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New notes on the Bembidiina of Taiwan
with description of two new species of *Bembidion* Latreille, 1802
(Insecta Coleoptera Carabidae)

Riassunto

[Nuove osservazioni sui Bembidiina di Taiwan, con la descrizione di due nuove specie di *Bembidion* Latreille, 1802 (Insecta Coleoptera Carabidae)]

Questo articolo fornisce nuove osservazioni sui Bembidiina di Taiwan, compresa la descrizione di due nuove specie del genere *Bembidion* Latreille, 1802: *B. (Blepharoplastaphus) wui* n.sp. e *B. yehi* n.sp.

La scoperta di una popolazione di *B. (Odontium) gebieni* Netolitzky, 1928, nuovo per Taiwan e precedentemente noto della provincia cinese del Fujang, insieme con le due nuove specie porta a 22 il numero delle specie di Bembidiina note per Taiwan.

Abstract

This paper provides new observations on the Bembidiina of Taiwan, including the description of two new species of gen. *Bembidion* Latreille, 1802: *B. (Blepharoplastaphus) wui* n.sp. and *B. yehi* n.sp.

The discovery of a population of *B. (Odontium) gebieni* Netolitzky, 1928, new for Taiwan and formerly known from Fujang, China, together with the two new species increases to 22 the number of known species of Bembidiina in Taiwan.

Keywords: *Bembidion*, *Blepharoplastaphus*, *Ocydromus*, *Odontium*, *Trichoplastaphus*, *Sinechostictus*, *Pseudolimnaeum*, Taiwan, taxonomy.

Introduction

Since the last paper regarding the Taiwanese Bembidiina (TOLEDANO, 2009), one of us (K.Terada) has collected more material of *Bembidiina* from Taiwan. This new material contains additional species that increase the number of species of Bembidiina from the island.

Of the 22 species currently known from Taiwan, only six are also known from other countries of the eastern Palaearctic region. Particularly noteworthy is the discovery of another new species of the subgenus *Blepharoplastaphus* Netolitzky, 1920 of the genus *Bembidion* Latreille, 1802. This subgenus includes species with extremely wide distribution and relatively low tendency to differentiation. The discovery of another new species of this subgenus, markedly similar to the Chinese

B.(Blepharoplastaphus) heyrovskyi Jedlička, 1932, suggests once again that the Taiwanese fauna of Bembidiina has a very strong tendency toward endemism.

Material and methods

This paper is based on the study of about 250 specimens of Bembidiina from Taiwan, China and Japan.

The specimens are from or will be deposited in the collections of the following institutions and individuals:

| | |
|------|--|
| ASCO | Aleš Smetana Collection, Ottawa, Canada; |
| BMNH | Natural History Museum, London (Max Barclay, Beulah Garner); |
| CAS | California Academy of Sciences, San Francisco, California, USA (Dave Kavanaugh); |
| CTVR | Luca Toledano Collection, Verona, Italy; |
| KTHJ | Katsuyuki Terada Collection, Hiroshima, Japan; |
| MSNV | Museo Civico di Scienze Naturali, Verona, Italy (Leonardo Latella); |
| NHMW | Naturhistorisches Museum, Wien (Manfred Jäch, Heinrich Schönmann, Harald Schillhammer); |
| NMNS | National Museum of Natural Science, Taichung, Taiwan; |
| NMPC | National Museum, Praha (Jiří Hájek, Josef Jelínek); |
| OSAC | Oregon State Arthropod Collection, Oregon State University, Corvallis, Oregon, USA (David Maddison); |
| SMTJ | Seiji Morita Collection, Tokyo, Japan. |

Measurements were made with a Leica M205c stereomicroscope at 25x (body) and 100x (phallus) magnifications. Ratios are abbreviated in the text as follows:

| | |
|-------|-----------------------------------|
| pw/pl | pronotum width / pronotum length; |
| pw/hw | pronotum width / head width; |
| el/ew | elytral length / elytral width; |
| ew/pw | elytral width / pronotum width; |
| bl/al | body length / length of antennae. |

The body length was measured, in mounted specimens, from the front margin of the clypeus to the apex of the elytra, and the length of antennae from the base of antennomere 1 to the apex of antennomere 11. The pronotal length was measured along the midline from the anterior to the posterior margin.

Dissections were made using standard techniques. Genitalia and small parts were preserved in Euparal, attached to label-size acetate sheets and mounted on the same pins as the specimens.

The photographs are composite images with progressive focusing obtained with a Nikon DSFi1 digital camera controlled by Nikon DS-L2 stand alone remote controller mounted on a Leica Z6 microscope equipped with a 1.0x Leica lens and a customized motorized stand made by LT, then processed with Helicon Focus® 3.61 and optimized with Photoshop® Elements 3.0 and Nikon ViewNX2®. Photographs of the aedeagi and body details are made with the same setup and processing method described above, while using a 5x Infinity Corrected Nikon Fluor lens on the Z6 microscope. The photo of the microsculpture is made with the same camera on a Leica M205c stereomicroscope and the same processing method.

The systematic treatment of the subtribe *Bembidiina* follows MADDISON (2012). In the following text, 'type seen' means that LT was able to study the type of a given species in the past but not during the writing of this paper.

Taxonomy

Genus *Bembidion* Latreille, 1802

Subgenus *Odontium* LeConte, 1848

Bembidion (Odontium) gebieni NETOLITZKY, 1928

Bembidion (Bracteon) gebieni NETOLITZKY, 1928: 168.

Bembidion (Bracteon) gebieni: NETOLITZKY (1942–43): 50.

Bembidion (Bracteon) gebieni: JEDLIČKA (1965): 91.

Bembidion (Odontium) gebieni: MARGGI et al. (2003): 257; LORENZ (1998): 202; LORENZ (2005): 218.

Bembidion (Odontium) gebieni: TOLEDANO (2008): 95.

Material examined. CHINA: 1 ♀, Nei Mongol, Wuhai, 8.v-13.v.1996, E. Kucera leg. (CTVR); 1 ♀, Nei Mongol, Desert 25 km S of Balotou, 26.vii.2007, Lgt. E. Kucera (CTVR); TAIWAN: 5 ♂♂, 6 ♀♀, Chiayi County, Chuchi, 1-iv-2010, K.Terada & C.-G. Huang leg. (Terada-107) (NMNS, KTHJ, CTVR). Type (NHMW) seen.

Distribution. China (Fujang, Nei Mongol), Taiwan.

Remarks. This is the first record for Taiwan, which confirms the relationships of a part of the Taiwanese fauna of *Bembidiina* with that of the eastern regions of China, as already shown by *B. (Desarmatocillenus) fochowense* Lindroth, 1980. This is also the first record of the species for Nei Mongol, China.

Subgenus *Blepharoplastaphus* NETOLITZKY, 1920

Bembidion (Blepharoplastaphus) wui n.sp. (Figs. 1, 6, 7)

Type locality. Taiwan, Nanao, Ilan County.

Type material. HOLOTYPE, ♂, "TAIWAN, Nanao, Ilan County, 3-iv-2010, K.Terada & L.-W. Yeh leg. (Terada-109) // HOLOTYPE // *Bembidion wui* sp.n. // Det. L. Toledano & K. Terada, 2014" [red] (NMNS). PARATYPES: 6 ♂♂, 3 ♀♀, same date

and locality as the holotype (NMNS, CTHJ, CTVR). All paratypes labelled as “PARATYPUS // *Bembidion wui* sp.n. // Det. L. Toledano & K. Terada, 2014” [red].

Diagnosis. A small Taiwanese *Blepharoplastaphus* species with square shoulders, very similar in habitus to *B. heyrovskyi* from Yunnan, China, but easily distinguishable from the later by the big, rounded apex of median lobe, much sharper in *B. heyrovskyi*. *B. wui* is also easily distinguishable from the other member of the subgenus present in Taiwan by the smaller size (5.38–5.84 mm in *B. (Blepharoplastaphus) teradai* TOLEDANO, 2009).

Description. Body length 4.06 to 4.24 mm. Dark bronze-greenish metallic, sometimes with bluish reflections on head and pronotum. Legs brown. Antennomeres dark brown with basal end reddish, antennomere 2 with basal half (except the reddish basal end) darker than the other antennomeres in most specimens. Palpi brown, with penultimate labial palpomere darkened and last labial palpomere yellowish.

Head with rather deep, wide and parallel frontal furrows, somewhat extending on clypeus. Eyes convex, antennae rather short ($bl/al = 2.10$ to 2.12).

Pronotum markedly transverse ($pw/pl = 1.56$ – 1.58), rather narrow in relation to elytra ($ew/pw = 1.64$ – 1.68). Sides rounded, very faintly sinuate before the short, square and somewhat sharp hind angles. Lateral channel wide, restricted near the hind angle. Anterior transverse impression faint, median line sharp, basal transverse impression wide and smooth, basal foveae square, deep, more or less rugose, laterally delimited by a sharp carina. Posterior margin straight in middle and oblique at sides with the hind angles slightly advanced in respect to the median portion of the basal margin.

Elytra ($el/ew = 1.38$ – 1.43) oval, wide and convex, with well marked, but somewhat rounded humeri. Fully winged. Elytral striae 1–8 complete, visibly impressed, punctate-sulcate, with convex intervals; parascutellar stria rather short, apical stria long and connected with apical end of stria 5 or 7, sometimes asymmetrical. Two discal elytral pores in interval 3 near stria 3.

Microsculpture distinct, in convex, isodiametric sculpticells on the whole dorsal surface of head; almost isodiametric, convex polygonal sculpticells on the pronotum, except for the disc where the sculpticells are slightly more transverse; flat, variously transverse sculpticells positioned in irregular rows on elytra.

Metaventral process unbordered. Ventral abdominal sternites with typical additional short setae characteristic of subg. *Blepharoplastaphus*.

Male genitalia (Figs. 6, 7). Shape of median lobe narrower than typical for *Blepharoplastaphus*, as shown by the other member of the subgenus present in Taiwan, *B. teradai*. Apex of median lobe rounded, endophallus with oval central brush and three faintly sclerotized sclerites ventrally positioned in respect to the central brush. Apically to this group of sclerites, membranes evidently covered by scales.

Etymology. Dedicated to Dr. Wen-Jer Wu (National Taiwan University, Taipei, Taiwan), an accomplished specialist in ecological entomology.

Distribution. So far known only from the type locality.

Remarks. The interspecific morphological diversity within *Blepharoplastaphus* is very low (TOLEDANO, 2009): the male genitalia and habitus of all species are very similar. Nevertheless, the species herewith described shares only with *B. heyrovskyi* the small size and details of endophallus, but both species are clearly distinguishable from one another by the apical shape of the median lobe.

***Bembidion (Blepharoplastaphus) teradai* TOLEDANO, 2009**

Bembidion (Blepharoplastaphus) teradai TOLEDANO, 2009: 582.

Material examined. TAIWAN: 1 ♂, 1 ♀, New Taipei City (former Taipei County), Hsinhsien, near Wulai, 4-iv-2010, K. Terada & L.-W. Yeh leg. (Terada-110) (KTHJ, CTVR).

Distribution. So far known only from localities not far from the type locality.

Subgenus *Trichoplastaphus* NETOLITZKY, 1914

***Bembidion (Trichoplastaphus) miwai* JEDLIČKA, 1946**

Bembidion (Trichoplastaphus) miwai JEDLIČKA, 1946: 2.

Bembidion (Trichoplastaphus) miwai: JEDLIČKA (1965): 116; MARGGI et al. (2003): 271; LORENZ (1998): 211; LORENZ (2005): 227.

Bembidion miwai: TERADA et al. (2005):170; TERADA (2006): 12.

Bembidion (Trichoplastaphus) miwai: TOLEDANO (2009): 585.

Bembidion (Trichoplastaphus) miwai: TOLEDANO & SCHMIDT (2010): 396.

Material examined. TAIWAN: 2 ♂♂, 2 ♀♀, Ilan County, Tachiaohsi, 4-iv-2010, K. Terada & L.-W. Yeh leg. (Terada-110) (KTHJ, CTVR); 5 exx., Taitung County, Foothills of Hsinkangshan nr. Chengkung, 350-400m, 19.VII.93, A. Smetana [T155] (ASCO, CTVR).

Type (NMPC) seen.

Distribution. Taiwan.

***Bembidion (Trichoplastaphus) taiwanum* NETOLITZKY, 1939**

Bembidion (Trichoplastaphus) taiwanum NETOLITZKY, 1939: 50.

Bembidion (Trichoplastaphus) taiwanum: NETOLITZKY (1943–44): 110; MARGGI et al. (2003): 271. LORENZ (1998): 211; LORENZ (2005): 227.

Bembidion (Trichoplastaphus) taiwanum: JEDLIČKA (1965): 118 (incorrect spelling).

Bembidion taiwanum: TERADA et al. (2005): 171; TERADA (2006):12.

Bembidion (Trichoplastaphus) taiwanum: TOLEDANO (2009): 585.

Bembidion (Trichoplastaphus) taiwanum: TOLEDANO & SCHMIDT (2010): 400.

Type material examined. Holotype, ♀, 1) “Holotype” [round, red, printed]; 2) “Formosa // near Mt. Ali // Takasaki // Y. Yano 29.XI.37.” [handwritten]; 3) “TYPE” [red, printed]; 4) “H. E. Andrewes Coll. // B.M. 1945-97.” [printed]; 5) “*B. Trichoplastaphus* // taiwanum Net. // Typus! Netolitzky” [handwritten](BMNH).



Figs. 1–2. Habitus of: 1 - *Bembidion (Blepharoplastaphus) wui* n.sp., holotype; 2 - *Bembidion yehi* n.sp., paratype. Scale: 1 mm.

Figs. 3–5. Apex of abdomen of *Bembidion yehi* n.sp.: 3 - male paratype; 4 - female paratype; 5 - aberrant male paratype (see text).



Figs. 6–13. Median lobe of the aedeagus of: 6 - *B. (Blepharoplastaphus) wui* n.sp. (left view); 7 - *B. (B.) wui* n.sp. (right view); 8 - *B. yehei* n.sp., holotype (left view: f = “fig-shaped” complex of sclerites; y = “y shaped” sclerite); 9 - *B. yehei* n.sp., holotype (right view: a = artifact, inclusion in the slide; ds = dorsal sclerite; cb = central brush); 10 - *B. yehei* n.sp., aberrant paratype (left view); 11 - *B. yehei* n.sp., aberrant paratype (right view: al = anterior ligament); 12 - *B. collutum* BATES, 1873, specimen from Lungmen, Taiwan (left view); 13 - *B. collutum* BATES, 1873, specimen from Lungmen, Taiwan (right view). Scale: 0.5 mm.

Additional material examined. TAIWAN: 3 ♂♂, 3 ♀♀, Ilan County, Tachiaohsi, 4-iv-2010, K. Terada & L.-W. Yeh leg. (Terada-110) (KTHJ, CTVR); 2 ♂♂, 10 ♀♀, Nantou County, Puli, 30-i- 2002, K. Terada leg. Terada-83 (KTHJ).

Distribution. Taiwan.

Ecological notes. During this study *B. taiwanum* and *B. (Trichoplastaphus) jelineki* TOLEDANO, 2009 have been proved to be sympatric. In fact a series of 2 ♂♂, 10 ♀♀ of *B. taiwanum* and 3 ♂♂, 3 ♀♀ of *B. jelineki* have been collected in the same place (Puli, Nantou County, Jan. 30, 2002, K. Terada leg. Terada-83).

Remarks. Due to the discovery of the sympatry of these species, a further examination of both type and paratype of *B. taiwanum* was conducted. As a result, it revealed that the paratype actually is a *B. jelineki*. Both species are recognizable by the pronotal size (wider, (pw/pl = 1.40–1.43) in *taiwanum*, narrower (pw/pl = 1.34–1.37) in *jelineki*), the different convexity of intervals (more flat in *taiwanum*, more convex in *jelineki*) and by the aedeagus (TOLEDANO, 2009; TOLEDANO & SCHMIDT, 2010).

***Bembidion (Trichoplataphus) sejii* TOLEDANO, 2009**

Bembidion (Trichoplataphus) sejii TOLEDANO, 2009: 586.

Bembidion (Trichoplataphus) sejii: TOLEDANO & SCHMIDT (2010): 400.

Material examined. TAIWAN: 2 ♂♂, 2 ♀♀, New Taipei City, Hsintien, 1-viii-2010, K. Terada & L.-W. Yeh leg. (Terada-119) (KTHJ, CTVR).

Distribution. So far known only from the type locality.

***Bembidion (Trichoplataphus) jelineki* TOLEDANO, 2009**

Bembidion (Trichoplataphus) jelineki TOLEDANO, 2009: 586.

Bembidion (Trichoplataphus) jelineki: TOLEDANO & SCHMIDT (2010): 400.

Material examined. TAIWAN: 2 ♂♂, 2 ♀♀, New Taipei City, Fulung, 19-iv-2001, K. Terada leg. (Terada-02) (KTHJ, CTVR); 20 exx., Chiayi County, Chuchi, Apr. 1-iv-2010, K. Terada and L.-W. Yeh leg., (Terada-107) (KTHJ, CTVR); 3 ♂♂, 3 ♀♀, Nantou County, Puli, 30-i-2002, K. Terada leg. (Terada-83) (KTHJ, CTVR).

Paratype of *B. taiwanum*, ♂, 1) "Paratype" [round, yellow, printed]; 2) "Yano 7.19 // FORMOSA // Near Mt. ARI // Takasaki // 29.XI.'37 // Y. Yano" [handwritten]; 3) "H. E. Andrewes // Coll. // B.M. 1945-97." [printed]; 4) "B. Trichoplataphus // taiwanum // Cotypus! // det. Netolitzky" [handwritten]; 5) "Bembidion jelineki Toledano, 2009 Det. Toledano & Terada, 2013" [printed] (BMNH).

Distribution. Taiwan.

***Bembidion cnemidotum* BATES, 1873 species group**

Remarks. The species described below is the first Taiwanese member of this group formerly known only from Japan and FE Russia.

***Bembidion yehi* n.sp.** (Figs. 2, 3, 4, 5, 8, 9, 10, 11, 14)

Type locality. Taiwan, Kuanyuan, Hualien County.

Type material. HOLOTYPE, ♂, 1) "TAIWAN, 29-vii-2010, Kuanyuan, Hualien County, K. Terada & L.-W. Yeh leg. (Terada-116)"; 2) "HOLOTYPUS //

Bembidion yehi sp.n. // Det. L. Toledano & K. Terada, 2014" [red] (NMNS). PARATYPES: 5 ♂♂, 5 ♀♀, same date and locality as the holotype (NMNS, CTHJ, CTVR); 1 ♂, 1 ♀, "TAIWAN, Kuanyuan, 2500 m. alt., Hualien County, 24-v-2012, K. Terada & L.-W. Yeh leg. (Terada-126)" (KTHJ, CTVR); 3 ♂♂, 1 ♀,

"TAIWAN, Kuanyuan, 2500 m. alt., Hualien County, 15-XI-2008 L.-W. Yeh leg. Terada (KTHJ, CTVR); 4 ♂♂, 1 ♀, "TAIWAN, Hualien County, Provincial Road 8 at Songlin Bridge, 2343 m, 24.18554°/121.32571°, 4 October 2013, Stop#2013-060, D.H. Kavanaugh & Y.M. Weng" (OSAC, CAS). All paratypes labelled as "PARATYPUS // *Bembidion yehi* sp.n. // Det. L. Toledano & K. Terada, 2014" [red].

Diagnosis. *Bembidion* species of the *cnemidotum* group from Taiwan with strongly convex elytra showing well marked shoulders and frons covered by evident punctures.

Description. Body length 5.20 to 5.90 mm. Dark green, metallic, with faint bluish reflections. Legs reddish brown, with the basal 5/6 of femurs darkened. Antennomeres 1 and 2 reddish, 3 slightly darkened in the apical half in most specimens, the remaining ones darkened, except for the basal end, reddish.

Head with rather deep, wide and slightly convergent frontal furrows, superficial but extending on clypeus. Frons faintly rugose and with scattered punctures. Eyes rather small and relatively flat, antennae rather short ($bl/al = 2.10$ to 2.26).

Pronotum transverse ($pw/pl = 1.33$ – 1.38) ($ew/pw = 1.65$ – 1.70). Sides rounded, clearly sinuate before the hind angles, these last of variable shape, right or slightly obtuse. Lateral channel narrow in the anterior fourth and in the posterior fifth, widened in the remaining portion. Anterior transverse impression superficial, punctured and with a fovea at middle, median line sharp, evident, basal transverse impression rather deep, finely and sparsely punctured, basal foveae deep, laterally delimited by a carina. Posterior margin slightly rounded, with posterior convexity, at middle.

Elytra ($el/ew = 1.41$ – 1.46) oval, very wide and convex, with humeri well marked but rather rounded. Maximum elytral width slightly behind the middle. Elytral striae visibly impressed, with fine punctures, stria 1 and 2 reaching apex, stria 3 to 7 almost complete, superficial and evanescent only near the apex, stria 7 slightly more superficial, parascutellar stria rather long and more impressed than the elytral striae, apical stria short and somewhat connected with apical end of stria 5. Two discal elytral pores on interval 3 near stria 3. Elytral intervals rather convex on the disc, more flat near the sides and apex.

Microsculpture superficial, isodiametric on head, more transverse and irregular on the pronotum, with extremely sharp and transverse sculpticells on the whole dorsal surface of elytra (fig. 14).

Male genitalia (Figs. 8, 10). Median lobe very thick with apical portion triangular and rounded apex; apical portion of ventral margin gently bent ventrally. Endophallus with a big central brush, somewhat triangular, easily visible from right view, with posterior portion more sclerotized, and progressively less sclerotized forward. Bulk of central brush (posterior portion) in vertical position, while it is oblique in *B. cnemidotum*. Ventral, "Y-shaped" sclerite (copulatory piece C3, MORITA, 1994) and dorsal sharp and long evidently sclerotized membrane (copulatory piece C4, MORITA, 1994) as in *B. cnemidotum* Bates, 1883, but both bigger than in that

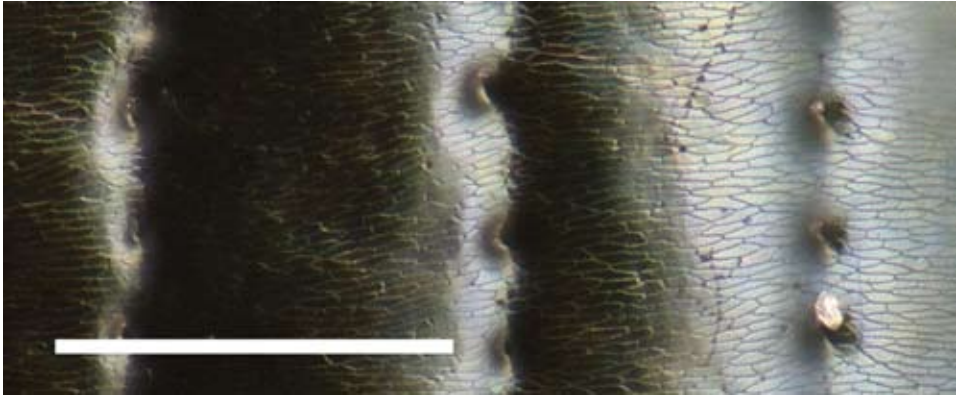


Fig. 14. Elytral microsculpture of *B. yehi* n.sp. Scale: 0.1 mm.

species. Also the remaining membranous sclerites near the central brush, easily visible from left view, corresponding to the copulatory pieces C1, C2 and C5 described by MORITA (1994) for the *cnemidotum* group, show analogies with the same sclerites of *B. cnemidotum* and in other species of the group, but in *B. yehi* they are more developed. They form a three dimensional, "fig-shaped" complex with wider portion near base, positioned in vertical position at the left side of the central brush.

Etymology. Dedicated to L.-W. Yeh (Hualien District Agricultural Research and Extension Station, Hualien, Taiwan) who collected the type series together with K. Terada.

Distribution. So far known only from the type locality.

Systematic notes. Due to the aedeagal characters, the species belongs to the *cnemidotum* group, being its first member found in Taiwan. It seems that the new species does not have any close relatives among the known species of this eastern palaeartic species group which includes also many recently described Japanese species (MORITA, 2008b, 2009).

Intraspecific variability. A single male specimen (CTVR, Figs. 5, 9, 11) from the same locality as the holotype shows elongate and convex apical end of the elytra, which is posteriorly protruding and evidently emarginated in respect to the rest of the elytral margin. The external shape of its median lobe is slightly different, while the endophallus is almost identical to that of the holotype, except for the fact that it is partly everted, as indicated by the apical ligament, which is clearly bent (Figs. 9, 11). This ligament is straight in the other specimens, included the holotype figured in Figs. 8 and 10. All these differences seem due to artifacts during the dissection of the specimen, therefore we refrain from describing another species on this specimen, waiting for better evidence based on additional material.

***Ocydromus* Clairville, 1806 complex**

***Bembidion* subg. *Asioperypus* Vysoky, 1986**

***Bembidion lunatum* (Duftschmid, 1812) species group auctt.**

***Bembidion (Asioperypus) collutum* BATES, 1873 (Figs. 12, 13)**

Bembidium collutum: BATES, 1873: 332 (incorrect spelling of the generic name).

Bembidion (Peryphus) collutum: NETOLITZKY (1942–43): 132.

Bembidion (Peryphus) collutum: JEDLIČKA (1965): 123.

Bembidion (Asioperypus) collutum: MARGGI et al. (2003): 243; LORENZ (1998): 215; LORENZ (2005): 231.

Bembidion (Ocydromus s.l. complex) collutum: TOLEDANO (2008): 98.

Material examined. TAIWAN: 3 ♂♂, 3 ♀♀, New Taipei City, Lungmen, near Kungliao, 14-iii-2002, K. Terada & M.-H. Hsu leg. (Terada-94) (NMNS, KTHJ, CTVR, SMTJ).

Type (China) not seen.

Distribution. Southern Japan, and Taiwan. This is the first report of this species from Taiwan.

Remarks. In order to correctly identify the six Taiwanese specimens mentioned above, we compared them with specimens of *B. collutum collutum* Bates, 1873 from SE China, with specimens of *B. collutum semiluitum* Bates, 1883 from Japan (type, BMNH, seen) and only with images of *B. collutum nakanoshimense* (Uéno, 1955) from the literature (UÉNO, 1955). The differences in the body characters between the subspecies seem extremely small, the endophalli are almost identical. The very small differences in the external shape of the aedeagi (*collutum* slightly narrower, *semiluitum* and *nakanoshimense* slightly broader, with the apical portion of the last one more pointed, triangular) could be due to individual variations and seem to suggest that these taxa could be synonyms. Our colleague Seiji Morita, who is dealing with these taxa, confirmed that probably at least *semiluitum* and *nakanoshimense* are synonyms, but he regards *semiluitum* as specifically independent from *collutum* (S. Morita, pers. comm.). Waiting for a revisionary study of these taxa, currently known as subspecies of *B. collutum*, at least provisionally we identify the Taiwanese specimens as *B. collutum*. Also the attribution to subgenera or to species group is under discussion: *B. collutum* has been placed in the subgenus *Asioperypus* Vysoky, 1986 (MARGGI et al., 2003; LORENZ, 1998, 2005), more recently reported as *Ocydromus* s.l. *lunatum* (Duftschmid, 1812) species group (TOLEDANO, 2008), or may belong to *Ocydromus* s.l. *lenae* (Csiki, 1928) species group (S. Morita, pers. comm.). We refrain from taking a decision regarding this matter, in hopes that an ongoing study about relationships within the Bembidiina using DNA sequence data (D. Maddison, pers. comm.) will make their position clear.

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References

- BATES H. W., 1873 - Descriptions of new genera and species of Geodephagous Coleoptera from China. *Transactions of the Entomological Society of London* (1873): 323-334.
- HABU A., 1973 - Notes and descriptions of Formosan Carabidae taken by Dr. S. – I. Uéno in 1961 (Coleoptera: Carabidae) III. *Bembidion*. *Transactions of the Shikoku Entomological Society*, 11(4): 107-116.
- JEDLIČKA A., 1946 - Descriptions des Carabidae nouvelles de l'Asie orientale. Published by the author, Praha, 13 pp.
- JEDLIČKA A., 1965 - Monographie des Tribus Bembidiini aus Ostasien. *Abhandlungen und Berichte aus dem staatlichem Museum für Tierkunde in Dresden (Entomologische Abhandlungen)*, 32 (7): 79-199.
- LORENZ W., 1998 - A systematic list of extant ground beetles of the world (Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). W. Lorenz, Tutzing, 502 pp.
- LORENZ W., 2005 - A systematic list of extant ground beetles of the world (Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). 2nd edition. W. Lorenz, Tutzing, 530 pp.
- MADDISON D. R., 2012 - Phylogeny of *Bembidion* and related ground beetles (Coleoptera: Carabidae: Trechinae: Bembidiini: Bembidiina). *Molecular Phylogenetics and Evolution*, 63 533–576.
- MARGGI W. A., HUBER C., MÜLLER-MOTZFELD G. & HARTMANN M., 2003 - Bembidiini. Pp. 241–273. In: LÖBL I. & SMETANA A. (eds.): *Catalogue of Palaearctic Coleoptera. Volume 1. Archostemata - Myxophaga - Adephaga*. Apollo Books, Stenstrup, Denmark, 819 pp.
- MORITA S., 1994 - Notes on the Bembidiinae (Carabidae) of Japan 8. *Ocydromus kamikochii* (Jedlicka). *Elytra*, 22(2): 221-225.
- MORITA S., 2008a - Notes on the Bembidiinae (Carabidae) of Japan XV. Two New Species of the Group of *Bembidion cnemidotum*. *Taichius, Special Publication of the Japan*

Coleopterological Society No.2: 31-37.

- MORITA S., 2008b - Notes on the Bembidiinae (Coleoptera: Carabidae) of Japan XIV. Two new species of the Subgenus *Blepharoplastaphus*. *Entomological Revue of Japan*, 62 (2): 273-277.
- MORITA S., 2009 - Notes on the Bembidiinae (Coleoptera, Carabidae) of Japan XIX. *Bembidion misellum* and its relatives from central Japan. *Elytra*, 37 (1): 27-39.
- NETOLITZKY F., 1928 - *Bembidion Gebieni* n. sp. aus China. *Koleopterologische Rundschau*, 14 (4): 168.
- NETOLITZKY F., 1939 - Beitrag zur Kenntnis der *Bembidion*-Arten des Fernen Ostens (Japan, Korea, Ostsibirien) (Coleoptera). 3. Mitteilung. *Proceedings of the Royal Entomological Society of London*, (Series B) 8 (3): 49-51.
- NETOLITZKY F., 1942-1943 - Bestimmungstabelle der *Bembidion*-Arten des paläarktischen Gebietes. *Koleopterologische Rundschau*, 28 (1942): 29-68; 28 (1943): 69-124; 29 (1943): 1-70.
- TERADA K., 2006 - A checklist of the Carabidae (Coleoptera) recorded from Taiwan. *Miscellaneous Reports of the Hiwa Museum for Natural History*, 46: 1-72.
- TERADA K., HSU M.-H. & WU W.-J., 2005 - A checklist of the Carabidae (Coleoptera) of Taiwan. *Miscellaneous Reports of the Hiwa Museum for Natural History*, 45: 163-216.
- TOLEDANO L., 2008 - Checklist of the Bembidiina of China (Coleoptera Carabidae) - *Memorie del Museo Civico di Storia Naturale di Verona*, 2. serie Sezione Scienze della Vita, 18: 95-100.
- TOLEDANO L., 2009 - Notes on the Bembidiina of Taiwan with description of three new species (Coleoptera, Carabidae). *Acta Entomologica Musei Nationalis Pragae*, 49 (2): 577-598.
- TOLEDANO L., SCHMIDT J., 2010 - Revision of the *Bembidion kara* Andrewes, 1921 species group and notes on the Palearctic species of *Bembidion* subgenus *Trichoplastaphus* Netolitzky, 1914 (Coleoptera: Carabidae: Bembidiini). *Entomologische Blätter*, 106: 371-406.
- UENO S. - I., 1955 - Marine insects of the Tokara Islands. VII. New species and new subspecies of the subfamily Trechinae (Coleoptera, Harpalidae). *Publications of the Seto Marine Biological Laboratory, Sirahama*, 4: 403-413.

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