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Weevils of the Tribe Sipalini (Coleoptera, Curculionidae, Rhynchophorinae) Part 3. The Genus *Sipalinus*

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INTRODUCTION AND ACKNOWLEDGMENTS

The present paper is the third and final part of a series on the Sipalini, a tribe of weevils ranging widely in Eurasia, Australasia, Africa, and the New World (South America north to the southwestern United States). The 35 species of the genera *Rhinostomus, Yuccaborus, Mesocordylus,* and *Orthognathus* have already been studied (Vaurie, 1970a, 1970b). *Sipalinus* is revised herein. *Sipalinus* is composed of seven species, five from Africa and two from Eurasia and Australasia. They are large species (up to 28 mm.) found under bark or logs; the larvae of at least some species live in dead or decaying trees.

The only treatment of the genus since its description was by Lacordaire (1866) who removed all the 11 New World species to a new genus, *Mesocordylus,* and left six Old World species in Schoenherr's *"Sipalus."* Voss (1958) presented a key to the genera of the tribe and discussed the species from Asia, *gigas* Fabricius and its synonyms, but not the species from Africa. In fact, three of the species from Africa (*aloysiisabaudiae, aurivilli,* and *squalidus*) have not even been mentioned in the literature (except in catalogues) since their descriptions.

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The adults of *Sipalinus* differ from those of *Mesocordylus* and *Orthognathus* as stated below in the diagnosis of the genus, and from *Rhinostomus* and *Yuccaborus* by having subtriangular and porrect, not outward curving mandibles; narrow and linear, not dilated and bilobed third tarsal segments; nondentate tibiae; shorter antennal scape; and a distinct postocular lobe on the pronotum.

For further information on the history and characters of the tribe, and for acknowledgments of aid, part 1 should be consulted.

Approximately 1800 specimens of *Sipalinus* have been examined from the collections of the institutions and individuals listed under Specimens Examined. The types, lectotypes, or cotypes of 10 of the 15 described forms have been examined. The location of the types of two forms (*gigas* Fabricius and *chinensis* Fairmaire) is unknown. A new species is described from Yunnan, China.

Two species which are listed under *Sipalinus* in the Junk Catalogue (Csiki, 1936) are removed from the genus. One, *Curculio elephas* Fabricius, 1781 which was said by Zimsen (1964) to be from Africa and to lack a type specimen, was described as having the elytra "postice spinosis" which does not apply to *Sipalinus*. The other, *Sipalus porosus* Walker, 1859, from Ceylon does not belong in the genus because of the unidentate femora (Walker cited the generic name with a question mark). Csiki (1936, p. 84) listed "*Sipalus granulatus* Boisduval, 1835 [non F.]" as a synonym of *S. burmeisteri* Boheman, 1838. As far as I can ascertain, Boisduval did no more than redescribe *granulatus* Fabricius, 1801.

As the material studied in the present paper comes chiefly from old collections, I have used the names which were then current for political units in Africa and Asia.

Checklist of Species and Subspecies of *Sipalinus* Marshall

Group I

gigas gigas (Fabricius)
  hypocrita (Boheman)
  tinctus (Walker)
  chinensis (Fairmaire)
  formosanus (Kono)
gigas granulatus (Fabricius)
  misumenus (Boheman), new synonymy
  cristatus (Schaufuss), new synonymy
yunnanensis, new species

Group II

guineensis (Fabricius)
mendicus (Boheman), new synonymy
madecassus (Fairmaire), new synonymy
burmeisteri (Boheman)
squalidus (Kolbe)
aloysiisabaudiae (Camerano)

Group III

aurivilli (Duvivier)

GENUS *SIPALINUS* MARSHALL

Sipalus SCHOENHERR, 1825 (not of Fischer, 1813, Mammalia). Type, by monotypy: *Calandra granulata* Fabricius, 1801, a synonym of *Sipalinus gigas* (Fabricius).

Hyposipalus Voss, 1940, p. 56, generic characters only, no species mentioned, invalid according to International Code of Zoological Nomenclature, 1961, art. 13b.

Sipalinus MARSHALL, 1943, p. 119, new name for *Sipalus* Schoenherr.

DIAGNOSIS: Large, robust, brownish, crusty looking, often heavily tuberculate species found in Old World only. They differ from species of the New World genera, *Mesocordylus* and *Orthognathus,* by having broader, almost pincer-like mandibles; slightly arcuate, not straight suture between first and second abdominal segments; ventral apex of beak tridentate; and no wirelike coil (flagellum?) in aedeagus. Also, the elytra, except in *aurivilli,* less cylindrical, less elongate, and base distinctly wider than base of pronotum.

DESCRIPTION: Length, excluding beak, 10 to 28 mm. (one, 8.5). Surface, except for front part of beak and rear part of head, covered with brownish glaze or crusty coating, often greased to black; elytra mottled with white and darker brown. Eyes widely separated above. Mandibles (fig. 9) stout, in repose broadly triangular. Beak, excluding mandibles, of approximately same length as pronotum, in dorsal view wider from base to scrobes and at extreme (dilated) apex than at middle; apex behind mandibles projecting slightly at middle where truncate; base with two or three longitudinal furrows and two blunt carinae, but base usually filled in with coating; ventral surface at apex tridentate (fig. 10), but outer dentations usually worn and blunt; scrobes lateral, oblique, nearly meeting under beak. Antennal club longer than wide (but not longer in *aurivilli*), its apical spongy part asymmetrical (but not in *aurivilli*) and

extending farther toward base on one edge than on other; scape shorter than funicle, gradually widened, reaching to eye; funicle six-segmented. Pronotum at least as long as wide; postocular lobe present; base margined and truncate. Scutellum triangular, no longer than an antennal segment. Elytra oblong-oval; base slightly (*aurivilli*) or distinctly (other species)

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

wider than base of pronotum; humeri prominent. Metepisternum with single row of punctures, at least at posterior, narrow end. Front coxae contiguous; middle coxae narrowly separated by from one-fifth to one-third of diameter of coxa. Abdomen with suture between first and second segments slightly arcuate.

Femora straight; middle femur extending beyond trochanter of hind femur (but not quite so far in *aurivilli*); hind femur extending to or beyond apex of elytra (fig. 53). Tibiae linear; those of *aurivilli* slightly widened to apex. Tarsi narrow; third segment not bilobed; under surface of all segments with row of hairs on each side of median glabrous line; rows in some species merging apically to form spongy pads; ter-

minal segment inserted at apex of third. Aedeagus with lateral line dividing dorsal and ventral surfaces, its two long appendages attached to sides of base of aedeagus; no "coil" present. Eighth tergum of male apically truncate; apical hairs shorter at middle, giving appearance of sinuate apex. Female genitalia apically more or less tubular, with rather prominent styli armed with bristles.

SEXUAL DIMORPHISM: In *Sipalinus aurivilli* Duvivier there seems to be no external difference between the sexes. In the six other species the beak is the only external character that differs in the sexes. In the males on each side under the scrobe or antennal opening, the beak is expanded laterally into two sharp little angles which, when not abraded, are readily visible when viewed from above (fig. 9). The females have no angles, but females of the African species, *S. guineensis, squalidus, aloysiisabaudiae, burmeisteri,* and both sexes of *aurivilli* may have this part feebly expanded. Males differ further by having the apex of the beak on the ventral side smooth or vaguely bicarinate, whereas females (except for *aurivilli*) have the ventral apex longitudinally strongly bicarinate and the carinae enclosing an elliptical depression (fig. 10). The antennal scrobe of males seems to be situated slightly farther front than that of females. The apex of the eighth tergum which, again with the exception of *aurivilli,* is narrow in females, broadly truncate in males, often protrudes from the pygidium and is a ready indication of the sex.

Lacordaire (1866) was mistaken in saying that the males were smaller than the females, but correct in pointing out that the anterior half of the beak of males is generally more strongly punctate; in females of four of the seven species it is feebly punctate or shining and impunctate. The other sexual differences given above have not been noted previously except for the scrobal angles or teeth on the beak of the males (Hustache, 1939).

DISTRIBUTION AND ECOLOGY: All the species from Africa occur south of about 15° N, and all have been taken in the northeastern part of the Congo (I have no record of *burmeisteri* from there, but it no doubt occurs). With the exception of *aloysiisabaudiae* and *squalidus,* the species are reported from both the western and eastern coasts. *S. aloysiisabaudiae* (fig. 51) has been seen from eastern Africa from the Congo south to Rhodesia and to Beira in Mozambique; *squalidus* (fig. 50) occurs on the west coast as well as in the northeast Congo and Uganda area. *S. aurivilli* (fig. 52) has about the same distribution as *aloysiisabaudiae,* but extends farther west from Mozambique into Angola, thence north on the west coast to Cameroon. The three species which occur most widely (*guineensis, burmeisteri,* and *squalidus*) were described from Guinea and they range from

there all the way to the Congo or to the coast, and *guineensis* to Madagascar (figs. 41, 50).

The only information I have on how the species of this extensive area live is from two specimens, one of which (*aloysiisabaudiae*) was found in the rotting wood of a baobab tree, and one (*guineensis*) under the bark of a recently felled tree.

The species from the Asian region are also associated with dying or felled trees of a number of families and are found under bark or under felled logs (see *gigas* for details). In Asia, one species (*yunnanensis*) is apparently restricted to northern Yunnan; its range comes within the range of the other species (*gigas*) which occurs farther west to the Himalayas and to the United Provinces of India, also in southern India and the island of Ceylon, the Nicobar and Andaman islands, east through the Greater Sundas to the Solomons and Australia; also the Malay Peninsula, Burma, southeastern China, the Philippines, north to Korea, Japan, and Manchuria (fig. 21).

Discussion: The date of the *Sipalus* of Schoenherr is generally given as 1826 when he described the genus at length. The name appears first, however, in 1825, along with a type species, and this is the correct date.

Sipalinus is divisible into three groups. Group I is composed of two species from Eurasia and Australasia (*gigas* and *yunnanensis*) in which the sides of the pronotum converge to the apex without a sharp constriction (figs. 29–31), the third tarsal segments are virtually covered ventrally with thick, spongy-hairy pads (fig. 11), and the apical border of the aedeagus is convex.

Group II includes four of the five species from Africa (*guineensis, burmeisteri, squalidus, aloysiisabaudiae*) which are characterized by having a strong apical constriction or "collar" on the pronotum (figs. 24–28), the tarsal soles furnished with fewer hairs in two well-separated rows, and the apical border of the aedeagus flat or concave.

Group III is composed of *aurivilli* from Africa which resembles the other species from Africa (group II) in the constriction of the apex of the pronotum, and resembles the species of group I in its abundantly hairy tarsal soles and convex border of the aedeagus. However, it presents also so many differences from the other groups that it might be considered generically distinct (see the discussion under the species).

Voss in his key (1940, p. 56) proposed a subgenus, *Hyposipalus,* for African species with the tarsal soles hairy on the sides only, but his name is invalid because no species was mentioned. Later (1958, p. 128), when he raised his African subgenus to the rank of genus, he still did

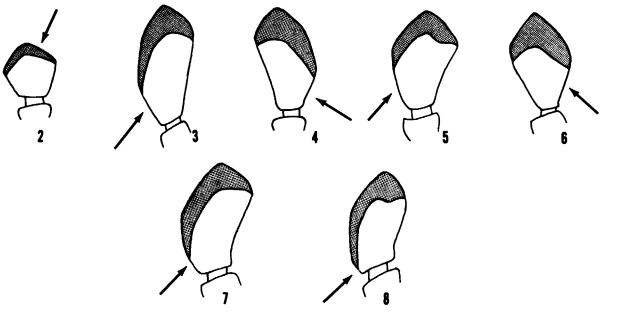
not mention any African species, but he synonymized the replacement name of *Sipalinus* given by Marshall (1943) with his own *Hyposipalus* of 1940. Actually, the less hairy tarsal soles are not diagnostic for all species from Africa, as mentioned above for *aurivilli.* Furthermore, the hairs can be worn thin or become clogged with some extraneous sticky substance so that the distinction between the two kinds of tarsal soles is not clear in all specimens.

SPECIES CHARACTERS: The characters that differ among species include the shape or punctation of the beak, the shape of the antennal club and its apical spongy part, the length of the second tarsal segment, the ventral vestiture of the tarsi, and the genitalia of both sexes. The most important diagnostic character, however, is the sculpture of the pronotum which differs among all species except in the case of *yunnanensis* where the pronotum resembles that of one of the subspecies of *gigas.*

The beak (figs. 15–20) of five species is arcuate, that of *aurivilli* is less arcuate, nearly straight in some specimens, and that of *aloysiisabaudiae* is distinctly straight. In the last two species and also in *yunnanensis* the beak is strongly or at least distinctly punctate to or near its apex, whereas in the other species it is quite feebly or shallowly punctate near the apex in males, and in the apical half in females; in females of *gigas* the apical half is virtually impunctate. Viewed laterally, the beak of the majority of species is compressed at the apex where it is thus narrower than it is at the middle or the base; the beak of *aurivilli* is strongly compressed; the beak of *yunnanensis,* however, is entirely cylindrical and the same width throughout. Although the beak of some species can appear proportionally longer or shorter than that of other species, many measurements of the beak in relation to the length of the pronotum show only random individual differences. All species have essentially the same tridentate ventral apex, but with wear this part often becomes at least on the sides, more lobed than dentate. Females of all species except *aurivilli* have a depression and carinae behind the central tooth (fig. 10), and males occasionally show a faint depression.

The club (figs. 2–8), although rather large, is often difficult to see as the antennae are held against the prosternum in many mounted specimens and either the beak obscures the view or only one side of the club is visible. The side usually visible is what would be the inner side or inner face if the antennae were in normal position. The inner side always has a larger corneous or sclerotized basal area and a smaller, spongy apical area than the outer side. The extent of the corneous and spongy areas differs among the species. The club of *aurivilli* is symmetrical, about as wide as long, and with the spongy part very small

at the apex. The club of the other species is asymmetrical, longer than wide, almost kidney shaped, with the spongy apex on one side of the club meeting the corneous base at various distances from the base, very close to the base in *aloysiisabaudiae,* somewhat less close in *burmeisteri* and *guineensis,* about one third from the base in *gigas* and *squalidus,* and nearly one-half in *yunnanensis.* There is some individual variation in the shape of the club, that of some individuals appearing more convex, of others more compressed.



FIGS. 2–8. Antennal club of *Sipalinus.* 2. *S. aurivilli.* 3. *S. gigas granulatus* (New Guinea), inner face; characteristic also of *S. squalidus.* 4. *S. gigas granulatus* (Philippines), outer face. 5. *S. yunnanensis,* inner face. 6. *S. yunnanensis,* outer face. 7. *S. guineensis,* inner face; characteristic also of *S. burmeisteri.* 8. *S. aloysiisabaudiae,* inner face.

The pattern of the ventral side of the tarsal segments is a glabrous line at the middle and a row of hairs on each side. In four of the species from Africa, the hairy rows are virtually parallel on all segments and are very narrow so that the median glabrous area is much wider than the rows of hairs. In *aurivilli* (Africa) and in the species from the Asian region (*gigas, yunnanensis*), the hairs are more abundant and in wider rows, and on the apex of the second segment and on nearly all of the third they tend to merge into spongy-hairy pads (fig. 11). These pads actually are distinctly divided by a narrow glabrous line, but the line is usually obliterated from view by some sticky substance which these weevils may walk in or on. The tarsal segments of most species are distinctly longer than wide, but scarcely so in *burmeisteri* and *aurivilli.*

The mottled dark brown and white elytra as described under *gigas* are virtually the same in all species except *aurivilli* which lacks the dark brown velvety stripes, the acute tubercles, and the large strial punctures,

but which presents a mottled although smoother appearance. When the elytra become abraded, the first marks reduced or becoming obsolete are the velvety stripes and finally the whitish tubercles. The elytra of specimens which are greased, often the majority of specimens, become black and smooth and shining. The rather triangular scutellum is small in proportion to the elytra, being about the width of a sutural interval.

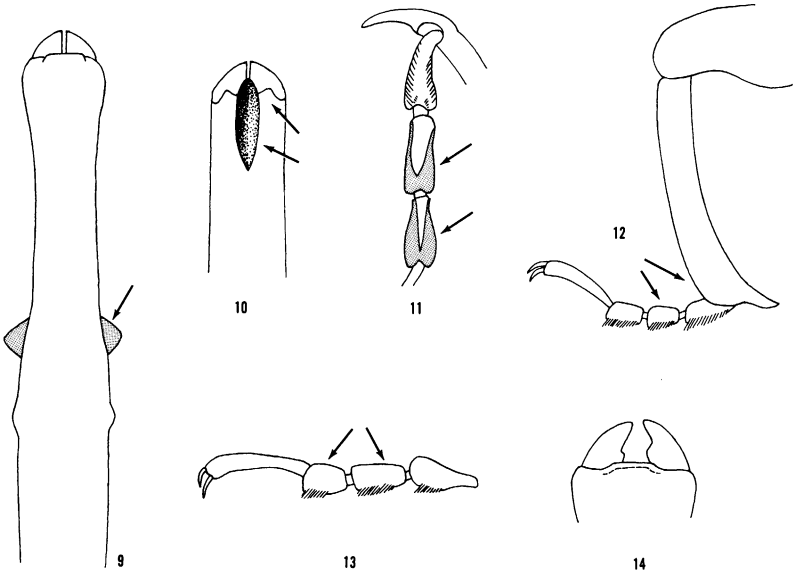
The pronotum is useful not only for distinguishing the groups of species, but also for the species themselves. The species from Africa (groups II and III) differ from those from Asia (group I) by having the sides of the pronotum in front strongly incised or constricted. The sculpture of the pronotum differs among the species as follows: the surface is uniformly smooth and furnished with tiny, shallow punctures in *aurivilli;* smooth and with very large, deep foveae on the disc in *guineensis,* but slightly tuberculate laterally; rather rough and tuberculate on the disc and laterally in *burmeisteri;* tuberculate and with a large apical gibbosity in *squalidus;* exceedingly sharply tuberculate-reticulate throughout in *aloysiisabaudiae;* strongly tuberculate laterally in *gigas* and *yunnanensis,* the disc either tuberculate also, in longitudinal rows, or flat and smooth medially, with scattered foveae (figs. 18, 22–31).

In the species from Africa (except *aurivilli*) the aedeagus is apically rounded-truncate with or without a slight median sinuation (figs. 46, 47), whereas in the species from Eurasia and Australasia the median sinuation is wider and deeper (figs. 42–45), but with considerable individual variation. In *aurivilli* there is a slight projection at the apex which has its own median sinuation (fig. 48). With the exception of *aurivilli,* the apical sclerotized border of the aedeagus of the species from Africa is flat or concave, but that of *aurivilli* and the species from Asia is convex. The eighth tergum of males is quite similar in all the species, as shown in figure 40 of *aurivilli.*

The coxites and styli of females (figs. 32–36) are similar in *guineensis, burmeisteri,* and *squalidus.* They differ slightly in *aloysiisabaudiae* in which the coxites are virtually straight, not turning outward apically, and the styli are proportionally smaller and seem to be situated more ventrally, so that they are scarcely visible in a dorsal view. In *aurivilli* the coxites of seven females are proportionally much larger than those of the other species from Africa. The eighth terga of the species from Africa (figs. 37, 38, 40) show the same pattern as the genitalia, i.e., the tergum of the first three species named above are similar, although the tergum of *guineensis* in profile view seems more decurved; the tergum of *aloysiisabaudiae* is pointed at the apex instead of truncate, and that of *aurivilli* is truncate, but it is not narrowed toward the apex.

In the females from the Asian region the apex of the eighth tergum is similar to that of *guineensis,* but the extreme apex is more or less triangular (fig. 39). The coxites and styli differ in their proportions between the two species (figs. 32, 33) from Asia.

The genitalia were soaked in aerosol solution and when soft were dis-



FIGS. 9–14. *Sipalinus.* 9. Beak, dorsal view (extreme base not shown), showing triangular mandibles in front, and scrobal angles of male behind. 10. Apex of beak, ventral view, showing dentations behind mandibles; also carinae and depression of female. 11. Tarsi, ventral view, showing spongy-hairy pads. 12. *S. aurivilli,* showing apically widened tibia; also short second tarsal segment characteristic also of *S. burmeisteri.* 13. Long second tarsal segment characteristic of majority of species. 14. *S. yunnanensis,* showing basal lobes on open mandibles.

sected with a pin, but were not cleared. A curious, dark, sclerotized formation was found in the dorsal (or ventral?) part of the female genitalia behind the coxites. In *aloysiisabaudiae* this structure is twisted and lobed like a cauliflower head; in *guineensis, burmeisteri,* and *squalidus* it is less elaborate and appears rather circular; in *aurivilli, gigas,* and *yunnanensis* it is not sclerotized and therefore is not readily evident. Zimmerman (1968) illustrated a sclerotization "of the junction between the common oviduct and the bursa copulatrix" of two weevils of the same subfamily, *Cosmopolites sordidus* and *pruinosus,* which might possibly

be what I have found. Further study has been initiated with the help of Vasco M. Tanner of Brigham Young University.

The spermatheca seem not to vary significantly among the species.

Key to the Species of *Sipalinus*

1. Elytra with strial punctures very fine, like pinpoints; hind tibia slightly expanded toward apex (fig. 12); pronotum smooth, shallowly punctate; antennal club as wide as long, with spongy apex minute (fig. 2); Africa. . . . . *aurivilli* (Duvivier)

   Elytra with strial punctures coarse, foveate, as large as one-half width of intervals; hind tibia not at all expanded; pronotum either tuberculate or deeply pitted and reticulate; antennal club much longer than wide (figs. 3–8); Africa and elsewhere. 2

2. Pronotum with large, irregular gibbosity or excrescence superimposed medially over apical collar (figs. 18, 27, 53); Africa. . . . . *squalidus* (Kolbe)

   Pronotum in front smooth or feebly elevated, but lacking distinct gibbosity or hump; Africa and elsewhere. 3

3. Species from Africa; pronotum appearing almost as wide as long (figs. 24, 26, 28); sides at apex strongly constricted, forming distinct collar. . 4

   Species from Eurasia and Australasia; pronotum longer than wide, sides at apex oblique or only feebly constricted (figs. 29–31). 6

4. Antennal club with spongy apex on one side extending virtually to base (fig. 8); beak straight (fig. 19); sides of pronotum with distinct, sharp tubercles usually visible with naked eye (fig. 28). . . . . *aloysiisabaudiae* (Camerano)

   Antennal club with spongy apex on one side not quite reaching base (fig. 7); beak arcuate (fig. 16); sides of pronotum feebly tuberculate or smooth. 5

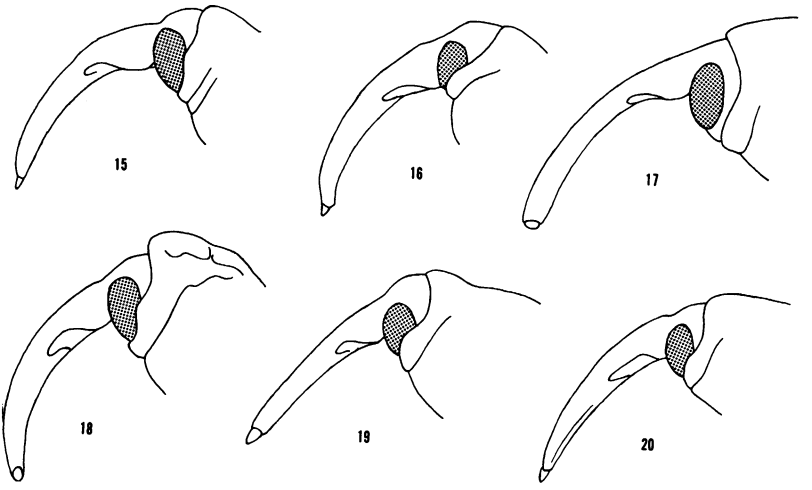
5. Second tarsal segment at least one and one-half times longer than wide and distinctly longer than third (fig. 13); pronotum on disc punctate-foveate, smooth between punctures (fig. 24). . . . . *guineensis* (Fabricius)

   Second tarsal segment only slightly longer than wide and scarcely longer than third (fig. 12); pronotum on disc rough and tuberculate (fig. 26). . . . . *burmeisteri* (Boheman)

6. Beak with apex compressed, rather flattened, thus in profile beak narrower at apex than at middle (fig. 15); beak in dorsal view either (female[1]) virtually impunctate and shining in apical half or two-thirds, or (male[1]) impunctate or feebly punctate in apical four-fifths; China, Japan, Himalayas, India, and islands of Australasia. . . . . *gigas* (Fabricius)

   Beak with apex cylindrical, thus in profile beak about same width at apex as at middle (fig. 17); beak in dorsal view (both sexes) strongly, confluently or rugosely punctate throughout; Yunnan Province, China. . . . . *yunnanensis,* new species

[1] Females are determined by the elongate impression (fig. 10) at the ventral apex of the beak (males may have a faint impression), and no angles under the antennal scrobes. Males have a sharp angulation on each side of the beak under the scrobe (fig. 9); these angles, unless much abraded, are visible from above.



FIGS. 15–20. Beak of *Sipalinus*. 15. *S. g. gigas* (Japan). 16. *S. guineensis;* characteristic also of *S. burmeisteri*. 17. *S. yunnanensis*. 18. *S. squalidus,* showing also hump of pronotum. 19. *S. aloysiisabaudiae*. 20. *S. aurivilli*.

GROUP I

EURASIAN, AUSTRALASIAN SPECIES

Sipalinus gigas

DIAGNOSIS: This polytypic species differs from other species by having the beak of female mostly shining and impunctate except at base, and, except *yunnanensis,* either by having pronotum longer than wide, not squarish, or by lacking a dorsally visible apical constriction on pronotum.

RANGE: From Manchuria and Japan south in eastern and southern China to the Malay Peninsula, Burma, and India; also the Philippines and Greater Sundas to New Guinea, the Solomons, and eastern Australia (fig. 21). Specimens examined, about 850.

DESCRIPTION: Length, 12 to 30 mm. Beak gently, evenly arcuate, about same length as pronotum; in profile narrowing to apex where rather compressed; male, beak densely or confluently punctate from base to apical fourth or fifth where punctures fine or faint; lower edge of scrobe expanded angularly; angles visible from above (fig. 9); beak of female with apical half, or more, shining and virtually impunctate; scrobe with lower edge not expanded; apex ventrally with elongate depression between two sharp carinae. Antennal club (figs. 3, 4) elongate, vaguely oblong-oval; apical spongy part asymmetrical, on inner face of club descending on one side to basal third, on other side (where edge of club

virtually straight) only to apical third. Pronotum slightly longer than wide, not constricted at apex; sides either subparallel to near apex or evenly arcuate and widest at about middle; extreme apex finely punctate; disc either flat and smooth between irregular foveae at least as large as punctures of elytral striae (fig. 31), or tuberculate in longitudinal rows of more or less confluent tubercles alternating with deep furrows (figs. 29, 30); median vitta of variable width and length; lateral tubercles separate, conical or rounded, equal in size to an antennal segment or, more often, to about one-half length of antennal club. Elytra with odd intervals much wider than even intervals and with short, dark brown, velvety stripes alternating, along intervals, with whitish or yellow areas from which emerge acute tubercles covered with whitish hairs; tiny, dense, setose tubercles also on narrow even intervals; strial punctures large, round, uniform, wider than even intervals and about size of pronotal punctures. Abdomen and center of metasternum finely punctate; sides of metasternum coarsely punctate as on elytra. Tibiae not widened to apex. Tarsi with second segment one and one-half times longer than wide and distinctly longer than third segment; all segments ventrally with two lateral rows of short, thick hairs; hairs of first segment present on sides only, of second and third segments expanded to form spongy-hairy pads, especially at apexes of segments, leaving narrow, median glabrous line. Aedeagus at apex broadly rounded, with small semicircular median emargination of variable depth (figs. 42–44); in dorsal view, apical sclerotized border either of same size as, or longer than, front part of lateral border. Genitalia of female (fig. 32). Eighth tergum of female narrowed to subtriangular apex (fig. 39).

DISCUSSION: It is curious that there are five species of *Sipalinus* in tropical Africa and only two in the vast area of Eurasia and Australasia. Eight forms, however, have been described from this region. The oldest name for any of these forms is *gigas* Fabricius, but, as the type of *gigas* cannot be traced and probably is no longer in existence, *gigas* Fabricius is really indeterminate. Nevertheless, as I hope to prove below, these forms are all variants of the same species, and I use *gigas* Fabricius for this complex.

Sipalinus gigas Fabricius, 1775, was described from Japan, and Japan has been associated with this name by almost all subsequent authors (Fabricius, 1781; Gmelin, 1790; Olivier, 1790; Herbst, 1795; von Heyden, 1879; Winkler, 1932; Voss, 1958, and Morimoto, 1962), with the important exception of Csiki (1936) in the world catalogue. He did mention Japan in the range of *hypocrita* Boheman, 1845 (type locality, Himalaya), which he considered a separate species. Although some

authors, such as Kolbe (1886), Yokoyama (1930), Matsumura (1931), Yuasa, (1932), and Kono (1934), agreed with Csiki, my own examination of the type of *hypocrita* shows that this form is not distinct from specimens from Japan, and I therefore agree with Voss and Morimoto and synonymize *hypocrita* with *gigas.*

The second oldest name is *granulatus* Fabricius, 1801 (type locality, Sumatra). Csiki (1936), Schaufuss (1885), Kolbe (1886), and Voss (1958), treated *granulatus* as a synonym of *gigas,* but Roelofs (1875), and Pascoe (1885), considered *granulatus* a distinct species occurring in Japan, as well as in some of the other islands farther south. Thus Japan has been included in the range of three described forms (*gigas, hypocrita,* and *granulatus*), but in my opinion only a single and highly variable form is concerned. Other forms involved in this complex are *tinctus* Walker, 1859 (type locality, Ceylon), synonymized with *hypocrita* by Csiki (1936) and also by Marshall (1930); *chinensis* Fairmaire, 1887 (type locality, Tchékiang) and *formosanus* Kono, 1934 (type locality, Formosa), synonymized with *gigas* by Voss (1958). I agree that these forms are not valid, and I include among them also *misumenus* Boheman, 1845 (type locality, Philippines), and *cristatus* Schaufuss, 1885 (type locality, Celebes).

I have not seen the types of *chinensis* or *formosanus.* Fairmaire said that his *chinensis* resembled *granulatus* but that the pronotum was widened at the middle; in fact, the pronotum is wider also in the type of *hypocrita* and in the majority of the specimens from Asia. Voss (1958) in his discussion of the possible "subspecies" of *gigas* (*formosanus, chinensis, granulatus,* and *hypocrita*) relied for differentiation of these forms on one of the characters used by Kono, i.e., whether the "middle fork" in the basal third of the beak was strong or weak or absent, or whether it was replaced by four parallel rows of little pearly tubercles. In examining many specimens, I find this character varying with the condition of the specimen. Where the characteristic tomentose brown coating of the beak is present, it forms little tufts which resemble the "pearly" knobs, and this coating can entirely obliterate the impressions of the "fork." Where the coating at the base of the beak is denuded or abraded, the "pearls" disappear and the "fork" becomes visible.

Another difference used by Kono (1934), who did not mention the *gigas* of Fabricius, concerns the pronotum, which he thought in *formosanus* was broadest at the middle but in *hypocrita* was broadest in front of the middle. This is a fine distinction with these weevils not only because the large tubercles projecting from the sides of the pronotum are irregular in position and do not correspond symmetrically on both sides, but also because the pronotum is not flat, but curves down in

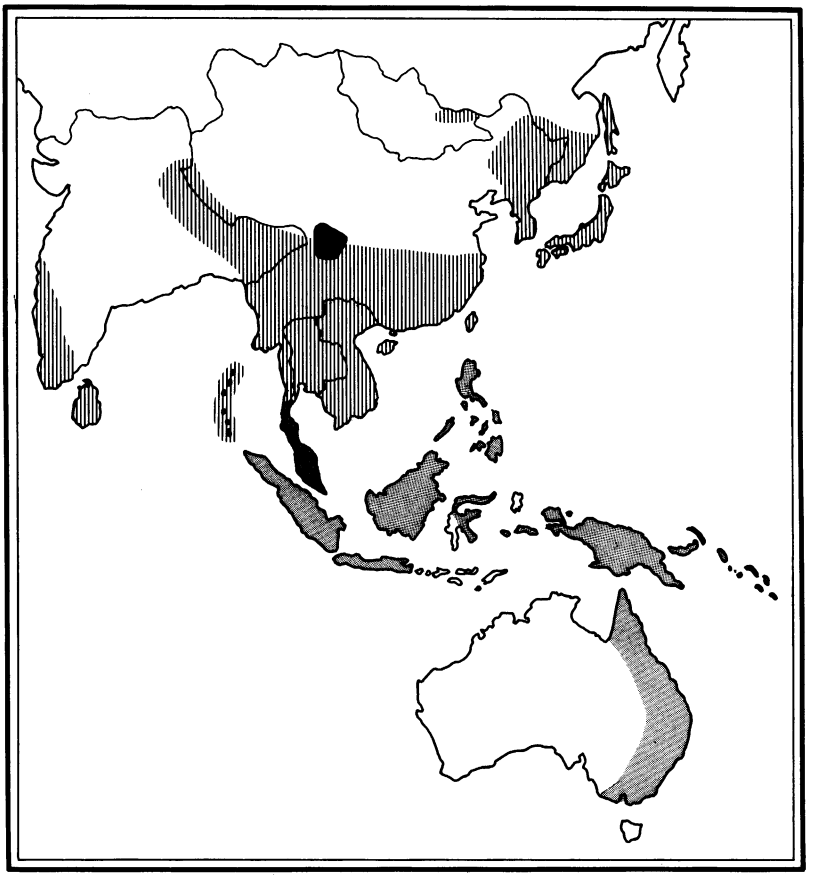
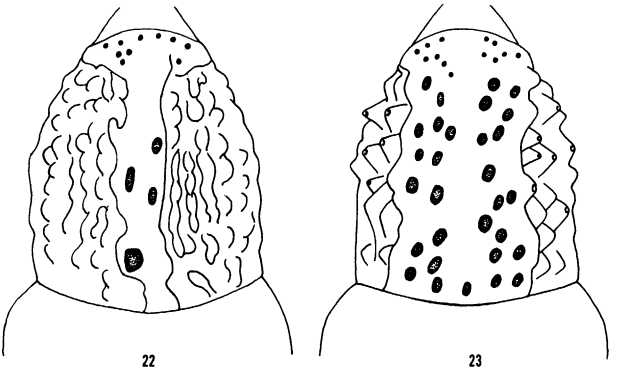


FIG. 21. Distribution of *Sipalinus yunnanensis* and of the subspecies of *S. gigas*. Black area = *S. yunnanensis*. Vertical lines = nominate *gigas;* gray dots = *gigas granulatus;* darker gray = area of intergradation.

front. Even with actual measurement on a grid it is difficult to determine the broadest part, except approximately. Specimens from Japan (Kono's *"hypocrita"*), as well as specimens from New Guinea, the Philippines, and elsewhere can have the pronotum broadest at, in front of, or even behind the middle. Thus the characters of the beak and the pronotum do not separate *chinensis* and *formosanus* from *hypocrita* or *tinctus,* the types of which I have seen, and I consider all four names as synonyms of *gigas*. The type specimens of *misumenus* and *cristatus* do not differ specifically from the type of *granulatus* which I recognize as a subspecies of *gigas*.

The species *gigas* can be divided into two subspecies (fig. 21). One, nominate *gigas* Fabricius, 1775 (type locality, Japan), characterized by having the pronotum (fig. 22) less elongate, with more arcuate sides, its black median vitta narrow, sometimes obsolete, flanked on each side by five or six or more irregular rows of merging tubercles, and the apical border of the aedeagus slightly longer, is more northern and continental in distribution, ranging from eastern Asia to Burma, the Himalayas, and India. The other subspecies, *granulatus* Fabricius, 1801



FIGS. 22, 23. Pronotum of *Sipalinus gigas.* 22. Nominate *gigas* (Japan). 23. *S. gigas granulatus* (Philippines).

(type locality, Sumatra), characterized by having the pronotum (fig. 23) with nearly straight sides, tuberculate on the sides only, the central third being a flat, smooth "shield" of large foveae, and the apical border of the aedeagus shorter, is found generally more to the south, and occurs on islands from the Philippines southwest to Sumatra and thence east to the Solomons, also eastern Australia from Queensland to Victoria. The two subspecies appear to meet in the Malay Peninsula where some specimens that I have examined are intermediate and might be relegated to either subspecies.

In the intermediate individuals the pronotum may show a mixture of characters or the pronotum may resemble one subspecies but the aedeagus the other. Thus, of eight specimens from Malacca, Singapore, Perak, Selangor, Batang Padang, and Salanga, four resemble *granulatus* both in the pronotum and the aedeagus, two resemble *granulatus* in the pronotum but nominate *gigas* in the aedeagus; in one the pronotum tends toward nominate *gigas,* but the aedeagus has the shorter sclerotized apex of *granulatus,* and one could be either subspecies. In Ranong, Siam, and

from unspecified locality from that country (probably also peninsular Siam), of six individuals, two by the pronotum are phenotypically nominate *gigas,* two are *granulatus,* and two are indeterminate. A few of the specimens from Tonkin in northern Indochina and from Fukien in southeastern China are also indeterminate, but the majority of individuals from these areas are referable to nominate *gigas.* A series of more than 100 specimens collected recently (1963, 1964) at four localities in Laos are referred also to nominate *gigas* because of the sculpture of the pronotum and the longer sclerotized apex of the aedeagus (five males dissected), but the shape of the pronotum is more elongate and parallel-sided than is normal for the nominate race. Thus geographic variation is not always clear cut and perhaps it may be an error to recognize subspecies. Abrasion and greasing of the surface (about one-half the specimens examined are blackened with grease), the great difference in the size of specimens (smaller specimens show the characters less distinctly), and individual variation all contribute to the difficulties of adequate determination. On the other hand, the difference between the subspecies in the borders of the aedeagus (figs. 42–44), although slight, is fairly constant. Of 31 dissected males from throughout the range of the species, 26 show a correlation between the aedeagus and the pronotum characteristic of each subspecies.

In addition to the characters that appear to vary geographically, there are some which vary only individually, such as the length of the pronotum relative to the length of the beak, its length relative to the width or the length of the elytra, the prominence or weakness of the postocular lobe, and the depth of the emargination of the apex of the aedeagus. As these weevils occur on or within trees and fallen logs they are no doubt readily dispersed over water in floating debris which may account for the variability in some populations.

Ecology: The plant families Pinaceae, Moringaceae, Fabaceae, Myrtaceae, and Moraceae have been noted in connection with *gigas,* but all the references are to nominate *gigas* only. The larvae in Japan, according to Kono (1934), live in various deciduous trees and if too numerous may destroy them. (Gardner (1934), who described many weevil larvae in India, mentioned larvae of *"hypocrita"* found in the wood of *Pinus khasya* in the Southern Shan States, and in *Moringa* sp. in the United Provinces at Dehra Dun. From Dehra Dun (specimens examined by me at the British Museum) he collected also two adults in September, 1933, "Ex *Dalbergia sissoo*" (Fabaceae). Additional records from India in the same museum are of two adults "under felled pine logs" and one adult "on underside of cut pine logs," at Shillong, Assam, June, 1918, collected

by Fletcher; also two males and a female from Jubliganj [spelling?], Haldwani, United Provinces, December, 1922, "under bark, *Holoptelea integrifolia,*" and a specimen "from bark of diseased rubber tree" at Agalwatte, Ceylon. I have seen other specimens collected by Atkinson in 1929 from trees of the family Fabaceae, "Ex *Milettia* sp." and "Ex *Milettia pendula*," at Byama, Burma, north of Rangoon; and a specimen "on *Heterophragma adenophyllum*" at Yanaungmyin Res[erve?]. At Pynchaung, North Toungoo, Burma, four adults were taken by Beeson in 1918 "under bark of jaman log," the Java plum (*Eugenia jambolana*), a large tree also called jambool or jambul (Myrtaceae). Two females were collected "in pine" by T. C. Maa in Fukien Province, China. Some adults have been taken at lights, and some under stones or bark.

Sipalinus gigas gigas (Fabricius)

Figures 15, 21, 22, 29, 30, 32, 39, 43, 44

Curculio gigas FABRICIUS, 1775, p. 127, Japan; type not found, not in Fabricius's collection in Copenhagen (Zimsen, 1964).

Sipalus hypocrita BOHEMAN, 1845, p. 209, Himalaya; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined.

Sipalus tinctus WALKER, 1859, p. 218, Ceylon; type, male, in British Museum (Natural History), examined.

Sipalus chinensis FAIRMAIRE, 1887, p. 130, Tchékiang [Chekiang Province], China; type not found.

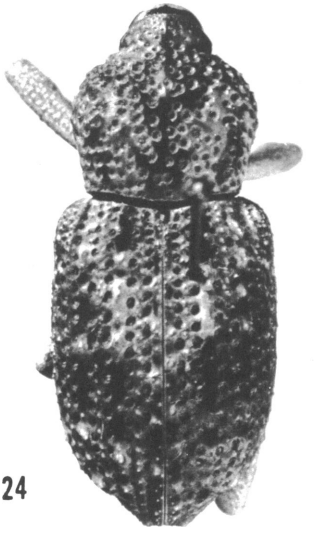
Sipalus formosanus KONO, 1934, Formosa; type, male, in Imperial Hokhaido University, Sapporo.

DIAGNOSIS: *Sipalinus g. gigas* differs from other subspecies in pronotum and aedeagus. Characteristic pronotum (fig. 22) more tuberculate on disc, with median vitta or stripe either absent or irregular in outline, black or in some specimens yellowish, much narrower than width of head; on each side of vitta, viewed dorsally, there are from four to seven longitudinal, irregular rows of mammillary tubercles, not only two or three; pronotum generally widest near middle, not so oblong, with sides converging to apex. Apical border of aedeagus longer (or thicker) than lateral border, not same size.

RANGE: Eastern and southern Asia from Manchuria, China, and Japan to India and Ceylon, including the Andamans and Nicobars (fig. 21). Specimens examined, approximately 450.

REMARKS: The synonymy, ecology, and geographic variation are discussed above under the species.

There is a good life-size illustration in color of nominate *gigas* in Heyne and Taschenberg (1908, pl. 32, fig. 10) under the name *Sipalus hypocrita.* The only other illustrations of which I know are by Herbst (1795, pl. 61, fig. 1), as *Rhynchophorus gigas* from Japan, and Olivier



FIGS. 24, 25. *Sipalinus* from Africa. 24. *S. guineensis.* 25. *S. aurivilli.*

(1808, pl. 12, fig. 146); these two are the same illustration, but the weevil is shown vertically in Olivier and horizontally and also reversed in position in Herbst. Although the shape and size and mottled elytral markings are correct for *gigas,* the color is shown as green, with black and white on the elytra, and some red on the pronotum.

Sipalinus gigas granulatus (Fabricius)

Figures 3, 4, 16, 21, 23, 31, 32, 39, 42

Calandra granulata FABRICIUS, 1801, p. 432, Sumatra; type in Universitetets Zoologiske Museum, Copenhagen, examined.

Sipalus misumenus BOHEMAN, 1845, p. 210, Philippines; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined. New synonymy.

Sipalus cristatus SCHAUFUSS, 1885, p. 204, Celebes; type, male, from Moccassar, Celebes, in Zoologisches Museum, Berlin, examined. New synonymy.

DIAGNOSIS: Subspecies *granulatus* differs from nominate *gigas* in pronotum and aedeagus. Characteristic pronotum (fig. 23) on disc smooth and pitted, rather than tuberculate, with median vitta merging with adjacent area to form a broad, yellow shield in about median third of pronotum, shield as wide as head, smooth between large foveae; on each side of yellow shield, viewed dorsally, there are only two or three, not four to seven, irregular rows of mammillary or acute tubercles; pronotum

generally oblong, with sides nearly parallel. Apical border of aedeagus same size as lateral border, not longer.

RANGE: Australasia from the Philippines and Greater Sundas to New Guinea, the Solomon Islands, and eastern Australia. (fig. 21). Specimens examined, approximately 400.

REMARKS: Although there is no type specimen of *gigas*, there is fortunately one of *granulatus* which is the type of the genus. According to Zimsen (1964), there are two specimens of *granulatus* in the Fabrician collection in Copenhagen, but I saw only one. The pronotum has the characteristic flat, smooth, yellow shield, but the lateral tubercles are not so acute as they are, for example, in the type of *misumenus;* they are more nodulous, as in the type of *cristatus.*

The habits of *granulatus* are presumably the same as those of nominate *gigas,* but I have no information on them. For further discussion, see the species above.

Sipalinus yunnanensis, new species

Figures 5, 6, 14, 17, 29, 33, 39, 45

TYPE MATERIAL: Type, female, "Tibet Prov. China" [=Likiang, Yunnan, *ca* latitude 28° N, longitude 98° 30′ E], collected by Father A. Genestier, 1919, and 13 male and 19 female paratypes with same data, type and 27 paratypes in the American Museum of Natural History, six female paratypes to be deposited in the British Museum (Natural History); Naturhistoriska Riksmuseum; Zoologisches Museum, Berlin; Zoologische Staatssammlung, Munich; Field Museum of Natural History, Chicago; and California Academy of Sciences, San Francisco; also a male and female paratype from Yunnan, 1913, L. M. Comby, collector, and two males, Tsekoo [=Tzeku], Yunnan, 1907, J. A. Soulié, collector, in Muséum National d'Histoire Naturelle, Paris.

DIAGNOSIS: This species is almost identical in dorsal aspect to nominate *gigas* and occurs within its range, but differs from *gigas* by having beak of female entirely densely punctate, not virtually impunctate in apical half, beak of both sexes in profile view more cylindrical (fig. 17), not narrowed or compressed toward apex, and styli of genitalia (fig. 33) of female proportionally much smaller. It differs from five species from Africa chiefly by lacking apical constriction of pronotum.

RANGE: Yunnan Province (probably northern part only), southwestern China (fig. 21).

DESCRIPTION OF TYPE, FEMALE: Length, 26 mm. Beak gently, evenly arcuate, very slightly longer than pronotum; viewed in profile from antennal scrobe to apex virtually cylindrical and of same width, not

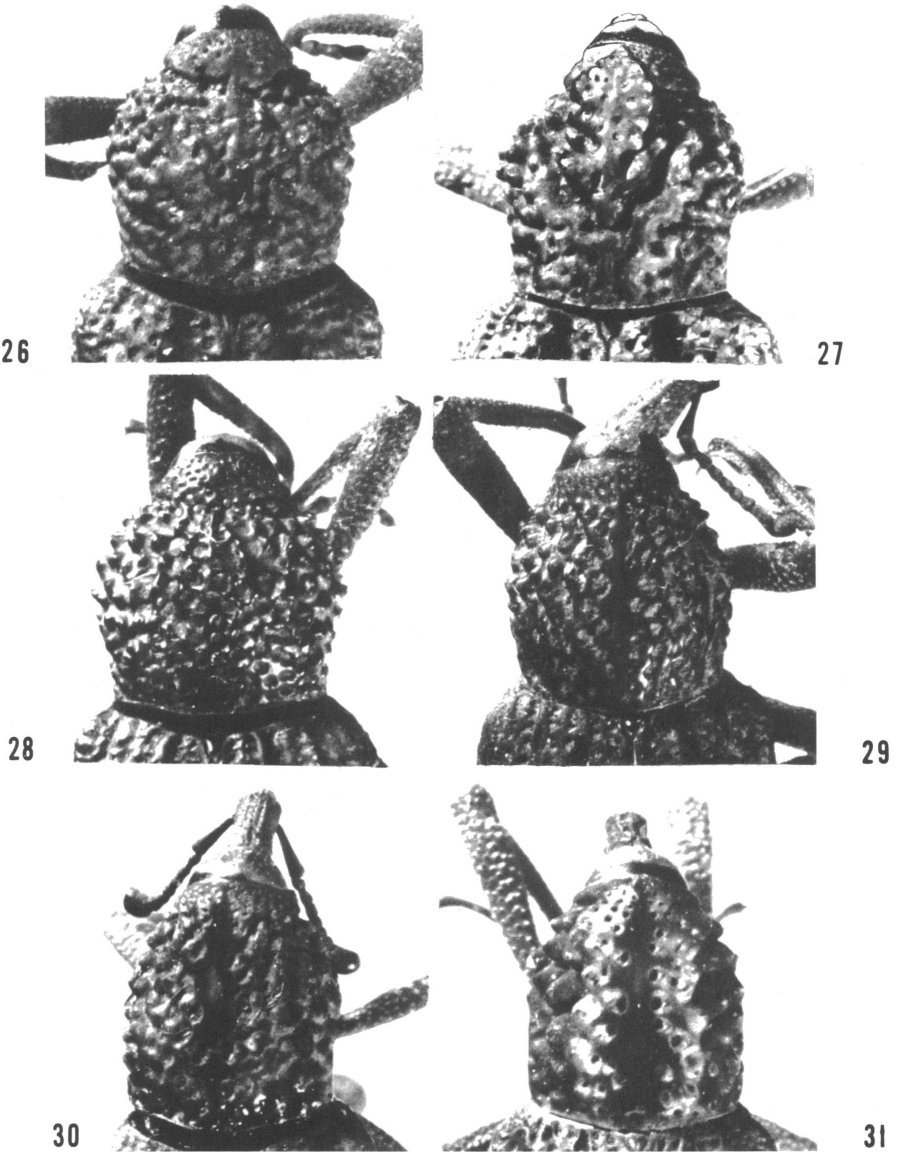
narrower at apex; basal impressions feeble; beak punctate throughout, with dorsal punctures elongate, dense, some confluent, but apical punctures round, fine, dense; scrobe with lower edge not expanded; apex ventrally with elongate depression between sharp carinae. Antennal club elongate, vaguely diamond shaped; apical spongy part asymmetrical, on inner face (fig. 5) descending on one side to about middle of club, on other side to only apical third. Pronotum slightly longer than wide, not constricted at apex; sides arcuate, widest at about middle; extreme apex finely punctate; discal surface uniformly tuberculate except for narrow, flat, irregular, impunctate median vitta; tubercles elongate or confluent, arranged in longitudinal rows, near base on each side of vitta about five rows of tubercles; lateral tubercles separate, conical, some very sharp, about size of antennal segment or slightly larger. Elytra, abdomen, metasternum, tibiae, and tarsi as described for *gigas.* Genitalia (fig. 33). Eighth tergum as described for *gigas.*

VARIATION FROM TYPE: The paratypes range in length from 16 to 32 mm. The majority are blackened with grease, and even those specimens that I soaked in carbon tetrachloride are grayish rather than brown or buffy. In some the beak is narrowly carinate at the middle, and the basal impressions and carinae are more marked than those of the type; in others the sculpture of the base of the beak is obscured by grease or heavy coating. In some paratypes on each side of the pronotal vitta there are as many as seven longitudinal rows of tubercles. The vitta itself in some individuals is almost twice as wide as that in others, and it is rather short or indistinct in several specimens. In some paratypes the pronotum is slightly more elongate and has less arcuate sides. Viewed dorsally, the apical "collar" of the pronotum seems stronger when the lateroanterior tubercles are sharper or larger and therefore more contrasting.

The males differ from the females by having the lower edge of the antennal scrobe expanded angularly on each side, the angles, unless abraded, readily visible from above, and by lacking the carinae and distinct elongate depression under the apex of the beak. Some males, however, have a faint, very short depression. The eighth tergum of males is broadly rounded and furnished with an apical fringe of hairs. The aedeagus is as described for *gigas,* with the apical border long as in nominate *gigas.*

ECOLOGY: No information.

REMARKS: The two localities of the type series are not far apart. The original label "Tibet Prov. China" is an error. The actual area (Likiang) was found through a field card number (F4722), an accession number



FIGS. 26–31. Pronotum of *Sipalinus*. 26. *S. burmeisteri*. 27. *S. squalidus*. 28. *S. aloysiisabaudiae*. 29. *S. yunnanensis;* characteristic also of nominate *gigas*. 30. Nominate *gigas* phenotype resembling *gigas granulatus*. 31. *S. gigas granulatus*.

(24141), and a letter, dated July 28, 1919, from the collector, Father Genestier, who gave the approximate latitude and longitude as about 28° N, 98° 30′ E. He wrote in his letter that the Coleoptera and Lepidoptera which he had sent to the American Museum of Natural History were collected in two places, on the Salween River "which runs across this country and has an altitude of 1700 meters, and also on the mountain which separates us from Thibet proper and which attains the height of from 4–5000 meters." The other locality, Tzeku, is at latitude 28° 02′ N, longitude 98° 51 E.

There is another name, *chinensis* Fairmaire (type locality, Chekiang) that possibly could be applied to the specimens from Yunnan. The type of *chinensis,* however, has not yet been found and Fairmaire's description does not include the sex, or the punctation of the beak, thus we cannot ascribe his name to *yunnanensis.* Fairmaire said (1887) that his species resembled *"granulatus,"* but had the thorax widened at the middle. I also have not seen the type of *formosanus* Kono, but Kono's statement that the beak of the female in front of the antennal scrobe is almost smooth ("glatt") shows that *formosanus* is not the same as *yunnanensis.*

The difference between *yunnanensis* and *gigas* in the punctation of the beak of the female is more marked than that between *yunnanensis* and the five species from Africa. In *gigas* the apical part of the beak of females is shining and virtually impunctate, whereas in females from Africa it is either opaque and feebly punctate or (*aloysiisabaudiae*) almost as densely and coarsely punctate as that of *yunnanensis.*

Although the male genitalia of *yunnanensis* and *gigas* are similar, the female genitalia differ. In five females of *yunnanensis* the styli are proportionally smaller than those of *gigas* and also much smaller than the apexes of the coxites; there are also fewer hairs at the apexes. In 12 females of *gigas* (China, Japan, Korea, the Philippines, and New Guinea), the styli are larger and longer, projecting as far forward as the apices of the coxites, even beyond the apices in some individuals (figs. 32, 33).

The mandibles on the type specimen are open (fig. 14) and show a small basal lobe on the inner edge.

Four males and five females, including the type, were dissected.

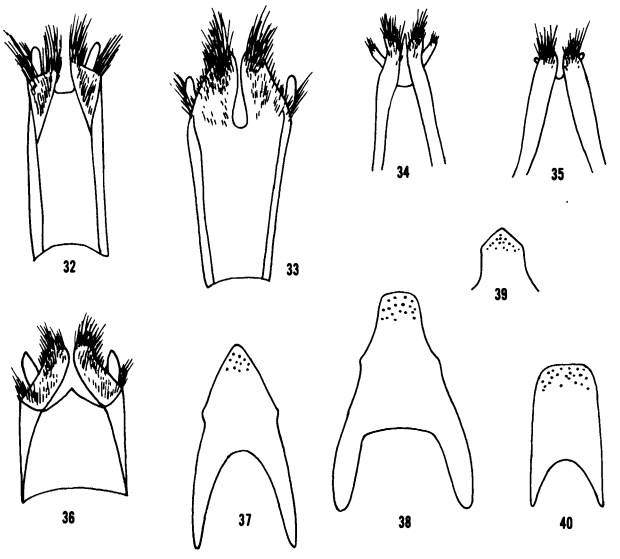
GROUP II

African Species

Sipalinus guineensis (Fabricius)

Figures 7, 24, 34, 38, 41, 47

Curculio guineensis Fabricius, 1798, p. 165, Guinea; two cotypes in Universitetets Zoologiske Museum, Copenhagen, examined.



FIGS. 32–36. Coxites and styli of female genitalia of *Sipalinus*. 32. *S. gigas*. 33. *S. yunnanensis*. 34. *S. guineensis;* characteristic also of *S. burmeisteri* and *squalidus*. 35. *S. aloysiisabaudiae*. 36. *S. aurivilli*.

FIGS. 37–40. Eighth tergum of females of *Sipalinus*. 37. *S. aloysiisabaudiae*. 38. *S. guineensis;* characteristic also of *S. burmeisteri* and *squalidus*. 39. *S. gigas,* apex only; characteristic also of *S. yunnanensis*. 40. *S. aurivilli;* characteristic also of male.

Sipalus mendicus BOHEMAN, 1838, p. 804, Sierra Leone; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined. New synonymy.

Sipalus madecassus FAIRMAIRE, 1903, p. 245, Madagascar; type, female, Diego Suarez, Madagascar, in Muséum National d'Histoire Naturelle, Paris, examined. New synonymy.

DIAGNOSIS: Elytra almost identical to those of *aloysiisabaudiae, burmeisteri,* and *squalidus,* also from Africa, but pronotum differs by being smooth, not rough, with disc punctate-foveate rather than tuberculate (fig. 24). Differing further from first-named species by having beak arcuate, not straight, from *burmeisteri* by having second tarsal segment longer, and from *squalidus* in lacking large hump on front of pronotum.

RANGE: Western Africa from Senegal to the Congo, and from northeastern Congo and Kilimanjaro south to Nyasaland; also Madagascar (fig. 41). Specimens examined, 564.

DESCRIPTION: Length, 13 to 28 mm. Beak distinctly, but in some specimens only slightly, arcuate; viewed laterally from scrobe to apex slightly narrowed and compressed; male, from base to near apex deeply, densely,

often confluently, punctate and near apex more finely and sparsely; scrobe with lower edge on each side expanded angularly; angles visible from above (fig. 9); female from scrobe to apex finely, shallowly, densely punctate, in some specimens with dorsal impunctate line; scrobe with lower edge not expanded; apex ventrally with elongate impression within sharp carinae (fig. 10). Antennal club elongate, vaguely oblong oval; apical spongy part asymmetrical, on one side extending obliquely to near base (fig. 7) where sclerotized or horny part equal in length to, or shorter than, terminal funicular segment. Pronotum appearing quadrate behind strong apical constriction or collar; sides strongly arcuate in front of middle, thence oblique or slightly sinuate to base; surface smooth, without elevations, coarsely, even confluently punctate-foveate, some specimens at middle with irregular, narrow, impunctate line. Elytra with odd intervals three and five, in some specimens also seven and nine much wider than even intervals and furnished with short, dark brown, velvety stripes alternating longitudinally with whitish or yellow areas from which emerge acute tubercles covered with whitish hairs; tiny, dense tubercles present also on narrow even intervals; strial punctures large, round, uniform, wider than even intervals and about size of pronotal punctures; disc from base to apical declivity with about 20 punctures. Abdomen with first segment with same large punctures as those on sides of metasternum, contrasting with finer punctures of remainder of abdomen. Tibiae not widened at apex. Tarsi with second segment one and one-half times longer than wide and distinctly longer than third segment; all segments ventrally with two rows of short, thick hairs laterally. Aedeagus (fig. 47) with apex broadly rounded, at middle just perceptibly sinuate or minutely, semi-circularly emarginate; apical sclerotized border flat or concave and about three times longer than width of lateral borders. Genitalia of female (fig. 34); eighth tergum narrowed to truncate apex (fig. 38).

ECOLOGY: A specimen in the British Museum from Ashanti, Gold Coast, was collected in October, 1936, under the bark of a newly fallen tree, the name of which is illegible on the handwritten label of the specimen. In spite of the abundance of this species (about 500 specimens examined), there is virtually no information on its habits, perhaps because it does not damage living trees.

REMARKS: The pronotum, as is true for others of the genus, varies considerably in shape, the sides being extremely bulbous in some individuals and only moderately so in others. The sides in front are actually minutely tuberculate as well as punctate, but the disc is smooth and even. There is some individual variability in the extent and distinctness

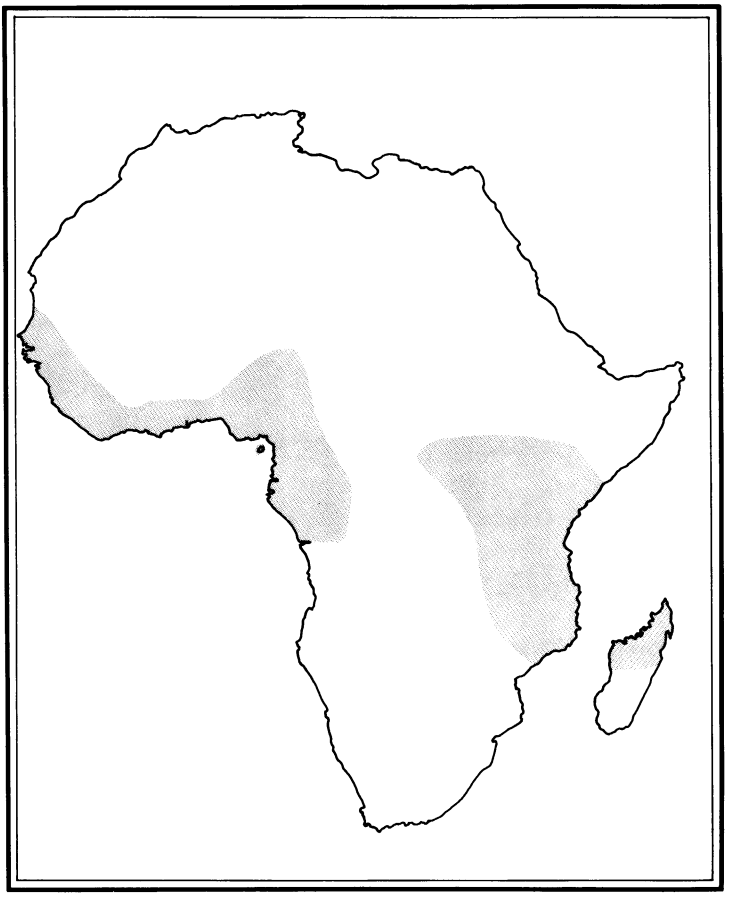


FIG. 41. Distribution of *Sipalinus guineensis.*

of a median line on the pronotum and in the amount of whiter or paler areas on both the pronotum and elytra. Fresh, well-marked specimens are not so common as are dark brown or black ones that are darkened by greasing; abrasion wears down the white tubercles of the elytra.

The types of *mendicus* Boheman (Sierra Leone) in which the elytra are greased, and of *madecassus* Fairmaire (Madagascar) appear to be the same species as *guineensis.* Fairmaire believed the genus was not known from eastern Africa. His type is a beautiful specimen with clear light markings on the elytra and the punctures of the pronotum very deep, as if cleared by caustic; the sides of the pronotum are less bulbous than those of the

majority of specimens examined. Hustache (1939, p. 48), however, found *madecassus* (he wrote *"madegassus"*) distinct from *guineensis* and *"mendicus,"* but somewhat intermediate.

Ten males and four females were dissected.

Sipalinus burmeisteri (Boheman)

Figures 7, 12, 16, 26, 34, 38, 46

Sipalus Burmeisteri BOHEMAN, 1838, p. 802 "Nova Guinea"; but type, male, labeled "Guin." for Guinea, Africa, in Naturhistoriska Riksmuseum, Stockholm, examined.

DIAGNOSIS: Dorsally this species readily mistaken for *guineensis* or *aloysiisabaudiae,* but pronotum tuberculate and rough, not smoothly foveate as that of *guineensis,* yet not acutely tuberculate-reticulate as that of *aloysiisabaudiae.* It differs from both species by having short, scarcely elongate second tarsal segments (fig. 12).

RANGE: Chiefly eastern Africa in Tanganyika and Mozambique, but also north (one specimen) in southern Sudan, and west in Cameroon and "Guinea." Specimens examined, 21.

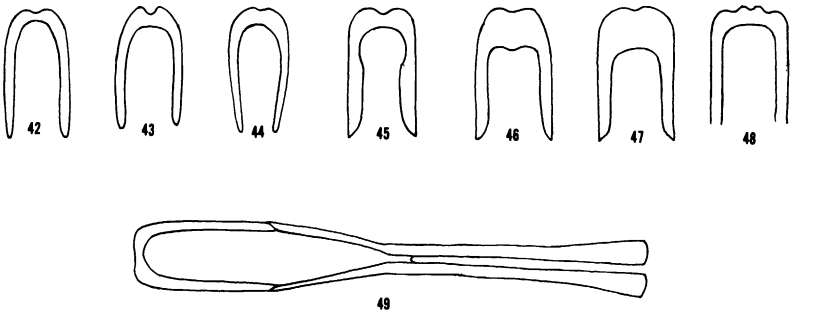
DESCRIPTION: Length, 12 to 26 mm. Beak and antennal club as described for *guineensis,* but club usually less oblong, and apical spongy part not extending so close to base where sclerotized part equal in length to, or shorter than, terminal segment of funicle. Pronotum appearing quadrate behind strong apical constriction; sides strongly arcuate in front of middle, thence oblique to base, with uneven, tuberculate surface and quite pronounced tubercles on sides of front; apical impression deep, in most specimens present dorsally as well as laterally; median elevated line extending from apical constriction toward base, often widened at center. Elytra, abdomen, and tibiae as described for *guineensis,* but discal strial punctures of elytra appearing somewhat larger and fewer. Tarsi with second segment scarcely longer than wide and scarcely, if at all, longer than third; ventrally as described for *guineensis.* Aedeagus as described for *guineensis,* but varying slightly (fig. 46). Genitalia and eighth tergum of female as described for *guineensis.*

ECOLOGY: No information, except that a specimen was collected at light.

REMARKS: The pronotum of one or two of the 21 specimens examined is almost as smooth as that of *guineensis,* but the difference in the tarsal segments appears to be constant. Other differences between the two species are: the antennal club of *burmeisteri* is less elongate and shows a lesser amount of spongy area; the beak appears somewhat heavier; the crease of the apical constriction of the pronotum is usually dorsal as well as lateral; and the second segment of the antennal funicle in

most specimens is not longer than the third. *Sipalinus burmeisteri* is probably more abundant than shown by the 21 specimens examined by me, but I failed to recognize it as a separate species until late in my study.

Boheman made an error in giving New Guinea as the type locality of *burmeisteri,* as the label on the type specimen reads only "*S. guineensis* var.♂Guin: Wester[mann]." In this case, it seems evident that "Guin" refers to Guinea in western Africa, not to the island, because in *burmeisteri* the pronotum, as Boheman himself said, is deeply constricted toward the



FIGS. 42–48. Apex of aedeagus of *Sipalinus.* 42. *S. g. granulatus.* 43. Nominate *gigas.* 44. Nominate *gigas* with less emargination at apex. 45. *S. yunnanensis.* 46. *S. squalidus;* characteristic also of *S. aloysiisabaudiae* and *burmeisteri.* 47. *S. guineensis.* 48. *S. aurivilli.*

FIG. 49. Aedeagus with its apodemes.

apex, which is not true of species found in New Guinea and the Oriental region. In Boheman's time it was probably not known that the species of Africa formed a distinct group. Not knowing this and not having seen the type, a number of authors have followed Boheman and assigned specimens from Australasia to *burmeisteri.*

Five males and two females were dissected.

Sipalinus squalidus (Kolbe)

Figures 3, 18, 27, 34, 38, 46, 50, 53

Sipalus squalidus KOLBE, 1883, p. 35. "Westafrika"; lectotype, Guinea, here designated from three original specimens in Zoologisches Museum, Berlin, examined. The lectotype and paralectotypes were so labeled by Haaf in 1963, but he did not publish on them (personal commun., 1966).

DIAGNOSIS: *Sipalinus squalidus* differs from all species by having an elevated, disclike platform or gibbosity on front of pronotum, and more bulbous sides of pronotum. Otherwise very similar to *guineensis,* also from Africa, but with pronotum tuberculate, not nearly smooth, and appear-

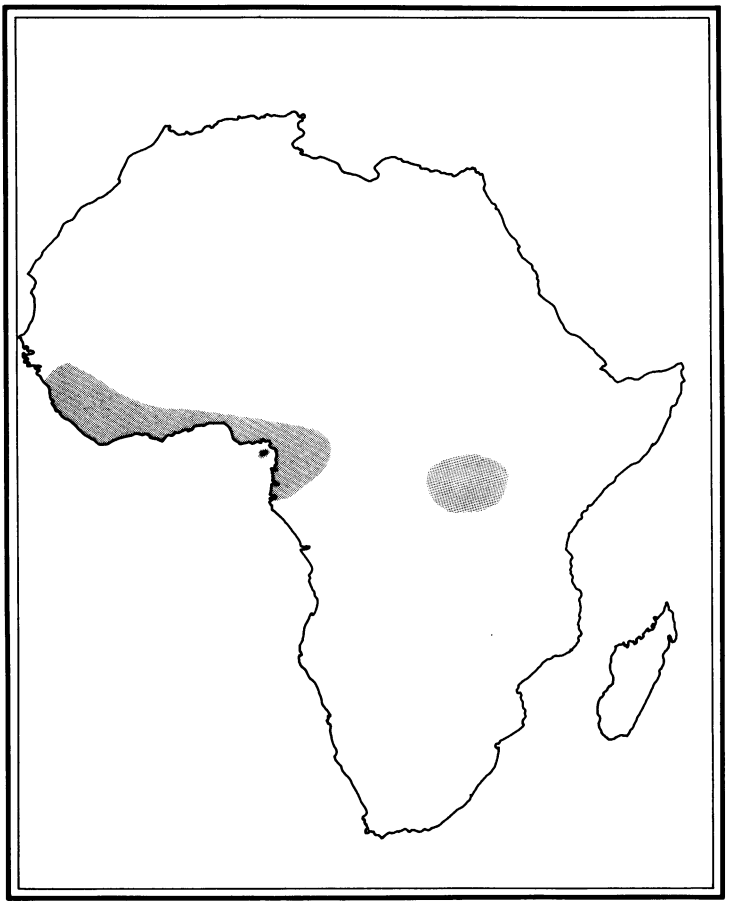


FIG. 50. Distribution of *Sipalinus squalidus*.

ing more elongate, less quadrate, and elytra having fewer, more irregularly shaped, not so round, strial punctures.

RANGE: Western Africa from Guinea to the Cameroons; also northeastern Congo and Uganda (fig. 50). Specimens examined, 140.

DESCRIPTION: Length, 12 to 25 mm. Beak and antennal club as described for *guineensis* but differing in having beak more curved, and that of female, viewed dorsally, rather swollen over scrobes; also spongy part of club extending farther from base (fig. 3). Pronotum slightly longer than wide, in front strongly constricted; sides behind constriction strongly arcuate, bulbous, and tuberculate, thence oblique

or sinuate to base; surface very uneven with large, separate or confluent tubercles separated on disc by deep, irregular troughs; apical collar hidden by elongate, irregular, punctate, usually yellowish gibbosity or elevation. Elytra as described for *guineensis,* but tubercles, as a rule, larger and sharper, strial punctures fewer (nine to 13 from base to apical declivity), deeper, more elongate, less round. Abdomen, tibiae, and tarsi as described for *guineensis,* but tarsi appearing less elongate. Aedeagus as in figure 46. Genitalia and eighth tergum of female as described for *guineensis.*

ECOLOGY: No information.

REMARKS: *Sipalinus squalidus* is more abundant in collections from western than from eastern Africa; I have seen almost 90 specimens from the Gold Coast and the Cameroons, but only 34 from the Congo and Uganda.

In typical specimens, the apical hump of the pronotum (figs. 18, 27) and the tuberculate bulging of the sides of the pronotum are strong and distinct. Smaller individuals of 12 mm. can have less conspicuous hump and less arcuate sides. The pronotum, when clean, is light brown, the apical gibbous part even paler in color. Some of the tubercles or parts of the disc may be abraded to black. A raised line on the disc either extends back from the front hump to the base of the pronotum as a sinuous line, or it may be broken up into flat tubercles. There are usually six to 10 punctures on the gibbosity, which varies individually in size and convexity.

In *aloysiisabaudiae,* which also has sinuous sides to the pronotum, the disc is more reticulate than tuberculate. *Sipalinus squalidus* differs further from that species by having the beak strongly arcuate, not straight, the eighth tergum of the female of different shape, and the sclerotized part of the antennal club larger.

Two males and two females were dissected.

Sipalinus aloysiisabaudiae (Camerano)

Figures 8, 19, 28, 35, 37, 46, 51

Sipalus Aloysii-Sabaudiae CAMERANO, 1907, p. 6, Toro [region in western Uganda, south of Mt. Ruwenzori]; no type designated and location of type series not known.

DIAGNOSIS: This species differs from the four other species of Africa by having sides of pronotum more sharply tuberculate and disc tuberculate-reticulate (fig. 28), beak virtually straight (fig. 19), eighth tergum of female pointed, not truncate, and antennal club on one side spongy almost to base of club, thus sclerotized part on this side only half the length of terminal funicular segment.

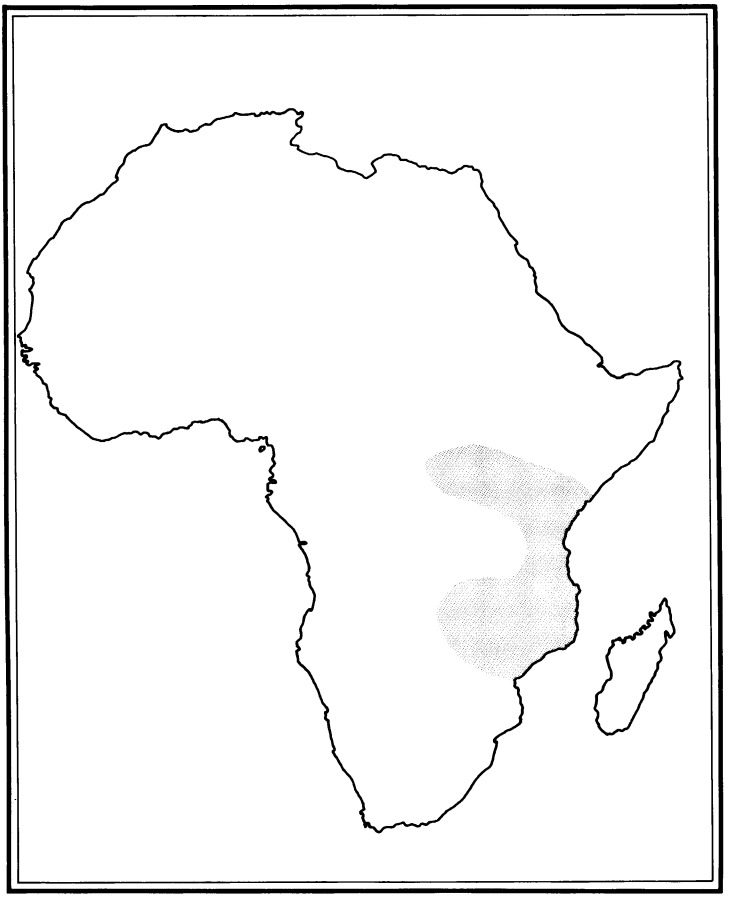


FIG. 51. Distribution of *Sipalinus aloysiisabaudiae.*

RANGE: Eastern Africa (fig. 51) from northeastern Congo south to Rhodesia and Mozambique. Specimens examined, 105.

DESCRIPTION: Length, 10 to 24 mm. Beak virtually straight, punctate strongly, densely, even confluently; viewed laterally, narrowed and flattened slightly from scrobe to apex; male with scrobe on lower edge feebly expanded angularly, but angle not or scarcely visible from above; female dorsally with impunctate median area of varying length; area over scrobes feebly swollen; ventral apex bicarinate and depressed. Antennal club as described for *guineensis,* but spongy part on one side extending virtually to base of club (fig. 8). Pronotum as described for

guineensis, but distinctly tuberculate; tubercles in many specimens sharp and spiniform laterally in front, rather confluent and reticulate on disc; a shining, narrow, irregular median carina present in many individuals. Elytra as described for *guineensis,* but discal strial punctures in some specimens less numerous. Abdomen, tibiae, and tarsi as described for *guineensis.* Aedeagus (fig. 46) nearly truncate but with slight median sinuosity; apical sclerotized border at least twice longer than width of lateral borders. Genitalia and eighth tergum of female as in figures 35 and 37.

ECOLOGY: The only notation on habits is from a specimen from Kanga or Kange, Tanganyika, taken in September, 1930, by R. Sweeney, "in rotting wood of baobab tree, *Adansonia digitata.*"

REMARKS: The type series was collected on an Italian expedition to Mt. Ruwenzori. The region of Toro, according to Chapin (1954), is at latitude 0.12° S to 1° 13′ N and longitude 29° 43′ E to 31° 15′ E. Camerano's description of *aloysiisabaudiae* is short, but he mentioned the characters of the beak and pronotum given above in the diagnosis; he did not mention the antennal club. This is the only species from Africa that is not recorded from western Africa; it is the only species with a straight beak.

The lateral-anterior tubercles of the pronotum are sharper than those of the other species and on large specimens can readily be seen with the naked eye. Some individuals with worn tubercles resemble dorsally *burmeisteri,* but are differentiated from that species by the beak, the club, and the longer second tarsal segments. The scrobal angles of the male appear to be less acutely angulate than those of the foregoing species, and are generally not visible from above. As the beak of the female is nearly as densely punctate as that of the male, the only character remaining for distinguishing the sexes is the ventral apex of the beak, which is smooth in the male, bicarinate in the female.

Four males and five females were dissected.

GROUP III

AFRICAN SPECIES

Sipalinus aurivilli (Duvivier)

Figures 2, 12, 20, 25, 36, 40, 48, 52

Sipalus Aurivilli DUVIVIER, 1892a, p. 166, Djabir Bandja [Uellé], Congo; type in Institut Royal des Sciences Naturelles, Brussels.

DIAGNOSIS: *Sipalinus aurivilli* differs from other species as follows: sexes not externally distinguishable; eighth tergum and genitalia of females differing; antennal club short, not elongate, with spongy apex sym-

metrical, not longer on one side; hind tibiae incurved and widened toward apex; pronotum smooth, not tuberculate, with shallow, not deep punctures; strial punctures of elytra minute, not as wide as intervals; tarsal soles more hairy than those of other species from Africa.

RANGE: Africa in the west (fig. 52) from Togo to Cameroon and from Angola to the east coast; also northeastern Congo. Specimens examined, 129.

DESCRIPTION: Length, 10 to 21 mm. Beak at base slightly arcuate, nearly straight apically; viewed laterally, from scrobe to apex strongly narrowed and flattened, with side margins sharply delimited; scrobe with lower edge scarcely expanded, and not visible from above; beak punctate throughout, but more finely toward apex; ventrally near apex not impressed or carinate. Antennal club almost as wide as long, spongy apex about one-fifth length of club, visible as narrow line (fig. 2); second segment of funicle glabrous at base. Pronotum slightly longer than wide; sides in front strongly constricted, thence evenly arcuate to base; surface convex, smooth, finely sparsely punctate, punctures tending to be larger laterally. Elytra with odd intervals (3, 5, 7) only slightly wider than even intervals and furnished with three or four widely separated punctures surrounded by buffy or whitish, hairy, slightly elevated irregular patches as wide as interval; even intervals with punctures dense, tiny; strial punctures also dense, tiny, on disc from base to apical declivity 20 or more punctures. Abdomen as described for *guineensis.* Middle and hind tibiae incurved and widened to apex (fig. 12); front and middle tibiae with outer apex feebly lobed. First tarsal segment ventrally with row of hairs on sides only; second and third segments with spongy-hairy pads covering all but extreme base of segments; second tarsal segment only slightly longer than wide and about equal in length to third. Aedeagus (fig. 48) with median apical projection slightly sinuate at middle; apical sclerotized border convex and scarcely longer than width of lateral borders. Genitalia and eighth tergum of female as in figures 36 and 40.

ECOLOGY: No information.

REMARKS: *Sipalinus aurivilli* is in a separate group because of the many differences given above in the diagnosis, and it might even be considered in a separate genus. In spite of the differences, however, it agrees with the other species of *Sipalinus* in the generic characters of the mandibles, the beak, the abdominal suture, the mottled elytra, and the absence of a coil (or flagellum) in the aedeagus. But in these characters there are slight modifications in *aurivilli;* thus the elytra lack the brown velvety patches, but have buffy patches; the beak of the female lacks the ventral apical depression and carinae present in other females; and the apex of

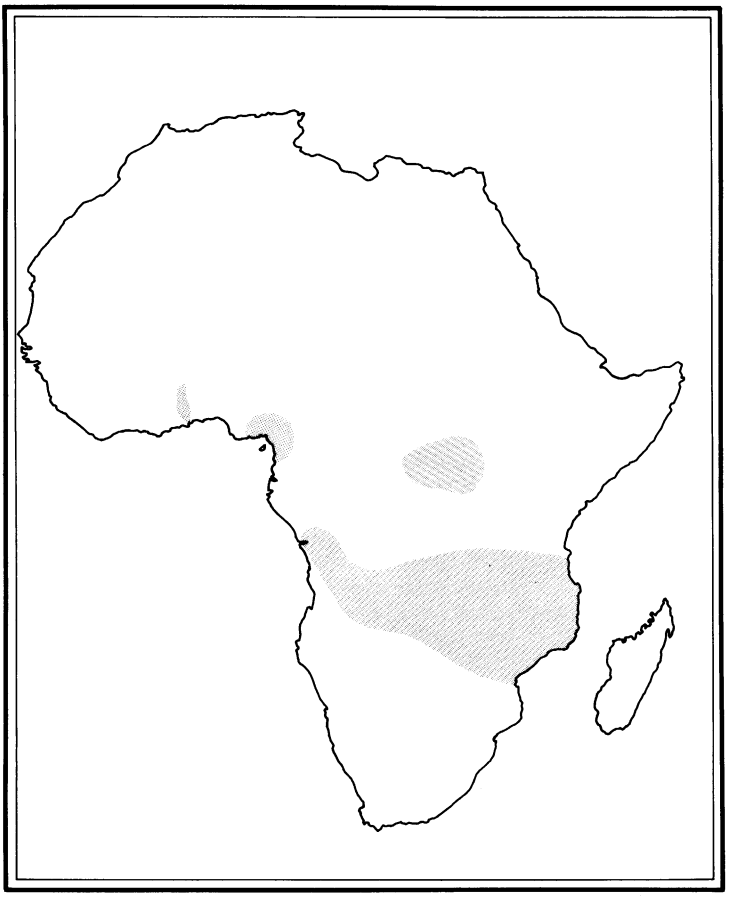


FIG. 52. Distribution of *Sipalinus aurivilli.*

the aedeagus projects forward instead of being emarginate. In the generic characters, it differs, of course, from the species of *Mesocordylus* and *Orthognathus,* which are New World genera of the same tribe, but it resembles them in the oblong shape, with the pronotum about as wide as the elytra, and in the symmetrical spongy part of the antennal club. Further, *aurivilli* agrees with some species, at least, of these genera by having a smooth, not tuberculate nor encrusted pronotum, the club nearly as wide as long, not elongate as in other *Sipalinus,* the tibiae widened toward the apex, not linear throughout, and the base of the second segment of the antennal funicle glabrous, not coated and en-

FIG. 53. *Sipalinus squalidus.*

crusted. Finally, *aurivilli* differs from all the species by having the eighth tergum of the female the same shape and nearly the same size as that of the male, whereas in other species that of the female is more or less bluntly triangular and is narrowed toward the apex (figs. 37–40). One of the dissected females from Rungu shows an interesting aberration in that the apex of one of the coxites is abnormally widened and possesses an additional stylus.

The type locality, "Djabir Bandja (Uellé)" is given by Chapin (1954) as Bondo (Djabir) on the lower Uellé River. Duvivier said (1892b, p. 258) it is on the plain above the river at an altitude of about 350 meters, and that the plain is covered with plantations as far as the forest on the banks of the Itimbiri River. Duvivier's brother spent a year or so in this region and collected about 350 species of Coleoptera, of which more than 60 were considered new.

Six males and eight females were dissected.

SPECIMENS EXAMINED

For convenience, the species are listed alphabetically. The name of the collector (in parentheses) if known, is followed by the letters indicating the institution or individual to which the specimens belong. These letter symbols are as follows:

A.M.N.H., the American Museum of Natural History

B.M., British Museum (Natural History)
B.V., Barry Valentine, Columbus, Ohio, private collection
C.A.S., California Academy of Sciences, San Francisco
C.N.C., Canadian National Collection, Ottawa
D.G.K., David G. Kissinger, South Lancaster, Massachusetts, private collection
F.M., Field Museum of Natural History, Chicago
M.N.H.N., Muséum National d'Histoire Naturelle, Paris
U.Z.M., Universitetets Zoologiske Museum, Copenhagen
Z.I.A.N., Zoologichesky Institut, Academia Nauk, Leningrad
Z.M.B., Zoologisches Museum, Berlin
Z.S.M., Zoologische Staatssammlung, Munich

Sipalinus aloysiisabaudiae (Camerano)

Congo: Kalimbo, Uele, 2 (M.N.H.N.); Lualaba River, 3 (Z.M.B.); Rutshuru, Kivu, 3 (DeWitte, M.N.H.N.). *Uganda*: Magamba near Masinde, 1 (Z.M.B.); [following all B.M.] Msozi [not located], 4300 ft., Jan., 1903, 8 (Radcliffe); Kigezi, 7000 ft., Sept., 1923, 2 (Hargreaves); Fort Portal, Nov., 1921, 1 (Hargreaves); Unyoro, near Hoima, 3700 ft., Dec., 1911, 1 (Neave); Mawakota, Sept., 1931, 1 (van Someren); Ruwenzori, 8000 ft., 1 ♂; Arua, Oct., 1919, 1 ♂ (McConnell); Mabira, July, 1913, 2 (Gowdey). *Kenya*: Rabai, 1929, 4 (van Someren, B.M.); Fort Hall, 2 (Z.M.B.); Ikutha, 7 (Z.M.B.). *Tanganyika*: [following Z.M.B.] Uheheland, Kidugala, 1; Mbunga, 1; Victoria Nyanse, Ukerewe, 3; Usambara, New Bethel, 1902–3, 20; Usambara, Derema, 1; Mulango, 1; Kilosa, Jan., 1926, 1 (Miller, B.M.); Kanga, Sept., 1950, 1 (Sweeney, B.M.); Amani, 2 (Z.M.B.); Ndanda, 1 ♂, 1 ♀ (Z.S.M.); Kigonsera [not located], 1 ♂ (Z.S.M.); Dar es Salaam, 21 (Z.M.B.), 1 ♂ (B.M.); Micindani, 2 (B.M., M.N.H.N.). *Nyasaland*: Blantyre, 1 (Old, B.M.). *Mozambique:* Beira, Apr., 1906, 2 (Sheppard, B.M.). *Rhodesia*: Salisbury, Apr., 1898, 1 ♀ (B.M.); Nchanga, 1 ♀ (Macnamara, B.M.); Tshinsenda, Congo-Rhodesia border, 4300 ft., May 1928, 1 ♂ (Evans, B.M.).

Sipalinus aurivilli (Duvivier)

Togo: Bismarckburg, near Yégué, 1893, 2 (Z.M.B.). *Nigeria*: Melor [? spelling, not located], 1 (Gray, B.M.). *Cameroon*: Namupa [not located], 1 ♂ (Z.S.M.); [following Z.M.B.] Bipundi, 1 (Zenken); Johann-Albrechtshohe [=Kumba], 1897, 1 (Conradt); Lolodorf, 5 (Conradt); Nssanakang, 1 (Diehl). *Congo*: 1 (U.Z.M.); Uelle, 1 (Z.S.M.); Kilwa, Nov., 1899, 1 (Reimer, Z.M.B); Yangambi, 1 (D.G.K.), 1953–1954, 4 (Donis, B.M.); 18 miles southwest of Elizabethville, 1928, 2 (Evans, B.M.); Beni, Ituri Forest, Sept., 1946, 1 (B.M.); [following, Lang and Chapin, A.M.N.H.] Malela, July, 1915, 1; Medje, 1910, 1914, 33; Batama, Sept., 1909, 1; Faradje, April, 1911, 1; Rungu, June, 1913, 11. *Tanganyika*: Kigonsera [not located], 8 (Z.M.B.,Z.S.M.); Dar es Salaam, 1 (Z.M.B.); Ndanda, 1938, 2 (Z.S.M.); Peramiho, 1 (Z.S.M.). *Nyasaland*: Mlange [=Mlanje or Mlanji] Mt., Feb., 1913, 2 (Neave, B.M.). *Mozambique*: Beira, 1907, 6 (Rudd, B.M.). *Rhodesia*: Mwinilunga, Apr., 1939, 1 (White, A.M.N.H.); Kashitu, Nov., 1914, Jan., 1915, 8 (Dollman, B.M.); Broken Hill, Nov., 1931, 1 (Pitman, B.M.); Nchanga, 6 (Macnamara, B.M.). *Angola*: Bailundo, 3 (Z.S.M.); Kuambo [not located], 2 (Z.S.M.); Cacolo, 1957, 1 ♂ (C.N.C.); Lake Calunda, 65 miles east Vila Lusa, Dec., 1954, 9 (de B. Machado, B.M.). *Country* ?: Ungoni, 3 (Z.M.B.).

Sipalinus burmeisteri (Boheman)

Cameroon: Junction Sanaga and Dyérem Rivers, 1 ♂ (Z.S.M.); Joko [=Yoko], 1 ♂ (Z.S.M.). *Guinea*: 1 ♂ (type of *burmeisteri*, N.R.). *Sudan*: Wau, Bahr el Ghazal, 1 ♀ (Z.S.M.). *Tanganyika*: Kilosa, Jan., 1926, 1 ♀ (Miller, B.M.); Morogoro, 1931–1932, 1 ♂ (Thompson, B.M.); Dar es Salaam, 1 ♀ (B.M.); Lindi, 1 ♀ (B.M.); Madibira, 1 ♂ (Z.S.M.); Peramiho, 1 ♂ (A.M.N.H.), 1 ♀ (Z.S.M.); Luculedi or Lukuledi River, 4 ♂, 5 ♀ (Z.S.M.). *Mozambique*: Amatongas Forest, about 160 km. west of Beira, Feb.–Mar., 1962, 1 ♀ (Cookson, B.M.).

Sipalinus gigas gigas (Fabricius)

Mongolia: Chan heou, 1 (Z.M.B.). *Soviet Union*: Vladivostok, 1 (Z.I.A.N.). *China*: 2 (B.M., Z.S.M.). Manchuria: Yablonya, Aug., 1940, 2 ♀ (Weymarn, C.A.S.); Sjalin, May, 1938, 1 ♀ (F.M.); Maoerschan, 1937, 1 ♂, 1 ♀ (F.M.). Chekiang: 3 (Z.S.M., Z.M.B.); Hangchow, May, 1923, 3 ♂ (Van Dyke, C.A.S.); Ningpoh, 2 (Z.S.M.). Hupeh: Ichang, 5 (Bowring, B.M.). Kiangsi: 1 (Z.M.B.). Fukien: 1 ♂, 2 ♀ (Maa, C.A.S.); Yungan City, May, 1940, 1 ♀ (Maa, C.A.S.); Changting, Niuling, June, 1941, 2 ♂ (Maa, C.A.S.); Yen-ping [=Nanping], June to Sept., 1917, 15 ♂, 15 ♀ (A.M.N.H.); Foochow, 1922, 1934–1936, 14 (B.M., Z.S.M.), 7 ♂, 6 ♀ (C.A.S., B.M., A.M.N.H.); Foochow region to Kuatan region, 9 ♂, 5 ♀ (A.M.N.H.); San Chiang, Foochow, 1927, 3 ♂ (Pope, A.M.N.H.). Kwangtung: 1950, 1 ♂, 1 ♀ (Gressitt, C.A.S.); Wang-lung-kun [not located], 1 ♂ (Z.M.B.); Long tao shan, 1 ♀ (Z.M.B.). Hong Kong: 3 ♀ (C.A.S.), Mar., 1899. 1 ♂, 1 ♀ (B.M.). Hainan: Dwa Bi, July, 1935, 1 ♂ (Gressitt, C.A.S.). Formosa (Taiwan): Hori, June, 1935, 1 ♂ (C.A.S.). *Korea*: 3 (Z.M.B., Z.I.A.N.); Wonsan, June, 1911, 1 ♂ (Thompson, C.A.S.); Seoul, July, 1948, 10 ♂, 2 ♀ (Loukashkin, C.A.S.); Aug., 1954, 1 ♂, 1 ♀ (Derse, A.M.N.H.); Po?on-ni [spelling?], 1 ♀ (C.A.S.). *Japan:* 13+ (A.M.N.H., B.M., C.A.S., F.M., Z.M.B., Z.S.M.). Hokkaido: Sapporo, July, 1923, 26 (Van Dyke, C.A.S.). Honshu (Honda): [following all C.A.S.]: Shuzenji Izu, 5; Matsushima Bay, Miyagi, 1929–1934, 7 (Gressitt); Lake Towada, July, 1924, 1 ♀ (S. Light); Nikko, July, 1923, 2 ♂, 1 ♀ (Van Dyke); Chuzenji, Nikko, Aug., 1953, 1 ♂, 1 ♀; Ashiya, 1909, 2; Yura Tango, 2 (Thompson); Kobe, June, 1912, 1 ♂ (Thompson); Kamakura, July, 1929, 1 ♂, July, 1953, 1 ♂ (Aoki); Ikaho, 1 ♀; Karuigawa, July, 1930, 1 ♀ (Gressitt); Tokyo, 1900, 1925, 1 ♂, 1 ♀ (C.A.S., F.M.); Yokohama, 1 (Z.S.M.); Yamasaki, 1932, 1 ♀ (F.M.); Kyoto, Midoro-Ike, Apr., 1955, 1 ♀ (Arnaud, C.A.S.); Tashiro, June, 1952, 2 (B.M.); Mt. Takao, near Tokyo, June, 1931, 3 (Gressitt, C.A.S.). Kyushu: Unzen [=Hot Springs], July, 1923, 12 (Van Dyke, C.A.S.); Nagasaki, 1 ♀ (U.Z.M.), 1907, 1 ♂ (Thompson, C.A.S.), Apr., 1948, 9 ♂, 9 ♀ (Wright, F.M.). Shikoku: Omogokei, Ehime Prefecture, 1 ♀ (F.M.). *Indochina*: Annam: Dalat, Langbian Prov., 1918, 1 ♂, 1 ♀ (Kloss, B.M.); Dran, Langbian Prov., 1 ♂ (Kloss, B.M.). Tonkin: Hoabinh, Aug., 1918, 1 ♂, 8 ♀ (de Salvaza, B.M.); Ngai-Tio, 1924, 1 ♂ (Stevens, B.M.). Laos: Vanky, 1963, 3 (Z.S.M.); Paklay, 1964, 26 (Z.S.M.); Vientiane, Mar.–June, 1963, 88 (Z.S.M.); Pakse, 1963–1964, 20 (Z.S.M.). *Burma*: Mt. Myin-Ma-Mti Raneh Kalaw, 1 ♀ (Anderson, C.A.S.); Tenasserim, 1 (Z.I.A.N.), 1 ♂, 1 ♀ (Z.M.B.), 1 ♂ (Atkinson, B.M.); [following all B.M.], Tavoy, 5; N. Chin Hills, 1; Tharawaddy, 3; Rangoon, 2; Ruby-Mines, 2 ♂, 1 ♀ (Doherty); Pyonchaung, N. Toungoo, 1918, 4 (Beeson); Byama Res. Prome, 1929, 6 (Atkinson); Mungphu. 1 ♂, 1 ♀ (Atkinson); R [iver] Nam Tamai, Aug., 1937, 2 ♂, 1 ♀ (Kingdon Ward); Yanaungmyin Res. Pyinmana, July, 1929,

1 (Atkinson). *Sikkim*: 2 (B.M.); Gopaldhara, Rungbong Valley, 3 (Stevens, B.M.). *Himalayas* (no locality): 9 (U.Z.M., Z.M.B., Z.I.A.N., and type of *hypocrita*, N.R.). *India*: 5 (B.M.); Adhoiwala, Dehra Dun, July, 1932, 1 ♀ (Saklani, C.A.S.); [following all B.M.] Sylhet, Chandkhira 7 (Sherwell); Buxar, 1; Kanara, 3; Dhoni Forest, S, Malabar, May, 1923, 1 ♂ (Barnes); Shimoga, Mysore State, May, 1937, 1 ♂ (Nathan); Pathri, Saharanpur, U.P., 1918, 5 ♀ (Beeson); Pashok, Darjeeling District, 1914, 2 ♂, 2 ♀ (Gravely, Lister); Gopaldhara, Darjeeling, June, 1918, 1 ♂, 1 ♀ (Stevens); Jubilganj, Haldwani, U.P., 1922, 2 ♂, 1 ♀; Nilgiri Hills, 1 ♀; Cochin [? in Kerala], 1. Assam: 1906, 1 ♂, 1 ♀; Khasia Hills, May, 1905, 1 ♂; Dejoo, North Lakhimpur, base of hills, July, 1910, 10 (Stevens); Silonibari, Upper Assam, June, 1911, 1 (Stevens); Nemotha, N. Cachar, 5; Nambor R[iver], Sibsagar, 1921, 1 (Beeson); Shillong, June, 1918, 1 ♂, May to July, 1908, 4 (Parish), June, 1918, 2 (Fletcher). United Provinces: Allah abad, 1 (B.M.); Dehra Dun, 1, Sept., 1933, 2 (Gardner, B.M.). *Ceylon*: 3 (B.M., Z.M.B), 1 ♂ (type of *tinctus*, B.M.); Agalawatte, 1919, 1 ♂ (Hutson, B.M.); Mabaoya Batticaloa, 2 (B.M.); Kandy, 1905 to 1910, 7 (B.M.); Kelani Valley near Colombo, 1910, 2 (Braine, B.M.); Peredinaya, 1910, 2 (B.M.). *Andamans*: 17 (B.M., Z.M.B., U.Z.M.). *Nicobars*: Camorta, 2 (Roepstorff, U.Z.M.).

Area of Intergradation (*gigas, granulatus*)

Siam: 1 ♂, 3 ♀ (B.M.); Renong [=Ranong], 1 ♂, 1 ♀ (B.M.). *Malaya*: Malacca, 1 ♂ (A.M.N.H.), 1 (Doherty, B.M.); Salanga, 1 ♂ (Z.M.B.); Singapore, 1 ♂ (B.M.); Ulu Langat, Selangor, Dec., 1947, 1 ♂ (Lange, C.A.S.); Perak, 1901, 2 (Grubeuer, Z.S.M.); Batang Padang, Jor Camp, 1923, 1 ♂ (Pendlebury, B.M.).

Sipalinus gigas granulatus (Fabricius)

Sumatra: 8 (Z.M.B., Z.S.M., Z.I.A.N.); Ranau, May, 1935, 2 ♂, 2 ♀ (Doesburg, C.A.S.); Solok, 1 (Fruhstorfer, Z.S.M.); Tandjong Morawa Sardang, 1 (Hagen, U.Z.M.); Ki Dulan, 1 ♂, 1 ♀ (B.M.); Siolak Daras, Korinchi Valley, Mar., 1914, 1 ♂ (B.M.). *Java*: 11 (Z.S.M., Z.I.A.N.); many (Z.M.B.); Soakemboea, 1 ♀ (C.A.S.); Batavia, 1 (Z.S.M.). *Borneo*: Sarawak: 1 (Z.M.B.); Quop, 1914, 1 ♂ (Bryant, B.M.); Mt. Dulit, 1932, 2 (B.M.); Between Tinjar and Rumak Bulan Ding, 2 (B.M.). *Borneo*: other localities: 3 (A.M.N.H., F.M., Z.S.M.); Pengaron, Martapoera, 1 ♀ (B.M.). *Philippines*: 13 (C.A.S., Z.M.B.), 2 ♀ (B.M.); 1 ♂ (type of *misumenus*, N.R.); Luzon: Laguna, Mt. Makiling, Sept., 1930, 1 ♀ (B.M.), Apr. to Nov., 1930, 1932, 101 (Hadden, C.A.S.), Agricultural College, Laguna, June, 1931, 3 (Hadden, C.A.S.); Mabatobato, Pili, Camarines Sur, May, 1932, 1 ♀ (Schneider, C.A.S.); Novaliches, Rizal, May, 1931, 1 ♂ (Juan, C.A.S.); Manila, 1 (B.M.). Mindoro: San Jose, Sept., 1945, 10 (Ross, C.A.S.). Palawan: Puerto Princesa, May, 1947, 1 ♂, 1 ♀ (F.M.). Mindanao: 1 (B.M.); Todaya, east slope Mt. Apo, Nov., 1946, 1 ♀ (F.M.); Caburan, Caburan, Davao Prov., Jan., 1947, 1 ♂ (F.M.); Zamboanga, May, 1932, 2 (Muzzal, C.A.S.); Zamboanga, Kabasalan, Apr., 1932, 1 ♀ (Muzzal, C.A.S.); Silipon Buk, June, 1932, 1 ♀ (Phillips, C.A.S.); Mt. Pulay and Payambugan, Mount Prov., 1931, 7 (Hadden, C.A.S.). *Lesser Sundas*: Ceram, 6 (B.M.); C. Ceram Mansela, 20 (B.M.); Buru, 5 (Z.M.B.); Amboina, 2 (U.Z.M.). *Celebes*: 2 (Z.M.B., Z.I.A.N.); 1933, 1 (Heinrich, B.M.); Makasar, 1 ♂ (type of *cristatus*, Z.M.B.). *Moluccas*: Larat, 1914, 1915, 1 ♀ (Muir, B.M.); Ternate, 1 ♀ (B.M.); Batjan, 2 (Z.M.B.). *Tenimber*: Jandema, 2 (B.M.). *Aru*: 1 (Z.M.B.). *New Guinea*: 50 (Z.M.B., Z.S.M.); Klamagoen River, Nov.,

1935, 1 ♂ (Heid, C.A.S.); Maffin Bay, July, 1944, 3 ♂, 2 ♀ (Ross, C.A.S.); Hollandia, Dec., 1933, 7 ♂, 7 ♀ (Stuber, A.M.N.H.), May, 1944, 2 ♂, 3 ♀ (Helfer, A.M.N.H.); Bulolo, Mar.–July, 1937, 3 ♂, 2 ♀ (Rio, F.M.); Koitakinumu, Central Div., Apr., 1918, 1 ♂ (Zimmer, F.M.); Mimika River, 1911, 3 ♂, 5 ♀ (Wollaston, B.M.); Saputa, near Buna, Papua, 1943, 1 ♂ (Sperry, F.M.; Aitape, Papua, Dec., 1944, 1 ♀ (Enns, A.M.N.H.); Biak Island, Feb., 1945, 1 ♂ (Blackmore, C.A.S.). *New Pomerania* (*New Britain*): 11 (Z.M.B.); Whiteman Range, Jan., 1959, 1 ♂ (Gilliard, A.M.N.H.); Talasea, 1925, 10 (Eichhorn, B.M.). *New Ireland*: 1923, 1924, 2 (Eichhorn, B.M.). *Admiralty Islands*: Lorengau, Aug., 1944, 1 ♀ (C.A.S.). *Solomon Islands*: Naval Air Base, 1 (Bohart, C.A.S.); Guadalcanal, 1944, 1 ♂ (Osborn, B.V.); Bougainville: 1928, 1 ♀ (A.M.N.H.), Empress Augusta Bay, Mar.–Apr., 1944, 1 ♂, 2 ♀ (Downs, F.M.), Piva, Mar., 1945, 1 ♀ (Walz, C.A.S.), Sept., 1944, 1 ♂, 3 ♀ (Valentine, B.V.). *Australia*: Queensland, 1 ♂ (Z.M.B.), 1 ♀ (Lea, C.A.S.); Northern Queensland, 2 ♂ (A.M.N.H.); Endeavor River, Queensland, 2 ♂ (A.M.N.H.); Victoria, 1 (Z.M.B.); Cooktown, 1 ♀ (Turner, B.M.); Mosman River, North Queensland, 3 (C.A.S.).

Sipalinus guineensis (Fabricius)[1]

Senegal: 2 (D.G.K., Z.I.A.N.). *Guinea*: 15 (B.M., Z.I.A.N., U.Z.M.). *Sierra Leone*: 1 ♂ (type of *mendicus*, N.R.); Njala, 2 (B.M.). *Liberia*: 4 (B.M., Z.I.A.N.). *Gold Coast*: 2 (B.M., Z.S.M.); Ashanti, 5 (B.M.); Bibianaha [not located], 3 (B.M.). *Togo*: Amedzowe [not located], 3 (Z.M.B.); Bismarckburg, near Yégué, 12 (Z.M.B.); Misahöhe, 10 (Z.M.B.). *Nigeria*: Mundame a Mungo [river], 1 (Z.M.B.); Azare, 15; Bendi, 1; Old Calabar, 1 (all B.M.). *Cameroon*: 6 (Z.S.M.); Bipindi or Bipundi, 13 (Z.M.B., Z.S.M.); Batouri District, 9 (B.M.); Gabon, 1 (B.M.); Johann-Albrechtshohe [=Kumba], 13 (B.M., Z.M.B.); Joko [=Yoko], 28 (Z.M.B., Z.S.M.); Jaunde [=Yaunde], 153 (B.M., Z.M.B., Z.S.M.); Lukelali [=Lukolela], 2 (Z.M.B.). *Spanish Guinea*: Nkolentangan, 2 (Z.M.B.). *Fernando Po*: 25 (Z.M.B.). *Congo*: 1 (C.A.S.); Barumbu, 10 (B.M., Z.M.B.); Yangambi, 3 (B.M.); Leopoldville, 2 (B.M.); Njam-Njam, 7; Uelleburg, 1; Victoria Nyanse, Ukerewe Island, 4 (all Z.M.B.); Akenze [=Akengai], 1 ♂; Avakubi, 1 ♂, 1 ♀; Gamangui, 1 ♂; Garamba, 1 ♂; Malela, 1 ♀; Medje, 126 ♂, 139 ♀; Rungu, 2 ♂, 1 ♀; Stanleyville, 1 ♂ (all A.M.N.H.). *Uganda*: Mabira Forest, 3 ♂ (B.M.); Kampala, 6 (B.M.). *Kenya-Tanganyika border*: Massai [=Massailand], 1 (B.M.). *Tanganyika*: Dar es Salaam, 1 (Z.M.B.); Kilimanjaro, 1 (Z.M.B.); Madibira, 3 (Z.S.M.); Morogoro, 1 (B.M.); Usambara, 1 (Z.M.B.). *Nyasaland*: Chiromo, Ruo River, 1 ♂, 1 ♀ (B.M.). *Madagascar*: Diego Suarez, 1 ♀ (type of *madecassus*, M.N.H.N.). *Locality without Country*: Ukoko, 3 (Z.M.B., Z.S.M.); Linnaea, 2; Japoma, 2; Lindo, 2; Chutes de Samlia . . . Mocquereys, 1 (all Z.M.B.).

Sipalinus squalidus (Kolbe)

Guinea: 3 (lectotype and syntypes of *squalidus*, Z.M.B.). *Sierra Leone*: 1 (B.M.). *Gold Coast* (all B.M.): 2; Ashanti, 1 (Evans), 2 (Cansdale); Bibianaha [not located], Oct., 1910, 1 (Spurrell). *Cameroon*: Bibundi, 1904, 2 (Tessmann, Z.M.B.); Batouri District, 1934, 2 (Merfield, B.M.); Johann-Albrechtshohe [=Kumba], 3 (Conradt,

[1] Collectors and dates are omitted for *guineensis*.

Z.M.B.); Joko [=Yoko], 1 (Z.M.B.); Muyuka and Mabete, Victoria, June, 1949, 21 ♂, 38 ♀ (Malkin, C.A.S.); Kribi, 1 ♀ (Z.S.M.); Dengdeng, 5 (B.M., Z.M.B.); Lolodorf, 1895, 4 (Conradt); Yanda or Yandi, 4 (Carnap); Barombi, 3 (Preuss); Buea, 1 (Preuss); Jsongo, 1938, 2 ♂ (Eisentraut); Nokundange, 1905, 3 (Tessmann) (all Z.M.B.). *Spanish Guinea*: Benito, 1906, 1 (Tessmann, Z.M.B.). *Fernando Po*: Santa Isabel, 1900, 3 (Conradt, Z.M.B.). *Congo*: 1 (U.Z.M.); Beni, Ituri Forest, 1946, 1 (B.M.); Yangambi, 1953, 8 (Donis, B.M.), 3 (D.G.K.); Matale, Oriental Prov., Bas-Uele District, 1958, 1 ♂ (F.M.); Avakubi, 1909, 1914, 1 ♂, 1 ♀; Bafwaboli, 1909, 1 ♀; Medje, 1914, 3 ♂, 3 ♀ (all Lang and Chapin, A.M.N.H.). *Uganda*: Entebbe, 1912, 4 (Gowdey, B.M.); Kampala, 1915, 5 (Gowdey, B.M.); Daro or Durro Forest, Toro, Oct., 1911, 1 (Neave, B.M.); Ruwenzori, 1 (Z.M.B.).

Sipalinus yunnanensis, new species

China: Yunnan Province (for the 37 specimens, see the text).

SUMMARY

In the present revision of the genus *Sipalinus* of the Old World, five species from Africa and two from Eurasia and Australasia are recognized as valid. Included is a new species, *yunnanensis*, from Likiang, Yunnan, China. The widespread Asian species, *gigas*, is considered to be polytypic, one subspecies being chiefly continental and northern, the other insular and generally more southern. Two names listed in catalogues are removed from the genus, *elephas* Fabricius, 1781 and *porosus* Walker, 1859. Geographic ranges, ecology, and synonyms are discussed; drawings, maps, and photographs are presented; parts of the male and female genitalia are shown for the first time.

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