



A new species of *Velutinodorcus* Yi, 2023 from Vietnam (Coleoptera: Lucanidae)

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Abstract. *Velutinodorcus vietnamicus* Jo & Tsuboi sp. n., from Vietnam is described and figured. The new taxon belongs to the small *Velutinodorcus carinulatus* group of species and is compared to the closely related species.

Riassunto. Una nuova specie di *Velutinodorcus Yi, 2023 del Vietnam (Coleoptera: Lucanidae)*. Si descrive e si illustra *Velutinodorcus vietnamicus* sp.n. del Vietnam. Il nuovo taxon appartiene al piccolo gruppo di specie *Velutinodorcus carinulatus* ed è confrontato con le specie ad esso più vicine.

Tóm tắt. Một loài mới của giống *Velutinodorcus Yi, 2023 từ Việt Nam (Coleoptera: Lucanidae)*. *Velutinodorcus vietnamicus* sp. n., từ Việt Nam được mô tả và minh họa. Loài mới này thuộc nhóm loài nhỏ *Velutinodorcus carinulatus* và được so sánh với các loài có quan hệ gần gũi.

Key words. Coleoptera, Lucanidae, new species, Vietnam

ZooBank registration. <https://zoobank.org/NomenclaturalActs/E7073AA6-C69A-4386-A9E6-8324B03554A7>

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Introduction

The name *Velutinodorcus* was created by MAES (1992) with *Dorcus velutinus* Thomson, 1862 as type species, but was considered a *nomen nudum* by HUANG & CHEN (2013: 80) because MAES did not give a description or any morphological character for its new genus. Yi (2023: 14) resurrected the name used by MAES (1992) with the same type species, and gave a very short indication (“long and dense setae on the elytra”) of the peculiar character of the species belonging to the genus: therefore at present the correct name of the taxon should be *Velutinodorcus Yi, 2023*; he also listed the 14 species he included in the genus.

The *Velutinodorcus carinulatus* group is characterized morphologically by the lack of development of the internal teeth on the apical portion of the male mandibles (Figs 4-7), and the three taxa included in this group are *V. carinulatus carinulatus* (Nagel, 1941), *V. carinulatus koreanus* (Jang & Kawai, 2008), and *V. japonicus* Nakane & Makino, 1985. They are characterized by narrow geographic distributions in Taiwan, Japan and Korea, respectively (Fig. 20). In particular, in the case of Korea (Haenam-gun, Jeollanam-do) and Japan (Tokunoshima Is., Kagoshima Pref.), the species are distributed only in specific areas and on specific islands, and

even in the case of the taxon *V. carinulatus carinulatus* distributed in Taiwan, the population seems to have a very restricted area.

During several entomological expeditions to Vietnam, organized by the Natural History Museum of the University of Florence in collaboration with the Vietnam National Museum of Nature, in the framework of a Memorandum of Understanding signed by the two Institutions (see VU *et al.*, 2014), many specimens of stag beetles (Coleoptera Lucanidae) were collected. In 2018, a male specimen belonging to the *Velutinodorcus* group of species was collected and recognized (L. BARTOLOZZI, 2023, personal communication) as a possible new species, showing morphological differences with *Velutinodorcus velutinus*, a species which is also present in Vietnam.

In 2022 and 2023 one of the authors (MT) was able to obtain from a local collector in Vietnam some more specimens of that interesting taxon, and after an accurate study we have been able to verify that it is a new species, which we describe below.

Material and methods

Specimens were studied using a stereomicroscope Olympus SZX16. Habitus photos were taken using a Olympus DP73 Microscope Digital Camera mounted on the stereo microscope; the stacking software was Combine ZP.

The following entomological collection abbreviations are used in the text:

YAC: Yu Asano collection (Ibaraki, Japan)

MTC: Makoto Tsuboi collection (Saitama, Japan)

MZUF: Natural History Museum, University of Florence (Florence, Italy)

VNMN: Vietnam National Museum of Nature (Hanoi, Vietnam)

Velutinodorcus vietnamicus sp. n. (Figs 1-3, 7, 11, 15, 19)

Examined material. Holotype ♂. Vietnam, Nghe An Province, border Pu Mat National Park, 13-14.VI.2018, A. Bandinelli, L. Bartolozzi, E. Orbach, S. Bambi, F. Fabiano, V. Sbordoni and L. Cecchi (VNMN); Paratypes: 4 ♂♂, 8 ♀♀: Vietnam, Quang Binh, Le Thuy, Lam Thuy, 800-1200 m, IV-VIII. 2023, local collectors (1 ♀: VNMN; 1 ♂, 1 ♀: MZUF; 3 ♂♂, 6 ♀♀: MTC); 3 ♂♂, 1 ♀: Vietnam, Thanh Hoa, Ba Thuoc, Pu Luong, 1200-1750 m, IV-VI. 2022, local collectors (2 ♂♂: YAC; 1 ♂, 1 ♀: MTC).

Description. Size (in millimeters). Holotype male - total length: 18.8 (including mandibles), 16.6 (without mandibles). Paratypes male - total length: 19.7-16.5 (including mandibles), 17.4-14.8 (without mandibles) (n = 7); Paratypes female - 19.1-16.8 (including mandibles), 17.7-15.6 (without mandibles) (n = 9).

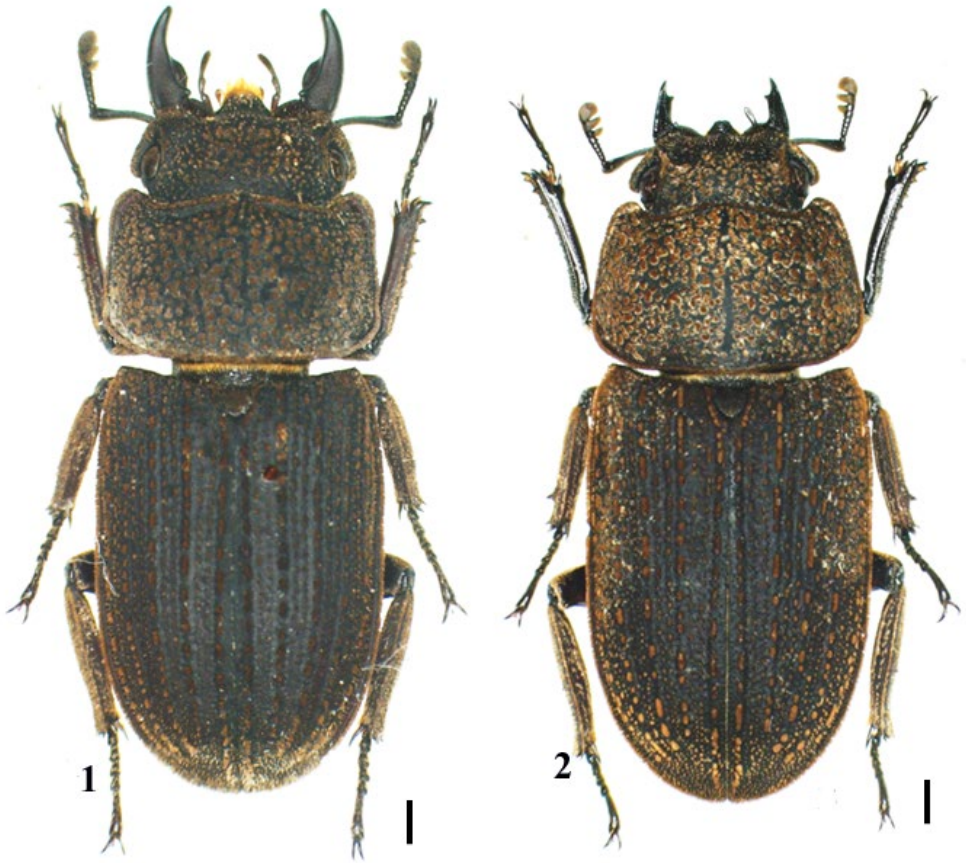
Male (Figs 1, 7, 15). Body black; head and thorax covered with short, irregular, yellowish-brown setae. Elytra with five straight rows of short, irregularly disposed, light brown setae. Mandible gently curved toward the tip, and the inner flat tooth, which is angled at about 141 degrees, begins at about 1/2 of the total length of the mandible. A small basal upper tooth present in the mandible near the head.

Head 2.4 times wide as long. Clypeus trapezoidal, its base about twice as wide than the distal part. The canthus is about 9/10 of the eye length and its thickness is about 1/4 of the eye length. Pronotum wide, nearly rectangular in shape, about 3/5 of its width in length. The anterior margin is broad and slightly convex and the posterior one is convex, without posterior lateral angles. Very short setae present on the sides and edges.

Width of elytra is about 1/3 of their length, the anterior angles at about 95 degrees, and the posterior margin is gradually rounded inwards from about 2/3 of its length.

Legs black to brownish black with one lateral small spine on mesotibiae and metatibiae.

Genitalia cylindrical, about three times as long as wide (Fig. 3). Parameres about as long as 1/3 of the genitalia; basal piece weakly curved medially in dorsal and ventral view, progressively rounded to apex, curved ventrally and gradually narrowed in lateral view. The flagellum is about 1.6 times as long as the genitalia and thin, wide at apex, with two lateral branches (Fig. 3).



Figs 1-2. *Velutinodorcus vietnamicus* sp. n., dorsal view. Scale = 1 mm. 1) male; 2) female.



Fig.3. *Velutinodorcus vietnamicus* sp. n., male genitalia.

Female (Figs 2, 11, 19). Black or dark brown body and dorsal surface of head and thorax covered with irregular short, light brown setae. Mandible about 0.7 times as long as the head, with internal teeth branching inward from about 1/4 part from the tip of the mandible. Clypeus is trapezoidal, nearly triangular, with a flat top surface about 1/3 the length of the underside. The long, thick, round-tipped, shaped canthi cover about 4/5 of the compound eyes. Pronotum is in the form of a ladder, the front end is about 0.8 times longer than the back end, and it is round without corners. There are very short setae on the sides and edges. Elytra oval and back surface has five rows of short, irregular, but straight, light brown setae. Legs are slightly shimmering black, with distinct spine on mesotibia and small spine on metatibia.

Diagnosis. Concerning the other species of the *Velutinodorcus carinulatus* group, the species more closely related to the new taxon is *Velutinodorcus carinulatus koreanus* for the shape of the inner tooth of the male mandibles and the ratio of the clypeus. But in *V. vietnamicus* sp. n. the inner flat tooth begins at about 1/2 of the total length of the mandible and forms an angle of about 141 degrees (Fig. 7), whereas in *Velutinodorcus carinulatus koreanus* it has an angle of about 160 degrees (Fig. 6). The clypeus of *Velutinodorcus carinulatus koreanus* is about 3 times wider at base than at apex, while in *Velutinodorcus vietnamicus* sp. n. is about twice as wide. In the male genitalia, the lateral branches of the flagellum are different in size and proportions (see Huang & Chen, 2013: 414-415 for the genitalia of *Velutinodorcus carinulatus koreanus*). In *V. vietnamicus* sp. n. the length of the part of flagellum from the insertion of the lateral branches to the apex is shorter (about 0.51 times instead of 0.54 times the length of the entire flagellum), and the lateral branches are about 0.2 times the length of the flagellum, instead of 0.1 times as in *Velutinodorcus carinulatus koreanus*. Females of the species belonging to the *Velutinodorcus carinulatus* group (Figs 8-11) are extremely similar one to each other and hard to identify if not collected with males or found in their known area of distribution.

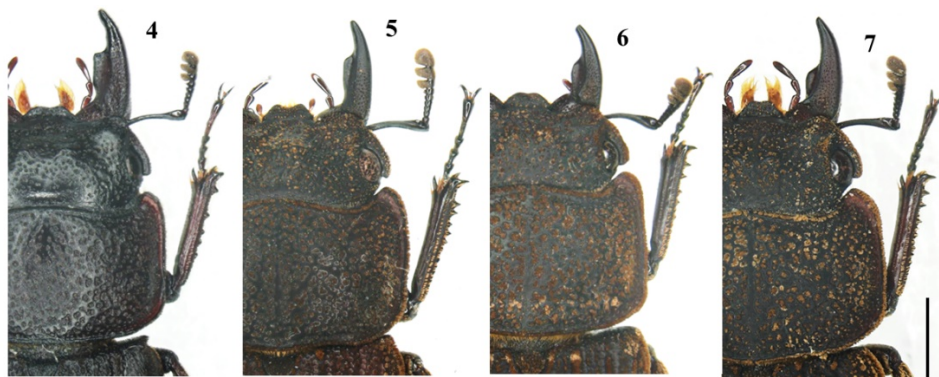
Etymology. The Latin name of the species refers to the country of Vietnam, where the new taxon has been collected.

Distribution. Central-northern Vietnam (Nghe An; Quang Binh; Tinh Thanh Hoa provinces).

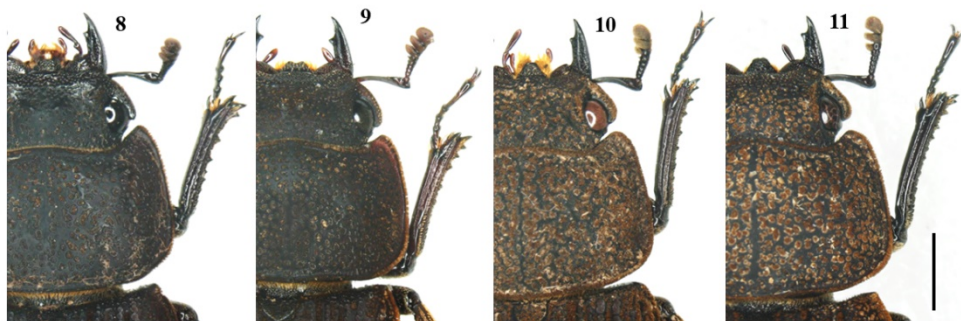
Remarks. HUANG & CHEN (2013) consider *Velutinodorcus koreanus* as a subspecies of *V. carinulatus*, accordingly with HAN *et al.* (2010), whereas Yı (2023) lists *V. koreanus* as a valid species. Here we followed the opinion of HAN *et al.* (2010) because they used molecular evidence supporting the status of *V. koreanus* as a subspecies of *V. carinulatus*.

Key to the species of *Velutinodorcus carinulatus* group (males)

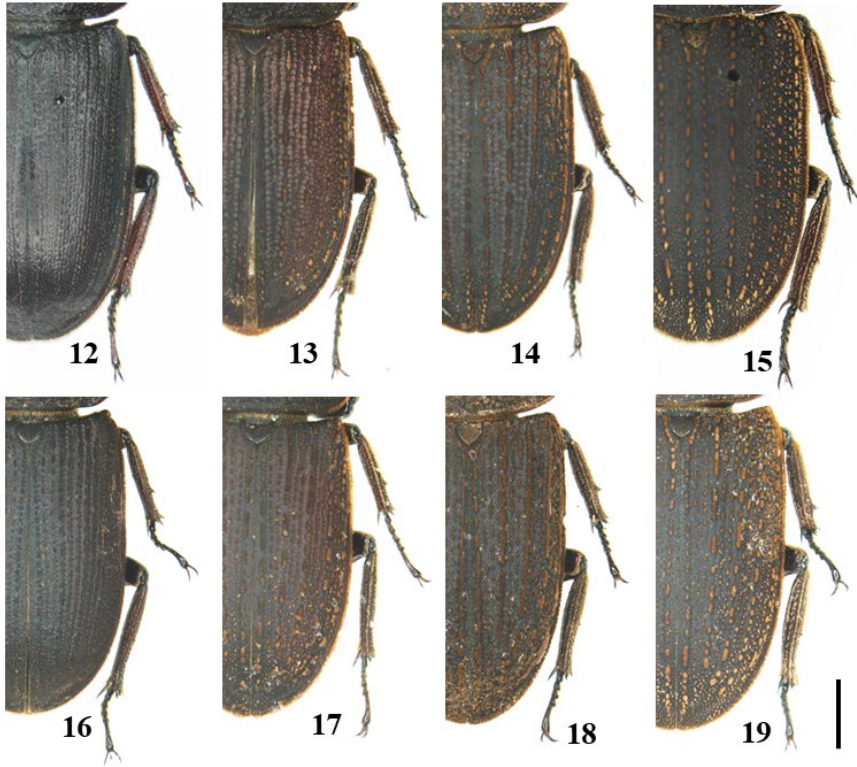
- 1. Elytral humeri with a small projection (Figs 4, 12) ***V. carinulatus carinulatus***
- Elytral humeri without a small projection 2
- 2. Mandibles with long and broad internal teeth (Figs 4 - 6) 3
- Mandibles with short and rounded internal teeth (Figs 1, 7, 15) ***V. vietnamicus* sp. n.**
- 3. Mandibles slightly curved, apical margin of clypeus wide and deeply emarginated (Figs 5, 13) ***V. japonicus***
- Mandibles more or less strongly curved, apical margin of clypeus narrow and slightly emarginated (Figs 6, 14) ***V. carinulatus koreanus***



Figs 4-7. *Velutinodorcus carinulatus* group, male dorsal view. Scale = 2 mm. 4, 8) *V. carinulatus carinulatus*; 5, 9) *V. japonicus*; 6, 10) *V. carinulatus koreanus*; 7, 11) *Velutinodorcus vietnamicus* sp. n.



Figs 8-11. *Velutinodorcus carinulatus* group, female dorsal view. Scale = 2 mm. 8) *V. carinulatus carinulatus*; 9) *V. japonicus*; 10) *V. carinulatus koreanus*; 11) *Velutinodorcus vietnamicus* sp. n.



Figs 12-19. *Velutinodorcus carinulatus* group, elytra in dorsal view. Scale = 2 mm. 12-15: males, 16-19: females. 12, 16) *V. carinulatus carinulatus*; 13, 17) *V. japonicus*; 14, 18) *V. carinulatus koreanus*; 15, 19) *Velutinodorcus vietnamicus* sp. n.

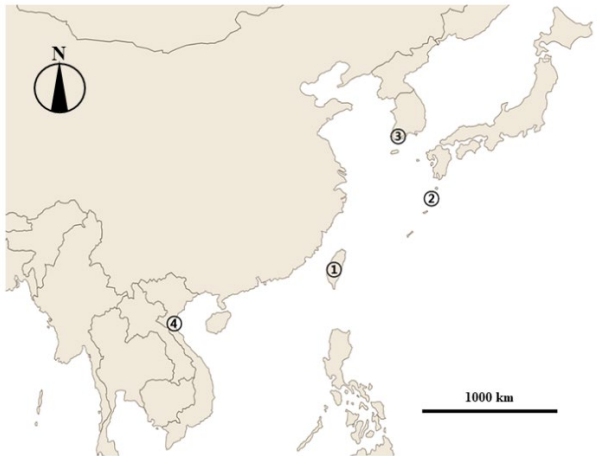


Fig. 20. Distribution of the species of the *Velutinodorcus carinulatus* group. 1 = *V. carinulatus carinulatus*; 2 = *V. japonicus*; 3 = *V. carinulatus koreanus*; 4 = *Velutinodorcus vietnamicus* sp. n. [QGIS World map, 2024].

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