

**NOTES ON GENUS *Cybister* Curtis, 1827 (Coleoptera: Dytiscidae) WITH THE
FIRST RECORDS OF *Cybister danxiaensis* Zhuo-Yin Jiang AND *Cybister
convexus* Sharp FROM VIETNAM**

**Nguyen Quang Cuong¹, Nguyen Thanh Manh¹, Phan Thi Giang^{2,3},
Ryndevidch Sergey⁴, Truong Xuan Lam^{1,2,*}**

¹Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology,
18 Hoang Quoc Viet, Ha Noi, Vietnam

²Graduate University of Science and Technology, Vietnam Academy of Science and
Technology, 18 Hoang Quoc Viet, Ha Noi, Vietnam

³Vinh University, 182 Le Duan, Vinh City, Vietnam

⁴Baranavichy State University, Baranavichy, 21 Voykova St., Belarus

Received 9 April 2024; accepted 18 June 2024

ABSTRACT

The genus *Cybister* Curtis, 1827 is reviewed for the fauna of Vietnam. The 5 species are diagnosed with illustrated habitus, leg, and male genitalia. Additional measurement data, and an updated identification key for all species are provided. Two species *Cybister convexus* Sharp, 1882, and *Cybister danxiaensis* Zhuo-Yin Jiang, 2023, are recorded for the first time in Vietnam.

Keywords. Coleoptera, Dytiscidae, Cybistrinae, *Cybister*, taxonomy, newrecord, Vu Quang.

Citation: Nguyen Quang Cuong, Nguyen Thanh Manh, Phan Thi Giang, Ryndevidch Sergey, Truong Xuan Lam, 2024. Notes on genus *Cybister* Curtis, 1827 (Coleoptera: Dytiscidae) with the first records of *Cybister danxiaensis* Zhuo-Yin Jiang and *Cybister convexus* Sharp from Vietnam. *Academia Journal of Biology*, 46(2): 101–120. <https://doi.org/10.15625/2615-9023/20535>

*Corresponding author email: txlam.iebr@gmail.com

INTRODUCTION

The genus *Cybister* Curtis, 1827 has 107 species worldwide (Nilsson, 2001; Nilsson & Hájek, 2022; Jiang et al., 2023). Beetles inhabit various water bodies (rivers, lakes, ponds, etc.). The bulk of species are confined to tropical regions in Asia and Africa. *Cybister* species have been recorded also in countries adjacent to Vietnam. Sixteen species are known from China (Jia et al., 2010; Nilsson, 1995, 2001; Nilsson & Petrov, 2007; Jiang et al., 2023) and 7 species from Laos (Hendrich & Brancucci, 2013).

In Vietnam, 5 species of the genus *Cybister* have been recorded before this study: *Cybister fumatus* Sharp, 1882; *Cybister lewisianus* Sharp, 1873; *Cybister rugosus* (W. S. Macleay, 1825); *Cybister limbatus* (Fabricius, 1775) and *Cybister guerini* Aubé, 1838 (Jiang et al., 2023). Recently, we have recorded 2 species of the genus *Cybister* as the species *Cybister sugillatus* Erichson, 1834, and *Cybister tripunctatus lateralis* (Fabricius, 1798) in Na Khau Nature Reserve, Yen Bai province (Lukashuk et al., 2023).

In this study, based on specimens deposited in the Institute of Ecology and Biological Resources, Ha Noi, Vietnam, we provided the measurement data and morphological structures of 5 species, of which the species *Cybister convexus* Sharp, 1882 and *Cybister danxiaensis* Zhuo, 2023 are recorded for the first time in Vietnam. A key to all species of genus *Cybister* in Vietnam is also produced.

MATERIALS AND METHODS

The study was conducted at sampling points in Cao Bang, Bac Kan, Lao Cai, Yen Bai, Ninh Binh, Ha Tinh provinces (between 18°09'28"–22°36'38"N and 104°58'52"–108°35'56"E). The middle elevations are between 408 m and 1,780 m (Table 1, Appendix 2). The water beetles were sampled in the years 2021, 2022, and 2023. Use a pond net (need to be 180 cm long, mesh size 0.5 mm) to collect samples. For each sampling point, the pond net was swept through the water, so that different vegetational units,

substrates, banks of ponds, streams, and water areas were covered. All samples were preserved in 70% ethanol and brought to the laboratory for further analysis. The studied specimens were examined and measured under a Nikon SMZ 800N Digital Stereo Microscope. Male specimens of each species were dissected. First relax in hot water for 30 minutes and then the genital capsule is extracted with strong, pointed forceps with curved tips. The median lobe of the aedeagus and the parameres were glued to a small card for photographing and mounted together with the specimen after being photographed. Photographs of detailed characteristics and male genitalia were taken with microscope a Nikon SMZ 800N Digital Stereo Microscope, using Helicon Focus 7 software. Illumination was with two Canon Speedlite 430EX III-RT flashlights and translucent paper diffusors. Images were edited with Adobe Photoshop CS6. The nomenclature of water beetles by the authors include Feng (1932, 1933), Miller et al. (2007), Mori & Kitayama (1993), Miller & Bergsten (2016), Jiang et al. (2023).

The following abbreviations are used in the descriptions: BL total length, measurement of length from clypeal margin to apex of elytra; EL total length minus head length, measurement of length from anterior margin of pronotum to apex of elytra; MW maximum width of body; PL pronotal length; WE maximal width of eye; DE minimal interocular distance; PW maximal pronotal width; WH width of head; 2LA length of second of antenna; 3LA length of third of antenna; 4LA length of fourth of antenna; LS length of scutellum; LF length of last left metafemur; LM length of last left metatibia; TA1 length of first tarsomere of metatarsomere; TA2 length of second tarsomere of last left metatarsomere; TA3 length of third tarsomere of last left metatarsomere; TA4 length of fourth tarsomere of last left metatarsomere; TA5 length of fifth tarsomere of last left metatarsomere; Length of inner spine; Length of inside spine.

Table 1. Sampling sites in Northern Vietnam

Site name	Elevation (m)	Coordinates
Nguyen Binh, Phia Oac, Cao Bang province	791	22°34'41"N, 105°55'20"E
Nguyen Binh, Phia Oac, Cao Bang province	879	22°36'38"N, 105°54'40"E
Nam Xuan Lac, Bac Kan province	612	22°19'45"N, 105°33'20"E
Bac Ngoi village, Ba Be, Bac Kan province	791	22°28'87"N, 105°63'82"E
Bat Xat district, Lao Cai province	1,050	21°28'35"N, 108°30'21"E
Bat Xat district, Lao Cai province	1,780	21°28'41"N, 108°30'28"E
Bat Xat district, Lao Cai province	1,650	21°22'82"N, 108°35'56"E
Na Khau, Van Yen, Yen Bai province	850	21°71'21"N, 104°58'52"E
Van Long, Gia Vien, Ninh Binh province	408	20°36'63"N, 105°88'01"E
Vu Quang National Park, Ha Tinh province	618	18°33'28"N, 105°15'54"E
Vu Quang National Park, Ha Tinh province	853	21°26'15"N, 105°33'41"E
Vu Quang National Park, Ha Tinh province	850	21°26'18"N, 105°33'24"E
Vu Quang National Park, Ha Tinh province	550	21°26'52"N, 105°33'45"E

RESULTS AND DISCUSSION

Taxonomy

Genus *Cybister* Curtis, 1827

Cybister Curtis, Bri. Ent. Vol. IV, p. 151 (1827); Leach, XIX. Sys. Sti. Gen. Fam. Dyt. Vol. III, p. 70 (1817)

Type species. *Dytiscus lateralis* Fabricius, 1798 (= *Dytiscus tripunctatus* Oliver, 1795) Fabricius, Sup. Ent. Sys., p. 64 (1798); Brinck, Nom. Und. Sys. Stu. Ube. Dyt. III, p. 9 (1945)

Diagnosis Large diving beetles. Olive green black dorsally with yellow border to pronotum and elytra. With distinctive yellow margins laterally on the pronotum and elytron. Prosternum and prosternal process with or without a prominent longitudinal sulcus, lateral margins not distinctly ridged throughout. Metacoxal lines present. Unguicular cleft on metatarsus narrow and angular at base. Metatarsus with one claw. Males with a single claw per metatarsus; females usually with single claws, except in some North and Central American species.

Subgenus *Cybister* Curtis, 1827

Pronotum and elytra with distinct yellow or brownish-yellow margins laterally, female with a single metatarsal claw.

Cybister guerini Aubé, 1838 (Figs. 1a–g)

Cybister guerini Aubé, 1838b:57; Vazirani (1969b):292; Regimbart (1899): 342; Feng (1932): 35; Zeng (1989): 91.

Material examined. INDIA, 1 male, Madras env., Manapakham, 10.9.1999, leg. Saluk S.V.

Diagnosis. Length 31–37.8 mm. Head, pronotum and elytra dark green to black, with distinct yellow or reddish-yellow clypeus and margins laterally (Fig. 1a). Ventral surface black; abdominal ventrites III–V with reddish-yellow spot on each side (Figs. 1b, c, d). Prosternal process lanceolate, with distinct lateral edging and surface flat, apex pointed. Metacoxal lines distinct, nearly parallel medially, divergent anteriorly, along metacoxal lines (Fig. 1c). Forelegs reddish-brown, midlegs and hindlegs reddish-brown to black (Figs 1a, e); protarsomeres 1–3 of male broadly expanded into a palette, with four rows of adhesive setae on their ventral side. Metatarsal claws single in both sexes. Aedeagus (Figs. 1f, g).

Distribution. China, India, Indonesia, Laos, Thailand, Vietnam ([Tonkin = Northern Vietnam], Hanoi) (Regimbart, 1899; Jiang et al., 2023).

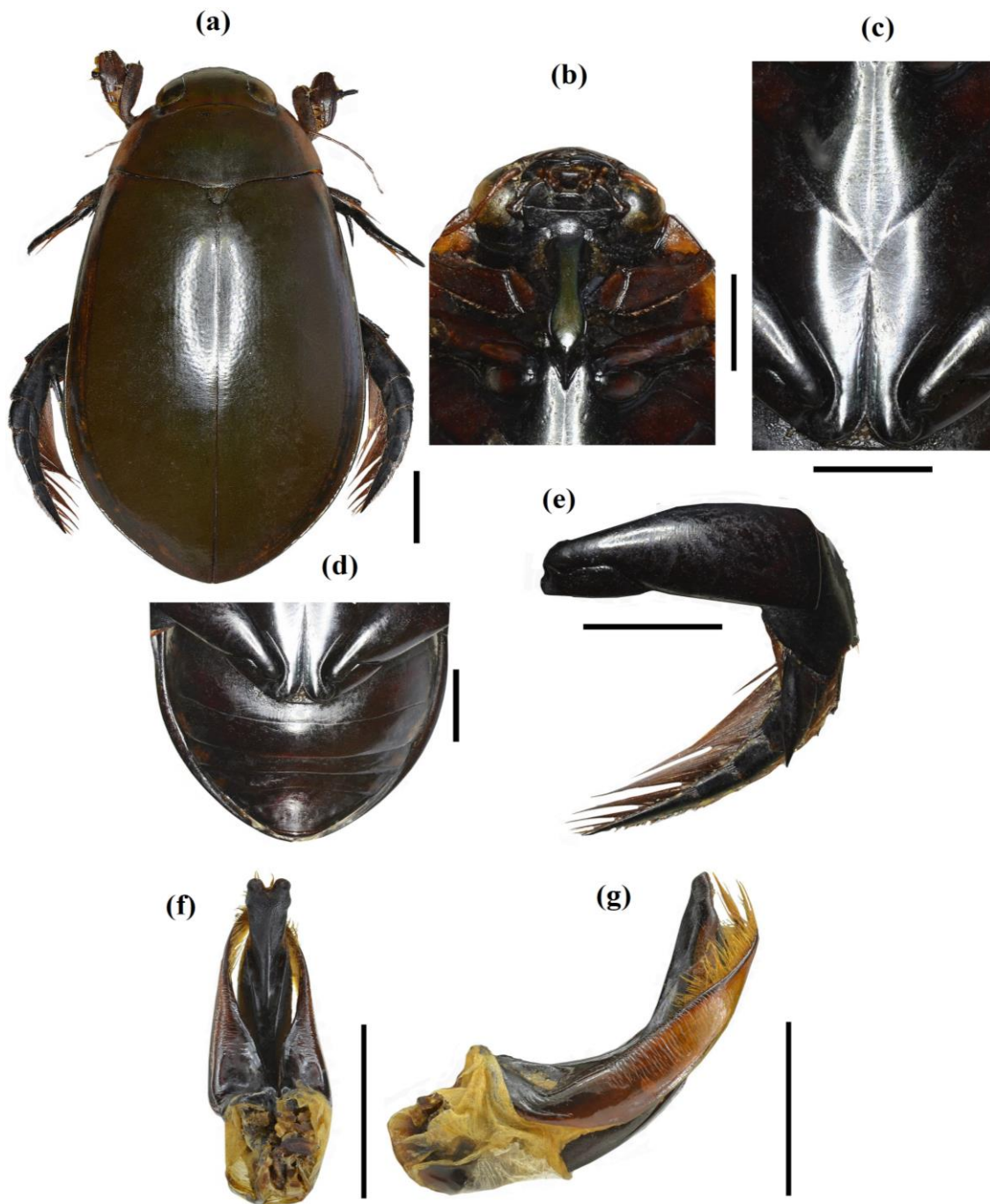


Figure 1. *Cybister guerini* Aubé (♂): (a) habitus, dorsal view; (b) head, ventral view, prosternum, and anterior part of mesoventrite; (c) metaventricle; (d) abdominal ventrites; (e) left metaleg, ventral view, (f) aedeagus, ventral view, (g) aedeagus, lateral view. Scale bar: 5 mm for a–e. 2 mm for f, g

Cybister limbatus (Fabricius, 1775) (Figs. 2a–e, 9a)

Dytiscus limbatus Fabricius, 1775: 230.

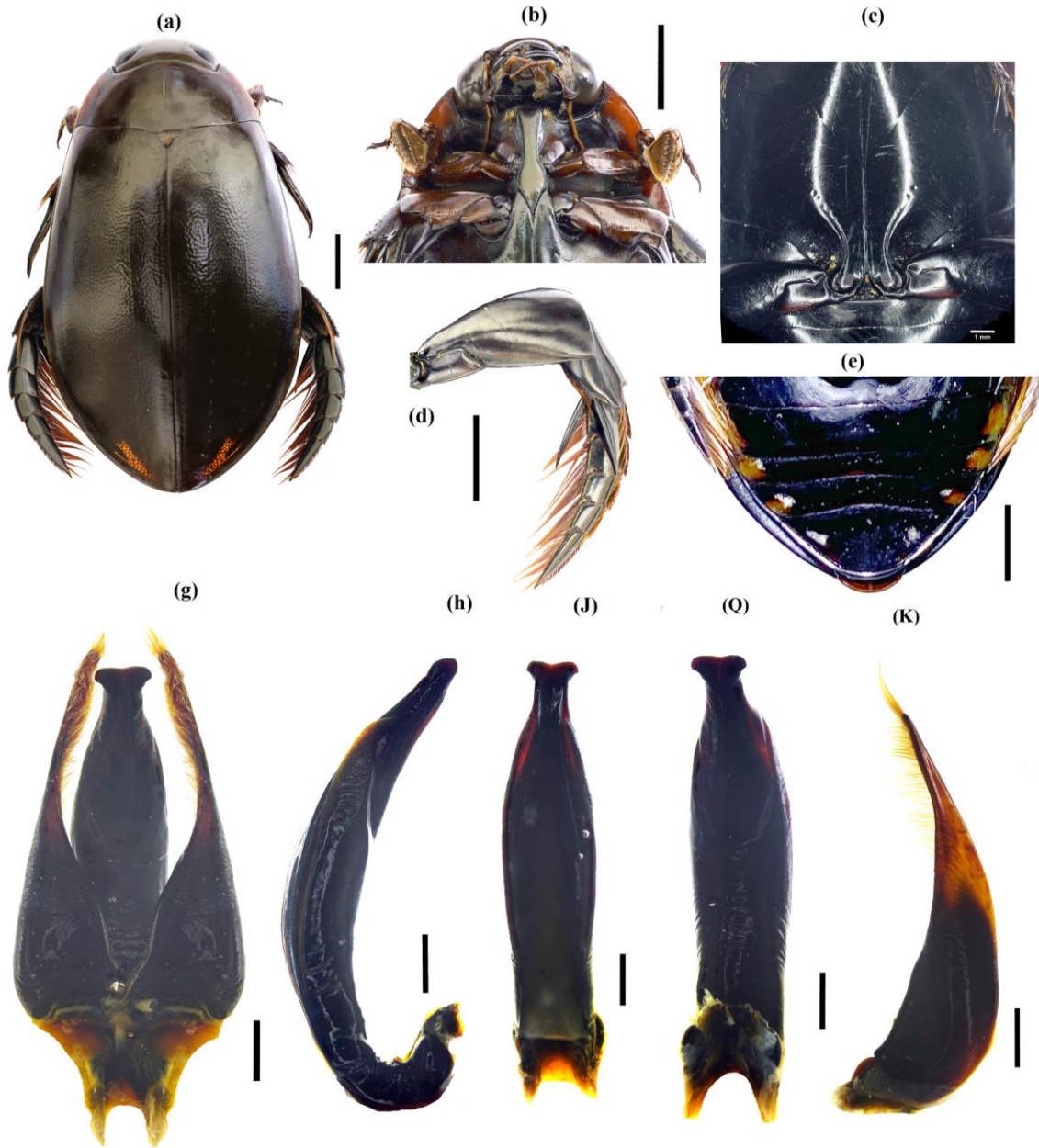


Figure 2. *Cybister limbatus* (Fabricius, 1775) (♂): (a) habitus, dorsal view; (b) head, ventral view, prosternum and anterior part of mesoventrite; (c) metaventrите; (d) left metaleg, ventral view; (e) abdominal ventrites; (g) aedeagus, ventral view; (h) median lobe of aedeagus, lateral view; (j) median lobe of aedeagus, dorsal view; (q) median lobe of aedeagus, ventral view; (k) paramere, lateral view. Scale bar: 5 mm for a, b, d, e; 1 mm for c, g–k

Dytiscus aciculatus Herbst, 1784: 123, synonymy by Schönherr (1808): 10.

Zimmermann (1920): 263, Vazirani (1969): 294, Nilsson (1995): 78.

Cybister limbatus (Fabricius, 1775): Aube (1838): 55, Regimbart (1899): 342,

Material examined. VIETNAM: Cao Bang province: 1 male, Hoai Khao, Quang

Thanh, Nguyen Binh, Phia Oac, H = 791 m, 22°34'41"N, 105°55'200"E, 08.V.2021, C3, leg. Truong Xuan Lam. **Lao Cai** province: 1 female, Bat Xat, H = 1650 m, 21°22'82"N, 108°35'56"E, 21.IX.2022, leg. Nguyen Quang Cuong; 1 female, Bat Xat, H = 1,780 m; 21°28'41"N, 108°30'28"E, 16.I.2022, leg. Truong Xuan Lam. **Ha Tinh** province: 1 female + 1 male, Vu Quang NP., H = 853 m, 21°26'15"N, 105°33'41"E, 12.VIII.2023, leg. Truong Xuan Lam.

Diagnosis. Length 33–39.1 mm. Body, pronotum and elytra (Fig. 2a). Head, clypeus yellow (Fig. 3b). Abdominal ventrites III–V with a reddish-brown spot on each side (Fig. 2e). Metacoxal lines distinct, well impressed, nearly parallel medially, divergent anteriorly, along metacoxal lines with a row of punctures (Fig. 2c). Forelegs reddish-brown, hindlegs reddish-brown to black (Figs. 2d, 9a). Protarsomeres 1–3 of male broadly expanded into a palette, with four rows of adhesive setae on their ventral side; both sexes with a single metatarsal claw (Figs. 2c, 9a). Metafemora with dorsodistal angle broadly rounded and ventrodistal angle almost right angled (Fig. 2d). Male genitalia (Figs. 2g–k).

Measurements. (Appendix 1), Average rate length of 2LA:3LA:3LA = 1:3.0:3.1, LS = 1.06–1.17 mm, of TA1/TA2/TA3/TA4/TA5 = 1.0/0.70/0.62/0.60/1.38, average rate of PW/DE = 3.46.

Comments. The morphological characteristics of the male of *Cybister limbatus* in this study are similar to those described by Jiang et al. (2023) by the following main characteristics: body elongate, oblong-oval; head; pronotum and elytra; ventral surface; dorsal surface; metacoxal; forelegs, midlegs and hindlegs; protarsomeres; metafemora, median lobe of aedeagus and paramere.

Distribution. Vietnam (Cao Bang, Lao Cai, Ha Tinh), China, Afghanistan, India, Japan, Laos, Myanmar, Nepal, Pakistan, Philippines, Thailand (Hendrich & Brancucci, 2013; Jiang et al., 2023).

Cybister tripunctatus lateralis (Fabricius, 1798) (Figs. 3a–f, 4a–g, 9b, c)

Dytiscus tripunctatus Olivier, 1795: 14.

Cybister tripunctatus (Olivier): Aube (1938): 76; Sharp (1882): 727; Zimmermann (1927): 43; Csiki (1937): 130; Nilsson (1995): 79, Hendrich & Balke (1995): 47, Chen et al. (1998): 27. *Cybister tripunctatus lateralis* (Fabricius, 1798): Nilsson (2001): 90; Hendrich et al. (2004): 121; Jia et al. (2011): 258; Ghosh & Nilsson (2012): 21.

Cybister tripunctatus orientalis Gschwendtner, 1931: 99; Ohba & Inatani (2011): 1.

Cybister asiaticus Sharp, 1882: 731.

Cybister tripunctatus var. *asiaticus* Sharp, 1882; Gschwendtner (1923): 108.

Cybister tripunctatus asiaticus Sharp, 1882; Regimbart (1899): 352; Balfour-Browne (1945): 122, Fernando (1961): 24; Vazirani (1968): 290, 1977: 92; Nilsson (1995): 79.

Material examined. VIETNAM: **Cao Bang** province: 1 male, Quang Thanh, Nguyen Binh, Phia Oac, H = 791 m, 22°34'41"N, 105°55'200"E, 08.V.2021, C3, leg. Truong Xuan Lam; 1 male, 2 females, Hoai Khao, Quang Thanh, Nguyen Binh, Phia Oac, H = 879 m, 22°36'38"N, 105°54'40"E, 10.V.2021, C 2, leg. Truong Xuan Lam. **Bac Kan** province: 3 females + 1 male, Nam Xuan Lac, H = 612 m, 22°19'45"N, 105°33'20"E, 31.X.2021, leg. Truong Xuan Lam; 1 male, Ba Be NP., H = 791 m, 22°28'87"N, 105°63'82"E, 22.XII.2023, leg. Nguyen Quang Cuong. **Lao Cai** province: 1 female + 1 male, Bat Xat, H = 1,050 m, 21°28'35"N, 108°30'21"E, 12.I.2022, leg. Nguyen Quang Cuong; 2 female + 1 male, Bat Xat, H = 1,780 m, 21°28'41"N, 108°30'28"E, 14.I.2022, leg. Truong Xuan Lam; 2 female, Bat Xat, H = 1,650 m, 21°22'82"N, 108°35'56"E, 24.IX.2022, leg. Truong Xuan Lam. **Yen Bai** province: 1 female, Na Khau Nature Reserve, Van Yen, 21°71'21"N, 104°58'52"E, H = 850 m, 29.VI.2021, leg. Truong Xuan Lam. **Ninh Binh** province: 1 female, Van Long, Gia Vien, H = 408 m, 20°36'63"N, 105°88'01"E,

16.IX.2022, leg. Nguyen Quang Cuong. **Thanh Hoa** province, 1 male, Xuan Lien Nature Reserve, 28. VI.2023, at light, leg. S.V. Saluk. **Ha Tinh** province: 1 female, Vu Quang NP., H = 618 m, 18°33'28"N, 105°15'54"E, 11.VIII.2023, leg. Nguyen Quang Cuong; 1 female + 1 male, Vu Quang

NP., H = 853 m, 21°26'15"N, 105°33'41"E, 14.VIII.2023, leg. Nguyen Quang Cuong; 1 male, Vu Quang NP., H = 850 m, 21°26'18"N, 105°33'24"E, 17.VIII.2023, leg. Truong Xuan Lam; 1 female, Vu Quang NP., H = 550 m, 21°26'52"N, 105°33'45"E, 12.VIII.2023, Phan Thi Giang.

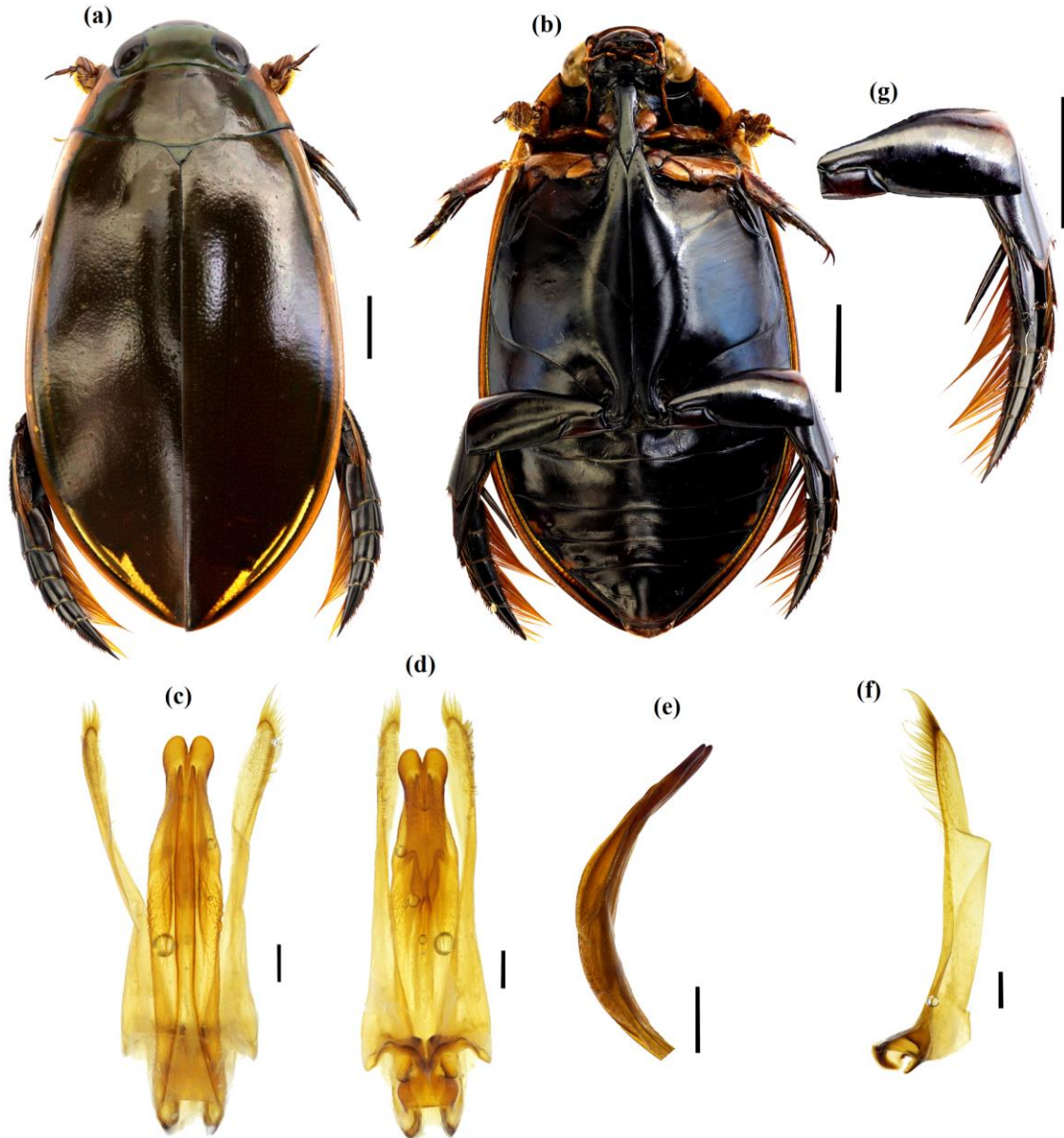


Figure 3. *Cybister tripunctatus lateralis* (Fabricius, 1798) (♂): (a) habitus, dorsal view; (b) habitus, ventral view; (g) left metaleg, ventral view; (c) aedeagus, ventral view; (d) aedeagus, dorsal view; (e) median lobe of aedeagus, lateral view; (f) paramere, lateral view. Scale bar: 5 mm for a, b, g; 0.5 mm for c, d, e, f

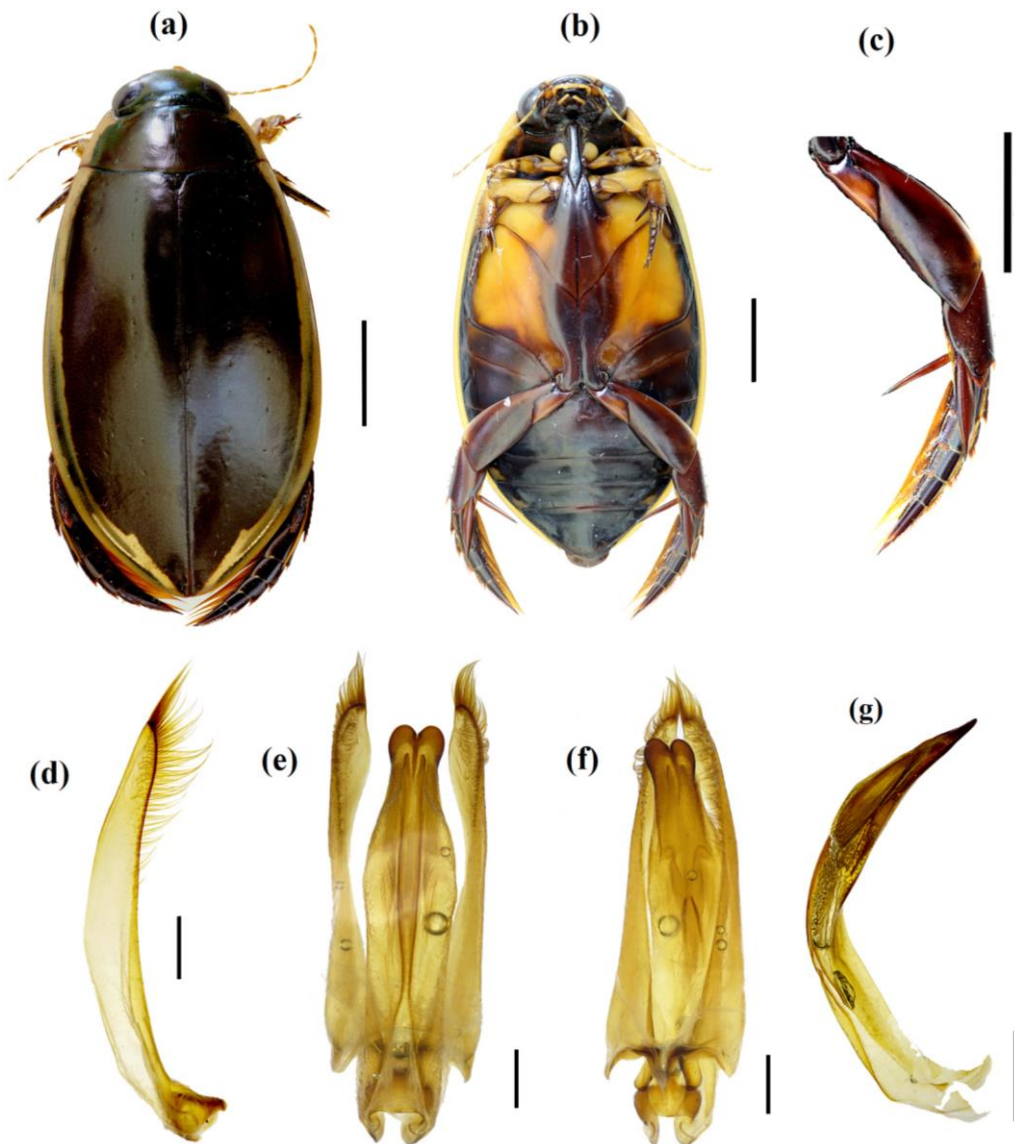


Figure 4. *Cybister tripunctatus lateralis* (Fabricius, 1798) (♂): (a) habitus, dorsal view; (b) habitus, ventral view; (c) left metaleg, ventral view; (d) paramere, lateral view; (e) aedeagus, ventral view; (f) aedeagus, dorsal view; (g) median lobe of aedeagus, lateral view. Scale bar: 5 mm for a, b, c; 1 mm for d, e, f, g

Diagnosis. Length 24–28 mm. Body, pronotum and elytra (Figs. 3a, 4a). Head, clypeus yellow, distinct yellow margins laterally, apex of yellow margin on the elytra slightly hooked (Fig. 3a) or apex of yellow margin on the lanceolate hooked elytra (Fig. 4a). Ventral surface black, with lateral part of metaventrите yellow (Fig. 3b) or ventral surface yellow (except abdominal ventrites),

with lateral part of metaventrите yellow (Fig. 4b). Abdominal ventrites III–V with a pale small spot on each side (Figs. 3e, 4e). Dorsal surface smooth in both sexes (Fig. 3a) or has small dots in male (Fig. 4a). Prosternal process lanceolate, with apex pointed, surface flat (Fig. 3c) or surface nothing flat (Fig. 4b). Metacoxal lines distinct, nearly parallel, along metacoxal lines with a row of punctures

(Figs. 3c, 4b). Forelegs yellow, midlegs and hindlegs reddish-brown (Figs. 3b, 9b) or forelegs, midlegs with yellow, hindlegs with reddish-brown (Figs. 4b, 9b). Metafemora with dorsodistal angle broadly rounded and ventrodistal angle acute angled (Figs. 3d, 4c). Median lobe of aedeagus 'C'-shaped in lateral view, moderately curved (Fig. 4g), paramere, ventral view (Fig. 4d), median lobe of aedeagus in ventral view and median lobe of aedeagus in dorsal view (Figs. 4e, f).

Measurements. (Appendix 1), Average rate length of 2LA/3LA/3LA = 1.0/1.91/1.96, of TA1/TA2/TA3/TA4/TA5 = 1.0/0.71/0.66/0.58/1.14, average rate of PW/DE = 3.13.

Comments. This species was first listed to Vietnam by Lukashuk et al. (2023). The morphological characteristics of the male of *Cybister tripunctatus lateralis* (Fabricius, 1798) of Figure 3 in this study is similar described by Hendrich & Brancucci, (2013) and Jiang et al. (2023) by the main characteristics: body elongate, oblong-oval; head; pronotum and elytra; ventral surface; dorsal surface; metacoxal; forelegs, midlegs and hindlegs; protarsomeres; metafemora, median lobe of aedeagus and paramere. However, some undercolored specimens of *Cybister tripunctatus lateralis* (Fig. 4) has several different characteristics described by Jiang et al. (2023) (except paramere, median lobe of aedeagus) such as apex of yellow margin on the lanceolate hooked elytra; ventral surface yellow, with lateral part of metaventricle yellow; dorsal surface has small dots in male; forelegs, midlegs yellow. But we also noted similar variations in the coloration of this species for some specimens from Turkmenistan. Male genitalia of these specimens have a typical structure for this species.

Distribution. Vietnam (Cao Bang, Bac Kan, Lao Cai, Yen Bai, Ninh Binh, Thanh Hoa, Ha Tinh), Afghanistan, United Arab Emirates, Azerbaijan, Bhutan, Cyprus, India, Iran, Iraq, Japan, Kyrgyzstan, Laos, Mongolia, Nepal, Oman, Pakistan, Russia, Singapore, Syria, Thailand, Tajikistan, Turkmenistan, Turkey, Uzbekistan (Ghosh &

Nilsson, 2012; Hendrich & Brancucci, 2013; Jiang et al., 2023; Lukashuk et al., 2023).

Cybister fumatus Sharp, 1882

Cybister fumatus Sharp, 1882: 731; Feng (1936): 13.

Distribution. China (Shanghai), Indonesia, Laos, Malaysia, Thailand, Vietnam (Jiang et al., 2023).

Cybister lewisianus Sharp, 1873

Cybister lewisianus Sharp, 1873: 46; Sharp (1882): 732; Regimbart (1899): 350; Feng (1932): 36; Zhao (1981): 110; Zeng (1989): 92; Li (1992): 36.

Distribution. China, India, Indonesia, Japan, Vietnam (Jiang et al., 2023).

Cybister rugosus (W. S. Macleay, 1825)

Dytiscus rugosus W. S. Macleay, 1825: 32;

Cybister indicus Aubé, 1838: 62; Sharp (1882): 992;

Cybister rugosus Nilsson, 1995: 78.

Distribution. China, Cambodia, Indonesia, Japan, Laos, Malaysia, Singapore, Thailand, Vietnam (Jiang et al., 2023).

Subgenus *Melanectes* Brinck, 1945

Pronotum and elytra without distinct yellow margins laterally, female with two metatarsal claws.

Cybister convexus Sharp, 1882 (Figs. 5a–h, 9e)

Cybister convexus Sharp, 1882: 718; Régimbart (1899): 353; Feng (1932): 35; Vazirani (1969): 284; Zeng (1989): 93.

Material examined. VIETNAM: **Ha Tinh** province: 1 female, Vu Quang NP., H = 618 m, 18°33'28"N, 105°16'–105°15'E, 11.VIII.2023, leg. Nguyen Quang Cuong; 1 female + 1 male, Vu Quang NP., H = 853 m, 21°26'15"N, 105°33'41"E, 14.VIII.2023, leg. Nguyen Quang Cuong; 2 females, Vu Quang NP., H = 850 m, 21°26'18"N, 105°33'24"E, 17.VIII.2023, leg. Truong Xuan Lam; 1 female, Vu Quang NP., H = 550 m, 21°26'52"N, 105°33'45"E, 12.VIII.2023, leg. Truong Xuan Lam.

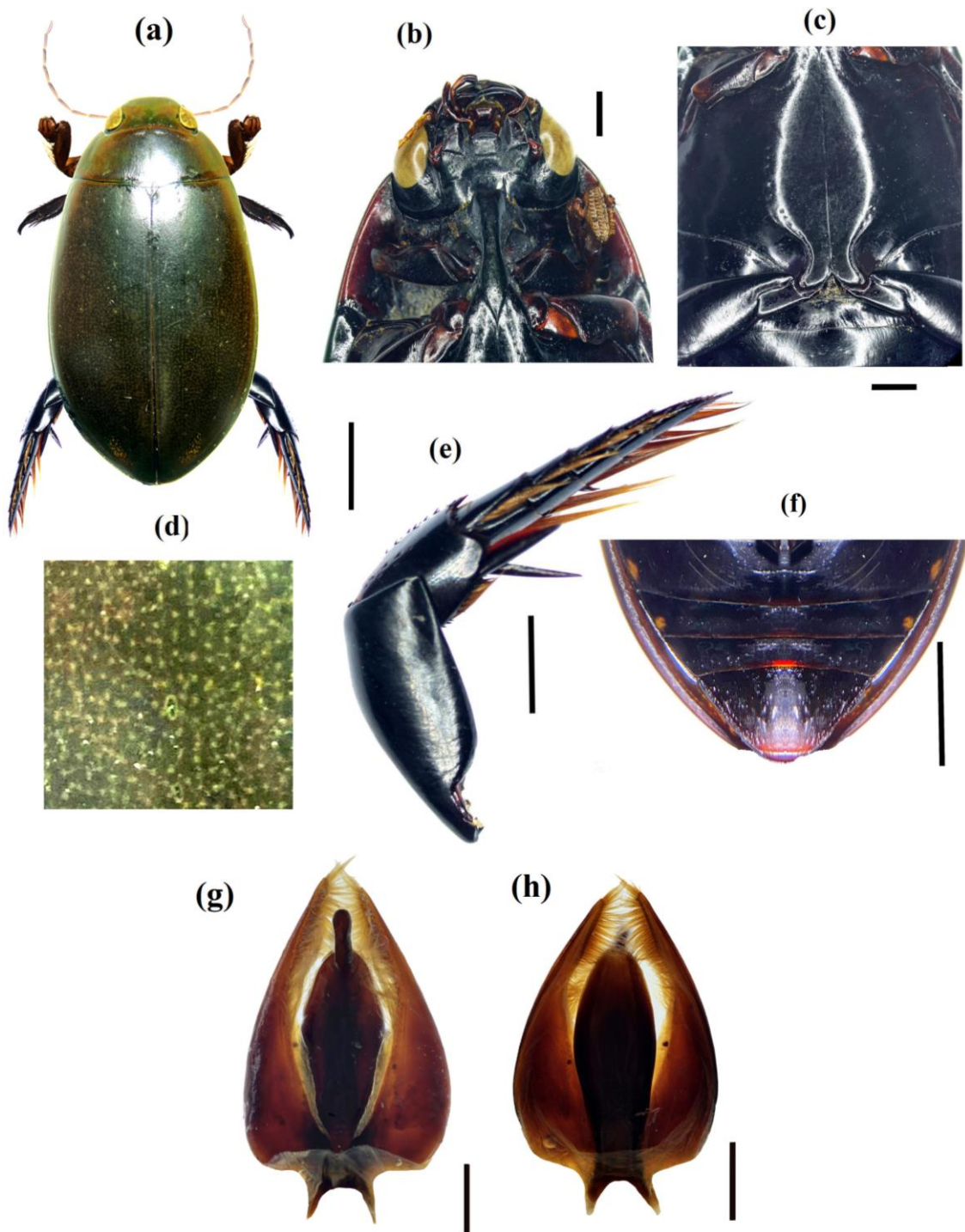


Figure 5. *Cybister convexus* Sharp (♂): (a) habitus, dorsal view; (b) head, ventral view, prosternum, and anterior part of mesoventrite; (c) metaventrite; (d) reticulation of elytra; (e) left metaleg, ventral view; (f) abdominal ventrites; (g) aedeagus, ventral view; (h) aedeagus, dorsal view. Scale bar: 5 mm for a, f; 2 mm for b, c, e; 1 mm for g, h; 8x for d

Diagnosis. Length 22.3–30 mm. Body elongate, head, pronotum and elytra dark, apex of elytra with reddish-brown spots (Fig. 5a). Ventral surface with reddish-brown to black; abdominal ventrites III–IV with a yellow spot on each side (Fig. 5e). Head and pronotum smooth, elytra densely covered with conspicuous small granules (Fig. 5f). Prosternal process lanceolate, with distinct lateral bead, surface flat, apex pointed (Fig. 5b). Metacoxal lines distinct, well impressed, nearly parallel medially, divergent anteriorly, along metacoxal lines with a row of punctures (Fig. 5c). Femur of forelegs with black and anterior part of forelegs with yellow; midlegs, hindlegs with black, (Figs 5a, d, 9e). Protarsomeres 1–3 of male broadly expanded into a palette, with four rows of adhesive setae on their ventral side. Male with a single metatarsal claw, female with two metatarsal claws. Metafemora with dorsodistal angle broadly rounded and ventral angle slightly obtuse (Fig. 5d). aedeagus in ventral view (Fig. 5g), paramere, ventral view (Fig. 5h), median lobe of aedeagus in ventral view and median lobe of aedeagus in dorsal view (Figs. 5e, f).

Measurements. (Appendix 1), Average rate length of $2LA/3LA/3LA = 1.0/0.89/0.94$, $LS = 0.62-0.63$ mm, of $TA1/TA2/TA3/TA4/TA5 = 1.0/0.66/0.55/0.45/1.02$, average rate of $PW/DE = 2.71$.

Distribution. China, India, Thailand (Jiang et al., 2023). Vietnam (Ha Tinh). This species is recorded for the first time in Vietnam.

Comments. The morphological characteristics of the male of *Cybister convexus* Sharp, 1882 in this study are similar to those described by Jiang et al. (2023), including the main characteristics: body elongate, oblong-oval; head; pronotum and elytra; ventral surface; dorsal surface; metacoxal; forelegs, midlegs and hindlegs; protarsomeres; metafemora, median lobe of aedeagus and paramere.

Cybister danxiaensis Jiang et al., 2023 (Figs 6a–g, 7a–d, 9f)

Cybister danxiaensis Jiang et al., 2023: 94.

Material examined. VIETNAM: Lao Cai province: 1 male, Bat Xat, H = 1,050 m, $21^{\circ}28'35''N$, $108^{\circ}30'21''E$, 12.I.2022, leg. Nguyen Quang Cuong.

Diagnosis (male). Length 21.7–21.9 mm. Head, pronotum with brown to black; elytra with brown, appendages black, ventral side blackish brown (Figs. 6a, b). Forelegs, midlegs with with brown, hindlegs with black. Habitus oblong oval, widest in apical third of elytra, dorsal surface with distinctly granules (Fig. 6a). Elytra with dense large protuberances, each protuberance with a small granule in the top (Fig. 6a). Medioapical area of elytra with setae of short. Abdominal ventrites without a yellow spot on each side (Fig. 7d). Head moderately broad, surface densely covered with small punctures, anterior margin of clypeus concave (Figs. 6a, b). Antenna long and slender (Fig. 6b). Pronotum broadest between posterior angles, coarse setigerous puncture row present along anterior margin, fine punctures dense whole surface. Ventral side (Fig. 6b). Prosternal process lanceolate, with distinct lateral bead, surface flat, apex pointed (Fig. 7c). Lateral parts of metaventricle tongue-shaped, slender, metacoxal lines distinct, well impressed, nearly parallel medially, along metacoxal lines with a row of punctures (Fig. 7b). Legs (Figs. 6c, 9f). Protarsomeres 1–3 with four rows, broadly expanded into a palette (Fig. 9f), claws simple. Hindlegs (Fig. 6c). Male genitalia (Figs. 6e–g). Median lobe of aedeagus ‘C’-shaped in lateral view, strongly curved, broadest at middle, strongly narrowing in apical fourth, apex rounded; in ventral view broad at base, apical fourth slender like a tubular spine, apex rounded (Fig. 6f). Parameres broad, distinctly curved in apical third, strap-like apically (Fig. 6g).

Measurements. (Appendix 1), Average rate length of $2LA/3LA/3LA = 1.0/0.82/0.91$, of $TA1/TA2/TA3/TA4/TA5 = 1.0/0.56/0.51/0.41/0.98$, average rate of $PW/DE = 2.69$.

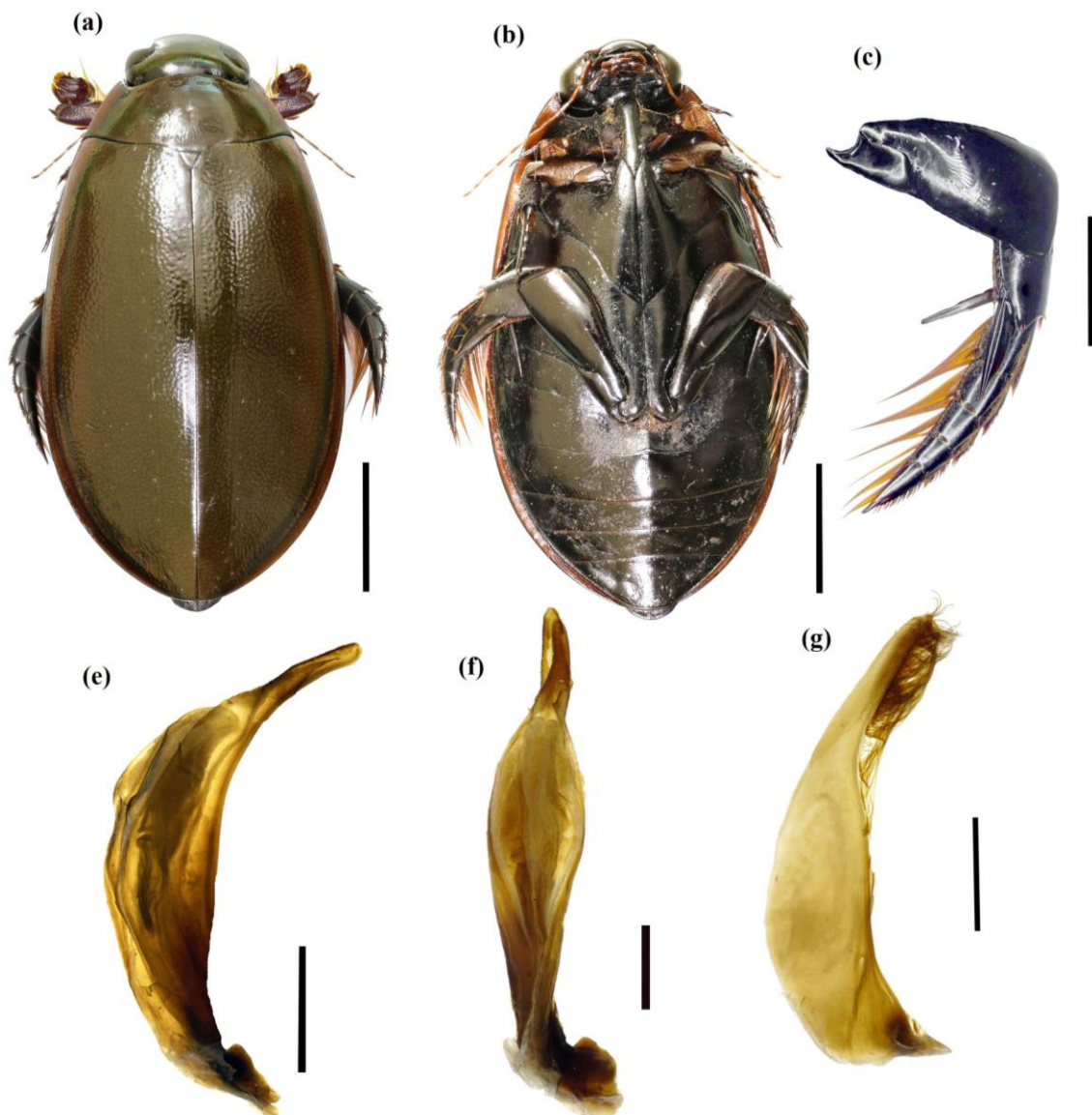


Figure 6. *Cybister danxiaensis* Jiang et al., 2023 (♂): (a) habitus, dorsal view; (b) habitus, ventral view; (c) left metaleg, ventral view; (e) median lobe of aedeagus, lateral view; (f) median lobe of aedeagus, ventral view; (d) paramere, lateral view. Scale bar: 5 mm for a, b; 3 mm for c; 1 mm for e, f, g

Distribution. China (Jiang et al., 2023). Vietnam (Lao Cai). This species is recorded for the first time in Vietnam.

Comments. The morphological characteristics of the male of *Cybister danxiaensis* in this study are similar to those described by Jiang et al. (2023), including the

main characteristics: body; head; pronotum and elytra; ventral surface; dorsal surface; metacoxal; protarsomeres; metafemora, median lobe of aedeagus and paramere. However, this study has several different characteristics described as forelegs, midlegs, and hindlegs (not described by Jiang et al., 2023).

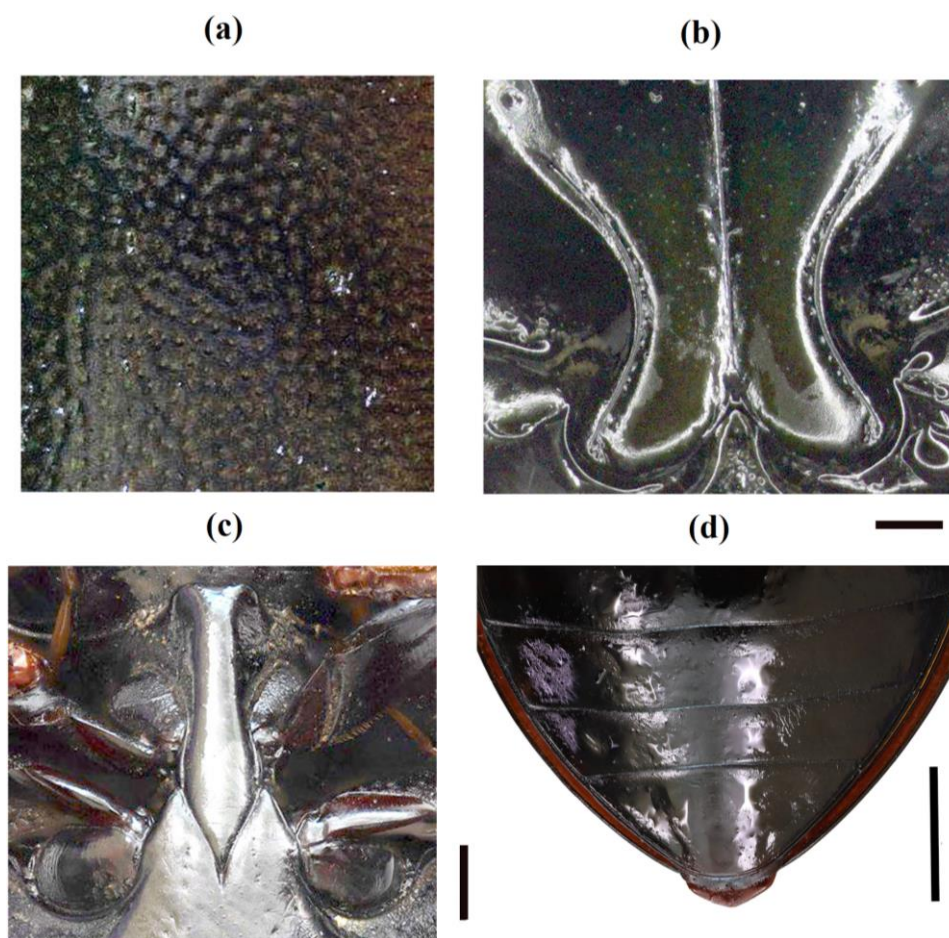


Figure 7. *Cybister danxiaensis* Jiang et al., 2023 (♂): (a) elytral structure; (b) metacoxal lines; (c) prosternal process; (d) abdominal ventrites. Scale bar: 3 mm for d; 2 mm for b, c; 8x for a

***Cybister sugillatus* Erichson, 1834** (Figs. 8a–j, 9d)

Cybister sugillatus Erichson, 1834: 227; Regimbart (1899): 355; Zimmermann (1919): 77; Kano (1931): 176; Feng (1932): 36; Zhao (1981): 110; Zeng (1989): 92; Mori & Kitazama (1993): 142.

Cybister bisignatus Aubé, 1838: 88; Sharp (1882): 991.

Material examined. VIETNAM: **Yen Bai** province. 1 male, Hoai Khao, Na Khau Nature Reserve, Van Yen, H = 850 m, pond & puddle in the forest, 21°71'21"N, 104°58'52"E, 29.VI.2021, leg. Truong Xuan Lam. **Ha Tinh** province: 1 female, Vu Quang NP., H = 618 m, 18°33'28"N, 105°15'54"E, 11.VIII.2023, leg.

Nguyen Quang Cuong; 1 male, Vu Quang, H = 550 m, 21°26'52"N, 105°33'45"E, 11.VIII.2023, leg. Phan Thi Giang.

Diagnosis. Length 18–23 mm. Body, head, pronotum and elytra dark green to black, lateral part of pronotum reddish-brown, apex of elytra with reddish-brown spots (Fig. 8a). Ventral surface black (Figs. 8b, c); abdominal ventrites III–IV with small yellowish spots on each side (Fig. 8e). Forelegs reddish-brown, midlegs and hindlegs black (Figs. 8a, d, 9d); Dorsal surface smooth. Prosternal process lanceolate, with distinct lateral bead, surface flat, apex pointed (Fig. 8b); lateral parts of metaventrite tongue-shaped, slender, not reaching lateral margins; metacoxal lines distinct, well impressed,

nearly parallel medially, divergent anteriorly, along metacoxal lines with a row of punctures (Fig. 8c). Protarsomeres 1–3 of male broadly expanded into a palette, with four rows of

adhesive setae on their ventral side; male with a single metatarsal claw (Fig. 9d); female with two metatarsal claws, posterior claw small and sinuate.

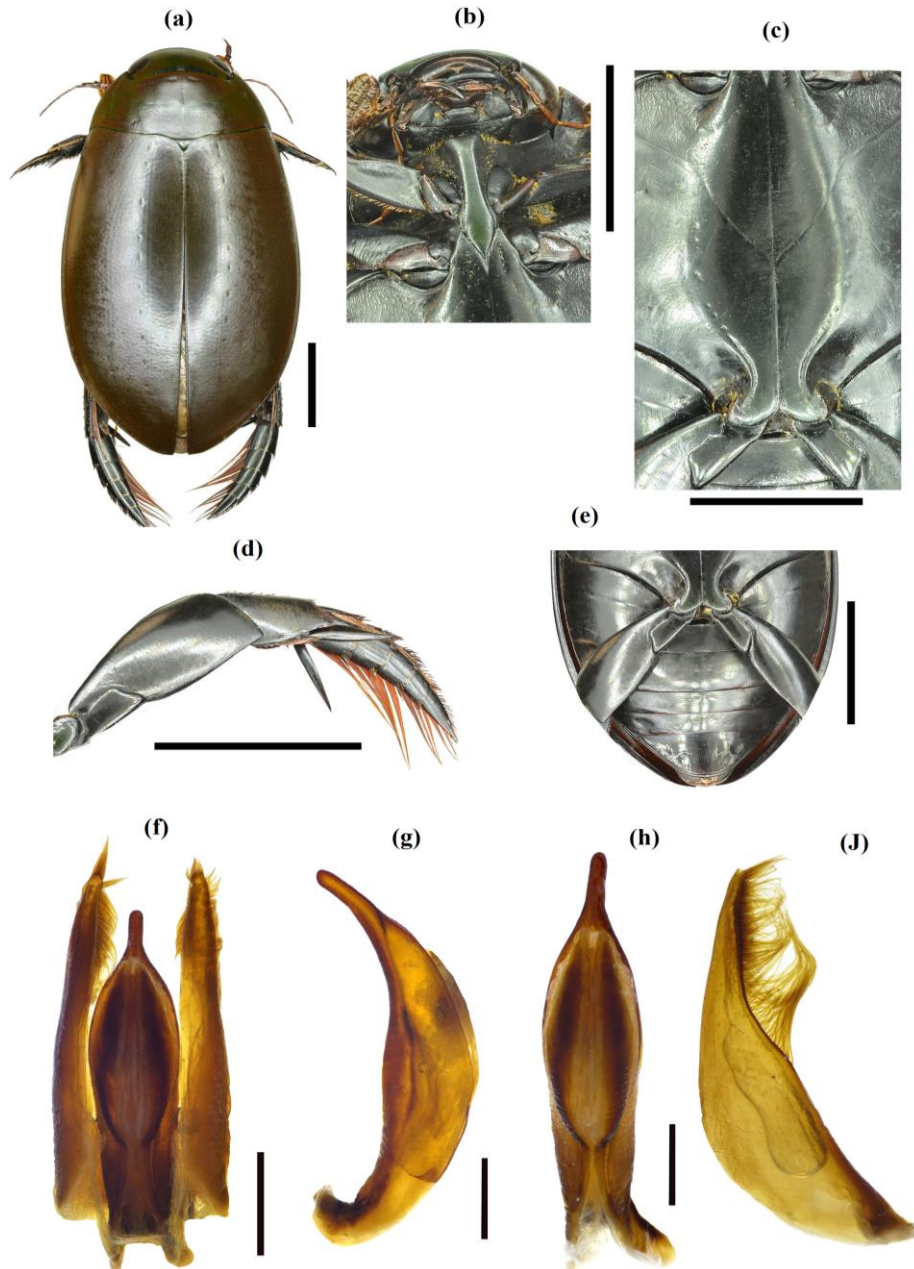


Figure 8. *Cybister sugillatus* Erichson (♂): (a) habitus, dorsal view; (b) head, ventral view, prosternum, and anterior part of mesoventrite; (c) metaventricle; (d) left metaleg, ventral view; (e); abdominal ventrites; (f) aedeagus, ventral view; (g) median lobe of aedeagus, lateral view; (h) median lobe of aedeagus, ventral view; (j) paramere left, lateral view.

Scale bar: 5 mm for a-e; 1 mm for f-j

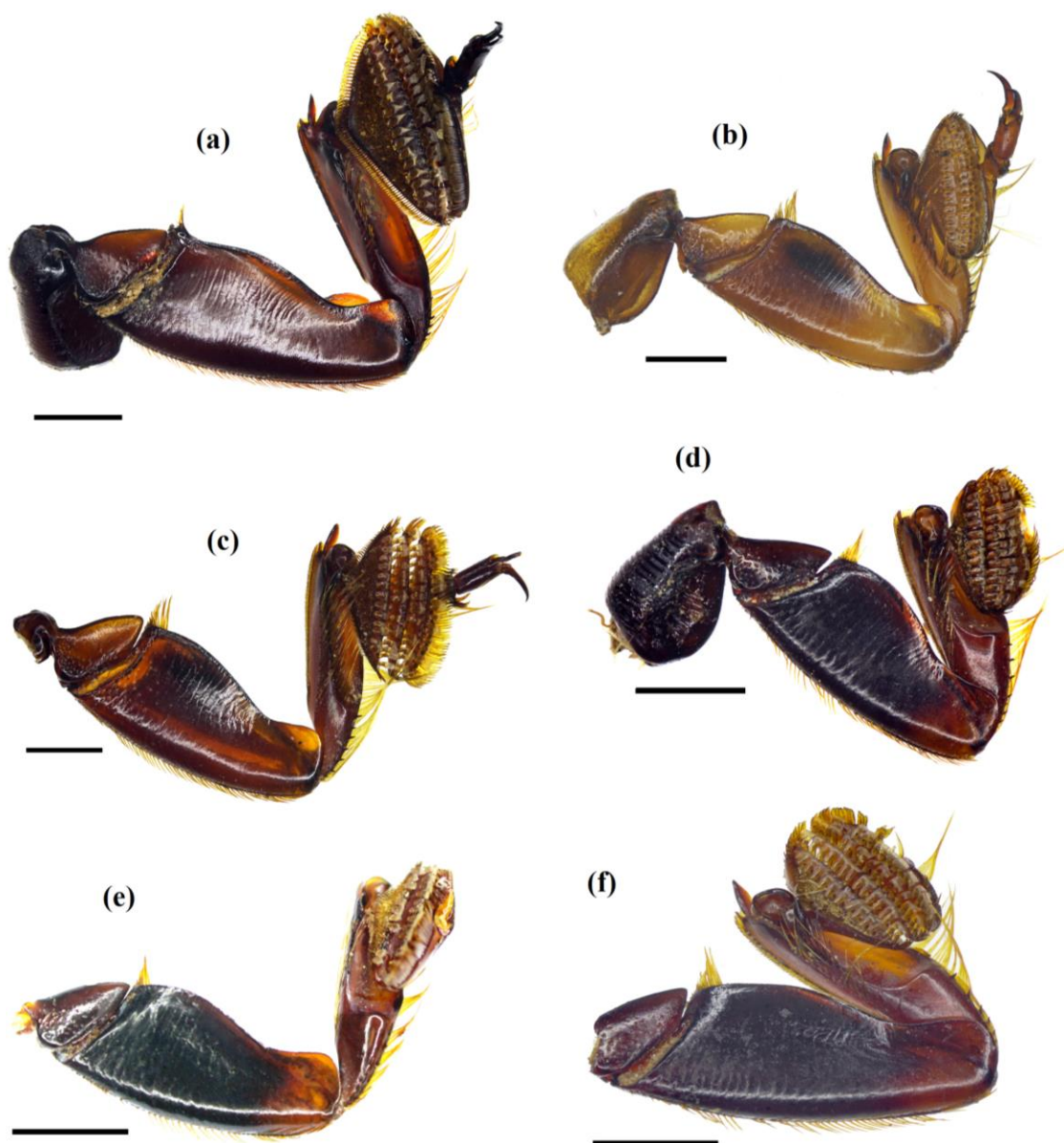


Figure 9. The right forelegs of *Cybister*, ventral view (♂): (a) *Cybister limbatus*; (b), (c) *Cybister tripunctatus lateralis*, (d) *Cybister sugillatus*, (e) *Cybister convexus*, (f) *Cybister danxiaensis*. Scale bar: 2 mm for a, e; 1 mm for b, c, d, f

Measurements. (Appendix 1), Average rate length of 2LA/3LA/3LA = 1.0/1.71/1.71, rate length of TA1/TA2/TA3/TA4/TA5 = 1.0/0.37/0.50/0.45/0.83, average rate of PW/DE = 2.58.

Distribution. Vietnam (Yen Bai, Ha Tinh), Afghanistan, Bhutan, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Pakistan,

Philippines, Singapore, Sri Lanka (Hendrich & Brancucci, 2013; Jiang et al., 2023; Lukashuk et al., 2023).

Comments. The morphological characteristics of the male of *Cybister sugillatus* Erichson, 1834 in this study are similar to those described by Jiang et al. (2023), including the main characteristics:

body elongate, oblong-oval; head; pronotum, protarsomeres; metafemora, median lobe of and elytra; ventral surface; dorsal surface; aedeagus and paramere.
metacoxal; forelegs, midlegs and hindlegs;

Key to the species of *Cybister* in Vietnam

(Based on the key to the species of Jiang et al., 2023)

1. Pronotum and elytra with yellow margins laterally; female with a single metatarsal claw. Subgenus *Cybister* Curtis, 1827.....2
 - Pronotum and elytra without yellow margins laterally; female with two metatarsal claws. Subgenus *Melanectes* Brinck, 1945.....8
2. Apex of median lobe of aedeagus furcate in ventral view.....3
 - Apex of median lobe of aedeagus not furcate in ventral view.....*C. lewisianus*
3. Metaventricle and metacoxae black with lateral parts yellow.....4
 - Metaventricle and metacoxae entirely black.....6
4. Smaller species, TL: 22–28 mm; female with dorsal surface smooth.....5
 - Larger species, TL: 28–33 mm; abdominal ventrites III–V black, with lateral yellow spots*C. rugosus*
5. Smaller species, TL: 22–24 mm; median lobe of aedeagus with apical notch shallower, lateral margins of apex straight and parallel in ventral view.....*C. fumatus*
 - Larger species, TL: 26–28 mm; median lobe of aedeagus with apical notch deeper, lateral margins of apex convex in ventral view (Figs. 3c, d; 4e)..... *C. tripunctatus lateralis*
6. Median lobe of aedeagus in ventral view with apex and base almost equal in width, lateral margins of apex sinuate, notch of apex shallower (Fig. 1f, g).....*C. guerini*
 - Median lobe of aedeagus in ventral view with apex narrower than base, lateral margins of apex concave, notch of apex deeper (Fig. 2g–k).....*C. limbatus*
8. Elytra with large protuberances densely arranged almost in rows, each protuberance with a medial puncture containing a small granule (Fig. 6a, 7a).....*C. danxiaensis*
 - Elytra smooth or with small granules.....9
9. Elytra smooth in both sexes (Fig. 8a).....*C. sugillatus*
 - Elytra with small granules in both sexes (Fig. 5d).....*C. convexus*

Acknowledgements: We are very grateful to S.V. Saluk (Scientific-Practical Centre of the National Academy of Sciences of Belarus for Biological Resources, Minsk, Belarus) for the loan of the material. This research was supported by the grant from the Vietnam Academy of Science and Technology Code: VAST04.07/23–24 (Nguyen Quang Cuong, IEBR) and the Belarusian Republican Foundation for Fundamental Research. (project B24V-008).

REFERENCES

Aiken R. B. & Roughley R. E., 1985. An effective trapping and marking method for aquatic beetles. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 137: 5–7.

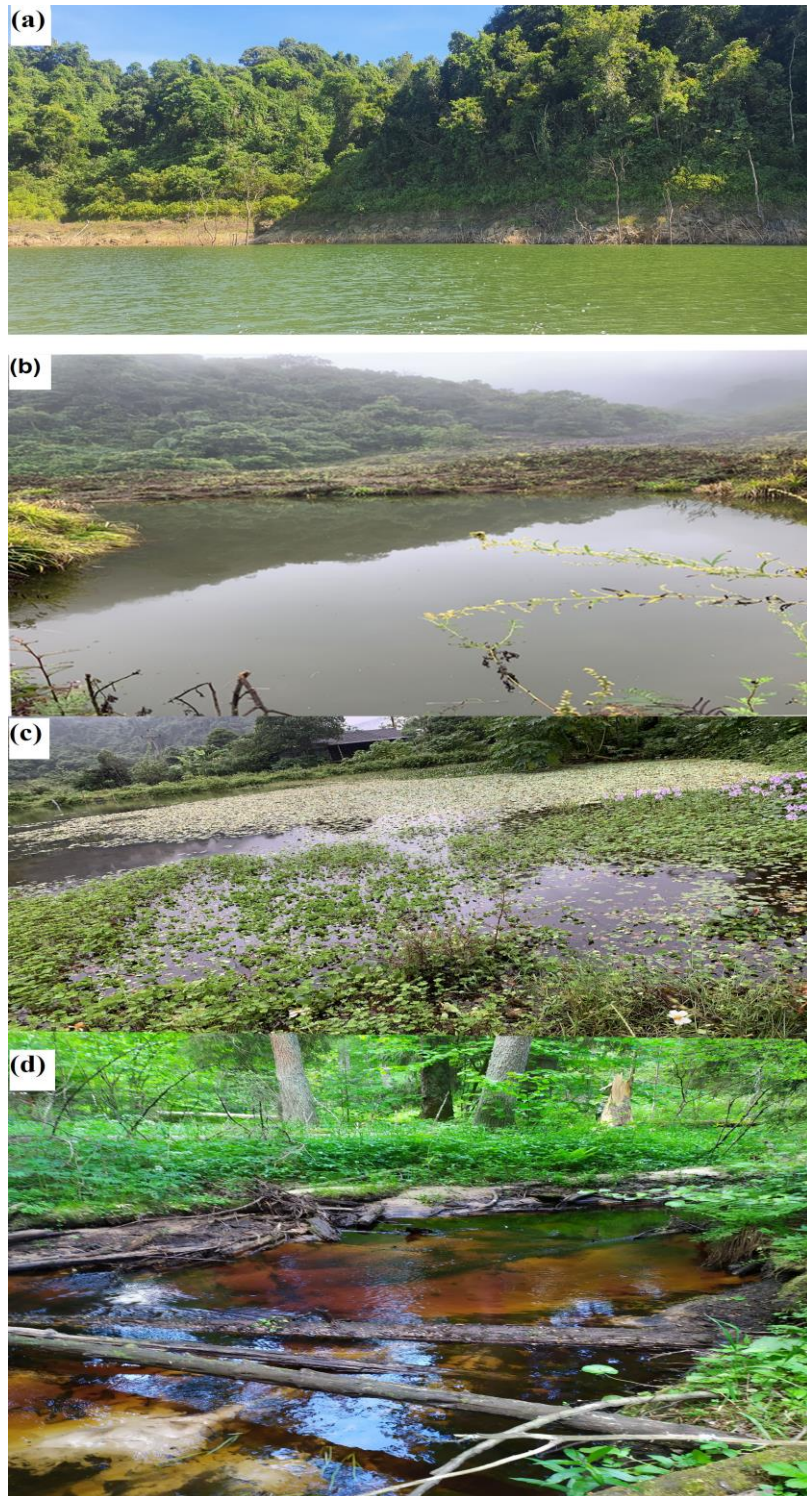
Atthakor W., Hendrich L., Sangpradub N. & Balke M., 2018. Diving beetles of the Sakaerat Biosphere Reserve, Nakhon Ratchasima Province, with four new records

- for Thailand (Coleoptera, Dytiscidae). *Spixiana*, 41: 91–98.
- Aubé C., 1838. Species général des hydrocanthares et gyriniens; pour faire suite au species général des coléoptères de la collection de M. le comte Dejean. Méquignon Père et Fils, Paris, XVI, pp. 804.
- Boheman C. H., 1858–1859. Coleoptera. pp. 1–217. In: Kongliga svenska fregatten Eugénies resa omkring jorden under befäl af C. A. Virgin åren 1851–1853. *Vetenskapliga iakttagelser. 2. Zoologi. 1. Insecta.* K. Svenska Vetenskaps-Akademien, Stockholm, pp. 617.
- Brinck P., 1945. Nomenklatorische und systematische Studien über Dytisciden. III. Die Klassifikation der *Cybister*inen. *Kunliga Fy-siografiska Sällskapet Handlingar*, 56(4): 1–20.
- Brinck P., 1946. Waterbeetles from Manchuria. With some zoogeographical remarks. *Opuscula Entomologica (Lund)*, 11: 146–156.
- Curtis J., 1827. British entomology; being illustrations and descriptions of the genera of insects found in Great Britain and Ireland. *J. Curtis*, 4: 147–194.
- Fabricius J. C., 1798. Supplementum entomologiae systematicae. Hafniae: C.G. Proft et Storch: 4 + 572 pp.
- Feng H. T., 1932. Aquatic insects of China. Article II. Catalogue of Chinese Dytiscidae. *Peking Natural History Bulletin*, 7(1932–1933): 17–37.
- Feng H. T., 1933. Classification of Chinese Dytiscidae. *Peking Natural History Bulletin*, 8(1933–1934): 81–146 + 2 pls.
- Feng H. T., 1936. Notes on some Dytiscidae from Musée Hoang Ho Pai Ho, Tientsin with descriptions of eleven new species. *Peking Natural History Bulletin*, 11(1936–37): 1–15.
- Ghosh S. K. & Nilsson A. N., 2012 Catalogue of the diving beetles of India and adjacent countries (Coleoptera: Dytiscidae). *Skorvonnoparn, Umel, Supplement*, 3: 1–77.
- Hendrich L. & Brancucci M., 2013. The genus *Cybister* Curtis, 1827 in Laos (Coleoptera: Dytiscidae, Cybistrini). *Entomologica Basiliensia et Collectionis Frey*, 34: 75–88.
- Jia F. L., Wang J., Wang J. F. & Wang Z., 2010. A revisional study of *Cybister* Curtis (Coleoptera: Dytiscidae: Dytiscinae) in China. *Entomotaxonomia*, 32: 255–263.
- Jiang Z., Zhao S., Mai Z., Jia F. & Hendrich L., 2023. Review of the genus *Cybister* in China, with description of a new species from Guangdong (Coleoptera: Dytiscidae). *Acta Entomologica Musei Nationalis Pragae*, 63(1): 75–102.
- Leach W. E., 1817. XIX. Synopsis of the stirpes and genera of the family Dyticea. pp. 68–73. In: The zoological miscellany; being descriptions of new or interesting animals. Vol. 3. London: E. Nodder & Son: v + 151 pp. + pls 121–150.
- Lukashuk A. O., Truong X. L. & Ryndevich S. K., 2023. First record of true bugs (Hemiptera: Heteroptera) and beetles (Coleoptera) for Na Khau Natural Reserve in Vietnam. *Zoological Readings: 125th Anniversary Collection of Scientific Papers.* Dr. Biol. Sciences Ivan Nikolaevich Serzhanin/Yanka Kupala State University: 11–12.
- Miller K. B. & Bergsten J., 2016. Diving beetles of the World. Systematics and biology of the Dytiscidae. Johns Hopkins University Press, Baltimore, pp. 320.
- Miller K. B., Bergsten J. & Whiting M. F., 2007. Phylogeny and classification of diving beetles in the tribe Cybistrini (Coleoptera, Dytiscidae, Dytiscinae). *Zoologica Scripta*, 36: 41–59.
- Mori M. & Kitayama A., 1993. Dytiscoidea of Japan. *Kankyo Kagaku, Toyonaka*, pp. 217 (in Japanese, with English book title).
- Nilsson A. N., 1995. Noteridae and Dytiscidae: Annotated check list of the

- Noteridae and Dytiscidae of China (Coleoptera). pp. 35–96. In: JÄCH M. A. & JI L. (eds): Water beetles of China, Vol. I. Zoo-logisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, Wien, pp. 410.
- Nilsson A. N., 2001. World catalogue of insects. Volume 3. Dytiscidae (Coleoptera). Apollo Books, Stenstrup, pp. 395.
- Nilsson A. N. & Hájek J., 2022. A World catalogue of the family Dytiscidae, or the diving beetles (Coleoptera, Adephaga). Version 1.I.2022. <http://www.waterbeetles.eu> (accessed: January 20, 2024).
- Nilsson A. N. & Petrov P. N., 2007. On the identity of *Cybister chinensis* Motschulsky, 1854 (Coleoptera: Dytiscidae). *Koleopterologische Rundschau*, 77: 43–48.
- Régimbar M., 1899. Révision des Dytiscidae de la région Indo-Sino-Malaise. *Annales de la Société Entomologique de France*, 68: 186–367.
- Schönherr C. J., 1808. Synonymia Insectorum, oder: Versuch einer Synonymie aller bisher bekannten Insecten; nach Fabricii Systema Eleutheratorum & c. geordnet. Erster band. Eleutherata oder Käfer. Zweiter Theil. Spercheus Cryptocephalus. C. F. Marquard, Stock-holm: x + 424 pp. + 1 pl.
- Sharp D., 1882. On aquatic carnivorous Coleoptera or Dytiscidae. *Scientific Transactions of the Royal Dublin Society, Series II 2*: 179–1003 + pls 7–18.
- Vazirani T. G., 1969. A review of the subfamilies Noterinae, Laccophilinae, Dytiscinae and Hydroporinae (in part) from India. *Oriental Insects*, 2(1968): 221–341.
- Zimmermann A., 1920. Dytiscidae, Haliplidae, Hygrobiidae, Amphizoidae. In: SCHENKLING, S. (ed.): *Coleopterorum Catalogus*, Vol. 4, pars 71. Berlin: W. Junk, pp. 326.

Appendix 1. The measurement features of the species in the genus *Cybister* from Vietnam

Feature	<i>Cybister limbatus</i>	<i>Cybister tripunctatus lateralis</i>	<i>Cybister convexus</i>	<i>Cybister sugillatus</i>	<i>Cybister danxiaensis</i>
BL total length: length from clypeal margin to apex of elytra	33.84–37.22	26.07–27.7	22.59–24.59	20.63	21.92
EL total length minus head length: length from anterior margin of pronotum to apex of elytra	27.95–30.75	22.43–22.62	17.65–18.52	18.65	19.77
MW maximum width of body	19.63–21.59	14.05–14.75	12.26–13.25	10.12	10.73
PL pronotal length	5.8–6.38	3.14–3.39	3.48–3.62	3.15	3.34
WE maximal width of eye	1.55–1.71	0.96–1.52	0.82–1.02	0.93	0.99
DE minimal interocular distance	4.03–4.43	3.09–3.19	3.31–3.43	3.08	3.26
PW maximal pronotal width	13.96–15.36	9.59–10.09	9.09–9.15	8.29	8.79
WH width of head	2.71–2.98	2.05–2.82	2.01–2.11	2	2.12
2LA length of second of antenna	0.42–0.46	0.44–0.45	0.70–0.82	0.45	0.48
3LA length of third of antenna	1.27–1.40	0.81–0.91	0.64–0.71	0.77	0.82
4LA length of fourth of antenna	1.3–1.43	0.84–0.92	0.68–0.75	0.77	0.82
LS length of scutellum	1.06–1.17	0.88–1.06	0.62–0.63	1.08	1.14
LF length of last left metafemur	8.65–9.52	6.02–7.06	5.62–5.77	4.89	5.18
LM length of last left metatibia	4.24–4.66	2.94–3.34	2.24–2.37	2.71	2.87
TA1 length of first tarsomere of last left metatarsomere	2.56–2.82	1.73–2.64	1.53–1.76	1.87	1.98
TA2 length of second tarsomere of last left metatarsomere	1.79–1.97	1.25–1.86	1.08–1.11	0.69	0.73
TA3 length of third tarsomere of last left metatarsomere	1.59–1.75	1.04–1.84	0.89–0.91	0.94	1.00
TA4 length of fourth tarsomere of last left metatarsomere	1.53–1.68	0.93–1.63	0.73–0.77	0.84	0.89
TA5 length of fifth tarsomere of last left metatarsomere	3.54–3.89	2.28–2.7	1.65–1.73	1.55	1.64
Length of inner spine	4.46–4.91	2.85–3.08	2.36–2.39	2.74	2.90
Length of inside spine	3.08–3.39	3.49–3.67	2.21–2.23	4.18	4.43



Appendix 2. Habitats of *Cybister* in Vietnam (a) Vu Quang, Ha Tinh (*Cybister limbatus*, *Cybister tripunctatus lateralis*); (b) Nam Xuan Lac, Bac Kan (*Cybister tripunctatus lateralis*); (c) (d) Bat Xat, Lao Cai (*Cybister danxiaensis*, *Cybister tripunctatus lateralis*)