cook), 1 ♂, 1 ♀; Muzo, 1 ♀. *Costa Rica*: Feb., Sept., Dec. (Nevermann), 4 ♂, 1 ♀; Azahar de Cartago (Underwood), 6 ♀ (including 1 syn-

type of *dasyurus*); Coronado, 1400-1500 m. (Assmann), 1 ♂; Hamburg Farm, Reventazon, Plain of Limon, Mar. (Dodge), 1 ♂, 1 ♀, Jan., Feb., Sept., Oct., Nov., 1926-1935, 7 ♂, 6 ♀; La Caja, near San Jose, Mar., 1929 (Schmidt), 1 ♀; Las Mercedes, Santa Clara, 200-300 m., 1 ♂; Ramal, Parismina, Santa Clara, June, 1925, 1 ♂; San Carlos, 1 ♀ (syntype of *dasyurus*); San Jose, 1200 m. (Fernandez), 1 ♂. *Ecuador*: 2 ♂, 3 ♀; Mera, 1 ♂ (type of *alternans*); Paramba, 3500 ft., May, 1897 (Rosenberg), 1 ♂, 1 ♀; Quito, 1 ♂; San[to] Domingo, 1 ♂, 7 ♀. *French Guiana*: Cayenne (Bowring), 1 ♂. *Honduras*: 1940 (von Hagen), 1 ♂, 1 ♀; Rio Claura, Apr., 1923 (Hubbell), 1 ♂, 1 ♀. *Mexico* [error in locality?]: 1 ♀. *Panama*: Bugaba, 2 ♂, 1 ♀; Chiriqui, 9 ♂, 19 ♀; Volcan de Chiriqui (Champion), 6 ♂ (including lectotype and syntype of *dasyurus*), 3 ♀; Pirri Range, Apr., 1912 (Goldman), 2 ♀. *Venezuela*: 2 ♂, 2 ♀.

***Metamasius difficilis* Günther**

Costa Rica: Mar., 1935, 1 ♂; Guapiles, Limon Prov., Aug., 1963 (Janzen), 1 ♂; Miravalles (Underwood), 1 ♀. *Ecuador*: Latacunga, 1 ♂ (type); Paramba (Rosenberg), 1 ♂, 1 ♀. *Honduras*: 1940 (von Hagen), 1 ♂.

***Metamasius dimidiatipennis* (Jekel)**

Brazil: 1 ♂; Para, 2 ♂, 3 ♀; Rio Felicio, Territory Amapa, July, 1959 (J. Lane), 1 ♂; São Paulo de Olivença (Waehner), 1 ♀; Benjamin Constant, Amazonas, 1 ♂. *British Guiana*: Kaieteur, July, 1911, 1 ♀; Tukeit, July, 1911, 1 ♀. *Colombia*: 1 ♂; Rio Suarez, 900 m., Aug., 1946 (L. Richter), 2 ♂; Rio Frio Valley, Sierra Nevada de Santa Marta, 1906 (Pittier), 1 ♂. *Costa Rica*: 2 ♂, 3 ♀; Azahar de Cartago (Underwood), 1 ♀; Surubres, 250 m. (Biolley), 1 ♂; Juan Viñas, near Rio Reventazon, 2700 ft., Oct., 1909 (Calvert), 1 ♂. *Ecuador*: Paramba, 1 ♀. *French Guiana*: Cayenne, 4 ♂, 2 ♀; Charvein, Bas Maroni, 1 ♀; Gourdonville, Kourou River, 1 ♂; Nouveau Chantier, 1 ♀; St. Laurent du Maroni, 2 ♂, 4 ♀ (including ♂ and ♀ cotypes of *consularis*). *Guatemala*: San Isidro, 1600 ft. (Champion), 1 ♂ (lectotype of *connexus*). *Mexico*: 1 ♂; Toxpam, 2 ♂, 2 ♀. *Panama*: 2 ♂, 1 ♀; Barro Colorado, 1 ♀, July, 1963 (Cavagnaro and Erwin), 1 ♂, 2 ♀; Taboga Island, 5 ♀; Chiriqui, 2 ♂, 1 ♀. *Peru*: 1 ♀; Chanchamayo, 1 ♀; Huanuco, 1 ♂; Iquitos, 1 ♂; middle Rio Ucayali, Mar., 1929 (Bassler), 1 ♂; Satipo, Jauja Prov., Mar., 1945 (Paprzycki), 1 ♀; upper Rio Huallaga, Oct., 1929 (Bassler), 1 ♀. *West Coast of America*: 1 ♀ (type of *dimidiatipennis*). *Java*: Apr., 1923, 2 ♂.

***Metamasius ensirostris* (Germar)**

Argentina: Refugio Piñalitos, Dept. Frontera, Misiones, Nov., 1954 (Partridge), 5 ♀; Rio Pa-

rana, 4; Rio Salado, 1 ♀; San Ignacio Missions, upper Parana, 2 ♀; Tandil, Feb., 1952, 3 ♀. *Brazil*: 7; 8 ♂ (including 2 paratypes of *dispar*), 9 ♀ (including type and 2 paratypes of *dispar*); Sete Lagoas, 1 ♂, 2 ♀; Joinville, 4; Petropolis, 1 ♂, 1 ♀; Santos, 1; Tijuca, 7; Alto de Serra, 1; Mendes, 92 km. from Rio de Janeiro, 8. Bahia: 15; Ilheus, 1. Espirito Santo: 21; Santa Thereza, Dec., 1928 (Conde), 3 ♀; Tijuco Preto, Oct., Nov., 1948 (Maller), 4. Goyaz: Jatahy, 1 ♂, 2 ♀. Mato Grosso: 2. Minas Gerais: Porto Alegre, 1; Vicosia, June, 1932 (Humbleton), 1 ♀. Parana: 2; Caviuna, Sept., Oct., Dec. (Maller), 1 ♂, 4 ♀; Eldorado, 1 ♀; Rolandia, Dec., 1947, 1 ♂. Rio Grande do Sul: Cerro Largo, 1 ♂, 3 ♀; Cruz Alta (Martin), 3; Dois Irmãos, 9 ♂, 1 ♀; Morro Sapucaia, 2 ♀; Nova Teutonia, 1 ♀; Pareci Novo, 1 ♂, 1 ♀; São Leopoldo, 5 ♂; São Salvador, 1 ♂, 1 ♀. Rio de Janeiro: 2 ♂, 3 ♀; B[ahia] de Pirahy, Nov., 1934, 2; Santa Cruz (Hensel), 3. Santa Catarina: 41; Corupa [Hansa Humboldt], Mar., Oct., Nov., Dec. (Maller), 3 ♂, 6 ♀, (Reitter), 5; Pinhal, Dec., 1947, 1 ♀; Rio Capivary, 1888 (Fruhstorfer), 3; Rio Natal, Dec., 1944 (Maller), 1 ♂; Rio Vermelho, Mar., Dec., 1945, 2 ♂, 4 ♀; São Francisco, Dec., 1948 (Maller), 1; Florianapolis, 1 ♂, 1 ♀; Itapiranga, 8 ♀; Theresopolis, 1888, 1. São Paulo: 49; Cantareira (Nick), 3 ♀; São Paulo, 8. *Colombia*: 1 ♂, 2 ♀; Cali, 1 ♂; Cartago, 1 ♂, 1 ♀. *Mexico* [error in locality?]: 3 ♂. *Paraguay*: 2; Mar., 1952, 6; Hohenau, Alto Parana, 1 ♀; Paso Yobai, Oct., 1950, 1 ♀. *Venezuela*: 1.

***Metamasius fasciatus* (Olivier)**

Costa Rica: Mar., 1925 (Nevermann), 1 ♂; Azahar de Cartago (Underwood), 1 ♀ (type of *ochreofasciatus*); Cartago, 1300 m., Nov., 1910 (Picado), 1 ♂; Hamburg Farm, Reventazon, Sept., 1928 (Nevermann), 1 ♀; Orosi (Picado), 2 ♂, 2 ♀; Pacayas (Werckele), 1 ♀. *Panama*: Chiriqui, 1 ♂, (Trotsch), 1 ♀. *Venezuela*: Caracas (Sallé), 1 ♀.

***Metamasius flavopictus* (Champion)**

Mexico: Jan., Mar., Dec., 3 ♂, 4 ♀. Guerrero: Omilteme, 8000 ft., July (Smith), 1 ♂ (type of *flavopictus*). Puebla: Cinco Señores, 1 ♀ (lectotype of *decempunctatus*). Veracruz: Jalapa (Hoegel), 1 ♂.

***Metamasius foveolatus* Günther**

Colombia: (See under the species in the text).

***Metamasius guentheri* Vaurie, new species**

Ecuador: (See under the species in the text).

***Metamasius hebetatus* (Gyllenhal)**

Bolivia: Yungas de la Paz, 1 ♀. *Colombia*: 6 ♂,

7 ♀; Bogota, 1 ♂, 1 ♀; Antioquia, 1 ♀ (type of *hebetatus*); Cauca, 12; Ibague, 14; Medellin Valley (Gallego), 1 ♂; Muzo, 1; Villaviciosa [= Villaviciencia?], 3. *Costa Rica*: 1 ♀; Nov., 1934 (Nevermann), 1 ♀; El Congo, 750 m., July, 1933 (Paez), 1 ♂, 2 ♀; Hamburg Farm, Sept., 1935, 1 ♂; Orosi, 1 ♀; San Carlos, 1 ♀; San Jose (Valerio), 1 ♀; Talamanca (Biolley), 1 ♀; *Ecuador*: 1 ♂, 1 ♀; Baños, Rio Pastaza Cañon, 1700 m., Nov., 1937 (Clark-MacIntyre), 3 ♂, 2 ♀; El Partidero, Nov., 1935 (MacIntyre), 1 ♀; Mangosisa River, 650 m., (Gomez), 1 ♀; Macas, 1 ♀; Nanegal, 5000 ft., 2 ♂; Paramba, 3500 ft., May, 1897 (Rosenberg), 4 ♂, 4 ♀; Puyo Oriente, 1000 m., Oct., 1937 (Clark-MacIntyre), 1 ♂; San Carlos, Nov., 1935 (Schultze-Rhonhof), 1 ♀; Santo Domingo, 1 ♂, Nov., 1953, 2 ♀, Nov., 1956 (Portman), 6; Tenguel (Roberts), 1 ♂, 1 ♀. "*Guiana*": 1 ♂. *Nicaragua*: Chontales (Richardson), 1 ♀. *Panama*: Bugaba (Champion), 1 ♀; Chiriqui, 1 ♂; Volcan de Chiriqui (Champion), 2 ♂, 3 ♀. *Peru*: 1 ♂; Chanchamayo, 1 ♀ (type of *conicicollis*); Chinchao, 25 km. below Carpish, Huanuco, 2500 m., Sept., 1946, 1 ♂, 1 ♀; Divisoria, Huanuco, Sept., 1946 (Woytkowski), 1 ♀; Rio Santiago, June, Nov. (Bassler), 2 ♀. *Venezuela*: 4 ♂, 2 ♀; Caracas, 4 ♂.

Metamasius hemipterus

***Metamasius hemipterus hemipterus* (Linnaeus)**

Lesser Antilles: (150 to 200 specimens). *Puerto Rico*: Adjuntas; Aibonito; Las Mesas; Mandios [?]; Maricao; Naguabo; San Juan; Santa Rita; Utuado. *St. Croix*. *St. Thomas*. *St. Kitts*. *Antigua*: St. John's. *Montserrat*. *Guadeloupe*: (Types of *decoratus*, *inscripta*, and *sacchari*), Domaine Duclos; Gourbeyre; Matouba. *Dominica*: Grand Bay. *Martinique*: Fort de France; La Meynard. *St. Vincent*. *Grenadines*: *Grenada*: Balthazar. *Bequia Island*. *Barbados*.

Trinidad: (30 to 40 specimens). Brasso; Montserrat District; St. Augustine; Woodlord Lodge Estate.

Venezuela: Amacuro River, 1; Mt. Duida, 3; Suapure, Caura River, 170; Territory of Amazonas, Camp 4, 7.

Colombia: Caucaya, Rio Putumayo, 1; Mocoa, 1.

Ecuador: Abitagua, 2; El Partidero, 1; Jatun Yacu, 3; Macas, 1; Napo River, 1; Quito, 5; Rio Coca, 7; Zamora, 4; Zatzayacu, 4.

Peru: Achinamiza, 33; Boqueron del Padre Abad, Loreto, 3; Chanchamayo, 5; Ekin-Uruhuasha, San Martin, 1; Huan, 1; Huanuco, 8; Iquitos, 7; Juanjuy, 1; Lima, 4; Luisiana, Apurimac River, 1; Marcapata, 1; middle Rio Ucayali, 17; Mishqui-yacu, Moyobamba, 3; Moyobamba region, 1; Pucallpa, 5; Quillabamba, 1; Rikuir-

Cocha, San Martin, 9; Rio Abujao, 2; Rio Maraño, 9; Rio Morona, 3; Rio Tapiche, 13; Rio Toro, 34; Rio Santiago, 7; Satipo, 10; Tingo Maria, 3; upper Rio Maraño, 5; upper Rio Tapiche, 3; upper Rio Huallaga, 3; Vaca-Pozo, San Martin, 8.

Bolivia: Chilumani, 6; Chuani, Dept. La Paz, 12; Cochabamba-Chapare, Alto Palmar, 4; Coroico 19; La Paz Dept., 25; Loma Alta, 3; Rio Bobi, La Paz, 2; Rio Espejo, Santa Cruz, 38; Rio Mapiri-Consata, 9; Rurrenabague, Rio Beni, 20; San Borja, 4; Santa Cruz Dept., 7; Santa Cruz de la Sierra, 8.

Argentina: Misiones, 1.

Uruguay: Montevideo, 1.

Brazil: Amazonas: Benjamin Constant, 26; Manaus, 1; Ilha das Flores, 1; Rio Madeira, Abuna, 10; São Paulo de Olivença, 5; Uypizanga, Rio Negro, 14 km. from Manaus, 16. Amapa: Rio Amapari, 2; Rio Felicio, 2; Serra do Navio, 45. Bahia: 7. Alagoas: Rio Largo, 1. Espirito Santo: Affonso Claudio, Laranja da Terra, 2; Santa Thereza, 1; Victoria, 1. Goyaz: Anapolis, 11; Jatahy, 9. Maranhão: Araçu, 50 km. east of Caninde, 1. Para: Alto Paru, Tirios, 1; Belem, 23; Cachimbo, 2; Mangabeira, Mocajuba, 5; Mosqueiro, Rio de Para, 1; Obidos, Rio Branco, 5; Rio Acara, 1; Santarem, 12; Itaituba, 1. Parana: Curitiba, 1. Pernambuco: 2. Rio de Janeiro: Campos, 2. Santa Catarina: 1. São Paulo: 5; Baguassu, 1; Ipiranga, 3; Rio Feio, 1; Riberão Preto, Fazenda Dumont, 1. Rondonia: 378 km. south of Porto Velho, 10. Rio Branco: Mt. Roraima, 1.

British Guiana: Bartica Triangle and Bartica-Potaro Rd., 8; Demerara, Georgetown, 6; Berbice, 2; Essequibo River, Moraballi Creek, 6; Ikuribisi, 1; Kaieteur, 4; Kamakusa, 6; Kanuku Mts., 1; Oronoque, New River, 1; Rupununi River, 1; Shudikar River, 4; Wanaina [not located], Northwest District, 2; Yawakuri River, 1.

Surinam: 5 (including type of *rufofasciatus*); Ongeljik, Para River, 11; Paramaribo, 9.

French Guiana: 19; Cayenne, 8 (including type of *ambiguus*).

Metamasius hemipterus sericeus (Olivier)

Greater Antilles: Dominican Republic: (About 20 specimens), 1 (type); Higueral; Jicome River, Monte Christie Rd.; La Romana; La Vega; Puerto Plata; Sanchez. *Haiti*: Grande Rivière, 4. *Cuba*: (About 50 specimens.) Buenos Aires, Trinidad Mts.; Guantanamo; Havana; mountains north of Imías, Oriente; Santiago; Soledad; Viñales; San Vicente, Sierra del Rosario. *Jamaica*: (About 40 specimens.) Baron Hill; Ferry; Newton.

Nicaragua: 9; Volcan Mombacho, 1; Chontales, 15; Bluefields, 4.

Costa Rica: 78; Alajuela, 1; Coto, 8; Guapiles,

Limon, 1; Hamburg Farm, 2; San Carlos, 1; Santiago de Cartago, 1; San Jose, 4; Turrialba, 4.

Panama: 111; Almirante, 1; Barro Colorado, 11; Bugaba, 1; Changuinola District, 2; Chiriqui, 69; Volcan de Chiriqui, 3; Matias Hernandez, Los Sabanas, 4; Potrerillos, 2; San Blas, 6; Santa Rosa, 1; trail to bat caves, Rio de Panama, 5.

Colombia: 40; Bogota, 4; Buenaventura, 2; Cartago, 1; Cauca, 18 or more; Ibagué, 8; Medellín, 3; Puerto Berrio, 2; Rio Aguatal [not located], 1; Lake Zapatoza region, 1.

Ecuador: 11; Balzabampa, 3; Bucay, 25; Cachavi, 4; Esmeraldas, 53; Guayaquil, 1; La Angelica, 1; Paramba, 6; Quevedo, 1; Santo Domingo, 57.

Area of Intergradation (*hemipterus* and *sericeus*)

Venezuela: 37; Caracas, 6; El Valle, Caracas, 1; Maracaribo, 5; Maracay, 6; Merida, 22; Puerto Escondido [not located], 1.

Colombia: Rio Frio and Sevilla, 19.

Metamasius hemipterus carbonarius (Chevrolat)

Mexico: 76; Colima: Armeria, 2; Volcan Colima, 44. Oaxaca: Tuxtepec, 1. Puebla: Esperanza, 1. Tabasco: Teapa, 2. Veracruz: Cerro de Plumas [= Palmas], 1; Cordoba, 1; Cosamaloapan, 1 (type of *carbonarius*); Jalapa, 4; Jesus Carranza, 1; Metlac, 2; Motzorongo, 14; Rio Metlac near El Fortin, 5; Santa Lucrecia [= Jesus Carranza], 1; Sontecomapan, 1; Toxpan [Tuxpan?], 4.

Guatemala: 65; Finca El Cipres, 2; El Rancho, 2; Guatemala City, 1; Izabal, 1; Moca. Suchitepequez, 1; Panama, 1; Panzos, 16; Puerto Barrios, 4; Rabinal, 1.

British Honduras: 8; Belize, 4; Benque Viejo, 2; Punta Gorda, 1; Rio Hondo, 2; M-tee District [not located], 21.

El Salvador: 5.

Honduras: 53; Lancetilla [not located], 1; San Alejo, Dept. Atlantida, 17; San Pedro Sula, 1; La Lima, 9; Subirana, Yoro, 1; Tegucigalpa, 2; Tela and Progreso, 60.

Metamasius inaequalis (Gyllenhal)

Brazil: 1 ♂, 1 ♀ (paratypes), 1 ♀; Barreiras de Monte Alegre, Nov., Dec., 1873, 2 ♂; Rio Mombu, Dec., 1932, 1 ♀. Amapa: Serra do Navio, Sept., 1957 (Lenko), 1 ♂, Dec. (Bicelli?), 1 ♀. Amazonas: Benjamin Constant, Nov., 1962 (Silva), 1 ♂; Benjamin Constant, Rio Javary, Mar., 1942 (Rabaut), 4 ♂; Manaus, Aug., 1962 (Lenko), 1 ♀. Bahia: 5 ♂, 4 ♀. Espirito Santo: 6 ♂, 2 ♀, 13; Tijuco Preto, Oct., Dec., 1948 (Maller), 2. Para: Coraci, 15 km. northwest of Caninde, Rio Gurupi, Apr., 1963 (Malkin), 1 ♂; Fordlandia, Rio Tapajos, Dec., 1 ♀; Tirios, Alto Paru, Feb., 1963 (Machado and Pereira), 1 ♀, Rio de Janeiro: 4 ♀.

Santa Catarina: 2 ♂, 2 ♀; Corupa, Aug., 1910, 1 ♀, Mar., Oct., Nov. (Maller), 4 ♂, 3 ♀, (Reitter), 7. São Paulo: 1 ♂, 1 ♀; Barueri, July, Aug., Dec., 1954 (Lenko), 3 ♂, 4 ♀; Laranjeiras, Sept., 1922, 1 ♂. *British Guiana*: Tukeit, July, 1911, 1 ♀; Essequibo River, Moraballi Creek, Sept., 1929, 1 ♂, 1 ♀. *Colombia*: Bogota, 1 ♀. *Costa Rica*: Hamburg Farm, 13; 25 km. northwest of David, May, 1960, 1 ♂; Pozo Azul (Underwood), 1 ♂; San Carlos, 1900 (Biolley), 1 ♂; Turrialba, 1. *Surinam*: 1 ♀. *Ecuador*: Coca, 1 ♂; Paramba, 1 ♂; Puyo Oriente, Dec., 1938 (Brown), 1 ♀. *French Guiana*: Gourdonville, Kourou River, 1; Guatimala, Kourou River, 3 ♀; Cayenne, 1 ♀ (type of *inaequalis*); Nouveau Chantier, 1 ♂, 1 ♀; Pariacabo, Kourou River, 1 ♂, 2 ♀; Passoura, Kourou River, 3; Roches de Kourou, 1 ♂, 2 ♀; St. Jean du Maroni, 1 ♀; St. Laurent du Maroni, 5 ♂, 2 ♀, 4. *Nicaragua*: Chontales (Janson) (Belt), 1 ♂, 2 ♀. *Panama*: Barro Colorado, Gatun Lake, July, 1923 (Shannon), 2 ♀; Bugaba (Champion), 4 ♂, 2 ♀; Chiriqui, 1 ♀. *Peru*: Middle Rio Ucayali, Nov., 1923 (Bassler), 1 ♂; Rio Santiago, Jan., Sept., Nov., 1924 (Bassler), 2 ♂, 1 ♀; Tingo Maria, 2200 ft., May, 1947, Dec., 1946 (Pallister), 1 ♂, 1 ♀; upper Rio Marañon, Oct., 1924 (Bassler), 1 ♂, 1 ♀; upper Rio Tapiche, Apr. (Bassler), 1 ♂. *Peru-Brazil Frontier*: Jan., 1928 (Bassler), 1 ♂. *Trinidad*: Sangre Grande, Nov., 1941 (Callan), 1 ♂. *Venezuela*: Suapure, Caura River, Mar., 1899 (Klages), 1 ♂, 2 ♀.

***Metamasius laticrus* Vaurie, new species**

Ecuador: (See under the species in the text).

***Metamasius liratus* (Gyllenhal)**

Dominica: 1 ♂, 1 ♀; Castle Bruce Junction, Mar., 1956 (Gates Clarke), 2 ♂; Laudet, June, 1911, 1 ♂. *Guadeloupe*: 12 ♂ (including 2 paratypes), 9 ♀ (including type and 4 paratypes); Gourbeyre, 3 ♂, 6 ♀; Matouba, 1900 ft., June, 1960 (Vaurie), 3 ♂, 2 ♀; Trois Rivières (Dufau), 1 ♂; north of Vernou, June, 1964 (Matthews), 1 ♂. *Martinique*: 1 ♂ (paratype), 1 ♀.

***Metamasius maculiventris* Champion**

Costa Rica: (Pittier), 1 ♀; Hamburg Farm, Reventazon, Oct., 1925 (Nevermann), 1 ♂; Turrialba, 1 ♂. *Ecuador*: San[to] Domingo, 1 ♂ (type of *dentirostris*). *Nicaragua*: Chontales (Belt), 1 ♂ (lectotype of *maculiventris*), 2 ♀. *No Locality*: 1 ♂.

***Metamasius maurus* (Gyllenhal)**

Dominica: 11; Castle Bruce Junction, Mar., 1956 (Gates Clarke), 3 ♂; Fresh Water Lake, Mar., 1956 (Clarke), 1 ♂, 1 ♀; G'leau Gommier, Mar., 1956 (Clarke), 1 ♂; Long Ditton, June,

1911, 4 ♂, 1 ♀. *Martinique*: 1 ♂, 2 ♀ (including type of *maurus*); St. Pierre, 1901, 2 ♂, 2 ♀. *St. Croix*: 1 ♀. *St. Vincent*: Jan., 1918, 1 ♂, 1 ♀; "lee-ward side" (Smith), 1 ♂.

***Metamasius melancholicus* (Gyllenhal)**

Brazil: 3. Bahia: 2 ♂, 1 ♀. Espirito Santo: 8 ♂ (including type), 3 ♀; Tijuco Preto, Nov., 1948 (Maller), 1 ♂. Para: 1 ♂. Rio de Janeiro: 2 ♂, 2 ♀. Santa Catarina: Corupa, Oct., 1945, 1 ♂, 1 ♀; Hansa Humboldt [= Corupa] (Reitter), 1 ♂, 2 ♀. "?Mexico" [probably error]: 2 ♂. *Peru*: 1 ♀.

***Metamasius metamasioides* (Günther)**

Colombia: (See under the species in the text).

***Metamasius mosieri* Barber**

Cuba: Cayamas, Santa Clara Province, May, 1904 (Schwarz), 1 ♂ (paratype); Trinidad, June, 1948 (Zayas), 1 [not examined]. *Dominican Republic*: Carr.[etera?] Mella, 8 km. from Ciudad Trujillo, Mar., 1955 (Nadler), 2 ♀. *United States*: *Florida*: Paradise Key, Dec., 1919 (Mosier), 1 ♀ (paratype); Royal Palm Park [Paradise Key], Nov., 1917 (Mosier), 1 ♀ (type); Corkscrew Swamp, Collier Co., Apr., 1958 (Woodruff), 1 ♂.

***Metamasius nudiventris* Champion**

Costa Rica: Mar., 1925 (Nevermann), 1; Boca de Limon, Mar., 1897, 1 ♂ (type of *scutatus*); Coronado, 1400–1500 m., Mar., 1925, 1 ♂, 2 ♀; Estrella, 2000 m., Sept. (Picado), 1 ♀; Orosi, 4. *Mexico*: 2. *Nicaragua*: (Sallé), 1 ♂ (lectotype of *nudiventris*), 4 ♀; Chontales, 2 ♀ (including syn- type of *nudiventris*). *Panama*: Chiriqui, 2 ♀; Lino, 12. *No Locality*: 2 ♂, 1 ♀. "Central Amer- ica": 1 ♀.

***Metamasius octonotatus* Champion**

Colombia: Cauca, Villa Elvira, 4 ♂, 2 ♀. *Costa Rica*: Hamburg Farm, Reventazon, Nov., 1923, 1 ♂; La Palma, 1500 m. (Valerio), 1 ♀; Orosi, 2 ♂; San Jose, 1160 m. (Valerio), 1 ♀; Turrialba, June, 1951 (Cartwright), 1 ♀. *Panama*: Bugaba, 1 ♀; Volcan de Chiriqui, 2500–4000 ft. (Champion), 1 ♀ (lectotype). *Peru*: 1 ♂.

***Metamasius peruanus* Hustache**

Bolivia: 1 ♂; Yungas de la Paz, 1 ♂, 1 ♀. *Peru*: 4 ♂, 4 ♀; Huanuco, 2 ♀; Marcapata, 2 ♂ (including type), 2 ♀.

***Metamasius puncticeps* Hustache**

Bolivia: Yungas de la Paz, 1 ♂. *Colombia*: 1 ♂; Mar., 1892, 1 ♀; (Standing), 1 ♂; Cauca, 1 ♂ (type), 4 ♀; Cauca, 3 ♂, (Richter), 3 ♀. *Ecuador*: 1 ♀; Guallabamba, 3000 ft. (Dolby- Tyler), 1 ♂; Bucay, 1 ♀.

***Metamasius pygidialis* Günther**

Costa Rica: Feb., 1928 (Nevermann), 3 ♀; Hamburg Farm, Reventazon, Limon, Feb., 1926, 1928, (Nevermann), 5 ♀ (including 2 cotypes of *pygidialis*). July, 1928 (Nevermann), 1 ♂ (cotype of *dasyncnemis*), Sept., 1935, 1 ♂ (cotype of *dasyncnemis*), Oct., 1935, 1 ♂ (cotype of *dasyncnemis*), 4 ♀ (including 1 cotype of *pygidialis*), Dec., 1924 (Nevermann), 1 ♀ (cotype of *pygidialis*). *Ecuador*: Carondelet, 1 ♂, 3 ♀. *Panama*: Sept., 1959, 1 ♂.

***Metamasius quadrilineatus* Champion**

El Salvador: Volcan Santa Ana, Sept., 1956, 1 ♀. *Guatemala*: 1 ♀; Purula, Verapaz (Champion), 1 ♂ (lectotype). *Mexico*: "Colonia" (Flohr), 1 ♂; Chiapas, Apr., 1959, 1 ♂.

***Metamasius quadrisignatus* (Gyllenhal)**

Dominica: 1 ♀; Fresh Water Lake, Mar., 1956 (Clarke), 3 ♂, 1 ♀; Long Ditton, June, 1911, 3 ♂; Roseau, June, 1937, 1500 ft. (Roys), 1 ♂, 1 ♀. *Guadeloupe*: 6 ♂, 4 ♀; Gourbeyre, 5 ♂, 2 ♀. *Martinique*: Mt. Pelée, 3300 ft., June, 1964 (Matthews), 1 ♂; Colson, 1900 ft., May, 1964 (Matthews), 2 ♂, 2 ♀. *Montserrat*: Mar., 1923 (Hubbard), 2 ♂, 1 ♀. *Panama*: Canal Zone: Ancon, Feb., 1953 (Lewis and Fants), 1 ♂. "America merid. insulae": 1 ♂ (type of *quadrisignatus*).

***Metamasius rimoratus* (Gyllenhal)**

Colombia: Antioquia, 1 ♀ (type); Muzo, 1 ♂. *Ecuador*: (Baron), 1 ♂, 1 ♀; San Carlos, Oct., 1935 (Schultze-Rhonhof), 1 ♀.

***Metamasius ritchiei* Marshall**

Cuba: La Breña, Moa, Oriente Province, 1954, 1 [photograph by Zayas, but not examined]; Viñales, San Vicente, Pinar del Rio Province, July, 1957, 1 [not examined, see text]. *Jamaica*: 1913 (Jackson), 1 ♂; June, 1917, 1 ♀. Manchester: Mandeville, Mar., 1957 (Allen), 1 ♂. Portland: Hardwar Gap to Waterfall, Nov., 1951 (Bengry), 1 ♀; Woodcutter's Gap to Green Hills, July, 1952 (Lynn), 1 ♂. St. Andrew: Halfway Tree (Ritchie), 1 ♂; Hardwar Gap, Dec., 1946 (Thomson), 1 ♀. St. Ann: Near Blackstonedged, 2000 ft., Aug., 1952 (Proctor), 1 ♂. St. Catherine: Above Rocks District, June, 1917 (Ritchie), 4 ♂ (including type); Golden River, Aug., 1926, 1 ♀; Harker's Hall, Sept., 1956 (Anderson), 4 ♂, 1 ♀. Trelawny: Baron Hill, Nov. (Perkins), 1 ♂.

***Metamasius rugipectus* (Champion)**

Costa Rica: 1 ♀. *Mexico*: Jan., 1952, 1 ♂, July, 1959, 1 ♀; Cerro de Plumas [=Cerro de Palmas, Veracruz], 1 ♀ (type). *Panama*: Taboga Island, Apr., 1950, 1 ♀.

***Metamasius sanguinipes* (Hustache)**

Brazil: Benjamin Constant, Amazonas, Oct., 1945 (Praetorius), 1 ♂. *Colombia*: Cauca, Putumayo, Nov., 1948 (Richter), 1 ♂. *Ecuador*: Archidona, 1 ♂; Mera, 1 ♂ (type of *sanguinipes*); Puyo Oriente, 1000 m., Nov., 1936 (Clark-MacIntyre), 1 ♀, Dec., 1938 (Brown), 1 ♀. *French Guiana*: Cayenne, 1 ♂; Charvein, Bas Maroni (Le Moul), 1 ♂ (paratype of *fractilineatus*); St. Laurent du Maroni (Le Moul), 2 ♀ (including type of *fractilineatus*). *Peru*: 1 ♂; Marcapata, 1 ♀.

***Metamasius scutellatus* Hustache**

Bolivia: Yungas de la Paz, 1000 m., 2 ♀. *Ecuador*: Macas (Buckley), 1 ♂. *French Guiana*: 1 ♀; Cayenne, 1 ♂; Nouveau Chantier, 1 ♂ (type of *scutellatus*); St. Jean (Schaus), 1 ♂, 1 ♀. *Nicaragua?*: 1 ♂ [in Chevrolat collection, Stockholm].

***Metamasius scutiger* Champion**

Panama: (See under the species in the text).

***Metamasius sellatus* Champion**

British Honduras: Benque Viejo (Father Stanton), 1 ♂. *Costa Rica*: Turrialba, 3 ♂. *Guatemala*: Mirandilla, 1 ♀. *Mexico*: 1 ♀; Cordova, 1 ♀; Tox-pam, 1 ♀. *Nicaragua*: Chontales, (Belt), 2 ♂ (including lectotype). *Panama*: 1 ♂, 1 ♀; Caldera Island, Portobello Bay [not located], 1 ♀ (syntype), Apr., 1908 (Jennings), 1 ♀, May, 1908, 2; Culebra, 1 ♀; Chiriqui, 13; Tabernilla, Canal Zone, May, 1907 (Busck), 1 ♂ (syntype).

***Metamasius sierrakowskyi* (Gyllenhal)**

Colombia: 1 ♂; Antioquia, 1 ♀ (type of *sierrakowskyi*). *Costa Rica*: (Nevermann), 2 ♀; Carillo, 1 ♂ (type of *rufocinctus*); Guapiles, 1 ♀; Hamburg Farm, Reventazon, June, 1935 (Scott), 1 ♂, Aug., 1929, 1 ♂; Peralta, May, 1928, 1 ♀; San Carlos, 1 ♂. *Nicaragua*: 1 ♀; Chontales, 1 ♂ (type of *cirratus*). *Panama*: 1 ♂; Chiriqui, 1 ♂ (type of *rufomaculatus*), 3 ♀.

***Metamasius signiventris* (Kirsch)**

Bolivia: Yungas de la Paz, 1000 m., 1 ♀; El Palmar, 1600 m., Chapare, Cochabamba, 1952, 1 ♀. *Brazil*: 1 ♀. *Colombia*: 5 ♂, 3 ♀; Cauca (Richter), 1 ♀; San Antonio, July, 1908, 1 ♂. *Ecuador*: 1 ♂ (type); Macas, 1 ♀; Porvenir, 1 ♀. *French Guiana*: Cayenne, 1 ♂. "Guiana": (Lansberg), 2 ♀. *Peru*: Cajon, Bergland, Dept. Cuzco, 1 ♂; Chinachao, 25 km. below Carpish, Huanuco, 2500 m., Sept., 1946 (Woytkowski), 5 ♂, 3 ♀; Marcapata, 1 ♂, 2 ♀; Piches-Perene v[alley], 2000–3000 ft., 1 ♀. *Venezuela*: 4 ♀. *No Locality*: 3 ♂, 1 ♀.

***Metamasius submaculatus* Champion**

Colombia: 2 ♂, 4 ♀; Caucathal, 1 ♂; Ibague, 6 ♂, 2 ♀. *Costa Rica*: 1 ♀; July, Sept., Nov., (Nevermann), 3 ♂, 1 ♀; Hamburg Farm, Reventazon, Nov., 1934, 5 ♂, 4 ♀; Reventazon, 4 ♂; San Jose, 1160 m. (Biolley), 2 ♂ (including lectotype), 2 ♀; Tres Rios, Apr., 1937 (Ballou), 1 ♂. *Ecuador*: Santo Domingo, Nov., 1956 (Portman), 1 ♂. *Nicaragua*: Chontales (Belt), 2 ♂, 2 ♀. *Panama*: Chiriqui, 1 ♂. *Venezuela*: Rancho Grande, July, 1947 (Box), 1 ♀.

***Metamasius sulcirostris* Champion**

Guatemala: 1 ♂ (Salvin) (lectotype). *Nicaragua*: Chontales (Belt), 1 ♂. *Panama*: Fort Clayton, Canal Zone, Aug., 1945 (Frick), 1 ♂. *Ecuador*: Rio Jatun Yacu, Mar., 1937 (Macintyre), 1 ♂ [this species?].

***Metamasius tectus* Vaurie, new species**

In addition to the type and paratypes from Peru, the following specimens have been seen:

Bolivia: Yungas de la Paz, 1 ♂, 1 ♀. *Brazil*: 2 ♀. Amapa: Serra do Navio, Sept., 1959 (Bicelli), 2 ♂. Amazonas: Benjamin Constant, Rio Javary, Mar., 1942 (Rabaut), 1 ♀. Bahia: Barreiras de Jacuruna, Rio Solimões, 1 ♀. *British Guiana*: Mile 24, Bartica-Potaro Road, 1948 (Atkinson), 1 ♀; Wainaina, North West District, 1931 (Myers), 1 ♀. *Colombia*: (Ovalle), 1 ♂; Mocoa "am Putumaya," 1 ♀. *Ecuador*: Canelos, 1 ♂. *French Guiana*: Cayenne, 1 ♂, 2 ♀; Gourdonville, Kourou River, 2 ♂; Guatimala, Kourou River, 1 ♀; St. Jean du Maroni, 1 ♂; St. Laurent du Maroni, 1 ♂, 1 ♀. *Peru-Brazil Frontier*: Jan., 1928 (Bassler), 1 ♂. *Peru*: 1 ♀; Rio Huallaga, Oct., 1930, 1 ♀; Chanchamayo, 1 ♀.

***Metamasius tibialis* (Waterhouse)**

Colombia: (See under the species in the text).

***Metamasius tuberculipectus* Hustache**

Bolivia: Chapare, 400 m. (Zischka), 1 ♂; Cosincho, Beni, Aug., 1925 (Harrington), 1 ♀; San Borja, Aug. (Harrington), 1 ♂; Yungas de la Paz, 5 ♂, 1 ♀. *Brazil*: Amazonas: (Bates), 1 ♀; Benjamin Constant, Nov., 1962 (Lenko), 1 ♀. *Colombia*: 5 ♂; Bogota, 1; Esmeralda, 3 ♀; Rio Gualiquia, 1 ♂. *Ecuador*: 6 ♂, 7 ♀; (Baron), 9 ♂, 8 ♀; Ambato, 1 ♀; Macas, 1 ♂; Mera, 1 ♂, 8 ♀; Quito, 1 ♂, 2 ♀; Santa Inez, 1 ♀. *French Guiana*: 1 ♂ (type of *tuberculipectus*); Cayenne, 1 ♂; St. Laurent du Maroni, 2 ♂ (syntypes), 3 ♂, 6 ♀. *Peru*: 8 ♂, 8 ♀; Chanchamayo, 1 ♀; Chinchao, 25 km. below Carpish, 2500 m., Sept., 1946 (Woytkowski), 1 ♂; Huanuco, 1 ♂; Marcapata, 1 ♂ (lectotype of *brevinasus*), 3 ♀ (including a syntype of *brevinasus*); Moyobamba region, Dec., 1925, 1 ♂; middle Rio Ucayali, Nov., 1923 (Bassler), 2 ♂; Piches and Perene v[alley]s?, 2000–3000 ft., 2 ♂; Rio Tapiche, Mar., 1928 (Bassler), 1 ♀; Rio Toro, 1 ♀; Satipo, Jauja Province, Apr., 1945, Dec., 1936, 2 ♂. *Venezuela*: Mt. Duida, Nov., 1928, 1 ♀; union of Orinoco and Ugeto [rivers], Alto Orinoco, Nov., 1951, 1 ♂, 1 ♀.

***Metamasius vicarius* Vaurie, new species**

Bolivia, Colombia, Ecuador: (See under the species in the text).

***Metamasius vicinus* Hustache**

Bolivia: 1 ♀. *Peru*: 1 ♂; Marcapata, 5 ♂, 2 ♀ (including a cotype of each sex).

***Metamasius yunquensis* Vaurie, new species**

Puerto Rico: (See under the species in the text).

BIBLIOGRAPHY

- ANDERSON, W. H.
1948. Larvae of some genera of Calandrinae (= Rhynchophorinae) and Stromboscerinae (Coleoptera: Curculionidae). *Ann. Ent. Soc. America*, vol. 41, pp. 413-437, pls. 1-2.
- ARNETT, R. H., JR.
1962. The beetles of the United States (a manual for identification). Washington, D. C., pt. 6, pp. 851-1048, illus.
- BARBER, H. S.
1920. A new tropical weevil from Florida and Cuba. *Proc. Ent. Soc. Washington*, vol. 22, pp. 150-152, pl. 8.
- BLACKWELDER, R. E.
1947. Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America. Part 5. Curculionidae. *Bull. U. S. Natl. Mus.*, no. 185, pp. 791-921.
- BLATCHLEY, W. S., AND C. W. LENG
1916. Rhynchophora or weevils of north eastern America. *Indianapolis*, pp. 3-682, figs. 1-155.
- BROWN, F. M.
1941. A gazetteer of entomological stations in Ecuador. *Ann. Ent. Soc. Amer.*, vol. 34, pp. 809-851, figs. 1-10.
- BRUNER, S. C., L. C. SCARAMUZZA, AND A. R. OTERO
1945. Catalogo de los insectos que atacan a las plantas económicas de Cuba. Havana, Estación Experimental Agronómica, pp. 1-246, pls. 1-12.
- BUCHANAN, L. L.
1941. A new species of *Metamasius* from Cuba (Coleoptera: Curculionidae). *Mem. Soc. Cubana Hist. Nat.*, vol. 15, pp. 169-172, pl. 12.
- CHAMPION, G. C.
1910. *Biologia Centrali-Americana*. Calandrinae. London, vol. 4, pt. 7, pp. 79-177, pls. 5, 9.
1913. Coleoptera, &c, in bromeliads. *Ent. Monthly Mag.*, ser. 2, vol. 24 [vol. 49], pp. 2-7.
- CHEVROLAT, L. A. A.
1833. Coléoptères du Mexique. Strasbourg, fasc. 20.
1880a. Séance du 25 février, 1880. *Ann. Soc. Ent. France*, ser. 5, vol. 10, *Bull. des Séances*, pp. xxxi-xxxii.
1880b. Diagnoses de rhynchophorides de la Guadeloupe. *Le Naturaliste*, vol. 2, pp. 315-316.
1880c. Diagnoses de curculionides de la Martinique. *Ibid.*, vol. 2, pp. 197-198.
1882. Calandrides. Nouveaux genres et nouvelles espèces, . . . 1re partie. *Ann. Soc. Ent. France*, ser. 6, vol. 2, pp. 555-582.
1885. Calandrides. Nouveaux genres et nouvelles espèces . . . 3e partie. *Ibid.*, ser. 6, vol. 5, pp. 275-292.
- COQUEREL, C.
1849. Observations entomologiques sur divers coléoptères recueillis aux Antilles. *Ann. Ent. Soc. France*, ser. 2, vol. 7, pp. 441-454, pl. 14.
- COSTA LIMA, A. DA
1956. Insetos do Brasil. Rio de Janeiro, vol. 10, pp. 7-373, figs. 1-260.
- CSIKI, E.
1936. Curculionidae: Rhynchophorinae, Cossoninae. In Junk, W., *Coleopterorum catalogus*. Berlin, vol. 30, pp. 3-212.
- DEGEER, C.
1775. Mémoires pour servir à l'histoire des insectes. Stockholm, vol. 5, pp. 1-448, pls. 1-16.
- GEMMINGER, M., AND E. VON HAROLD
1871. *Catalogus coleopterorum*. Munich, vol. 8, pp. 2181-2668.
- GERMAR, E. F.
1824. *Insectorum species novae*. Halle, vol. 1, pp. 1-624.
- GÜNTHER, K.
1935. Neue Curculioniden, gesammelt von F. Nevermann in Costa Rica, mit ökologischen Daten. *Ent. Zeitschr.*, vol. 49, pp. 223-225, figs. 1-4.
1936. Notizen über Rüsselkäfer aus Costa Rica. *Ent. Rundschau*, vol. 53, pp. 190-192, figs. 1-3.
1941. Ergänzungen und Berichtigungen zu *Coleopterorum Catalogus*, pars 149: Rhynchophorinae (Curcul.), mit einigen Neubeschreibungen. *Deutsche Ent. Zeitschr.*, vol. 4, pp. 24-53, figs. 1-15.
- GYLLENHAL, L.
1838. In Schoenherr, C. J., *Genera et species curculionidum*. Paris, vol. 4, pt. 2, pp. 601-1121.
- HELLER, K. M.
1912. Sudamerikanische *Metamasiopsis*-Arten (Col.). *Deutsche Ent. Zeitschr.*, pp. 390-393.
1927. Bestimmungsschlüssel aussereuropäischer Käfer. *Calendrini spurii* (*Laogenia*, etc.) und Verwandte. *Ent. Blätter*, vol. 23, pp. 1-14.
- HERBST, J. F.
1795. *Natursystem . . . Insecten . . . Käfer*. Berlin, vol. 6, pp. 3-520, pls. 60-95.

- HORN, G. H.
1873. Contributions to a knowledge of the Curculionidae of the United States. Proc. Amer. Phil. Soc., vol. 13, pp. 407-447.
- HUSTACHE, A.
1932. Curculionides de la Guadeloupe. In Gruvel, A., Faune des Colonies Françaises. Paris, vol. 5, fasc. 1, no. 24, pp. 1-142, figs. 18-28.
1936. Nouveaux sphénophorides sudaméricains (Curculionidae). Bull. Ann. Soc. Ent. Belgique, vol. 76, pp. 87-114.
1938. Espèces nouvelles de Curculionidae de l'Amérique tropicale. Ent. Blatter, vol. 34, pp. 231-243.
- INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE
1959. Opinion 572. Suppression under the plenary powers of the generic name *Calandra* Clairville and Schellenberg, 1798, and validation under the same powers of the specific name *abbreviatus* Fabricius, 1787, as published in the binomen *Curculio abbreviatus* (class Insecta, order Coleoptera). Bull. Zool. Nomenclature, vol. 17, pp. 112-116.
- JEKEL, M. H.
1858. Spicilegium entomologica. Descriptions of new curculionidous beetles collected on the voyage of H.M.S. Herald. With notes by Adam White. Ann. Mag. Nat. Hist., ser. 3, vol. 2, pp. 356-361.
- KIRSCH, T.
1889. Coleopteren gesammelt in den Jahren 1868-1877 auf einer Reise durch Süd Amerika von Alphons Stübel. Abh. Ber. Zool. Mus. Dresden, no. 4, pp. 1-58, pls. 1-4.
- KISSINGER, D. G.
1964. Curculionidae of America north of Mexico. A key to the genera. South Lancaster, Massachusetts, pp. 1-143, figs. 1-59.
- KUSCHEL, G.
1955. Nuevas sinonimias y anotaciones sobre Curculionoidea (1). Rev. Chilena Ent., vol. 4, pp. 261-312.
1956. Attelabidae und Curculionidae aus El Salvador. Senckenbergiana, vol. 37, pp. 319-339, figs. 1-31, pl. 44.
1958. Neotropische Rüsselkäfer aus dem Museum G. Frey (Col. Curcul.). Ent. Arb., vol. 9, pp. 750-798, figs. 1-71.
- LACORDAIRE, T.
1866. Histoire naturelle des insectes. Paris, vol. 7, pp. 1-620, pls. 61-80.
- LECONTE, J. L.
1876. In LeConte, J. L., and G. H. Horn, The Rhynchophora of America north of Mexico. Proc. Amer. Phil. Soc., vol. 15, pp. 1-455.
- LENG, C. W., AND A. J. MUTCHLER
1914. A preliminary list of the Coleoptera of the West Indies as recorded to January 1, 1914. Bull. Amer. Mus. Nat. Hist., vol. 33, pp. 391-493.
- LEPESME, P., AND R. PAULIAN
1941. Sur la présence de *Metamasius sericeus* Ol. dans l'ouest africain (Col. Curculionidae). Bull. Soc. Ent. France, vol. 46, pp. 31-37, 13 figs.
- LEPESME, P., J. BOURGOGNE, E. CAIRASCHI, R. PAULIAN, AND A. VILLIERS
1947. Les insectes des palmiers. Paris, pp. 1-903, figs. 1-638.
- LINNAEUS, C.
1764. Museum S . . . R . . . M . . . Ludovicae Ulrica Reginae. Stockholm, pp. 3-722.
- MARSHALL, G. A. K.
1916. A new weevil attacking pine-apples in Jamaica. Bull. Ent. Res., vol. 7, pp. 197-198, fig. 1.
1938. On the genus *Temnoschoita* Chev. (Col. Curc.). Rev. Zool. Bot. Africaines, vol. 30, pp. 321-326.
1943. Notes on synonyms and homonyms in Curculionidae. In Marshall, G. A. K., New Indian Curculionidae (Col.). Ann. Mag. Nat. Hist., ser. 11, vol. 10, pp. 105-119.
- OLIVIER, A. G.
1790. Encyclopédie méthodique. Histoire naturelle. Insectes. Paris, vol. 5, pp. 1-793.
1807. Entomologie . . . Texte. Paris, vol. 5, pp. 1-612.
1808. Entomologie . . . Planches, genera 66-100. Paris, vol. 8, no. 83 Curculio, pls. 1-35.
- PANZER, G. W. F.
1798. Voets Beschreibungen und Abbildungen hartschaaliger Insecten. Nürnberg, pt. 3, pp. 1-121, pls. 1-48.
- PERTY, M.
1830. Insecta brasiliensia. In Spix, J. B., and C. F. Ph. de Martius, Delectus animalium articulorum. Munich, pp. 1-190, pls. 1-40.
- PETTEY, F. W.
1953. The boring beetles of prickly pear in South Africa and their importance in control of *Opuntia megacantha*. Sci. Bull. Dept. Agr. South Africa, no. 340, pp. 1-26, figs. 1-10.

- REID, A. L.
1956-1957. Distribution and ecology of the pineapple weevil (*Metamasius ritchiei*). Invest. Rept., Jamaica, pp. 14-18.
- ROSEN, D. E., AND R. M. BAILEY
1963. The poeciliid fishes (Cyprinodontiformes), their structure, zoogeography, and systematics. Bull. Amer. Mus. Nat. Hist., vol. 126, pp. 3-176, figs. 1-61.
- SAFFORD, W. E.
1917. Natural history of Paradise Key and the nearby Everglades of Florida. Ann. Rept. Smithsonian Inst., pp. 377-434, pls. 1-64.
- SCOTT, H.
1912. A contribution to the knowledge of the fauna of Bromeliaceae. Ann. Mag. Nat. Hist., ser. 8, vol. 10, pp. 424-438, pl. 10.
- SELANDER, R. B., AND P. VAURIE
1962. A gazetteer to accompany the "Insecta" volumes of the "Biologia Centrali-Americana." Amer. Mus. Novitates, no. 2099, pp. 1-70, figs. 1-8.
- SMIT, F. G. A. M.
1963. Species-groups in *Ctenophthalmus* (Siphonaptera; Hystrichopsyllidae). Bull. Brit. Mus. (Nat. Hist.), vol. 14, no. 3, pp. 108-152, pls. 1-58.
- STURM, J.
1826. Catalog meiner Insecten-Sammlung. Nürnberg, pt. 1, pp. 3-207, pls. 1-4.
- TING, P. C.
1936. The mouth parts of the coleopterous group Rhynchophora. Microentomology, vol. 1, contrib. 3, pp. 93-114, figs. 75-82.
- VAURIE, P.
1951. Revision of the genus *Calendra* (formerly *Sphenophorus*) in the United States and Mexico (Coleoptera, Curculionidae). Bull. Amer. Mus. Nat. Hist., vol. 98, pp. 29-186, figs. 1-116.
- VOSS, E.
1953. Neue und bemerkenswerte Curculioniden aus Columbien und Bolivien (Col. Curc.). Ent. Mitteil., pp. 3-30, figs. 1-4.
1954. Curculionidae (Col.) Beitrag zur Kenntnis der Curculioniden. Beitr. Fauna Perus (Titschack, editor), vol. 4, pp. 193-376, figs. 1-22.
- WATERHOUSE, C. O.
1879. Descriptions of new Coleoptera from Medellin, Colombia, recently added to the British Museum collection. Cist. Ent., vol. 2, pp. 421-429.
- WILIE, J. E.
1943. Entomología agrícola del Peru. Lima, pp. 1-468, figs. 1-212.
- WOLCOTT, G. N.
1948. The insects of Puerto Rico. Coleoptera. Jour. Agr. Univ. Puerto Rico, vol. 32, pp. 225-416, illus.
1955. Entomología económica puertorriqueña. Bull. 125, Est. Exper. Agr., Univ. de Puerto Rico, pp. 1-297, figs. 1-131.
- WYNIGER, R.
1962. Pests of crops in warm climates and their control. Basel, pp. 1-555.
- ZIMMERMAN, E. C.
1941. The Rhynchophorinae found in Hawaii (Coleoptera: Curculionidae). Proc. Hawaiian Ent. Soc., vol. 11, pp. 96-102.

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