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Revision and Cladistic Analysis of the Plant Bug Genus *Fingulus* Distant (Heteroptera: Miridae: Deraeocorinae)

GARY M. STONEDAHL¹ AND GERASIMOS CASSIS²

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¹ Research Associate, Department of Entomology, American Museum of Natural History; Senior Scientific Officer, International Institute of Entomology, 56 Queen's Gate, London SW7 5JR, UNITED KINGDOM.

² Senior Entomologist, Department of Entomology, The Australian Museum, 6-8 College St., Sydney 2000, P.O. Box A285, Sydney South, AUSTRALIA.

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ABSTRACT

The deraeocorine genus *Fingulus* Distant is revised. Twenty-six species are recognized, including 16 new species from southeast Asia and the islands of the Pacific Basin. *Fingulus shenefelti* Akingbohungbe is proposed as a new junior synonym of *Fingulus ifensis* Linnavuori. Dorsal habitus views are provided for four species, and illustrations of the male genitalic structures are presented for all species. Scanning electron micrographs are given for the head, metafemur, pretarsus, and metathoracic scent efferent system of representative species. A key is provided for all species, excluding two from China, *Fingulus brevirostris* Ren and *Fingulus ruficeps* Hsiao and Ren, the identities of which could not be established in the present study. A cladistic analysis of species re-

lationships is conducted using the genus *Angerianus* Distant for outgroup comparison. Two strongly supported clades are recognized as species groups from the resulting phylogeny—the *porrecta* group, containing 12 species distributed in tropical Asia and the islands of the tropical west Pacific, and the *atrocaeruleus* group, with nine species distributed in New Guinea, New Caledonia, and northeast Australia. The remaining five species, all distributed in tropical Africa, occupy basal (plesiomorphic) positions on the species cladogram. The biogeographic implications of the proposed species phylogeny are discussed in light of the hypothesis of Indo-Pacific area relationships presented by Schuh and Stonedahl (1986).

INTRODUCTION

The genus *Fingulus* was described by Distant in 1904 to accommodate a single specimen collected in North Queensland, Australia. Distant provisionally placed *Fingulus* near the New World genus *Physetonotus* Reuter, now a junior synonym of *Pycnoderes* Guérin-Ménéville (Bryocorinae: Ecritotarsini). A second species, *porrecta* (type locality, Hong Kong), was described in the genus *Ix* by Bergroth (1916), who stated that the new genus differed from all other genera of Bryocorinae by the horizontally produced head. Hsiao (1944) erected the genus *Anchix*

for a new species from the Philippine Islands, *atra*, stating that the new genus was “closely related to *Ix* Bergroth, but distinguished from it by the more robust body, declivent pronotum, incrassate femora, and strongly discrete cuneus.” Carvalho (1955b) examined the types of all three genera and synonymized *Anchix* and *Ix* with *Fingulus*. The first placement of *Fingulus* in the subfamily Deraeocorinae was by Carvalho (1952). Additional descriptions of *Fingulus* species were published by Miyamoto (1965), Linnavuori (1975), Akingbohungbe (1981), Ren (1983),

and Hsiao and Ren (1983). Akingbohunge (1981) provided a key to all species known at the time, excluding *brevirostris* Ren and *ruficeps* Hsiao and Ren, which he was apparently unaware of in the literature.

Our study of *Fingulus* was initiated following the discovery of a number of undescribed species from Asia and the tropical Pacific in the collections of the Bernice P. Bishop Museum, Honolulu. The purpose of the research presented here is to provide a means for distinguishing *Fingulus* from other Old World Deraeocorinae and for identifying the 26 included species. A key to species is given, which in most cases allows for the recognition of both males and females. The species treatments are arranged alphabetically in the text and each is accompanied by illustrations of the left paramere and vesica of the male genitalia (two species are known from females only). A diagnosis and description are provided for each species, and complete label data are recorded for all specimens examined. A cladistic analysis and biogeographic discussion follow the species treatments.

TAXONOMIC CHARACTERS

The following characters were found to be useful for distinguishing species and for investigating the relationships between species. A list of characters used in the cladistic analysis of species is provided in table 1 and the distribution of the various character states among the taxa is presented in table 2.

HEAD: The head of *Fingulus* species is relatively long compared to other deraeocorines, resulting primarily from the strongly developed, necklike region behind the eyes (figs. 1, 11, 13, 15). In addition, some species such as *porrecta* (fig. 29) and *atra* have the tylus well produced antieriad of the antennal bases, which adds to the overall length of the head. The frons is usually subhorizontal and weakly convex, but sometimes is more strongly deflexed at the juncture with the tylus. Head width is variable, with some species like *atra* having a relatively narrow head and small eyes, while others (e.g., *inflatus*, *libbyi*, *longiceps*) have much broader heads with larger eyes. The ratio of vertex width to head width is a useful character for distinguishing species. The head immediately behind the eyes

is sometimes slightly to moderately inflated, and the narrowed portion of the neck is nearly always marked with a transverse, impressed line or furrow. Head length is measured in dorsal view from the posterior border with the collar to the apex of the tylus and is subject to some variation depending on the position of the head within the pronotal socket. Head width is measured between the lateral margins of the eyes in dorsal view, and vertex width is a minimum measurement between the inner margins of the eyes in dorsal view.

ANTENNAE: The antennal structure is fairly uniform in the genus, with segment I usually somewhat inflated and the remaining segments much narrower. The relative length of segment II is useful for distinguishing species, but is not a particularly strong character in the cladistic analysis. Sexual dimorphism in antennal structure is slight (males rarely have segment II very slightly inflated distally) or nonexistent. The length of segment I is measured from the middle of the basal constriction to the apex, and segment II is a maximum measurement.

LABIUM: The length of the labium shows some variation between species but, like antennal length, is not particularly useful for determining species relationships. Segments I–III are usually similar in length, with segment IV up to twice as long as the others. Labial coloration also varies between species, ranging from uniformly darkened or narrowly pale distally, to entirely pale in a few species. The labium is measured from the basal juncture with the tylus to the apex. The relative lengths of the labial segments are given in arbitrary units beginning with the first segment (e.g., 16:16:20:35). The actual ratio of one segment to another can be calculated directly from these relative scores (e.g., ratio of segment IV to segment I in above example is 2.2:1).

PROTHORAX: The general structure of the pronotum is detailed in the generic description. Characters useful for distinguishing species include the posterior width of the pronotal disc (measured as the maximum distance between the posterolateral angles), the width and surface texture of the collar, development of the calli, particularly the prominence of the posterior border, and the development of a tubercle or conical process on the pros-

ternal xyphus. The collar dorsally is usually slightly roughened or sometimes has distinct transverse ridges. In some species, the collar bears series of fine to moderately coarse punctures. The punctate collar is a primary character supporting the monophyly of a large clade of species inhabiting southeast Asia and the Philippine Islands. Although usually distinctly flattened dorsally, several species (e.g., *atra*, *atrocaeruleus*, *longiceps*) possess a very weakly rounded collar. The development of the impressed line bordering the calli posteriorly and the degree of convexity of the posterior lobe of the disc are useful features for distinguishing some species. Many species of *Fingulus* have a rounded tubercle or conical process on the prosternal xyphus. The size and shape of this structure and its position and orientation on the xyphus show considerable variation within the genus.

SCUTELLUM: The scutellum of *Fingulus* species is usually slightly to moderately elevated above the level of the hemelytra, with a weakly convex, punctate dorsal surface. In several species, the scutellum is noticeably inflated, especially distally, with the dorsal surface more strongly convex and the punctures very faint or missing distally.

METATHORACIC SCENT EFFERENT SYSTEM: The ostiolar peritreme of all *Fingulus* species is well developed and protrudes strongly from the surface of the metapleuron. The size and shape of the ostiole are variable and, in particular, the development of the tongue at the apex of the ostiolar canal is useful for distinguishing some species. The ostiole and evaporative area of most species are the same color as the surrounding metathorax, but in several African and Asian species this region is dirty white or pale yellow.

HEMELYTRA: All species are macropterous with a deep cuneal incisure and the hemelytra strongly deflexed at the cuneal fracture (figs. 13, 15). The lateral margins of the hemelytra are nearly straight or weakly rounded anteriorly (only the hemelytra of *gracilis* are weakly concave laterally, fig. 11). The length of the cuneus is variable, ranging from 1.5–3.5 times its maximum basal width. The pattern of dark markings on the hemelytral membrane is an especially useful character for distinguishing species, particularly in southeast Asia and the Pacific Islands. Most

species have the areolar cells or at least the areas bordering the veins suffused with fuscous. In addition, a large group of species from New Guinea and two species from the Philippine Islands have a dark stripe extending from the inner apical angle of the primary areolar cell to the apex of the membrane (fig. 13).

LEGS: Leg coloration is variable, with most species having the femora and basal third to half of the tibiae darkened, and the remaining portion of the leg pale. Four species (i.e., *novoguineensis*, *parvus*, *porrecta*, *sumatranus*) have uniformly pale legs. The femora of some species are noticeably inflated distally. This is especially true of the hind femora, which in some New Guinea species are quite strongly swollen (see character 19 in cladistic analysis).

MALE GENITALIA: Our survey of genitalic structures in the Deraecorini was not extensive enough to allow us to establish even tentative relationships between *Fingulus* and other genera of the tribe (except see generic discussion). The parameres are typical of the subfamily, and display no features which are unique to the genus. Variation in development of the sensory lobe, shaft, and apical processes of the left paramere provides some useful characters for distinguishing species (see characters 26 and 27 in cladistic analysis).

The vesica is composed of a sclerotized, tubular skirt surrounding the distal region of the ductus seminis, and a distal membranous sac, which usually bears one or more lobal sclerites or fields of spines (see generic description and illustrations of male genitalia). The unmodified secondary gonopore is positioned within a depressed, cuplike cavity, lined with heavy spines. This spinose cavity appears to be unique to *Fingulus*, but a much broader survey of genera is needed to confirm this finding. Within *Fingulus*, various characteristics of the vesica are useful for distinguishing species and for determining relationships between species (see characters 21–25 in cladistic analysis). The basal skirt of the vesica sometimes has a tonguelike flap dorsally (figs. 6d, 7d, 9d, 10d) or a small, spinose process arising from the inner dorsodistal surface of the cuplike cavity (figs. 14d, 26d). In addition, the basal skirt some-

times possesses one or more fields of spines on the lateral and/or ventral surfaces (figs. 5d, 22d, 23d, 31d). The position and structure of the sclerites and spine fields on the membranous lobes of the vesica offer additional characters for distinguishing species.

MATERIAL AND METHODS

Approximately 120 specimens were examined representing material from nine major collections. A list of collections and curators is given in the Acknowledgments. The holotypes of all species were examined with the exceptions of *brevirostris* Ren, *collaris* Miyamoto, *longicornis* Miyamoto, and *ruficeps* Hsiao and Ren. Our attempts to borrow the types of these species from institutions in China and Japan were unsuccessful. We have been able to identify the two Miyamoto species by comparing nontype material against the original descriptions. However, none of the examined specimens could be recognized as belonging to either *brevirostris* or *ruficeps*, and these species are included in the present study only for the purpose of reference to the original descriptions. Even if these species were represented in the material we examined, they could not have been identified with certainty because of the inadequacy of the information provided in the original descriptions, and the absence of illustrations of the male genitalia.

Many of the new species described in this paper are based on one to several specimens, sometimes from widely separated localities. Several of these species (e.g., *inflatus*, *nigri-fasciatus*, *novoguineensis*) exhibit variation in external characters such as head width, length of the antennae, and leg coloration. As it is impossible to determine the limits of variation in these little known species, we have elected in most cases to recognize slightly variant individuals as conspecific with the holotype, but do not designate them as paratypes.

Illustrations of genitalic structures were prepared from temporary slide mounts in glycerin jelly, using a Wild M-25 compound microscope with camera lucida. Dissected genitalic structures were placed in plastic microvials containing glycerin for permanent storage. Scanning electron micrographs were

prepared on a Hitachi S-2500 microscope using Ilford HP-5 film.

All measurements were made with an ocular micrometer and are reported in the text in millimeters.

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SYSTEMATICS

Fingulus Distant

Fingulus Distant, 1904: 275 (n. gen.). – Carvalho, 1955a: 27 (key); 1955b: 221 (syn.); 1957: 86, 87 (cat.). – Linnavuori, 1975: 11 (descr.). – Aking-

bohungebe, 1981: 182 (descr.). Type species by monotypy: *Fingulus atrocaeruleus* Distant.

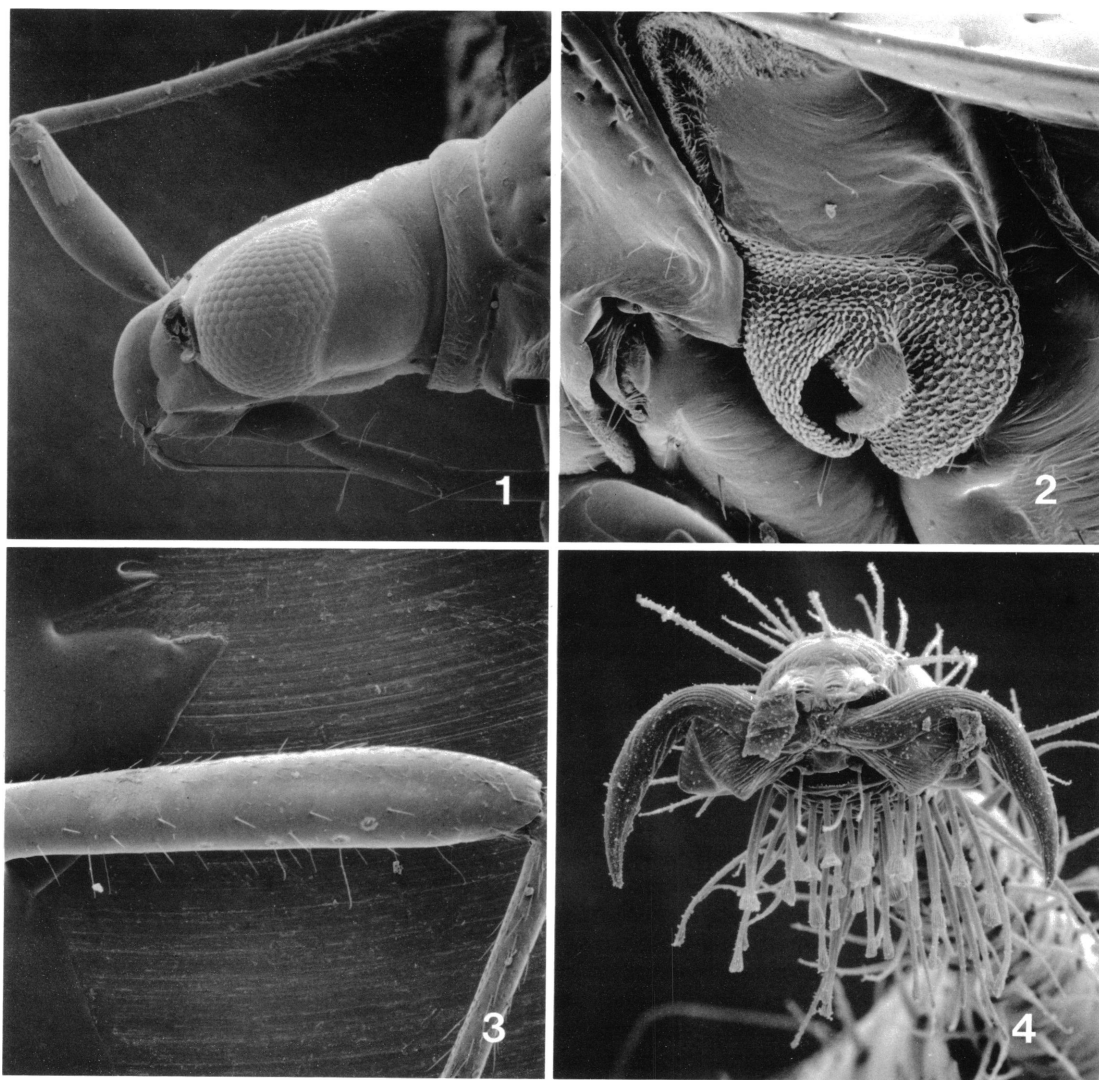
Ix Bergroth, 1916: 234, 235 (n. gen.). – Carvalho, 1955b: 221 (syn.). Type species by monotypy: *Ix porrecta* Bergroth.

Anchix Hsiao, 1944: 377, 378 (n. gen.). – Carvalho, 1955b: 221 (syn.). Type species by monotypy: *Anchix atra* Hsiao.

DIAGNOSIS: Distinguished from other genera of Deraeocorinae by the porrect head with strongly developed, necklike postocular region, usually with transverse constriction or furrow posteriad of eyes (figs. 1, 13, 29); broad, flattened or rarely weakly rounded pronotal collar (figs. 1, 11, 13, 15, 29); strongly protruding ostiole of metathoracic scent efferent system (fig. 2); deep cuneal incisure marking strongly deflexed hemelytra (figs. 13, 15); and structure of the male genitalia, especially the vesica with gonopore opening into sclerotized, tooth-lined cavity (see description of genitalia).

REDESCRIPTION: *Male*. Length from apex of tylus to cuneal incisure 1.90–4.33; width across humeral angles of pronotum 1.01–2.04; castaneous to dark fuscous general coloration, sometimes tinged with red especially on cuneus; body elongate to broadly ovate; pronotum and hemelytra coarsely punctate, shining, glabrous, or with very short, fine setae protruding from punctures. **Head.** Relatively small; porrect and appearing somewhat dorsoventrally flattened in lateral view, with strongly developed gula, prominent tylus, and subhorizontal frons (fig. 1); about as long as broad to distinctly longer than broad in dorsal view; postocular region strongly developed, necklike, usually slightly bulging posteriad of eyes, inflated region bordered posteriorly by shallow, transverse furrow; frons sometimes with prominent tubercle or conical process distally; eyes large, occupying entire height of head, well removed from anterior margin of pronotum. **Antennae.** Inserted slightly above line drawn through middle of eye, fossae more or less contiguous with anterior margin of eye; segment I moderately to strongly inflated, broadest medially, usually weakly curved and set with scattered, short, suberect setae; segments II–IV cylindrical, similar in diameter, with evenly distributed, short, pale setae; antennal coloration variable (see species treatments). **Labium.**

Reaching from between procoxae to slightly beyond apices of metacoxae, segments I–III similar in length, segment IV up to twice as long as others; labial segment I and sometimes II slightly to moderately inflated. **Pronotum.** Slightly broader than long, strongly narrowed anteriorly and sometimes noticeably constricted at level of posterior margin of calli and at juncture of collar and calli; collar relatively broad, flattened, or sometimes weakly rounded, variously roughened and sometimes with fine to coarse punctures; calli smooth, impunctate, confluent medially, reaching lateral margins of disk, not or only weakly elevated with posterior margins often poorly defined; posterior lobe of disc weakly to strongly elevated, sometimes rising abruptly from posterior margin of calli; posterior margin of disc convexly rounded, produced posteriorly over mesoscutum and base of scutellum, and usually concealing both in dorsal view; propleuron punctate, dorsal margin sometimes weakly carinate; prosternal xyphus sometimes with rounded tubercle distally, or rarely with more prominent, ventrally directed, conical process; scutellum flattened or weakly convex dorsally, not or only slightly elevated above hemelytra, or rarely strongly elevated, especially distally; metathoracic scent efferent system with strongly protruding ostiole and distinct evaporative area (fig. 2). **Hemelytra.** Strongly deflexed at cuneal fracture; lateral margins nearly straight or weakly convex; cuneus with moderately to strongly curved outer margin; cuneal incisure deep; membrane reaching well beyond apex of abdomen, pale or variously infuscated, areolar veins darkened; primary cell of membrane large, secondary cell small, sometimes nearly obsolete. **Legs.** Femora elongate, sometimes inflated distally, especially metafemora (fig. 3); tibiae cylindrical; tarsal segments similar in length or with segments I and III slightly longer than segment II; pretarsal claws with prominent basal tooth; parempodia short, setiform (fig. 4). **Genitalia.** *Genital capsule:* Very small, short, narrowing distally; aperture subspherical, posterodorsally orientated, sometimes slightly more sinistral; paramere sockets asymmetrical with left socket much larger and positioned ventrad of right socket. *Left paramere:* L-shaped, C-shaped, or rarely



Figs. 1–4. Scanning electron micrographs of *Fingulus novoguineensis* (figs. 1, 2, 4) and *Fingulus inflatus* (fig. 3). 1. Head and pronotal collar. 2. Ostiole and evaporative area of metathoracic scent efferent system. 3. Metafemur showing trichobothria. 4. Pretarsus.

broadly U-shaped in dorsal view; sensory lobe weakly to strongly developed, usually set with numerous long, stout setae; shaft narrowed distally, usually with distinct dorsal and ventral processes apically. *Right paramere*: Small, linear, with weakly sclerotized basal region; gradually narrowed distally with acute apical process. *Vesica*: Composed of (1) basal, tubular sclerotized skirt surrounding distal region of ductus seminis, (2) simple, unmodified secondary gonopore, and (3) distal

membranous sac comprising 2–4 lobes which are usually provided with sclerotized appendages (spicules or spiculae of some authors) and/or fields of spines. In all species, the sclerotized appendages of the vesica appear to be simple outgrowths of the membrane cuticle and have no obvious connection with the gonopore or the basal skirt. Schwartz (1987) applied the term “lobal sclerite” to this type of vesical appendage in the Mirinae, and we have adopted this usage

in the present study. The secondary gonopore opens into a sclerotized cuplike cavity, which is positioned within and attached to the distal margins of the basal skirt. The walls of this cup appear to be simple expansions of the sclerotized distal region of the ductus seminis. The cup is broadly opened dorsodistally and its inner surfaces, especially laterally, are set with numerous sclerotized teeth; sometimes the inner dorsodistal surface of the cup bears a small spinose process medially (figs. 14d, 26d), which is seen in lateral view to protrude slightly from the cavity. The dorsal surface of the basal skirt is sometimes produced as a slightly elevated, tongue-like flap, extending distally in some species to a level near the middle of the gonopore cavity; species lacking this flap usually have the basal skirt noticeably depressed in this region. The entire vesica is surrounded by a tubular phallosome, which is narrowly opened dorsally for much of its length.

Female. Macropterous. Length 2.74–4.48, width 1.24–1.83; similar to male in color and general structure, except usually slightly larger in overall size, with smaller eyes and correspondingly broader vertex.

DISTRIBUTION: Widely distributed in the Old World tropics and subtropics, including west, central and east Africa, south India, southeast Asia, and the islands of the tropical Pacific from the Ryukyu chain, Taiwan and Sumatra, east to New Caledonia and north-east Australia.

HOST ASSOCIATION: The habits of *Fingulus* species are essentially unknown, but we suspect that most are generalized predators with little or no host plant specificity. The only reported host association is for a single specimen of *puncticollis* collected on *Ficus* sp. Two species, *maai* and *novocaledonicus*, have been collected by general sweeping, and several species have been taken in light traps and Malaise traps. The only record of predation comes from two specimens of *porrecta* collected in India, which were reared on *Leeuwenia karniyana* Priesner (Thysanoptera: Phlaeothripidae).

DISCUSSION: The relationships of deraecorine genera and tribes are very poorly known. In the classification presented by Carvalho (1952), *Fingulus* is placed in the Deraecorini, a group which we contend has no

defining characters and is almost certainly paraphyletic. This tribe contains all taxa that cannot be accommodated by one of the more narrowly defined tribes (Clivinemini, Hyaliadini, Saturniimirini, Termatophylini), some of which also may not be monophyletic. Given the problems that exist with the tribal classification of the Deraecorinae and the virtual absence of information on relationships of higher taxa, we have elected not to pursue the question of generic relationships beyond the few preliminary findings discussed below.

In a very brief examination of Old World Deraecorini, we discovered a genus which we believe is closely related to *Fingulus*. This genus, *Angerianus* Distant, is externally very similar to *Fingulus*, differing primarily in the shorter, anteriorly vertical head (not produced beyond eyes in dorsal view), much longer first antennal segment, and more elongate femora. The male genitalia of the two genera are similar, but the vesica of *Angerianus* does not possess the well developed basal skirt, and the secondary gonopore does not open into a tooth-lined cavity. Although the gonopore of deraecorines is frequently depressed and may be bordered by spinose lobes or serrate, sclerotized plates (see figures in Carvalho, 1985 and Kelton, 1959), we have not observed the condition typifying *Fingulus* in any other group, and believe it to be unique to the genus. We recognize that our sampling of this subfamily is small and that more comprehensive studies of the male genitalia are needed to establish well supported patterns of relationship in the Deraecorinae.

A second genus which bears a superficial resemblance to *Fingulus* is *Stethoconus* Flor. Like *Fingulus*, this genus is characterized by a strongly convex pronotum with broad, flattened collar and by hemelytra which are noticeably deflexed at the cuneal fracture. However, the short head with a basal carina, the impunctate hemelytra, and the male genitalia are very different from those of *Fingulus*, suggesting that the two genera are not closely related. *Stethoconus* was first considered to be a dicyphine by Reuter (1910), who placed the genus in his Division Macrolopharia. The genus was maintained in the tribe Dicyphini (subfamily Phylinae) by Carvalho (1952), but was later moved to the Clivinemini (Deraeo-

corinae) by Kerzhner (1964) (see also discussion in Cassis, 1984: 170). Henry et al. (1986), dissatisfied with the tribal placement of *Stethoconus*, moved the genus into the Hyaliadini, a placement which is better supported by the external morphological characters of the genus.

KEY TO *FINGULUS* SPECIES

1. Frons with prominent tubercle or conical process (fig. 11) 2
Frons without tubercle or process 3
2. Elongate species with lateral margins of hemelytra weakly concave (fig. 11); head, pronotum, and legs dark reddish brown; length of head posteriad of eyes greater than length of eye in dorsal view; antennal segment I greatly enlarged, greatest width six to seven times that of segment II (fig. 11); west Africa *gracilis* Akingbohungbe
Oval-elongate species with lateral margins of hemelytra weakly convex; head, pronotum, and legs brownish yellow; length of head posteriad of eyes much less than length of eye in dorsal view; greatest width of antennal segment I only three times that of segment II; Sumatra *sumatranus*, n. sp. (♀ only)
3. Ostiole and evaporative area of metathoracic scent efferent system white or pale yellow, much paler than surrounding thoracic pleura 4
Ostiole and evaporative area of metathoracic scent efferent system darkened, similar to thoracic pleura in coloration 8
4. Length of antennal segment II less than posterior width of pronotum; scutellum weakly and evenly elevated, or rarely slightly inflated distally 5
Length of antennal segment II greater than posterior width of pronotum; scutellum strongly elevated, becoming more prominent distally, apical region strongly deflexed 7
5. Prosternal xyphus with prominent, conical process, which is noticeably paler than remainder of prothorax; Laos, Thailand, Sabah *umbonatus*, n. sp.
Prosternal xyphus without prominent, pale process, but sometimes with low, rounded tubercle 6
6. Vertex relatively broad, in males nearly half the width of the head across the eyes (ratio, 0.46:1), in females about a third of head width (ratio, 0.32:1 to 0.38:1); distal half of scutellum of male slightly inflated, impunctate; male genitalia as in figure 28; west and central Africa *parvus* Akingbohungbe
Vertex narrower, less than one-third the width of the head in both males and females (ratio, 0.24:1 to 0.30:1); scutellum of male slightly elevated above level of hemelytra, but not more strongly inflated distally; male genitalia as in figure 9; south India, southeast Asia *collaris*, n. sp.
7. Antennal segment II uniformly pale; pronotal collar of male broader than greatest thickness of antennal segment I; male genitalia as in figure 17; west Africa *libbyi* Akingbohungbe
Distal fourth of antennal segment II infuscated; pronotal collar of male narrower than antennal segment I; male genitalia as in figure 16; southeast Asia *inflatus*, n. sp.
8. Pronotal collar punctate 9
Pronotal collar impunctate, sometimes slightly to moderately roughened or with weak transverse ridges 16
9. Hemelytral membrane with dark stripe extending from inner apical angle of areolar cell to apex of membrane 10
Hemelytral membrane without distinct dark stripe, sometimes broadly darkened basally, but only to level of apex of areolar cell or slightly beyond 11
10. Length of antennal segment II equal to or greater than posterior width of pronotum; labium with segments II–IV similar in thickness, all noticeably thinner than segment I; length of labial segment IV not more than 1.5 times that of segment III; male genitalia as in figure 24; south Philippine Islands, north Sulawesi *nigrifasciatus*, n. sp.
Length of antennal segment II much less than posterior width of pronotum; labium with segments I and II much thicker than segments III and IV; length of labial segment IV more than two times that of segment III; male genitalia as in figure 7; north Philippine Islands *atra* (Hsiao)
11. Antennal segment II uniformly pale 12
Antennal segment II darkened apically 13
12. Legs, including coxae, uniformly pale; male genitalia as in figure 30; Hong Kong, south India *porrecta* Distant
Legs darkened basally, only tarsi and distal two-thirds of tibiae pale; male genitalia as in figure 19; Philippine Islands, Ryukyu Islands, Taiwan *longicornis* Miyamoto
13. Ratio of vertex width to width of head across eyes 0.36:1 to 0.38:1; male genitalia as in figure 10; Laos, Sabah .. *curticornis*, n. sp.

- Ratio of vertex width to width of head across eyes 0.17:1 to 0.28:1 14
14. Length of antennal segment II greater than posterior width of pronotum (ratio, 1.13:1); male genitalia as in figure 31; south India, Vietnam *puncticollis*, n. sp.
- Length of antennal segment II less than posterior width of pronotum (ratio, 0.79:1 to 0.88:1) 15
15. Labial segment IV of male about twice as long as segment III; sensory lobe of left paramere moderately produced and evenly rounded (fig. 20b); vesica as in figure 20d; north Philippine Islands *luzonicus*, n. sp.
- Labial segment IV of male less than twice the length of segment III (ratio, 1.68:1); sensory lobe of left paramere strongly produced and somewhat angulate (fig. 6b); vesica as in figure 6d; Philippine Islands *apoensis*, n. sp.
16. Hemelytral membrane with a dark stripe extending from inner apical angle of areolar cell to apex of membrane (fig. 13)—stripe sometimes slightly obscured distally, or rarely extending only halfway to apex of membrane 17
- Hemelytral membrane sometimes broadly infuscated basally, but dark markings not reaching beyond level of apex of areolar cells 24
17. Antennal segment I three times as long as width of vertex; length of antennal segment II much greater than posterior width of pronotum; male genitalia as in figure 21; Papua New Guinea *maai*, n. sp.
- Antennal segment I rarely more than twice as long as width of vertex; length of antennal segment II less than or equal to posterior width of pronotum, or slightly greater than pronotal width in some females 18
18. Large species—length from apex of tylus to cuneal fracture 3.27–3.80; length of antennal segment II 1.61–2.11 19
- Smaller species—length from apex of tylus to cuneal fracture 2.35–3.19; length of antennal segment II 1.12–1.46 21
19. Length of labium greater than posterior width of pronotum; cuneus nearly three times as long as its greatest width; Papua New Guinea *gressitti*, n. sp. (♀ only)
- Length of labium less than posterior width of pronotum; cuneus about twice as long as its greatest width, sometimes slightly more 20
20. Antennal segment II entirely pale or only lightly tinged with fuscous at extreme apex; labium reaching to near apex of mesosternum, segment IV twice as long as segment III; male genitalia as in figure 25; Papua New Guinea *novobritanicus*, n. sp.
- Antennal segment II strongly suffused with fuscous on distal third; labium not reaching beyond apices of procoxae, segment IV about 1.5 times as long as segment III; male genitalia as in figure 22; Papua New Guinea *magnus*, n. sp.
21. Antennal segment II entirely pale; cuneus narrow, about three times as long as greatest width; collar flattened dorsally; New Guinea 22
- Antennal segment II darkened distally; cuneus broader, less than twice as long as greatest width; collar weakly rounded dorsally; Australia, New Caledonia 23
22. Calli weakly but noticeably elevated, defined posteriorly by row of punctures in weakly depressed furrow; male genitalia as in figure 5; west Irian Jaya .. *angusticuneatus*, n. sp.
- Calli indistinct, not noticeably elevated, limited punctures along posterior border not occurring in furrow; male genitalia as in figure 23; east Irian Jaya, Papua New Guinea *morobe*, n. sp.
23. Dark stripe on hemelytral membrane reaching apical margin; left paramere with prominent, subangulate sensory lobe and indistinct apical processes (fig. 26a–c); vesica as in figure 26d; New Caledonia *novocaledonicus*, n. sp.
- Dark stripe on hemelytral membrane not reaching apical margin; left paramere with less prominent, rounded sensory lobe and weakly developed apical processes (figs. 8a–c); vesica as in figure 8d; northeast Australia *atrocaeruleus* Distant
24. Labium reaching between procoxae or slightly beyond, length 1.02–1.11; legs uniformly pale; male genitalia as in figure 27; Irian Jaya, Papua New Guinea *novoguineensis*, n. sp.
- Labium reaching to apex of mesosternum or slightly beyond, length 1.42–1.64; legs mostly fuscous, tarsi and distal half to two-thirds of tibiae pale; Africa 25
25. Hemelytral membrane within areolar cells mostly pale, sometimes narrowly infuscated bordering veins; length of antennal segment II (1.13–1.33) less than posterior width of pronotum; male genitalia as in figure 14; west and southeast Africa *ifensis* Linnavuori
- Hemelytral membrane within and between areolar cells strongly suffused with fuscous; length of antennal segment II (1.64–1.71) equal to or greater than posterior width of pronotum; male genitalia as in figure 18; southwest Ethiopia .. *longiceps* Linnavuori

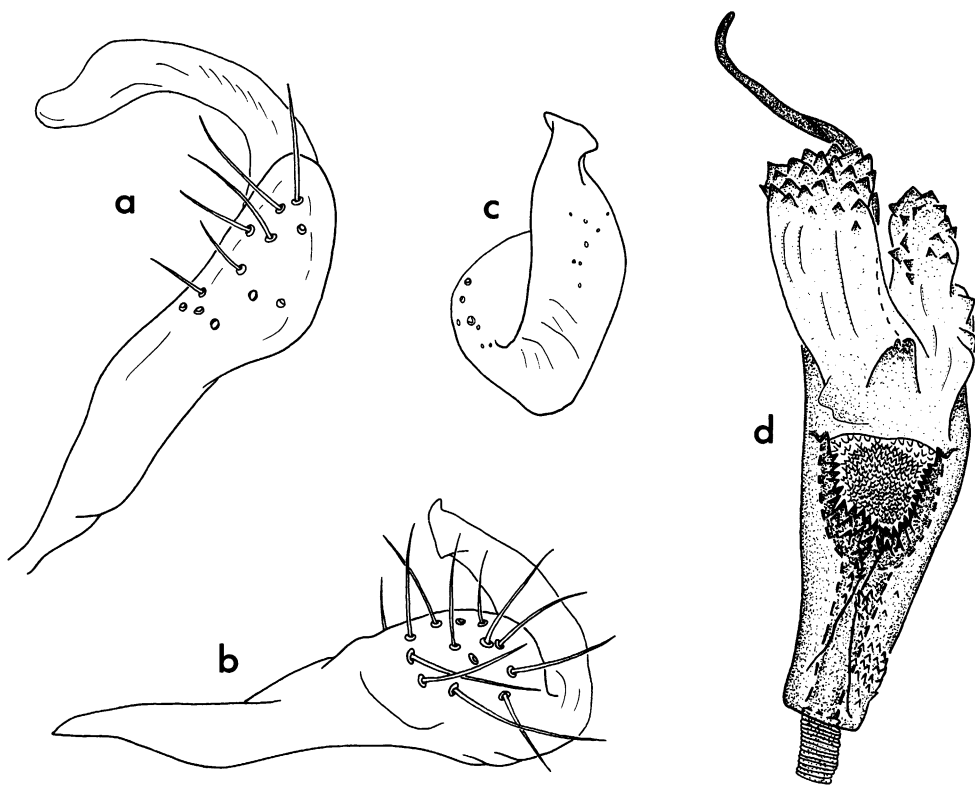


Fig. 5. Male genitalia of *Fingulus angusticuneatus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

***Fingulus angusticuneatus*,**
new species
Figure 5

DIAGNOSIS: *Fingulus angusticuneatus* is distinguished from other members of the genus by the following combination of characters: antennal segment II uniformly pale, length slightly less than posterior width of pronotum (see measurements below); pronotal collar flattened, lacking distinct punctures; calli weakly elevated, bordered posteriorly by row of punctures in shallow furrow; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; hemelytral membrane with dark medial band extending from inner apical angle of primary areolar cell to apex of membrane; and male genitalia as in figure 5. This species is further distinguished from *novobritanicus* and *magnus* by its smaller overall size, and from *maai* by the lengths of antennal segments I and II (see couplet 17 in key).

DESCRIPTION: *Male holotype.* Length 3.19; dark reddish brown general coloration, head slightly paler. **Head:** Width across eyes 0.55, vertex 0.15; slightly longer than broad in dorsal view; junction of frons and tylus weakly depressed; postocular region bordering eyes slightly inflated laterally in dorsal view, separated from remainder of neck by shallow impressed line—distance from impressed line to posterodorsal angle of eye equal to greatest width of antennal segment I. **Antennae:** I, length 0.35, dark reddish brown; II, length 1.29, pale brownish yellow; III–IV missing. **Labium:** Length 1.10, reaching to between procoxae; dark reddish brown, segment IV slightly paler; relative lengths of segments 15: 15:13:20. **Pronotum:** Posterior width 1.37; collar flattened, without distinct punctures, about as broad as greatest width of antennal segment I; calli as described above; posterior lobe of disc rising steeply and evenly from posterior margins of calli; lateral margins of disc straight; prosternal xyphus weakly con-

vex medially but without distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum weakly convex dorsally, not noticeably elevated above hemelytra. **Hemelytra:** lateral margins weakly rounded; cuneus nearly three times as long as greatest width; membrane suffused with fuscous inside areolar cells and with dark medial band extending from inner apical angle of primary areolar cell to apex of membrane. **Legs:** Femora dark reddish brown, moderately inflated distally; basal third to half of tibiae darkened; tarsi and distal portion of tibiae pale brownish yellow. **Genitalia:** Left paramere with moderately produced sensory lobe; shaft with distinct apical processes (fig. 5a–c). Vesica with single lobal sclerite (fig. 5d).

Female. Unknown.

ETYMOLOGY: From the Latin, *angustus* (narrow) and *cuneatus* (wedge-shaped), referring to the narrow cuneus of the forewing.

DISTRIBUTION: Irian Jaya, Indonesia.

DISCUSSION: The holotype of this species was damaged during dissection, resulting in the disassociation of the hemelytra, metathorax, and three of the remaining four legs from the main body of the specimen. The detached body parts were fixed to a second card point, which was mounted below the main specimen. Despite the fragmented condition of the holotype, it is easily identifiable by the characters given in the diagnosis.

HOLOTYPE ♂: INDONESIA: **Irian Jaya:** *Vogelkop:* Fak Fak, S. coast of Bombarai, 10–100 m, June 3, 1959, T.C. Maa (BISH).

***Fingulus apoensis*, new species**

Figure 6

DIAGNOSIS: Recognized by the darkened ostiole and evaporative area of the metathoracic scent efferent system, pronotal collar with distinct punctures, antennal segment II infuscated distally, and male genitalia as in figure 6. Further distinguished from *curticornis* by the smaller ratio of vertex width to head width; from *puncticollis* by the shorter second antennal segment; and from *luzonicus* by the relative lengths of labial segments III and IV.

DESCRIPTION: *Male holotype.* Length 2.88; dark brown general coloration, head some-

what lighter especially on frons, lorum, and jugum. **Head:** Width across eyes 0.58, vertex 0.16; slightly longer than broad in dorsal view; junction of tylus and frons indistinct; region immediately posteriad of eyes not noticeably inflated, narrowing abruptly to weakly impressed line—distance from line to postero-dorsal angle of eye much less than greatest width of antennal segment I. **Antennae:** I, length 0.36, dark brown; II, length 1.19, yellowish brown, apical sixth infuscated; III–IV, dark brown, segment III pale basally. **Labium:** Length 1.28; dark brown, segment IV yellowish brown; relative lengths of segments 16:15:15:26. **Pronotum:** Posterior width 1.35; collar flattened, punctate, slightly broader than greatest width of antennal segment I; calli weakly elevated, bordered posteriorly by broad, shallow depressed region; posterior lobe of disc rising abruptly from calli; prosternal xyphus with broad, weakly elevated tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum weakly convex dorsally, not noticeably elevated above hemelytra. **Hemelytra:** Weakly rounded laterally; cuneus twice as long as greatest width; membrane suffused with fuscous to level of apices of areolar cells. **Legs:** Dark reddish brown; tarsi and distal third to half of tibiae pale testaceous; femora weakly inflated distally. **Genitalia:** Left paramere with strongly produced, somewhat angulate sensory lobe (fig. 6a, b). Vesica with two lobal sclerites; basal tubular skirt with distinct dorsal flap (fig. 6d).

Female. Length 2.89–3.04; width of head across eyes 0.56–0.58; width of vertex 0.14; length of antennal segment I 0.36–0.40, segment II 0.99–1.09; length of labium 1.39–1.49; posterior width of pronotum 1.25–1.34.

ETYMOLOGY: Named for the type locality, Mt. Apo.

DISTRIBUTION: Philippine Islands.

HOLOTYPE ♂: PHILIPPINE ISLANDS: **Mindanao:** Mt. Apo, Mainit River, 6000 ft, Sept. 10, C.S. Clagg (AMNH).

PARATYPES: PHILIPPINE ISLANDS: **Mindanao:** 1♀, Mt. Apo, Galog River, 6000 ft, Sept. 5, C.S. Clagg (AMNH).

ADDITIONAL SPECIMENS: PHILIPPINE ISLANDS: **Luzon:** 1♀, Mt. Makiling, C.F. Baker (UZMH).

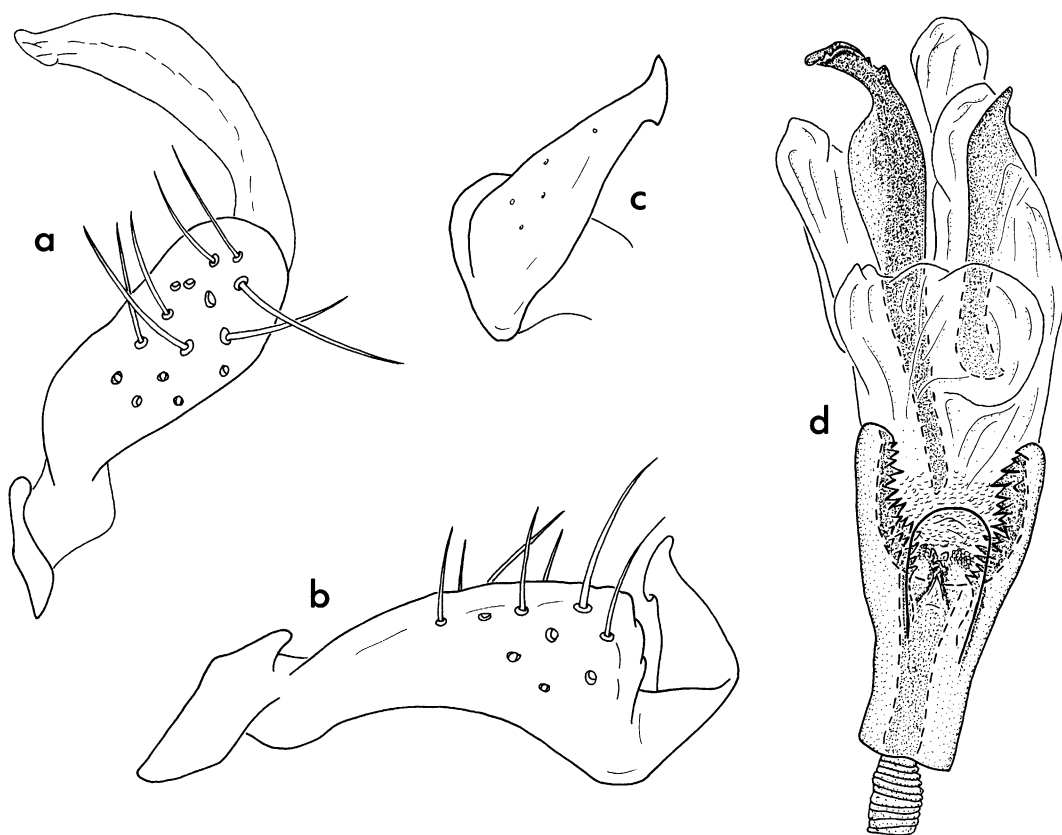


Fig. 6. Male genitalia of *Fingulus apoensis*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

Fingulus atra (Hsiao)

Figure 7

Anchix atra Hsiao, 1944: 378 (n. sp.).

Fingulus atra: Carvalho, 1957: 87 (n. comb., cat.).

– Akingbohunge, 1981: 193 (key).

DIAGNOSIS: Distinguished from other species with punctate pronotal collars by the small head with narrow vertex, short first antennal segment, labium with distinctly inflated second segment and elongate fourth segment, hemelytra with dark medial band extending from inner apical angle of primary areolar cell to apex of membrane, and male genitalia as in figure 7. This species is further characterized by the darkened ostiole and evaporative area of the metathoracic scent efferent system and the short, uniformly pale second antennal segment.

REDESCRIPTION: *Male*. Length 3.04; dark

brown general coloration. **Head:** Width across eyes 0.51, vertex 0.11; dark brown, frons and vertex yellowish brown; narrow, much longer than broad in dorsal view; junction of tylus and frons very shallowly depressed; region immediately posteriad of eyes narrowly and weakly inflated, bordered posteriorly by impressed line—distance from line to postero-dorsal angle of eye slightly less than greatest width of antennal segment I. **Antennae:** I, length 0.28, brown; II, length 0.82, yellowish brown, apex narrowly tinged with fuscous; III, brown, pale basally; IV, missing. **Labium:** Length 1.47; dark reddish brown, segment IV brownish yellow; relative lengths of segments 16:16:16:34. **Pronotum:** Posterior width 1.38; collar weakly convexly rounded, coarsely punctate, distinctly broader than greatest width of antennal segment I; calli weakly elevated, bordered posteriorly by shallow fur-

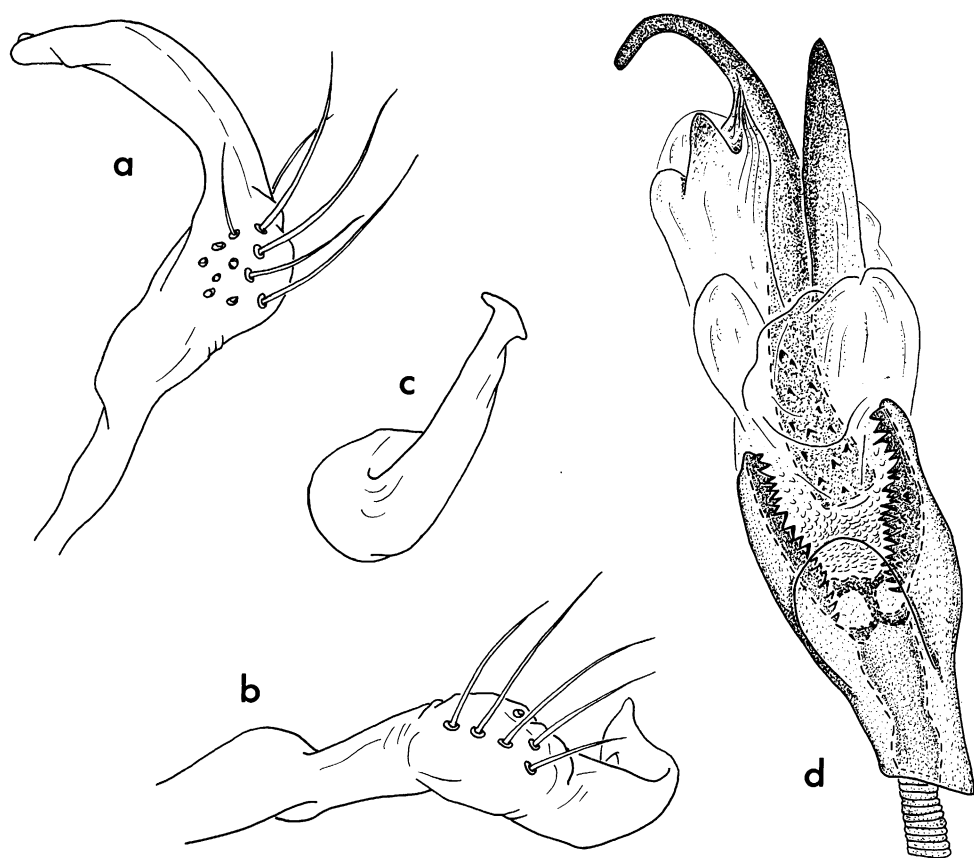


Fig. 7. Male genitalia of *Fingulus atra*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

row; posterior lobe of disc well elevated above calli in lateral view; ventral surface of prosternal xyphus weakly convex, but without distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum flattened dorsally, not noticeably elevated above hemelytra. **Hemelytra:** weakly rounded laterally; cuneus slightly more than twice as long as greatest width; membrane suffused with fuscous to level of apices of areolar cells, and with dark medial band extending from inner apical angle of primary areolar cell to apex of membrane. **Legs:** Dark reddish brown; tarsi and distal two-thirds of tibiae pale testaceous; hind femora moderately inflated distally. **Genitalia:** Left paramere with weakly produced sensory lobe (fig. 7a, b). Vesica with two lobal sclerites; basal tubular skirt with distinct dorsal flap (fig. 7d).

Holotype Female. Length 3.34; width of head across eyes 0.53; width of vertex 0.12; length of antennal segment I 0.31, segment II 0.89; segments III–IV brown; length of labium 1.56; posterior width of pronotum 1.50.

DISTRIBUTION: Luzon, Philippine Islands.

DISCUSSION: This species was originally described from a series of five specimens collected by C. F. Baker in the Philippine Islands. We have examined three of these specimens as follows: holotype female, Mt. Makiling, Luzon; allotype male, Zamboanga, Mindanao; paratype female, Basilan Island. The last two specimens are not conspecific with the holotype, but belong instead to the new species, *Fingulus nigrifasciatus*. The two other paratypes referred to in the original description (female, Mt. Makiling; male, Zamboanga) were not located. We did examine one male specimen of *atra* which appears to

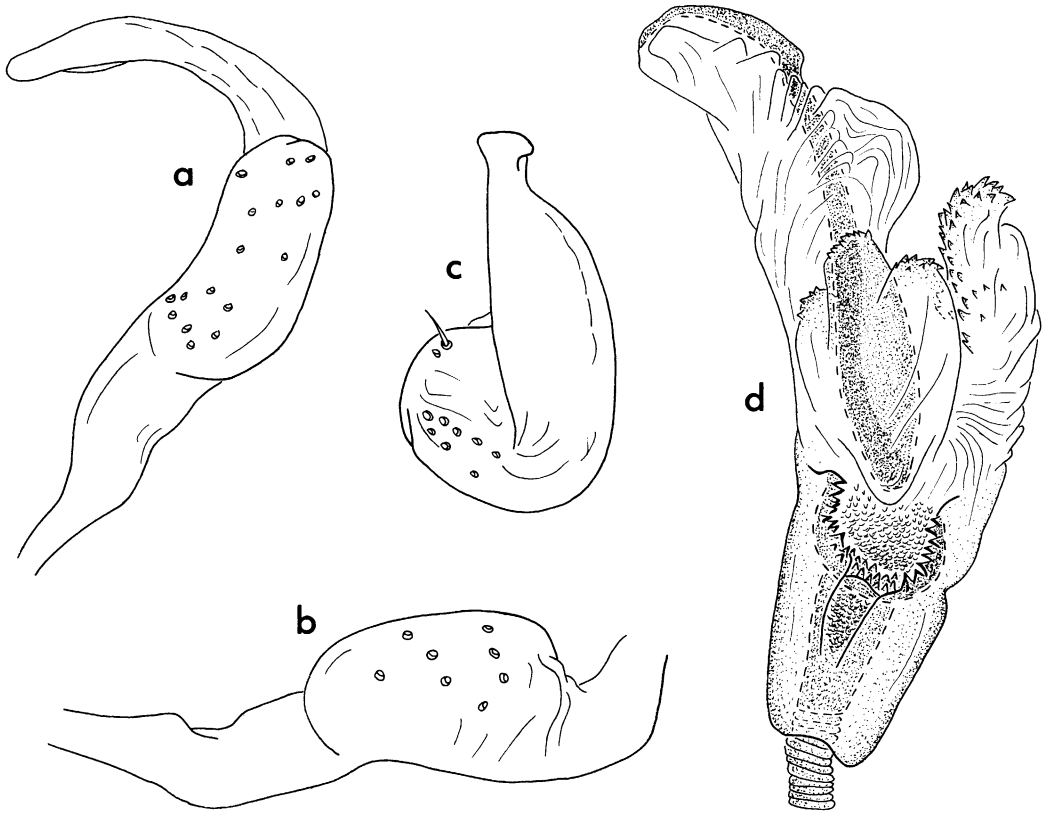


Fig. 8. Male genitalia of *Fingulus atrocaeruleus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

be from the same collection as the holotype—both specimens have a second label bearing the number “20746” written in black ink. However, Hsiao did not list a male from Mt. Makiling in his type data, nor does this specimen bear his paratype label. We speculate that Hsiao either made a mistake in reporting his type data, or simply overlooked the male specimen in the vast collections of the USNM.

SPECIMENS EXAMINED: PHILIPPINE ISLANDS: **Luzon:** 1♀ (holotype), 1♂, Mt. Makiling, C.F. Baker (USNM).

Fingulus atrocaeruleus Distant

Figure 8

Fingulus atrocaeruleus Distant, 1904: 275 (n. sp.). — Carvalho, 1953: 41 (distr.); 1957: 87 (cat.). — Akingbohunge, 1981: 193 (key).

DIAGNOSIS: Recognized by the relatively broad vertex; weakly inflated, impunctate pronotal collar; darkened apex of second an-

tennal segment; slightly inflated scutellum; and hemelytral membrane with dark medial spot extending from apex of areolar cell to slightly beyond midpoint of membrane. The ostiole and evaporative area of the metathoracic scent efferent system are uniformly darkened.

REDESCRIPTION: *Male holotype.* Length 2.51; dark reddish brown general coloration. **Head:** Width across eyes 0.62, vertex 0.20; about as long as broad in dorsal view; junction of tylus and frons weakly depressed; region immediately posteriad of eyes moderately inflated, bordered posteriorly by faint impressed line—distance from line to posterodorsal angle of eye distinctly less than greatest width of antennal segment I. **Antennae:** I, length 0.32, dark reddish brown; II, length 1.12, pale brownish yellow, apical fourth infuscated; III–IV, brown. **Labium:** Length 1.17, reaching to middle of mesosternum; yellowish brown, apex of segment IV

infuscated; relative lengths of segments 15:15:14:23. **Pronotum:** Posterior width 1.42; collar weakly inflated, somewhat convexly rounded, impunctate, about as broad as greatest width of antennal segment I; calli very slightly elevated, with indistinct posterior margins; posterior lobe of disc well elevated above calli in lateral view; ventral surface of prosternal xyphus with low, broadly rounded tubercle; ostiole and evaporative area of metathoracic scent efferent system darkened; scutellum distinctly elevated above surface of hemelytra. **Hemelytra:** Weakly rounded laterally; cuneus about 1.5 times as long as greatest width; membrane tinged with fuscous within areolar cells, especially bordering veins, and with dark medial spot extending from inner apical angle of primary areolar cell to slightly beyond midpoint of membrane. **Legs:** Dark reddish brown; tarsi and distal half of tibiae pale testaceous; femora weakly inflated distally, hind pair slightly more than others. **Genitalia:** Left paramere and vesica as in figure 8.

Female. Length 2.96–3.12; width of head across eyes 0.63–0.67; width of vertex 0.22–0.24; length of antennal segment I 0.36, segment II 1.40–1.44; length of labium 1.28–1.35; posterior width of pronotum 1.65–1.68.

DISTRIBUTION: Northeast coast of Australia. A single female was reported from Madagascar by Carvalho (1953), but this record is almost certainly in error. We have not examined this specimen, which should be deposited in the Institut Scientifique de Madagascar, but suspect that it is a new species, probably endemic to Madagascar.

SPECIMENS EXAMINED: AUSTRALIA: New South Wales: 1♀, Sydney, Mosman District, Dec. 25, 1956, in light trap, W.W. Writh (USNM); 1♀, Northmead, 26-10-1963, D. K. McAlpine (AM). Queensland: 1♀, Bundaberg, Aug. 20, 1919, F. Muir (AMNH); 1♂, Bonga Mts., N. Geary (AM); 1♂ (holotype), Townsville, March 20, 1903, P.P. Dodd (NHML). 1♀, Mt. Glorious, 1-12-30, H. Hacker (USNM).

Fingulus collaris Miyamoto

Figure 9

Fingulus collaris Miyamoto, 1965: 155, 156 (n. sp.).

DIAGNOSIS: Recognized by the weakly and evenly inflated scutellum, pale ostiole and

evaporative area of metathoracic scent efferent system, pale spot on base of corium, and structure of the male genitalia (fig. 9).

REDESCRIPTION: *Male.* Length 2.75–2.81; dark fuscous general coloration, base of corium with poorly defined pale spot. **Head:** Width across eyes 0.61–0.62, vertex 0.15–0.18; about as long as broad in dorsal view; dark brown with vertex, lorum, and jugum slightly paler; junction of tylus and frons weakly concave; region immediately posterior of eyes weakly inflated and separated from remainder of neck by a faint, impressed line—distance from line to posterodorsal angle of eye distinctly less than greatest width of antennal segment I. **Antennae:** I, length 0.35–0.36, dark reddish brown; II, length 1.13–1.15, uniformly pale brownish yellow; III, brownish yellow, distal third infuscated; IV, brown, narrowly pale distally. **Labium:** Length 1.31–1.42, nearly reaching posterior margin of mesosternum; brown, segment IV yellowish brown; relative lengths of segments 17:17:16:27. **Pronotum:** Posterior width 1.46–1.51; collar weakly convex dorsally, impunctate, slightly broader than greatest width of antennal segment I; calli weakly elevated, posterior border shallowly depressed; posterior lobe of disc rising abruptly from calli, well elevated above head and anterior lobe of disc in lateral view; prosternal xyphus with short, broad, posteroventrally directed tubercle; ostiole and evaporative area of metathoracic scent efferent system dirty white; scutellum weakly and evenly elevated above surface of hemelytra. **Hemelytra:** Weakly rounded laterally; cuneus slightly less than twice as long as greatest width; membrane tinged with fuscous basally, especially bordering areolar cells. **Legs:** Femora brown or dark reddish brown, middle and hind pairs slightly inflated distally; tibiae pale brownish yellow, hind pair with dark band basally; tarsi brownish yellow. **Genitalia:** Left paramere with moderately produced, evenly rounded sensory lobe (fig. 9a, b). Vesica with single, broad lobal sclerite; basal tubular skirt with distinct dorsal flap (fig. 9d).

Female. Length 2.83; width of head across eyes 0.62; width of vertex 0.18; length of antennal segment I 0.36, segment II missing; length of labium 1.42; posterior width of pronotum 1.46.

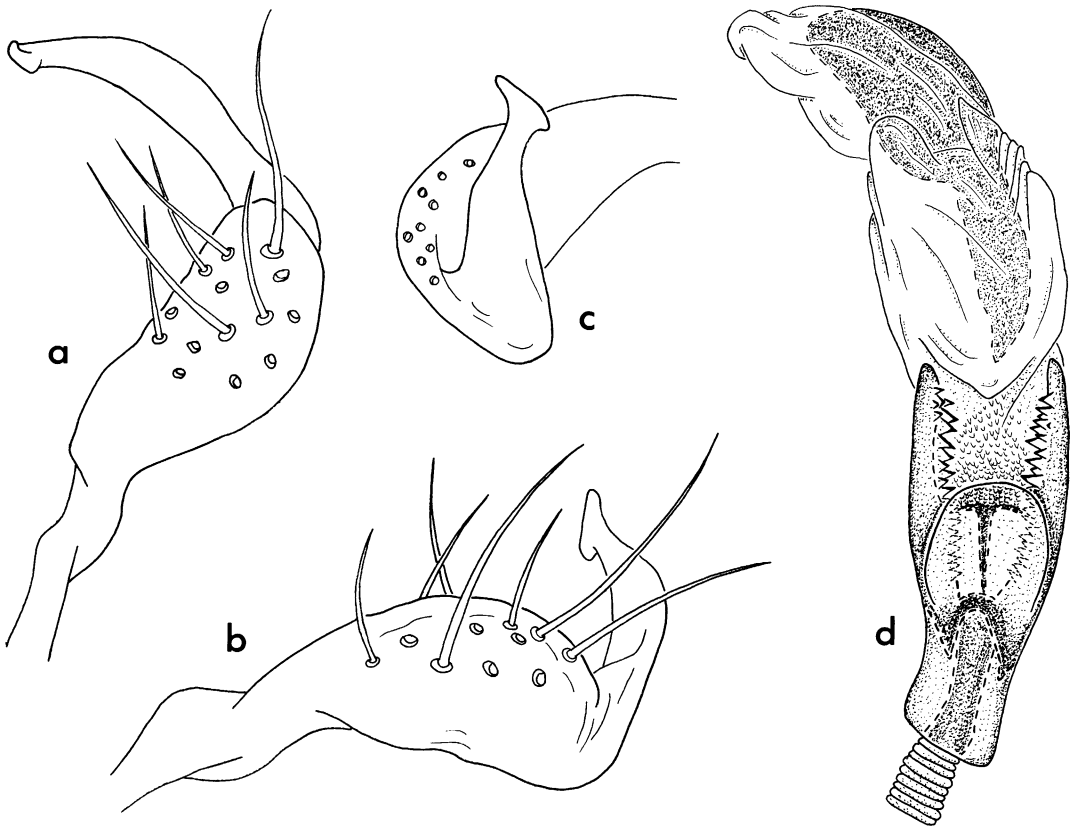


Fig. 9. Male genitalia of *Fingulus collaris*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

DISTRIBUTION: South India, Laos, Thailand, and Iriomote Island, Japan.

DISCUSSION: Our identification of this species is based on a comparison of nontype material against the original description of the holotype female, Iriomote Is., Japan. Our attempts to obtain this specimen from Kyushu University were unsuccessful.

SPECIMENS EXAMINED: **INDIA:** **Madras:** *Nilgiris Dist.*: 1♂, Nilgiris Hills, Coonoor, T.V. Campbell (NHML). **LAOS:** **Vientiane Prov.:** 1♂, Ban Van Eue, Nov. 30, 1966, native collector (BISH). **THAILAND:** **Chiangmai Prov.:** 1♀, Doi Suthep, April 1–5, 1958, T.C. Maa (BISH).

***Fingulus curticornis*, new species**

Figure 10

DIAGNOSIS: Recognized by the broad vertex, short second antennal segment with dis-

tal half infuscated, long labium, and structure of the male genitalia (fig. 10). The pronotal collar is shallowly punctate and much broader than the greatest width of antennal segment I, and the scent gland ostiole and evaporative area of the metathorax are uniformly darkened.

DESCRIPTION: *Male holotype.* Length 3.04; dark brown general coloration. **Head:** Width across eyes 0.69, vertex 0.26; as long as broad in dorsal view; dark brown with lorum, jugum, and neck posteriad of postocular constriction slightly paler; junction of tylus and frons very shallowly depressed; region immediately posteriad of eyes not inflated, narrowing abruptly to distinct impressed line defining anterior margin of neck—distance from line to posterodorsal angle of eye about half as broad as greatest width of antennal segment I. **Antennae:** I, length 0.34, dark reddish brown; II, length 0.88, yellowish brown with

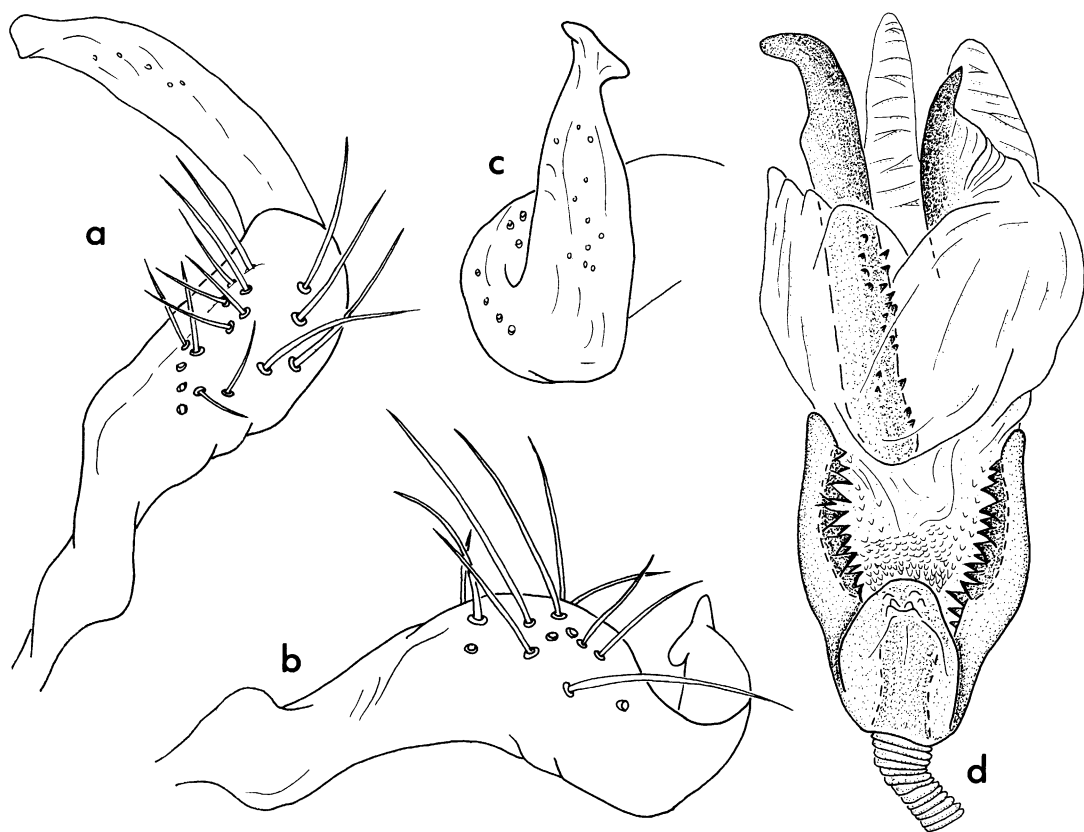


Fig. 10. Male genitalia of *Fingulus curticornis*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

slightly less than distal half infuscated; III–IV, fuscous, narrowly pale basally. **Labium:** Length 1.85, reaching between metacoxae; dark yellowish brown; relative lengths of segments 20:20:24:39. **Pronotum:** Posterior width 1.57; collar flattened, shallowly punctate, about half again as broad as greatest width of antennal segment I; calli weakly elevated, bordered posteriorly by broad, shallow depression; posterior lobe of disc well elevated above head and anterior lobe of disc in lateral view; prosternal xyphus with broad, conical posterior angle, but lacking tubercle on ventral surface; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum weakly and evenly elevated above surface of hemelytra, dorsal surface flattened. **Hemelytra:** Weakly rounded laterally; cuneus slightly less than twice as long as greatest width; membrane

bordering areolar veins lightly tinged with fuscous. **Legs:** Femora reddish brown, middle and hind pairs slightly inflated distally; tibiae and tarsi yellowish brown; tibiae narrowly darkened basally. **Genitalia:** Left paramere with low, broadly rounded sensory lobe (fig. 10a, b). Vesica with two lobal sclerites; basal tubular skirt with distinct dorsal flap (fig. 10d).

Female. Length 2.96–3.26; width of head across eyes 0.63–0.69; width of vertex 0.23–0.26; length of antennal segment I 0.33–0.38, segment II 0.94–1.05; length of labium 1.75–1.78; posterior width of pronotum 1.47–1.64.

ETYMOLOGY: From the Latin, *curtus* (short) and *cornus* (horn), referring to the comparatively short antennae.

DISTRIBUTION: Laos and Sabah.

HOLOTYPE ♂: MALAYSIA: **Sabah:** Bettotan, nr. Sandakan, Aug. 16, 1927 (NHML).

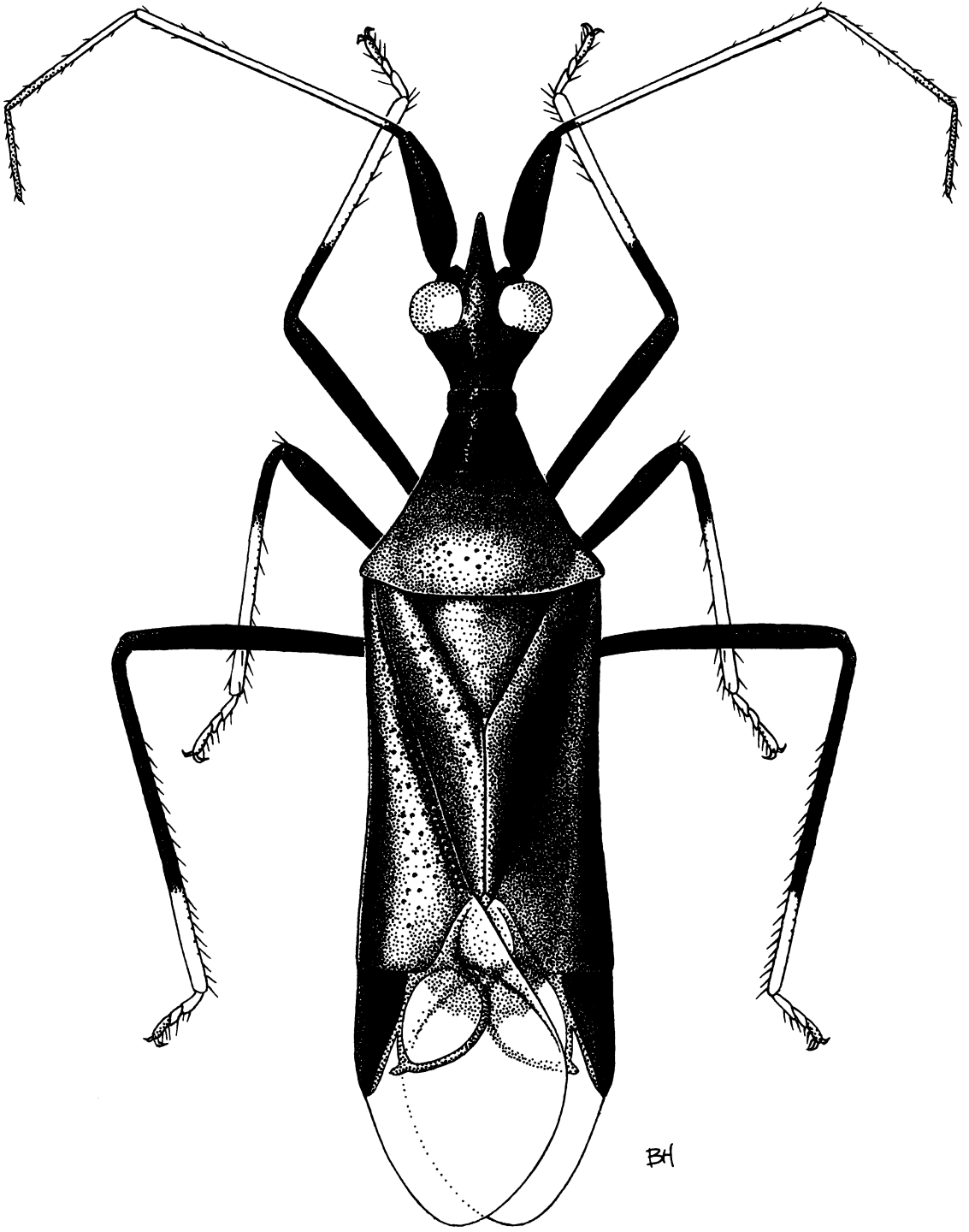


Fig. 11. *Fingulus gracilis*, dorsal habitus, ♀.

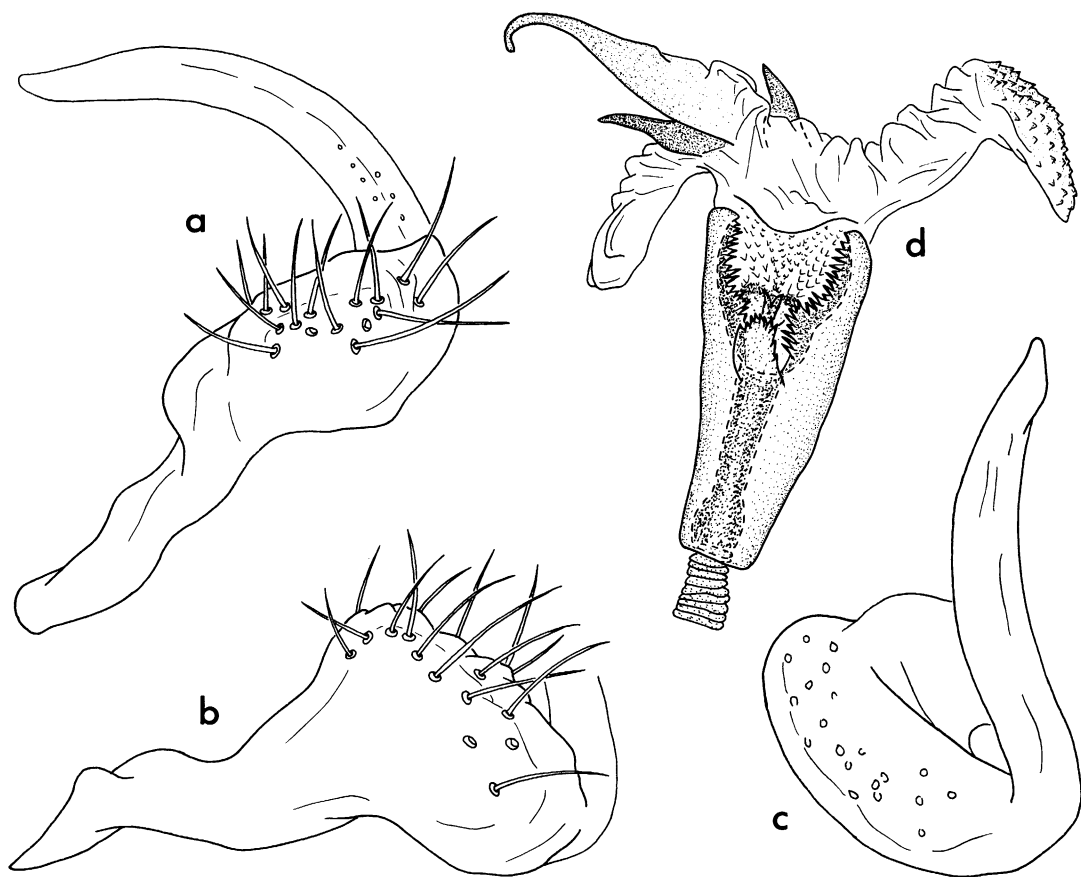


Fig. 12. Male genitalia of *Fingulus gracilis*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

PARATYPES: LAOS: **Vientiane Prov.**: 1♀, Phou-kow-kuei, April 17, 1965, J.L. Gressitt (BISH). MALAYSIA: **Sabah**: 1♀, Ranau, Sept. 30–Oct. 5, 1958, L.W. Quate (BISH).

Fingulus gracilis Akingbohunge

Figures 11, 12

Fingulus gracilis Akingbohunge, 1981: 182–184, 193 (n. sp., key).

DIAGNOSIS: Distinguished from other members of the genus by the long, slender body form (fig. 11); strongly inflated first antennal segment; prominent, conical process on the frons; strongly developed postocular region of the head; and by the structure of the male genitalia (fig. 12).

REDESCRIPTION: *Male*. Length 4.10–4.33; dark brown general coloration. **Head:** Width

across eyes 0.75–0.84, vertex 0.21–0.23; dark brown to nearly black with pale spot bordering posteromedial angle of each eye; slightly longer than broad in dorsal view; weakly produced anteriorly of antennal fossae in lateral view; frons with prominent, conical process (fig. 11); postocular, necklike region of head strongly developed, nearly as long as distance between tip of tylus and hind margin of eyes in dorsal view; postocular region bordering eyes not inflated and without discernible impressed line. **Antennae:** I, length 0.88–0.90, dark reddish brown, strongly inflated, more than three times the thickness of segment II, narrowing distally; II, length 1.88–2.08, pale brownish yellow, base narrowly infuscated; III, brownish yellow, slightly darker distally; IV, dark brown, narrowly pale basally. **Labium:** Length 1.44–1.50, reaching to poste-

rior margin of procoxae or slightly beyond; dark brown, segment IV usually paler yellowish brown; relative lengths of segments 23:21:19:23. **Pronotum:** Posterior width 1.36–1.40; collar flattened, with several fine transverse striae, width of collar much less than diameter of antennal segment I; calli indistinct, posterior border very weakly depressed; posterior lobe of disc weakly convex, not noticeably elevated above head in lateral view; ventral surface of prosternal xyphus flattened, without broad tubercle or conical process; ostiole of metathoracic scent efferent system pale, sometimes tinged with fuscous especially along dorsal margin, evaporative area darkened but with region posteriad of ostiole usually slightly paler than surrounding pleura; scutellum not noticeably elevated above surface of hemelytra, dorsal surface weakly convex. **Hemelytra:** Elongate, parallel-sided, with weakly concave lateral margins; cuneus about 3.5 times as long as greatest width; membrane clear or very lightly tinged with fuscous especially bordering areolar veins. **Legs:** Femora dark reddish brown, hind pair slightly inflated distally; tibiae fuscous basally, distal half to two-thirds pale brownish yellow, hind tibiae pale only on distal third; tarsi brownish yellow. **Genitalia:** Left paramere with prominent sensory lobe (fig. 12a, b); shaft uniformly narrow, without apical processes (fig. 12c). Vesica with two small lobal sclerites, and with distinct field of spines on right lobe of membranous sac (fig. 12d).

Female. Length 4.44–4.56; width of head across eyes 0.81–0.82; width of vertex 0.22; length of antennal segment I 0.91–0.95, segment II 1.86–1.90; length of labium 1.50–1.51; posterior width of pronotum 1.39–1.53.

DISTRIBUTION: West Africa.

DISCUSSION: Externally, *gracilis* is somewhat atypical of the genus, with a much more elongate body form, greatly enlarged first antennal segment, and conical process on the frons. However, the structures of the male genitalia, particularly the basal sclerotized skirt of the vesica with secondary gonopore opening into spinose cuplike cavity, unequivocally place this species in *Fingulus*.

SPECIMENS EXAMINED: GHANA: **Eastern Prov.:** 5♂, 3♀, Tafo, various dates between July 31 and Jan. 22, 1966–1968, UV light trap, D. Leston (AMNH); 1♀, Leyon, Aug.

27, 1968, UV light trap, D. Leston (NHML). **IVORY COAST:** 1♂ (holotype), Bingerville, Aug. 1962, J. Decelle (MRAC).

***Fingulus gressitti*, new species**

Figure 13

DIAGNOSIS: Distinguished from other New Guinea species by its large size, narrow head with relatively small eyes, long labium, and elongate cuneus (see couplet 19 in key). Although similar to *magnus* and *novobritanicus* in size and general structure, *gressitti* is easily distinguished by the longer labium and cuneus, narrower head, and by the less abruptly elevated pronotal disc.

DESCRIPTION: *Female holotype.* Length 3.64; dark reddish brown general coloration, with lorum, jugum, and head posteriad of eyes slightly paler. **Head:** Width across eyes 0.64, vertex 0.19; distinctly longer than broad in dorsal view; moderately produced anteriad of antennal fossae in lateral view; juncture of tylus and frons deeply notched; postocular region bordering eyes moderately inflated, separated from remainder of neck by weakly impressed line—distance from line to posterodorsal angle of eye less than greatest width of antennal segment I. **Antennae:** I, length 0.44, dark fuscous; II, length 1.77, yellowish brown, extreme apex slightly darker; III–IV, brown, segment III narrowly pale basally. **Labium:** Length 1.86, reaching to apex of mesosternum; fuscous, segment IV yellowish brown; relative lengths of segments 25:23:23:35. **Pronotum:** Posterior width 1.68; collar flattened, transversely roughened but without distinct punctures, slightly broader than greatest width of antennal segment I; calli indistinct, with weak posteromedial depression; posterior lobe of disc rising gradually from collar, strongly elevated above head; ventral surface of prosternal xyphus with low, broad tubercle distally; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum weakly elevated above hemelytra, dorsal surface slightly convex. **Hemelytra:** Lateral margins weakly rounded, cuneal incisure deep; cuneus nearly three times as long as greatest width; membrane with areolar cells mostly darkened, except distomedially, and with a dark, medial band extending from inner apical an-

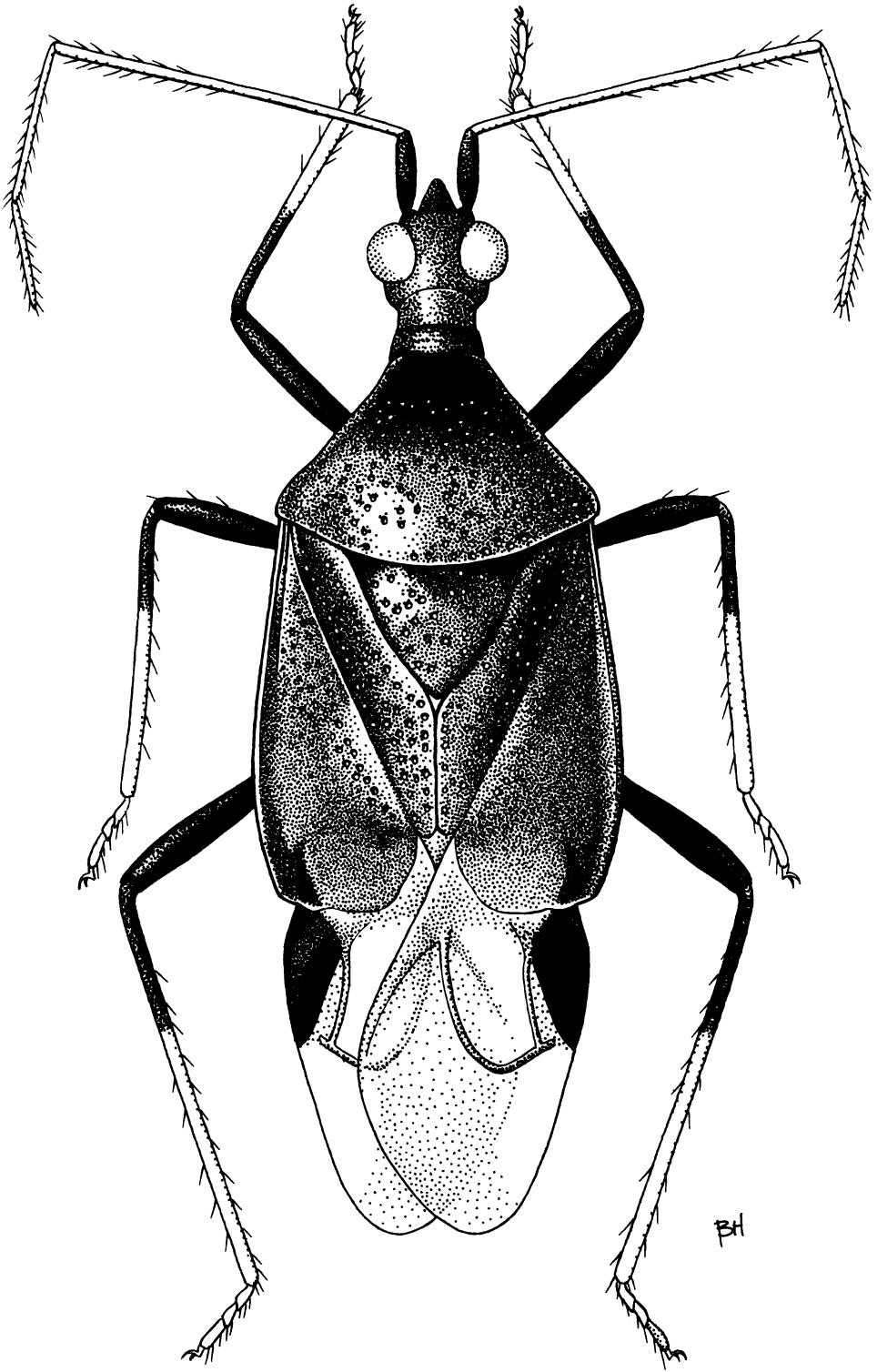


Fig. 13. *Fingulus gressitti*, dorsal habitus, holotype ♀.

gle of primary cell to apex of membrane. **Legs:** Femora dark fuscous, middle and hind pairs inflated distally, hind pair slightly more so; tibiae pale brownish yellow, basal third to nearly half fuscous; tarsi pale, claws darker yellowish brown. **Genitalia:** Not examined.

ETYMOLOGY: Named for J. L. Gressitt.

DISTRIBUTION: Papua New Guinea.

DISCUSSION: Although this species is described from a single female specimen, it is clearly distinguishable from other New Guinea taxa by the characters provided in the diagnosis. This species and *sumatranus*, also known from a single female, were described primarily to make distributional information available for biogeographic analysis.

HOLOTYPE ♀: PAPUA NEW GUINEA: **Morobe Prov.:** Wau, Mt. Missim, 1800 m, March 22, 1966, J.L. Gressitt (BISH).

Fingulus ifensis Linnavuori,
new status
Figure 14

Fingulus longiceps ifensis Linnavuori, 1975: 12 (n. subsp.).

Fingulus shenefelti Akingbohunge, 1981: 186–189, 193 (n. sp., key). NEW SYNONYMY.

DIAGNOSIS: Recognized by the following combination of characters: antennal segment II infuscated distally, length of segment less than posterior width of pronotum; labium pale brownish yellow, apex of segment IV slightly darker; pronotal collar roughened but lacking distinct punctures; hemelytral membrane lightly infuscated bordering veins but otherwise pale; scent gland ostiole and evaporative area of metathorax uniformly darkened; and vesica of male genitalia with two lobal sclerite (one long and curled), extensively sclerotized left lobe of membranous sac, and distally spinose right membranous lobe (fig. 14d).

REDESCRIPTION: *Male.* Length 2.85–3.11; dark reddish brown general coloration. **Head:** Width across eyes 0.66–0.73, vertex 0.15–0.18; about as long as broad in dorsal view; reddish brown; junction of tylus and frons very shallowly and broadly depressed; region immediately posteriad of eyes slightly inflated, then abruptly narrowed, but lacking distinct impressed line—distance from medial constriction of neck to posterodorsal angle of

eye about half again as broad as greatest width of antennal segment I. **Antennae:** I, length 0.38–0.42, dark reddish brown; II, length 1.26–1.27, pale brownish yellow, distal third infuscated; III, pale brownish yellow, apical third darkened; IV, fuscous, narrowly pale basally. **Labium:** Length 1.42–1.50, reaching apex of mesosternum or slightly beyond; pale brownish yellow, segment IV slightly darker distally; relative lengths of segments 16:16:20:35. **Pronotum:** Posterior width 1.39–1.57; collar flattened, transversely roughened but without distinct punctures, slightly broader than greatest width of antennal segment I; calli weakly elevated, bordered posteriorly by row of punctures set in shallow depression; posterior lobe of disc rising gradually from calli, moderately elevated above head and anterior lobe of disc in lateral view; prosternal xyphus with conical posterior angle, but lacking tubercle on ventral surface; ostiole and evaporative area of metathoracic scent efferent system as dark as surrounding thoracic sclerites; scutellum weakly and evenly elevated above surface of hemelytra, dorsal surface nearly flat. **Hemelytra:** Nearly straight laterally, weakly curved just anterior of cuneal incisure; cuneus slightly less than twice as long as greatest width; membrane pale, lightly tinged with fuscous bordering areolar veins. **Legs:** Femora dark reddish brown, middle and hind pairs slightly inflated distally; tarsi and distal half to two-thirds of tibiae pale brownish yellow, basal region of tibiae darkened. **Genitalia:** Apex of shaft of left paramere with very strong dorsal process and much weaker ventral process (fig. 14c). Vesica as in figure 14d.

Female. Length 3.15–3.49; width of head across eyes 0.66–0.74; width of vertex 0.19–0.22; length of antennal segment I 0.39–0.45, segment II 1.13–1.33; length of labium 1.50–1.64; posterior width of pronotum 1.27–1.40.

DISTRIBUTION: West and southeast Africa.

DISCUSSION: Our examination of the holotypes of *longiceps* and *longiceps ifensis* revealed that these two taxa are in fact distinct species differing primarily in body size, especially the longer second antennal segment of *longiceps*, color pattern on the hemelytral membrane, and the structure of the male genitalia. Further, we were unable to distinguish between the type of *ifensis* and various spec-

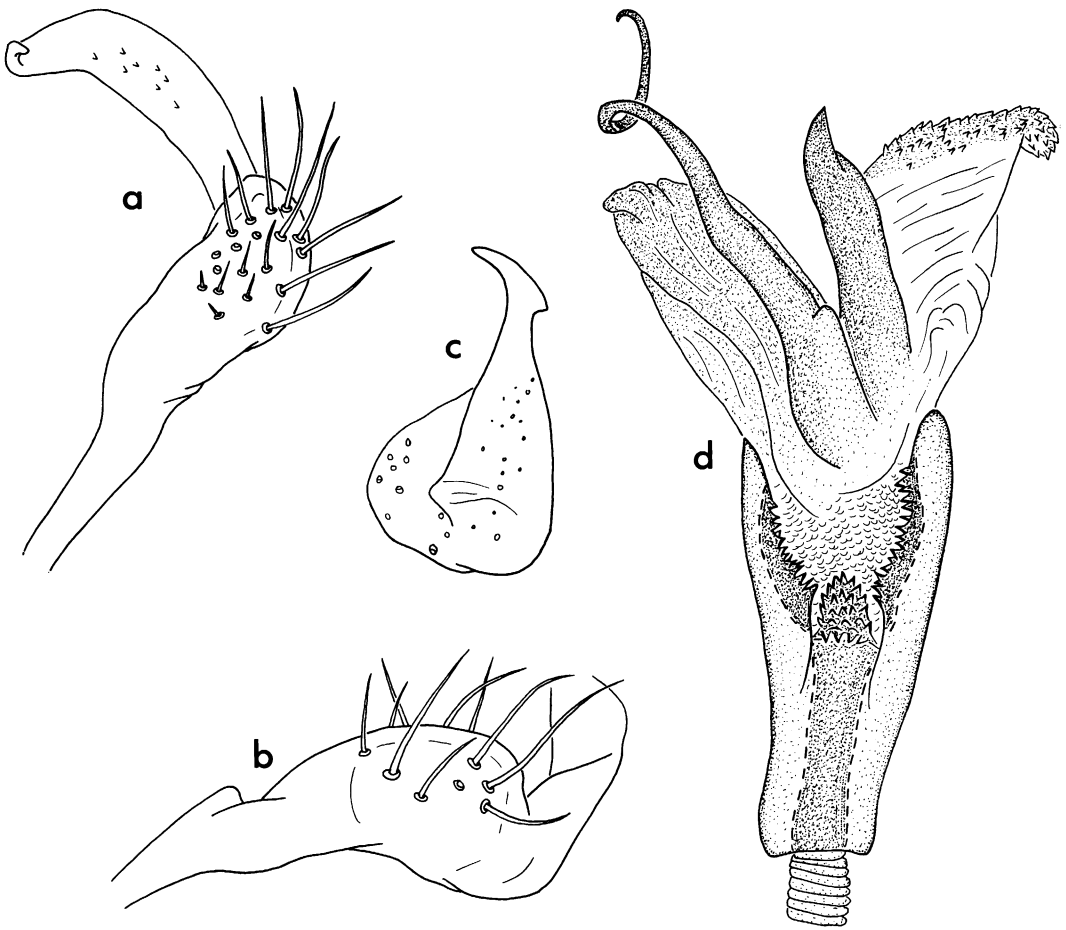


Fig. 14. Male genitalia of *Fingulus ifensis*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

imens, including paratypes, of *shenefelti*, and here place the latter species in synonymy with *ifensis*. Akingbohungebe seems to have been unaware of Linnavuori's species *ifensis* when he reviewed the African species of the genus in 1981.

SPECIMENS EXAMINED: GUINEA: 1♀, Kindia Region, Mt. Gangan, 600 m, May 18, 1951, Bechyné (CARV). NIGERIA: **Western State:** 1♀, Ibaden, IITA, Golf Course Lake, Feb. 6–10, 1978, D. & M. Davis (USNM); 1♀ (holotype, *ifensis*), Ile-Ife, Jan. 5, 1970, J.T. Medler (AMNH, Linnavuori Collection); 1♂ (paratype, *shenefelti*), Ile-Ife, Jan. 23, 1978, Akingbohungebe (UIFE); 1♀ (paratype, *shenefelti*), Ile-Ife, Feb. 2, 1973, J.T. Medler (MRAC). REPUBLIC OF SOUTH

AFRICA: Cape of Good Hope: Pondoland: 1♂ (head missing, Jan. 1924), 1♀ (Sept. 1923), Port St. Johns, R.E. Turner (NHML). **Natal:** 1♂, Umtentweni, July, 1954, A.L. Capener (AMNH, Slater Collection). **UGANDA:** 1♂, 1♀, Kampala, Feb. 7, 1931, H. Hargreaves (NHML).

***Fingulus inflatus*, new species**

Figures 3, 15, 16

DIAGNOSIS: Recognized by the strongly inflated scutellum, antennal segment II darkened distally, length of segment slightly greater than posterior width of pronotum; scent gland ostiole and evaporative area of metathorax dirty white; prosternal xyphus with

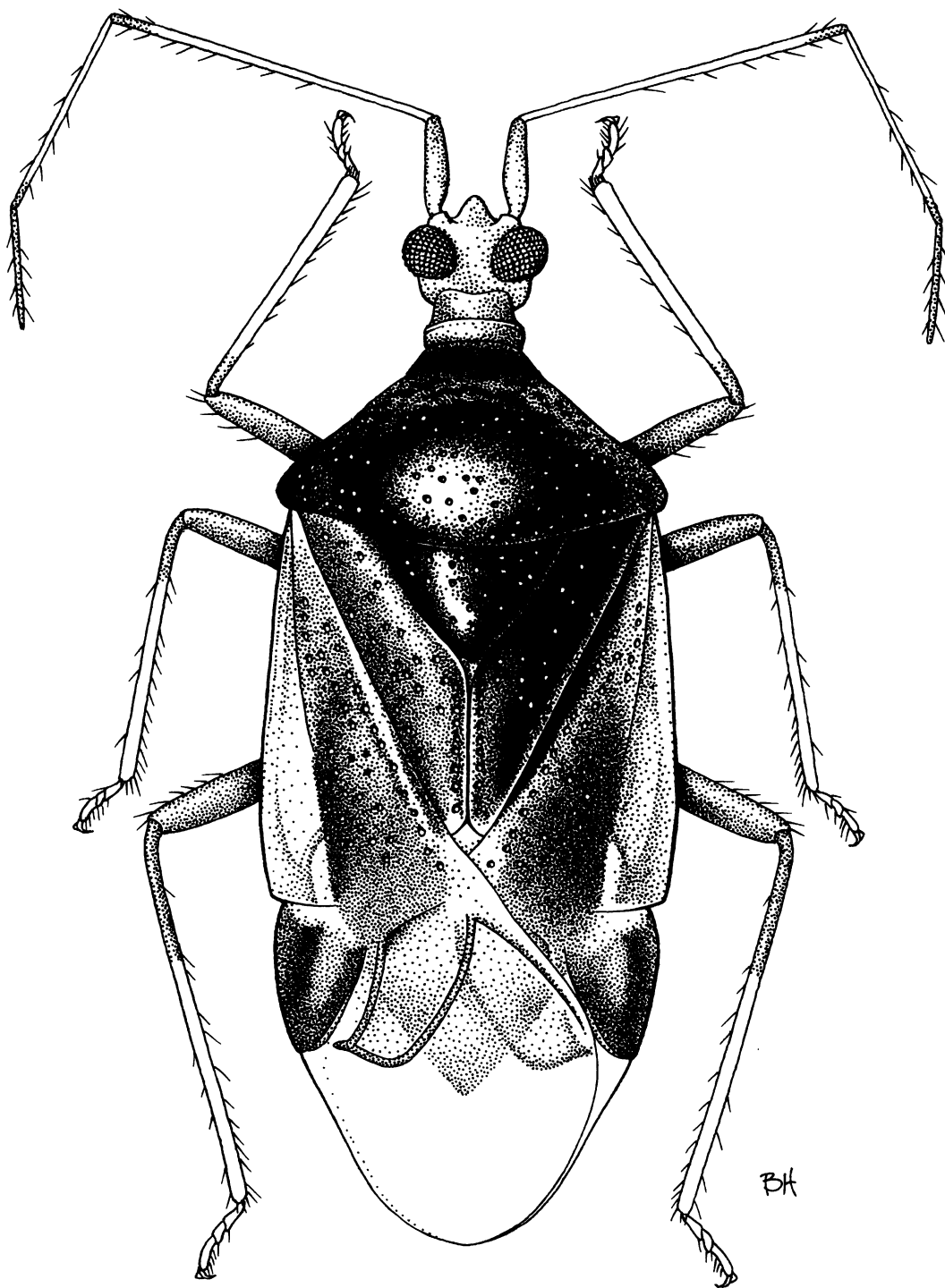


Fig. 15. *Fingulus inflatus*, dorsal habitus, ♀.

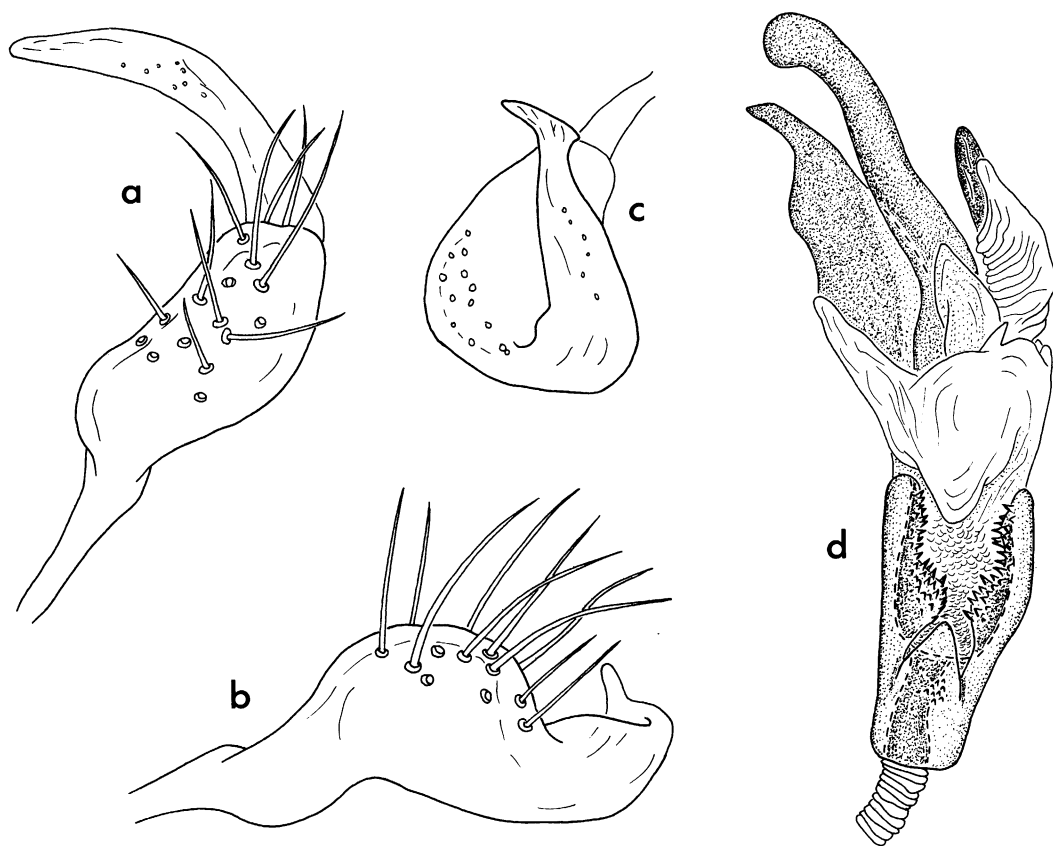


Fig. 16. Male genitalia of *Fingulus inflatus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

short, broad, ventrally directed tubercle; and left paramere and vesica of male genitalia as in figure 16. The pronotal collar of *inflatus* is flattened, without punctures, and as broad as the greatest width of antennal segment I.

DESCRIPTION: *Male holotype.* Length 2.88; dark reddish brown general coloration. **Head:** Width across eyes 0.65, vertex 0.15; as long as broad in dorsal view; dark yellowish brown, tylus and base of neck darker fuscous; junction of tylus and frons shallowly depressed; postocular region bordering eyes slightly inflated, then narrowing to distinct neck defined anteriorly by faint, impressed line—distance from line to posterodorsal angle of eye as broad as greatest width of antennal segment I. **Antennae:** I, length 0.41, dark reddish brown; II, length 1.53, pale brownish yellow, distal fourth infuscated; III, brownish yellow, apical third darkened; IV, fuscous, narrowly

pale basally. **Labium:** Length 1.28, reaching nearly to apex of mesosternum; segments I and II fuscous, III and IV brownish yellow, IV slightly darker distally; relative lengths of segments 15:16:18:27. **Pronotum:** Posterior width 1.39; collar flattened, very finely roughened, without distinct punctures, as broad as greatest width of antennal segment I; calli weakly elevated, posterior borders shallowly depressed; posterior lobe of disc rising steeply from calli, well elevated above head and anterior lobe of disc in lateral view; prosternal xyphus with low, rounded tubercle projecting from ventral surface; ostiole and evaporative area of metathoracic scent efferent system dirty white; scutellum strongly elevated above surface of hemelytra, slightly more so distally, dorsal surface flattened. **Hemelytra:** Weakly rounded laterally; cuneus about twice as long as greatest width; mem-

brane with distal half of primary areolar cell and all of secondary cell infuscated, outer borders of areolar veins lightly infuscated. **Legs:** Femora dark reddish brown, hind pair very slightly inflated distally; tibiae pale brownish yellow, narrowly infuscated basally, hind pair more broadly darkened; tarsi brownish yellow. **Genitalia:** Left paramere with prominent, evenly rounded sensory lobe; shaft with very strong dorsal process and weak ventral process (fig. 16a–c). Vesica with three lobal sclerites; basal tubular skirt with small, apically acute dorsal flap (fig. 16d).

Female paratype. Length 3.26; width of head across eyes 0.66; width of vertex 0.16; length of antennal segment I 0.44, segment II 1.86; length of labium 1.42; posterior width of pronotum 1.75.

ETYMOLOGY: From the Latin, *inflatus* (puffed, swollen), referring to the inflated scutellum.

DISTRIBUTION: Malaya, Taiwan, and Vietnam.

DISCUSSION: The female specimens from Malaysia and Taiwan differ from the paratype female in having a slightly broader head (0.72–0.78) with larger eyes, and less strongly elevated scutellum. The second antennal segments of these two specimens measure 1.56 and 1.90, respectively. All other external features are comparable with the paratype female.

HOLOTYPE ♂: VIETNAM: Mt. Lang Bian, 1500–2000 m, May 19–June 8, 1961, N.R. Spencer (BISH).

PARATYPES: 1♀, same data as holotype.

ADDITIONAL SPECIMENS: MALAYSIA: **Malaya:** *Pahang Prov.*: 1♀, Cameron Highlands, Ginling Kiel, 5000 ft, May 30, 1938, H.M. Pendlebury (CARV). TAIWAN: 1♀, Sun-moon Lake, May 1958, N.L.H. Krauss (BISH).

Fingulus libbyi Akingbohungbe

Figure 17

Fingulus libbyi Akingbohungbe, 1981: 189–193 (n. sp., key).

DIAGNOSIS: Recognized by the strongly inflated scutellum; long, uniformly pale second antennal segment; broad, weakly inflated postocular region; broad, flattened pronotal collar, without distinct punctures; pale scent

gland ostiole; and structure of male genitalia (fig. 17).

DESCRIPTION: **Male.** Length 2.81–3.15; dark brown general coloration. **Head:** Width across eyes 0.66–0.75, vertex 0.14–0.16; as long as broad in dorsal view; dark brown with jugum, lorum and expanded region posteriad of eyes sometimes paler yellowish brown; junction of tylus and frons depressed; postocular region bordering eyes weakly and broadly inflated; neck slightly constricted medially but without distinct impressed line—distance from constriction to posterodorsal angle of eye half again as broad as greatest width of antennal segment I. **Antennae:** I, length 0.42–0.44, dark reddish brown; II, length 1.71, uniformly pale brownish yellow; III–IV, missing. **Labium:** Length 1.23–1.53, reaching to apex of mesosternum; segments I and II fuscous, III and IV brownish yellow, IV slightly darker distally; relative lengths of segments 16:18:18:24. **Pronotum:** Posterior width 1.39–1.47; collar flattened, transversely roughened, without distinct punctures, half again as broad as greatest width of antennal segment I; calli weakly elevated, with depressed punctate posterior border; lateral margins of disc slightly constricted at level of posterior margin of calli; posterior lobe of disc rising steeply from calli, well elevated above head and anterior lobe of disc in lateral view; prosternal xyphus with low, rounded tubercle projecting from ventral surface; scent gland ostiole white, surrounding evaporative area darkened except posterior margin sometimes narrowly pale; scutellum strongly elevated above surface of hemelytra, slightly more so distally, dorsal surface flattened. **Hemelytra:** Weakly rounded laterally; cuneus about twice as long as greatest width; membrane pale, lightly tinged with fuscous bordering veins. **Legs:** Femora dark reddish brown, very slightly inflated distally; tibiae pale brownish yellow, basal fourth infuscated; tarsi brownish yellow. **Genitalia:** Left paramere with broadly rounded sensory lobe (fig. 17b). Vesica with several lobal sclerites, one of these long and strongly curved distally (fig. 17d).

Female. Length 3.00–3.19 (3.95–3.99); width of head across eyes 0.68–0.69 (0.81–0.84); width of vertex 0.16–0.17 (0.21–0.23); length of antennal segment I 0.39–0.40 (0.55–0.56), segment II 1.68 (2.26–2.37); length of

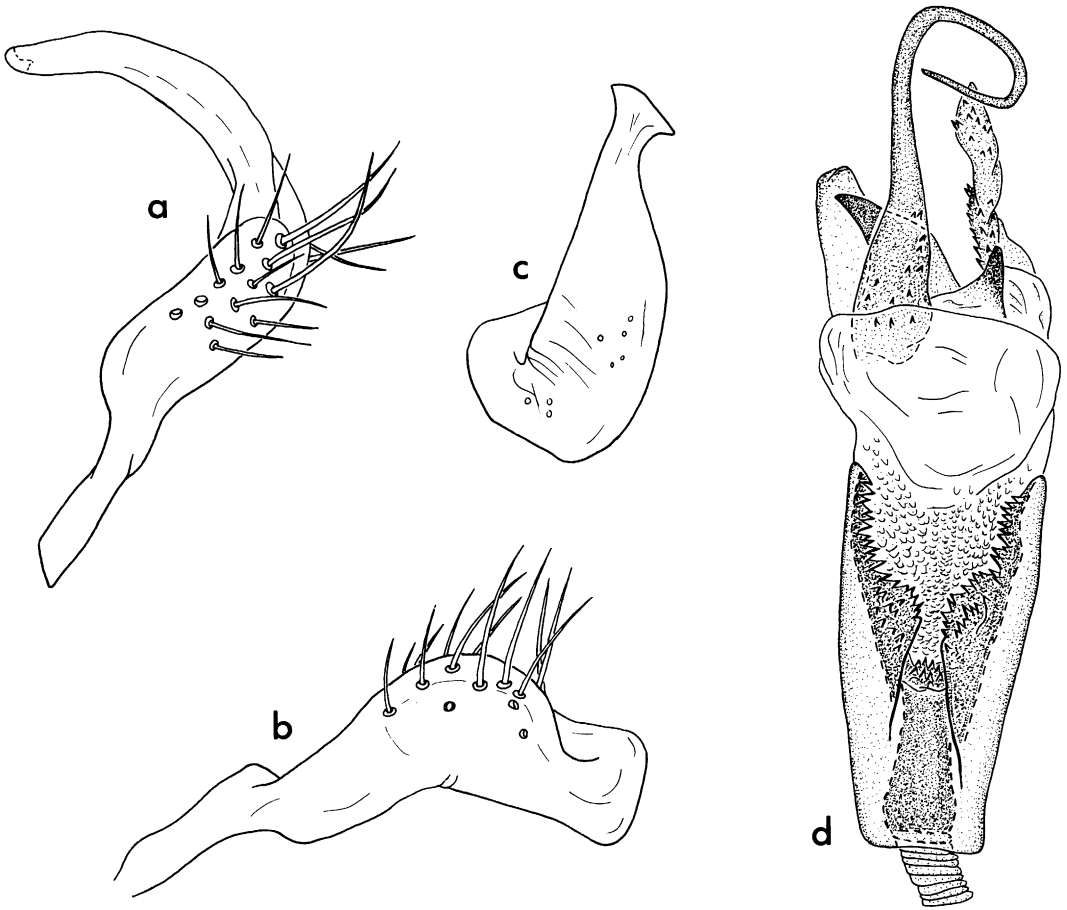


Fig. 17. Male genitalia of *Fingulus libbyi*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

labium 1.20–1.24 (1.64); posterior width of pronotum 1.46–1.53 (1.97–2.00).

DISTRIBUTION: West and central Africa.

DISCUSSION: The female paratype from Ile-Ife and the female from the Ivory Coast are considerably larger (measurements for these specimens are given in parentheses in the female description) than the remainder of the material that we examined. Aside from the larger size, all external morphological features of these specimens agree with those of typical *libbyi* females. Even a comparison of female genitalic structures did not reveal any discernible differences. Therefore, we consider these larger specimens to be conspecific with the holotype, and recognize the species as being quite variable in overall size.

SPECIMENS EXAMINED: GHANA: **Eastern**

Prov.: 1♂ (paratype, Dec. 20, 1965), 1♀ (Dec. 26, 1965), 1♀ (paratype, Jan. 14, 1966), 1♂/♀? (head and abdomen missing, March 18, 1966), Tafo, UV light trap, D. Leston (MRAC). **IVORY COAST:** 1♀, Bingerville, Aug. 1962, J. Decelle (MRAC). **NIGERIA:** **Western State:** 1♂ (holotype), Ile-Ife, Dec. 8, 1977, Akingbohungbe (UIFE); 1♀ (paratype), Ile-Ife, Jan. 1, 1976, Akingbohungbe (MRAC). **REPUBLIC OF CONGO:** **Equateur Prov.:** 1♂, Eala, Nov. 1934, J. Ghesquière (MRAC).

Fingulus longiceps Linnavuori

Figure 18

Fingulus longiceps Linnavuori, 1975: 11, 12 (n. sp.). – Akingbohungbe, 1981: 193 (key).

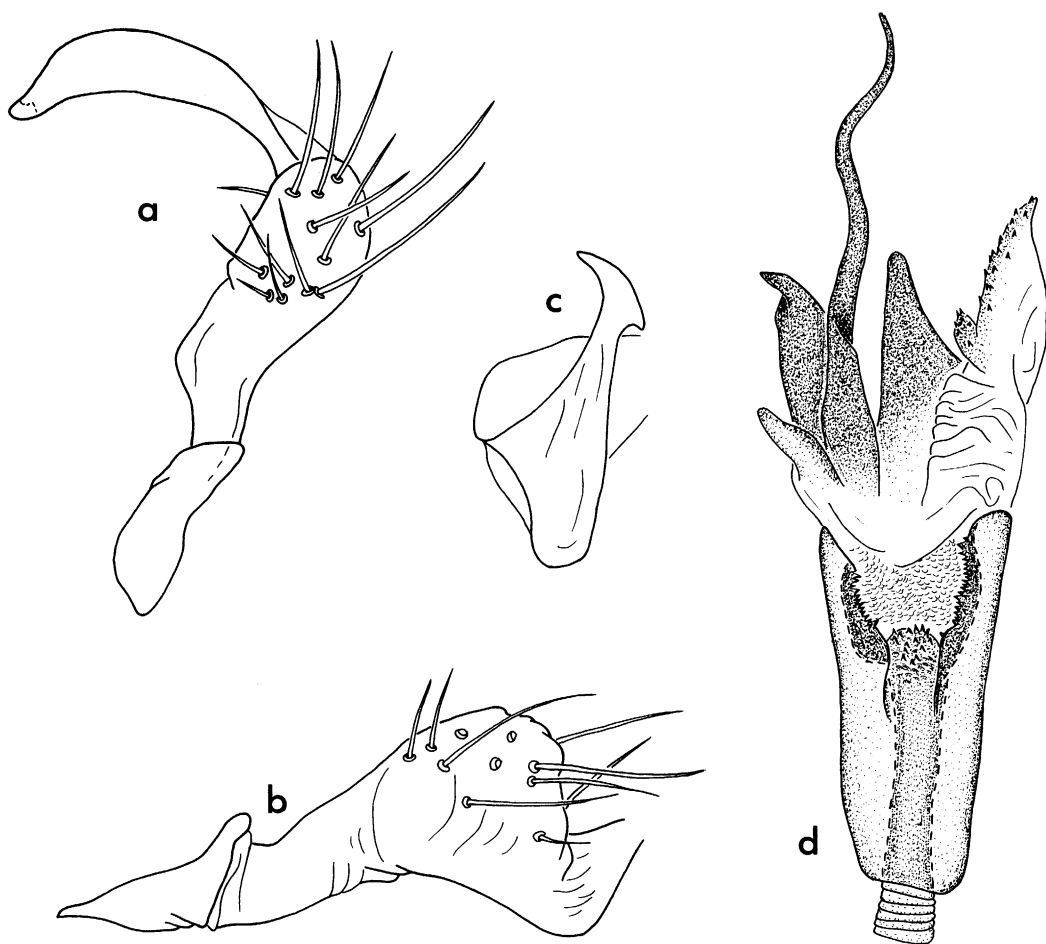


Fig. 18. Male genitalia of *Fingulus longiceps*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

DIAGNOSIS: Similar to *ifensis*, but distinguished by the larger body size, especially length of antennal segment II, darkened areolar veins of hemelytral membrane, and the structure of male genitalia (fig. 18).

DESCRIPTION: *Male holotype.* Length 3.26; yellowish brown general coloration—head, pronotal collar and calli, cuneus, and anterior half of hemelytral membrane dark reddish brown. **Head:** Width across eyes 0.76, vertex 0.19; as long as broad in dorsal view; junction of tylus and frons weakly depressed; region immediately posteriad of eyes slightly inflated, narrowing posteriorly to medial constriction of neck but without distinct impressed line—distance from constriction to postero-

dorsal angle of eye slightly less than half again as broad as greatest width of antennal segment I. **Antennae:** I, length 0.42, dark reddish brown; II, length 1.64, brownish yellow, basal joint and distal fourth fuscous; III, fuscous, narrowly pale basally; IV, missing. **Labium:** Length 1.42, reaching to apex of mesosternum; brownish yellow; segment I, base of II, and apex of IV fuscous; relative lengths of segments 16:18:19:28. **Pronotum:** Posterior width 1.55; collar weakly rounded dorsally, with fine transverse wrinkles, but lacking distinct punctures, slightly broader than greatest width of antennal segment I; calli not noticeably elevated, posterior border defined by row of punctures in very weak depression;

posterior lobe of disc well elevated above head and anterior lobe of pronotum in lateral view; prosternal xyphus not visible; scent gland ostiole and evaporative area of metathorax uniformly darkened; scutellum weakly elevated above surface of hemelytra, dorsal surface nearly flat. **Hemelytra:** Nearly straight laterally; cuneus slightly less than twice as long as greatest width; membrane infuscated to level of apices of areolar cells, distal half pale. **Legs:** Femora dark fuscous, not noticeably inflated distally; tibiae pale brownish yellow, basal half or slightly less fuscous; tarsi brownish yellow, segment III darker brown. **Genitalia:** Left paramere with prominent sensory lobe; apex of shaft with strong dorsal process and less prominent ventral process (fig. 18a-c). Vesica as in figure 18d.

Female. Length 3.42; width of head across eyes 0.73; width of vertex 0.23; length of antennal segment I 0.43, segment II 1.71; length of labium 1.57; posterior width of pronotum 1.69.

DISTRIBUTION: Southwest Ethiopia.

SPECIMENS EXAMINED: ETHIOPIA: **Kefa Prov.:** 1♂ (holotype), 1♀ (paratype), Belleta Forest, June 13-14, 1963, R. Linnavuori (AMNH, Linnavuori Collection).

Fingulus longicornis Miyamoto

Figure 19

Fingulus longicornis Miyamoto, 1965: 153-155 (n. sp.).

DIAGNOSIS: Recognized by the relatively narrow vertex, uniformly pale second antennal segment, coarsely punctate pronotal collar, and structure of the male genitalia. The scent gland ostiole of *longicornis* is uniformly darkened and the hemelytral membrane is clear, except for some limited infuscation bordering the areolar veins.

REDESCRIPTION: **Male.** Length 2.88-3.08; dark reddish brown general coloration, ventral surface of head slightly paler. **Head:** Width across eyes 0.58-0.64, vertex 0.14; slightly longer than broad in dorsal view; moderately produced anteriorly of eyes in lateral view; junction of tylus and frons indistinct; post-ocular region short, with strong transverse impressed line posteriorly of eyes, region between line and posterior margin of eye very slightly inflated laterally in dorsal view, dis-

tance from line to inner-posterior angle of eye much less than greatest width of antennal segment I. **Antennae:** I, length 0.42-0.45, reddish brown; II, length 1.44-1.53, pale brownish yellow; III-IV, brown or yellowish brown. **Labium:** Length 1.31-1.35; reaching nearly to apex of mesosternum; yellowish brown, segments I, II, and apex of IV sometimes darker brown; relative lengths of segments 18:16:17:26. **Pronotum:** Posterior width 1.30-1.41; collar flattened, coarsely punctate, slightly broader than greatest width of antennal segment I; calli weakly elevated, with well defined anterior and posterior borders; posterior lobe of disc slightly elevated above level of head in lateral view; ventral surface of prosternal xyphus convexly rounded, but without distinct callus or tubercle; ostiole and evaporative area of metathoracic scent efferent system darkened; scutellum slightly elevated above level of hemelytra, dorsal surface weakly convex. **Hemelytra:** Lateral margin of corium weakly rounded distally, anterior third nearly straight; cuneus about twice as long as greatest width; membrane bordering veins lightly infuscated. **Legs:** Femora dark reddish brown, not noticeably inflated distally; tibiae and tarsi pale brownish yellow, basal third of tibiae fuscous. **Genitalia:** Left paramere as in figure 19a-c. Vesica teneral, not illustrated.

Female. Length 3.34-3.40; width of head across eyes 0.59-0.65; width of vertex 0.15-0.18; length of antennal segment I 0.45-0.47, segment II 1.35-1.57; length of labium 1.36-1.46; posterior width of pronotum 1.42-1.59.

DISTRIBUTION: Philippine Islands, Ryukyu Islands, and Taiwan.

DISCUSSION: We were unable to obtain the holotype or paratypes of this species from Kyushu University. Further, the female allotype has not been deposited in the Bernice P. Bishop Museum, Honolulu as stated in the original description. Our recognition of this species is based on a comparison of non-type material with the description and figures presented by Miyamoto (1965: 153-155).

SPECIMENS EXAMINED: JAPAN: 1♀, Okinawa Island, Nakagusuku Park, 100-150 m, May 25, 1965, Malaise trap, J.L. Gressitt (BISH). **PHILIPPINE ISLANDS:** **Mindanao:** *Zamboanga del Sur:* 1♂, Lemesahan, 600 m, Sept. 7, 1958, light trap, H.E. Milliron (BISH). **TAIWAN:** 1♀, Hori, Aug. 23-24, 1947, L.

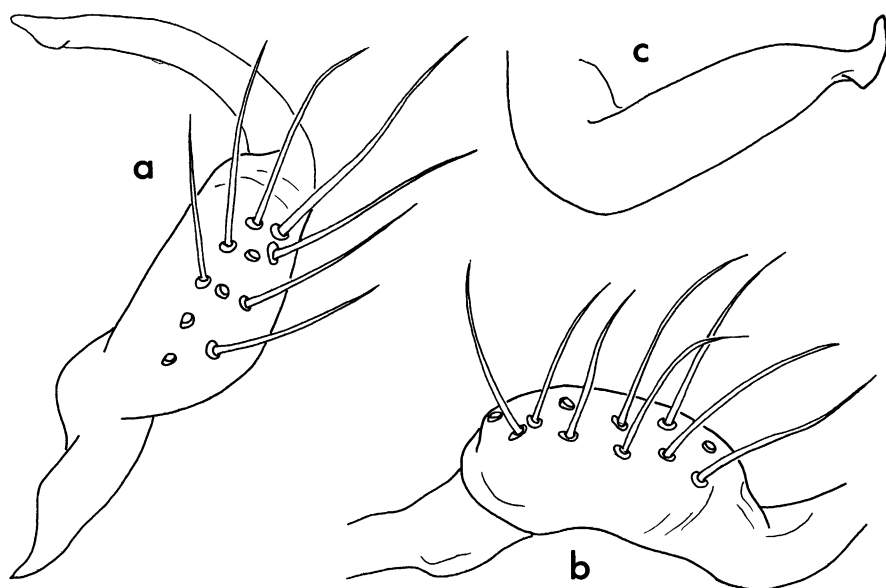


Fig. 19. Left paramere of *Fingulus longicornis*. a. Dorsal view. b. Lateral view. c. Apical view.

Gressitt (CAS); 1♂, Kwantzing, Tainan Hsien, 250 m, April 6–7, 1965, C.M. Yoshimoto (BISH).

***Fingulus luzonicus*, new species**

Figure 20

DIAGNOSIS: Similar to *apoensis*, but distinguished by the longer labium, especially segment IV, and the structure of the male genitalia (fig. 20). Also resembling *atra*, but readily distinguished by the longer second antennal segment with darkened apex, uninflated second labial segment, and hemelytral membrane without dark medial band. *Fingulus luzonicus* can be separated from the remaining two species known from the Philippines, *longicornis* and *nigrifasciatus*, by the shorter second antennal segment and structure of the male genitalia. It is further distinguished from *longicornis* by the darkened apex of antennal segment II and from *nigrifasciatus* by the uniformly pale distal half of the hemelytral membrane.

DESCRIPTION: *Male holotype.* Length 3.15; dark brown general coloration. **Head:** Width across eyes 0.58, vertex 0.15; noticeably longer than broad in dorsal view with tylus extending well anterior of antennal bases; junction of tylus and frons indistinct; neck short;

postocular region not noticeably inflated, narrowing abruptly to weakly impressed line—distance from line to posterodorsal angle of eye much less than greatest width of antennal segment I. **Antennae:** I, length 0.33, dark yellowish brown, lightly tinged with red; II, length 1.09, pale brownish yellow, distal third fuscous; III–IV, dark brown, narrowly pale basally. **Labium:** Length 1.67; segments I–III dark brown, segment IV yellowish brown; relative lengths of segments 18:19:19:40. **Pronotum:** Posterior width 1.35; collar flattened, shallowly punctate, slightly broader than greatest width of antennal segment I; calli weakly elevated, bordered posteriorly by broad, shallow depression; posterior lobe of disc well elevated above head; prosternal xyphus with weakly convex ventral surface and tuberculate posterior angle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum weakly convex dorsally, not noticeably elevated above hemelytra. **Hemelytra:** Weakly rounded laterally; cuneus twice as long as greatest width; membrane suffused with fuscous to level of apices of areolar cells, distal region pale. **Legs:** Femora brown, front pair and ventral surface of middle and hind pairs brownish yellow; tibiae pale brownish yellow, basal third of middle pair fuscous, hind

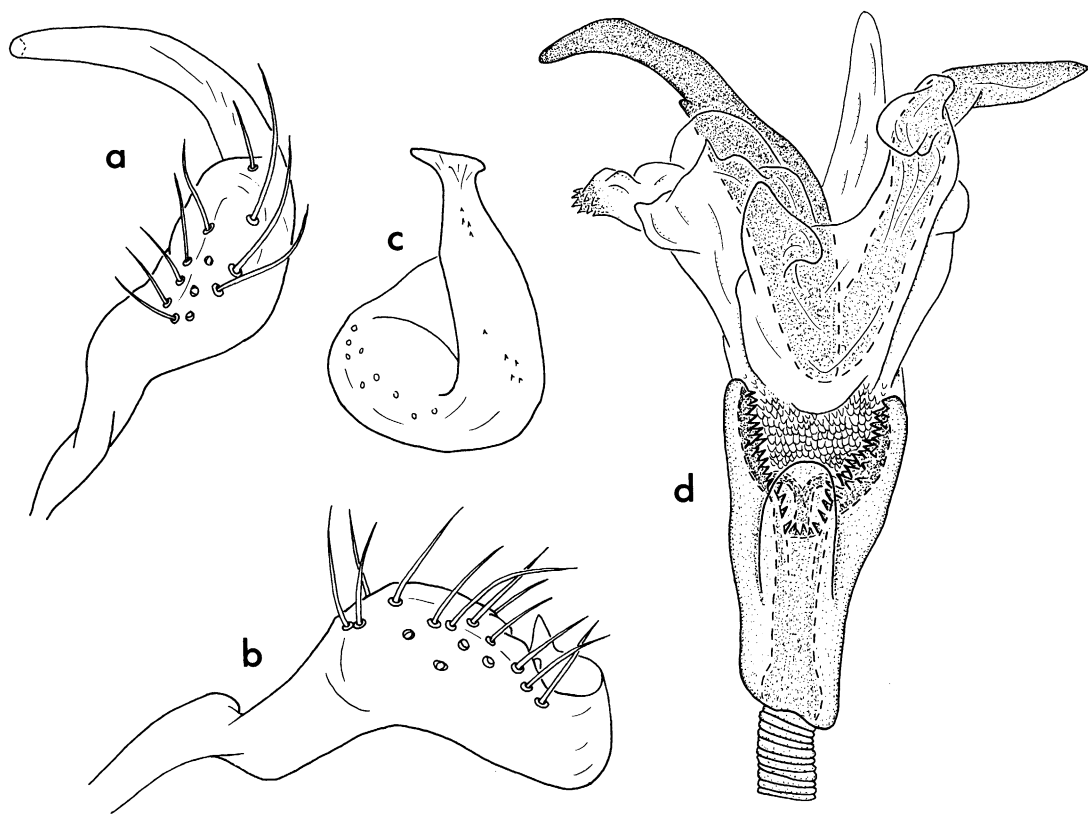


Fig. 20. Male genitalia of *Fingulus luzonicus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

pair missing; tarsi brownish yellow. **Genitalia:** Shaft of left paramere with well developed apical processes (fig. 20c). Vesica with two lobal sclerites; basal tubular skirt with apically rounded dorsal flap (fig. 20d).

Female. Unknown.

ETYMOLOGY: Named for its occurrence on Luzon, Philippine Islands.

DISTRIBUTION: Luzon, Philippine Islands.

HOLOTYPE ♂: PHILIPPINE ISLANDS: Luzon: Mt. Makiling, C.F. Baker (UZMH).

Fingulus maai, new species

Figure 21

DIAGNOSIS: Recognized by the long antennae (see couplet 17 in key), well developed postocular region of head, impunctate pronotal collar, dark medial band on hemelytral membrane, and structure of the male genitalia (fig. 21).

DESCRIPTION: *Male holotype.* Length 2.66; reddish brown general coloration. **Head:** Width across eyes 0.62, vertex 0.15; yellowish brown with tylus and postocular region darker reddish brown; as long as broad in dorsal view; weakly produced anteriad of antennal fossae in lateral view; tylus strongly deflexed distad of basal juncture with frons; postocular region bordering eyes slightly inflated, separated from remainder of neck by shallow impressed line—distance from impressed line to posterodorsal angle of eye slightly less than greatest width of antennal segment I. **Antennae:** I, length 0.47, dark reddish brown; II, length 1.60, yellowish brown, apical fourth slightly darker; III, brown; IV, missing. **Labium:** Length 1.13, reaching to apex of mesosternum; dark reddish brown, segments III and IV slightly paler; relative lengths of segments 17:15:12:20. **Pronotum:** Posterior width 1.35; collar flattened, with

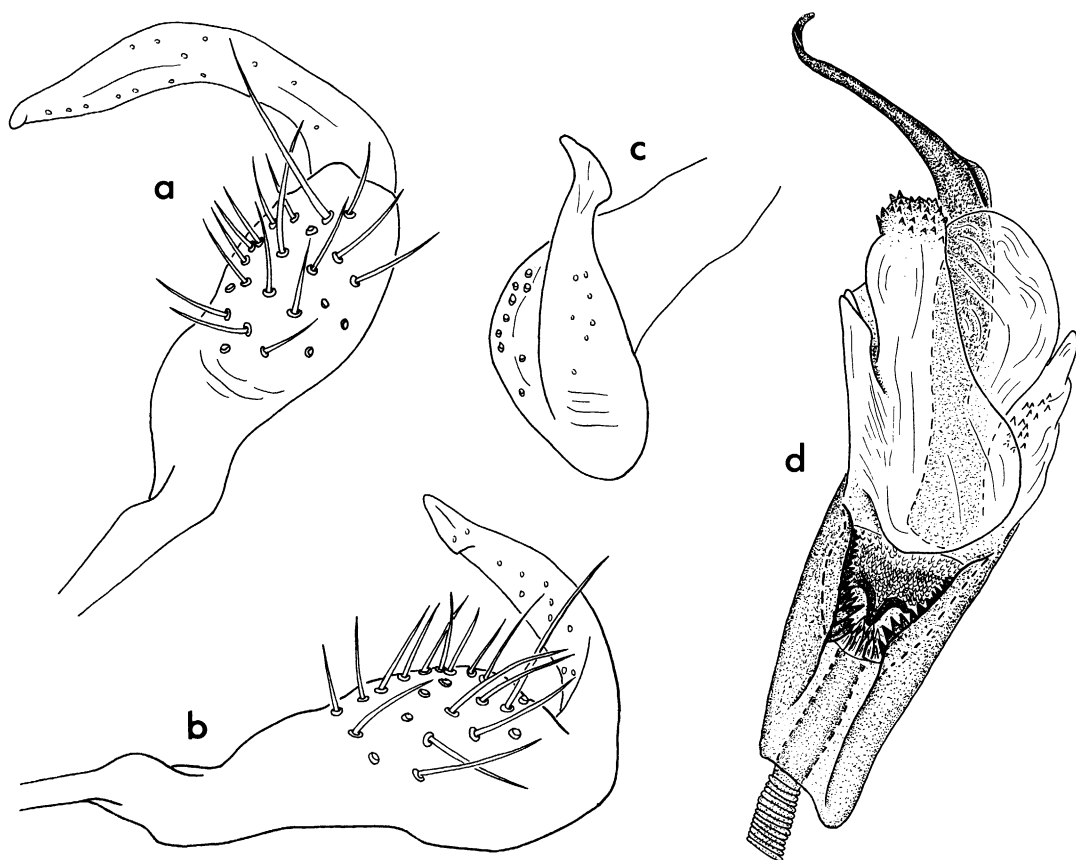


Fig. 21. Male genitalia of *Fingulus maai*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

fine transverse wrinkles, about as broad as greatest width of antennal segment I; calli not noticeably elevated, posterior margin indistinct; posterior lobe of disc well elevated above head; prosternal xyphus with convexly rounded ventral surface but lacking distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum slightly elevated above hemelytra, dorsal surface weakly convex. **Hemelytra:** Lateral margins weakly rounded; cuneus twice as long as greatest width; membrane suffused with fuscous bordering areolar veins and with dark medial band extending from inner margin of primary areolar cell to apex of membrane. **Legs:** Forefemora dark reddish brown, not noticeably inflated distally; foretarsi and tibiae pale brownish yellow, basal third of tibiae fuscous; middle and

hind legs missing. **Genitalia:** Left paramere with weakly elevated sensory lobe (fig. 21b). Vesica with single, large lobal sclerite (fig. 21d).

Female. Unknown.

ETYMOLOGY: Named for T. C. Maa.

DISTRIBUTION: Papua New Guinea.

HOLOTYPE ♂: PAPUA NEW GUINEA: **Central Prov.:** Daradae Pl[antatio]n., 80 km N of Port Moresby, 500 m, Sept. 5, 1959, sweeping, T. C. Maa (BISH).

***Fingulus magnus*, new species**

Figure 22

DIAGNOSIS: Recognized by the large overall size, dark medial band on hemelytral membrane, labium reaching only to apices of procoxae, hind femora strongly inflated distally,

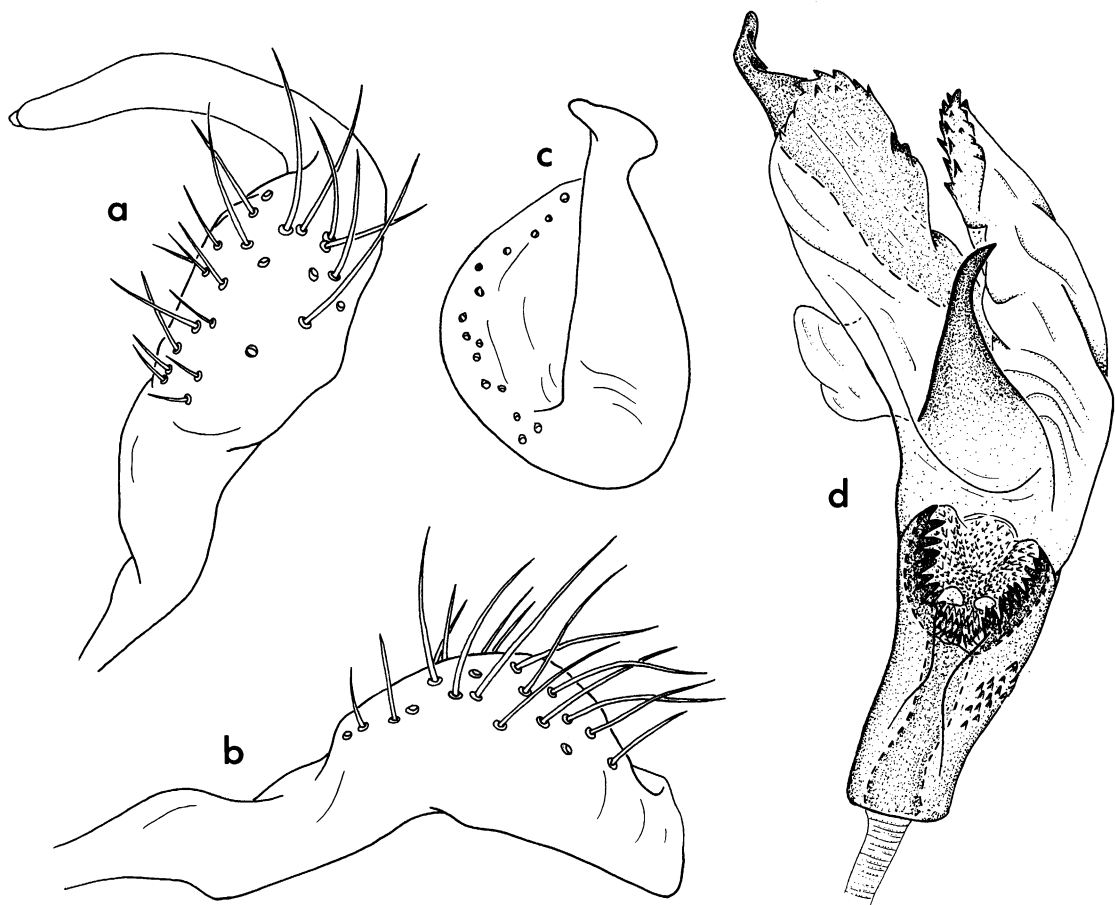


Fig. 22. Male genitalia of *Fingulus magnus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

and male genitalia as in figure 22. *Fingulus magnus* is distinguished from the closely related *gressitti* and *novobritanicus* by the characters given in couplets 19 and 20 of the key.

DESCRIPTION: Male. Length 3.64–3.72; dark reddish brown general coloration, most of head slightly paler. **Head:** Width across eyes 0.76–0.77, vertex 0.22–0.23; as long as broad in dorsal view; weakly produced anteriorly of antennal fossae in lateral view; tylus strongly deflexed distad of basal juncture with frons; postocular region immediately posteriad of eyes moderately inflated, separated from remainder of neck by shallow impressed line—distance from line to posterodorsal angle of eye slightly less than greatest width of antennal segment I. **Antennae:** I, length 0.41–0.44, fuscous; II, length 1.76–1.79, yellowish

brown, apical fourth infuscated; III–IV, fuscous, narrowly pale basally. **Labium:** Length 1.39–1.42, reaching to apices of procoxae; dark reddish brown; relative lengths of segments 21:20:15:24. **Pronotum:** Posterior width 2.04; collar flattened, transversely roughened but without distinct punctures, as broad as greatest width of antennal segment I; calli indistinct; posterior lobe of disc strongly elevated above head; ventral surface of prosternal xyphus strongly rounded but without distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum moderately elevated above hemelytra, dorsal surface weakly convex. **Hemelytra:** Lateral margins nearly straight anteriorly, curving inward just anteriorly of cuneal fracture; cuneus twice

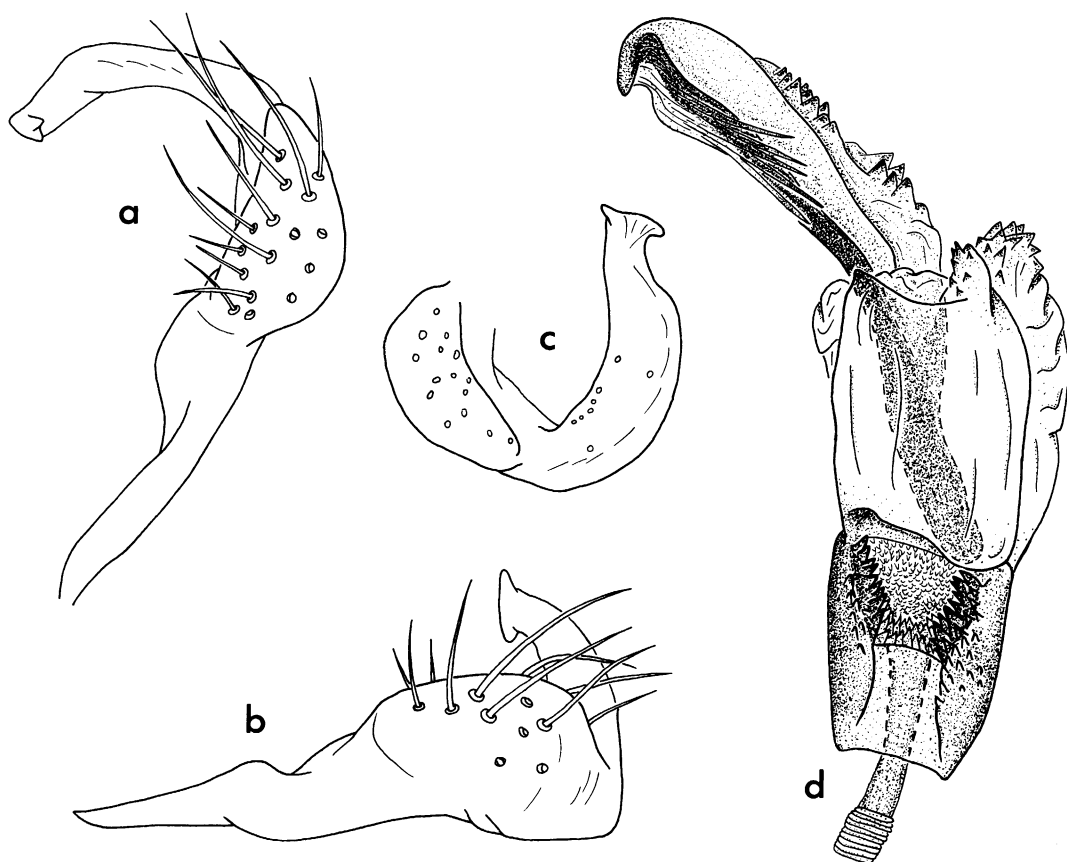


Fig. 23. Male genitalia of *Fingulus morobe*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

as long as greatest width; membrane suffused with fuscous inside areolar cells and with broad, dark, medial band extending from inner angle of primary areolar cell to apex of membrane, band broadening slightly distally. **Legs:** Femora dark reddish brown, middle and hind pairs inflated distally, hind pair strongly so; tibiae pale brownish yellow, basal third to nearly half fuscous; tarsi pale. **Genitalia:** Vesica with two lobal sclerites (fig. 22d). Left paramere as in figure 22a–c.

Female. Unknown.

ETYMOLOGY: From the Latin, *magnus* (large, great), in reference to the large body size.

DISTRIBUTION: Papua New Guinea.

HOLOTYPE ♂: PAPUA NEW GUINEA: **Morobe Prov.:** Ulap, 800–1100 m, Sept. 1968, N.L.H. Krauss (BISH).

PARATYPES: 1♂, same data as holotype (CARV).

Fingulus morobe, new species

Figure 23

DIAGNOSIS: Similar to *angusticuneatus*, but distinguished by the unelevated calli with indistinct posterior margins, and the structure of the male genitalia (fig. 23). Also closely resembling *maai*, but differing by the shorter antennae (see couplet 17 in key) with the second segment uniformly pale, not darkened apically, narrower cuneus, and structure of the male genitalia. *Fingulus morobe* is further characterized by the broad, impunctate pronotal collar and the dark, medial band on the hemelytral membrane.

DESCRIPTION: *Male.* Length 2.66–2.74; dark

reddish brown to nearly black general coloration. **Head:** Width across eyes 0.56–0.66, vertex 0.16–0.18; yellowish brown with tylus and postocular region usually darker reddish brown; as long as broad in dorsal view; weakly produced antieriad of antennal fossae in lateral view; tylus prominent, junction with frons broadly depressed, strongly deflexed distally; postocular region bordering eyes slightly inflated, separated from remainder of neck by shallow impressed line—distance from impressed line to posterodorsal angle of eye slightly less than greatest width of antennal segment I. **Antennae:** I, length 0.33–0.36, dark reddish brown; II, length 1.13–1.29, uniformly pale brownish yellow; III–IV, yellowish brown. **Labium:** Length 1.06–1.18, reaching nearly to apex of mesosternum; dark reddish brown; relative lengths of segments 15:15:12:21. **Pronotum:** Posterior width 1.35–1.49; collar flattened, with fine transverse wrinkles, slightly broader than greatest width of antennal segment I; calli not noticeably elevated, posterior margin indistinct; posterior lobe of disc well elevated above head; prosternal xyphus with convexly rounded ventral surface but lacking distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum slightly elevated above hemelytra anteriorly, sloping gradually downward distally, dorsal surface weakly convex. **Hemelytra:** Lateral margins weakly rounded, especially antieriad of cuneal fracture; cuneus three times as long as greatest width; membrane suffused with fuscous bordering areolar veins and with dark medial band extending from inner margin of primary areolar cell to apex of membrane. **Legs:** Femora dark reddish brown, hind pair strongly inflated distally; tibiae pale brownish yellow, basal third to nearly half fuscous; tarsi pale. **Genitalia:** Left paramere with prominent sensory lobe; shaft with dorsal and ventral apical processes equally developed (fig. 23a–c). Vesica as in figure 23d.

Female. The only known specimen is teneral and badly distorted. Accurate measurements of body parts could not be obtained.

ETYMOLOGY: Named for its occurrence in the Morobe Province of Papua New Guinea.

DISTRIBUTION: Irian Jaya and Papua New Guinea.

HOLOTYPE ♂: PAPUA NEW GUINEA: **Morobe Prov.:** Ulap, 800–1100 m, Sept. 1968, N.L.H. Krauss (BISH).

PARATYPES: INDONESIA: **Irian Jaya:** 1♂, Waris, S of Hollandia, 450–500 m, Aug. 1–17, 1959, sweeping, T.C. Maa (CARV). PAPUA NEW GUINEA: **Morobe Prov.:** 1♂, Kilolo Crk., 7 km W of Wau, 1070 m, Aug. 15–25, 1967, G.A. Samuelson (BISH); 1♂, Wau, 1200 m, Sept. 11, 1961, Malaise trap, J. Sedlacek (BISH). **Sepik Prov.:** 1♀, Maprik, 160 m, Oct. 14, 1957, J.L. Gressitt (BISH).

Fingulus nigrifasciatus,
new species

Figure 24

DIAGNOSIS: Related to *atra*, on the basis of the coarsely punctate pronotal collar, well defined pronotal calli, uniformly pale second antennal segment, and hemelytral membrane with dark medial band. This species can be separated from *atra* by the longer second antennal segment, structure of the labium (see couplet 10 in key), and characters of the male genitalia (fig. 24). It is readily distinguished from other species in the Philippine Islands by the dark medial band on the hemelytral membrane.

DESCRIPTION: *Male.* Length 2.81–3.17; dark brown general coloration. **Head:** Width across eyes 0.51–0.52, vertex 0.11–0.12; dark brown; jugum, lorum, and inflated postocular region brownish yellow; distinctly longer than broad in dorsal view; moderately produced antieriad of eyes in lateral view; tylus prominent, strongly deflexed distally, junction with frons shallowly depressed; postocular region bordering eyes moderately inflated, separated from remainder of neck by impressed line—distance from line to posterodorsal angle of eye equal to greatest width of antennal segment I. **Antennae:** I, length 0.36–0.40, dark brown; II, length 1.28–1.31, uniformly brownish yellow; III–IV, dark yellowish brown, segment III slightly paler basally. **Labium:** Length 1.28–1.29; dark reddish brown, segment IV brownish yellow; relative lengths of segments 18:18:15:23. **Pronotum:** Posterior width 1.18–1.24; collar flattened, coarsely punctate, distinctly broader than greatest width of antennal segment I; calli weakly elevated with well defined posterior margins;

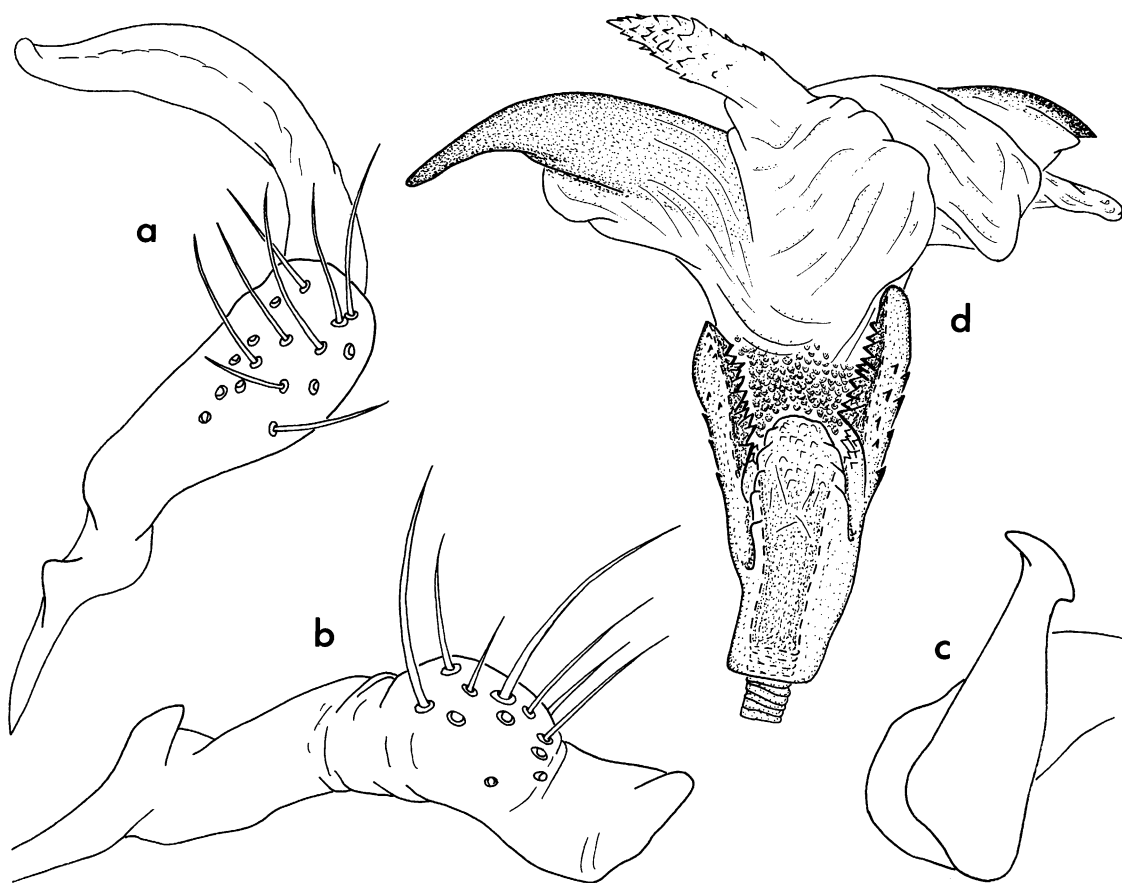


Fig. 24. Male genitalia of *Fingulus nigrifasciatus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

posterior lobe of disc rising very gradually from calli, only slightly elevated above level of head in lateral view; ventral surface of prosternal xyphus convexly rounded, but without distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum not noticeably elevated above hemelytra, dorsal surface nearly flat. **Hemelytra:** Weakly rounded laterally; cuneus slightly more than twice as long as greatest width; membrane clear inside areolar cells, but with dark medial band extending from inner margin of primary areolar cell to apex of membrane. **Legs:** Femora dark fuscous, hind pair very slightly inflated distally; tibiae pale brownish yellow, distal third to half fuscous; tarsi pale. **Genitalia:** Left paramere with relatively weak

sensory lobe; shaft with well developed apical processes (fig. 24a–c). Vesica as in figure 24d.

Female. Length 3.38; width of head across eyes 0.55; width of vertex 0.13; length of antennal segment I 0.44, segment II broken, segments III–IV missing; length of labium 1.35; posterior width of pronotum 1.27.

ETYMOLOGY: From the Latin, *nigrum* (black, dark) and *fascia* (band, stripe), referring to the dark stripe on the hemelytral membrane.

DISTRIBUTION: Philippine Islands and north Sulawesi.

DISCUSSION: The male specimen from Sulawesi differs from those collected in the Philippine Islands by having noticeably longer antennae (segment I, 0.47; II, 1.61), coarser punctures on the pronotum, and a slightly

larger vesica with apically rounded lobal sclerite—other characters of the male genitalia and external morphology are very similar. The specimens examined from the Philippine Islands exhibited little to no variation in most of the characters studied.

In our discussion of *atra*, we noted that the allotype and one paratype of this species are not conspecific with the holotype. They are instead included here as paratypes of the new species *nigrifasciatus*. We have turned over the *atra* type labels on these specimens in order to reduce possible confusion regarding their correct identity.

HOLOTYPE ♂: PHILIPPINE ISLANDS: **Rizal Prov.**: Mt. Montalban, Wa-wa Dam, 150–200 m, March 2, 1965, H.M. Torrevillas (BISH).

PARATYPES: PHILIPPINE ISLANDS: **Basilan**: 1♀, Island of Basilan, C.F. Baker (USNM, bears overturned paratype label No. 56720 for *Anchix atra* Hsiao—see discussion above). **Zamboanga del Sur**: 1♂, Zamboanga, 1927, C.F. Baker (USNM, bears overturned allotype label No. 56720 for *Anchix atra* Hsiao—see discussion above); 1♂ (teneral), Milbuk, Aug. 9–10, 1958, light trap, H.E. Milliron (BISH).

ADDITIONAL SPECIMENS: PHILIPPINE ISLANDS: 1♀, Acc. No. 783, Bur. Agr., P.I., C. R. Jones (CAS, specimen without head, measurements not taken). **INDONESIA**: **Sulawesi**: *Northern Prov.*: 1♂, Dumoga-Bone National Park, Plot B (fog 3, tray 85) February 8, 1985 (NHML, Project Wallace).

Fingulus novobritanicus, new species

Figure 25

DIAGNOSIS: Similar to *magnus* but distinguished by the uniformly pale second antennal segment, sometimes lightly tinged with fuscous at extreme apex only; labium reaching to near apex of mesosternum, with segment IV twice as long as segment III; and male genitalia as in figure 25. This species is distinguished from *gressitti* by the characters given in couplet 19 of the key, and from the remaining New Guinea species by its relatively large body size. As in *gressitti* and *magnus*, the pronotal collar of *novobritanicus* lacks distinct punctures, the calli are poorly defined, and the hemelytral membrane is

marked by a dark longitudinal band medially.

DESCRIPTION: *Male*. Length 3.27–3.50; dark fuscous to nearly black general coloration; lorum, jugum, and head posteriad of eyes slightly paler. **Head**: Width across eyes 0.69–0.70, vertex 0.18–0.21; as long as broad in dorsal view; moderately produced anteriorly of antennal fossae in lateral view; broadly depressed at juncture of tylus and frons; postocular region bordering eyes moderately inflated, separated from remainder of neck by weakly impressed line—distance from line to posterodorsal angle of eye about equal to greatest width of antennal segment I. **Antennae**: I, length 0.42–0.45, dark fuscous; II, length 1.61–2.11, yellowish brown, extreme apex lightly tinged with fuscous; III–IV, brown, segment III narrowly pale basally. **Labium**: Length 1.42–1.60, reaching middle of mesosternum; fuscous, segment IV yellowish brown; relative lengths of segments 19:19:15:29. **Pronotum**: Posterior width 1.64–1.71; collar flattened, transversely roughened but without distinct punctures, slightly broader than greatest width of antennal segment I; calli indistinct, without discernible posterior borders; posterior lobe of disc rising abruptly from collar, strongly elevated above head; ventral surface of prosternal xyphus with low, broad, posteriorly directed tubercle; ostiole and evaporative area of metathoracic scent efferent system uniformly darkened; scutellum weakly elevated above hemelytra, dorsal surface slightly convex. **Hemelytra**: Lateral margin of corium nearly straight anteriorly, curving inward posteriad of midpoint to deep cuneal fracture; cuneus slightly more than twice as long as greatest width; membrane with proximal third and distal margins of primary areolar cell tinged with fuscous, and with dark, medial band extending from inner angle of primary cell to apex of membrane. **Legs**: Femora dark fuscous, middle and hind pairs inflated distally, hind pair strongly so; tibiae pale brownish yellow, basal third to nearly half fuscous; tarsi pale. **Genitalia**: Left paramere and vesica as in figure 25.

Female. Length 3.80; width of head across eyes 0.71; width of vertex 0.20; length of antennal segment I 0.47, segment II 1.97; length of labium 1.75; posterior width of pronotum 1.83.

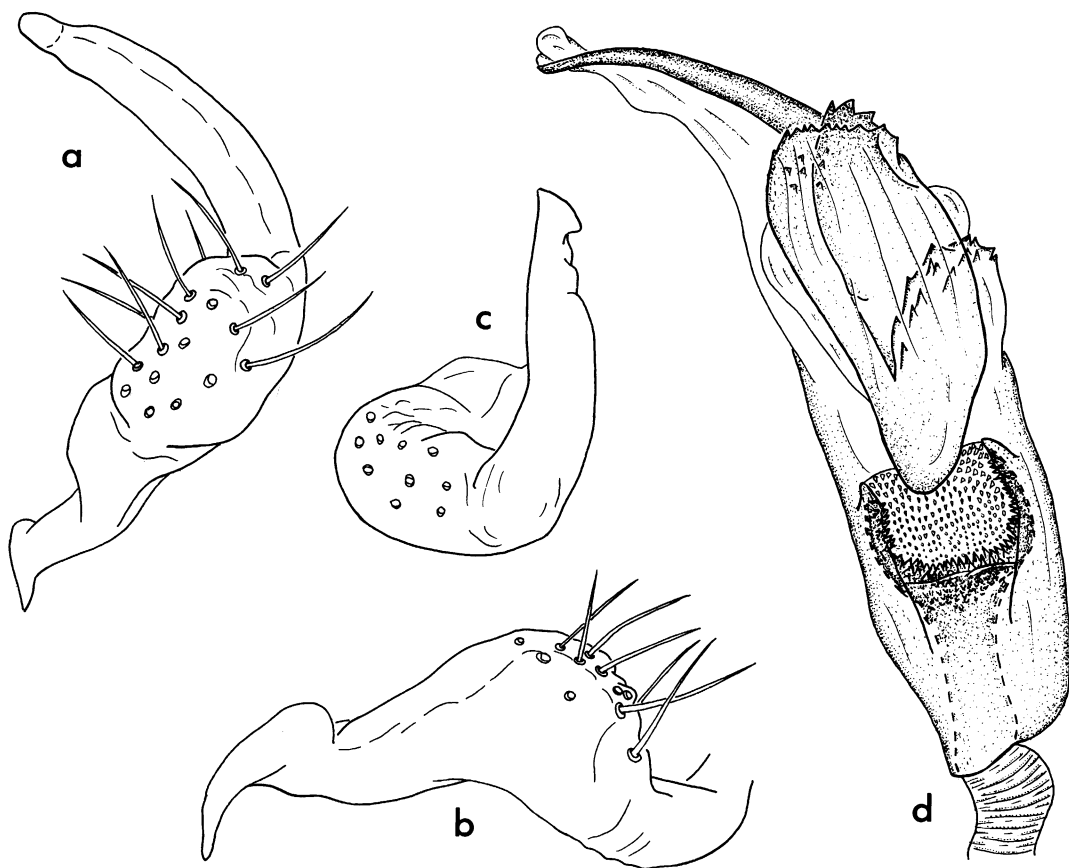


Fig. 25. Male genitalia of *Fingulus novobritanicus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

ETYMOLOGY: Named for its occurrence on New Britain.

DISTRIBUTION: Papua New Guinea.

DISCUSSION: The male specimen from Madang and the female from Rossel Island have much longer antennae (segment II, 2.11 and 1.97, respectively) than the holotype and paratype from New Britain (segment II, 1.61 and 1.68, respectively). Other external features, most notably the well developed tubercle on the prosternal xyphus, and the genitalia of the Madang male are in agreement with the holotype.

HOLOTYPE ♂: PAPUA NEW GUINEA: **East New Britain Prov.:** Gazelle Peninsula, Baining, St. Paul's, 350 m, Sept. 5, 1955, J.L. Gressitt (BISH).

PARATYPES: PAPUA NEW GUINEA: **East**

New Britain Prov.: 1♂, Vudal, SW of Keravat, Dec. 13, 1959, T.C. Maa (BISH).

ADDITIONAL SPECIMENS: PAPUA NEW GUINEA: **Madang Prov.:** 1♂, Friedrich Wilh[elms].-hafen [= Madang], Biró, [18]96 (CARV). **Milne Bay Prov.:** 1♀, Rossel Island, Abaleti, 0–50 m, No. 12, Sept. 28, 1956, L.J. Brass (Arch. Exped. V, AMNH).

Fingulus novocaledonicus, new species

Figure 26

DIAGNOSIS: Similar to *atrocaeruleus* with relatively broad vertex, bicolored second antennal segment, weakly rounded impunctate pronotal collar, dark scent gland ostiole, and hemelytral membrane with dark medial band—distinguished from *atrocaeruleus* pri-

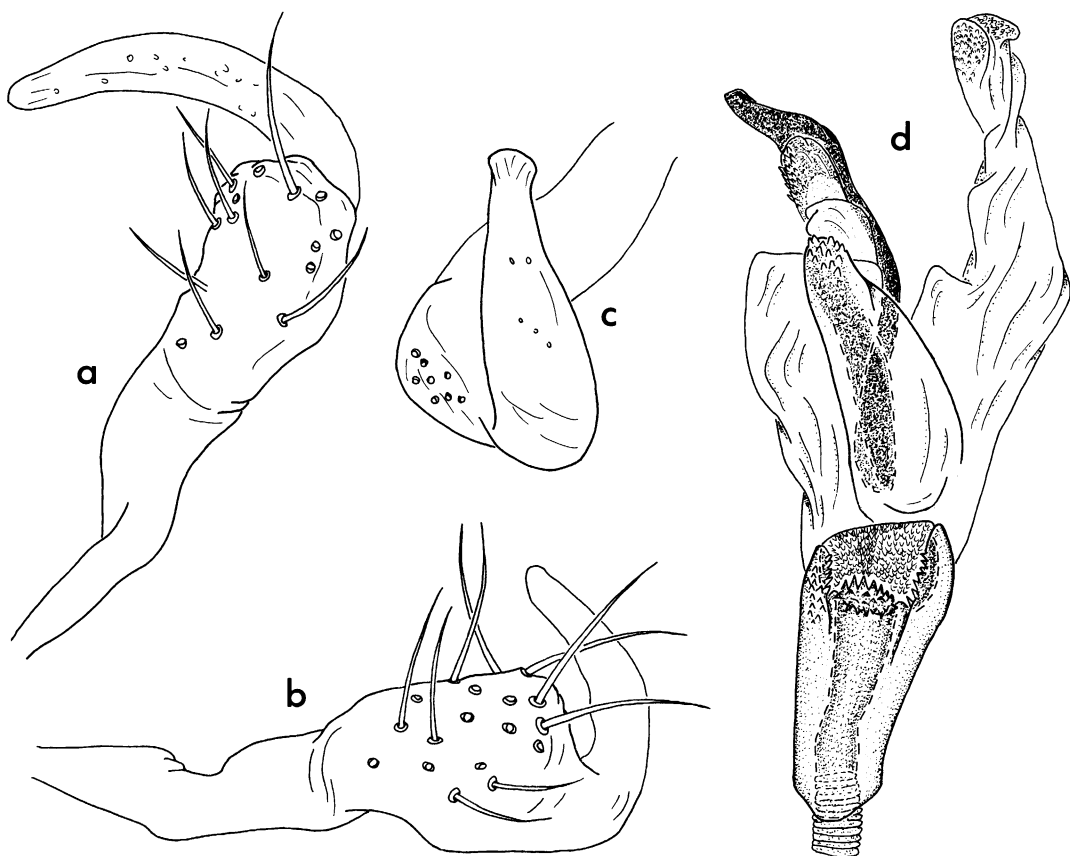


Fig. 26. Male genitalia of *Fingulus novocaledonicus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

marily on the basis of the male genitalia (fig. 26), but also by the dark band reaching the apex of the hemelytral membrane.

DESCRIPTION: Male. Length 2.35–2.50; brown or dark brown general coloration; inflated postocular region of head, pronotal collar, and cuneus usually yellowish brown; hemelytra of paler specimens tinged with red, especially on cuneus and outer posterior angle of corium. **Head:** Width across eyes 0.58–0.61, vertex 0.18–0.22; as long as broad in dorsal view; weakly produced antieriad of antennal fossae; tylus prominent, strongly deflexed distally, junction with frons weakly notched; postocular region bordering eyes moderately inflated, separated from remainder of neck by weakly impressed line—distance from line to posterodorsal angle of eye about equal to greatest thickness of antennal segment I. **Antennae:** I, length 0.32–0.35,

reddish brown; II, length 1.28–1.36, yellowish brown, apex narrowly darkened; III, brown, slightly paler basally; IV, missing. **Labium:** Length 1.13–1.18, reaching slightly beyond apices of procoxae; brownish yellow, apex of segment IV slightly darker; relative lengths of segments 14:14:13:22. **Pronotum:** Posterior width 1.26–1.37; collar weakly rounded, impunctate, as broad as greatest thickness of antennal segment I; calli not noticeably elevated, posterior margins indistinct; posterior lobe of disc well elevated above head in lateral view; ventral surface of prosternal xyphus with low, broadly rounded callus; ostiole and evaporative area of metathoracic scent efferent system sometimes slightly paler than surrounding pleura, but never white; scutellum slightly elevated above surface of hemelytra, dorsal surface weakly convex. **Hemelytra:** Lateral margins of co-

rium nearly straight anteriorly, weakly rounded distally; length of cuneus slightly more than 1.5 times greatest width; membrane lightly infuscated inside areolar cells, especially bordering veins, and with dark medial band extending from inner margin of primary areolar cell to apex of membrane. **Legs:** Femora reddish brown, not noticeably inflated, or with hind pair very slightly swollen distally; tibiae pale brownish yellow, basal third to half infuscated; tarsi pale. **Genitalia:** Left paramere and vesica as in figure 26.

Female. Length 2.85; width of head across eyes 0.65; width of vertex 0.20; length of antennal segment I 0.36, segment II 1.46; length of labium 1.28; posterior width of pronotum 1.59.

ETYMOLOGY: Named for its occurrence on New Caledonia.

DISTRIBUTION: New Caledonia.

HOLOTYPE ♂: NEW CALEDONIA: Anse Vata, Oct. 23, 1958, C.R. Joyce (BISH).

PARATYPES: NEW CALEDONIA: 1♂, same data as holotype (BISH); 1♂, Col d'Amieu, 650 m, March 31, 1968, sweeping, J.L. Gressitt (BISH); 1♂, Thio, Nov. 11, 1958, C.R. Joyce (BISH); 1♀, Foret di Thi, Oct 30, 1967, J. & M. Sedlacek (BISH).

Fingulus novoguineensis, new species

Figures 1, 2, 4, 27

DIAGNOSIS: Similar to *atrocaeruleus* and *novocaledonicus*, sharing with these species the relatively broad vertex, bicolored second antennal segment, weakly rounded impunctate pronotal collar, and dark scent gland ostiole—distinguished from these and other New Guinea species by the uniformly pale legs, hemelytral membrane without dark medial band, and by the structure of the male genitalia (fig. 27).

DESCRIPTION: *Male.* Length 2.66–2.74; brown to dark reddish brown general coloration. **Head:** Width across eyes 0.55–0.58, vertex 0.20–0.23; as long as broad in dorsal view; weakly produced anteriorly of antennal fossae; tylus prominent, strongly deflexed distally, junction with frons weakly and broadly depressed in lateral view; postocular region bordering eyes moderately inflated, separated from remainder of neck by weakly

impressed line—distance from line to posterodorsal angle of eye about equal to greatest width of antennal segment I. **Antennae:** I, length 0.34–0.36, brown to dark fuscous; II, length 1.20–1.41, pale brownish yellow, apical fourth infuscated; III–IV, brown or dark brown, segment III sometimes narrowly to broadly pale basally. **Labium:** Length 1.02–1.06, reaching to or slightly beyond apices of procoxae; uniformly brownish yellow; relative lengths of segments 16:14:11:19. **Pronotum:** Posterior width 1.36–1.42; collar weakly rounded, impunctate, noticeably narrower than greatest width of antennal segment I; calli not noticeably elevated, with very weakly depressed posterior margins; posterior lobe of disc well elevated above head in lateral view; ventral surface of prosternal xyphus nearly flat without rounded callus or tubercle; ostiole and evaporative area of metathoracic scent efferent system as dark as surrounding pleura; anterior margin of scutellum somewhat elevated above surface of hemelytra, sloping downward distally to level of hemelytra, dorsal surface weakly convex. **Hemelytra:** Lateral margins weakly rounded; cuneus twice as long as greatest width; membrane infuscated to level of apices of areolar cells. **Legs:** Uniformly brownish yellow, except as noted in discussion; hind femora very weakly inflated distally. **Genitalia:** Lobes of vesica with strong spines but lacking distinct sclerites (fig. 27d). Left paramere as in figure 27a–c.

Female. Length 2.89–3.04; width of head across eyes 0.55–0.58; width of vertex 0.21–0.22; length of antennal segment I 0.36–0.38, segment II 1.42–1.58; length of labium 1.06–1.11; posterior width of pronotum 1.40–1.56.

ETYMOLOGY: Named for its occurrence in New Guinea.

DISTRIBUTION: Irian Jaya and Papua New Guinea.

DISCUSSION: Although *novoguineensis* is diagnosed as having uniformly pale legs, we examined two specimens from Wisselmeren Enarotadi and Dimifa (see complete data under Additional Specimens) that possessed bicolored legs—femora and basal third of tibiae fuscous, tarsi and distal two-thirds of tibiae brownish yellow. All other characteristics of these specimens, including the genitalia of the male, are consistent with those of the holo-

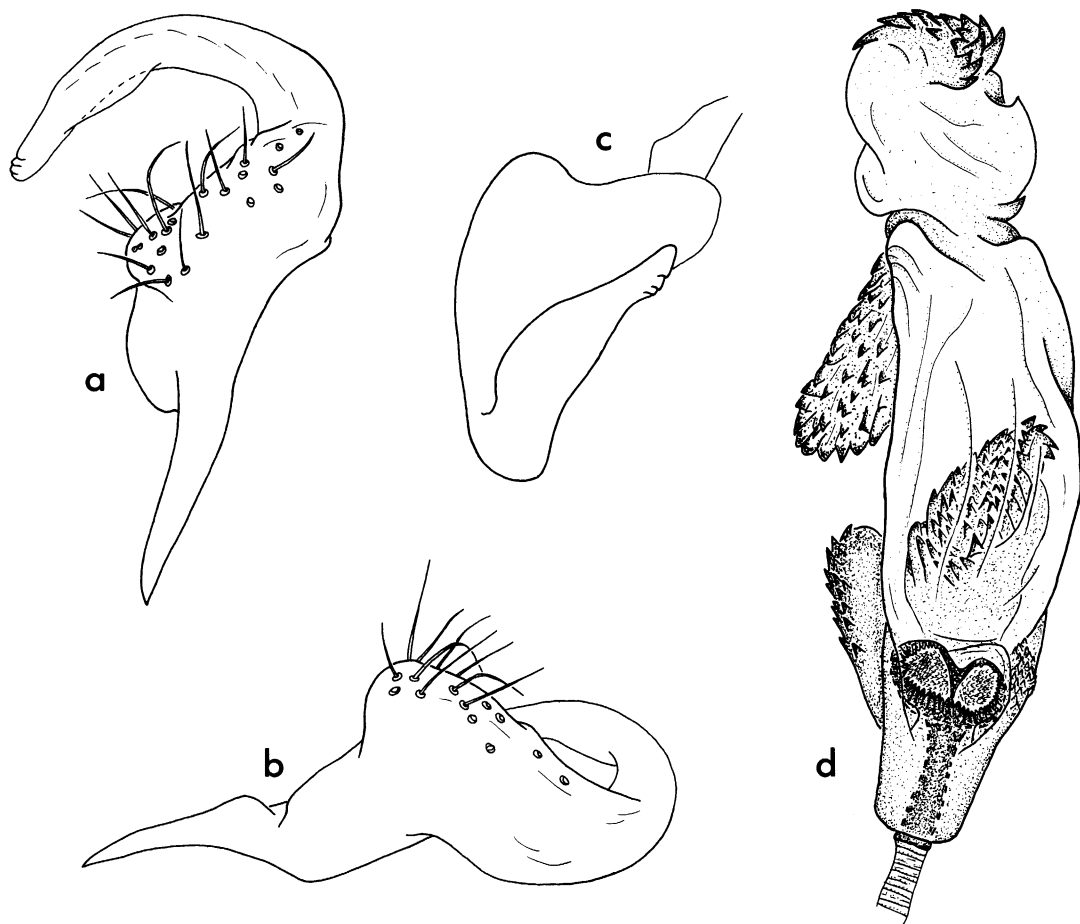


Fig. 27. Male genitalia of *Fingulus novoguineensis*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

type, so we are treating them here as conspecific. Such extreme variation in leg color is atypical of the genus and appears to be restricted to this species.

HOLOTYPE ♂: PAPUA NEW GUINEA: **Eastern Highlands Prov.**: Moife, 2100 m, Oct. 7–14, 1959, primary forest, T.C. Maa (BISH).

PARATYPES: PAPUA NEW GUINEA: **Chimbu Prov.**: 1♀, Mt. Karimui, 2100–2300 m, April 16–20, 1977, on *Vaccinium* sp., J.L. Gressitt (BISH); 1♀, Mt. Wilhelm, 3000 m, above Keglsugl, July 4, 1955, J.L. Gressitt (BISH). **Eastern Highlands Prov.**: 1♂, same data as holotype. **Southern Highlands Prov.**: 1♀, SE slope of Mt. Giluwe, 2450 m, Oct 12, 1958, J.L. Gressitt (BISH). **Western Highlands Prov.**: 1♂, Simbai, 1600–1800 m, Sept. 1968, N.L.H. Krauss (BISH).

ADDITIONAL SPECIMENS: INDONESIA: **Irian Jaya**: 1♂, Wisselmeren Enarotadi, 1850–1900 m, July 28, 1962, J. Sedlacek (BISH). PAPUA NEW GUINEA: **Southern Highlands Prov.**: 1♀, Dimifa, SE of Mt. Giluwe, 2200 m, Oct. 10, 1958, J.L. Gressitt (BISH).

Fingulus parvus Akingbohunge
Figure 28

Fingulus parvus Akingbohunge, 1981: 185–186, 193 (n. sp., key).

DIAGNOSIS: Recognized by the broad vertex (see couplet 6 in key), long labium, distally inflated scutellum, pale scent gland ostiole and evaporative area of metathorax, and structure of male genitalia (fig. 28).

REDESCRIPTION: *Male*. Length 1.90–2.88;

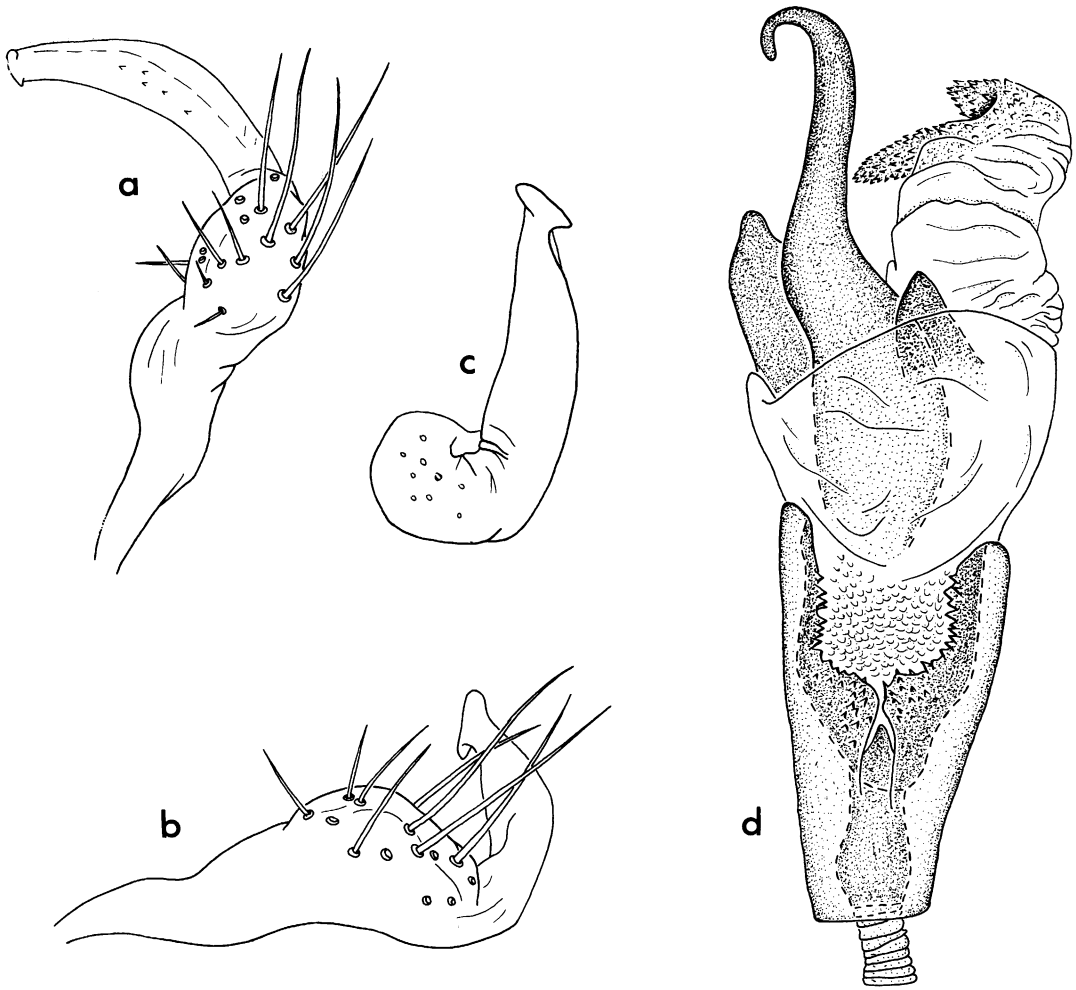


Fig. 28. Male genitalia of *Fingulus parvus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

brown or dark brown general coloration, head and pronotal collar sometimes lighter yellowish brown. **Head:** Width across eyes 0.48–0.54, vertex 0.22–0.25; marginally longer than broad in dorsal view; brown or yellowish brown; weakly produced anterior of antennal fossae; tylus prominent but with base less abruptly protruding, junction with frons broadly depressed; postocular region bordering eyes moderately inflated, separated from remainder of neck by shallow impressed line—distance from line to posterodorsal angle of eye nearly half again as broad as greatest width of antennal segment I. **Antennae:** I, length 0.31–0.37, dark yellowish brown to

fuscous; II, length 0.82–0.97, brown or yellowish brown, apex usually slightly darker brown; III–IV, brown, segment III pale basally. **Labium:** Length 1.13–1.35, reaching apices of mesocoxae or sometimes to middle of metacoxae; yellowish brown, segment I and sometimes II darker brown; relative lengths of segments 14:16:16:32. **Pronotum:** Posterior width 1.01–1.34; collar flattened, with weak transverse ridges, about as broad as greatest width of antennal segment I; calli slightly elevated, posterior margins weakly depressed; posterior lobe of disc well elevated above head in lateral view; ventral surface of prosternal xyphus weakly convex but without

distinct callus or tubercle; scent gland ostiole white, evaporative area posteriad of ostiole lightly to heavily suffused with fuscous but usually noticeably paler than surrounding pleura; anterior and posterior thirds of scutellum well elevated above surface of hemelytra, middle third broadly depressed; inflated distal region of scutellum impunctate. **Hemelytra:** Anterior half of embolium straight, distal half weakly rounded; cuneus less than twice as long as greatest width—ratio from 1.66:1 to 1.83:1; membrane lightly to moderately tinged with fuscous at least to level of apices of areolar cells, or sometimes a rounded darkened region extending beyond cells. **Legs:** Brown or dark yellowish brown, femora usually slightly darker than tibiae and tarsi; femora not noticeably inflated distally. **Genitalia:** Left paramere with prominent sensory lobe; shaft with well developed apical processes (fig. 28a–c). Vesica as in figure 28d.

Female. Length 2.70–3.04; width of head across eyes 0.65–0.66; width of vertex 0.21–0.26; length of antennal segment I 0.31–0.35, segment II 0.98–1.16; length of labium 1.46–1.64; posterior width of pronotum 1.48–1.64.

DISTRIBUTION: West and central Africa.

DISCUSSION: The holotype of *parvus* is much smaller than the other males that we examined and also has the apically spinose right lobe of the vesica much less developed. Females are larger than the average male, with a much broader head and larger eyes, shorter first antennal segment, and longer labium. Despite the considerable variation in size and structure of the examined specimens, they all possess the identifying characteristics provided in the diagnosis and are treated here as conspecific.

SPECIMENS EXAMINED: GHANA: 1♂ (holotype), Mt. Atewa, May 28, 1967 (MRAC). NIGERIA: **Western State:** 1♀, Ile-Ife, Jan. 26, 1975, J.T. Medler (MRAC). REPUBLIC OF CONGO: 2♀, Ganza [possible misspelling for Ganzi], 860 m, May 30–June 4, 1949, G.F. de Witte (CARV). **Orientale:** 1♂, Yangambi, Oct. 1956, N.L.H. Krauss (NHML). **Parc National Albert:** 1♂, Ruwenzori Mts., Kalonge près Kyandolire, 1800 m, on wild banana tree, Sept. 27, 1952, P. Vanschuytbroeck & J. Kekenbosch (MRAC). UGANDA: 1♀, Kampala, Feb. 7, 1931, H. Har-

greaves (NHML); 1♂, Kawanda, June 17, 1943, feeding on leaf (NHML).

Fingulus porrecta (Bergroth)

Figures 29, 30

Ix porrecta Bergroth, 1916: 235, 236 (n. sp.).

Fingulus porrecta: Carvalho, 1957: 87 (n. comb., cat.). – Akingbohunge, 1981: 193 (key).

DIAGNOSIS: Recognized by the pale brown general coloration with cuneus and posterolateral angle of corium red, short neck without inflated region behind eyes, punctate pronotal collar, weakly elevated pronotal disc, uniformly pale brownish yellow legs, and structure of the male genitalia (fig. 30).

REDESCRIPTION: **Male.** Length 3.26–3.57; pale brown general coloration, thoracic pleura darker brown; corium lightly tinged with red; cuneus and posterolateral angle of corium bright red. **Head:** Width across eyes 0.67–0.68, vertex 0.12–0.14; brown; distinctly longer than broad in dorsal view; moderately produced anteriad of eyes in lateral view; tylus prominent, junction with frons indistinct; not inflated posteriad of eyes in dorsal view; neck with strongly impressed line nearly contiguous with posterior margins of eyes. **Antennae:** I, length 0.44–0.45, brown or yellowish brown; II, length 1.65–1.68, uniformly brownish yellow; III–IV, brownish yellow. **Labium:** Length 1.50–1.54; reaching nearly to apex of mesosternum; yellowish brown; relative lengths of segments 18:18:20:30. **Pronotum:** Posterior width 1.35–1.36; collar flattened, punctate, about as broad as greatest width of antennal segment I; calli not noticeably elevated, posterior margins weakly depressed; posterior lobe of disc only slightly elevated above level of head in lateral view; ventral surface of prosternal xyphus with broad rounded callus, but lacking distinct tubercle; ostiole and evaporative area of metathoracic scent efferent system fuscous; scutellum slightly elevated above hemelytra, dorsal surface weakly convex. **Hemelytra:** Nearly straight laterally, curving inward slightly just anteriad of cuneal incisure; cuneus twice as long as greatest width; most of membrane lightly tinged with fuscous, but noticeably darker bordering areolar veins. **Legs:** Uniformly pale brownish yellow; fem-

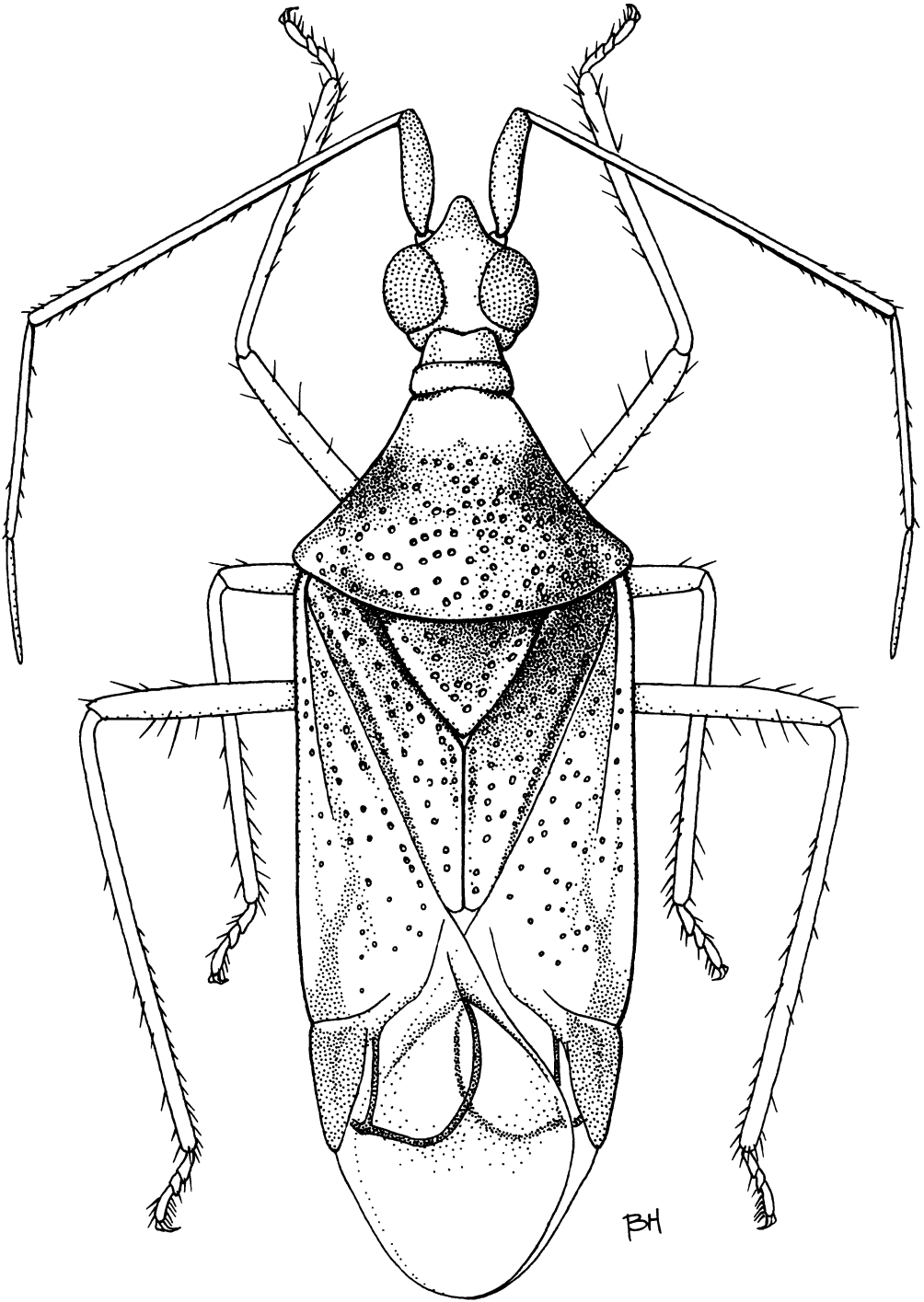


Fig. 29. *Fingulus porrecta*, dorsal habitus, ♂.

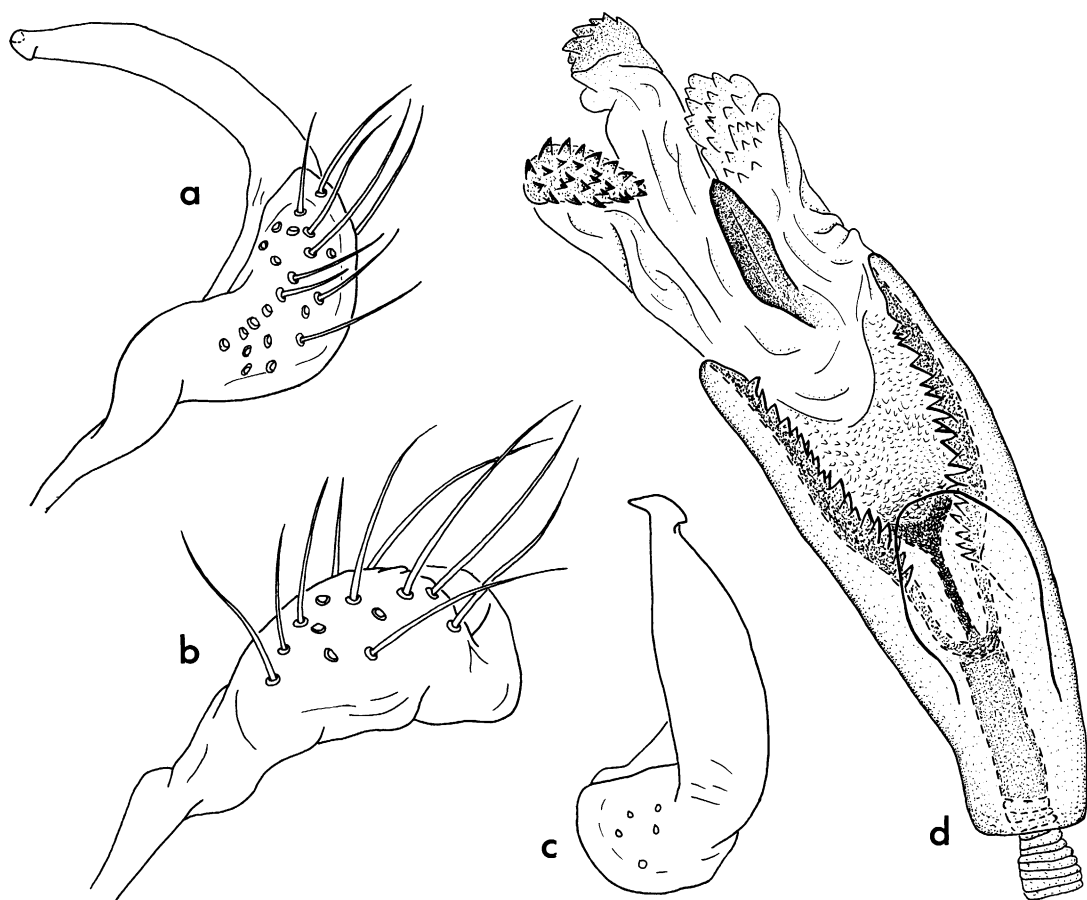


Fig. 30. Male genitalia of *Fingulus porrecta*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

ora not inflated distally. **Genitalia:** Basal tubular skirt of vesica large, dorsal surface with prominent rounded flap (fig. 30d). Left paramere as in figure 30a–c.

Female. Length 3.65–3.88; width of head across eyes 0.64–0.69; width of vertex 0.15; length of antennal segment I 0.47, segment II 1.61–1.75; length of labium 1.50–1.60; posterior width of pronotum 1.39–1.57.

DISTRIBUTION: Hong Kong and south India.

SPECIMENS EXAMINED: HONG KONG: 1♂, collected by Kobele (holotype, USNM). INDIA: **Mysore:** *Bangalore Dist.:* 1♂, 1♀, Bangalore, Aug. 8, 1976, C. A. Viraktamath, reared on *Leeuwenia karnyiana* Priesner (Thysanoptera: Phlaeothripidae) (BMNH). *Kolar Dist.:* 1♀, ChikBallapur, 1926, T.V.

Campbell (CARV); 1♂, NundiDrug, 1926, T.V.C. (CARV). We examined four additional specimens collected by T.V. Campbell in southern India, 1930 (no other locality data given) that may belong to this species. These specimens could not be identified with certainty because of their poor (teneral) condition.

***Fingulus puncticollis*, new species**

Figure 31

DIAGNOSIS: Recognized by the narrow vertex (ratio of vertex width to head width 0.17: 1–0.20:1), coarsely punctate pronotal collar, length of second antennal segment greater than posterior width of pronotum, and male genitalia as in figure 31. The scent gland os-

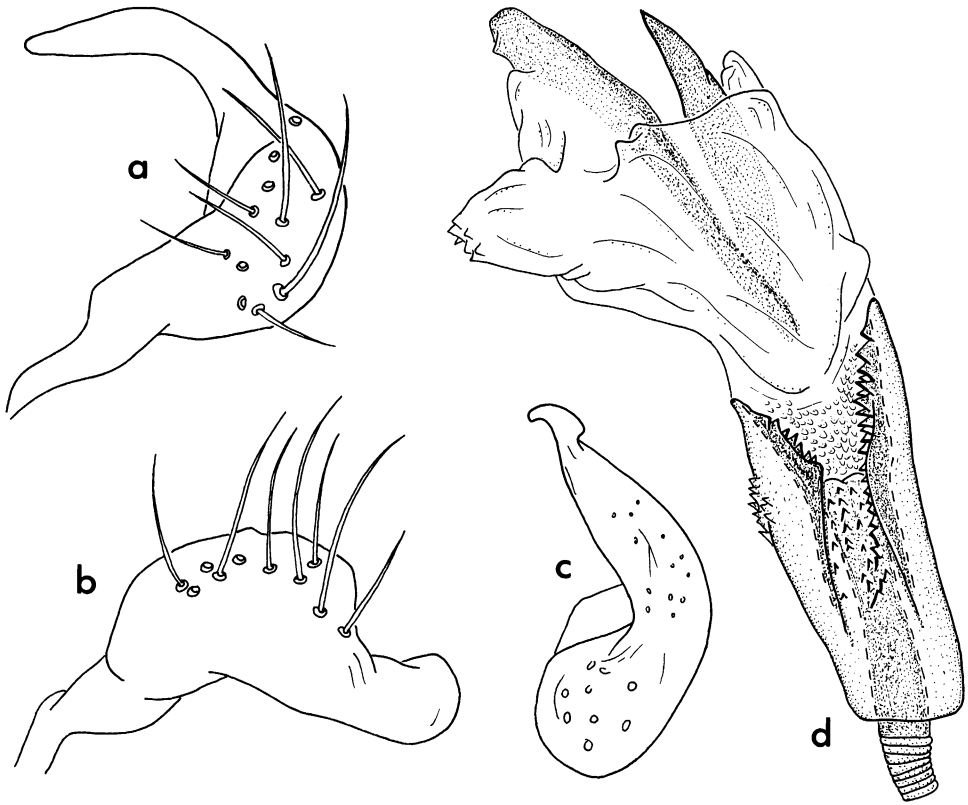


Fig. 31. Male genitalia of *Fingulus puncticollis*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

tirole of this species is darkened, and the hemelytral membrane is without a dark, medial band.

DESCRIPTION: *Male*. Length 3.19–3.24; dark brown general coloration. **Head:** Width across eyes 0.61–0.64, vertex 0.11–0.12; dark brown; jugum, lorum, and dorsal region of neck slightly paler; distinctly longer than broad in dorsal view; moderately produced anteriorly of eyes in lateral view; tylus very prominent basally, strongly deflexed distally, junction with frons indistinct; neck with strong, transverse impressed line just posterior of eyes, region between line and posterior margin of eye narrowly and weakly inflated in dorsal view, more broadly inflated in lateral view. **Antennae:** I, length 0.43–0.45, dark brown; II, length 1.52, brownish yellow with apex narrowly infuscated; III–IV, missing. **Labium:** Length 1.30–1.31; reaching to middle of mesosternum; yellowish brown, segments I,

II and apex of IV darker brown; relative lengths of segments 18:18:18:26. **Pronotum:** Posterior width 1.24–1.34; collar flattened, coarsely punctate, slightly broader than greatest width of antennal segment I; calli not noticeably elevated, but with well defined anterior and posterior borders; posterior lobe of disc weakly elevated above level of head in lateral view; ventral surface of prosternal xyphus weakly convex, without distinct callus or tubercle; ostiole and evaporative area of metathoracic scent efferent system dark brown; scutellum very slightly elevated above hemelytra, dorsal surface weakly convex. **Hemelytra:** Nearly straight laterally, weakly curved inward at cuneal incisure; cuneus twice as long as greatest width; membrane lightly infuscated inside areolar cells, especially bordering veins. **Legs:** Femora brown or dark brown, not inflated distally; tibiae and tarsi brownish yellow, basal third of tibiae fus-

cous. **Genitalia:** Left paramere and vesica as in figure 31.

Female. Unknown.

ETYMOLOGY: From the Latin, *punctum* (little hole, puncture) and *collum* (neck, collar), referring to the coarsely punctate pronotal collar.

DISTRIBUTION: South India and Vietnam.

DISCUSSION: In addition to the material listed below, we have examined a single female from Chanthaburi in southeast Thailand (BISH) and one female from Pekalongan in Java (CARV) that may be conspecific with the holotype of *puncticollis*. The external features of these specimens agree with those of the type and paratype, with the exception of the second antennal segment, which is uniformly pale rather than darkened distally. However, as we cannot positively associate these females with known males, we have treated them as unidentified and have labeled them as *Fingulus* sp. (nr. *puncticollis*). A single male also was examined from Thailand (Chiangmai Prov., Doi Suthep) which is similar to *puncticollis*, but recognizable as a distinct species based on the structure of the male genitalia. It is not described in the present study because its head is missing. This specimen has been returned to the Bishop Museum bearing our label for *Fingulus* n. sp. (nr. *puncticollis*).

HOLOTYPE ♂: INDIA: **Madras:** *Coimbatore Dist.:* Coimbatore, July 1, 1912, on fig leaf, Y.R. coll. (NHML).

PARATYPES: VIETNAM: 1♂, Riv. de Quangtri, Anam, May 5, 1927, D.E. Wright (CAS).

Fingulus sumatranus, new species

DIAGNOSIS: Very similar to *porrecta* in size, coloration, and general structure, but distinguished by the conical process on the frons, darkened apex of antennal segment II, shorter labium, less reddened cuneus, and distinctly bicolored tibiae. This species is easily distinguished from other members of the genus by its paler brown general coloration and by the low, conical process on the frons.

DESCRIPTION: *Female holotype.* Length 3.88; brown general coloration; head and pronotal disc yellowish brown; cuneus and distolateral margin of corium tinged with red.

Head: Width across eyes 0.66, vertex 0.17; noticeably longer than broad in dorsal view; moderately produced anteriad of eyes in lateral view; frons with low conical tubercle above base of tylus; postocular region bordering eyes weakly inflated in dorsal view, separated from remainder of neck by strong impressed line—distance from line to posterodorsal angle of eye about one-third the thickness of antennal segment I. **Antennae:** I, length 0.48, yellowish brown; II, length 1.71, yellowish brown basally, distal third darker brown; III–IV, missing. **Labium:** Length 1.39; reaching slightly beyond apices of procoxae; brown, segment IV yellowish brown; relative lengths of segments 20:18:18:23. **Pronotum:** Posterior width 1.52; collar flattened, set with fine punctures, slightly broader than greatest width of antennal segment I; calli weakly elevated, but with well defined anterior and posterior borders; posterior lobe of disc only slightly elevated above level of head in lateral view, rising gradually from juncture with calli; ventral surface of prosternal xyphus weakly convex, but without distinct callus or tubercle; ostiole and evaporative area of metathoracic scent efferent system fuscous; scutellum weakly elevated above hemelytra, dorsal surface nearly flat. **Hemelytra:** Nearly straight laterally, weakly curving inward distally, with shallow cuneal incisure; cuneus about twice as long as greatest width; most of membrane lightly infuscated, except noticeably darker inside areolar cells. **Legs:** Yellowish brown; bases of tibiae and distal third of femora darker brown; hind femora not inflated distally. **Genitalia:** Not examined.

Male. Unknown.

ETYMOLOGY: Named for its occurrence in Sumatra.

DISTRIBUTION: Sumatra.

HOLOTYPE ♀: SUMATRA: Fort de Kock, 920 m, Nov. 1920, E. Jacobson (USNM).

Fingulus umbonatus, new species

Figure 32

DIAGNOSIS: Recognized by the uniformly pale second antennal segment; broad, weakly inflated postocular region of neck; large, pale, ventrally directed tubercle on prosternal xyphus; pale scent gland ostiole; and structure of the male genitalia (fig. 32).

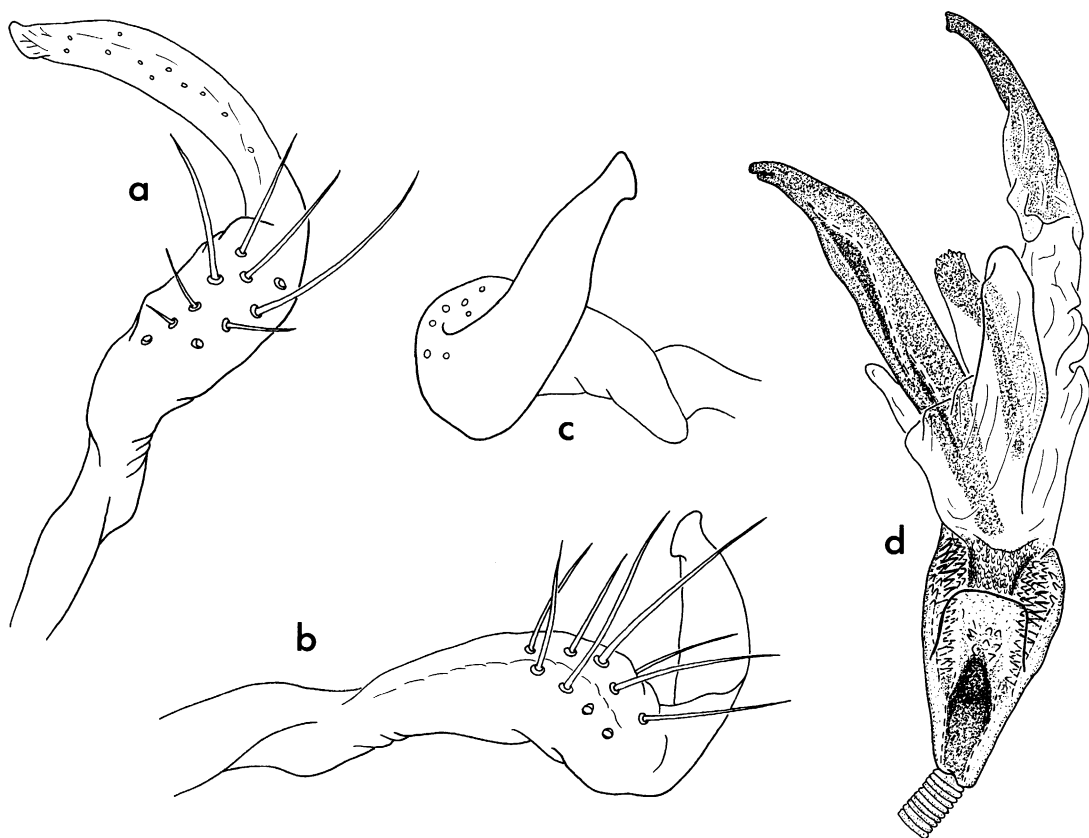


Fig. 32. Male genitalia of *Fingulus umbonatus*. a. Left paramere, dorsal view. b. Left paramere, lateral view. c. Left paramere, apical view. d. Vesica.

DESCRIPTION: *Holotype Male*. Length 2.43; dark brown general coloration, head and pronotal collar slightly paler. **Head:** Width across eyes 0.58, vertex 0.16; brown; as long as broad in dorsal view; weakly produced anteriorly of eyes in lateral view; tylus moderately produced, gradually deflexed distally, junction with frons very shallowly depressed; neck weakly but broadly inflated posteriorly of eyes, constricted medially, but without distinct impressed line—distance from constriction to posterodorsal angle of eye twice the greatest width of antennal segment I. **Antennae:** I, length 0.36, dark brown; II, length 0.95, uniformly brownish yellow; III–IV, missing. **Labium:** Length 1.35; reaching between mesocoxae; dark brown, segment IV yellowish brown; relative lengths of segments 18:16:16:27. **Pronotum:** Posterior width 1.18; collar flattened, impunctate, slightly broader than greatest width of antennal segment I; calli

weakly elevated, posterior margins slightly depressed; posterior lobe of disc moderately elevated above level of head in lateral view; prosternal xyphus with large, pale, ventrally directed tubercle arising from ventral surface; scent gland ostiole white, surrounding evaporative area fuscous; scutellum slightly elevated above surface of hemelytra, dorsal surface weakly convex. **Hemelytra:** Weakly rounded laterally, with deep cuneal incisure; cuneus about 2.5 times as long as greatest width; membrane mostly pale, lightly suffused with fuscous only along outer distal margin of primary areolar cell. **Legs:** Femora dark brown, not noticeably inflated distally; tibiae pale brownish yellow, narrowly darkened basally; tarsi pale. **Genitalia:** Left paramere with weakly produced sensory lobe; shaft with weak apical processes (fig. 32a–c). Vesica as in figure 32d.

Female. Length 2.74–2.85; width of head

TABLE 1

Description of Characters

(Values from left margin: character no., additivity, length on tree, consistency index)

HEAD		
0 + 4	0.25	RELATIVE LENGTH: (0) Shorter than width across eyes, or as long as broad; (1) distinctly longer than broad
1 + 1	1.00	WIDTH ACROSS EYES: (0) greater than anterior width of pronotum; (1) equal to or slightly less than anterior width of pronotum
2 + 3	0.33	NECK: (0) not or only slightly swollen immediately posteriad of eyes; (1) moderately to strongly swollen posteriad of eyes
3 + 2	0.50	IMPRESSED LINE ON NECK: (0) absent or weakly defined; (1) well developed
4 + 1	1.00	DORSAL MARGIN OF EYE: (0) raised slightly above level of vertex in lateral view; (1) at or below level of vertex in lateral view
5 + 2	0.50	DEPRESSION BETWEEN TYLUS AND FRONS: (0) shallow or obsolete; (1) moderately to strongly developed
ANTENNAE		
6 + 5	0.20	LENGTH OF SEGMENT II: (0) greater than or equal to posterior width of pronotum; (1) less than posterior width of pronotum
LABIUM		
7 + 4	0.25	APEX REACHING TO: (0) posterior margin of mesosternum or between metacoxae; (1) procoxae or slightly beyond
8 + 4	0.25	LENGTH OF SEGMENT IV: (0) less than two times length of segment I (ratio less than 1.80:1); (1) about two times length of segment I (ratio greater than 1.90:1)
9 - 4	0.50	COLORATION: (0) bicolored - basal fourth to three-fourths fuscous, distal region pale yellow; (1) entirely pale; (2) entirely fuscous
THORAX		
10 + 4	0.25	DORSAL SURFACE OF COLLAR: (0) slightly to moderately rounded; (1) flattened
11 + 2	0.50	DORSAL SURFACE OF COLLAR: (0) smooth or sometimes slightly roughened, but without distinct punctures; (1) finely to coarsely punctate
12 + 2	0.50	POSTERIOR BORDERS OF CALLI: (0) indistinct; (1) well defined
13 + 3	0.33	SCUTELLUM: (0) weakly to moderately elevated, dorsal surface evenly convex; (1) strongly elevated, usually more abruptly convex distally
14 + 3	0.33	ROUNDED TUBERCLE OR CONICAL PROCESS ON PROSTERNAL XYPUS: (0) absent; (1) present

TABLE 1—(Continued)

15 + 2	0.50	COLOR OF OSTIOLAR PERITREME: (0) pale yellow or dirty white; (1) brown or fuscous
16 + 2	0.50	TONGUE AT APEX OF OSTIOLAR CANAL: (0) indistinct or relatively small; (1) noticeably developed
17 + 1	1.00	SETOSE AREA ON ANTERODORSAL MARGIN OF METAEPISTERNUM: (0) present; (1) absent
HEMELYTRA		
18 + 4	0.25	FUSCOUS STRIPE ON MEMBRANE: (0) absent; (1) present
19 + 4	0.25	LENGTH OF CUNEUS: (0) 2.0–2.5 times basal width; (1) 3.0–3.5 times basal width
LEGS		
20 + 2	0.50	HIND FEMORA: (0) not or only slightly inflated distally; (1) moderately to strongly inflated distally
MALE GENITALIA		
21 + 1	1.00	BASAL SKIRT OF VESICA: (0) without tongue-like lobe dorsally; (1) with tongue-like lobe
22 + 3	0.33	BASAL SKIRT OF VESICA: (0) without spinose process arising from inner dorsodistal surface of cuplike cavity; (1) with spinose process
23 + 2	0.50	SPINES ON RIGHT MARGIN OF BASAL SKIRT OF VESICA: (0) absent; (1) present
24 + 2	0.50	MEMBRANOUS LOBES OF VESICA: (0) at least one lobe, usually more, with field of well developed spines; (1) lobes without fields of spines, or rarely with several scattered spines apically
25 - 6	0.33	LOBAL SCLERITES OF VESICA: (0) two or three present; (1) one present; (2) absent
26 + 3	0.33	SENSORY LOBE OF LEFT PARAMERE: (0) moderately to strongly developed; (1) weakly developed
27 + 3	0.33	DORSAL APICAL PROCESS OF LEFT PARAMERE: (0) absent or much reduced; (1) moderately to strongly developed

across eyes 0.59–0.62; width of vertex 0.18–0.20; length of antennal segment I 0.39–0.40, segment II 1.15–1.16; length of labium 1.53; posterior width of pronotum 1.35–1.36.

ETYMOLOGY: From the Latin, *umbonis* (rounded protuberance, knob), referring to the large, rounded tubercle arising from the ventral surface of the prosternal xyphus.

DISTRIBUTION: Laos, Sabah, and Thailand.

HOLOTYPE ♂: LAOS: **Vientiane Prov.**: Ban Van Eue, Feb. 15, 1966, native collector (BISH).

PARATYPES: MALAYSIA: *Sabah*: 1♀, Sandakan, C.F. Baker (USNM). THAILAND: 1♀, Ban Na, 108 m, May 5–10, 1958, T.C. Maa (BISH).

CLADISTIC ANALYSIS

The data set used in the cladistic analysis of *Fingulus* species contained 21 characters of the external morphology, mostly representing both sexes, and seven characters of the male genitalia. Descriptions of these characters are provided in Table 1. *Angerianus* was selected as the sole outgroup for the analysis based on its suspected sister-group relationship with *Fingulus* (see generic description). Our limited survey of deraeocorine genera did not reveal any other taxa that we believed to be closely related to *Fingulus*. For most characters, the condition found in *Angerianus* was considered to be plesiomorphic ('0' state), and alternative conditions in the ingroup taxa were coded as apomorphic (derived states '1' and '2') (see table 2 for character codings). Characters 8, 10–13, 19, and 25 were coded as apomorphic for *Angerianus*, which reflects our preliminary hypothesis that these are derived features within the Deraeocorinae, although they do not appear to be restricted to *Angerianus* and *Fingulus*. The polarities of characters 21–23 were assigned as present = apomorphic, absent = plesiomorphic, since homologous structures could not be identified in *Angerianus*. The polarity of character 6 was assigned arbitrarily because it displayed variation spanning more than one character state in the outgroup. This character was assigned a missing data code ('-') for *Angerianus*. Missing data codes also were assigned in cases where structures were damaged, teneral, or not represented (e.g., male genitalic characters for species known only from females). Two multistate characters were included in the analysis (9, 25). They were treated as nonadditive (unordered) because in both cases, a clear transformation series was not evident.

The analysis used the mh and bb tree-building options of the Hennig86 microcomputer phylogenetics package developed by J. S. Farris. Several runs of the data were conducted, each producing the same three equally parsimonious trees (length = 79, consis-

TABLE 2
Character Matrix Processed by Hennig86

	0000000000111111111122222222 0123456789012345678901234567
Angerianus	000000-01011110000010-0200
angusticuneatus	0011111102100001111110010101
apoensis	0001101000111011100001001001
atra	1101101010011011101001001011
atrocaeruleus	0011101101000011101000000100
collaris	0001101000011110000001001111
curticornis	0001101010111011100001001011
gracilis	0000000100100000000100100000
gressitti	101111000010001110111-0000
ifensis	0000001011100011100000100001
inflatus	0001100000111110000001001001
libbyi	0000000000100110000000100001
longiceps	0000000000000011100000100001
longicornis	000110000011101110000-11
luzonicus	1101101010111011100001001011
maai	0001100002100001111010000101
magnus	0011111102100001111010010001
morobe	0001111002100001111110010101
nigrifasciatus	1011100000111011101001000011
novobritanicus	0011100100100011101010000100
novocaledonicus	0011100101000011101000100100
novoguineensis	0011101101000001100000010200
parvus	0000000010100110100000000001
porrecta	1001100001111011100001000101
puncticollis	1001100100111011100000001001
sumatranus	100110010011101110000-0000
umbonatus	0000101000111010000001001010

tency index = 37, retention index = 71). The three trees differ only in the arrangement of the species *ifensis* and *longiceps* at node 46 (see fig. 33). One alternative has these two taxa on a separate stem as sister species, and another resolved answer has *ifensis* as the sister group of [*longiceps* + (component 45)]. The third tree has *ifensis* and *longiceps* unresolved at node 46. The Nelson consensus (fig. 33) has the same length and consistency as the individual trees and the topology of the third alternative described above. A list of additivities, lengths, and consistency indices for all characters as they apply to figure 33 is given in table 1. Synapomorphies for all internal nodes are given in table 3. Characters having alternative optimizations at a node are displayed with the character states involved separated by a period (e.g., 0.1). Character distributions for terminal taxa are not provided, but can be determined from the data matrix (table 2).

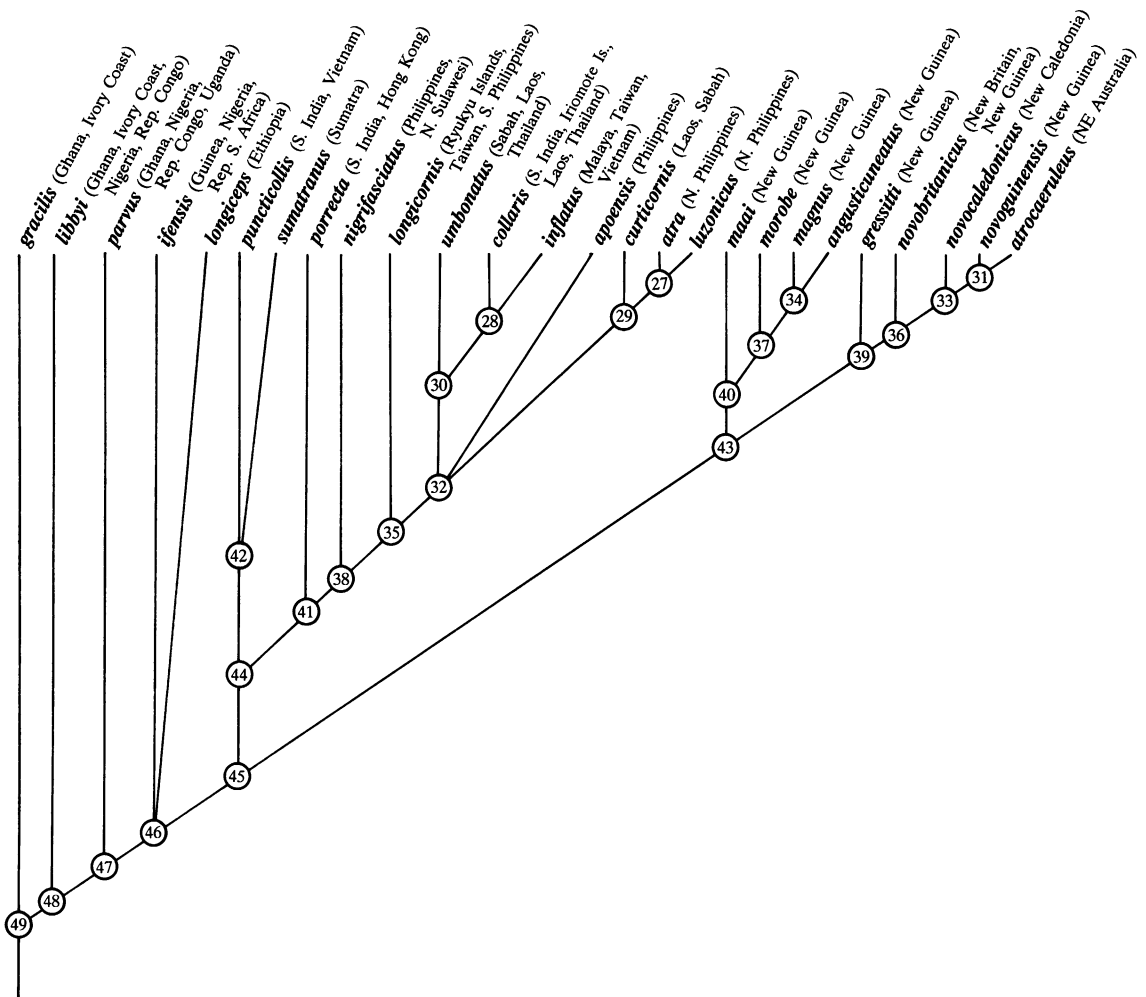


Fig. 33. Cladogram for *Fingulus* species (length = 79, ci = 37, ri = 71). Character state changes occurring at the numbered nodes are given in table 3.

We choose to recognize two of the larger clades depicted in figure 33 as species groups because of their strong character support. The *porrecta* group (component 44) is defined by the long head (character 0-1), punctate pronotal collar (11-1), and well defined posterior borders of the calli (12-1). The only other occurrence of characters 11 and 12 are in the outgroup, *Angerianus*. Character 0 is slightly more homoplasious, showing a reversal at node 35 and reoccurrence at node 27. This character also occurs in the distantly related species, *gressitti*.

The *atrocaeruleus* species group (component 43) is defined by the fuscous stripe on the hemelytral membrane (18-1), the distally

inflated hind femora (20-1), and the vesica with a single lobal sclerite (25-1). Each of these characters shows homoplasy, having consistency indices of 0.25, 0.50, and 0.33, respectively. Together, the *atrocaeruleus* and *porrecta* species groups form a larger clade (component 45) defined by the impressed line on the neck (3-1) and the unelevated eyes (4-1). This clade also is supported by a reversal in character 22.

BIOGEOGRAPHIC DISCUSSION

The genus *Fingulus* has a typical Indo-Pacific distribution, with taxa distributed in west and central Africa, India, tropical Asia, and

TABLE 3

List of Character State Changes at Ancestral Nodes for Figure 33

49: 10-1, 13-1, 19-1, 22-1	37: 5-1, 6-1, 19-0.1, 23-1
48: 14-1, 19-0, 27-1	36: 7-1, 27-0
47: 16-1	35: 0-0, 24-0.1
46: 13-0, 15-1	34: 2-1, 7-1, 19-0.1
45: 3-1, 4-1, 22-0	33: 9-1, 10-0, 20-0
44: 0-1, 11-1, 12-0	32: 6-1, 24-1
43: 18-1, 20-1, 25-1	31: 6-1
42: 7-1, 24-0.1	30: 15-0, 16-0
41: 21-1	29: 8-1
40: 9-2, 14-0, 17-1	28: 13-1
39: 2-1, 27-0.1	27: 0-1, 1-1
38: 26-1	

the tropical Pacific as far east as New Caledonia. Sometimes referred to as paleotropical by botanists and marine biologists, this distribution pattern has been largely overlooked by biogeographers studying terrestrial animals. It has been primarily through the study of phytophagous insects and the application of cladistic biogeographic methods that the Indo-Pacific has emerged as a distinct biogeographic entity (see review in Schuh and Stonedahl, 1986).

The primary hindrance to studies of cladistic biogeography in the Old World tropics is the lack of sufficient distributional data, which is necessary for the accurate determination of areas of endemism. Many groups of insects remain poorly known throughout large portions of southeast Asia and the western tropical Pacific. The genus *Fingulus* is a prime example of a broadly distributed but very poorly collected Indo-Pacific group. The limited, disjunct distribution records for species such as *curticornis* (Laos, Sabah), *porrecta* (south India, Hong Kong), and *umbonatus* (Laos, Sabah, Thailand) suggest that these and perhaps other species of the genus are more widely (generally) distributed than current records indicate.

The determination of areas of endemism and the formulation of hypotheses of area interrelationship must be considered as tentative when based on data from insufficiently sampled groups. However, it is only through the formulation and testing of these preliminary hypotheses that our understanding of biogeographic patterns is enhanced. One such hypothesis of area interrelationships for the Indo-Pacific was proposed by Schuh and

Stonedahl (1986; fig. 11) based on the distributions of various groups of phytophagous insects. Their summary cladogram incorporated 18 broadly defined areas of endemism stretching from Ghana in tropical west Africa to Fiji and Tonga in the Pacific.

On a gross scale, the *Fingulus* cladogram (fig. 33) is similar to the summary cladogram of Schuh and Stonedahl (1986), each having the most plesiomorphic members of the group distributed in tropical Africa and the more derived taxa occurring in tropical mainland Asia and the islands of the tropical Pacific. Another significant feature of the *Fingulus* cladogram is the sister-group relationship of a large clade of Asian and west Pacific species (component 44) and a clade of species distributed in New Guinea, New Caledonia, and northeast Australia (component 43). A clear pattern of area relationships is not evident within the clade of Asian and west Pacific species. This is primarily the result of the inclusion of a number of widespread taxa in this clade (e.g., *collaris*, *curticornis*, *porrecta*, *puncticollis*) and the unresolved relationships of the species stemming from node 32. We are unable to comment on area relationships within New Guinea, because discrete areas of endemism could not be identified based on the limited collections of *Fingulus* inhabiting this region. One notable feature of the New Guinea clade (component 43) is the inclusion of species from northeast Australia and New Caledonia. In the summary cladogram of Schuh and Stonedahl (1986), New Guinea is the sister area of Fiji + Tonga.

The *Fingulus* cladogram incorporates areas not treated in the work of Schuh and Stonedahl (1986) as follows: (1) portions of east Africa are included as likely sister areas of all Asian and Pacific areas (node 46); New Caledonia and northeast Australia are shown to be most closely related to New Guinea (component 43); and (3) Sumatra is shown to have affinities with south India and tropical mainland Asia (node 42). A number of areas in west and central Africa are unique to the *Fingulus* cladogram (i.e., Ivory Coast, Nigeria, Republic of Congo, Uganda), but none of these appears to be endemic. Other nonendemic areas included in the distributions of Asian *Fingulus* are Hong Kong, Laos, the Ryukyu Islands, Taiwan, and Vietnam.

The distributional data for *Fingulus* spe-

cies also exclude a number of areas that are consistently represented in the groups studied by Schuh and Stonedahl (1986) (e.g., Burma, Fiji, northeast India, Java, New Ireland, Solomon Islands, Sri Lanka, Tonga). Further, a number of areas supported as "endemic" in the work of these authors are not confirmed as such in the present study. For example, none of the three species of *Fingulus* known from south India are endemic to the region (*collaris* also occurs in Thailand, *porrecta* in Hong Kong, and *puncticollis* in Vietnam). Because of these and earlier described incongruencies, we have not attempted to combine the rather limited data provided here with that of Schuh and Stonedahl (1986) into a more comprehensive area cladogram for the Indo-Pacific.

The biological and geological histories of the Indo-Pacific are complex, and it is clear that much more information is needed to test and refine even the most general of biogeographic hypotheses for this region. Obviously, more than one major biogeographic pattern is involved in this part of the world, as is evidenced by the occurrence of South Temperate and Transpacific elements in the fauna (see discussion in Schuh and Stonedahl, 1986). With the elucidation of more restricted areas of endemism, the number and complexity of biogeographic patterns in the Indo-Pacific will certainly increase. The ability of biogeographers to recognize and interrelate these patterns depends foremost on the cladistic and distributional data supplied in contemporary systematic studies.

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