

QUEINNECTRECHUS FABBRII, NEW SPECIES OF TRECHINE
BEETLE FROM THE ZHEDUO SHAN MOUNTAINS,
SOUTH-WESTERN CHINA
(Coleoptera, Carabidae)

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INTRODUCTION

The peculiar trechine genus *Queinnectrechus* was erected by Deuve (1992) for the species *Q. excentricus* Deuve, 1992, from the Min Shan Mountains in northern Sichuan. Later Uéno (1995, 1998a, 1998b), and Belousov and Kabak (2003), respectively, highly increased the knowledge of this genus, with descriptions of several new species and illustrations of very informative features of the male genitalia. Presently, the genus includes several species living in forests and pastures at high altitude in mountains of south-western China (Sichuan and Yunnan provinces) (Löbl & Smetana 2003; Belousov and Kabak 2003; Lorenz 2005).

In the Zheduo Shan Mountains, North of the Gongga Shan Massif (Sichuan), two distinct species were known so far: *Q. zheduoshanus* Uéno, 1998, and *Q. glacialis* Uéno, 1998. In recent years our friend Roberto Fabbri, of the Museum of Natural History of Ferrara (Italy), offered to us for study a series of trechine beetles collected in the Zheduo Shan Mountains. Their examination allows the authors of the present contribution to describe a third *Queinnectrechus* species from this massif, and to give further information on this very interesting genus of mountain dweller carabid beetles.

MATERIAL AND METHODS

The following data come from 11 examined specimens (see: Type Material) received by one of the authors (P.M.) from R. Fabbri.

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Male and female genitalia were dissected, dehydrated in ethanol, cleared in cold KOH, and examined and illustrated, using standard techniques before being mounted on microscope slides. Line drawings were made using a camera lucida attached to a stereoscopic microscope Wild M-5. Photographs were obtained with on a microscope Nikon Labophot II and camera Nikon D1.

ABBREVIATIONS OF MEASUREMENTS: see tab. 1.

COLLECTIONS: NMNS: Department of Zoology, National Museum of Nature and Science, Tokyo, Japan; CC: Casale collection (University of Sassari, Italy); CM: Magrini collection (Florence); CMU: Monguzzi collection (Milan); CVT: Vigna Taglianti collection (University of Rome “Sapienza”, Italy).

Tab. 1 – *Queinnectrechus fabbrii* n. sp., measurements. L: overall Length, from apex of mandibles to apex of elytra, measured along suture; TL: body Total Length, from the anterior margin of clypeus to the apex of elytra, measured along the suture; HMW: head maximum width; LA: antennal length; PL: length of the pronotum, measured along the midline; PMW: Maximum Width of Pronotum, as greatest transverse distance; PB: width of the base of pronotum; EL: length of elytra, measured from the base of scutellum to the apical angle along the midline; EW: elytral maximum width; PMW/PL: ratio Maximum Width of Pronotum/Length of Pronotum, as linear distance from anterior to basal margin, measured along the midline; EL/EW: ratio Length of Elytra measured along the suture/maximum Width of Elytra; EW/PMW: ratio maximum width of elytra/maximum width of pronotum; LE: length of median lobe of aedeagus; AN: length of antennomeres 1, 2, 3, 4, 11.

<i>Queinnectrechus fabbrii</i> n. sp.	L	TL	LA	L LA	PM W	PL	PB	PMW PL	EL	EW	EL EW	EW PMW	LE	HM W	AN 1°	AN 2°	AN 3°	AN 4°	AN 11°
HT ♂	4.47	4.14	2.36	1.88	0.93	0.80	0.67	1.16	2.57	1.83	1.40	1.96	0.75	0.80	0.22	0.17	0.24	0.22	0.27
PT MIN	4.27	3.98	2.23	1.80	0.86	0.77	0.62	1.11	2.34	1.73	1.30	1.87	0.74	0.77	0.19	0.17	0.22	0.19	0.24
PT MAX	4.53	4.27	2.50	1.94	0.99	0.83	0.69	1.20	2.57	1.92	1.40	2.06	0.76	0.83	0.22	0.19	0.25	0.22	0.27
PT MED	4.37	4.08	2.35	1.87	0.93	0.79	0.65	1.14	2.45	1.82	1.34	1.95	0.75	0.80	0.21	0.18	0.23	0.20	0.25

Queinnectrechus fabbrii n. sp.

TYPE LOCALITY. China (W Sichuan): W Kanding, Zheduo Shan, eastern slope, 4300-4500 m a.s.l.

TYPE MATERIAL. Holotype: ♂, China, W Sichuan, 4300-4500 m a.s.l., W Kanding,

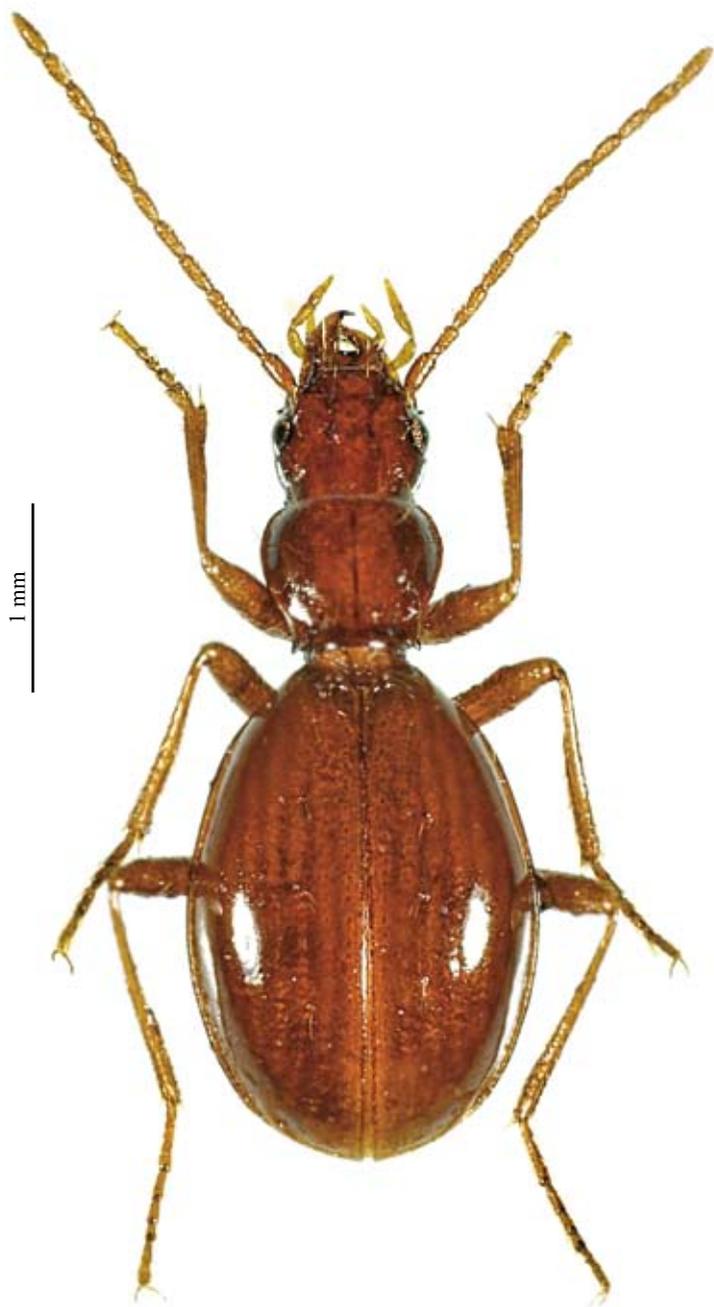
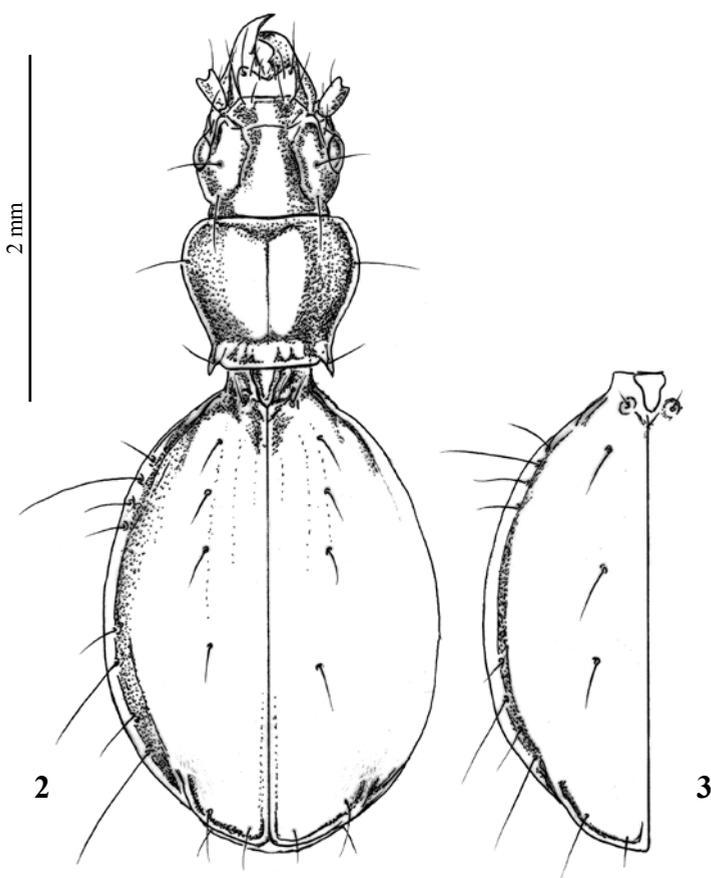


Fig. 1 – *Queinnectrechus fabbrii* n. sp., habitus, dorsal aspect, male holotype (photo: P. Magrini).



Figs 2-3 – *Queinnectrechus fabbrii* n. sp.: male paratype (2); female paratype (3) (drawings: A. Casale).

Zheduo Shan, alpine region with *Rhododendron*, 13-22.VI.2004, R. Fabbri leg. (CM). Paratypes: 7 ♂♂, 3 ♀♀, same data as holotype (1 ♀, MNHT; 1 ♂, CC; 4 ♂♂, 2 ♀♀, CM; 1 ♂, CMU; 1 ♂, CVT).

DIAGNOSTIC FEATURES. A medium sized trechine species, with the character states of the genus *Queinnectrechus* in the sense of authors.

Colour uniformly testaceous reddish. Pronotum cordiform, with hind angles attenuated in digitiform processes acutely prominent backward. Elytra globose, very convex, markedly narrowed at the base, each with three or four discal setiferous punctures; angulo-apical puncture present. Male genitalia as in figs (4-8). Ovipositor as in fig. 10.

Close to *Q. smetanai* Uéno, 1995, *Q. zheduoshanus* Uéno, 1998, *Q.*

glacialis Uéno, 1998, *Q. miroslavi* Belousov and Kabak, 2003, and *Q. incisus* Belousov and Kabak, 2003, but markedly distinct for several different morphological features (see: Relationships).

DESCRIPTION. General features as in figs 1-3. Medium sized: TL: mm 3.98-4.27; L: 4.27-4.53. Colour uniformly reddish testaceous, with somewhat paler yellow reddish palpi, antennae and legs. Cuticular microlines effaced altogether, integument highly polished and shiny.

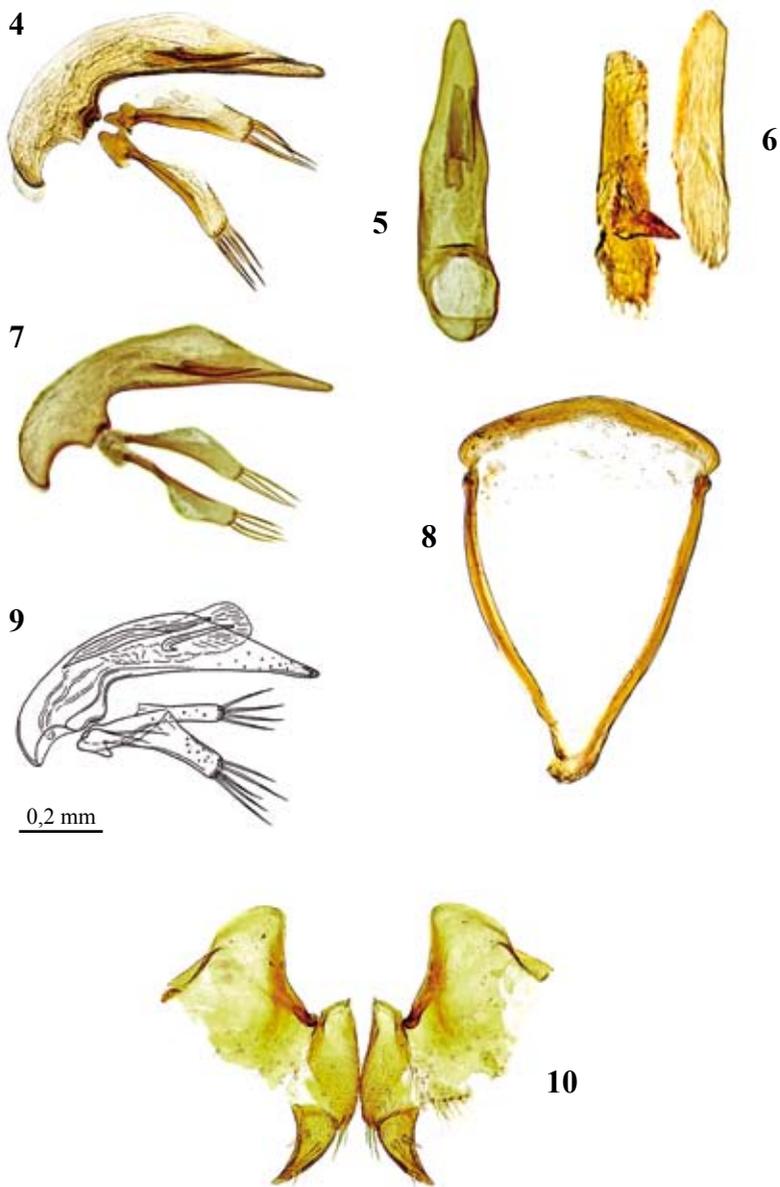
Head wider than long, with frontal furrows angulate, markedly impressed in anterior two-thirds, shallower posteriorly towards the neck constriction; frons convex; supraorbital areas each bearing a distinct foveole at the insertion of the anterior supraorbital seta; eyes moderately convex, slightly shorter than genae, which are regularly and markedly prominent, narrowed to the neck constriction; labrum very deeply emarginated at the anterior side; labium fused, with broad mentum tooth; submentum sex-setose; antennae elongate, reaching backwards the level of the fourth humeral setiferous puncture.

Pronotum slightly transverse (PMW/PL 1,11-1.20), cordiform, widest at the anterior third; disc very convex; sides markedly arcuate in front, shortly and regularly sinuate in the basal fourth, moderately divergent towards hind angles, which form digitiform processes acutely prominent postero-laterally; marginal furrows deep; anterior margin gently arcuate, front angles effaced; base feebly arcuate, obliquely emarginated inside postangular processes; basal foveae small, but markedly deep.

Elytra rather wide (EL/EW 1.30-1.40), egg-shaped, narrowed at the base, much wider than prothorax; disc very convex; humeri effaced, with pre-humeral margins oblique; lateral sides regularly rounded; lateral furrows widened and flattened in the basal fourth, at the level of the humeral group of setiferous punctures; striae effaced, except the apical striole which is deep, short and curved; intervals flat; apical carina developed. Chaetotaxy as in figs 2-3: three or four setiferous discal punctures on each elytron; posterior discal setiferous pore far removed from the elytral apex, about at level between umbilicate pores 5 and 6; umbilicate series with the pores of the humeral group almost equidistant; angulo-apical puncture present.

Legs long; protibiae slightly dilated and sparsely pubescent at apex, each with a long, deep groove on the external side; protarsi in the male each with two basal tarsomeres slightly dilated and denticulate inwards.

Male genitalia as in figs 4-8. Median lobe of aedeagus elongate,



Figs 4-10 – *Queinnectrechus fabbrii* n. sp.: median lobe of aedeagus and parameres on acetate (holotype), left lateral aspect (4); median lobe of aedeagus on perspex (holotype), ventral aspect (5); copulatory pieces (paratype), not scale photo, ventral aspect (6); median lobe of aedeagus and parameres on perspex (paratype), left lateral aspect (7); *Q. fabbrii*, abdominal segment IX (holotype) (8); *Q. glacialis* Uéno, aedeagus of the male holotype, left lateral aspect (from Uéno 1998) (9); *Q. fabbrii* n. sp. (female paratype), ovipositor (10) (photo: P. Magrini).

11



12



Figs 11-12 – China, Sichuan (Kanding), Zheduo Shan 4300-4500 m, habitat of *Q. fabbrii* n. sp. (photo: R. Fabbri).

markedly bent basally, almost straight apically, regularly narrowed, not truncate at apex; basal bulb large, with wide, emarginated basal orifice; sagittal carina small sized but evident. Endophallus armed with two elongate, sub-equal in size copulatory pieces; right (ventral) sclerite less sclerotized than the right; left sclerite markedly sclerotized, with a developed, triangular pre-basal prominence. Parameres long, each with four-five apical setae.

SPECIFIC EPITHET. We wish to dedicate this interesting new species to

our friend Roberto Fabbri, well known specialist of Coleoptera Byrrhidae, who obtained the specimens of the type series and offered them to us for study.

GEOGRAPHICAL DISTRIBUTION AND HABITAT. As anticipated in Introduction, the new species described in this paper is sympatric, but not syntopic, with two other species of the genus, i.e. *Q. zheduoshanus* Uéno, 1998 and *Q. glacialis* Uéno, 1998.

All specimens of *Q. fabbrii* n. sp. were sampled on the western slopes of the Zheduo Shan Mountains, at 4300-4500 in alpine zone with *Rhododendron*, under stones and sifting litter and soil (Fabbri, personal communication) (figs 11-12). On the contrary, *Q. zheduoshanus* was described from two female individuals sampled at lower altitude (3250 m), in a secondary forest of young *Abies*, although *Q. glacialis* was described from two specimens (one ♂, one ♀, both teneral), sampled at 3870 m and 3920 m, respectively, at Zheduo Shankou “beneath piled stones deeply buried at the edges of the moraines”. The efforts to collect the second specimen were described by Uéno himself (1998), and allowed the author to suppose that “this is an upper hypogean species quite exceptional for a member of *Queinnectrechus*”.

Furthermore, both of the taxa described by Uéno were sampled on the eastern side of the massif (Uéno, personal communication).

The occurrence of three different species of *Queinnectrechus* in the Zheduo Shan mountains is not surprising: all the area of the Gongga Shan massif, and more in general mountains and forests of Sichuan, are well known as one of the main hotspots of biodiversity in the world. Furthermore, in many montane areas of all continents several trechine species of the same genus are sympatric, and frequently syntopic (see, among others, Casale & Vigna Taglianti 2005).

RELATIONSHIPS. All morphological features stressed above (i.e.: pronotum with hind angles attenuated in large-sized digitiform processes directed backward; elytra elongate, with 3-5 discal setiferous pores and angulo-apical pore present; posterior discal setiferous pore far removed from elytral apex; shape of both median lobe of aedeagus and copulatory pieces of the endophallus) show that *Q. fabbrii* n. sp. belongs to a group of *Queinnectrechus* species, originated and radiated from a common ancestor, presently distributed in the Gongga Shan Mts. and its vicinities in south-western China (Sichuan).

The following, provisional key, modified from Belousov and Kabak (2003), will facilitate the identification of the close species known so far from this area:

1. Small-sized (body length mm 3.85-4.05 mm), elongate species, with paler yellowish colour of the dorsal side. Genae long and plane. Median lobe of aedeagus (fig. 9) without basal sagittal carina; endophallus with two elongate, markedly different to each other copulatory pieces. Sichuan: Zheduo Shan, eastern slopes at 3870-3920 m.....*Q. glacialis* Uéno, 1998
- Medium-sized species (body length mm 3.98-4.75 mm) with darker, reddish or brown blackish colour of the dorsal side. Genae short, convex or sub-convex.....2
2. Usually 5 discal setiferous pores on each elytron. Genae distinctly convex. Colour brown, usually infuscated on elytra except for sutural intervals and lateral margins as well. Sichuan: Gongga Shan (above Camp 3), 3300-3350 m.....*Q. smetanai* Uéno, 1998
- Usually 3-4 discal setiferous pores on each elytron.....3
3. Genae markedly convex, at least in posterior part. Digitiform processes of hind angles of pronotum more strongly produced. Colour amber reddish or testaceous reddish.....4
- Genae moderately convex. Digitiform processes of hind angles of pronotum smaller. Colour darker brown, with at least the elytral disc markedly infuscated, dark brownish to blackish.....5
4. Smaller sized species (TL: mm 3.98-4.27). Median lobe of aedeagus elongate, markedly bent basally, almost straight apically, regularly narrowed, not truncate at apex in lateral aspect (figs 4-7). Endophallus armed with two elongate, sub-equal in size copulatory pieces: right (ventral) sclerite less sclerotized than the right, left sclerite markedly sclerotized, with a developed, triangular pre-basal prominence (figs 5-6). Sichuan: Zheduo Shan, western slopes at m 4300-4500.....*Q. fabbrii* Casale & Magrini, n. sp.
- Larger sized species (TL: mm 4.17-4.59). Median lobe of aedeagus feebly and gradually arcuate, obliquely truncate at apex in lateral aspect. Endophallus armed with two sclerotized plates, the longest (left) of which is acuminate apically and less sclerotized. Sichuan: Sabde, 4200 m.....*Q. miroslavi* Belousov & Kabak, 2003
5. Larger sized species (TL: mm 4.07-4.75). Head elongate, with conical eyes and longer antennae. Endophallus with large broad lamella and deeply emarginate plate. Sichuan: NE Lixian, north of Tonghua village, 3900 m.....*Q. incisus* Belousov & Kabak, 2003
- Smaller sized species (TL: mm 4.0-4.05). Head less elongate, with less conic eyes and shorter antennae. Male unknown. Sichuan: Zheduo Shan, eastern slopes, 3250 m.....*Q. zheduoshanus* Uéno, 1998

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SUMMARY

Queinnectrechus fabbrii, new species of trechine beetle from the Zheduo Shan Mountains (Sichuan, south-western China), is described. Specimens of the new taxon have been sampled on the western slopes of the mountain at 4300-4500 m, in alpine pastures with *Rhododendron*. The new species is sympatric, but not syntopic, in the same mountain with two other *Queinnectrechus* species, i.e. *Q. zheduoshanus* Uéno, 1998 and

Q. glacialis Uéno, 1998, both of them living on the eastern slopes, the first at 3250 m, in forest, and the second on moraines at 3870-3920 m, respectively. Morphological and diagnostic features of the new taxon are described and illustrated. Furthermore, a key is given for identification of the closely related species of the genus, known so far from the Gongga Shan massif and its vicinities.

RIASSUNTO

Queinnectrechus fabbrii, nuova specie di Trechini dei Monti Zheduo Shan (Sichuan, Cina sud-occidentale) (Coleoptera, Carabidae).

Gli autori descrivono *Queinnectrechus fabbrii*, nuova specie dei Monti Zheduo Shan (Sichuan, Cina sud-occidentale), scoperta sul versante occidentale del massiccio in prateria alpina a 4300-4500 m di quota. La specie è simpatica ma non sintopica nello stesso massiccio con due specie congeneri, *Q. zheduoshanus* Uéno, 1998 e *Q. glacialis* Uéno, 1998, note del versante orientale a quote differenti (la prima a 3250 m, in foresta, la seconda su morene a 3870-3920 m). Sono descritti e illustrati i caratteri morfologici e diagnostici del nuovo taxon, ed è fornita una tabella di identificazione utile per evidenziare le principali differenze nei confronti delle specie affini, note del massiccio del Gongga Shan e sistemi montuosi vicini.

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