

The Trechine Beetles (Coleoptera, Trechinae) from the
Zhongdian Area in Northwestern Yunnan
Mainly Collected by Aleš SMETANA

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Abstract The trechine beetles mainly collected by Aleš SMETANA in the Zhongdian area in northwestern Yunnan, Southwest China, are enumerated. Of the three species involved, one new species of the genus *Queimectrechus* is described under the name of *Q. globipennis*, *Bhutanotrechus farkaci* DEUVE is transferred to the genus *Agonotrechus* and redescribed, and the remaining one is identified with *Trechus macrops* JEANNEL. In addition to these, *Trechus sichuanicola* DEUVE and *Bhutanotrechus sichuanicola ventrosior* DEUVE are also transferred to *Agonotrechus*, and the latter is regarded as a full species.

Through the courtesy of Dr. Aleš SMETANA of the Agriculture and Agrifood Canada, I had an opportunity to examine a rich collection of the carabid subfamily Trechinae made by him in northwestern Yunnan and western Sichuan, Southwest China. A closer inspection of this collection has revealed that it contains many described and some undescribed species. Since our knowledge of Chinese trechines is not yet satisfactory, and since taxonomic revision seems needed for certain species previously described, I would like to take this golden opportunity for making some revisions on the basis of ample material. In the first place, I am going to take up the trechines collected in the Zhongdian area in northwestern Yunnan.

The abbreviations used in this paper are the same as those explained in previous papers of mine. The standard ratios of *Agonotrechus farkaci* are calculated on the basis of 24 specimens (12 ♂♂, 12 ♀♀) randomly picked up, including a pair of the paratypes. The specimens examined are preserved in the collections of Dr. SMETANA (Ottawa), the Musée d'Histoire Naturelle, Genève, and the National Science Museum (Nat. Hist.), Tokyo.

Before going further, I wish to express my heartfelt thanks to Dr. Aleš SMETANA for his kindness in submitting to me for taxonomic study all his collection of the Trechinae made in China. Hearty thanks are also due to Dr. Jan FARKAČ and Mr. Artur GITZEN for their kind help in examining invaluable specimens including the paratypes of *Bhutanotrechus farkaci* for comparative study.

Agonotrechus farkaci (DEUVE, 1995), comb. nov.

Bhutanotrechus farkaci DEUVE, 1995, Revue fr. Ent., (N. S.), **17**, p. 10, figs. 6, 12; type locality: montagnes à 15 km à l'ouest de Zhongdian [=Mt. Xue Shan].

Length: 4.35–5.30 mm (from apical margin of clypeus to apices of elytra).

The diagnostic characters of this species was given by DEUVE accompanied with fine illustrations of its habitus (fig. 12) and male genitalia (fig. 6), though his description is not correct in saying "la présence de 4 soies seulement à l'extrémité des paramères." In the following lines, I will give a redescription of the species.

Closely allied to *A. ventrosior* (DEUVE, 1995, p. 11) (new combination and status; see *Notes*), but the prothorax is more transverse on an average and more contracted both at apex and at base, the elytra are shorter with somewhat narrower basal part, and the aedeagus is differently shaped.

Colour brown to blackish brown, head black except for clypeal and vertexal parts, elytra more or less infuscate except along margins, faintly iridescent and sometimes with faint greenish tinge; propleura and epipleura usually brownish; buccal appendages, antennae and legs light brown. Apterous; fore body relatively large in proportion to hind body; microsculpture fine, mostly consisting of transverse meshes on head and of transverse lines on pronotum and elytra, though largely obliterated on elytra.

Head fairly large, transverse, depressed above, with frontal furrows deeply impressed and only feebly arcuate on dorsum but becoming much shallower behind supraorbital areas, not angulate but often obliquely rugose inwards at about the post-eye level; eyes small and flat, usually as long as genae but sometimes five-sixths as long as the latter; genae more or less convex though individually variable in convexity; neck constriction distinct at the sides; labrum only slightly emarginate at apex; antennae stout, reaching basal third of elytra, with middle segments each slightly less than twice as long as wide, segment 2 the shortest, terminal segment the longest.

Pronotum transverse subcordate, distinctly wider than head, widest at a level between four-sevenths and three-fifths from base; PW/HW 1.44–1.58 (M 1.51), PW/PL 1.44–1.59 (M 1.52), PW/PA 1.59–1.71 (M 1.66), PW/PB 1.21–1.31 (M 1.27); sides widely reflexed except near front angles, strongly and widely arcuate in front, less so behind middle, and briefly sinuate just before hind angles, which are denticulate and more or less produced laterad; base wider than apex, PB/PA 1.25–1.39 (M 1.30), very slightly bisinuate; dorsum gently convex, basal transverse impression mal-defined, basal foveae fairly large, outwardly arcuate at the bottom.

Elytra short ovate, widest at about or a little before the middle, and a little more gradually narrowed towards bases than towards apices; basal areas relatively narrow; EW/PW 1.53–1.67 (M 1.61), EL/PL 2.98–3.26 (M 3.11), EL/EW 1.23–1.32 (M 1.27); shoulders indistinct; sides rather widely reflexed throughout, feebly but regularly arcuate in proximal halves except for moderately arcuate prehumeral parts, moderately so behind, and widely and almost conjointly rounded at apices, each with a shallow

preapical emargination; dorsum moderately convex, with rather steep apical declivity; striae superficial, finely punctate, becoming shallower at the side though almost entire; scutellar striole distinct; apical striole short but deeply impressed, gently curved and free at the anterior end, usually directed to stria 5 but sometimes directed to stria 7; stria 3 with two setiferous dorsal pores at 1/8–1/7 and 2/5–4/9 from base, respectively; preapical pore lying near the level of the terminus of apical striole, usually adjoining stria 2 but sometimes lying on the apical anastomosis of striae 2 and 3; marginal umbilicate pores regular.

Legs short and fairly stout, of ordinary conformation for a member of *Agonotrechus*.

Male genital organ small though rather heavily sclerotized, similar in general configuration to that of *A. ventrosior* but the aedeagus is less arcuate at middle and has broader apical lobe. Aedeagus about three-tenths as long as elytra, slender, and only feebly arcuate at middle, with basal part moderately curved ventrad and bearing a fairly large sagittal aileron; viewed dorsally, apical part gradually narrowed towards apical lobe whose apex is rather widely rounded; viewed laterally, apical lobe fairly wide, slightly curved ventrad, and rather widely rounded at the extremity. Copulatory piece about one-fourth as long as aedeagus, spatulate, and gradually acuminate. Styles with fairly broad apical parts, each bearing four to six (usually five) setae of unequal length at the apex.

Specimens examined. 2 ♂♂, 1 ♀ (paratypes), “N YUNNAN 23. VI. 1994/27.49N 99.34E 4200–4700 m/mts. 15 km W of ZHONGDIAN/Igt. J. Farkač & D. Král; 66 ♂♂, 62 ♀♀, “CHINA N Yunnan, Xue/Shan nr. Zhongdian/3900 m 25. VI. 1996/27°49N 99°34E C41//collected by/A. Smetana”; 23 ♂♂, 14 ♀♀, same locality and collector, but “4050 m 24. VI. 1996/27°49N 99°34E C40”; 1 ♂, 2 ♀♀, same data but “C39”; 6 ♂♂, 4 ♀♀, same data but “C38”; 25 ♂♂, 13 ♀♀, same locality and collector, but “4000–4100 m 23. VI. 96/27°49N 99°34E C36”.

Notes. This species was originally placed under the genus *Bhutanotrechus* together with *sichuanicola ventrosior*. The same arrangement was already suggested by the French author (DEUVE, 1992 b, p. 174), who stated that “*T. sichuanicola* peut plus précisément être rapproché du genre *Bhutanotrechus* UÉNO.” However, this opinion can be disputed for several reasons.

I have seen all the described species of *Agonotrechus* (s. lat.), which include four topotypical specimens of *Trechus sichuanicola* DEUVE (1989, p. 317, figs. 3, 6) collected by myself and six topotypical specimens of *Bhutanotrechus sichuanicola ventrosior* identified by DEUVE himself, and I am confident that these taxa and *Bhutanotrechus farkaci* are decisively different in evolutionary trend from *Bhutanotrechus reflexicollis* S. UÉNO (1977, p. 192, figs. 9–11). The latter is a large long-legged species of elongate body form, in which the prothorax is barrel-shaped, the prehumeral border of elytra is obliterated at the internal end, and the elytral striae are obliterated altogether. On the contrary, the members of *Agonotrechus* are always short-legged and more or less short-bodied, with the prothorax widest distinctly before the middle and

with the elytra either entirely or almost entirely striated and completely bordered at the prehumeral parts. The three taxa described by DEUVE perfectly fall in this category and share none of the diagnostic features of *Bhutanotrechus*. It is true that these apterous species are somewhat different from fully winged, ordinary species of *Agonotrechus* and may be discriminated in a species-group of their own, but the members of this primitive genus is usually rather variable in morphological features, above all in the number of elytral dorsal pores, condition of hind wings, and the number of parameral setae. The variation often appears individually, not only inter-specifically.

DEUVE (1995, p. 11) considered that his *farkaci* is different from *sichuanicola* in the number of parameral setae, four in the former and seven in the latter. However, this character is often unstable in such primitive genera as *Trechiana* and *Agonotrechus*, and in the three taxa concerned, the number varies from five to seven in *sichuanicola*, from four to five (probably more) in *ventrosior*, and from four to six in *farkaci*. On the other hand, *ventrosior* seems specifically different from *sichuanicola*. It is intermediate in both external and genitalic features between *sichuanicola* and *farkaci*, and may be even closer to the latter. From *sichuanicola*, it is distinguished by the following details:

Colour darker, wholly blackish, sometimes a little brownish at the posterior part of head and antero-lateral parts of pronotum but never on elytra, which are faintly iridescent; ventral surface black; femora usually infuscate. Fore body smaller in proportion to large hind body. Head with eyes somewhat larger on an average and usually more convex, usually as long as genae but sometimes 1.2 times as long as the latter. Prothorax less transverse, PW/HW 1.40–1.46 (M 1.44) [1.50–1.53 (M 1.51) in *A. sichuanicola*], PW/PL 1.37–1.45 (M 1.42) [1.47–1.53 (M 1.49) in *A. sichuanicola*], widest at a level a little nearer to the middle, less contracted at apex and usually narrower at base, PW/PA 1.56–1.62 (M 1.59) [1.62–1.69 (M 1.65) in *A. sichuanicola*], PW/PB 1.31–1.41 (M 1.35) [1.25–1.32 (M 1.29) in *A. sichuanicola*], PB/PA 1.15–1.21 (M 1.18) [1.23–1.33 (M 1.28) in *A. sichuanicola*], with the sides less widely reflexed, less strongly but more evenly arcuate, and more deeply sinuate just before hind angles, which are more protrudent postero-laterad. Elytra larger, short and broad, widest at about middle; EW/PW 1.62–1.73 (M 1.67) [1.48–1.54 (M 1.51) in *A. sichuanicola*], EL/PL 3.06–3.19 (M 3.13) [2.97–3.15 (M 3.06) in *A. sichuanicola*], EL/EW 1.30–1.36 (M 1.32) [1.34–1.37 (M 1.36) in *A. sichuanicola*]; sides more regularly arcuate from shoulders to apices, which are a little more prominent; striae shallower especially at the side and more finely punctate, though almost entire with the exception of the anterior half of stria 8, which is almost always evanescent. Aedeagus about two-sevenths as long as elytra, less strongly curved ventrad than in *A. sichuanicola*; viewed laterally, apical lobe broader and narrowly rounded at the extremity [distinctly more acuminate towards blunt extremity in *A. sichuanicola*]; viewed dorsally, apical lobe gradually narrowed towards narrowly rounded apex [abruptly narrowed at the level of apical orifice and subparallel-sided to near the bluntly ending extremity in *A. sichuanicola*]; each style bearing four or five apical setae often supplemented by a minute subapical accessory seta.

These differences seem to suffice for recognition of an independent species. DEUVE described "le pronotum plus transverse (lt/Lt 1,57)" in *ventrosior* than in *sichuanicola*, but in the specimens before me, the prothorax is constantly narrower in the former than in the latter.

The new taxonomic changes proposed in this paper are as follows:

Agonotrechus sichuanicola (DEUVE, 1989), comb. nov.

Agonotrechus ventrosior (DEUVE, 1995), comb. et stat. nov.

Agonotrechus farkaci (DEUVE, 1995), comb. nov.

According to SMETANA, *Agonotrechus farkaci* is abundant in the subalpine forests on Mt. Xue Shan. His collecting sites C36, 38, 39 and 40 lie in a "high montane coniferous forest with intermixed birches and rhododendrons", and the trechine beetle was collected by "sifting various forest floor debris, moss and pieces of rotting wood." The site C41 is a "mixed broadleaved and coniferous forest (*Abies*, *Betula*, *Rhododendron*, etc.)," and the collection was made by "sifting leaf litter and other forest floor debris, particularly piles of rotting wood and debris below them."

***Queinnectrechus globipennis* S. UÉNO, sp. nov.**

(Fig. 1)

Length: 3.40 mm (from apical margin of clypeus to apices of elytra).

A relatively small species with small fore body and large hemiglobular elytra, recognized at a glance on the characteristic shape of hind body; surface glabrous and polished as in the other congeners; microsculpture completely vanished. Colour dark brown, head black except for clypeus; buccal appendages exclusive of mandibles yellowish brown; antennae and tarsi brown.

Head transverse with wide neck, depressed above; frontal furrows deep especially on dorsum, not angulate, and widely divergent posteriad; frons and supraorbital areas moderately convex, the latter with two pair of supraorbital setae on lines divergent posteriorly, the anterior setae clearly foveolate at the bases; eyes small and flat, only slightly longer than genae, which are convex and about seven-ninths as long as eyes; neck constriction distinct at the sides though not very deep; labrum transverse, shallowly emarginate at apex; mandibles stout, sharply hooked at apices; palpi short and stout, with penultimate segments widely dilated towards apices; antennae also short and stout, subfiliform, reaching basal three-tenths of elytra, segment 2 about five-sixths as long as 3 and subequal in length to each of 4–10, segments 6–10 each oval and a little more than 1.5 times as long as wide, terminal segment the longest.

Pronotum small, subcordate, wider than head, wider than long, widest at two-thirds from base, and more strongly narrowed towards base than towards apex; PW/HW 1.24, PW/PL 1.15, PW/PA ca. 1.36, PW/PB 1.46; sides finely bordered in apical three-fifths but immarginate behind, strongly arcuate in front, less so behind, and deeply sinuate at basal sixth, probably with two pair of marginal setae though the posterior pair is lacking in the holotype; apex wider than base, PB/PA ca. 0.93, with front

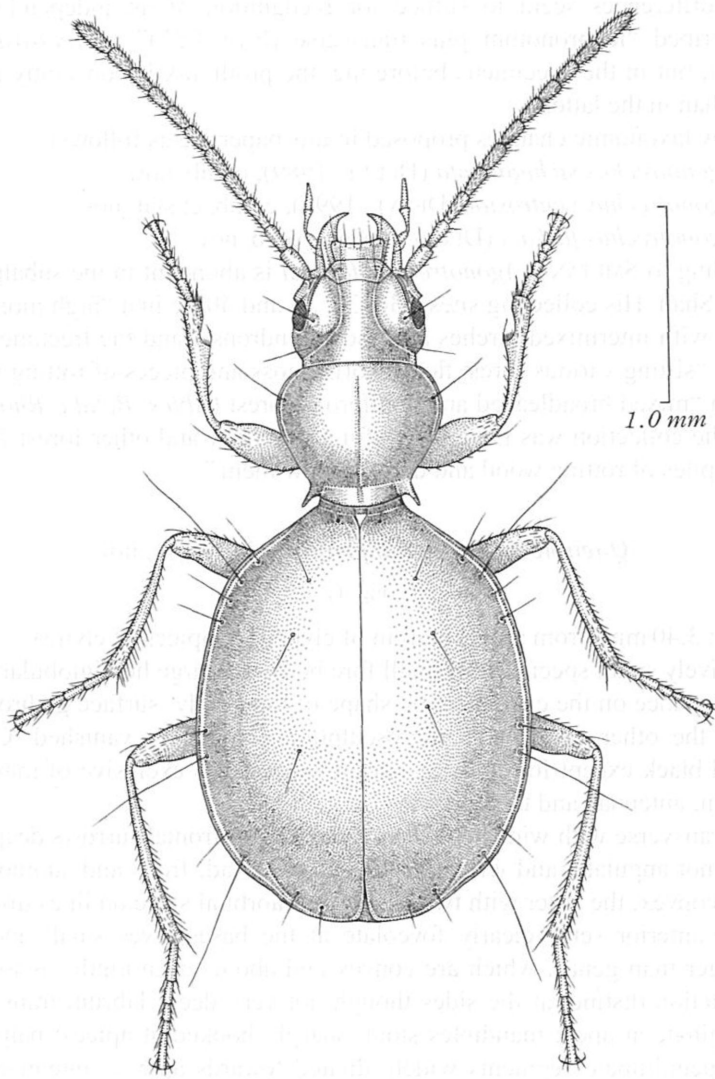


Fig. 1. *Queinnectrechus globipennis* S. UENO, sp. nov., ♀, from Mt. Xue Shan near Zhongdian.

angles rounded off; base gently arcuate, briefly oblique on each side just inside hind angle, which forms a digitiform process protrudent postero-laterad; disc strongly convex, with clearly impressed median line which is dilated in basal area; basal transverse impression sulciform and continuous; basal foveae small but deep, each externally delimited by carinate anterior continuation of postangular digitiform process; basal area smooth.

Elytra short and broad, hemiglobularly convex, widest slightly behind the middle, with basal parts briefly produced anteriorly and forming a short basal peduncle; EW/PW 1.99, EL/PL 2.84, EL/EW 1.24; shoulders very obtuse though not so completely effaced as in the other congeners, with prehumeral borders much less oblique though becoming finer anteriorly and obsolete under the lateral convexity of basal areas; sides rather widely reflexed, feebly arcuate behind shoulders but strongly so in posterior halves and widely rounded at apices, which form a small re-entrant angle at suture, each with a slight preapical emargination; disc narrowly depressed along suture and devoid of appreciable striation, with the exception of apical striole which is deeply impressed though short and free at the anterior end; apical carina very short and very obtuse; three setiferous dorsal pores present on the site of stria 3 at about 1/6, 1/3 and 4/9–3/5 from base, respectively; preapical, apical and marginal umbilicate pores as in the other congeners.

Legs relatively short and stout; protibiae as in the other congeners in conformation; tarsomere 1 shorter than tarsomeres 2 and 3 together in mesotarsus, about as long as that in metatarsus.

Male unknown.

Type specimen. Holotype: ♀, "CHINA N Yunnan Xue/Shan nr. Zhongdian/3900 m 25. VI. 1996/27°49N 99°34E C41//collected by/A. Smetana." To be deposited in the collection of the Musée d'Histoire Naturelle, Genève.

Notes. At first sight, this new species looks like a member of *Deuveotrechus* due to the hemiglobular hind body. It is, however, obvious that the present trechine is a third species of *Queinnectrechus* in view of the posteriorly evanescent lateral borders of pronotum, the anteriorly diminished prehumeral borders of elytra, the absence of preapical pore, and above all, the digitiform processes formed by the pronotal hind angles. After describing *Q. smetanai* (UÉNO, 1995, p. 94, figs. 1–3), I had an opportunity to visit the Naturhistorisches Museum Basel and to compare both *Q. smetanai* and the present species with the holotype of *Q. excentricus* DEUVE (1992 a, p. 354; 1992 b, p. 183, figs. 22–23). It was found as the result that *Q. smetanai* is more closely related to the type species than *Q. globipennis* is, though all the three belong to the same lineage. To our present knowledge, the three species of *Queinnectrechus* occur on three different mountains that are considerably distant from one another, but other species of the same genus must be found on the intervening mountains if we can locate good natural forests that are indispensable for the existence of these specialized humicolous trechines.

As was already mentioned in the *Notes* following the account of *Agonotrechus farkaci*, SMETANA'S collecting site C41 is a mixed broadleaved and coniferous forest on Mt. Xue Shan. Judging from its habitus, *Queinnectrechus globipennis* may be a saproxyphilous species, and probably lives under "piles of rotting wood" or in the "debris below them."

Trechus (s. str.) *macrops* JEANNEL, 1927

Trechus (s. str.) *macrops* JEANNEL, 1927, Abeille, Paris, **33**, pp. 157, 160, figs. 533–536; type area: Yunnan. — UENO & YIN, 1993, Elytra, Tokyo, **21**, p. 354.

Other references are omitted.

Specimens examined. 8 ♂♂, 5 ♀♀, “CHINA N Yunnan/Zhongdian env. 3200–/3300 m 21–22. VI. 1996/27°50N 99°36E C35//collected by/A. Smetana, J. Farkač/and P. Kabátek.”

Notes. As in the previous record from the Dali area (UENO & YIN, 1993, *loc. cit.*), I tentatively regard *macrops* as a full species. Since then, however, this trechine beetle has been collected from several localities in Yunnan and Sichuan, and seems widely distributed in Southwest China. A careful comparative study based upon the material from many more localities is needed for clarifying its true systematic status in the group of *Trechus indicus*.

要 約

上野俊一：SMETANA 博士などによって中国云南省中甸地域で採集されたチビゴミムシ類。——中国云南省北西部の中甸地域，とくに雪山で，Aleš SMETANA 博士などによって採集されたチビゴミムシ類は，3種に分類された。大多数は，DEUVE によって記載された *Bhutanotrechus farkaci* だったが，豊富な資料に基づいて検討した結果，明かにハバビロチビゴミムシ属 *Agonotrechus* のものと判定されたので所属を移した。またこの機会に，*Bhutanotrechus* 属のものと考えられていた *sichuanicola* もハバビロチビゴミムシ属に移し，その亜種として記載された *ventrosior* を独立種と認めて，その理由を説明した。奇妙な形態をした1種は，雌1点しか採集されなかったが，*Queinnectrechus* 属の第3の種と考えられ，しかも既知種とは顕著に異なるので，*Q. globipennis* S. UENO という新名を与えて記載した。他の1種は，云南省西部の山麓地帯に広く分布する *Trechus macrops* JEANNEL に同定された。

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