The genus Cybister Curtis, 1827 in Laos (Coleoptera: Dytiscidae, Cybistrini)

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The genus *Cybister* Curtis, 1827 in Laos (Coleoptera: Dytiscidae, Cybistrini)

by Lars Hendrich & Michel Brancucci †

Abstract. An annotated checklist of the seven species in the genus *Cybister* Curtis, 1827 occurring in Laos is presented. They belong to the subgenera *Cybister* (s. str.) with four species: *C. fumatus* Sharp, 1882, *C.* cf. *limbatus* (Fabricius, 1775), *C. rugosus* (Macleay, 1825) and *C. tripunctatus lateralis* (Fabricius, 1798), and *Cybister* (*Melanectes*) Brinck, 1945 with three species: *Cybister* (*M.*) *dehaanii* Aubé, 1838, *C.* (*M.*) *siamensis* Sharp, 1883, and *C.* (*M.*) *sugillatus* Erichson, 1834. *Cybister rugosus* is recorded for the first time in Laos. All species are widespread in South-east Asia and/or China. For all species the locality data are listed and each species is illustrated with two habitus photographs. Notes on the general distribution and photos of the habitats of the species are given. In Laos at least two species, *C.* cf. *limbatus* and *C. tripunctatus lateralis,* are sold at food markets. All *Cybister* known to date are inhabitants of permanent standing bodies of water in open or woodland areas and can be attracted to light.

Key words. Laos – Dytiscidae – *Cybister* – edible insects – distribution – taxonomy

Introduction

Adult predatory water beetles were collected in the course of several field trips to Laos between 1997 and 2011 by Michel Brancucci and Michael Geiser from Basel and several Czech entomologists. Laos had not been previously well investigated for dytiscid beetles, so the study provided a number of new species and new regional records. The objective of this paper is to present an annotated checklist of the known species of the genus *Cybister* Curtis, 1827 in Laos and to provide some notes on the general distribution and habitat preferences of each species. In his catalogue NILSSON (2001) listed 102 valid species and 10 subspecies, mainly distributed in the Afrotropical and Oriental regions. Most species, if not all, are inhabitants of larger and permanent standing bodies of water in open or woodland areas. Despite many Oriental species of the genus being sold at food markets in China (Guangzhou and Beijing), Thailand (CHEN *et al.* 1998, HILL *et al.* 1982) and Laos (M. Geiser, pers. comm.), and their being the largest predatory water beetles in South-east Asia, their taxonomy is still poorly known, and the whole genus is in current need of comprehensive taxonomic revision. Therefore the determination of one species in this paper is only tentative ("cf."). To date, seven species of the genus *Cybister* are known to be present in Laos. However, the majority of the species are included in the keys to species of either VAZIRANI (1969), MORI & KITAYAMA (1993) or JIA *et al.* (2011).

Material and Methods

The 143 specimens examined in this study are deposited in the Natural History Museum of Basel, Switzerland (NHMB), in the National Museum, Prague, Czech Republic (NMPC), in the Zoological State Museum Munich, Germany (ZSM), in

the Hans Hebauer, collection, Rain/Niederbayern, Germany, in the Jaroslav Šťastný collection (Liberec, Czech Republic), and in the Zoological Museum of the University of Copenhagen (ZMUC). The beetles were examined with the aid of a Leica MZ 9.5 binocular microscope at 10–60× magnification.

Taxonomy and faunistics

Subgenus *Cybister* Curtis, 1927

Cybister (*Cybister*) *fumatus* Sharp, 1882 Fig. 1

Cybister fumatus Sharp, 1882: 731, RÉGIMBART 1899: 350, ZIMMERMANN 1920: 260, FENG 1936: 13, NILSSON 1995: 79, NILSSON 2001: 88, JIA *et al.* 2011: 261.

Material examined. 9 specimens. 4 exx, "Laos-C.: Kham Mouan prov., Ban Khoun Ngeun, 200m, 18°07′N 104°29′E, Pacholátko leg. 19.–31.V.2001" (NHMB, CLH); 1 ex., "LAOS: Vientiane prov., Phou Khao Khouay, 18°20.369′N 102°48.523′E, 25.–30.V.2008, A. Solodovnikov & J. Pedersen leg.", "nr. strongly disturbed primary rainforest on light" (ZMUC); 1 ex., "Laos, Sekong Prov., Tad Faek waterfalls, 15°14.7′N, 106°42.1′E, 118 m, light trap, 8.V.2010, J. Hájek leg" (NMPC). 1 ex., "Laos Bolikhamsay prov. Nam Kading NPA research center near Ban Phone Kham 18°20′N/104°08′E 250 m, 23.–29.V.2011", "NHMB Basel Laos 2011 Expedition M. Brancucci, M. Geiser, D. Hauck, Z. Kraus, A. Phantala & E. Vongphachan" (NHMB); 1 ex., "Laos Bolikhamsay prov., Pakkading Ban Phone Kham env. 18°19′N/104°08′E 200–300 m, 23.–29.V.2011", "NHMB Basel Laos 2011 Expedition M. Brancucci, M. Geiser, D. Hauck, Z. Kraus, A. Phantala & E. Vongphachan" (NHMB); 1 ex., "LAOS, Savannakhet prov. 10 E of Savannakhet Dong Natad forest, 180 m a. s. l., 4.12.2011, J. Šťastný lgt." (CJS).

Distribution. Vietnam, Laos (Fig. 20), Thailand, Malaysia (RÉGIMBART 1899, ZIMMERMANN 1920). According to NILSSON (1995) the species is widespread in South-east Asia.

Collecting circumstances. All specimens were collected at lower altitudes, between 180 m and 300 m. The specimen from Sekong was attracted to a light trap placed near the bank of lowland river (Fig. 10). The specimen from Dong Natad was collected in a shallow swamp in lowland monsoon primary forest, associated with *Hyphydrus lyratus* Swartz, 1808, *Hyphydrus* sp.nov., *Lacconectus* sp. (Fig. 12).

Cybister (*Cybister*) cf. *limbatus* (Fabricius, 1775) Fig. 2

Dytiscus limbatus Fabricius, 1775: 230.
Cybister limbatus (Fabricius, 1775): AUBÉ 1838: 55, RÉGIMBART 1899: 342, ZIMMERMANN 1920: 263, VAZIRANI 1969: 294, NILSSON 1995: 78, NILSSON 2001: 89, JIA *et al.* 2011: 261, GHOSH & NILSSON 2012: 20–21.

Material examined. 12 specimens. 4 exx, "Laos-C.: Kham Mouan prov., Ban Khoun Ngeun, 200m, 18°07′N 104°29′E, Pacholátko leg. 27.–31.V.2001" (NHMB, ZSM); 1 ex., "Laos-N., Bolikhamxai prov., 70 km NNE Vientiane, 27.–30.IV.1997, Thong Khan, 150m, 19°35′N 101°58′E, Vit Kuban leg." (NHMB); 1 ex., "LAOS: Vientiane prov., Phou Khao Khouay, 18°20.369′N 102°48.523′E, 25.–30.V.2008, A. Solodovnikov & J. Pedersen leg.", "nr. strongly disturbed primary rainforest on light" (ZMUC); 5 exx, "LAOS, Houa Phan Prov., Phou Pane MT, 1350–1500 m, 20°13′ N / 104°00′E, 1.–16. VI. 2009, M. Brancucci leg." (NHMB); 1 ex., "Laos, Louangnamtha pr. 21°09′N/101°19′E, Namtha ([track to] Muang Sing, 900–1200 m, 5.–31.V.1997, Vít Kubán" (NHMB).

Distribution. The species is known from India to Vietnam, Thailand, Myanmar, West Malaysia, southern China, the Philippines and north to the Ryukyu Islands (ZIMMERMANN 1920, VAZIRANI 1977, NILSSON 1995). It is widespread throughout Laos (Fig. 21).

Remarks. The type material of *C. guerini* Aubé, 1838 and *C. limbatus* should be studied carefully before identifying freshly-collected material. In many collections, historical specimens of the same species may be found under the two different names.

Collecting circumstances. *Cybister limbatus* has been collected in various types of largely perennial standing water such as ponds, paddy fields (YANO *et al.* 1983), fish cultivation ponds, shallow lakes and ditches. It is frequently attracted to light and the most common larger species of the genus in South-east Asia. In Thailand, adults prey on the larvae and pupae of *Aedes aegypti* (L.) and *Culex quinquefasciatus* Say (YUKALAND 2005). The species is sold as food in Thailand (CHEN *et al.* 1998) and Laos (M. Geiser pers. comm.) where it is called "Mang mee-eng" (BRISTOWE 1932).

Cybister (*Cybister*) *rugosus* (W.S. Macleay, 1825) Fig. 3

Trochalus rugosus W.S. Macleay, 1825: 136.
Cybister rugosus (W.S. Macleay): SHARP, 1882: 745; RÉGIMBART 1899: 347; ZIMMERMANN 1920: 264, VAZIRANI 1977: 92, YANO at al. 1983: 17, CHEN *et al.* 1998: 27, NILSSON 2001: 89, NILSSON 1995: 78, HENDRICH *et al.* 2004: 120, JIA *et al.* 2011: 261.
Cybister indicus Aubé, 1838: 62.

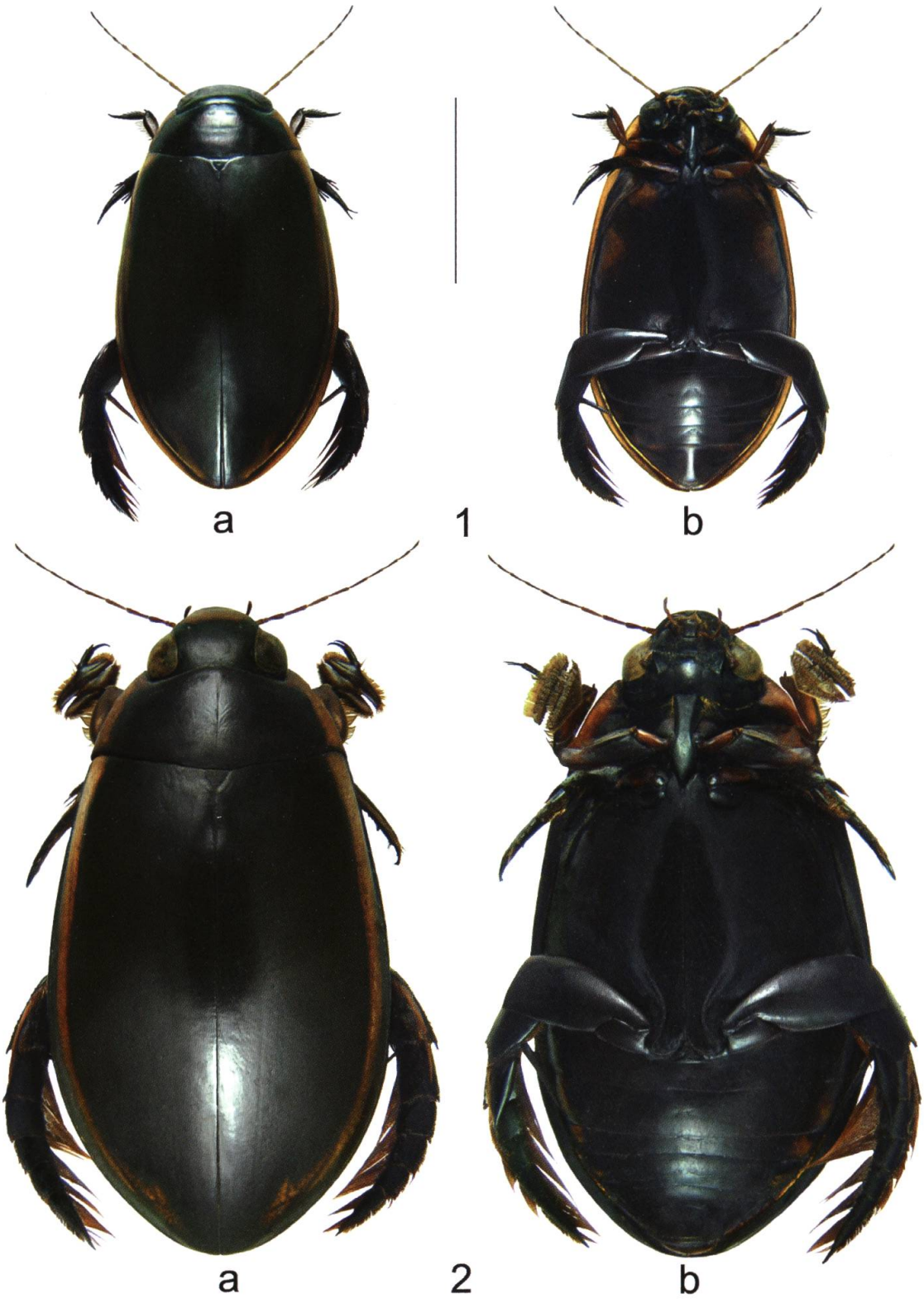
Material examined. 1 specimen. 1 ex., "Laos-N. Vientiane prov., Vang-Vieng 300m, 18°55′23″N 102°26′55″E, 10.–15.V. & 1.–6.VI.2001, Jiří Kolibáč leg." (NHMB).

Distribution. Southern Vietnam, Thailand, Cambodia, Peninsular Malaysia, Singapore, Indonesia: Batam, Sumatra, Java and Kalimantan (RÉGIMBART 1899, ZIMMERMANN 1927, HENDRICH *et al.* 2004) and Taiwan (NILSSON 1995). **First record for Laos** (Fig. 23).

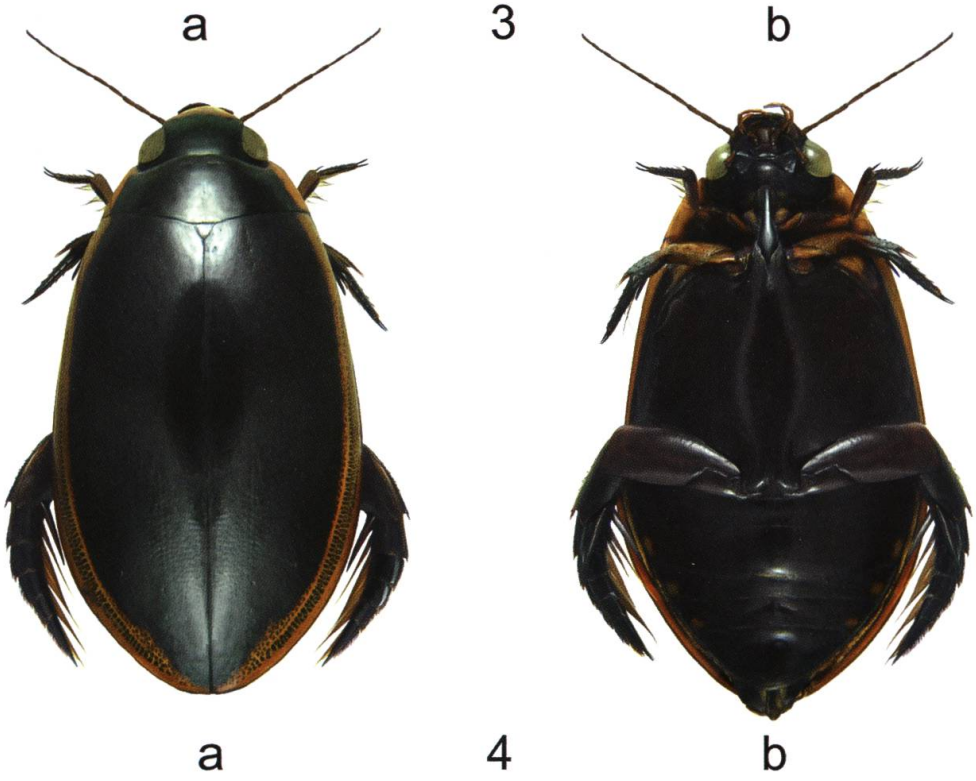
Collecting circumstances. In South-east Asia *C. rugosus* has been collected in various types of largely perennial standing water such as ponds, paddy fields (YANO *et al.* 1983), fish cultivation ponds, shallow lakes and ditches. *Cybister rugosus* is frequently attracted to light, but much rarer than *C. tripunctatus lateralis*. The species is sold as food in Thailand (CHEN *et al.* 1998).

Cybister (*Cybister*) *tripunctatus lateralis* (Fabricius, 1798) Fig. 4

Dytiscus tripunctatus Olivier, 1795: 14.
Cybister tripunctatus (Olivier): AUBÉ 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: RÉGIMBART 1899: 352, BALFOUR-BROWNE 1945: 122, FERNANDO 1961: 24, 1964: 82, 86, 88, VAZIRANI 1968: 290, 1977: 92, NILSSON 1995: 79, and references therein.



Figs 1–2. 1 – *Cybister fumatus* (a, dorsal side, b ventral side); 2 – *Cybister* cf. *limbatus.* Scale = 1 cm (photos: U. Schmidt).



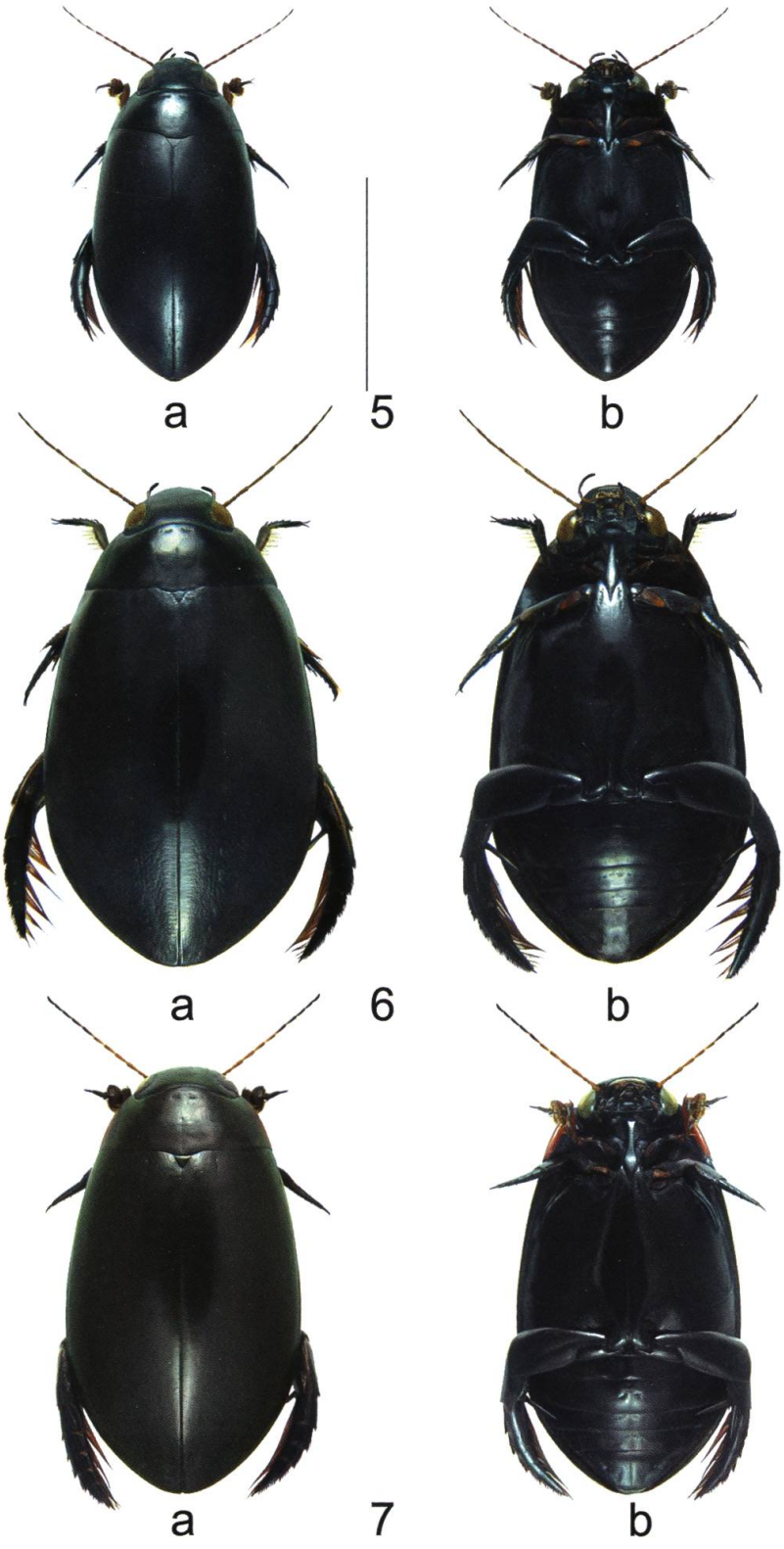
Figs 3–4. 3 – Habitus of *Cybister rugosus* (a, dorsal side, b ventral side); 4 – *Cybister tripuncatus lateralis.* *S*cale = 1 cm (photos: U. Schmidt).

Material examined. 15 specimens. 4 exx, "Laos-N. Vientiane prov., Vang-Vieng 300m, 18°55′23″N 102°26′55″E, 10.–15.V. & 1.–6.VI.2001, Jiří Kolibáč leg." (NHMB); 1 ex., "Vientiane prov., Lao Pako, env. 55 km NE of Vientiane, 1.–4.V.2004, F.&L. Kantner leg." (NHMB); 1 ex., "Laos-N. Louangphrabang, 11.–21.V.2002, Thong Khan, -750m, 19°35′N 101°58′E, Vít Kubán leg." (NHMB); 1 ex., "Laos NE, Hua Phan prov., Phu Phan Mt., 1500–1900m, 20°12′N 104°01′E 17.V.–3.VI.2007, M. Brancucci leg." (NHMB); 1 ex., "Laos-C.: Kham Mouan prov., Ban Khoun Ngeun, 200m, 18°07′N 104°29′E, Pacholátko leg. 19.–31.V.2001" (NHMB); 1 ex., Laos, Bokeo prov., 5 km W Ban Toud, Bokeo Nature Reserve, 500–700 m, 20°27–28′N 100°45′E, 4.–18.V.2011", "NHMB Basel Laos 2011 Expedition M. Brancucci, M. Geiser, D. Hauck, Z. Kraus, A. Phantala & E. Vongphachan" (NHMB); 1 ex., "LAOS, Savannakhet prov. 10 E of Savannakhet Dong Natad forest, 180 m a. s. l., 4.12.2011, J. Šťastný lgt." (CJS); 1 ex., "LAOS, Vientiane prov.; 10 km W of Vang Viang, 250 m a. s. l. 29.– 30.11.2011, J. Šťastný lgt." (CJS); 1 ex., "LAOS, Khammouane prov. E of Thakhek, Gnomalat, Phonsang village env, 170 m a. s. l., 2.–3.12.2011, J. Štastný lgt." (CJS); 1 ex., "LAOS, Khammouane prov. E of Thakhek, Gnomalat, Phonsang village env, 180 m a. s. l., 2.–3.12.2011, J. Šťastný lgt." (CJS); 1 ex., "LAOS, Luang Prabang prov., S of Muang Ngoi, 340 m a. s. l. 24.–26.11.2011; J. Šťastný lgt." (CJS); 1 ex., "LAOS, Champasak prov.; Paksong env., Tad Yuang, waterfall, 1125 m a. s. l., 6.12.2011; J. Šťastný lgt." (CJS).

Distribution. *Cybister tripunctatus* and its subspecies are in need of modern revision. The species occurs in most tropical and subtropical areas of the Old World. The nominotypical form is recorded from Madagascar, the Mascarenes and the Seychelles; the subspecies *africanus* occurs in all of continental Africa and also reaches the Arabian Peninsula and southern Europe; the subspecies *lateralis* is distributed from Turkey in the Palaearctic region to China, and all over the Oriental and Indomalayan region; on New Guinea, in Australia and New Caledonia it is replaced by the subspecies *Cybister* (s.str.) *tripunctatus temnenkii* AUBÉ, 1838 (NILSSON 2001, GHOSH & NILSSON 2012). In Laos the species is widespread all over the country and specimens have been collected at altitudes from 170 m to 1900 m (Fig. 22).

Biology and collecting circumstances. The most common species of the genus in South-east Asia, it is eurytopic and widespread in artificial habitats such as irrigation channels, flooded paddy fields, open swamps, fish-cultivation and ornamental ponds and larger ditches (Figs 13–17), even in urban and suburban areas (HENDRICH *et al.* 2004). It is also known from forest swamps and the well-vegetated lake-shores of smaller mountain lakes (HENDRICH & BALKE 1995), as well as slack pools in rocky river beds (Figs 18, 19). In general, the species prefers more open and exposed habitats. The feeding habits of the larvae, which prey largely on other insect larvae, were recently studied by OHBA & INATANI (2011). At Vang Viang (Figs 13, 14) the species was associated with the dytiscids *C. sugillatus*, *Rhantaticus congestus (*Klug, 1833), *Hydaticus fabricii*-group, *Copelatus* sp., *Hydroglyphus* sp., *Laccophilus chinensis* Boheman, 1858 and at Tad Yuang it was found with *Hydaticus pacificus*-group and *Laccophilus vietnamensis* Balke et Hendrich, 1997 (Šťastný in litt.).

Remarks. The species is the most common *Cybister* sold as food in Northern Thailand (Chiang Mai) (CHEN *et al.* 1998) and China (Guangzhou, Beijing and Hong Kong); "particularly abundant in the autumn [...] large numbers are captured easily because at this time of the year they disperse to seek new bodies of water and they collect at lights at night" (HILL *et al.* 1982).



Figs 5–7. 5 – Habitus of *Cybister dehaanii* (a, dorsal side, b ventral side), 6 – *Cybister siamensis*; 7 – *Cybister sugillatus.* Scale = 1 cm (photos: U. Schmidt).

Subgenus *Melanectes* Brinck, 1945

Cybister (*Melanectes*) *dehaanii* Aubé, 1838 Fig. 5

Cybister dehaanii Aubé, 1838: 101; SHARP 1882: 726, RÉGIMBART 1899: 356, ZIMMERMANN 1920: 259, GUIGNOT 1956: 397, VAZIRANI 1969: 286, VAZIRANI 1977: 88, BALKE *et al.* 1998: 73, HEBAUER *et al.* 1999: 339–340, NILSSON 2001: 91, HENDRICH *et al.* 2004: 120, GHOSH & NILSSON 2012: 22.

Material examined. 23 specimens. 2 exx, "LAOS: Vientiane prov., Phou Khao Khouay, 18°20.369′N 102°48.523′E, 25.–30.V.2008, A. Solodovnikov & J. Pedersen leg.", "nr. strongly disturbed primary rainforest on light (ZMUC); 4 exx, "Laos, Kammouan Prov., Nakai env., Route no. 8, 17°42,8′N, 105°09,1′E, 560 m, 4.–8.V.1992, E. Jendek & O. Šauša leg." (NMPC); 2 exx, "Khammouan Prov., Nakai env., 500–600m, 22.V.–8.VI.2001, 17°43′N 105°09′E, E.Jendek & O.Sausa leg." (CHH); 2 exx, "Laos centr. Kham Mouan Prov. Nakai vill. env. Ca. 70 km NNE Muang Khammouan 500–600 m, 17°43′N 105°09′E 7.–25.V.2002 M. Strba leg." (ZSM); 8 exx, "Laos Umg. Vientiane III.–VI.1963" (ZSM); 3 exx, "Laos Umg. Vientiane III–VI.1963", "Cybister dehaanii Aubé det. V. Gueorguiev 1964", "confirmed J. Balfour-Browne det. 1965", "NHM Basel coll. Brancucci" (NHMB); 1 ex., "Laos N-Vientiane Prov. Vang-Vieng, 300 m N 18°55′23″, E 102°26′55″ 10.–15.v. & 01–06.vi. 2001, Jiří Kolibáč leg." (NHMB); 1 ex., "Laos C-Kham Mouan Prov. Ban Khoun Ngeun ~ 200 m, 18°07 N 104°29 E, Pacholátko leg., 19.–31.v.2001 (NHMB); 1 ex., "Laos Bolikhamsay prov., Pakkading Ban Phone Kham env. 18°19′N/104°08′E 200–300 m, 23.–29.V.2011", "NHMB Basel Laos 2011 Expedition M. Brancucci, M. Geiser, D. Hauck, Z. Kraus, A. Phantala & E. Vongphachan" (NHMB).

Distribution. India (West Bengal), Central Laos (Fig. 24), Cambodia, Vietnam, Thailand, West Malaysia and Indonesia (Borneo, Java, Sumatra and Sulawesi) (RÉGIMBART 1899, VAZIRANI 1977, HENDRICH *et al.* 2004, GHOSH & NILSSON 2012).

Collecting circumstances. The smallest species of the genus in South-east Asia. Single specimens or small series were collected in shaded, detritus-rich woodland pools, lakes and swamps rich in rotten leaves and decaying twigs. Most records are from lowland or hilly primary rainforest areas (e.g. HEBAUER *et al.* 1999). *Cybister dehaanii* is less frequently attracted to light than other species of the genus and is quite rare in collections.

Cybister (*Melanectes*) *siamensis* Sharp, 1882 Fig. 6

Cybister siamensis Sharp, 1882: 717; RÉGIMBART 1899: 354, ZIMMERMANN 1920: 264, ZIMMERMANN 1927: 42, NILSSON 2001: 92, GHOSH & NILSSON 2012: 22.

Material examined. 2 specimens. 1 ex., "Laos Ventiane" [Vientiane], "NHM Basel coll. Brancucci" (NHMB); 1 ex., "Museum Paris Laos inter. Harmand 1876", "NHM Basel coll. Brancucci" (NHMB).

Distribution. Thailand, India (Andaman Islands), Vietnam, Laos (Fig. 23), Indonesia (Sumatra), Borneo (Sabah, Sarawak) (RÉGIMBART 1899, ZIMMERMANN 1920, 1927, NILSSON 2001, GHOSH & NILSSON 2012).

Biology and collecting circumstances. *Cybister siamensis* is quite rare in collections and only known from specimens collected in the 19th century. Most probably a lowland rainforest species but nothing is known of its habitat.

Cybister (*Melanectes*) *sugillatus* Erichson, 1834 Fig. 7

Cybister sugillatus Erichson, 1834: 227, Régimbart 1899: 355, Fernando 1964: 82, 86, 88; Vazirani 1977: 89, Nilsson 1995: 78, and references therein; Nilsson 2001: 93, Hendrich *et al.* 2004: 121, Jia *et al.* 2011: 259, Ghosh & Nilsson 2012: 22–23.
Cybister bisignatus Aubé, 1838: 88.
Cybister notasicus Aubé, 1838: 90.
Cybister olivaceus Boheman, 1858: 21.

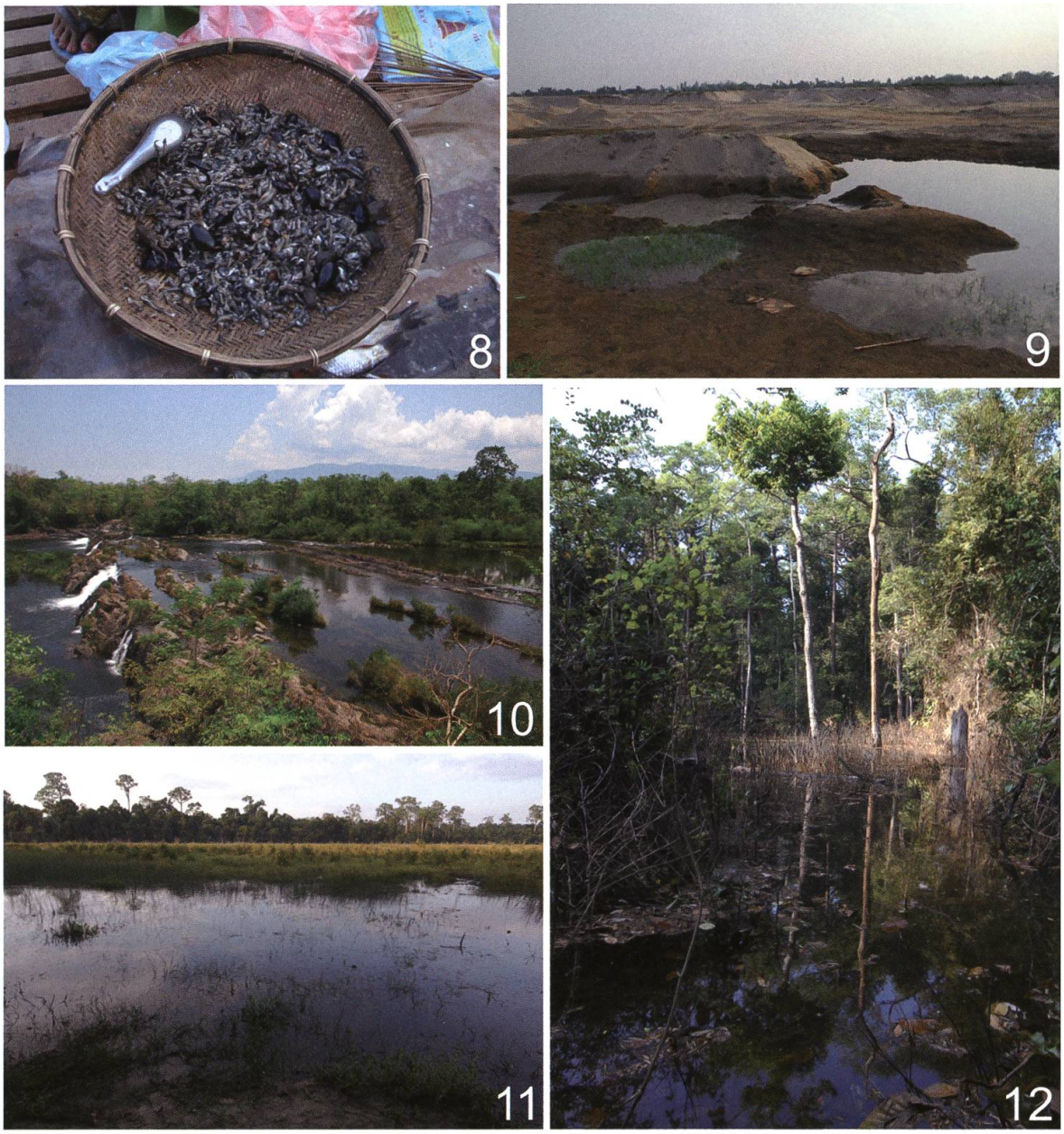
Material examined. 80 specimens. 24 exx, "LAOS, Houa Phan Prov., Phou Pane MT, 1350–1500 m, 20°13′ N / 104°00′E, 1.–16. VI.2009, M. Brancucci leg." (NHMB); 37 exx, "LAOS-NE, Hua Phan prov., PHU PHAN Mt., ~20°12′N 104°01′E, 1500–1900m, 17.v.–3.vi.2007, M. Brancucci leg." (NHMB); 2 exx, "LAOS-NE, Houa Phan prov., Ban Saluei→Phou Pane Mt., 20°11–13′N 103°59′–104°01′E, 1300–1900 m, 9.–17.vi.2009, Michael Geiser leg." (NHMB); 3 exx, "LAOS-NE, Houa Phan prov., Ban Saluei→Phou Pane Mt., 20°12–13.5′N 103°59.5′–104°01′E, 1340–1870 m, 10.v.–16.vi.2009, M. Brancucci & local coll. leg." (NHMB); 5 exx, "LAOS-NE, Houa Phan prov., Ban Saluei→Phou Pane Mt., 20°12–13.5′N 103°59.5′–104°01′E, 1340–1870 m, 7.iv.–25.v.2010, C. Holzschuh & local coll. leg." (NHMB); 3 exx, "LAOS-NE, Xieng Khouang prov., 30km NE Phonsavan: Ban Na Lam→Phou Sane Mt., 19°37–8′N 103°20′E, 1300–1500 m, 10–30.v.2009, M. Brancucci leg." (NHMB); 2 exx, "Laos Umg. Vientiane III–VI.1963", "*Cybister dehaanii* Aubé det. V. Gueorguiev 1964", "confirmed J. Balfour-Browne det. 1965", "NHM Basel coll. Brancucci" (NHMB); 1 ex., "Laos, Vientiane Prov., Vang Vieng, 10.–14.V.2007, B. Makovský leg." (NMPC); 2 exx, "Laos, Vientiane prov., Vientiane city, Don Chan sand dune in Mekong river, 17°57.4′N, 102°36.5′E, ca. 160 m, 24.–26.IV.2010, J. Hájek leg." (NMPC); 1 ex., "LAOS, Vientiane prov.; 10 km W of Vang Viang, 250 m a. s. l. 29.– 30.11.2011, J. Šťastný lgt." (CJS).

Distribution. This species is widespread in the Oriental region, where it is known from Sri Lanka, India, Pakistan, Nepal, Bhutan, Myanmar, Malaysia, Singapore, Indonesia and north to the Ryukyu Islands, China and the Philippines (Régimbart 1899, Nilsson 1995, Hendrich *et al.* 2004, Ghosh & Nilsson 2012). All records from Laos are from the central part of the country (Fig. 25).

Collecting circumstances. *Cybister sugillatus* has been collected in various types of largely perennial standing waters, such as pools (Fig. 9), fish cultivation ponds, paddy fields, shallow lakes (Figs 13, 14), ditches and slow flowing streams. It also occurs in black-water habitats in freshwater swamp forests (Selangor, West Malaysia) (Hendrich *et al.* 2004). At Vang Viang (Fig. 13, 14) the species was associated with the Dytiscidae *C. tripuncatatus* ssp. *lateralis*, *Rhantaticus congestus*, *Hydaticus fabricii*-group, *Copelatus* sp., *Hydroglyphus* sp., *Laccophilus chinensis* (Šťastný in litt.).

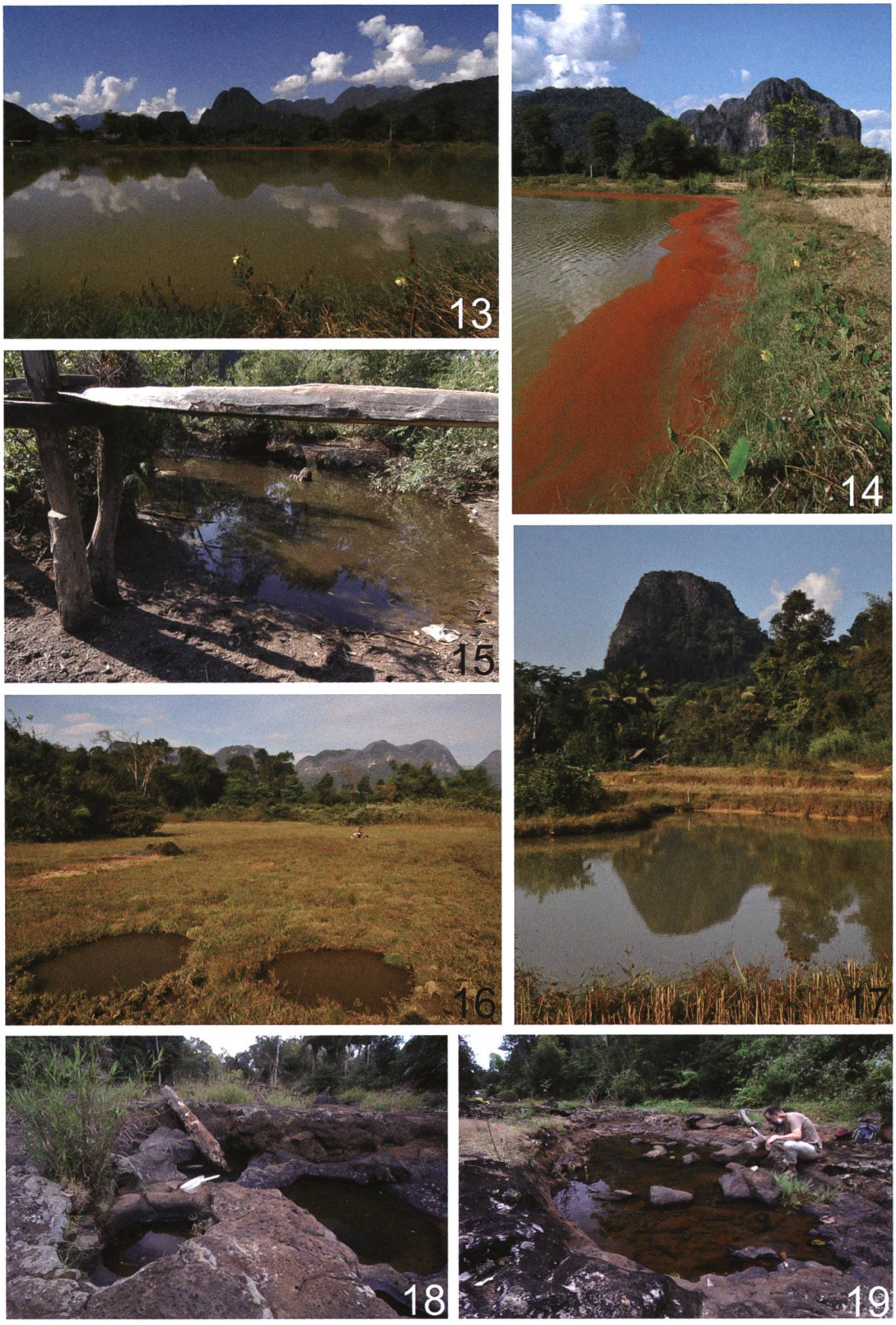
Biology

The Indomalayan *Cybister* are typical inhabitants of larger and more perennial lentic waters rich in submerged vegetation. *Cybister dehaanii* and most probably *C. siamensis* are inhabitants of woodland pools and swamps in primary or slightly disturbed rain forest areas. The most eurytopic species is *C. tripunctatus lateralis*, inhabiting woodland pools, puddles and ditches often rich in emergent and submerged vegetation, forested and swampy lake margins, stiller pools in intermittent streams and the irrigation channels of paddy fields and open flooded meadows. In *C. dehaanii* and *C. fumatus* the population density appears to be quite low, as only small numbers of beetles may be found at one spot. In *C. sugillatus*, *C. limbatus* and *C. tripunctatus lateralis* aggregations of a dozen of more specimens are known, and the latter two species are sold on food

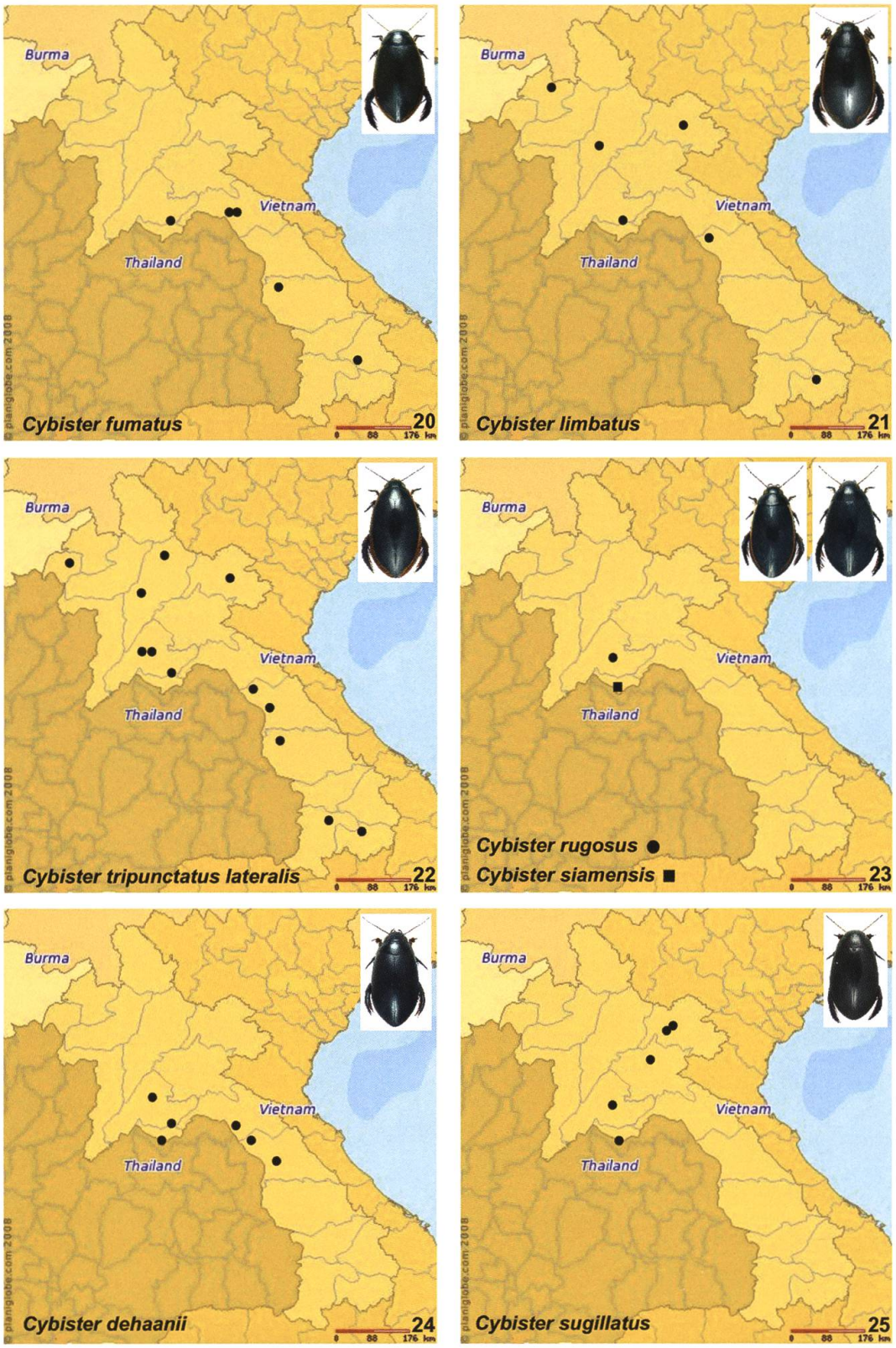


Figs 8–12. 8 – *Cybister limbatus*, *C. tripunctatus lateralis*, *Eretes griseus*, tadpoles, frogs and small fishes sold on a food market in Attapeu, southern Laos (photo: M. Geiser). Most *Cybister* were sold dead and with removed heads (M. Geiser pers. com.). 9 – Vientiane city, Don Chan sand dune in Mekong river, habitat of *C. sugillatus* (photo: J. Hájek). 10 – Sekong Province, Tad Faek waterfalls, one specimen of *C. fumatus* was collected at a light trap placed near the border of this lowland river (photo: J. Hájek). 11 – Savannakhet Province, 10 km E of Savannakhet; Dong Natad forest, lowland monsoon primary forest, habitat of *C. fumatus* (photo: J. Šťastný). 12 – Savannakhet Province, 10 km E of Savannakhet; Dong Natad forest, habitat of *C. tripunctatus lateralis* (photo: J. Šťastný).

markets in Laos (Fig. 8). The larvae of most species occurring in Laos remain unknown. According to the locality data, up to three species may be syntopic. Co-occurring dytiscid species mainly include various *Hydaticus* sp. of the *pacificus*-group and *fabricii*-group, *Eretes griseus* (FABRICIUS, 1781), *Laccophilus* and occasionally *Sandracottus* species. All *Cybister* are capable of flight and may be trapped at light.



Figs 13–19. 13–14 – Vientiane Province, 10 km W of Vang Viang, habitat of *C. tripunctatus lateralis* and *C. sugillatus* (photo: J. Šťastný). 15–16 – Khammouane Province E of Thakhek, Gnomalat, Phonsang village env., drying creek bed and waterlogged pasture, habitat of *C. tripunctatus lateralis* (photos: J. Šťastný). 17 – Luang Prabang Province S of Muang Ngoi; fish ponds and paddy fields in extensively cultivated landscape, habitat of *C. tripunctatus lateralis* (photo: J. Šťastný). 18–19 – Champasak Province Paksong env., Tad Yuang, rock pools near waterfall, habitat of *C. tripunctatus lateralis* (photo: J. Šťastný).



Figs 20–25. Distribution in Laos: 20 – *C. fumatus*; 21 – *C. limbatus*; 22 – *C. tripunctatus lateralis*; 23 – *C. rugosus* and *C. siamensis*; 24 – *C. dehaanii*; 25 – *C. sugillatus*.

Conservation

The species *C. dehaanii*, and most probably *C. siamensis*, are associated with lentic habitats (pools, puddles, smaller ditches) situated in the declining primary lowland and lower mountain rainforest of Laos. Further investigations, using more effective collecting methods such as baited bottle traps, are needed to clarify their actual conservation status.

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