Zeitschrift: Entomologica Basiliensia
Herausgeber: Naturhistorisches Museum Basel, Entomologische Sammlungen
Band: 2 (1977)

Artikel: Coleoptera: Fam. Carabidae Subfam. Trechinae
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DOI: https://doi.org/10.5169/seals-980656

Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel

Coleoptera: Fam. Carabidae Subfam. Trechinae

By **Shun-Ichi Uéno**

Abstract: The collection of Trechinae made by the Bhutan-Expedition 1972 made by the Naturhistorisches Museum in Basel contains six species, of which four are new to science and are described, while the remaining two, both alate, are previously known from northern India and its adjacent areas. The new species are *Perileptus* (s. str.) *cylindriformis, Trechus* (s. str.) *bhutanicus* (close to *T. imaicus* from Sikkim), *T.* (s. str.) *wittmeri* (related to *T. balfourbrownei* from West Bengal), and *Bhutanotrechus reflexicollis*. Of particular interest is *Bhutanotrechus* (new genus), which is a derivative of the *Agonotrechus* stock but is greatly different in the mode of specialization from other derivative genera of the same phyletic group. *Perileptus cylindriformis* is also remarkable, having no close relatives in the nominate subgenus but resembling *P. cameroni* of the subgenus *Parablemus*. At all events, the trechid fauna of Bhutan is decisively Himalayan and bears a close relationship to those of West Bengal and Sikkim.

Since *Trechus indicus* was described by PUTZEYS (1870, pp. 175–176) from "Indes orientales", many papers have been published on the trechid fauna of the Himalayan Mountains. First brought to light were Indian and Sikkimese species, which were mainly dealt with by JEANNEL (1920, 1923, 1926, 1927, 1928 a, b, 1930, 1935), and also by ANDREWES (1935, 1936) and the present author (1965, 1972 a, 1976). Nepalese forms became known to science only after the Second World War, but about a dozen species have already been recorded from the mountainous country since 1960 (JEANNEL, 1960 b; UÉNO, 1967, 1972 b, 1973; HŮRKA, 1970; MORVAN, 1972). Although our knowledge is still very poor as to the trechid faunas of northern Burma and the Chinese side of the Himalayan Massif, there are at least some fragmentary records for Tibetan (JEANNEL, 1928 a, 1935), Burmese (BATES, 1892, pp. 297–298; ANDREWES, 1947, p. 4), and Yunnanese (JEANNEL, 1927, pp. 160–161, 1935, p. 275, 1937, pp. 87–88) trechine beetles. Thus, Bhutan has remained a large gap in our knowledge of the distribution of Himalayan trechids.

Through the courtesy of Dr. Walter Wittmer, I have had an opportunity to study a collection of Trechinae made by the Bhutan-Expedi-

tion 1972 organized by the Naturhistorisches Museum in Basel. Consisting of thirty specimens, the collection is not particularly large, but is very interesting from the taxonomic and zoogeographic points of view. As a matter of fact, this is the first lot of trechid beetles ever brought forth from Bhutan.

After a close examination, it has become apparent that the Bhutanese specimens are classified into six species belonging to four different genera. Two of them, *Neoblemus championi* and *Trechus indicus,* are fully winged, widespread species, previously known from northern India and its adjacent areas. The remaining four are new to science, and will be described in this paper under the names of *Perileptus* (s. str.) *cylindriformis, Trechus* (s. str.) *bhutanicus, T.* (s. str.) *wittmeri* and *Bhutanotrechus reflexicollis.* With the exception of the first-named, all these new species are apterous subalpine insects and are doubtless endemic to Bhutan.

Zoogeographically, the trechid fauna of Bhutan is definitely Himalayan. Four of the six known species either occur or have close relatives in West Bengal and/or in Sikkim; *N. championi* and *T. indicus* are widespread as noted elsewhere, *T. bhutanicus* is closely allied to Sikkimese *T. imaicus,* and *T. wittmeri* is related to West Bengalese *T. balfourbrownei. Perileptus cylindriformis* is an isolated species known so far only by the single type-specimen, but it shows a striking resemblance to *P. cameroni,* which occurs in West Bengal (cf. Uéno, 1976, p. 47). At any rate, this is an alate lowland insect, so that its occurrence in other parts of the Himalayas, most probably in West Bengal, can be safely surmised. This is also suggested by the distribution of *N. championi,* in whose coexistence the type of *P. cylindriformis* was discovered. Of particular interest is *Bhutanotrechus reflexicollis.* This remarkable trechine is a peculiar derivative of the *Agonotrechus* stock and has no close relatives anywhere, but the *Agonotrechus* group itself is primarily Himalayan, narrowly extending eastwards through Yunnan and northern Viet-Nam to high mountains in Taiwan and southwestern Japan (cf. Uéno, 1975, p. 150).

It seems apparent that all the trechid beetles endemic to Bhutan are high altitude inhabitants, while the non-endemic species appear to occur only at lower altitudes along river valleys in the western part of the country. Needless to say, the materials now available, which were taken only at nine different localities, are too small to disclose the true aspect of the trechid fauna of Bhutan. However, no systematic col-

lectings of this group of beetles have ever been attempted in the Himalayas, and the fragmentary collections previously made in other Himalayan countries are nearly always useless for analysing the vertical distribution of the subfamily. It is, therefore, not meaningless to make the above remark, however tentative it may be.

The specimens examined in this study, including all the holotypes of the new species, are deposited in the collection of the Naturhistorisches Museum in Basel, with the exception of some of the paratypes and duplicate specimens, which are retained in the National Science Museum (Nat. Hist.), Tokyo. The abbreviations employed throughout this paper are as follows: AL = length of antennae; HW = greatest width of head, including eyes; PW = greatest width of pronotum; PL = length of pronotum, measured along the mid-line; PA = width of pronotal apex; PB = width of pronotal base; EW = greatest width of elytra; EL = greatest length of elytra; M = arithmetic mean.

Before going into further details, I wish to express my sincere thanks to Dr. Walter Wittmer for giving me the privilege of studying the very interesting collection of Bhutanese Trechinae made by the painstaking efforts of the expedition members.

Perileptus (s. str.) **cylindriformis** S. Uéno, sp. nov., Figs. 1–2

Length: 2.00 mm (from apical margin of clypeus to apices of elytra).

Very remarkable, isolated species, somewhat resembling *P. cameroni* (JEANNEL, 1923, pp. 397, 407, fig. 7, 1926, pp. 408, 427, fig. 205; ANDREWES, 1935, pp. 50, 54, fig. 6; UÉNO, 1976, p. 44, figs. 1–2) in general appearance, but it is darker, smaller, narrower and parallel-sided, and is decisively different from the latter species in the arrangement of elytral pubescence (cf. UÉNO, 1976, loc. cit.).

Small, elongate and convex; fully winged; surface covered with recurved pubescence, which is fairly dense on elytra. Colour light reddish brown, shiny; head dark brown except for buccal parts; lateral sides of pronotum and elytra narrowly edged with dark colour; each elytron with a vague dark blotch just behind the middle; ventral side of hind body blackish brown with the exception of epipleura which are dark yellowish brown; antennae brown except for proximal segments; palpi, two or three proximal segments of antennae, legs and pubescence light yellowish brown.

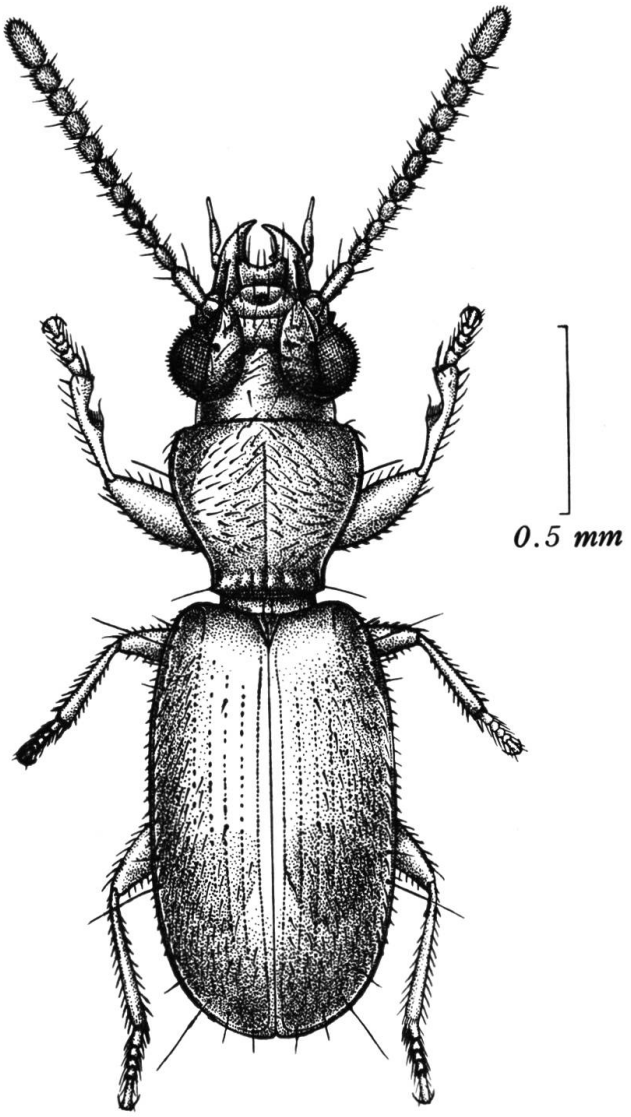


Fig. 1. *Perileptus* (s. str.) *cylindriformis* S. Uéno, sp. nov., ♂, of Samchi in southwestern Bhutan.

Head large and wide, almost as wide as pronotum, and moderately depressed above; surface rather sparsely covered with fairly long, recurved hairs; frontal furrows deep throughout, strongly arcuate, and rather widely divergent anteriad; frons flat, with a transverse furrow connecting frontal furrows at the level of anterior supraorbital setae; vertex and supraorbital areas moderately convex and more or less uneven; eyes large and prominent; genae very short, flat, and only slightly oblique; neck wide, with distinct neck constriction; clypeal central tubercle distinct; labrum shallowly emarginate at apex and

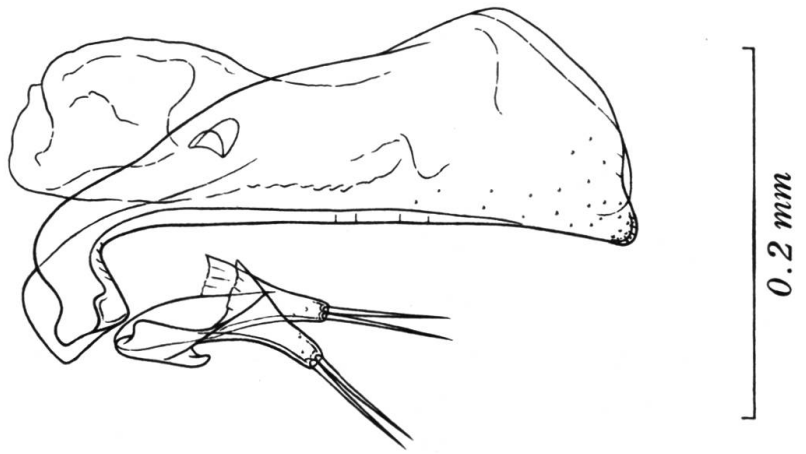


Fig. 2. *Perileptus* (s. str.) *cylindriformis* S. Uéno, sp. nov., of Samchi; male genitalia, left lateral view.

without central tubercle; antennae short, stout, moniliform and dilated towards apices, only reaching basal one-ninth of elytra, AL/EL 0.80, with segment 2 about as long as segment 3 and distinctly longer than segment 4, segments 7–10 each globular, only slightly longer than wide, terminal segment a little longer and broader than scape.

Pronotum cordate and convex, a little wider than long, widest at five-sevenths from base and contracted posteriad; PW/HW 1.03, PW/PL 1.11, PW/PA 1.34, PW/PB 1.68; surface rather densely covered with piliferous punctures, the hairs being fairly long and suberect; sides finely bordered throughout, gently arcuate in front, feebly so behind the widest part, distinctly sinuate at about one-seventh from base, and then parallel to each other towards hind angles, which are obtuse and not denticulate; apex very slightly arcuate, with front angles rounded off; base much narrower than (about four-fifths as wide as) apex, PA/PB 1.26, nearly straight at middle, but obliquely truncated at each side near hind angle; median line wide and sharply cut on the disk, but not widening basad nor reaching base; basal area depressed, with the transverse impression wide and mal-defined but coarsely rugose; basal foveae small though fairly deep; postangular carinae very short but distinct.

Elytra elongate, widest at about one-third from base, and very slightly compressed just behind middle; EW/PW 1.27, EL/EW 1.73; surface convex though moderately depressed on the disk, basal area steeply declivous towards basal peduncle; shoulders distinct and sa-

lient, with the base roundly advanced at each side; humeral border strongly arcuate, curving backwards to the base of stria 5; sides narrowly bordered throughout, very feebly arcuate behind shoulders, almost straight at middle, and then feebly arcuate again to apical seventh; apices almost conjointly rounded, though having a very small re-entrant angle at suture; striae deeply impressed and coarsely punctate on the disk, but disappearing near base, before apex and at side, stria 1 entire except for the basal portion, 2–5 distinct for the large part, 5 deepening near base and continuing to marginal gutter, 6 indicated by a row of slight punctures, 7–8 evanescent; intervals lightly convex on the disk but flat at the side, irregularly covered with rather short, suberect pubescence, which is largely worn out on the disk in the type-specimen but is dense at the side; stria 3 with three setiferous dorsal pores at about $^1/_5$, $^1/_2$ and $^4/_5$ from base respectively, though not conspicuous.

Microsculpture nearly obliterated, trace of transverse lines being detected in some parts of head and pronotum, but not on elytra.

Legs short and stout; protibiae widely dilated towards apices and gently bowed; tarsi thick, segments 3–4 each wider than long in pro- and mesotarsi, about as wide as long in metatarsus; in ♂, two proximal segments of each protarsus moderately dilated and inwardly denticulate at apices.

Male genital organ small, but the ventral part of aedeagus is moderately sclerotized. Aedeagus about two-sevenths as long as elytra, widely dilated towards large apical orifice, and with very small basal part, which is strongly bent towards the ventral side; apex rounded; ventral side nearly straight at middle in profile. Styles very small and of equal length, each provided with two setae at apex.

Female unknown.

Type-specimen: Holotype: ♂, Samchi, 300 m, southwestern Bhutan, 7/11-V-1972.

Notes: Because of the unusually convex, cylindrical form of body, the peculiar configuration of prothorax and the short stout appendages, this interesting new species is very much isolated from the other members of the subgenus *Perileptus* (s.str.) and resembles *P. cameroni* Jeannel of northern India. The latter species belongs to the subgenus *Parablemus,* which is mainly characterized by the regular arrangement of elytral pubescence and the convex ovate elytra. In the holotype of

P. cylindriformis, the pubescence is largely worn out on the disk, but outer intervals are densely covered with rather short pubescence as in the other species of the nominate subgenus, and minute punctures scattered on inner intervals, which can be detected under high magnification, show that a similar condition of pubescence must have existed all over the elytra. Besides, it has an elongate parallel-sided body, which could be regarded as the typical *Perileptus*-form, were it not for the unusual convexity. Perhaps, the present species represents an intermediate state between *Perileptus* (s. str.) and *Parablemus,* the latter of which has been derived from the former beyond all doubt.

Neoblemus championi Jeannel, 1923

Neoblemus championi JEANNEL, 1923, Ann. Mag. nat. Hist., (IX), 12, pp. 410, 411; type-locality: Diva (Kumaon). ANDREWES, 1935, Fauna Brit. Ind., Coleopt. Carab., 2, p. 57.

Neoblemus Championi: JEANNEL, 1926, Abeille, Paris, 32, p. 434. CSIKI, 1928, Coleopt. Cat., pars 98, p. 231.

Specimens examined: 5 ♂♂, 1 ♀, Samchi, 300–350 m, southwestern Bhutan, 7/11-V-1972.

Notes: This species, the type of the genus, is widely distributed along the southern side of the Himalayas, from the Uttar Pradesh in the northwest to Assam in the southeast. I have seen seven of the nine specimens of the type-series and a few additional ones, from various localities in northern India. The Bhutanese specimens examined accord well with the Indian ones in every detail, excepting that the elytra are somewhat smaller and shorter on an average. The standard ratios of body parts in the Bhutanese specimens are as follows: AL/EL 1.27–1.34 (M 1.31) in ♂, 1.19 in ♀, PW/HW 1.02–1.04 (M 1.03), PW/PL 1.33–1.38 (M 1.36), PW/PA 1.16–1.23 (M 1.20), PW/PB 1.51–1.57 (M 1.55), PA/PB 1.23–1.36 (M 1.29), EW/PW 1.28–1.33 (M 1.31) [1.30–1.40 (M 1.35) in the type-series], EL/EW 1.64–1.76 (M 1.70) [1.70–1.79 (M 1.74) in the type-series].

Trechus (s. str.) **indicus** Putzeys, 1870

Trechus indicus PUTZEYS, 1870, Ent. Ztg. Stettin, 31, p. 175; type area: Indes orientales. JEANNEL, 1923, Ann. Mag. nat. Hist., (IX), 12, p. 416, fig. 11. ANDREWES, 1935, Fauna Brit. Ind., Coleopt. Carab., 2, pp. 63, 64.

Trechus (s. str.) *indicus:* JEANNEL, 1927, Abeille, Paris, 33, pp. 157, 158; 1928, Ann. Mag. nat. Hist., (X), *1*, p. 284; 1935, Rev. fr. Ent., *1*, p. 275. CSIKI, 1928, Coleopt. Cat., pars 98, p. 246.

Trechus indicus var. *Championi:* ANDREWES, 1947, Ark. Zool., 38 A (20), p. 4 [nec Jeannel, 1920].

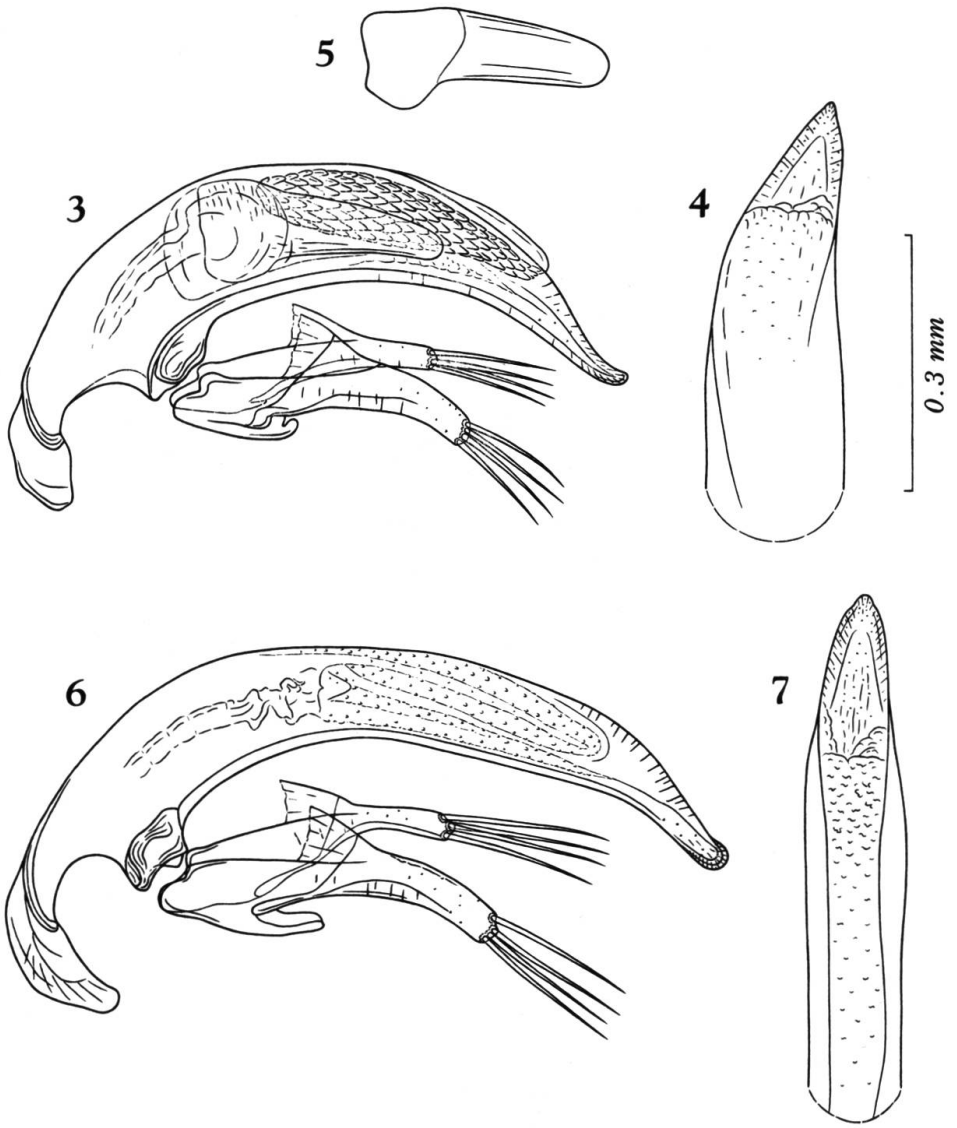
Trechus (s. str.) *macrops* JEANNEL, 1927, Abeille, Paris, 33, pp. 157, 160, figs. 533–536; type area: Yun-Nan; 1928, Ann. Mag. nat. Hist., (X), *1*, p. 289. CSIKI, 1928, Coleopt. Cat., pars 98, p. 246.

Trechus macrops: ANDREWES, 1935, Fauna Brit. Ind., Coleopt. Carab., *2*, pp. 63, 67, fig. 10.

Specimens examined: 1 ♀, Golakha, 1,780 m, southwestern Bhutan, 29-IV-1972; 1 ♂, 1 ♀, Paro, 2,300 m, western Bhutan, 28-IV-1972; 4 ♂♂, 6 ♀♀, Thimphu River, 2,300–2,500 m, western Bhutan, 29-IV-1972.

Notes: This is a very variable species widely distributed along the Himalayas, from Kashmir in the west to northern Burma, Yunnan and Szechwan in the east. It has not been recorded from Nepal, but *T. nepalensis* Morvan (1972, p. 988, figs. 15–17), described from Choya in the valley of Kali Gandaki, is no doubt conspecific with *T. indicus* according to my re-examination of one of its paratypes. However, I have refrained from suppressing Morvan's name, since certain differences observed between the paratype of *T. nepalensis* and specimens of *T. indicus* from northern India and Bhutan may prove to be geographical. Although a careful comparative study based upon fuller materials is needed for drawing a final conclusion, I should like to point out at present that the longer and more strongly curved apical part of aedeagus and the presence of sagittal aileron, both regarded by Morvan as the characteristics distinguishing *T. nepalensis* from *T. macrops (= T. indicus),* cannot be used as specific characters. These aedeagal features are variable both geographically and individually, and the sagittal aileron is usually well developed in *T. indicus,* contrary to the description and figure given by Jeannel in his account of *T. macrops.*

The specimens from Bhutan are somewhat different from those of northwestern India in that the coloration is darker, that the pronotum is more transverse, and that the apical part of aedeagus is broader and less sharply bent at the extremity. They are probably closer to the Chinese population, which was described by JEANNEL (1927, pp. 157, 160) as a full species, *T. macrops,* but later synonymized by the same author (1935, p. 275) with *T. indicus.* Further, the preapical pore on each elytron is usually absent in the Bhutanese specimens, a condition which is very exceptional in the genus *Trechus* and which was used by JEANNEL (1960 a, p. 50) for erecting his subgenus *Meruitrechus* for two African species. In *T. indicus,* this pore is always weak and often absent on one elytron. The degeneration attains to its extreme in the Bhutanese



Figs. 3–7. Male genitalia, left lateral view (3 and 6), apical part of aedeagus, dorsal view (4 and 7), and separated copulatory piece, left lateral view (5). 3–5, *Trechus* (s. str.) *bhutanicus* S. Uéno, sp. nov., of Muelhagang near Gogona in central Bhutan. 6–7, *T.* (s. str.) *wittmeri* S. Uéno, sp. nov., of Kotoka-Gogona in central Bhutan.

population, in which the pore is present on both the elytra only in one of the thirteen specimens examined, and on one elytron in two of the remaining twelve. At all events, no decisive difference is found between specimens from various localities, and though the variation seems partly geographical, I have been unable to define useful subspecies, with the possible exception of "subsp. *nepalensis*".

Trechus (s. str.) **bhutanicus** S. Uéno, sp. nov., Figs. 3–5

Length: 3.50–3.55 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *T. imaicus* (JEANNEL, 1923, pp. 416, 421, fig. 13, 1927, pp. 157, 161, figs. 537–539; ANDREWES, 1935, pp. 63, 68, fig. 11; UÉNO, 1965, p. 343, figs. 1–2) from Sikkim and accords well with Uéno's redescription of the latter, but the head is smaller, the pronotum is obviously less transverse, with the sides less strongly arcuate in front, the aedeagus is more regularly arcuate, especially behind middle, bearing an elongate, well sclerotized sagittal aileron, and the copulatory piece is much larger.

Colour dark brown, shiny; head almost black; clypeus, suture and lateral margins of elytra reddish; palpi, proximal three segments of antennae (the rest light brown), propleura, epipleura and legs brownish yellow. Head small, with frontal furrows deep throughout and somewhat angulate at middle; eyes flat though perfectly faceted; genae moderately convex, four-sevenths to five-eighths as long as eyes; antennae reaching basal one-fourth of elytra; other cephalic features as in *T. imaicus*. Pronotum subcordate and convex, much less transverse than in *T. imaicus* though obviously wider than head, widest at about three-fifths from base, and equally contracted in front and behind; PW/HW 1.39 in the holotype, 1.40 in the allotype, PW/PL 1.29 in both the holotype and allotype, PW/PA 1.50 in the holotype, 1.43 in the allotype, PW/PB 1.37 in the holotype, 1.33 in the allotype, PB/PA 1.09 in the holotype, 1.08 in the allotype; sides regularly arcuate from front angles to near hind angles, and very briefly but distinctly sinuate just before the latter; base very slightly bisinuate, with the lateral parts almost perpendicular to the mid-line; hind angles small, nearly rectangular or somewhat sharp; postangular carinae prominent; other pronotal features as in *T. imaicus*. Elytra oval, widest at about middle, and moderately convex; EW/PW 1.49 in both the holotype and allotype, EL/EW 1.42 in the holotype, 1.39 in the allotype; sides gently arcuate from shoulders to the level of eighth umbilicate pore, then slightly emarginate, and moderately rounded again to apices, which form a small re-entrant angle at suture; striae almost entire, indistinctly crenulate, inner striae rather deeply impressed, but outer ones (stria 7 in particular) are superficial and partially obsolete, stria 8 deepening in apical half; apical striole short but deeply impressed, gently curved, either free at the anterior end (holotype) or hooked inwards and joining

stria 3 (allotype); apical carina salient though obtuse; intervals slightly convex on the disk but flat at the side; setiferous dorsal pores on stria 3 situated at basal $^1/_6$–$^1/_5$ and about middle; other features as in *T. imaicus*. Ventral surface and legs as those in *T. imaicus*.

Male genital organ rather heavily sclerotized. Aedeagus about one-third as long as elytra, regularly arcuate from base to apex and gradually attenuated towards the tip; basal part large and fairly elongate, not particularly bent towards the ventral side, with fairly large basal orifice, the lateral sides of which are semicircularly emarginate; sagittal aileron elongate and well sclerotized; viewed laterally, apical lobe narrowly produced and evidently turned up at the extremity, which is blunt; viewed dorsally, apical part subtriangular and inclined to the left, gradually tapering to the pointed extremity; ventral side rather deeply emarginate behind middle in lateral view. Inner sac armed with a fairly large copulatory piece and an elongate patch of heavily sclerotized teeth; copulatory piece spatulate and rounded at apex, bearing at base a rather poorly sclerotized, mal-defined lamella; the elongate patch of teeth lies at the right dorsal side of inner sac and stretches for about half the length of aedeagus. Styles moderate, left style being obviously larger than the right, each provided with four setae at apex.

Type-series: Holotype: ♂, allotype: ♀, Muelhagang, 3,650–4,000 m, near Gogona, central Bhutan, 12-VI-1972.

Further specimen examined: 1 ♂, Dechhi Paka, 3,300 m, central Bhutan, 19-VI-1972.

Notes: The Dechhi Paka specimen is larger (4.00 mm in length) than the type-series, and has ampler pronotum, which is more strongly contracted anteriorly and has a little wider base. The standard ratios of body parts in this specimen is as follows: PW/HW 1.50, PW/PL 1.28, PW/PA 1.57, PW/PB 1.30, PB/PA 1.20, EW/PW 1.41, EL/EW 1.44. The aedeagus is perfectly similar in shape to that of the holotype, but it is smaller (about three-tenths as long as elytra), the patch of sclerotized teeth of the inner sac is less extensive (occupying about two-fifths the length of aedeagus), and the copulatory piece is rather poorly sclerotized. It is possible that the Dechhi Paka population is distinguished from the Muelhagang one as a geographical race. However, I prefer to refrain from giving it a new subspecific name, since the materials now available are too small to reveal the true aspect of infraspecific variation of *T. bhutanicus*.

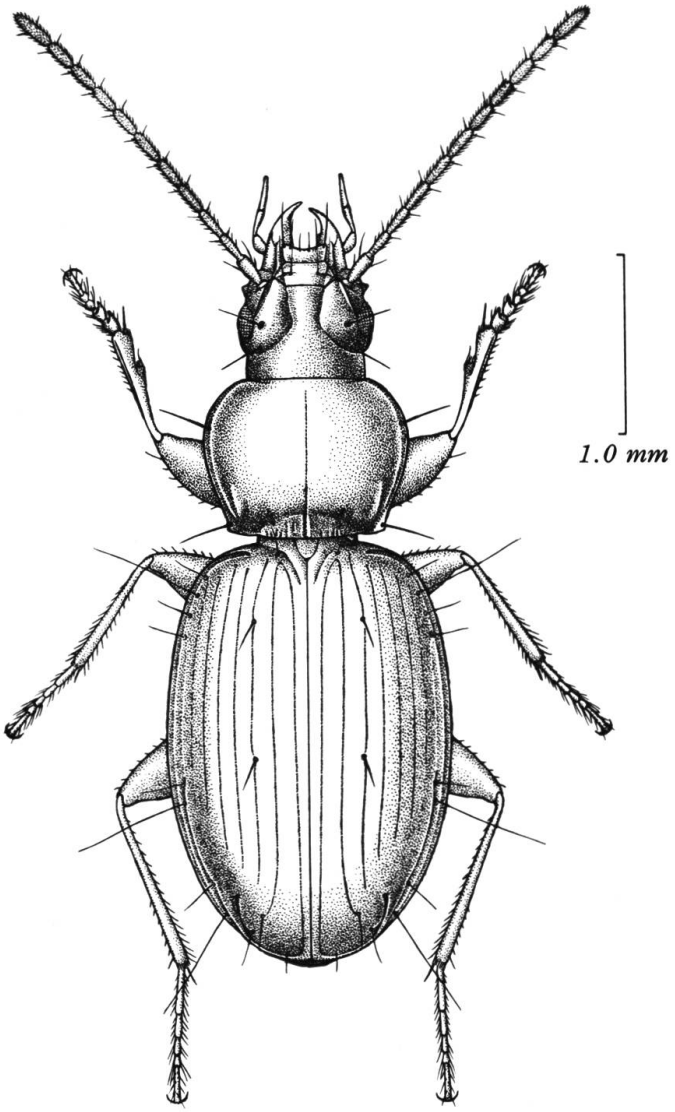


Fig. 8. *Trechus* (s. str.) *wittmeri* S. Uéno, sp. nov., ♂, of Kotoka-Gogona in central Bhutan.

Trechus (s. str.) **wittmeri** S. Uéno, sp. nov., Figs. 6–8

Length: 3.90 mm (from apical margin of clypeus to apices of elytra).

Belonging to the group of *T. hingstoni* and related to *T. balfour-brownei* (Uéno, 1965, p. 346, figs. 3–5) from the Ghum District in West Bengal, but the present species is decisively different from the Bengalese one in the shape of pronotum and elytra, above all in the structure of pronotal hind angles, and in the configuration of male genitalia. From *T. bhutanicus,* to which it is superficially similar, this new species can be distinguished by the slight ante-basal sinuation of pronotal sides and

the obtuse hind angles; they are radically different from each other in the structure of male genitalia.

Slightly larger than *T. balfourbrownei.* Apterous. Colour as in *T. balfourbrownei,* pitchy brown, shiny, with almost black head and somewhat iridescent elytra; suture and lateral margins of elytra reddish; palpi pale yellowish brown; antennae, epipleura and legs dark yellowish brown.

Head as in *T. balfourbrownei,* but the frontal furrows are obtusely subangulate at middle and the meshes of microsculpture are generally less transverse; genae slightly less convex, three-fifths as long as eyes; antennae thinner than those in *T. balfourbrownei,* reaching basal two-ninths of elytra, with median segments each nearly 2.5 times as long as wide, terminal segment the longest. Pronotum less orbicular than in *T. balfourbrownei,* widest at about four-sevenths from base, and more strongly contracted in front than behind; PW/HW 1.52, PW/PL 1.30, PW/PA 1.63, PW/PB 1.31; surface convex and with vague transverse striations; microsculpture composed of fine transverse lines, though partially obliterated; sides narrowly reflexed for the most part, rather strongly arcuate in front, less so behind middle, and only very briefly and very slightly sinuate just before hind angles, which are obtuse but much more distinctly marked than in *T. balfourbrownei;* base slightly bisinuate, and slightly arcuate on each side close to hind angle; apex evidently narrower than base, PB/PA 1.25, with front angles rounded; postangular carinae distinct though obtuse; other pronotal features as in *T. balfourbrownei.* Elytra oval, more elongate than those in *T. balfourbrownei,* widest at about middle, and moderately convex though somewhat depressed on the disk; EW/PW 1.40, EL/EW 1.45; shoulders rounded; sides moderately reflexed, very feebly arcuate behind shoulders, moderately rounded behind middle, and slightly emarginate before apices, which form a minute re-entrant angle at suture; striation as in *T. balfourbrownei,* but the apical striole is more strongly arcuate; stria 3 with two setiferous dorsal pores at about $^{2}/_{11}$ and $^{1}/_{2}$ from base respectively; other elytral features as in *T. balfourbrownei.* Ventral surface and legs as those in *T. balfourbrownei,* though the legs are slenderer than in the latter.

Male genital organ elongate and moderately sclerotized, strikingly differing in shape from that of *T. balfourbrownei.* Aedeagus very slender, about three-eighths as long as elytra, and arcuate from base to apex; dorsal side narrowly open for its large part, but the basal bulb is

perfectly closed; basal part small, not bent towards the ventral side; lateral sides of basal orifice very deeply emarginate; sagittal aileron remarkably long, heavily sclerotized, and curved posteriorly in a sickle-shape; viewed dorsally, apical lobe fairly broad to near the extremity, which is obtusely tuberculate; viewed laterally, apical lobe narrow, slightly reflexed at the extremity, which is narrowly rounded; ventral side moderately emarginate before middle in profile, but almost straight behind there to the base of apical lobe. Inner sac scaly, but the scales are minute and hardly sclerotized; no differentiated copulatory piece nor patches of sclerotized teeth. Styles fairly large; left style much larger than the right; each provided with four long setae at apex.

Type-specimen: Holotype: ♂, Kotoka–Gogona, 2,600–3,400 m, central Bhutan, 10-VI-1972.

Further specimen examined: 1 ♀, Dorju-la, 3,100 m, central Bhutan, 26-VI-1972.

Notes: The Dorju-la specimen is excluded from the type-series, as it is slightly different from the holotype. It is 3.75 mm in the length of body, the coloration is more reddish than in the type, and the pronotum has more evenly rounded sides and regularly arcuate base. The standard ratios of its body parts are as follows: PW/HW 1.48, PW/PL 1.31, PW/PA 1.57, PW/PB 1.33, PB/PA 1.18, EW/PW 1.34, EL/EW 1.42. Being unable to see males from the Dorju-la population, I cannot decide at present whether the difference noticed above is geographical or merely individual.

Genus **Bhutanotrechus** S. Uéno, nov.

Type-species: *Bhutanotrechus reflexicollis* S. Uéno, sp. nov.

Closely allied to *Agonotrechus* (JEANNEL, 1923, p. 428, 1928 b, pp. 23, 28, 85; ANDREWES, 1935, pp. 61, 74), with which it agrees in most of the basic characters, but can be distinguished from the latter by its specialized facies, peculiar shape of prothorax, obliteration of the internal end of prehumeral border, extreme degeneration of elytral striae, presence of two setiferous dorsal pores instead of one, and absence of inner wings.

Similar in general appearance to certain agonines; body elongate, not much constricted between prothorax and hind body, and glabrous throughout, with relatively stout antennae and long legs; inner wings absent; colour brown, moderately depigmented.

Head small and elongate, with small eyes and long convex genae, which are perfectly glabrous; frontal furrows irregular, very deeply impressed and more or less sinuate in front, becoming shallower posteriad but entire to neck constriction; two pairs of widely distant supraorbital pores present on lines convergent posteriad, the anterior pore being at the mid-eye level and the posterior not adjoining frontal furrow. Labrum transverse, with the apex almost straight though slightly emarginate at the median portion, sexsetose. Mandibles fairly slender and bidentate. Mentum completely fused with submentum, the former bearing a broad porrect tooth in apical emargination, which is truncated or slightly emarginate at the tip, the latter being sexsetose; ligula moderately arcuate at apex and octosetose; paraglossae not very slender, though extending much beyond ligula. Palpi slender; penultimate segments moderately dilated towards apex in maxillary palpus but only feebly so in labial palpus, that of the former being asetose, while that of the latter quadrisetose; apical segments subcylindrical though having subconical tips, about as long as the penultimate in labial palpus but much longer than that in maxillary palpus. Antennae filiform, relatively stout and not very long.

Pronotum transverse, with very widely reflexed sides, which are widely arcuate and not sinuate behind; marginal setae normal, the posterior one being almost on the hind angle; postangular parts widely lamellar and produced backwards, with denticulate hind angles; basal transverse impression mal-defined, basal foveae small but deep; postangular carinae absent.

Elytra oblong-ovate, depressed on the disk and declivous at the basal part; shoulders distinct though rounded; prehumeral borders slightly arcuate and attenuated inwards, not forming distinct terminal point though reaching approximate base of stria 5; sides rather widely reflexed in basal half, more narrowly behind the widest part and regularly rounded at apices; striae obliterated altogether, indistinct vestiges of inner striae being perceptible at the most; scutellar striole present though sometimes slight; apical striole very short but deeply impressed, free at the anterior end though seemingly directed to the site of stria 5; apical carina prominent; two setiferous dorsal pores present on the site of stria 3; preapical pore widely distant from apex and lying before the level of the terminus of apical striole; apical pores normal; marginal umbilicate pores regular and aggregated, the four pores of the humeral set being ranged equidistantly.

Ventral surface glabrous and smooth; anal setae normal. Legs long and fairly slender; protibiae straight, gently dilated towards apices, distinctly grooved on the external face, and wholly covered with pubescence on the anterior face; tarsi long, segment 4 with a long ventral apophysis in pro- and mesotarsi; in ♂, two proximal segments of each protarsus gently dilated, inwardly denticulate at apices, and furnished beneath with sexual adhesive appendages.

Aedeagus tubular, elongate and arcuate; basal part small, with small basal orifice; sagittal aileron well developed; apical lobe short and nearly symmetrical; inner sac small, being armed with a large spatulate copulatory piece with its convex face towards the right side, but devoid of sclerotized teeth. Styles large, left style being a little longer than the right, each provided with four apical setae.

Range: Known so far only from central Bhutan.

Notes: Although strikingly differing in facies, this new genus is a close relative of *Agonotrechus* beyond all doubt. The two genera have many basic characters in common, including the conformation of mouth parts and the structure of male genitalia. On the other hand, *Bhutanotrechus* possesses several prominent features, which are not found in *Agonotrechus* itself but are common among derivative genera of the *Agonotrechus* complex. In this phyletic group, *Agonotrechus* is the only known genus whose members are either fully winged or brachypterous, have large eyes and entirely striate elytra, and occur at relatively low altitudes. All the others are derivative genera, whose members are always apterous, more or less microphthalmic, and confined in higher places, especially in the tropics. In these flightless trechines, the prehumeral borders and the striae of elytra are usually degenerated, and even the side borders of pronotum are sometimes effaced in posterior half. With the exception of *Kozlovites caviceps* Jeannel (1935, pp. 279–281, fig. 9) from Tibet, all these species have short broad body, the dorsal side of which is more or less strongly convex.

It is evident that *Bhutanotrechus* is a member of derivative genera of the phyletic group, but it shows an evolutionary trend considerably different from that observed in most of the others. Its body is elongate and not much constricted between the prothorax and the hind body; instead of degenerating, the lateral margins of its pronotum have become unusually explanate and widely reflexed; its legs have grown longer and slenderer than in *Agonotrechus*. As was pointed out else-

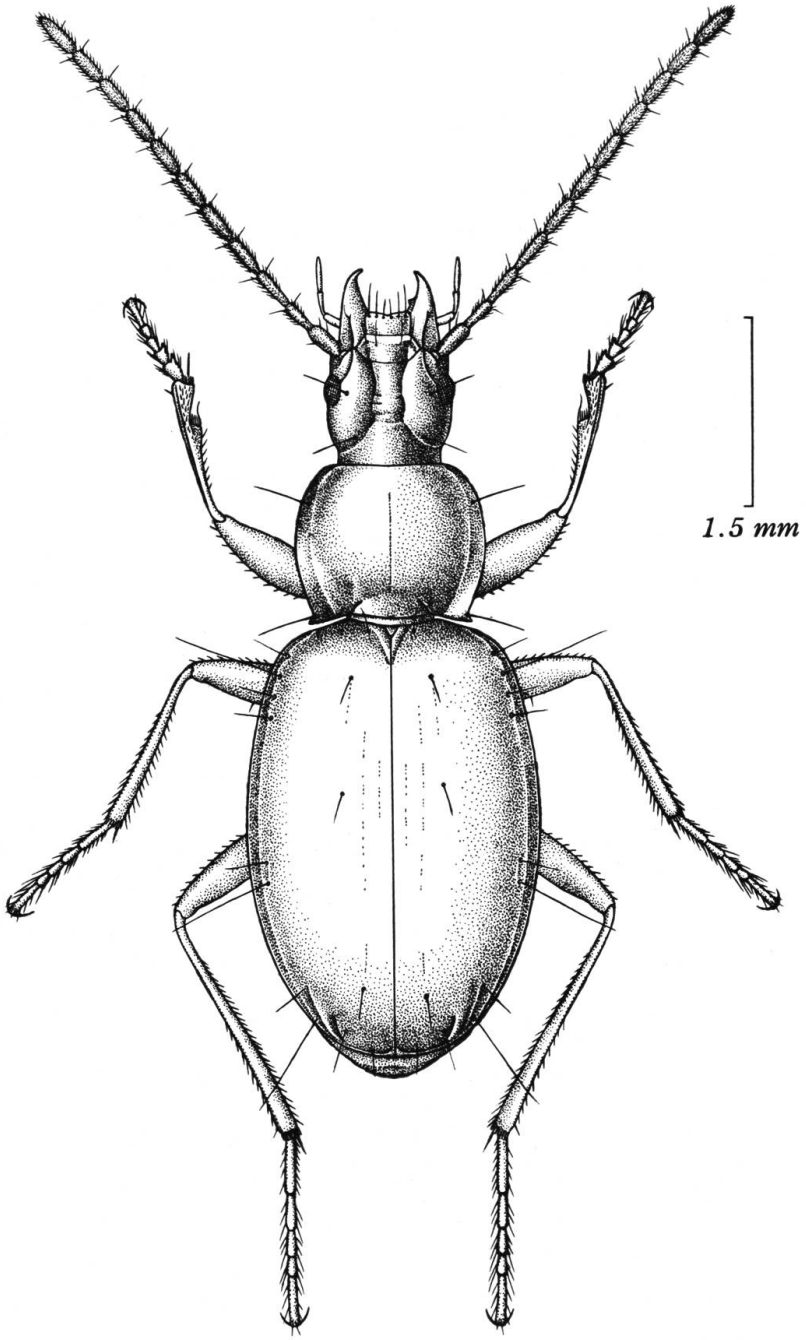


Fig. 9. *Bhutanotrechus reflexicollis* S. Uéno, gen. et sp. nov., ♂, of Dechhi Paka in central Bhutan.

where (cf. UÉNO, 1975, p. 150), derivative genera of the *Agonotrechus* complex seem to have no direct relations among themselves, but may have become independently differentiated from the mother stock. *Bhutanotrechus* provides another example of this, since it must have

been derived from an *Agonotrechus*-like ancestor but has evolved into an isolated genus. However, besides apterism and microphthalmy, it shows reduction of the prehumeral borders and obliteration of the elytral striae as in the other derivative genera, and is parallel with *Kozlovites* in the peculiar configuration of frontal furrows. It is, therefore, conceivable that these are the general trends among derivative, high altitude forms of the phyletic group of *Agonotrechus*.

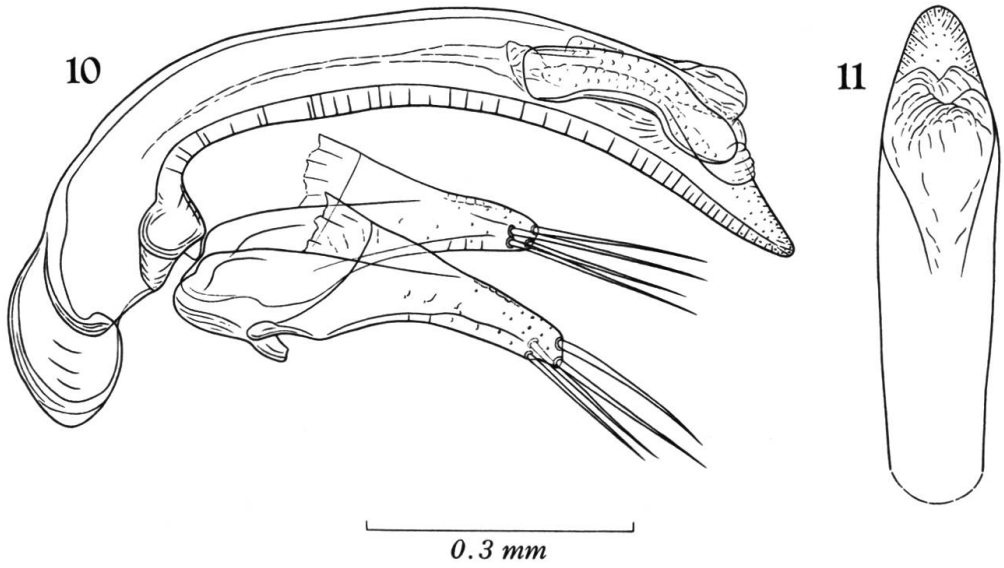
Bhutanotrechus reflexicollis S. Uéno, sp. nov., Figs. 9–11

Length: 5.7–6.0 mm (from apical margin of clypeus to apices of elytra).

Body large, elongate and moderately depressed above; facies variable to some extent, mainly because of the variability in prothoracic proportions. Colour chestnut brown to dark brown, shiny, distinctly iridescent on elytra; palpi usually paler than the other parts.

Head small, elongate, and depressed above, with gently convex supraorbital areas; frons slightly but distinctly constricted a little before the mid-eye level, then gently expanding, and constricted again before vertex, being separated from the latter by a distinct transverse impression; frontal furrows deep and sinuate before the transverse impression, but shallow and regularly, though rather weakly, curved behind to neck constriction; microsculpture composed of fine transverse (or oblique) lines partially forming irregular transverse meshes; eyes small and feebly convex; genae long, usually more than 1.5 times as long as eyes though the proportion is variable to some extent according to individuals, and more or less convex, particularly at the posterior part; neck relatively narrow, with distinct neck constriction at the sides; antennae fairly stout, reaching basal two-fifths of elytra in ♂, basal three-eighths of elytra in ♀, with segment 2 about three-fourths as long as segment 3 or 4, middle segments cylindrical, each more than 2.5 times as long as wide, terminal segment the longest though narrower than scape.

Pronotum ample, transverse, much wider than head, widest at about five-ninths from base, and more strongly contracted in front than behind; PW/HW 1.40–1.50 (M 1.45), PW/PL 1.23–1.39 (M 1.28), PW/PA 1.64–1.77 (M 1.69), PW/PB 1.21–1.29 (M 1.25); surface gently convex on the disk, more strongly at the sides, usually with vague transverse striations; apical transverse impression obsolete; median line distinctly impressed on the disk, though not widening basad and



Figs. 10–11. *Bhutanotrechus reflexicollis* S.Uéno, gen. et sp. nov., of Dechhi Paka in central Bhutan. 10, Male genitalia, left lateral view. 11, Apical part of aedeagus, dorsal view.

usually disappearing before base; microsculpture composed of fine transverse lines though largely obliterated; sides widely explanate and reflexed, the margin becoming narrower in front but remarkably widening in the postangular area which extends posteriad, rather strongly arcuate near front angles, feebly so behind the widest part but not sinuate before hind angles; apex evidently narrower than base and slightly arcuate, PB/PA 1.32–1.46 (M 1.36), with front angles rounded and hardly advanced; base nearly straight or slightly arcuate at middle and posteriorly oblique on each side, the oblique lateral parts being either straight or slightly arcuate; hind angles laterally denticulate and sharp; basal area depressed and nearly smooth, with the transverse impression wide and mal-defined; basal foveae small but deep, smooth at the bottom.

Elytra oblong-ovate, widest at about middle, moderately convex at the sides and in apical two-fifths, but depressed on the disk and declivous in the basal area; EW/PW 1.48–1.58 (M 1.52), EL/EW 1.42–1.46 (M 1.44); shoulders rounded, with gently arcuate humeral borders; sides very feebly arcuate in front, more strongly so behind, and conjointly rounded at apices; striae obliterated, trace of several inner striae usually visible though fragmentary and indistinct, stria 8 always present between the apical two pores of the marginal umbilicate series;

apical striole deeply impressed though very short and only slightly curved; two setiferous dorsal pores present at $^1/_{13}$–$^1/_8$ (usually about $^1/_9$) and $^1/_3$–$^2/_5$ from base respectively; preapical pore much closer to suture than to apex; microsculpture indistinct though consisting of fine transverse lines.

Legs long; tarsi fairly slender, but they look stouter than they are because of their dark coloration.

Male genital organ small though heavily sclerotized. Aedeagus about one-fourth as long as elytra, elongate, and arcuate from base to apex though only feebly so before middle; basal part small, moderately curved towards the ventral side, and bearing large, heavily sclerotized sagittal aileron; basal orifice small, with the sides either nearly straight or very slightly emarginate; apical lobe short, widely rounded at the extremity in dorsal view, narrowly subtriangular and blunt at the extremity in lateral view; ventral side widely emarginate in profile. Inner sac scaly but the scales are hardly sclerotized; copulatory piece large, spatulate, sinuate and gently twisted, with the apex widely rounded. Styles large and broad, each bearing four long setae at apex.

Type-series: Holotype: ♂, allotype: ♀, Dechhi Paka, 3,300 m, central Bhutan, 19-VI-1972. Paratypes: 1 ♂, Dechhi Paka, 3,300 m, central Bhutan, 19-VI-1972; 1 ♀, Pele-la, 3,450 m, central Bhutan, 19/24-VI-1972; 1 ♂, Kotoka–Gogona, 2,600–3,400 m, central Bhutan, 10-VI-1972.

Notes: Because of the elongate body and the peculiar conformation of prothorax, this remarkable new species looks much like an agonine, so that the name "*Agonotrechus*" could be more appropriately used for the present trechine if it were not preoccupied.

The geographical relationship of the three localities noted above and the environmental conditions at the respective places were described by Baroni Urbani and others (1973) in their account of the Bhutan-Expedition 1972.

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