

Faunistic notes and new taxa of the genus *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) of Shanxi Province, China

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ABSTRACT Faunistic notes of the genus *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) from North China, Shanxi Province are provided. Two new species are also described and figured: *Carabus (Cychrostomus) anchocephalus rectigranulatus* n. subsp. and *C. (Morphocarabus) latreillei shanxiensis* n. subsp.

KEY WORDS Carabidae; *Carabus*; faunistic; *Morphocarabus*; *Cychrostomus*; new subspecies; Shanxi; China.

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INTRODUCTION

In this paper are presented the results of faunal research carried out in Shanxi Province, North China in the summer of 2022. Although numerous information on the *Carabus* of Shanxi is already known (Deuve, 2013; 2021), the Province still has vast gaps that cannot be considered filled even with the present paper. The study of the collected specimens have clarified even more the distribution of some Carabidae species and led to the identification of two new *Carabus* subspecies: *Carabus (Morphocarabus) latreillei shanxiensis* n. subsp. and *Carabus (Cychrostomus) anchocephalus rectigranulatus* n. subsp. These results allow to better understand the Carabidae fauna of Shanxi.

RESULTS

Systematics

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

Genus *Carabus* Linnaeus, 1758

Subgenus *Carabus* Linnaeus, 1758

Carabus (Carabus) manifestus manifestus Kraatz, 1881

MATERIAL EXAMINED. CHINA • 2 males, 2 females; Shanxi, Lu Liang, Kang Cheng Zhen; Aug. 2022.

REMARKS. New data for this area.

Subgenus *Piocarabus* Reitter, 1896

Carabus (Piocarabus) sui sui Imura et Zhou, 1998

MATERIAL EXAMINED. CHINA • 1 male; Shanxi, Lu Liang, Kang Cheng Zhen; Aug. 2022. CHINA • 1 male, 2 females; Shanxi, Lu Liang, Xi Xian Shi Ma Gou, Aug. 2022.

REMARKS. New localities for this species.

Carabus (Piocarabus) vladimirskyi vladimirskyi Dejean, 1830

MATERIAL EXAMINED. CHINA • 1 male, 1 female; Shanxi, Lu Liang, Kang Cheng Zhen; Nov. 2022. CHINA • 2 males, 2 females; Shanxi, Lu

Liang, Jun Zhuang Zhen; Nov. 2022. CHINA • 2 males, 2 females; Shanxi, Lu Liang, Kang Cheng Zhen, Jao Kou Xian; Aug. 2022.

REMARKS. New data for this area.

Subgenus *Scambocarabus* Reitter, 1896

Carabus (Scambocarabus) sculptipennis sculptipennis Chaudoir, 1877

MATERIAL EXAMINED. CHINA • 2 males; 1 female; Shanxi, Lu Liang, Kang Cheng Zhen; Aug. 2022.

REMARKS. New localities for the species.

Subgenus *Pagocarabus* Morawitz, 1886

Carabus (Pagocarabus) crassesculptus crassesculptus Kraatz, 1881

MATERIAL EXAMINED. China • 1 female; Shanxi, Lu Liang, Kang Cheng Zhen; Nov. 2022. CHINA • 1 male, 1 female; Shanxi, Lu Liang, Kou Xian; Nov. 2022.

REMARKS. New records for the Province.

Subgenus *Cathaicus* Bates, 1870

Carabus (Cathaicus) brandti gansuanus Breuning, 1932

MATERIAL EXAMINED. CHINA • 1 female; Shanxi, Kang Cheng Zhen, Jiao Kou Xian; Aug. 2022. CHINA • 1 male; Shanxi, Lu Liang, Xi Xian Shi Ma Gou; Aug. 2022.

REMARKS. *Carabus (Cathaicus) brandti* is a quite variable species between its large areal and between each population. The specimens studied in this study are consistently small and slender.

Subgenus *Damaster* Kollar, 1836

Carabus (Damaster) smaragdinus zhongtiaoshanus Imura et Yamaya, 1994

MATERIAL EXAMINED. CHINA • 1 male; Shanxi, Lu Liang, Kang Cheng Zhen; Nov. 2022. CHINA • 1 male; Shanxi, Lu Liang, Fen Xi Xian; Nov. 2022.

REMARKS. The present localities expand the known range of the subspecies towards the north.

Subgenus *Cychrostomus* Reitter, 1896

Carabus (Cychrostomus) anchocephalus rectigranulatus n. subsp. (Figs. 1–3)

<https://www.zoobank.org/8349B8C2-3FCE-44C5-8BF2-B42AE8ACEF48>

TYPE MATERIAL. Holotype. CHINA • male; Shanxi Province, Lu Liang, Kang Cheng Zhen; Nov. 2022. Paratypes. CHINA • 1 male, 5 females; Shanxi Province, Lu Liang, Kang Cheng Zhen; Nov. 2022; author's and Albert Rautenstrauch (Hamburg, Germany) collections. The holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution.

DESCRIPTION OF HOLOTYPE. Length including mandibles: 22 mm, maximum width of elytra: 8.1 mm. Quite short and stout shape for the species. Upper surface almost black, only the edges slightly bronzed; decidedly mat. Head quite small, frons furrows rather short and shallow. Short mandibles for the species; basal tooth of the right mandible rudimentary, consisting of a single broad and blunt tooth. Pronotum transverse (1.3 times as broad as long), fore angles prominent, basal angles prominent and rounded, sides significantly bent upwards particularly at the base. Elytra oval, slightly convex profile; shoulders strongly protruding; very wide side margins, strongly bent upward toward the shoulders. Sculpture of elytra triploid homodyname type, forming row of rounded tubercles quite spaced apart, in a large marginal area the elytral sculpture has almost completely vanished; just at the apex of elytra the 3 primary rows of tubercles fused forming a smooth rib. Aedeagus (Figs. 2, 3) rather short and stocky, regularly arched in the median portion; apex rather short and rounded.

VARIABILITY. Very limited variability that concerns only the size. The size in males ranges from 21.5 mm to 22 mm, females ranges from 23 mm to 24 mm.

ETYMOLOGY. The given name wants to point out the elytral sculpture formed of series aligned granules.

REMARKS. As the geographical distribution suggests, *C. (Cychrostomus) anchocephalus rectigranulatus* n. subsp. is close related to *C. anchocephalus farinosus* Rapuzzi, 2023 from Hohhot vicinity (Inner Mongolia). From the latter the new sub-

species is easily distinguishable for some very evident characters: general shape shorter and stouter; darker color; shorter head and smaller eyes; frons furrows shorter and shallower; basal tooth of the right mandible forming a single broad and stout protuberance and not bifid; different sculpture of elytra.

A certain affinity of *C. (Cychrostomus) anchocephalus rectigranulatus* n. subsp. could be also found with the subspecies *lanzhouensis* Deuve, 1991 from which it is distinguished by the following characters: stouter head; shorter mandibles; pronotum stronger transverse with fore angles prominent and basal angles rounded; sides of pronotum strongly bent upward; sculpture of the elytra more regular and smoother; the smooth ribs formed by the fusion of the 3 primary rows concern only the very apex of elytra.

Subgenus *Morphocarabus* Géhin, 1885

Carabus (Morphocarabus) latreillei shanxiensis
n. subsp. (Figs. 4–6)

<https://www.zoobank.org/277F2E1C-14D5-4198-867B-B18E4F17E239>

TYPE MATERIAL. Holotype. CHINA • male; Shanxi, Lu Liang, Kang Cheng Zhen, Jiao Kou Xian; Aug. 2022. Paratypes. CHINA • 1 female; Shanxi, Lu Liang, Kang Cheng Zhen, Xi Xian Shi Ma Gou; Aug. 2022 • 1 male, 7 females; Shanxi, Lu Liang, Kang Cheng Zhen; Aug. 2022; in the author's and Albert Rautenstrauch (Hamburg, Germany) collections. The holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution.

DESCRIPTION OF HOLOTYPE. Length including mandibles: 22 mm, maximum width of elytra: 7.8 mm. Color uniformly black, slightly shin. Head quite stout, eyes very prominent. Antennae tin and



Figures 1–3. *Carabus (Cychrostomus) anchocephalus rectigranulatus* n. subsp. Fig. 1: holotype. Fig. 2: holotype aedeagus lateral view. Fig. 3: holotype aedeagus frontal view. Figures 4–6. *Carabus (Morphocarabus) latreillei shanxiensis* n. subsp.. Fig. 4: holotype. Fig. 5: holotype aedeagus lateral view. Fig. 6: holotype aedeagus frontal view.

long protruding the base of pronotum with the 5 apical segments; antennae with segments 5th to 9th forming tubercles very moderately prominent; before each tubercle with a glabrous longitudinal impression. Pronotum moderately transverse (1.25 times as wide long), surface very faintly wrinkled, not punctate; sides widely margined and bent upwards; hind angles very prominent behind the base of pronotum, slightly diverging. Elytra oval, very moderately convex. Sculpture of elytra triploid nearly homodynamous type; intervals very slightly convex, smoothed above. All the elytral intervals are fragmented, the primary ones forming slightly longer segments interrupted by very shallow foveae. Aedeagus (Figs. 5, 6) rather small, uniformly curved throughout its length; elongated apical portion, sub-cylindrical and rounded apex.

VARIABILITY. The females measure 23 and 24 mm respectively. The general shape is rather broad and depressed. The sculpture is of slightly heterodynamous triploid type, all the intervals are slightly convex, almost smooth. The primary intervals consist of slightly convex segments separated by very shallow foveae, the secondary and tertiary intervals consist of a series of aligned and very slightly convex granules. Upper surface mat.

ETYMOLOGY. The new subspecies is named after the Shanxi, its Province of origin.

REMARKS. This new subspecies is much closer to *C. latreillei semicoriaceus* Kraatz, 1881 from Liaoning (Liaodong Peninsula) rather than to *C. la-*

treillei latreillei Fischer, 1822 widely diffused in North-East China (Inner Mongolia, Heilongjiang, Hebei, Beijing) (Deuve, 2013). With *semicoriaceus*, it shares the general elongated shape and the basal lobes of the pronotum very prominent and bent upwards. Instead, it differs for the much thicker head, the more transverse pronotum, the much smoother and less convex elytral sculpture. The aedeagus is uniformly curved throughout its length, the apex is longer and flexed to the left in frontal view.

Carabus latreillei shanxiensis differs from *C. latreillei latreillei* for the more elongated shape, the larger pronotum, the sides of the pronotum more widely bent upwards, for the basal lobes of the pronotum sharper and longer protruding behind its base and strongly bent upwards, for the much more regular and smooth elytral sculpture.

Compared to *C. latreillei mengguicus* Rapuzzi, 2023 known from East Inner Mongolia, the new subspecies appears completely different as it does not share any significant characteristics with it.

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