

New taxa of the genus *Carabus* Linnaeus, 1758 of Southern Sichuan Province, China

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ABSTRACT

In this paper, four new subspecies of *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) from South Sichuan province (China) are described and figured: *C. (Acoptopterus) rautenstrauchi alberti* n. subsp., *C. (Pseudocoptolabrus) taliensis shanlenggang* n. subsp., *C. (Pseudocoptolabrus) taliensis butuoensis* n. subsp., and *C. (Coptolabrus) gemmifer rectipustulatus* n. subsp.

KEY WORDS

Coleoptera; Carabidae; *Carabus*; faunistic; Sichuan; China.

Received 07.03.2024; accepted 22.08.2024; published online 30.09.2024

INTRODUCTION

The Sichuanese *Carabus* fauna is one of the best well known of China with a very high number of endemic species and subspecies (Deuve, 2013; 2021) which is difficult to find equals in other areas of Asia. Despite this, the vastness and complex orography of the territory create conditions such that we are still far from being able to consider this fauna sufficiently known. The proof is that every year several new taxa are described. The study of a large material collected from Southern Sichuan gave me the opportunity to identify 4 unknown subspecies of *Carabus*: *Carabus (Acoptopterus) rautenstrauchi alberti* n. subsp. which expands the range of this interesting species to the northwest; *Carabus (Pseudocoptolabrus) taliensis shanlenggang* n. subsp. and *Carabus (Pseudocoptolabrus) taliensis butuoensis* n. subsp. allow to better understand the distribution and variability of this polytypic species widely distributed in Yunnan, Southwest Sichuan and Northeast Burma; *Carabus (Coptolabrus) gemmifer rectipustulatus* n. subsp. which represents one of the most distinct forms within this species.

RESULTS

Systematics

Ordo COLEOPTERA Linnaeus, 1758
Subordo ADEPHAGA Schellenberg, 1806
Familia CARABIDAE Latreille, 1802
Subfamilia CARABINAE Latreille, 1802
Genus *Carabus* Linnaeus, 1758

Subgenus *Acoptopterus* Lapouge, 1927

Carabus (Acoptopterus) rautenstrauchi alberti n. subsp.

<https://www.zoobank.org/C8717A9A-FF51-4C80-BC7C-24F4F66490D6>

TYPE MATERIAL. Holotype. CHINA • male; Sichuan, Gu Dui Xiang, Meigu to Shanlenggang; 2250 m asl; Jul. 2022; it is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution (Fig. 1). Paratypes. CHINA • 2 females; same data as holotype; author's collection (Prepotto, Udine, Italy) • 14 males, 5 females; same data as holotype; A. Rautenstrauch collection (Hamburg, Germany).

DESCRIPTION OF HOLOTYPE. Male. Length including mandibles: 20.5 mm, maximum width of elytra: 7.3 mm. Distinguished from the typical subspecies by its larger size, much more robust head, wider and more strongly sinuous pronotum, much shorter basal angles of the pronotum, proportionally narrower and longer elytra, more convex and slightly heterodynamic elytral sculpture, apex of aedeagus much wider and rounded. Aedeagus as in Figs. 2, 3.

VARIABILITY. Minimal variability: the size in males ranges from 20 to 21.5 mm, in females from 22 to 23 mm.

DISTRIBUTION. This new subspecies is only known from the type locality.

ETYMOLOGY. The new subspecies is cordially dedicated to the honor of my friend and colleague Albert Rautestrauch (Augsburg, Germany) to whom the species is also dedicated.

Subgenus *Pseudocoptolabrus* Reitter, 1896

Carabus (Pseudocoptolabrus) taliensis shanlenggang n. subsp.

<https://www.zoobank.org/498C3ED8-27CD-4D41-A72F-A9089E73F651>

TYPE MATERIAL. Holotype. CHINA • male; Sichuan, 30 km behind Meigu to Shanglenggang; 2700 m; Jul. 2022; the holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution (Fig. 4).

DESCRIPTION OF HOLOTYPE. Male. Length including mandibles: 31 mm, maximum width of elytra: 9.5 mm. Upper side black with very faint blue tint on head, pronotum and the edge of elytra. Legs, antennae and palpi black. Head big and ticked, neck almost as wide as the base of the pronotum; eyes big and convex, very prominent; vertex of the head convex, surface strongly wrinkled; frons faintly punctured; clypeus smooth. Mandibles quite long and strong, evenly curved. Long palpi; apical segment



Figures 1–3. *Carabus (Acoptopterus) rautenstrauchi alberti* n. subsp. Fig. 1: holotype male. Fig. 2: holotype aedeagus in lateral view. Fig. 3: holotype aedeagus frontal view. Figures 4–6. *Carabus (Pseudocoptolabrus) taliensis shanlenggang* n. subsp. Fig. 4: holotype male. Fig. 5: holotype aedeagus lateral view. Fig. 6: holotype aedeagus in frontal view.

of maxillary and labial palpi very dilated; penultimate segment of labial palpi multisetose. Antennae very long and thin, extending over the apical half of elytra; third and fourth articles of the antennae superiorly tuberosus. Mentum tooth acute but apically blunt. Quite big pronotum for the species, moderately transverse (1.1 times as broad as long), sinuated, widened in the anterior third, narrowed to the base; hind angles acute, very slightly prominent behind its base; disc strongly and uniformly punctured with a characteristic papilionid-shaped bas-relief.

Elytra very elongated, narrow but rather globose, very convex; shoulders narrow and rounded; sculpture of elytra convex, triploid heterodyname type: primary intervals forming links interrupted by large and deep rounded foveae, secondary intervals forming irregular links moderately convex, tertiary ones forming grains irregularly disposed between the other intervals. Legs very long and quite strong. The first four protarsal segments with adhesive sole. Aedeagus as in Figs. 5, 6.

DISTRIBUTION. *Carabus (Pseudocoptolabrus) taliensis shanlenggang* n. subsp. is only known from the type locality.

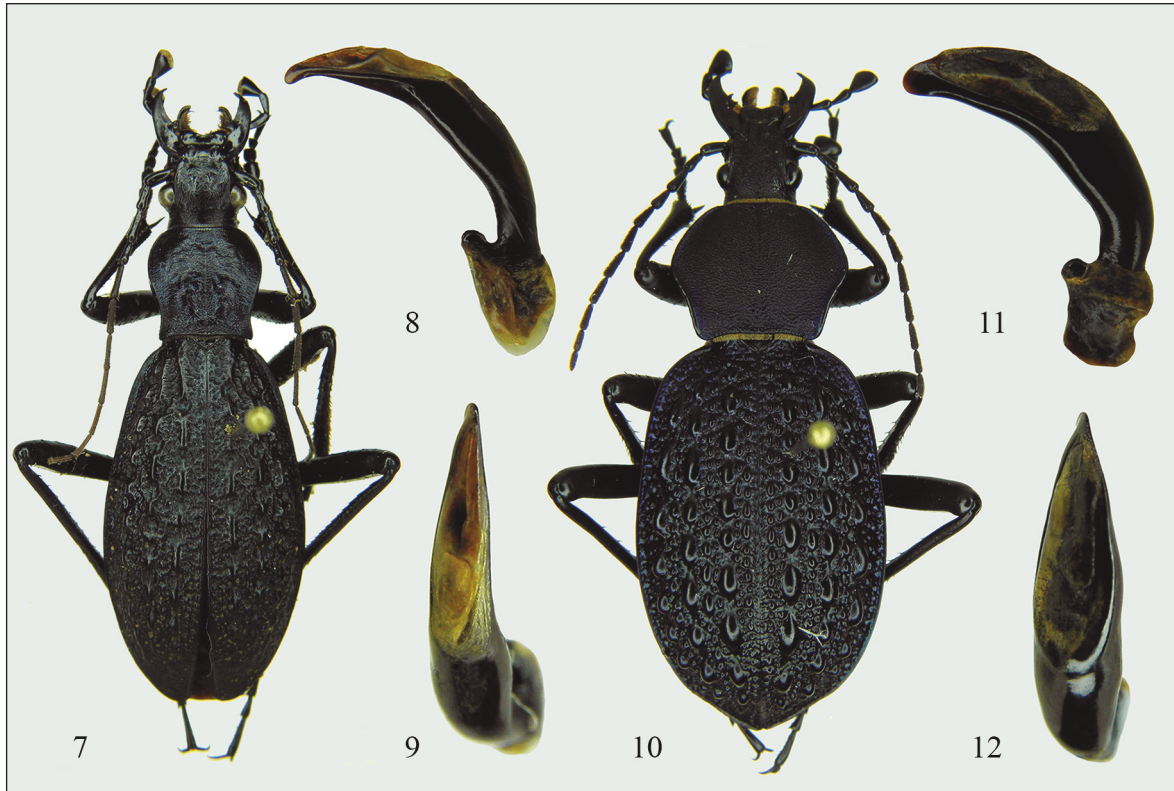
ETYMOLOGY. This new subspecies is named after the type locality.

REMARKS. Close to *C. taliensis shimianensis* Rapuzzi, 2013 but: stronger head, frons strongly wrinkled, wider and shorter mandibles, longer antennae, mentum tooth apically rounded (acuminate in *C. taliensis shimianensis*); bigger and larger pronotum.

Carabus (Pseudocoptolabrus) taliensis butuoensis
n. subsp.

<https://www.zoobank.org/4739AE59-5DD1-4669-A431-8C698FE541E5>

TYPE MATERIAL. Holotype. CHINA • male; Sichuan, Butuo to Puge; 2874 m; 27°39'14"N, 102°45'14"E; Jul. 2022; the holotype is temporarily housed at the author's collection (Prepotto,



Figures 7–9. *Carabus (Pseudocoptolabrus) taliensis butuoensis* n. subsp. Fig. 7: holotype. Fig. 8: holotype male aedeagus in lateral view. Fig. 9: holotype aedeagus in frontal view. Figures 10–12. *Carabus (Coptolabrus) gemmifer rectipustulatus* n. subsp. Fig. 10: holotype. Fig. 11: holotype aedeagus in lateral view. Fig. 12: holotype aedeagus in frontal view.

Udine, Italy) waiting to be definitively deposited in a public Institution (Fig. 7). Paratypes. CHINA • 2 females; Sichuan, Qing Heng to Jinyang; 2846 m; 27°56'47"N, 103°04'39"E; 31 Jul. 2022 • 1 female; Sichuan, Qing Heng to Jinyang; 3389 m; 27°49'46"N, 103°12'05"E; 4 Aug. 2022; paratypes in the author's collection (Prepotto, Udine, Italy).

DESCRIPTION OF HOLOTYPE. Male. Length including mandibles: 30.5 mm, maximum width of elytra: 9.3 mm. Similar in general appearance to the previous subspecies (*shanlenggang*) but very distinct for the following characters: shorter head, thinner mandibles, sharper mentum tooth, simple antennae, more convex and irregular elytral sculpture such as to give the bottom of the elytra a much more wrinkled appearance. Median lobe of the aedeagus stockier, spatulate and nearly straight apex (Figs. 8, 9).

VARIABILITY. The paratypes females collected in a location not close to the type location of the holotype have significantly larger dimensions (33 to 37.5 mm) and a clearly convex appearance. This population is ascribed to *butuoensis* even in the absence of male specimens from this locality since all the main discriminatory characteristics are perfectly respected.

DISTRIBUTION. *Carabus (Pseudocoptolabrus) taliensis butuoensis* n. subsp. is only known from the type locality.

ETYMOLOGY. The new subspecies is named after its type locality.

Subgenus *Coptolabrus* Solier, 1848

Carabus (Coptolabrus) gemmifer rectipustulatus n. subsp.

<https://www.zoobank.org/287F0D64-A0BF-44B2-9999-5303871A4A18>

TYPE MATERIAL. Holotype. CHINA • male; Sichuan, Yanyuan to Wodixiang; 2700 m asl; 16 Aug. 2022; the holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution (Fig. 10).

DESCRIPTION OF HOLOTYPE. Male. Length including mandibles: 31.5 mm, maximum width of elytra: 11.7 mm. Color black with head, pronotum and margins of elytra blue-violet; head and pronotum mat, elytra more shine. Head very long, prominent eyes; very long mandibles, basal tooth of the left mandible bifid, basal tooth of the right mandible more rudi-

mentary; very short and thin antennae, protruding the base of pronotum with the 2 apical segments. Palps very developed with the apical segments extremely dilatated. Pronotum strongly transverse, almost perfectly hexagonal, maximum width near the middle, strongly narrowed anteriorly and posteriorly; basal lobes very few prominent, not diverging towards and strongly bent downwards. Surface strongly and uniformly punctured; medial furrow thin but complete. Very short and convex elytra, subparallel shape; shoulders rounded but protruding; apex of the elytra simple, perfectly rounded, without any mucrons. Elytral sculpture formed by primary tubercles rounded and very prominent; secondary smaller, less convex than the primary ones and perfectly aligned; tertiaries in series of smaller tubercles, very numerous and close to each other. Male aedeagus typical of the species (Figs. 11, 12).

DISTRIBUTION. *Carabus (Coptolabrus) gemmifer rectipustulatus* n. subsp. is only known from the type locality.

ETYMOLOGY. The given name wants to point out the very regular elytral sculpture formed of series of perfectly aligned tubercles.

REMARKS. The new subspecies is well distinguished from *C. (Coptolabrus) gemmifer* (including subspecies) for the following characters: pronotum strongly transverse, hexagonal shape, shorter basal lobes, surface of pronotum more strongly and regularly punctured. Elytra shorter; apex of elytra rounded, without apical mucrone. Different elytral sculpture: primary, secondary and tertiary tubercles rounded and perfectly aligned.

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