

Three new *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) of the subgenus *Apotomopterus* Hope, 1838 from North and Central Vietnam

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ABSTRACT Three new taxa belonging to subgenus *Apotomopterus* Hope, 1838 (genus *Carabus* Linnaeus, 1758, Coleoptera Carabidae) from Vietnam are here described and figured: *Carabus (Apotomopterus) anacoreta* n. sp. from Ha Giang Province, *C. (Apotomopterus) tarasovinus toussainti* n. ssp. from Nghe An Province, and *C. (Apotomopterus) tonkinensis tropicus* n. ssp. from Da Nang Province.

KEY WORDS Coleoptera; Carabidae; *Carabus*; *Apotomopterus*; new species; new subspecies; Ha Giang; Nghe An, Da Nang; Vietnam.

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INTRODUCTION

Currently, the genus *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) in Vietnam includes about ten species (Deuve, 2021) all belonging to the subgenus *Apotomopterus* Hope, 1838. All of them are described or known from the northernmost part of the Country.

A substantial part of the known species is the result of recent contributions with the description of new taxa from the northern provinces of the Country: Yen Bai Province: *Carabus (Apotomopterus) tonkinensis yenbaiensis* Deuve, 2013; Ha Giang Province: *C. (A.) tonkinensis hagiangensis* Rapuzzi, 2020, *C. (A.) narcissus* Rapuzzi, 2023; *C. (A.) vietnamicus* Rapuzzi, 2023; Lai Chau Province: *C. (A.) tenuicostatus* Rapuzzi, 2023, *C. (A.) artemisioides* Rapuzzi, 2023.

In the present article three new taxa of *Carabus* from Vietnam are described: *C. (Apotomopterus) anacoreta* n. sp., *C. (A.) tarasovinus toussainti* n. ssp., and *C. (A.) tonkinensis tropicus* n. ssp.

Carabus tonkinensis tropicus from Da Nang Province in the central part of Vietnam shifts further south the limit of the entire *Carabus* genus in Southeast Asia. *Carabus (A.) tarasovinus toussainti* represents the first report of this Laotian species in Vietnam. Finally, *C. (A.) anacoreta* from Ha Giang Province appears very enigmatic, his morphological characteristics are so unique that cannot be found no similarity within the entire *Apotomopterus* subgenus.

RESULTS

Systematics

Ordo COLEOPTERA Linnaeus, 1758
Subordo ADEPHAGA Schellenberg, 1806
Familia CARABIDAE Latreille, 1802
Subfamilia CARABINAE Latreille, 1802
Genus *Carabus* Linnaeus, 1758
Subgenus *Apotomopterus* Hope, 1838

Carabus (Apotomopterus) anacoreta n. sp.
<https://www.zoobank.org/702AEC23-723E-447D-A425-9F552CEB6DDC>

MATERIAL EXAMINED. Holotype male: NORTH-EAST VIETNAM • 1 specimen; Ha Giang Province, Xin Man; Aug. 2023. Paratypes; 8 specimens; same data as the holotype; 6 males and 2 females. The holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution (Figs. 1–4).

DESCRIPTION OF HOLOTYPE. Male. Wide oval shape. Length including mandibles: 31 mm, maximum width of elytra: 10.1 mm. Dorsal and ventral side black, very shiny; legs black, palps and antennae brown, apex of palps paler.

Head stout; eyes big and convex; frons and vertex sub depressed, almost smooth above; very superficially wrinkled only on the disc and neck; neck quite short and stout; labrum bilobate; mandibles exceptionally long, narrow, sickled-shaped, curved along whole inner edge. Mentum tooth largely obtuse and acuminate, shorter than the lateral lobes. Palps very long, apical segment dilatated; preapical segment of labial palps with 3 setae. Submentum with a lateral seta. Antennae very long and thin, longly exciding the half of elytra.

Pronotum small and slightly transverse (1.2 times as wide as long), sinuate, strongly narrowed to the base in the shape of an inverted trapezoid. Maximum width at the apical third. Sides uniformly margined and fully bent upwards; hind angles of pronotum not lobed and very moderately protruding behind its base; anterolateral angles strongly protruding forward the anterior bead. Disc of pronotum almost flat, superficially wrinkled with a characteristic protuberance of a “papilionid” shape; median impression well distinguishes. Two lateral setae, one basal and one medial.

Oval elytra, apiculate apex; maximum width at the apical third; narrow and rounded shoulders. Sides of elytra widely margined, more or less bent upwards, particularly at the apical part. Quite convex elytral sculpture of triploid almost homodynamic type; the primary intervals a little more convex, forming links interrupted by small fovea; secondary and tertiary intervals forming uninterrupted lines. Near the suture of the elytra there is a supernumerary primary interval forming a series of grains and short links, it shows approximately half

of the size compared the other intervals. Striae slightly punctate.

Legs very long. Very elongated and thin tarsi. Protarsi in male very long and only very slightly dilated, segments 1 to 4 with ventral pad of adhesive soles.

Aedeagus very characteristic. In lateral view (Figs. 2, 3), the median lobe is extremely elongated, sub rectilinear and progressively narrowed towards the apex. The apex forms a flattened and downwards hook. In frontal view (Fig. 4) the apical lobe is very long and thin.

VARIABILITY. Very limited variability. In males the length including mandibles ranges from 30 mm to 32 mm, in females the length including mandibles range from 31 mm to 33 mm. In the females the distal segment of the palps is simple and not dilated; the elytra with a moderate preapical emargination.

ETYMOLOGY. The specific name is attributed to this extraordinary new species aims to emphasize its geographical isolation in a distant and remote place which has allowed it to remain unknown to today.

REMARKS. *Carabus (A.) anacoreta* n. sp. is a very distinct morphologically species and geographically isolated. The structure of the aedeagus clearly reminds that of the *C. (Apotomopterus) longeantennatus* Hauser, 1931 species group, especially with *C. (A.) acorep* Lassalle et Prunier, 1993. From them *C. (A.) anacoreta* is very easy separated for the homodynamic-type elytral sculpture - homodynamic in *C. (A.) acorep*, homodynamic but clearly more irregular in *C. (A.) longeantennatus* - the different shape of the pronotum, the apical segment of palps dilatated in males and simple in females, and the male protarsi very long and only slightly dilated. But the most remarkable character of the new species is the strongly developed mandibles that has no similarity in any species of *Apotomopterus* known to date. Under this point of view, according to the classic classification of the genus *Carabus* proposed by Breuning (1932–1936) based on the structure of the mandibles, the new species would be placed among the *Carabus longimandibulares* group, very far from the *Apotomopterus* subgenus. It cannot be ruled out that the new species should belong to a distinct subgenus.



Figures 1-4. *Carabus (Apotomopterus) anacoreta* n. sp., Fig. 1: holotype. Fig. 2: male aedeagus lateral view (dorsal). Fig. 3: male aedeagus lateral view (ventral). Fig. 4: male aedeagus frontal view.

Carabus (Apotomopterus) tarasovinus toussainti
n. ssp.

<https://www.zoobank.org/F1E76338-55F6-4E3F-9A49-399C04613B3F>

MATERIAL EXAMINED. Holotype female: NORTHEAST VIETNAM • 1 specimen; Nghe An Province, Tuong Duong; Jun. 2023. The holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution (Fig. 5).

DESCRIPTION OF HOLOTYPE. Female. Ovate shape. Length including mandibles: 32 mm, maximum width of elytra: 11 mm; dorsal side uniformly black, mat; ventral side and appendix black.

General shape close to *C. (A.) tarasovinus* Deuve, 2009 but decidedly wider and more robust; head clearly larger and shorter, more punctured on the disc. Pronotum of different shape, clearly more transverse (1.3 times as broad as long), with regularly rounded sides - sub hexagonal in *C. (A.)*

tarasovinus - not sinuate; more convex disc and less wrinkled; base of the pronotum truncated and basal lobes only weakly perceptible. Elytra clearly wider and more rounded, shoulders more prominent; heterodynamous sculpture, primary and secondary intervals equally convex, the primaries interrupted only beyond half the length of the elytra, tertiaries reduced to a series of small granules; strongly punctate striae; preapical emargination much more weakly indicated.

ETYMOLOGY. This new *Carabus* is very cordially dedicated to the honor of Emmanuel Toussaint, specialist in Phylogeny and Evolution of Coleoptera and Lepidoptera at the Natural History Museum of Geneva (Swiss).

REMARKS. *Carabus (A.) tarasovinus toussainti* n. ssp. presents very clear distinctive characters compared to the typical form described from Laos: stouter head, much wider and globose pronotum with non-sinuous but regularly rounded margins; elytra much wider and convex. In the future, the de-

sirable examination of the male will allow to confirm the status of subspecies or of valid species for this interesting and distinctive taxon.

Carabus (Apotomopterus) tonkinensis tropicus n. ssp.

<https://www.zoobank.org/C7E98390-DBE3-4E8F-8F46-B821BFE99CC2>

MATERIAL EXAMINED. Holotype female: CENTRAL VIETNAM • 1 specimen; Da Nang Province, Ba Na hills, top of Mt. Chua; 1480 m asl; Aug. 2023. The holotype is temporarily housed at the author's collection (Prepotto, Udine, Italy) waiting to be definitively deposited in a public Institution (Fig. 6).

DESCRIPTION OF HOLOTYPE. Female. Long-oval shape. Length including mandibles: 32 mm, maximum width of elytra: 9.5 mm; dorsal side uniformly black, mat. Ventral side and appendix black.

General shape close to *C. (A.) tonkinensis yenbaiensis* Deuve, 2013 and especially to *C. (A.) tonk-*

inensis hagiangensis Rapuzzi, 2020 but decidedly opaquer. The pronotum is much wider (1.42 times as wide as long) and flatter in shape. Elytral sculpture clearly flatter, the primaries slightly interrupted only beyond half the length of the elytra, a little dominant over the secondaries and tertiaries which are almost uninterrupted and form keels. Elytra laterally clearly edged but not bent upward before the preapical emargination.

ETYMOLOGY. The given name aims to highlight the extremely southern locality of origin of the new taxon on the edge of the tropical area.

REMARKS. *Carabus tonkinensis* Deuve, 1990 is a species widely distributed in southern China (Yunnan Province) and northern Vietnam. The description of *C. tonkinensis tropicus* from the province of Da Nang greatly expands the range of the species towards the south and currently represents by far the southernmost taxon known of the entire *Carabus* genus. The new subspecies is easily recognizable for various characteristics and in par-

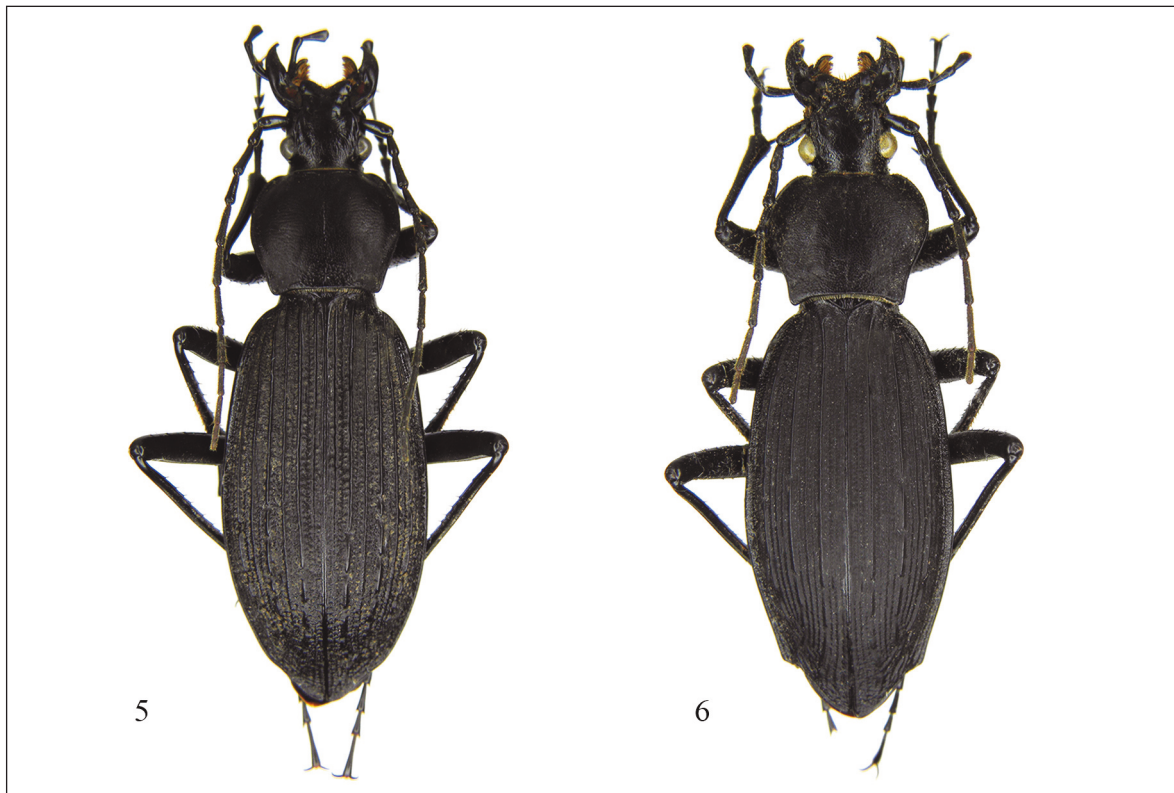


Figure 5. *Carabus (Apotomopterus) tarasovinus toussainti* n. ssp., holotype female.
Figure 6. *Carabus (Apotomopterus) tonkinensis tropicus* n. ssp., holotype female.

ticular for: exceptionally transverse pronotum with sub-flat disc; slightly convex elytral sculpture; preapical emargination not bent upward laterally.

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