

Viettherchnus Kirejtshuk, 1985 and *Ceramphosia* gen. n. from the Indo-Malayan Region (Coleoptera: Nitidulidae)

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The paper comprises a revision of the genus *Viettherchnus* endemic to the Indo-Malayan Region (*V. finitimus finitimus* Kirejtshuk, 1985; *V. f. indiensis* ssp. n.; *V. philippinensis* Kirejtshuk, 1987; *V. plagiatus* sp. n.; *V. sulawesiensis* sp. n.; *V. s. septentrionalis* ssp. n.) and description of *Ceramphosia cornuta* gen. et sp. n., presumably closely related to *Viettherchnus*.

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This paper deals with some little known and new representatives of the *Cyllodes* complex of genera (Nitidulinae), including fungivorous forms, many of which are rather characteristic for the Indo-Malayan Region.

The genus *Viettherchnus* Kirejtshuk, 1985 was proposed for a species from Vietnam characterized by highly specialized structure of the male mandible. The second species of this genus was described from the Philippines (*V. philippinensis* Kirejtshuk, 1987). Additional specimens collected in India, Vietnam, peninsular Malaysia, Sulawesi (Indonesia) and the Philippines have now been found among material from various museums. Among these specimens we found two new species of *Viettherchnus*. Finally, a specimen from Java belonging to the same complex of genera (*Cyllodes* complex) should be regarded as representing a separate, new genus. This genus shows structural adaptations similar to those in species of *Viettherchnus*, which presumably have developed independently to serve a very similar function.

Abbreviations: AIC – Australian National Insect Collection, Canberra; FMC – Field Museum of Natural History, Chicago; NHL – Natural History Museum, London; NMW – National Museum of Wales, Cardiff; SMD – Staatliches Museum für Tierkunde, Dresden; SMS – Staatliches Museum für Naturkunde,

Stuttgart; ZIN – Zoological Institute, Russian Academy of Sciences, St.Petersburg.

Genus *Viettherchnus* Kirejtshuk, 1985

Type species *Viettherchnus finitimus* Kirejtshuk, 1985 (by monotypy).

Remarks. This genus is distinguishable from all other genera of the *Cyllodes* complex by the presence of secondary sexual characters in the structure of the mandibles. It has also characteristic features in the body shape, prosternal process, mesosternum, antennae and legs, as well as in punctation and sculpture. All these features are given in the redescription (below) of the type species and omitted in descriptions of other species. The group under consideration includes species with extremely similar male and female genitalia. The taxonomic characters to distinguish the species of this group are found in the structure of the mandible, antennal club, middle and hind femora, coloration and punctation.

Key to species of the genus *Viettherchnus*

1. Body black with 2 small bright red distinct spots on each elytron; antennal club shorter than 2nd-8th antennal segments combined; elytral surface with more or less defined longitudinal rows of punctures. Figs 12-17. 2.5-2.9 mm. Peninsular Malaysia *V. plagiatus* sp.n.

- Body more or less unicolourous or sometimes with indistinct lightening of the disc of the pronotum or elytra; antennal club as long as 2nd-8th antennal segments combined 2
2. Punctures on elytra not arranged in longitudinal rows; punctuation of dorsum especially fine, particularly on the elytra; elytral apices separately rounded, forming a distinct sutural angle; antennal club no more than 1.3 times as long as wide; scape of male with gradually outlined external edge and not concave at frons. Figs 18-19 and Kirejtshuk, 1987, figs 4, 21-27. 2.1 mm. Mindanao
 *V. philippinensis* Kirejtshuk, 1987
- Longitudinal rows of punctures on elytra more or less distinct; sutural angle between the elytral apices less distinct; upper surface more coarsely punctured; antennal club at least 1.5 times as long as wide . . . 3
3. Antennal club narrower, slightly wider than tibiae, not longer than 2nd-8th antennal segments combined; male scapus with gently curved outer edge and without any trace of concavity at frons. Figs 1-9. 2.6-2.9 mm. Vietnam and southern India
 *V. finitimus* Kirejtshuk, 1985
- Antennal club comparatively larger, in the widest part about 1.5 times wider than tibiae, usually as long as 2nd-8th antennal segments combined or longer; male scapus with angulate outer edge and distinct concavity at frons. Figs 20-26. 2.3-3.0 mm. Sulawesi and Luzon *V. sulawesensis* sp. n.

Viettherchnus finitimus finitimus Kirejtshuk, 1985
(Figs 1-9)

Viettherchnus finitimus Kirejtshuk, 1985: 163-164 - Vietnam.

Specimen additional to the types. 1 ♂ (ZIN), "Vietnam: Prov. Gialai-Contum, Thai Nguyen, 9-16.XI. 1988, A. Gorochov" [in Cyrillic letters].

Description. Male. Length 2.6-2.9, breadth 1.9-2.1, height 0.8-1.0 mm. Almost hemispherical; dorsum almost black with dark brown elytra; pygidium, middle of hind metasternal half, ventral surface, legs, antennae, mouth parts and epipleura reddish (or slightly brownish), although the antennal club is quite dark; greater part of elytral disc frequently reddish; dorsum glabrous and shiny; ventral surface with short inconspicuous hairs.

Head surface with punctures as large as eye facets or somewhat smaller, separated by 2-3 puncture diameters; interstices smooth. Pronotum with slightly sparser punctures scarcely smaller than those on head; space between them smooth. Elytra with poorly outlined punctures in longitudinal rows, those on disc rather small, but at sides and at apices somewhat larger than those on head. Pygidial surface punctured nearly as head but with alutaceous interspaces. Ventral surface with punctures somewhat larg-

er than on dorsum; spaces between them on ventrites almost as wide as a puncture diameter and alutaceous, interspaces on prosternum and metasternum sparser (to 2 puncture diameters) and more or less smoothed.

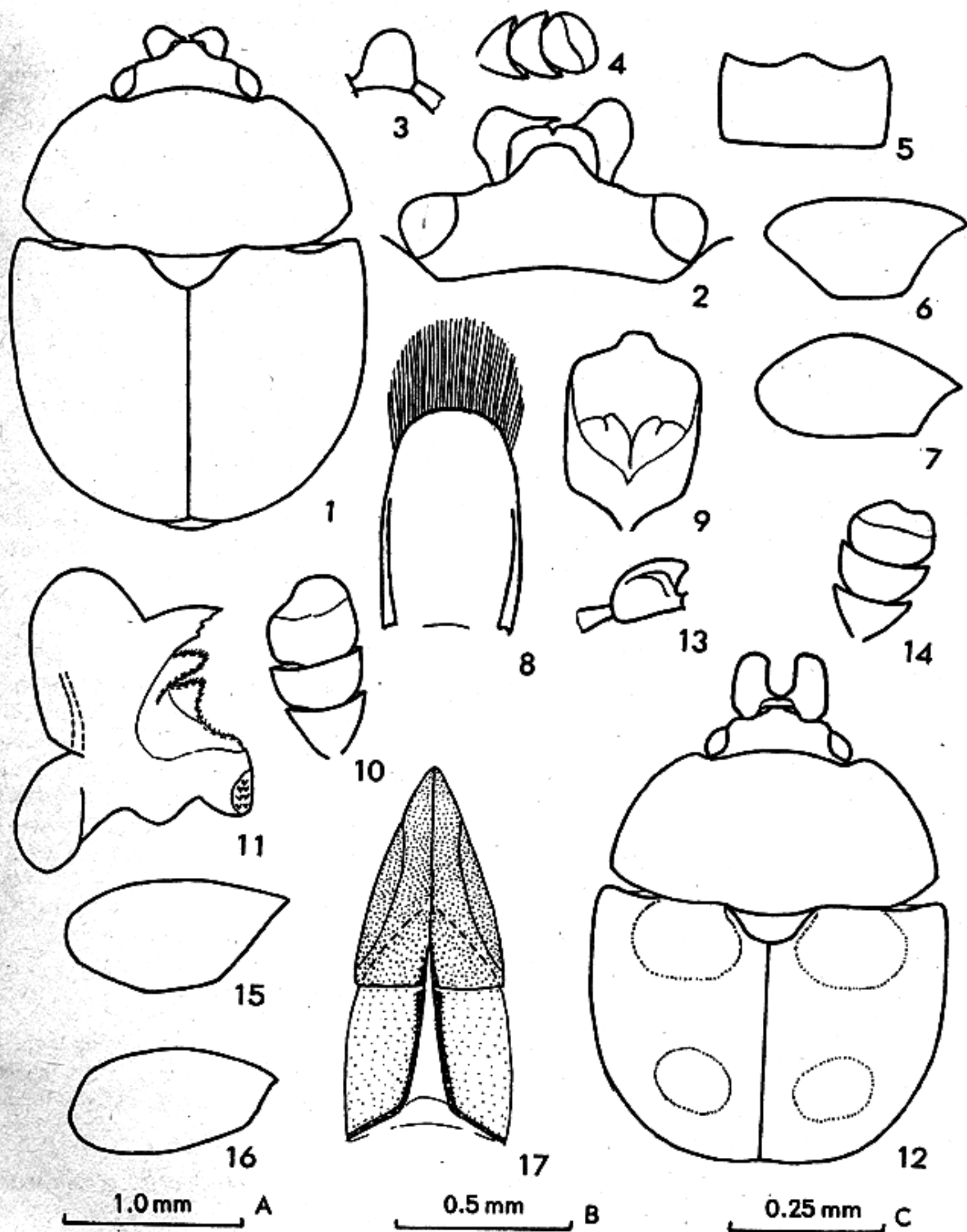
Head length slightly more than half the distance between eyes, widely depressed behind antennal insertions, its fore edge convex and widely rounded. Mandibles strongly elevated before labrum, with strongly raised lateral lobes. Antennae much shorter than breadth of head, their club scarcely longer than two-fifths of their total antennal length; scapus nearly as long as wide, subquadrangular, with curved outline along its edge. Antennal grooves slightly extended behind mentum and convergent. Pronotum strongly and evenly convex, narrowly bordered at sides and apex. Scutellum three times as wide as long. Elytra very strongly convex, narrowly bordered at lateral and apical edges, subsutural lines expressed only at distal fifth; their apices separately rounded. Pygidium widely rounded at apex.

Prosternum roof-like (carinate), with short flat and nearly rhomboid apex, vertically abrupt. Distance between middle and hind coxae subequal and three times greater than distance between fore coxae. Mesosternum deeply depressed and roof-like, with sharp carina. Metasternum flat, with fore part extended forward and shallowly emarginate at its edge, hind edge of metasternum almost straight. Caudal marginal lines of middle coxa strongly deviating from the middle of hind edge of cavity and inclining back to the middle of metepisternum, forming a triangle. Caudal marginal lines of hind coxae not developed. 1st ventrite much longer than hypopygidium, with transverse apex. Epipleura steeply sloping below.

All tibiae simple and nearly three-quarters as wide as antennal club. Femora 2.5 and more times wider than corresponding tibiae. Fore tarsi wider than tibiae but narrower than antennal club, middle and hind ones very narrow but with 1st-3rd tarsomeres narrowly lobed; claws simple.

Aedeagus well sclerotized.

Remarks. In the original description of this species, figures of femora are incorrect. This species is readily distinguishable by the coloration, punctuation, shape of the male head and mandibles and by the lack of sexual dimorphism in the shape of middle femora.



Figs 1-17. *Vlettherchnus*. 1-9, *V. finitimus finitimus*: 1, body, dorsal; 2, male head, dorsal; 3, scape of male; 4, antennal club; 5, mentum; 6, male middle femur, ventral; 7, male hind femur, ventral; 8, tegmen, ventral; 9, penis trunk, dorsal; 10-11, *V. finitimus indiensis* subsp. n.: 10, antennal club; 11, male right mandible, ventral; 12-17, *V. plagiatus* sp. n.: 12, body with outline of reddish spots on elytra, dorsal; 13, scape, dorsal; 14, antennal club; 15, male middle femur, ventral; 16, male hind femur, ventral; 17, ovipositor, ventral. Scales: A - to Figs 1, 6-7, 12, 15, 16; B - to Figs 3-5, 13, 14; C - to Figs 2, 8, 9.

Viettherchnus finitimus indiensis subsp. n.

(Figs 10-11)

Holotype. ♂ (NHL), India, "Madras, 68.106, *lucidus*" (*lucidus* is A. Murray's unpublished name), "indeterminable p. crr. *Cyll. humeralis* Grouv.??" (A. Grouvelle's label).

Description. Male, holotype. Length 3.3 (without head), breadth 2.2, height 1.1 mm. Reddish straw coloured with darkened antennal club and black eyes. Terminal segment of antennal club almost twice as large as 9th or 10th antennal segments.

Aedeagus nearly as that in the nominotypical subspecies, but weakly sclerotized, probably because the specimen under our study is teneral.

Remarks. This specimen with missing head looks like a teneral specimen of *V. f. finitimus*, but is somewhat larger and more finely punctured on the upper surface. The specimen also differs in the quite peculiar shape of the terminal antennal segment. We presume that the proposed subspecies can be distinguished from the nominotypical form on the basis of the antennal structure and larger body size.

Dissection of the head of the specimen under our study was undoubtedly carried out by A. Murray. By doing so he left only the antennal club and a part of the epicranium with some eye facets glued separately to the card, the rest of the epicranial remains are lost.

Viettherchnus philippinensis Kirejtshuk, 1987

(Figs 18-19)

Viettherchnus philippinensis Kirejtshuk, 1987: 151-152 - Mindanao.

Remarks. This species is the smallest among its congeners and has completely diffuse punctation on the elytra, with a slightly raised projection on outer edge in the male mandibles and comparatively short antennal club. This species can be identified using the key, additional figures are given in Kirejtshuk, 1987: 149 (Figs 4, 21-27).

Viettherchnus plagiatus sp. n.

(Figs 12-17)

Holotype. ♂ (SMS), peninsular Malaysia, "Cameron Highlands, Tanah Rato, 1-6.4.1990, A. Ridel".

Paratypes. 6 specimens (NMW, SMS, ZIN), as holotype.

Description. Male, holotype. Length 2.8, breadth 1.8, height 0.9 mm. Ventral surface

somewhat convex, dorsum black, with two bright red spots on each elytron, one at the base between shoulder and scutellum and another behind the middle; ventral surface and appendages dark brown with a blackish antennal club; space between antennal insertions with a deep transverse concavity bearing a low tubercle on each side; mandibles with lateral projections long and flat, subparallel-sided, with their apices bluntly rounded-off, their ventral surface concave for most of their length; middle and hind femora as figured; punctures on elytra much finer and shallower than those on pronotum, smaller than eye facets, separated by four to five diameters, evenly distributed over surface. Aedeagus moderately sclerotized.

Female. Similar to male, differing in not projecting mandibles and not exposed anal sclerite. Ovipositor moderately sclerotized.

Variations. Length 2.5-2.9 mm. The size of the elytral spots varies between individuals, but the position is quite regular. One male paratype has the mandibular process very poorly raised, but in all cases the processes are subparallel-sided.

Remarks. This species is easily distinguishable by the specific coloration, modifications of the male mandible, dark and comparatively small antennal club, and by the elytral surface with almost diffuse punctation, in contrast to *V. finitimus* and *V. sulawesiensis* sp.n. Further, the ventral side of the body in this species is more convex than in other members of the genus. The shapes of the middle and hind femora of this new species are different from those of both above-mentioned species.

Viettherchnus sulawesiensis sp. n.

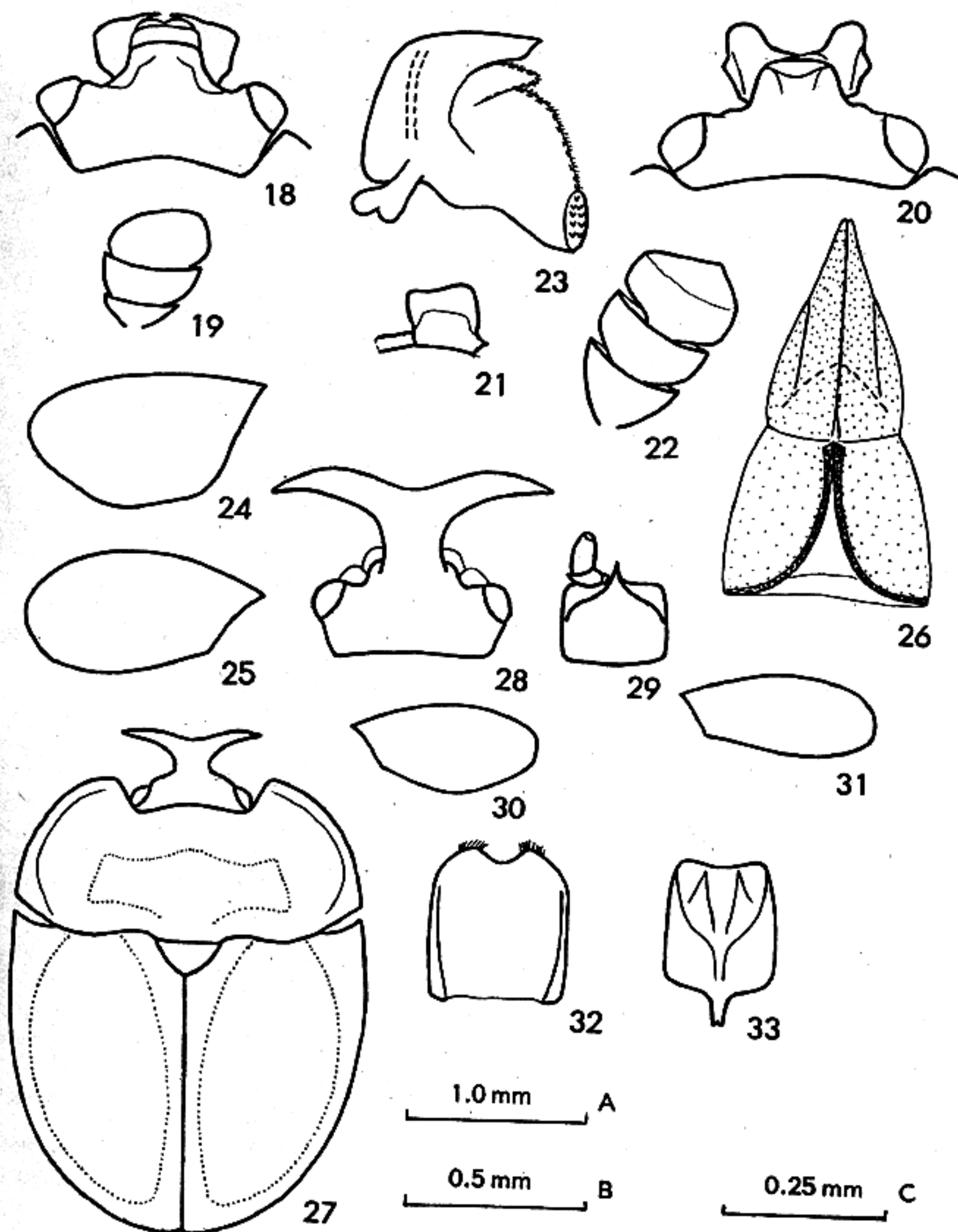
Description. Body almost unicolourous chestnut brown, with a considerable lateral projection of male mandible and rather large antennal club.

Viettherchnus sulawesiensis sulawesiensis subsp. n.

(Figs 20-26)

Holotype. ♂ (NHL), Indonesia, "Sulawesi, Utara, Dumoga-Bone N.P., 9-16 May 1985, lowland forest, ca 200 m. Malaise trap, R. Ent. Soc. Lond. Project Wallace B.M. 1985-10."

Paratypes. 22 specimens, all from Dumoga-Bone N.P. (AIC, NHL, NMW, ZIN): 1, "15-22 May 1985, Plot B, ca 300 m, Lowland forest, Malaise trap 1"; 1, "April 1985, Plot B, ca 300 m, Lowland forest, Malaise trap



Figs 18-33. *Viettherchnus* and *Ceramphosia* gen. n. 18-19, *V. philippinensis*: 18, head, dorsal; 19, antennal club; 20-26, *V. sulawesiensis sulawesiensis* sp. et subsp. n.: 20, head, dorsal; 21, scape, dorsal; 22, antennal club; 23, female right mandible, ventral; 24, male middle femur, ventral; 25, male hind femur, ventral; 26, ovipositor, ventral; 27-33, *C. cornuta* gen. et sp. n.: 27, body with outline of reddish spots on pronotal and elytral discs, dorsal; 28, head, dorsal; 29, mentum with labial palpus, dorsal; 30, male middle femur, ventral; 31, male hind femur, ventral; 32, tegmen, ventral; 33, penis trunk, dorsal. Scales: A - to Figs 24-25, 27, 30-31; B - to Figs 18-22, 28-29; C - to Figs 23, 26, 32-33.

7"; 1, "24 February 1985, Plot B, ca 300 m, Lowland forest, Flight interception trap 2"; 2, "3 January 1985, Lowland forest ca 200 m, fungi on log"; 3, "2 January 1985, Base Camp area ca 190 m. At light"; 1, "13-20 March 1985, Plot B, ca 300 m, Lowland forest, Malaise trap 1"; 2, "April 1985, Plot B, ca 300 m. Lowland forest, flight interception trap"; 1, "9-16. May 1985, Lowland forest, ca 200 m, Malaise trap"; 1, "Edwards Camp, lowland forest, 664 m, 26.V-28.V., Malaise trap"; 1, "G. Mogogonipa summit, 1008 m. 24 February 1985, Malaise trap"; 1, "24/4-1/5/85, Plot A, ca 200 m, Lowland forest, Malaise trap 1"; 1, "6-13 February 1985, Plot B, ca 300 m, Lowland forest, Malaise trap 1"; 1, "November 1985, Plot B, ca 300 m, Lowland forest, Malaise trap 2"; 1, "0° 35' N, 123° 54' E, 232 m, 1-3.IX.1985, A.H. Kirk-Spriggs, Malaise trap sample, Rentic 3"; 3, "0° 34' N, 123° 54' E, 214 m, 21-23.VII.1985, A.H. Kirk-Spriggs, Malaise trap sample, forest edge, Sungai Tumpah" ("23. vii-3. viii. 1985" and "13-21.VII.1985"); 1, "9-16 May 1985, Lowland forest edge, ca 200 m, Malaise trap"; 1, "24-31 July 1985, Plot B, ca 300 m, Lowland forest, Malaise trap 3".

Description. Male holotype. Length 3.0, breadth 2.0, height 1.0 mm. Dorsum chestnut brown, with elytral suture and large basal part of elytra around scutellum paler; spots absent; ventral surface and appendages dark brown, antennal club with first two segments and basal part of apical segment black; space between antennal insertions shallowly concave, with a ridge-like tubercle on each side; mandibles with the outer edge of each projection angulate, their apices bluntly pointed, turning up abruptly at half their length; middle and hind femora as figured; punctures on elytra slightly finer and shallower than those on pronotum, nearly as large as eye facets, separated by two and a half to three diameters and loosely arranged into longitudinal rows. Aedeagus moderately sclerotized.

Female. Similar to male, but differing in the simple mandibles and not exposed anal sclerite. Ovipositor moderately sclerotized.

Variations. Length 2.6-3.0 mm. In some individuals the greater part of the elytral disc and side margins of the pronotum are paler in colour. There is also some variation in the development of the male mandibular processes, but even in small-sized males the outer edge of each projection is angulate.

Remarks. This species is distinguished by its comparatively larger and paler antennal club and brownish yellow lighter parts of the body, as opposed to *V. finitimus* and *V. plagiatus* sp. n. in which the lighter parts are reddish. In addition, the shapes of the middle and hind femora are quite different from those in other species of the genus. This species can be divid-

ed into two geographical subspecies: the nominotypical one (*V. s. sulawesiensis* from Sulawesi) and another one (*V. s. septentrionalis* from Luzon). The last form is differing from the nominotypical only in the dark unicolourous and, perhaps, slightly smaller body, but this difference in coloration is rather constant among the studied specimens from Indonesia and Philippines.

Viettherchnus sulawesiensis septentrionalis ssp. n.

Holotype. ♂ (FMC), Philippines, "Mt. Makiling, Laguna prov., 4 km SE Los Banos, 11-IV-1977", "berlese debris, under bark, L.E. Watrous".

Paratypes. 9 specimens (FMC, ZIN), as holotype, but partly collected "7-IV-1977" and "8-IV-1977", some labelled "on fungi".

Description. Male, holotype. Length 2.4, breadth 1.9 mm. Dorsum unicolourous chestnut brown, with the remaining characters as those in the nominotypical subspecies. Further, mandibles of studied males of this subspecies have shorter apices and wider lateral processes.

Female. Similar to male, but differing in the features mentioned for the female of the nominotypical subspecies.

Variations. Length 2.3-2.8 mm. All paratypes with comparatively dark and unicolourous dorsum.

Genus *Ceramphosia* gen. n.

Type species *Ceramphosia cornuta* gen. et sp. n.

Remarks. This genus is proposed for the single species described below. We regard the strongly raised, quite peculiar frontal horn as an essential feature of the new genus. At present only a single male of the genus is known. We admit that the above mentioned character probably refers only to secondary sexual characters of the male, but the new genus is also distinguishable in possessing a strong median process at the anterior edge of mentum, and in the prohypomera and epipleura steeply sloping downwards. The specimen under study has a shallowly emarginate hind edge of metasternum, whereas in most species of the *Cyllodes* complex the hind edge of metasternum is straight (except in species of the genus *Palloides* Erichson, 1843 with hind edge of metasternum deeply emarginate). Moreover, the distance between the hind coxae in *Ceramphosia* gen. n. compared to that between fore and middle coxae has similar proportions as those in *Cyllodes*, *Neopallodes* Reitter, 1884

and *Viettherchnus*. *Ceramphosia* is separable from the *Neopallodes* by the presence of characteristic horn in the male; the prosternal process not projecting behind; normal length of tarsi on all legs; unmodified shape of tibiae and slightly exposed anal sclerite of the male. All the remaining characters of *Ceramphosia* are similar to those of *Cyllodes* species.

Ceramphosia cornuta sp. n.
(Figs 27-33)

Holotype. ♂ (SMD), Indonesia, "Mt. Guntur, Garoet, Westjava, 1350 m, Overbeck leg., 1935, 1" (antennae missing).

Description. Male, holotype. Length 3.0, breadth 2.0, height 1.2 mm. Body subovate, bright reddish brown, with dorsal surface of head, marginal stripes of pronotum and each elytron rather darkened (almost blackish); dorsum smooth and shiny, with dorsal and ventral surface glabrous.

Head and pronotal surface with small distinct punctures, significantly smaller than eye facets, separated by four to six diameters; interspaces between them smooth. Elytra with clearly defined longitudinal rows of punctures somewhat larger than those on head and pronotum, intervals between punctures in a row to three puncture diameters; interspaces between rows with diffuse and scarcely visible punctures. Prosternum, metasternum and ventrites with not quite distinct punctures, larger than eye facets; interspaces between them about a puncture diameter, but in the middle of metasternum punctures become much sparser and considerably smaller, and on hypopygidium punctures are as large as eye facets, separated by up to three puncture diameters.

Head concave, nearly as long as distance between eyes, the latter are composed of comparatively small facets; frontal part of head extended into a widely forked horn. Labrum not visible under frontal horn. Mandibles moderately raised. Mentum subquadrangular, slightly narrowed forward, about 1.5 times as wide as long, with a median process before anterior edge. Terminal segments of labial palps bulbous at base, becoming narrower towards truncate apices, slightly longer than thick. Pronotum gently sloping to lateral margins, with deeply excised fore margin and convex hind margin extending back posteriorly to cover part of scutellum. Elytra gently and steeply sloping to lateral and apical margins,

their apices rounded, forming a slightly visible sutural angle; sutural lines closely following the suture and traced only at distal quarter. Pygidium slightly exposed from under elytral apices, with widely rounded hind margin. Anal sclerite scarcely visible from under pygidial apex.

Prosternum sharply carinate before procoxae and flattened behind them; intercoxal process vertically abrupt at apex. Mesosternum sharply carinate in distal half and flatly sloping forward. Metasternum slightly convex, its fore edge between coxae shallowly arched and emarginate, its hind edge between coxae almost straight. Caudal marginal line behind middle coxal cavities slightly arched, deviating from hind edge of coxal cavity at outer part; intercoxal line closely approached to fore edge of metasternum. Distance between middle coxae about twice that between hind coxae, almost three times that between fore coxae. Caudal marginal lines behind hind coxal cavities not deviating from their edge. First ventrite nearly as long as second to fourth combined. Hypopygidium slightly longer than preceding ventrite and widely rounded at almost transverse apex. Hypomera and epipleura extremely steeply sloping downwards.

All tibiae flattened, subtriangular, about 1.5 times as wide as prosternal process. All femora flattened, 2.5-3.5 times wider than tibiae. Fore tarsi slightly narrower than tibiae, but middle and hind tarsi not wider than half the width of tibiae, tarsal claws simple.

Aedeagus moderately sclerotized.

Discussion. The two genera dealt with in this paper should be regarded as members of the *Cyllodes* complex of genera, the species of which pass all stages of their life cycle in association with soft and fruiting bodies of fungi, or mycelial aggregation (Hayashi, 1978; Leschen, 1988; Kirejtshuk, 1992; and others). The Australian endemic groups evidently deviated from the *Cyllodes* complex and have quite different bionomic features: Lawrenceosini are myrmecophilous (Kirejtshuk, 1990) and Camptomorphini are known as predators of scale insects (Kirejtshuk & Lawrence, 1992).

It may be assumed that in the type of feeding both genera show adaptations similar to those in other members of the *Cyllodes* complex. The molar part of mandibles of *Viettherchnus* and *Cyllodes* shows a tendency for reduction (see Figs 11, 23), apparently associated with the liquid food consumed. It seems that the man-

dibular structure corresponds to the published data on the mode of life (see works cited above). Therefore we assume that the peculiar structure of the mandibles of *Viettherchnus* species and the shape of the frons of *Ceramphosia cornuta* gen. et sp. n. are adaptations which have evolved in the result of their specialized mode of life. It is possible that the peculiar mandibular adaptations described above serve a specific function of moving aside soft fungal substrate.

It is quite significant, at least in the species of *Viettherchnus*, that the structural adaptation in the mandible has strengthened the sexual dimorphism. This way of evolutionary change in the Nitidulidae is sufficiently regular and usually characterises the formation of taxa with a supraspecific rank (Kirejtshuk, 1992, 1994).

Our treatment of these groups as separate genera reflects our desire to express their distinctiveness, although we appreciate in phylogenetic terms the recent separation of both *Viettherchnus* and *Ceramphosia* gen. n. from the main trunk of the *Cyllodes* complex of species. It should be understood that our treatment of these genera is preliminary until the *Cyllodes* complex of genera is fully revised; it is clear, however, that both groups should have a particular position within the complex of genera as taxa of subgeneric or generic rank.

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