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# THE MOLE BUGS OF THE GENUS SPALACOCORIS

## (Hemiptera: Lygaeidae)[1]

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The genus *Spalacocoris* is perhaps the most remarkable and bizarre unit contained in the family Lygaeidae. It is certainly the most unusual and highly modified group in the large and varied subfamily Blissinae.

The various species of *Spalacocoris* are medium to large sized insects (8–15 mm), rather cylindrical in shape, with enormous fossorial fore legs and an abdomen which is not tapered but of nearly uniform width and with the posterior margin truncate. The fossorial fore legs are as highly specialized as are those of the mole (*Talpa*) or of the mole cricket (*Gryllotalpa*). The fore femur is tremendously incrassate, often nearly as large as the pronotum, the inner face is deeply concave basally to enable the femur when at rest to fit closely against the curved surface of the prothorax. The fore tibia is short and broad with the ventral and distal portions bearing a series of heavy thick spines.

These insects have additional modifications which are unique in the Blissinae such as an elongate cylindrical pronotum, parallel sided throughout, with prominent posteriorly directed lobes along the posterior margin laterad of the base of the scutellum. The posterior half of the pronotum is conspicuously punctate as is a narrow anterior area, the greater portion of the anterior half of the pronotum is glabrous, smooth and shining. The scutellum possesses a high median carina that frequently is swollen and tuberculate midway along its length (figs 20–23). The forewing shows little differentiation in texture between the membrane and corium, but the corium itself can be subdivided into very distinct parts. The inner half is dull and velvety in texture and rather conventional in appearance but the entire lateral portion of the corium is shining, glabrous and roughly punctate.

The genitalia also exhibit a high degree of distinctiveness. The male aedeagus (figs 16–17) is definitely lygaeoid and the configuration of the sperm reservoir of value in species discrimination. The claspers are, however, not hook or blade shaped but are short, thick and rather "block-like" in general appearance.

The female genitalia (figs 30–31) are extremely shortened and flattened. The ovipositor shows great modification from the lygaeoid type and appears to be intermediate in condition between Coreoidea and Lygaeoidea. It is strikingly different from the elongate-laciniate type found in most lygaeids and possesses inter-valvular sacs which have not been previously reported in lygaeids but have been observed to be present in many leptocorisines

1. This work was supported by a grant from the National Science Foundation.

(Alydidae- Coreoidea) and to be of specific value (Ahmad, in press). The seventh abdominal sternum is not cleft to the base as reported by Scudder (1959) as characteristic of Lygaeidae and the first and second valvulae are not united. The lateral and ventral sclerites which Bonhag and Wick (1953) reported in *Oncopeltus fasciatus* are absent. However, the spermatheca is typical of Blissinae and very different from the coreoid type (figs 24–26).

The shortening and flattening of the ovipositor into a rather coreoid appearing structural area can, of course, be interpreted as a parallelism or convergence phenomenon and due to some unusual oviposition or ecological habits. The presence of inter-valular sacs is more difficult to explain but until a survey of the occurrence of these sacs has been made in the Lygaeidae, one cannot really evaluate their phylogenetic significance.

Additional generic characters of *Spalacocoris* are as follows: fore coxal cavities closed; antennae moderately clavate with basal segment not, or only very slightly, exceeding apex of tylus; head acuminate with tylus declivent and greatly exceeding apices of juga; compound eyes set slightly away from antero-lateral pronotal angles, ocelli extremely large and prominent; pronotum with lateral margin carinate along anterior fourth, rounded and cylindrical beyond, posterior margin of pronotum deeply concave with prominent depressed postero-lateral lobes on either side of base of scutellum; median carina of scutellum usually sexually dimorphic, low and narrow in females, rising to obtuse tubercles midway along length in males (figs 20–23); texture of corium and membrane little differentiated; apical corial margin shallowly concave; fore femur with numerous small spines along ventral surface, mid and hind femora mutic; mesosternum strongly shining, lacking a sharply defined median groove; basal metatarsal segment much larger than segments two and three combined.

*Spalacocoris* bears some resemblance to *Chelochirus* which also possesses greatly incrassate fore legs. This latter genus is, however, flattened rather than cylindrical. We hope to treat the generic relationships of the Blissinae in a later paper and it is premature to do more here than note some striking external resemblances to such small genera as *Pirkimerus* whose members at first glance appear completely different in habitus.

*Spalacocoris* was described by Stål (1874) with *S. sulcifer* n. sp. as monotype. Distant (1901) synonymized *sulcifer* with *Ischnodemus sulcatus* Walker (1872) and the genus has been considered to be monotypic since that time.

Our material indicates that five nominal species are represented. Of these *sulcifer* Stål and *sulcatus* Walker are treated as distinct and three new species are described: *rufusculus* (Sumatra), *philippinensis* (Luzon, Samar) and *nigritus* (Java). Of these species, two very distinct groups are represented; one consists of *rufusculus* alone which has a very distinct type of scent gland orifice (fig 13); lacks a median longitudinal pronotal trough and possesses a transverse pronotal impression. The other group contains the remaining four species, all of which are closely related in pronotal configuration, genitalia, scent gland orifices and most other characteristics. This complex can, however, be further subdivided into two units. One unit containing *sulcatus* and *philippinensis* possesses uniformly yellow legs, a deeply troughed pronotal furrow and a sperm reservoir with the anterior "plate" pointed (figs 14–15). The second sub-unit composed of *sulcifer* and *nigritus* has at least the mid and hind legs dark brownish, a much less deeply troughed pronotal furrow and a blunt apex to the anterior "plate" of the sperm reservoir (figs 16–17).

We have found the sperm reservoir and the claspers to be the most reliable criteria for species discrimination. In addition, scutellar configuration, leg color, shape of the scent gland orifices, and the posterior pronotal lobes offer useful secondary characteristics.

Our series of most species are unfortunately rather short. It is conceivable from the close relationship of some species that a "rassenkreis" or "formenkreis" may ultimately prove to be present through the islands of the E. Indies, but for the present it seems prudent to assign specific status to all of the taxa.

In Java *sulcatus* and *nigritus* appear to be sympatric but fortunately reasonable series are present and indicate that two quite distinct species are represented. A more complex problem exists with *sulcatus* and *sulcifer* as both occur in Malaya and adequate material has only been available from Java.

Nothing is known of the biology of any of these species other than a note by Distant (1903) who mentions *Spalacocoris sulcatus* taken sucking the root of a "zingiberaceous" plant and having a disagreeable odor. This record is from Malaya and may refer to *sulcifer* but as Distant, Walker and others often used "Malaya" to include all of the East Indies, the record cannot be definitely assigned. From the morphological modifications it seems evident that these insects are fossorial. All other blissines whose host plants are known are confined in feeding habits to graminaceous plants. Miller's (1956) statement that these insects are possibly predaceous seems unwarranted.

## Key to species of Spalacocoris

1. Legs uniformly yellow ..... 2
   Mid and hind legs dark brown to castaneous, fore femur either yellow or dark ..... 4
2. Scent gland orifice sharply angulate (fig 13); pronotum lacking a median longitudinal trough; basal width of pronotum greater than median length ..... **rufusculus** n. sp.
   Scent gland orifice crescentic, never sharply angulate (figs 9–12); anterior lobe of pronotum with a deep median trough; median length of pronotum greater than basal width ..... 3
3. Larger, generally 12–15 mm in length; claspers strongly curved in the middle (figs 1, 5); apical portion of sperm reservoir broad and arrow-head shaped (fig 14) ..... **philippinensis** n. sp.
   Smaller, generally 8.5–11 mm in length; claspers almost flat in middle (figs 2–6); apical portion of sperm reservoir narrow; tapering and compressed (figs 15, 19) ..... **sulcatus** (Walker)
4. Large species, generally 13–16 mm in length; all legs uniformly dark reddish brown; claspers pointed at apices (figs 4, 8); apical portion of sperm reservoir small, knob-like and blunt (figs 17–18); anterior inner margin of scent gland orifice truncated (fig 12) ..... **nigritus** n. sp.
   Smaller species (10.83 mm); fore femur dull, yellowish; claspers rounded at apices (figs 3, 7); apical portion of sperm reservoir large and broadly rounded at apex (fig 16); anterior inner margin of scent gland orifice rounded (fig 11) ... **sulcifer** Stål

**Spalacocoris rufusculus** Slater and Ahmad, n. sp.

Head black, except testaceus about base of tylus, bucculae and area of antenniferous

tubercles, pronotum with ochraceous to red brown narrowing along anterior margin as an elongate median, irregular area mesally on anterior lobe and major part of posterior lobe, latter irregular, becoming paler caudad and about humeri; scutellum dark brown becoming yellowish at apex; hemelytra with entire corium and clavus uniformly reddish brown in strong contrast to black membrane; below with abdomen pale reddish brown as is metathoracic scent gland orifice, acetabulae, posterior portion of propleuron and mesal thoracic region; legs and labium brightoch raceous-yellow; antennae brown, the basal segment paler; lateral area of pronotum and legs with numerous long slender upstanding hairs; corium laterally with numerous shorter but upstanding hairs; posterior pronotal lobe and shining lateral corial area evenly punctate, corium less conspicuously so; anterior lobe of pronotum smooth except weakly rugulose near anterior margin.

Head relatively wider than other species, greater than width of anterior pronotal margin and subequal to median head length, length head, 1.00 mm; width head, 1.02 mm; interocular space, .50 mm; pronotum completely lacking a conspicuous median trough; a well developed narrow transverse median groove or constriction present entirely across central area of pronotum; pronotum rather convex for genus, evenly narrowing cephalad; antero-lateral angles rounded, not raised, ridged, nor at all carinate-reflexed; posterior margin evenly deeply concave with posteriorly directed lobes laterad of scutellum strongly developed but only obsoletely excavated; length pronotum, 2.15 mm; width pronotum, 2.35 mm; scutellum with a strong, complete median carina, length 1.00 mm; hemelytron typical for genus with polished lateral 1/2 of corium, and dull velvety clavus, membrane and inner 1/2 of corium, membrane nearly attaining apex of abdomen and completely covering the expanded connexivum laterally, distance apex clavus- apex corium 1.70 mm; distance apex corium- apex abdomen 3.15 mm; labium at most reaching anterior region of mesosternum, remote from mesocoxae, length labial segments, I, .65 mm; II, .60 mm; III, .40 mm; IV, .60 mm; fore femur grossly incrassate, armed below with many stout spines, one much larger than others; tibiae short, stout, armed with spines but with ventral row extending to near base rather than separating into a lateral "second" row near apex; metathoracic scent gland opening strongly and sharply angulate (fig 13); length of antennal segments, I, .30 mm; II, .42 mm; III, .41 mm; IV, .60 mm; total length 9.65 mm.

Holotype: ♀ SUMATRA: Ajr Njuruk Sempu, 1400 m, VIII.1916, E. Jacobson, Leiden Mus.

We have described this species from a single specimen as it is the most distinctly different species of the genus and its lack of a median pronotal trough and presence of a transverse pronotal impression cause some modification of the generic concept. The lack of the above pronotal features as well as the lack of carinate, raised antero-lateral pronotal margins, shape of the scent gland orifice, and contrasting coloration between corium, clavus and membrane, all separate *rufusculus* readily from all the other species. The arrangement of tibial spines also appears distinctive but as there is some variation in the other species, the value of their arrangement must await further material.

**Spalacocoris philippinensis** Slater and Ahmad, n. sp. Plate I.

General coloration nearly uniformly dark mahogany brown to black, becoming castaneous on abdomen; legs and labium yellow, antenna brown, or at least infuscated with brown distally; tibial spines black; body form and configuration much as in *nigritus* but some-

what more robust, length head, 1.45 mm, width head, 1.2 mm, interocular space, .62 mm; pronotum punctured heavily on posterior 1/2 as in *nigritus*, median longitudinal groove deep and broad, extending almost to posterior margin of pronotum, conformation similar to *nigritus*; lateral pronotal margins parallel sided, postero-lateral lobes prominently produced and strongly flattened, length pronotum, 3.21 mm; width pronotum, 2.50 mm; scutellum with upright tubercles on median carina acute and slightly divergent, length scutellum, 1.35 mm; distance apex clavus- apex corium, 1.68 mm; distance apex corium- apex abdomen, 4.98 mm; membrane extending well onto terminal abdominal segment, nearly attaining apex of abdomen; scent gland orifice lunate (fig 9); antennae short, thick, segments II & III slightly clavate, IV fusiform; length antennal segments, I, .36 mm; II, .52 mm; III, .48 mm; IV, 1.12 mm; length labial segments, I, .9 mm; II, .97 mm; III, .60 mm; IV, .93 mm, labium attaining base of prosternum, segment I reaching posterior margin of head;

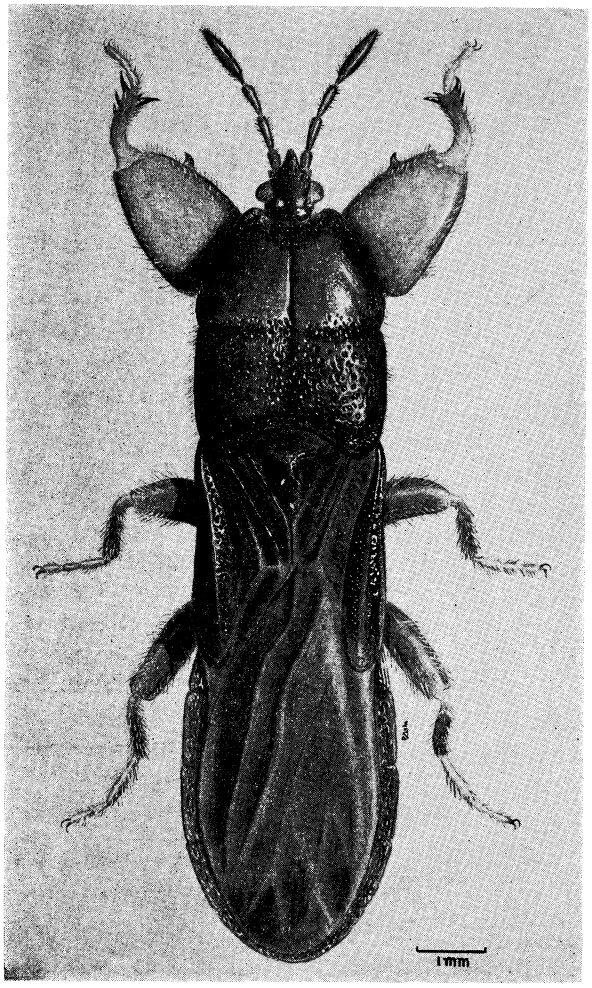


Plate I. *Spalacocoris philippinensis* n. sp. (holotype), dorsal view.

fore femur bearing a large thick spine, ventrad on distal 1/3; aedeagus with anterior projection of sperm reservoir acute (fig 14); claspers strongly curved near middle (figs 1, 5); total length 14.97 mm (type), 13.46 mm (average).

Holotype: ♂ PHILIPPINES: Samar (Baker) In U. S. Nat. Mus. Paratypes: 4 ♂♂ PHILIPPINES: Luzon, Mt Banahao (Baker); Mt Makiling (Baker); Negros Oriental, L. Balinsasayo (C. M. Yoshimoto); MALAYSIA: N. BORNEO: Sandakan Residency Gomantong Caves, 32 km S. Sandakan (T. C. Maa). In Helsinki Mus., Bishop Mus. and J. A. Slater collections.

This species is related to *sulcatus* by virtue of the yellow legs and acuminate apex of the sperm reservoir. It is however, a much larger, more robust species approaching *nigritus* in size, and the claspers are quite distinct from those of *sulcatus*. Additional differentiating characters are given in the preceding key. The shape of the scent gland orifice is also diagnostic for the various *Spalacocoris* species (figs 9, 13). As with some other species of *Spalacocoris* there is considerable size variation present, even in the short series available. The ♂ from Mt Banahao does not, or scarcely, exceeds in size some specimens of *sulcatus*. Whether or not this size variation has geographic significance must await adequate series from the various islands of the Philippines.

**Spalacocoris sulcatus** (Walker)

*Ischnodemus sulcatus* Walk., 1872: 133.—Lethierry & Severin, 1894: 164.
*Spalacocoris sulcatus*: Distant, 1901: 466 (*nec* syn.); ? Distant, 1903: 248.—Miller, 1956: 61.

General form and shape similar to *nigritus*; coloration black; posterior 1/2 of pronotum red-brown; antennal segment I yellowish, succeeding segments brown, a pale brown spot at base of tylus; black coloration suffusing to brown on abdomen, lateral shining portion of corium and tibiae, femora, tarsi and labium bright yellow, length head, 1.00 mm, width head, .97 mm, interocular space, .45 mm; pronotal sculpturing and shape as in *nigritus*, but median longitudinal trough generally deeper and nearly attaining anterior pronotal margin, carina at antero-lateral angles raised and slightly reflexed, lateral margins little narrower until near anterior 1/4, slightly sinuate, posterior margin with well developed posteriorly directed, excavated lobes laterad of scutellum, length pronotum, 2.50 mm, width pronotum, 1.75 mm; scutellum with a strongly raised median carina, length scutellum, .90 mm; hemelytra with the characteristic dull, uniformly velvety clavus, inner 1/2 of clavus and membrane, lateral corial margins sinuate, distance apex clavus- apex corium, 1.20 mm; distance apex corium- apex abdomen, 3.95 mm; femora armed below with 1 very large spine and scattered lesser spines; tibiae short, bearing numerous thick, heavy spines; labium exceeding fore coxae but not posterior margin of prosternum, length labial segments, I, .70 mm; II, .65 mm; III, .35 mm; IV, .62 mm; claspers strongly pointed at apices (figs 2, 6); apical tip of sperm reservoir pointed (figs 15, 19); length antennal segments, I, .25 mm; II, .36 mm; III, .30 mm; IV, .80 mm; total length, 10.15 mm.

MATERIAL EXAMINED: Holotype ♂, Mt Ophir; 34 specimens, JAVA: Preanger, Mt Tjimerang, 800 m; Mt Ophir, G. Tjimerang; Soekaboemi; N. BORNEO: Sandakan Residency Gomantong caves, 32 km S. Sandakan; VIETNAM: Fyan, 900–100 m, Dilinh (Djiring) (G. Besser, F. C. Drescher, E. le Moult, T. C. Maa, R. N. Spencer and C. M. Yoshimoto). In British Mus. (Nat. Hist.); U. S. Nat. Mus., Leiden Mus., Bishop Mus., P. D. Ashlock and J. A. Slater collections.

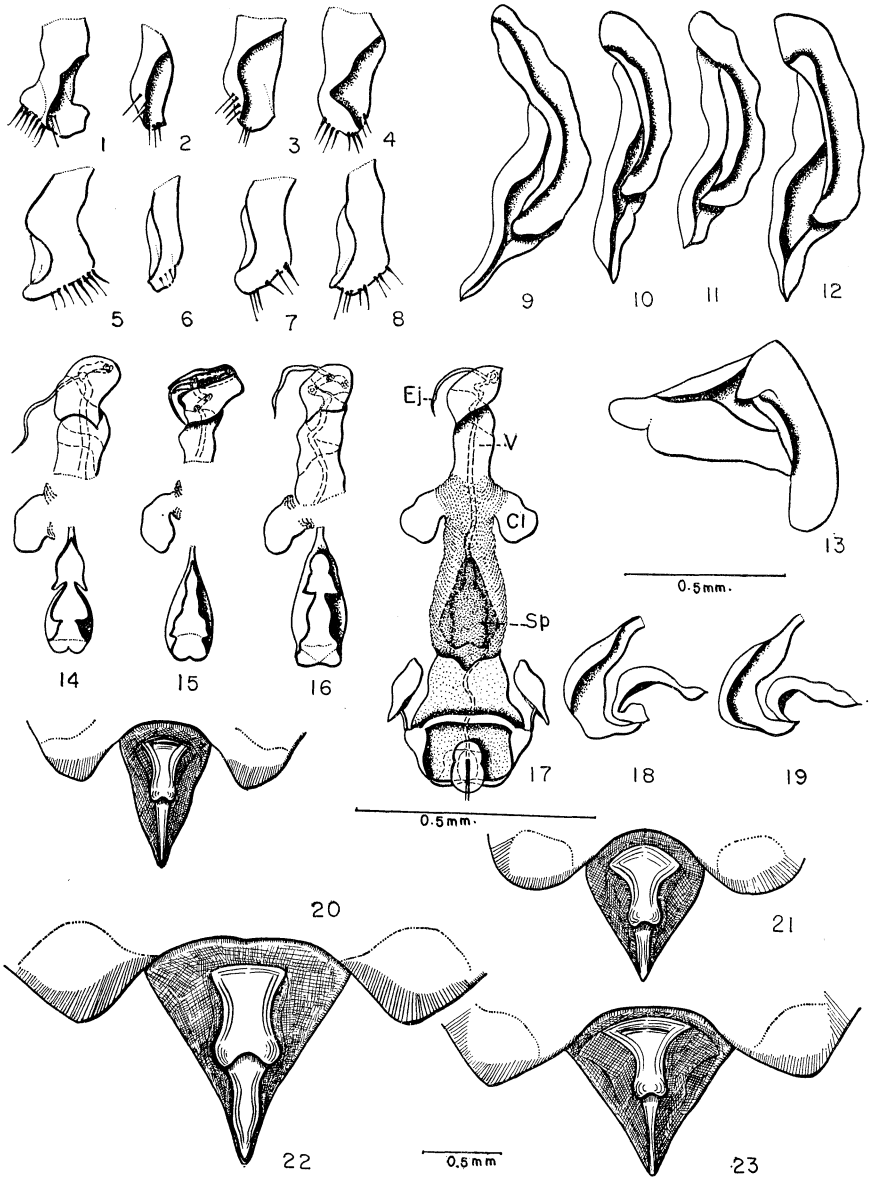


Plate II. *Spalacocoris* spp. Figs. 1–8. Claspers, inner and outer views. 1–5, *philippinensis*; 2, 6, *sulcatus*; 3, 7, *sulcifer*; 4, 8, *nigritus*. Figs. 9–13. Scent gland orifices, ventral view. 9, *philippinensis*; 10, *sulcatus*; 11, *sulcifer*; 12, *nigritus*; 13, *rufusculus*. Figs. 14–16. Aedeagi inflated, ventral view, without basal plate, theca or conjunctival membrane; fig. 17, *nigritus* entire. 14, *philippinensis*; 15, *sulcatus*; 16, *sulcifer*. Figs. 18–19. Sperm reservoirs, lateral view. 18, *nigritus*; 19, *sulcatus*. Figs. 20–23. Scutellum with posterior portion of pronotum, dorsal view. 20, *sulcatus*; 21, *sulcifer*; 22, *philippinensis*; 23, *nigritus*. (Legends to the figs.: cl – conjunctival lobes; ej – ejaculatory duct; sp – sperm reservoir; v – vesica.)

*S. sulcatus* is one of the smallest species of the genus. It can be readily distinguished by the characters given in the key. There is some variation in the considerable series present from Java, particularly in the coloration of the hemelytra, scutellum and pronotum, many specimens showing a bright red-brown coloration on the posterior lobe of the pronotum, scutellum and the basal portion of the hemelytra, to a point just caudad of the apex of the claval commissure. Other specimens are completely dark.

*Sulcatus* can easily be separated from *nigritus* by the form of the ♀ genitalia, for in *sulcatus* the paired inter-valvular sacs (fig 30) are symmetrical and separated from each other, but in *nigritus* are fused. The spermatheca lacks the apical flange present in *nigritus* (fig 25).

**Spalacocoris nigritus** Slater & Ahmad, n. sp.

Body generally black, becoming dark mahogany brown on legs, abdomen, metathoracic scent gland and sometimes antennae; tarsi yellowish as is an obscure marking near apex of corium, strongly punctate on posterior 1/2 of pronotum and lateral 1/2 of corium, central portion of anterior 1/2 of pronotum smooth, anterior 1/4–1/3 coarsely rugulose; weak punctures on inner 1/2 of corium and clavus; head, pronotum, scutellum and outer 1/2 of corium strongly shining, inner 1/2 of corium, clavus and membrane strongly contrasting, having a dull, velvety appearance; head small semi-globose, eyes prominent, set away from anterior margin of pronotum, length head, 1.45 mm, width head, 1.28 mm, interocular space, .62 mm; pronotum very elongate, slightly narrowed from base to anterior 1/4, hence angulately tapering mesad; antero-lateral angles produced as a thickened, raised carina or ridge, anterior margin strongly concave, prominent mesal longitudinal trough present, becoming obsolete before either anterior or posterior margin, pronotal margin cylindrical, dorsal surface convex, posterior margin with strongly produced excavated posteriorly directed lobes laterad of scutellum, length pronotum, 3.30 mm, width pronotum, 2.70 mm; scutellum with a prominent median carina, length 1.30 mm; shining outer portion of corium with radial vein raised and ridge-like, lateral margin sinuate; apical margin concave but appearance "lobate" due to greatly contrasting texture of 2 portions of corium, distance apex clavus- apex corium, 2.00 mm; distance apex corium- apex abdomen, 4.75 mm; abdomen nearly linear but expanding instead of tapering to apex; connexium broad, slightly upturned but nearly completely covered by broad membrane which almost attains apex of abdomen; fore femur enormously enlarged (maximum width 1.35 mm) armed below near center with 1 large spine, 2 irregular series of short spines from near base to apex; tibiae short and thick, apex and ventral surface expanded and armed with numerous heavy, thick spines, extending toward base on outer face as 2 rather irregular spiraled rows; labium extending caudad to posterior margin of prosternum, length labial segments, I, .90 mm; II, .95 mm; III, .60 mm; IV, .80 mm; length antennal segments, I, .35 mm; II, .60 mm; III, .55 mm; IV, 1.25 mm; total length, 13.00 mm; sperm reservoir with apex knob-like (fig 17); claspers curved in the middle and pointed at apices; spermatheca possessing apical "flange" (fig 24).

Holotype: ♂ JAVA: Preanger, T. Jimerang; (F. C. Drescher). In Leiden Mus. Paratypes 23 JAVA: same data as holotype; Soekaboemi, Roban; MALAYSIA: N. BORNEO: Bundu Tuka, (F. C. Drescher, F. le Moult, F. Muir. T. C. Maa). In Stockholm Mus., BISHOP Mus., USNM, P. D. Ashlock, R. L. Usinger & J. A. Slater collections.

*Nigritus* from Java represents the largest and most robust of all the species of *Spalaco-*

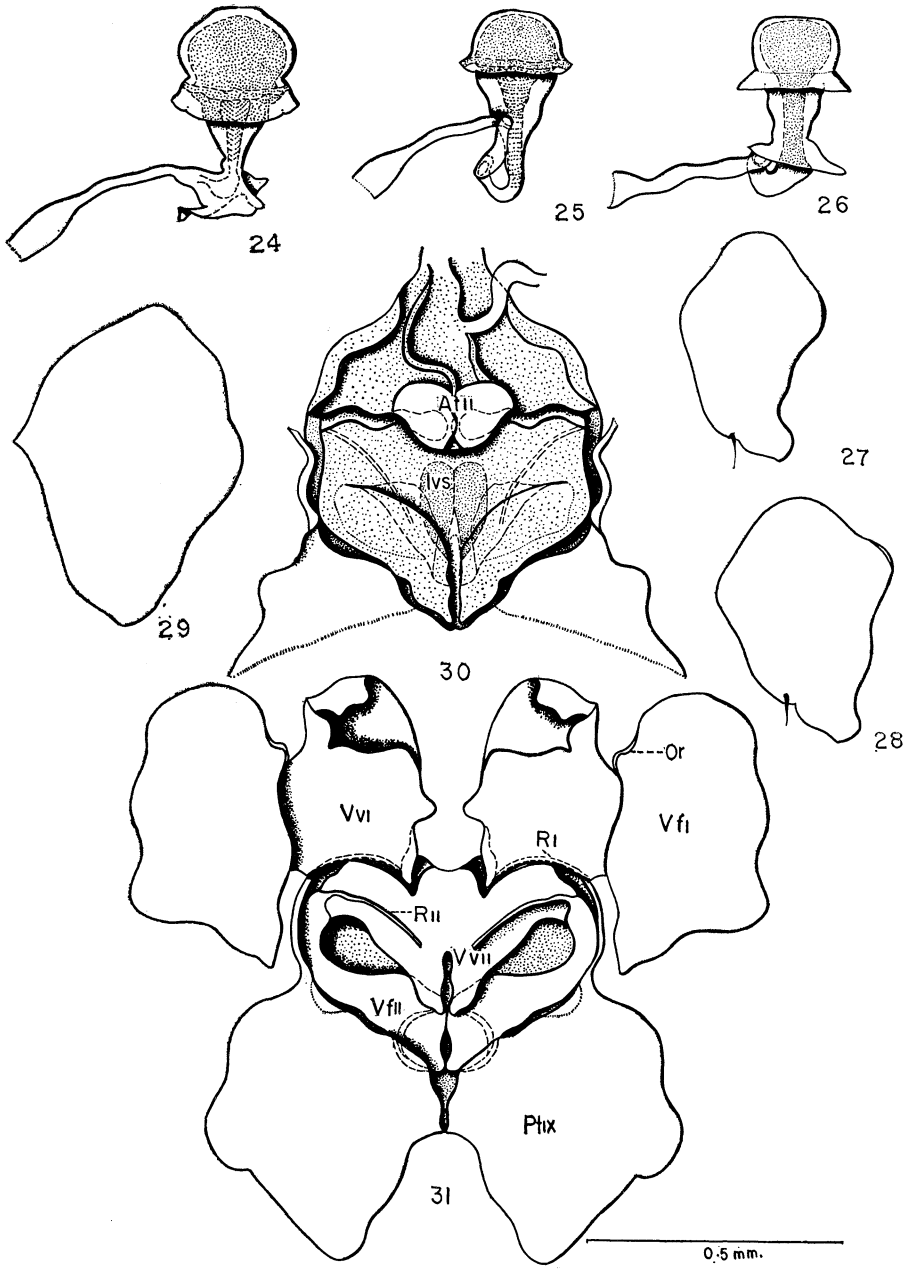


Plate III. *Spalacocoris* spp. Figs. 24–26. Spermathecae, ventral view. 24, *nigritus*; 25, *sulcatus*; 26, *sulcifer*. Figs. 27–29. First valvifers, ventral view. 27, *sulcatus*; 28, *nigritus*; 29, *sulcifer*. Figs. 30–31. Ovipositor, with part of 9th paratergite. 30, *sulcatus*, dorsal view; 31, *sulcatus*, ventral view. (Legends to the figs.: at II – attachment of the second valvifers; ivs–intervalvular sacs; or – outer ramus; pt IX – ninth paratergite; r I – first inner ramus; r II – second ramus; vf I – first valvifers; vf II – second valvifer; vv I – first valvulae; vv II – second valvulae.)

*coris.* The antennae are black and legs, including the fore femur are uniformly dark brown, often nearly black in color. This species is most closely related to *sulcifer* as is evidenced by the coloration of the mid and hind legs, the blunt apex to the apical plate of the sperm reservoir and by having an apical flange to the spermatheca. It can easily be separated from *sulcifer* by the pointed claspers (rounded in *sulcifer*), knob-like terminal plate of the sperm reservoir (cap-like in *sulcifer*) and other characters given in the key.

**Spalacocoris sulcifer** Stål

*Spalacocoris sulcifer* Stål, 1874: p. 130.—Distant, 1901, 1903 (as syn.).

General coloration black to dark mahogany brown; antennae nearly uniformly black; fore femur yellowish tan; fore tibia and entire mid and hind legs mahogany to reddish brown, the tibiae never pale yellow, fore tibial spines black; antennal segment I at most barely attaining apex of tylus, head acuminate, length cephalad of anterior margin of eye greater than eye length (7.5 mm) (in *sulcatus* the distances are subequal); length head, 1.30 mm; width head 1.03 mm; interocular space, .55 mm; pronotum robust, lateral margins straight, median groove shallow, becoming obsolete on posterior lobe, caudo-lateral pronotal lobes large and depressed, length pronotum, 2.65 mm; width pronotum, 1.85 mm; scutellum (length 1.05 mm) with median lobe strongly elevated near middle, tubercular projection small and obsolete, scent gland orifice lunate (fig 11); distance apex clavus- apex corium, 1.23 mm; distance apex corium- apex abdomen 4.05 mm, membrane extending midway onto terminal abdominal tergum; legs as in other members of genus; labium not attaining base of proster num, basal segment reaching base of head, length labial segments, I, .75 mm; II, .75 mm; III, .47 mm; IV, .60 mm; antennal segments II and III clavate, 4th weakly fusiform, length antennal segments, I, .30 mm; II, .45 mm; III, .46 mm; IV, .90 mm; apical end of sperm reservoir cap-like (fig 16); claspers rounded at apices (figs 3, 7).

MATERIAL EXAMINED: Holotype and 1 paratype: ♀ MALAYA: Malacca (Stevins) (Stockholm Mus.); 2♂♂ MALAYA: Perak, (F. M. S. Batang, Kadang), Kuala, Woh. BRITISH MUSEUM (NAT. HIST.).

In general size and appearance this species most closely resembles *sulcatus* (Walker). The leg coloration which is a useful superficial character to separate most species, is difficult to use here unless one has all species available for comparison. The large swollen fore femur is dull yellow but the mid and hind legs are dark castaneous to chocolate brown and this differs markedly from the pale coloration of all of the legs in *sulcatus* and *philippinensis.*

*Sulcifer* is a more robust species than *sulcatus* and has a less deeply grooved median pronotal furrow (this character is, however, somewhat variable in the genus).

Actually, *sulcifer* appears to be most closely related to the much larger *nigritus* as is evidenced by the rounded apex to the sperm reservoir, apical flange in the spermatheca, weakly grooved pronotal furrow and general habitus and coloration. The claspers and sperm reservoir are distinctive (figs 3–4, 7–8, 16–18).

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