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Taxonomic notes on Asian species of *Canthydrus* SHARP

I. Revision of *Canthydrus angularis* SHARP, description of a new species and 12 lectotype designations (Coleoptera: Noteridae)

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Abstract

The nomenclature and taxonomic status of *Canthydrus angularis* SHARP, 1882 (Coleoptera: Noteridae) are revised. It is confirmed to be valid, not a junior subjective synonym of *Canthydrus morsbachi* (WEHNCKE, 1876). A morphological diagnosis, illustrations of habitus and male genitalia and distribution of *Canthydrus angularis* are given. *Canthydrus bakeri* PESCHET, 1921 is synonymised with *C. angularis*. *Canthydrus mazzoldii*, a new species close to *C. angularis* is described from Thailand and Laos. *Canthydrus angularis* is recorded for the first time from Bangladesh, Bali, and Lombok. Lectotypes are designated for *Canthydrus angularis* SHARP, 1882, *C. arabicus* SHARP, 1882, *C. frontalis* SHARP, 1882, *C. haagi* (WEHNCKE, 1876), *C. laetabilis* (WALKER, 1858), *C. morsbachi* (WEHNCKE, 1876), *C. nitidulus* SHARP, 1882, *C. ornatus* SHARP, 1882, *C. politus* (SHARP, 1873), *C. proximus* SHARP, 1882, *C. semperi* (WEHNCKE, 1876), and *C. weisei* (WEHNCKE, 1876).

Key words: Coleoptera, Noteridae, *Canthydrus*, Oriental Region, new species, new synonymy, new distribution records, lectotype designations.

Introduction

With more than 60 described species, the Burrowing Water Beetle genus *Canthydrus* SHARP, 1882 is the most speciose and widespread noterid genus in the Old World (NILSSON 2005). Nevertheless, the taxonomy of this genus is still not thoroughly understood and the status of many Oriental taxa is yet to be confirmed. This makes correct identification of the Asian *Canthydrus* species often very difficult or impossible, due also to the limited number of taxonomic works, which are usually restricted to single countries or species groups (e.g. VAZIRANI 1969, WEWALKA 1992).

The present paper is a first step towards a comprehensive revision of the genus in the Oriental and Palearctic Realms. It includes a redescription of *C. angularis* SHARP, a species up to now formally and erroneously synonymised with *C. morsbachi* (WEHNCKE). In addition, a new species related with *C. angularis* is described. Furthermore, lectotypes are designated for 12 Asian species of *Canthydrus*.

Material and Methods

The material examined is deposited in the following collections:

HHR	Collection Hans Hebauer, Rain, Germany
IRSNB	Institut Royal de Sciences Naturelles de Belgique, Bruxelles, Belgium
LHM	Collection Lars Hendrich, Munich, Germany [property of NMW]
MNHNP	Muséum National d'Histoire Naturelle, Paris, France
MTP	Collection Mario Toledo, Parma, Italy
NHMA	Natural History Museum, Amsterdam, The Netherlands

NHML	The Natural History Museum, London, UK
NMW	Naturhistorisches Museum Wien, Vienna, Austria
PMB	Collection Paolo Mazzoldi, Brescia, Italy

For the orientation of the aedeagus, I have followed the criteria proposed in MILLER & NILSSON (2003) for rotated structures in Hydradephaga. Therefore, for each species, the aedeagus is described and figured in its anatomical position, with the concave (dorsal) side above and the convex (ventral) side below, thus, what is often named “right” side of the median lobe becomes “left” side of the median lobe and what is named “right” paramere becomes “left” paramere and vice versa.

Measurement abbreviations: L = total length, W = maximum width.

Canthydrus angularis SHARP

Canthydrus angularis SHARP, 1882: 277 (orig. descr.).

Canthydrus angularis: BRANDEN 1885: 16 (valid sp.); RÉGIMBART 1895: 345 (valid sp.); 1899: 247 (junior syn. of *morsbachi* WEHNCKE); ZIMMERMANN 1927a: 7, 8; CSIKI 1938: 124 (valid sp.); GUIGNOT 1956: 60; VAZIRANI 1977a: 5 (valid sp.).

Canthydrus luctuosus var. *angularis*: RÉGIMBART 1889: 148.

Canthydrus luctuosus var. *morsbachi* (WEHNCKE, 1876): RÉGIMBART 1889: 148 (partim).

Canthydrus morsbachi [misident.]: RÉGIMBART 1899: 247; 1903: 333; ZIMMERMANN 1920: 12; 1927a: 7, 8; 1927b: 2; GUIGNOT 1956: 60; VAZIRANI 1968: 100; 1969: 232; 1970: 442; 1972: 118; 1974: 16; 1975: 20; 1977a: 7; 1977b: 42; 1977c: 124; 1981: 258; BRANCUCCI 1979: 194; WEWALKA 1982: 119; TOLEDO 2003: 78; HENDRICH, BALKE & YANG 2004: 108; NILSSON 2005: 103.

Canthydrus bakeri PESCHET, 1921: 693 (orig. descr.) **syn.n.**

Canthydrus bakeri: NILSSON 1995: 40 (partim); 2003: 33; TOLEDO 2003: 78 (partim); NILSSON 2005: 97 (partim).

Canthydrus bakei [misspelled]: HUA 2002: 34.

Canthydrus guttula (AUBÉ, 1838) [misident.]: RÉGIMBART 1892: 980 (partim); 1899: 247 (partim.); KANO 1931: 117 (misspelling, ?misinterpretation).

Canthydrus scapharius GUIGNOT, 1948: 9 (orig. descr.).

Canthydrus scapharius: GUIGNOT, 1951: 83 (junior syn. of *morsbachi* WEHNCKE).

TYPE LOCALITIES: *C. angularis*: Singapore; *C. bakeri*: Philippines, Luzon, Los Baños; *C. scapharius*: Zaire, Musosa [mislabelled].

TYPE MATERIAL:

Canthydrus angularis: **Lectotype** ♂ (NHML) here designated; the specimen is dissected and glued on rectangular white card: “Type [circular NHML red bordered label, added subsequently] \ Malay Pen. [printed white label with orange, longitudinal stripe] \ Sharp Coll. 1905-313 \ Type 485 H. angularis n.sp. Singapore [Sharp hw.]”.

Paralectotypes: 4 exs. with same data as lectotype except for: “Paratype” [sic! Circular NHML yellow bordered label, added subsequently] and “Singapore \ 485” [both labels Sharp hw.].

Canthydrus bakeri: syntypes in MNHNP, IRSNB. Two syntypes in IRSNB glued together on same card: “Paratype [sic! Red, printed label] \ Canthydrus bakeri n.sp. R. Peschet det. 1920 [printed, white label with species name and year, handwritten by Peschet]”.

Canthydrus scapharius: holotype in MNHNP.

ADDITIONAL MATERIAL EXAMINED:

BANGLADESH: Mymensingh, 22 km N Mymensingh, Amuakanda, 12 m a.s.l., 24,9490N/90,3595E, 10.IV.2006, leg. B. Fiedl, M. Shah Alam, M. Shah (HKH Project) (1 ♀ NMW).

MYANMAR: Shan State, west shore of Inle Lake in Nyaung-win village, 20°36.718'N 96°52.908'E, ca. 890 m, wetland, 3.VI.2004, leg. H. Shaverdo & H. Schillhammer (2 exs. NMW).

THAILAND: Khon Kaen University, blackwater pool, 23.II.1994, leg. W. Shepard (56 exs. MTP, NMW); Tale Noi, 7°47'N100°13'E, at light, 1.–2.V.1993, leg. H. Malicky (1 ex. NMW); NW Thailand, Chom thung, 18°26'N98°41'E, 24.–27.IV.1991, leg. L. Dembický (1 ex. NMW); Mae Tae, Chiang Mai, 13.IX.1988, leg. Yimiam (1 ex. NMW); San Sai, Chiang Mai, 25.–31.VII.1987, leg. T. Abe (1 ex. LHM); W Thailand, Kanchanaburi, at light, leg. M. Jäch, 26.XI.1990 (1 ex. NMW); S Thailand, Pattani Distr., Sai Buri, 26.IV.1992, leg. J. Horák (1 ex. NMW); same locality, 23.–28.IV.1993, leg. J. Strnad (1 ex. NMW); Sakon Nakhon, Nong Haan, artificial wetlands, 23.XI.1995, leg. N. Nieser (“N9525”) (1 ex. NHMA).

CAMBODIA: Siem Reap, road to Angkor, light trap, 22.V.2003, leg. G. Constant & K. Smets (12 exs. IRSNB)



Figs. 1–2: Habitus photographs: 1) *Canthydrus mazzoldii*; 2) *C. angularis*, a) specimen from Thailand; b) specimen from Sumatra, c) specimen from the Philippines. Scale bar = 1 mm.

- VIETNAM: Southern Vietnam, Vung Tae, 14.–26.IV.1989, leg. Snizek (8 exs. MTP, NMW).
- MALAYSIA: W Malaysia, Perak, 25 km NE of Ipoh, Banjaran Titi Wangsa Mts., Korbu Mt., 1200 m, 1.–15.IV.2000, leg. P. Čechovský (1 ex. NMW); Pahang/Johor, Endau Rompin NP, Salendang, 100 m, 28.II.–12.III.1995, leg. M. Štrba & J. Hergovits (2 exs. NMW); Sabah, Sandakan, S Lokan (AP), IX.1996, leg. A.Y.C. Chung (1 ex. NHML); Sabah, 5 miles S Mt. Trus Madi, 1800 ft., small muddy pool, 18.–28.VIII.1977, M.E. Bacchus, "B.M. 1978-48" (34 exs. NHML); Sabah, Sapulut, light trap "(12a)", 1.VII.1996 (1 ex. NMW); Sabah, ca. 5 km S Sapulut, Saliku River, 16.V.2001 (1 ex. NMW); Sarawak, Kelabit Hill, Bareo, Pa Ukat, 1000 m, 27.II.1993, leg. H. Zettel "(12)" (1 ex. NMW).
- SINGAPORE: Singapore, Kim Kiat Road, 20.II.1926, leg. C. Dover (1 ex. IRSNB); Sungai Buloh N.P., pond, 5.XII.1996, leg. L. Hendrich (81 exs. LHM).
- PHILIPPINES: "Luzon, Dumaguete, Wolterack leg" (4 exs. IRSNB); Luzon, Los Baños "(1a)", 12.XI.1992, leg. H. Schillhammer (1 ex. NMW); same locality, but "(6)", 17.XI.1992, leg. H. Schillhammer (24 exs. NMW); Luzon, Los Baños, lake shore "(24)", 16.XI.1993, leg. H. Zettel (23 exs. NMW, MTP); Mindoro, E Puerto Galera, Sabang "(1)", 13.XI.1992, leg. M. Jäch (3 exs. NMW); Mindanao, small stream, Bakdolong, 3.XII.1993, leg. N. Nieser, "(N9364)" (1 ex. NHMA).
- INDONESIA: Sumatra, Bengkulu Prov., nr. Kurup, Bukit Kaba Mt., 3°29'S102°36'E, 1000–1500 m; 18.–25.I.2000, leg. J. Bezděk (7 exs. MTP); N Sumatra, Lake Toba, Samosir, ca. 900 m, 3.II.1990, leg. S. Schödl (1 ex. NMW); Sumatra, Benkoelen, Tambang Sawah, leg. E. Douglas, 1929 (1 ex. NHMA); Bali, Ubud ca. 300 m, rice field, 28.VIII.1990, leg. M. Balke & L. Hendrich (20 exs. LHM); Lombok, Suranadi, 3.II.1988, leg. M. Jäch (1 ex. NMW); N Sulawesi, Gunung Ambang "(13)", 20.IV.1992, leg. S. Schödl (7 exs. NMW); N Sulawesi, Tasek Ria, W Manado, 13.IV.1992, leg. M. Jäch "(6)" (10 exs. NMW); N Sulawesi, surroundings of Modoin-ding, NE Kotamobagu, 19.IV.1992, leg. M. Jäch "(12)" (6 exs. NMW); N Sulawesi, Lake Limboto nr. Gorontalo, 25.IV.1992, leg. M. Jäch "(21)" (1 ex. NMW); S Sulawesi, Bantaeng-Bulukumba "(36)", 2.V.1992, leg. M. Jäch (4 exs. NMW); N Sulawesi, Dumoga-Bone Nat. Park, base camp, ca. 190 m, pond in open sun, II.1985, "R. Ent. Soc. London, Project Wallace, B.M. 1985-10" (1 ex. NHML); N Sulawesi, Danau Mooat, 1200 m, nr. Kotamobagu, litter under stilt palms, 16.II.1985, "R. Ent. Soc. London, Project Wallace, B.M. 1985-10" (1 ex. NHML); SE Sulawesi, Rawa Aopa Nat. Park, Aopa village, 8.–10.II.1994, leg. M. Štrba & I. Jeniš (1 ex. NMW).

DESCRIPTION: Habitus (Figs. 2, 3, 6). L: 3.00–3.80 mm; W: 1.65–2.00 mm. Large, shining and convex, maximum width at base of pronotum; lateral sides of elytra, in dorsal outline, poorly rounded or almost straight, strongly tapering toward apex; in lateral view strongly concave proximally. Colouration pitch-black with iridescent reflections on pronotum and elytra and reddish patterns on head, pronotum and elytra, which are more or less extended; in some cases elytra completely black except for two submedial, reddish spots.

Head: pitch-black, labrum, clypeus and part of the front reddish-yellow; extension of paler parts variable, specimens of certain populations with heads mostly reddish. Dorsal surface with quite impressed microreticulation of rounded meshes. Ventral surface varies from reddish to black; antennae and mouthparts testaceous or reddish-yellow.

Pronotum: wide, convex, pitch-black or black; reddish colouration of lateral sides variably extended: almost completely deep-black (except hind angles) to widely faded laterally, reaching disc. Surface shining; microreticulation clearly finer than on head, composed by hardly discernable meshes, arranged in thin, irregular wrinkles. Lateral sides widely convex; lateral bead well developed, but not strongly marked.

Elytra: maximum width at the base, convex in lateral view; lateral sides in dorsal outline poorly rounded or even almost straight towards the apex; in lateral view sides forming a strong concave curve just back the pronotum, enhancing the pronoto-elytral situation. Colouration pitch-black or black; each elytron normally with two reddish markings, in basal and submedial position. These markings are very variable in extension: some specimens with large, irregular, reddish ones on shoulders and more or less in the middle of the length; markings often reduced to a more or less regular, circular submedial spot and two spots at base of elytra, due to fragmentation of the basal marking; in many other specimens the reddish pattern is missing almost completely, reduced to a small, semicircular spot, just behind the middle of the elytral length. Microreticulation as on pronotum.

Underside: slightly concave, black or pitch-black, except reddish or testaceous hypomera and proepisterna, epipleura reddish-brown proximally, prosternal and metacoxal process often reddish-brown. Surface covered by impressed microreticulation of rounded meshes, more shallow on sternites.

Legs: reddish, reddish-brown or black-brownish; tibiae and metatarsal segments often darkened apically.

Male: circular sucking hairs on pro- and mesotarsi, as in all members of the genus. Median lobe of aedeagus very characteristic (Figs. 9, 10), elongate and sinuate dorsally, apically expanded in a “dog’s head”-like process. Left paramere (Fig. 12) blunt, with a dense mat of hairs on inner surface of distal half, together with the usual fringe of apical, longer hairs. Right paramere as in Fig. 12.

Female: not differing externally from male; size on average larger.

VARIABILITY: Extension of paler patterns on head, pronotum and elytra variable. The type series of *C. angularis* (Singapore) has reddish patterns poorly extended: hind angles of pronotum and a small area just behind; base of elytra with a longitudinal, reddish stripe divided into two parts and a submedial irregular spot. Such colouration has been observed also from southern China, Myanmar, Peninsular Malaysia, Sumatra (Figs. 2b, 3, 6). Specimens from Vietnam and Thailand (northern Thailand specially) share more extended reddish patterns (Fig. 2a), whereas populations from the Philippines and Sulawesi are almost completely black, except for hind angles of pronotum and a submedial, small, circular spot (Fig. 2c). Finally, specimens examined from Bali, Lombok and Borneo (Sabah, Sarawak, Kalimantan) share very dark colouration as those from the Philippines and Sulawesi, but a more or less distinct reddish marking is also visible at the base of each elytron, divided into two spots. In general it can be said that a range of melanism seems to occur from north-west to south-east, although exceptions are known (China, Myanmar).

DIFFERENTIAL DIAGNOSIS: This species is easily distinguished from all other Oriental *Canthyrus* species by the following characters: body large, strongly convex seen in lateral view, lateral sides of pronotum widely rounded and anterior half of elytra strongly concave, together forming a distinct S-sinuation; colouration dark, pronotum always black on the disc and part of head always yellow; male genitalia distinctive.

Externally, dark specimens of *C. angularis* (namely *C. bakeri*) are almost indistinguishable from *C. guttula* (AUBÉ) from the Malagasy Subregion.

TAXONOMIC REMARKS: Since RÉGIMBART (1889, 1899) *Canthyrus angularis* has been formally accepted as a synonym of *C. morsbachi* (e.g. VAZIRANI 1968, TOLEDO 2003, HENDRICH et al. 2004, NILSSON 2005). However, according to the external features (colouration, body outlines and convexity, etc.) of the lectotype of *C. morsbachi*, the latter is definitely closer to *C. luctuosus* (AUBÉ) than to *C. angularis*. Therefore, the primary type specimens of *C. morsbachi* and *C. angularis* surely do not belong to the same species.

Whilst the status and the distribution of *C. morsbachi* are still obscure, *C. angularis* is a well characterized species, widespread in the Oriental Region.

Due to the facts presented above (under “Variability”) and due to the absence of other significant differences, I consider *C. bakeri* a dark form of *C. angularis* without taxonomic value.

DISTRIBUTION (Fig. 14): Widespread in the Oriental Region: Bangladesh, southern China (Yunnan, see TOLEDO 2003), Myanmar, Laos, Vietnam, Cambodia, Thailand, Malaysia (Peninsular Malaysia, Sabah, Sarawak), Singapore, Philippines, Indonesia (Sumatra, Java, Bali, Lombok, Sulawesi, Kalimantan). First record for Bangladesh, Bali and Lombok.

I cannot confirm the record of KANO (1931) for Taiwan [*C. guttula* (AUBÉ), formally a misidentification of *C. bakeri*], which is at least probable; data for Timor and New Guinea (as *C. bakeri*) need confirmation; the latter, most probably, should be referred to another species (Toledo, in prep.).

The first record of “*C. morsbachi* sensu auct.” for India was given by RÉGIMBART (1899); VAZIRANI (1968: 228, 232) wrongly affirms to record this taxon from India for the first time, giving information on the distribution in India (Kerala, Madras, Maharashtra, Orissa) and a diagnosis, with illustration of the median lobe of the aedeagus, this latter differing clearly from the unmistakable aedeagus of *C. angularis*. Data for India and Sri Lanka (under *C. morsbachi* sensu auct.) should therefore be discarded.

Canthydrus mazzoldii sp.n.

TYPE LOCALITY: Small pond, ca. 10 x 5 m, near the river Khég, partly shaded by bamboo, eutrophicated, ca. 700 m a.s.l., ca. 2–3 km S of Phitsanulok – Chumpae road, ca. 80 km E Phitsanulok, Thung Salaeng Luang National Park, northern Thailand.

TYPE MATERIAL: **Holotype** ♂ (NMW) “Thailand, Thung Salaeng Luang N.P., Pond, 4.I.1997. leg. P. Mazzoldi”. **Paratypes**: same data as holotype (16 exs. MTP, NMW, PMB); “Phetchabun Prov., Nam Nao N.P., 25.XI.1995, leg. Zettel (24)” (1 ex. NMW); “LAOS: NE, Hua Phan prov., Ban Saluei, Phu Phan mt., 20°15'N 104°02'E, 1500-2000 m a.s.l., 26.IV-11.V.2001, J. Bezdek leg.” (6 exs. HHR, MTP).

DESCRIPTION: Habitus (Figs. 1, 5, 8). L: 3.50–4.00 mm (holotype: 3.70 mm); W: 2.00–2.35 mm (holotype: 2.10 mm). Large, shining (but a bit less shining than *Canthydrus angularis*). Broadly oval in dorsal outline, maximum width at shoulders, clearly tapering toward elytral apex. Strongly convex in lateral view; dorsal colouration black, except for the following parts, which are reddish-yellow: labrum, distal portion of clypeus, hind angles of pronotum and an irregularly circular, submedial spot on each elytron. Male genitalia very distinctive.

Head: pitch-black, faded distally on clypeus and labrum. Reticulation (small, rounded cells) fine, but distinct. Underside of head pitch-brown; labium, antennae and mouthparts testaceous.

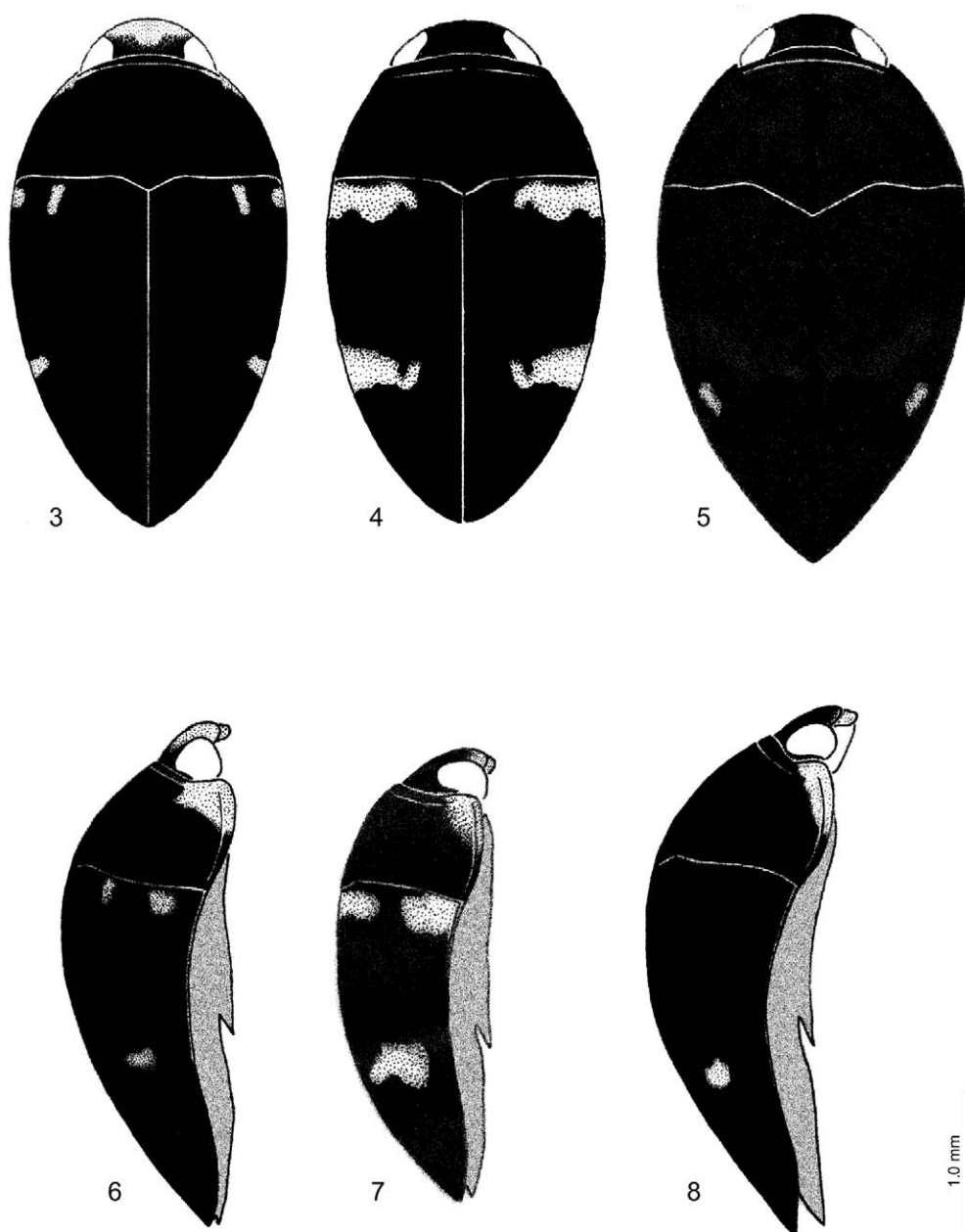
Pronotum: wide, convex; black, except hind angles, which are reddish-yellow. Dorsal reticulation extremely fine, composed of very small and elongated cells; surface shining, not shagreened. Lateral bead not strongly marked.

Elytra: quite elongate, convex; maximum width at base; lateral sides, in dorsal view, poorly rounded, in lateral view concave from base. Surface somewhat shagreened, reticulation slightly more impressed than on pronotum, with longer and wrinkled meshes. Three series of irregular, impressed dots along proximal half, sparse and not arranged in regular series on distal half. Colour black: each elytron with a submedial, irregularly rounded, reddish-yellow spot.

Underside: slightly concave; almost completely pitch-black, hind angles of hypomera testaceous, distal portion of metacoxal process and last sternite reddish. Metacoxae and first three sternites strongly reticulate (circular meshes), less impressed on remaining sternites. Metacoxae with grooves close to metacoxal plate.

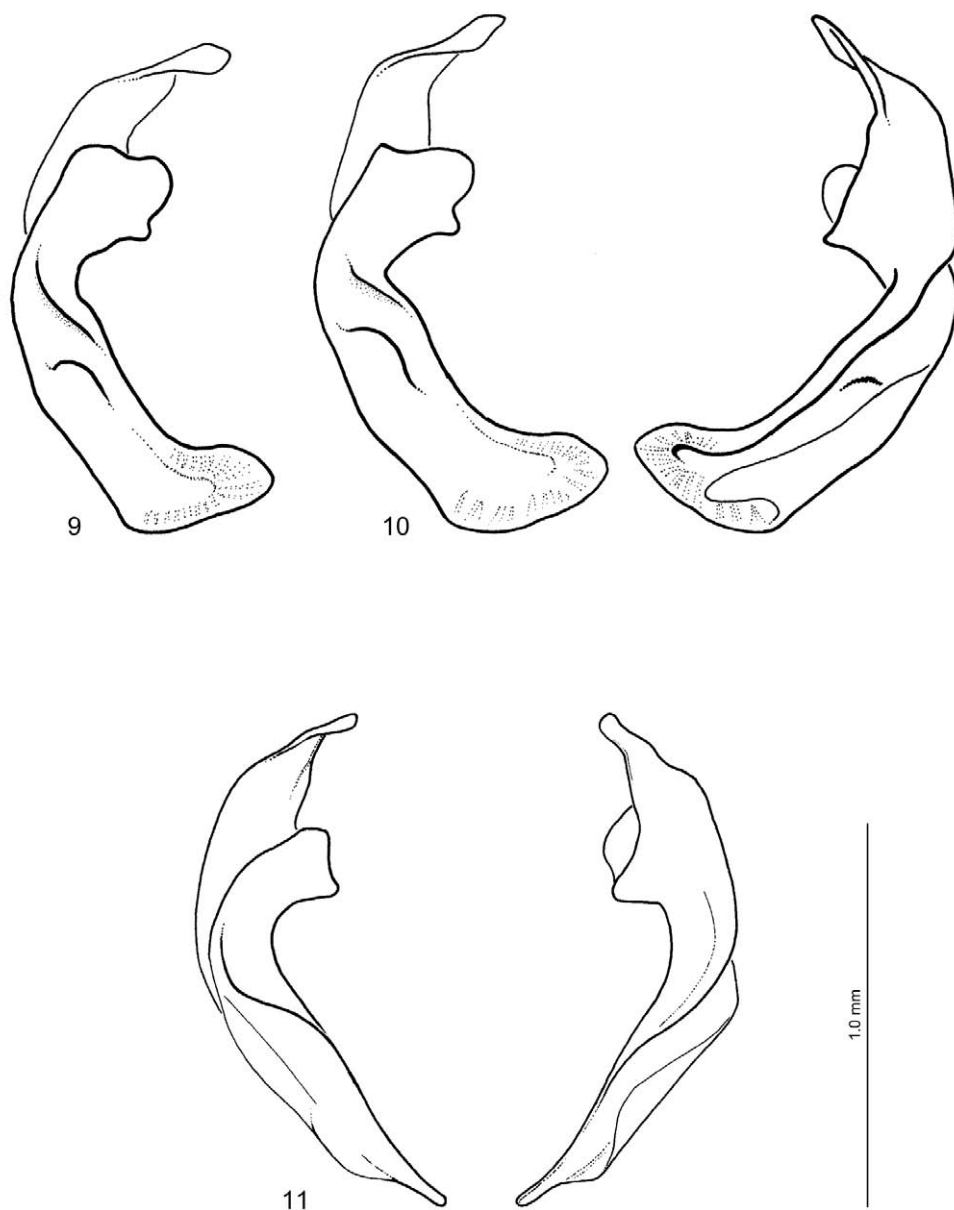
Legs: femora and tibiae black, distally reddish. Pro- and mesotarsi reddish; metatarsi dark brown.

Male: median lobe of aedeagus (Fig. 11) gradually narrowed from base to apex, which is somewhat pointed; dorsal side slightly sinuate, ventral side with a thin keel, abruptly ending just before apex. Left paramere (Fig. 13) wide basally and abruptly narrowed at about mid-length, ending with a long and stiff apex, bearing a tuft of short hairs. Right paramere (Fig. 13) triangular.



Figs. 3–5: Subschematic dorsal outline and colour patterns: 3) *Canthydrus angularis*, typical form (Sumatra); 4) lectotype of *C. morsbachi*; 5) holotype of *C. mazzoldii*.

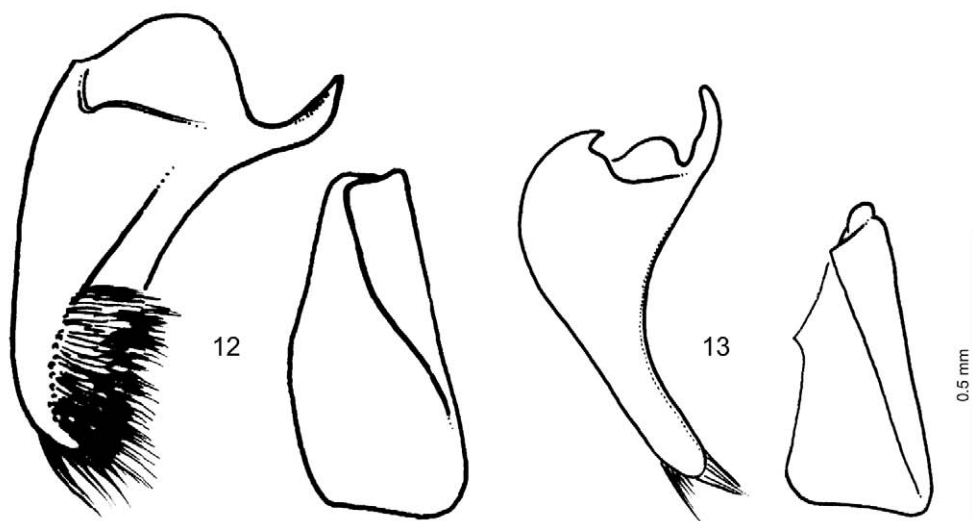
Figs 6–8: Subschematic lateral outline and colour patterns: 6) *Canthydrus angularis*, typical form (Sumatra); 7) lectotype of *C. morsbachi*; 8) holotype of *C. mazzoldii*.



Figs. 9–11: Median lobe of aedeagus: 9) *Canthydrus angularis*, specimen from Sumatra (left side only); 10) *C. angularis*, specimen from Sulawesi (left side; right side); 11) *C. mazzoldii*, holotype (left side; right side).

Female: not differing externally from males, except for average larger size.

DISTRIBUTION (Fig. 14): Northern Thailand, north-eastern Laos. *Canthydrus mazzoldii* is sympatric with *C. angularis*, although these two species have not been collected together at the same localities.



Figs. 12–13: Parameres, left and right view: 12) *Canthydrus angularis*, specimen from Sumatra; 13) *C. mazzoldii*, holotype.

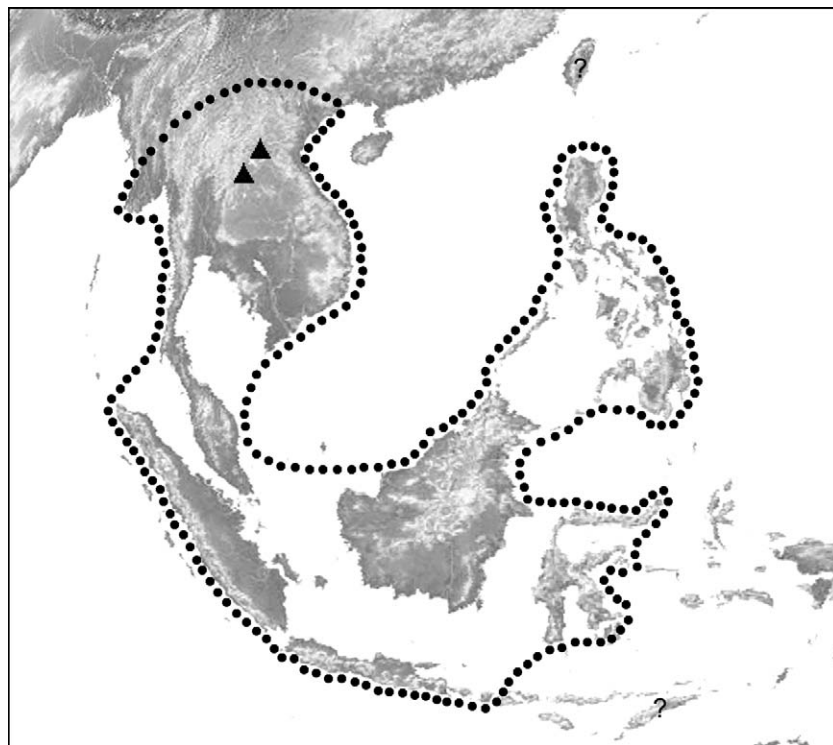


Fig. 14: Distribution of *Canthydrus angularis* (dotted line) and *C. mazzoldii* (triangles). Question marks in Taiwan and Timor refer to unconfirmed records of *C. angularis*.

DERIVATIO NOMINIS: This species is dedicated to Paolo Mazzoldi, who collected most of the type material.

TAXONOMIC REMARKS: The new species is very close to *C. angularis*, but readily distinguished by the combination of the following characters: larger size (one of the largest species known in the genus), stronger convexity (almost globular) and wider body. The median lobe and the left paramere are distinctive and unique in this genus.

Lectotype designations of some *Canthydrus* taxa

Type material of some taxa of *Canthydrus* held in the NHM and the MNHNP has been studied. For each taxon only the original description is cited. The taxonomy of these taxa will be treated in a forthcoming revision.

Canthydrus arabicus SHARP

Canthydrus arabicus SHARP, 1882: 272 (orig. descr.).

TYPE LOCALITY: al-Hejaz (also Hijaz, Hedjaz), Arabia.

TYPE MATERIAL: **Lectotype** ♂ (NHML) here designated and dissected, glued on a large, rectangular card, together with a female syntype, each one with its symbol of sex close, handwritten; labels as follows: "Type [red bordered, circular label, added subsequently] \ Hedjaz \ Sharp Coll. 1905-313 \ 1147 arabicus [Sharp hw.] \ Canthydrus arabicus, Sharp. Types. [Sharp hw.]" plus my designation label and blue, circular label "Lectotype". **Paralectotypes**: 1 ♀ (NHML), glued on same card with the lectotype: same labels of lectotype, plus my label of paralectotype designation and light-blue circular label "Paralectotype"; 3 ♀♀, 2 ♂♂ (NHML) from left to right, glued on the same large and rectangular card [the 5th specimen is pinned upside down with a micropin], on which is handwritten (Sharp hw.) the symbol of sex under each specimen plus "1147 [left corner]" and "Hedjaz Millingen [underside]"; labels as follows: "Paratype [yellow, circular label, probably added subsequently] \ Hedjaz \ Sharp Coll. 1905-313 \ Canthydrus arabicus Ind. [?] typ. D. S." plus my designation label and light-blue circular label "Paralectotype".

Canthydrus frontalis SHARP

Canthydrus frontalis SHARP, 1882: 276 (orig. descr.).

TYPE LOCALITY: Arabia.

TYPE MATERIAL: **Lectotype** ♂ (NHML) here designated and dissected, labelled "Type [red, circular label, added subsequently] \ Arabia \ Sharp Coll 1905-313 \ type 487 Canthydrus frontalis Arabia [Sharp hw.]" plus my designation label and blue circular label "Lectotype". **Paralectotypes**: 4 exs. (NHML), sex not examined, exception made for a ♂ pinned upside down with a micropin. They are all labelled as follows "Cotype [yellow, circular label, added subsequently] \ Arabia \ Sharp Coll 1905-313" one specimen bearing an additional label "487. Canthydrus frontalis Ind. [?] typ. D. S. Arabia". All specimens with my designation label and light-blue circular label "paralectotype".

I have been unable to trace the syntypes labelled "Bombay".

Canthydrus haagi (WEHNCKE)

Hydrocanthus haagi WEHNCKE, 1876: 222 (orig. descr.).

TYPE LOCALITY: Thailand ("Siam").

TYPE MATERIAL: **Lectotype** ♂ (MNHNP) here designated, glued on a small, pointed card, labelled "Haag \ Siam [both small, rectangular labels, bordered, Wehncke hw.]" plus my designation label. **Paralectotype** (MNHNP), sex not examined, maybe ♀, glued on same card as lectotype, unlabelled, except for a very small, unwritten, rectangular label and my designation label.

Canthydrus laetabilis* (WALKER)Hydroporus laetabilis* WALKER 1858: 205 (orig. descr.).

TYPE LOCALITY: Ceylon.

TYPE MATERIAL: **Lectotype** ♂ (NHML) here designated and dissected, labelled "Type [red, circular label, added subsequently] \ Ceylon \ 59 106 [these two latter handwritten (Walker hw.?) on the two sides of a faded-blue, circular label: "Ceylon" (upper side), "59 106" (downside)] \ Ceylon \ laetabilis Walker. A.n.h. (type) [maybe Sharp hw.] \ laetabilis [Walker hw.]" plus my designation label and blue circular label "Lectotype". **Paralectotype** (NHML), sex not examined, missing an elytron, labelled "Cotype [yellow, circular label, added subsequently] \ Ceylon \ 59 106 [on faded-blue circular label as for the lectotype] \ Ceylon [same printed label as lectotype] \ Canthydrus laetabilis, Walk. Cotype" plus my designation label and light-blue circular label "Paralectotype".

Canthydrus morsbachi* (WEHNCKE)Hydrocanthus morsbachi* WEHNCKE, 1876: 222 (orig. descr.).

TYPE LOCALITY: "Cochinchina" [southern Vietnam].

TYPE MATERIAL: **Lectotype** ♀ (MNHN), here designated, glued on a small, pointed card, labelled "Morsbach \ Cochinchina [both small, rectangular labels, bordered, Wehncke hw.] \ Dr Régimbt. vidit 1898 [printed rectangular label]" plus my designation label.

Canthydrus nitidulus* SHARPCanthydrus nitidulus* SHARP, 1882: 278 (orig. descr.).

TYPE LOCALITY: Formosa [Taiwan].

TYPE MATERIAL: **Lectotype** ♂ (NHML), here designated, labelled "Type [red, circular label, added subsequently] \ Formosa \ Sharp Coll 1905-313 \ Type 482 H. [sic] nitidulus n.sp. Formosa [rectangular label, Sharp hw.]" plus my designation label and blue circular label "Lectotype". **Paralectotype** ♀ (NHML), labelled "Cotype [yellow, circular label, added subsequently] \ Formosa \ Sharp Coll 1905-313 \ Canthydrus nitidulus, Shp. Co-type. [maybe J. Balfour-Browne hw.]" and with my designation label and light-blue circular label "paralectotype".

I have been unable to trace the syntypes labelled "Northern China, Kiu Kiang".

Canthydrus ornatus* SHARPCanthydrus ornatus* SHARP 1882: 275 (orig. descr.).

TYPE LOCALITY: Persia.

TYPE MATERIAL: **Lectotype** ♂ (NHML) here designated and dissected. The specimen has been glued by me on a new card on which I cut out a lateral window to make part of its underside visible; the original card has been pinned under the new one. Labels as follows: "Type [red, circular label, added subsequently] \ Persia \ Sharp Coll. 1905-313 \ Persia (Millingen) [Sharp hw.] \ Type 488 Canthydrus ornatus Persia n.sp. [Sharp hw.]" plus my designation label and blue circular label "Lectotype". **Paralectotype** ♀ (NHML), glued on its original card, labelled as follows: "Cotype [yellow, circular label, added subsequently] \ Persia \ Sharp Coll. 1905-313 \ Persia (Millingen) 488 [Sharp hw.] \ Canthydrus ornatus Sharp Co. type [maybe J. Balfour-Browne hw.]" plus my designation label and light-blue circular label "Paralectotype".

Canthydrus politus* (SHARP)Hydrocanthus politus* SHARP, 1873: 51 (orig. descr.).

TYPE LOCALITY: Japan, Kobe (Hiogo).

TYPE MATERIAL: **Lectotype** (NHML), sex not examined, here designated, glued on large, rectangular card hw. by Sharp "Hydrocanthus politus Type D.S. Japan" bearing the following labels "Type [red, circular label, added subsequently] \ Japan. Lewis. \ Sharp Coll. 1905-313 \ Type 479 Hydrocanthus politus [Sharp hw.]" plus my designation label and blue circular label "Lectotype". **Paralectotype** (NHML), sex not examined, glued on large, rectangular card, as lectotype, hw. by Sharp "Hydrocanthus politus Ind. typ. D.S. Japan" and labelled "Cotype

[yellow, circular label, added subsequently] \ Japan. Lewis. \ Sharp Coll. 1905-313". Two additional specimens in NHML, ex Sharp's coll., one labelled "Hydrocanthus politus var. D. S., China [Sharp hw., on same large card on which is glued the specimen] \ China \ Sharp coll. 1905-313.", the second mounted on a smaller card, unwritten, labelled "China \ Sharp coll. 1905-313. \ Kin[!] Kiang [Sharp hw.] \ Hydrocanthus politus D.S. [Sharp hw.]", are not to be considered types.

***Canthydrus proximus* SHARP**

Canthydrus proximus SHARP, 1882: 278 (orig. descr.).

TYPE LOCALITY: Thailand, Bangkok.

TYPE MATERIAL: Although not specified in the original description, this species has probably been described from one specimen only. Nevertheless, for ensuring stability I designate a lectotype. **Lectotype** ♂ (NHML), here designated: "Type [circular, red bordered label] \ Siam \ Sharp coll 1905-313. \ Type 483 Hydrocan [sic] proximus n.s. Bangkok [Sharp hw.]".

***Canthydrus weisei* (WEHNCKE)**

Hydrocanthus weisei WEHNCKE, 1876: 222 (orig. descr.).

TYPE LOCALITY: "Cochinchina" [southern Vietnam].

TYPE MATERIAL: **Lectotype** ♂ (MNHP), here designated and dissected, glued on a small, pointed card, labelled "Morsbach \ Cochinchina [both small, rectangular labels, bordered, Wehncke hw.] \ Dr Régimbt. vident 1898 [printed rectangular label]" plus my designation label.

Errata

In my previous article (TOLEDO 2003) I have found two important errors:

- page 80, under TAXONOMIC REMARKS of *Canthydrus antonellae* sp.n. (third line): replace "...; all these species are more convex..." with: "...; all these three species are moderately convex..."
- page 87, references: "Jäch, M.A. & Ji, L. 2003: Key to adults of Chinese water beetles family (Coleoptera), pp. 21–36. ...". The correct author names are: "Jäch, M.A. & Balke, M."

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