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A new species of *Bembidion* LATREILLE from Nemrut Dağ, Turkey (Coleoptera: Carabidae)

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Abstract

Bembidion (*Ocydromus*) *nemrutdagi* sp.n. from the Nemrut Dağ (Turkey, Adıyaman Prov.) is described. Its nearest relative, *B. cordicolle* DUVAL, 1851, is transferred to the subgen. *Ocydromus* CLAIRVILLE, 1806 s.l. (sensu KRYZHANOVSKIJ et al. 1995). The systematic relationships of some species groups are discussed.

Key words: Coleoptera, Carabidae, Bembidiina, *Bembidion*, *Ocydromus*, Turkey, taxonomy.

Introduction

While studying Turkish *Bembidion* LATREILLE, 1802 we detected two specimens extremely similar to *B. cordicolle* DUVAL, 1851, from which they could be distinguished by the number of elytral pores. After comparison with the other species occurring in the area and after a thorough literature study we concluded that these specimens represent an undescribed species.

Material and methods

This paper is based on the study of 60 specimens belonging to the species dealt with herein and several hundreds of other specimens belonging to the subgen. *Ocydromus* CLAIRVILLE, 1806 sensu KRYZHANOVSKIJ et al. (1995).

Collection Acronyms:

CF	Coll. Facchini, Piacenza
CM	Coll. Moret, Madrid
CN	Coll. Neri, S. Lorenzo in Noceto, Forlì
CR	Coll. Rébl, Nové Strašecí
CT	Coll. Toledano, Verona
NMW	Coll. Naturhistorisches Museum Wien

The measurements, made with a Leica MZ12 stereobinocular microscope at 25 x (body) and 100 x (median lobes of aedeagi), are expressed in the text by the following abbreviations:

el/ew	elytral length / elytral width ratio
ew/pw	elytral width / pronotum width ratio
pw/hw	pronotum width / head width ratio
pw/pl	pronotum width / pronotum length ratio

The body length has been measured from the front margin of the clypeus to the apex of the elytra, and the antennal length from the base of the antennomere 1 to the apex of antennomere 11. The dissections were made using standard techniques; genitalia and small parts were preserved in Euparal, on acetate labels fixed on the same pins as the specimens. The pictures were

taken with a Nikon Coolpix 995 digital camera on a Leica MZ12 stereobinocular microscope and processed with the Color-it!2.3™ program on a Macintosh Powerbook G4 computer.

For brevity, in the following text “*Ocydromus* s.l.” means “*Ocydromus* sensu KRYZHANOVSKIJ et al. (1995)”.

***Bembidion* subgen. *Ocydromus* CLAIRVILLE, 1806 s.l.
(*cordicolle* group)**

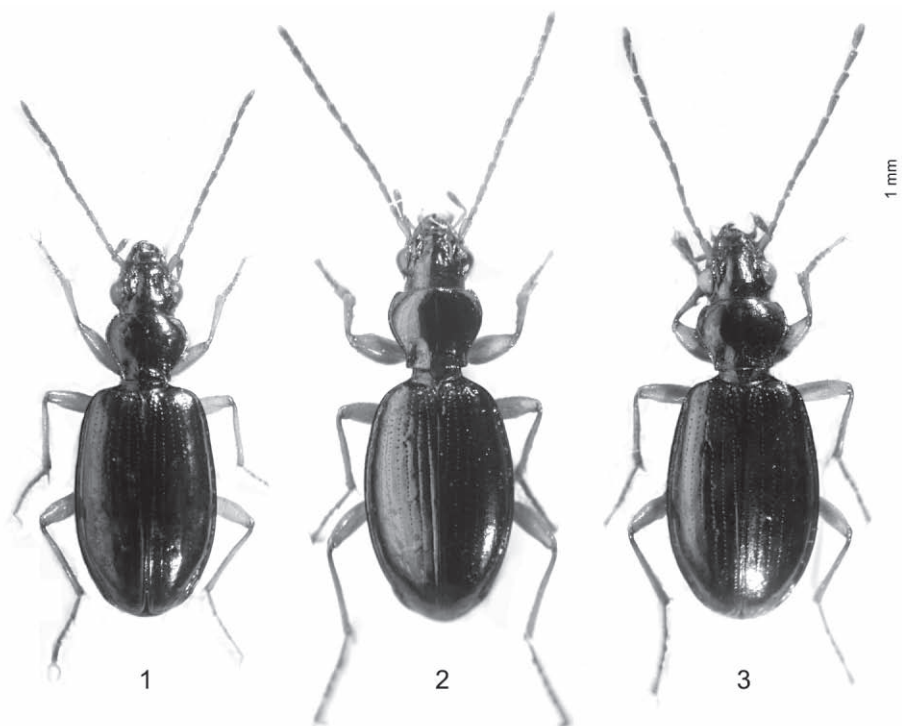
DIAGNOSIS: Species from Turkey and neighbouring regions unicolorous brown to dark green, pronotum small and cordiform, elytra oval with rounded shoulders, maximum width beyond middle, apical pore isolated, inner sac of aedeagus with a short flagellum, lacking membranous sac (sensu MÜLLER-MOTZFELD 1986) and “tricorned body” (sensu LINDROTH 1963).

SYSTEMATIC NOTES: The available literature does not clarify the systematic position of *B. cordicolle*. NETOLITZKY (1942) mentions it in the key for the subgenera as an isolated species in an intermediate position between the subgenera *Nepha* MOTSCHULSKY, 1864 and *Omoperypus* NETOLITZKY, 1931. It was also attributed to the subgen. *Peryphus* DEJEAN, 1821 (LORENZ 1998, 2005, MARGGI et al. 2003) while *B. veldkampii* KIRSCHENHOFER, 1994, a synonym of *B. cordicolle*, was described under *Peryphanes* JEANNEL, 1941.

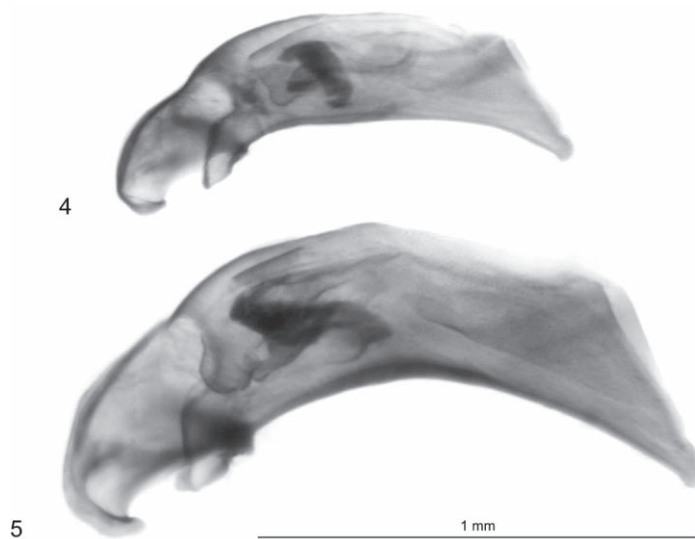
The *cordicolle* group shares the presence of an isolated apical elytral pore with *Omoperypus* and *Nepha*, as observed by NETOLITZKY (1942). This character, as already pointed out by TOLEDANO (2000), has no supraspecific value. The presence of this character in species of the same subgenus is probably due to a common derivation (e.g. subgen. *Josefia* TOLEDANO, 2000), but the presence of this character in different monophyletic lineages (e.g. *Omoperypus*, *Nepha*, *Josefia*, *B. algidum* ANDREWES, 1935, *B. misellum* HAROLD, 1877) does not necessarily suggest close phylogenetic relationship.

For many aspects of the habitus and the male genitalia, *B. cordicolle* and *B. nemrutdagi* sp.n. seem to belong to the very large “constellation” of species groups which forms the subgenus *Ocydromus* s.l. where it is certainly difficult to find reliable and well defined split points between real monophyletic groups, suitable to define independent subgenera. The “crossed sharing” of a set of characters present in several groups in different combinations gives the impression of a very large, polymorphic complex of species, probably sharing a common origin. The *cordicolle* group shares with most species groups within *Ocydromus* s.l. the presence of a tubular flagellum which in this case is poorly developed. In some cases a plesiomorphic significance has been already attributed to the flagellum (LINDROTH 1976). The unicolorous species of *Peryphanes* show an extreme development of the flagellum, which protrudes from the base of the aedeagus, a character certainly not shared by the *cordicolle* group. Although the *cordicolle* group shares pronotal and elytral similarities with some species of *Ocyturanus* MÜLLER-MOTZFELD, 1986 and *Terminophanes* MÜLLER-MOTZFELD, 1998, any relationship is not confirmed by the examination of the male genitalia since the endophallus of *B. cordicolle* and *B. nemrutdagi* sp.n. lacks the synapomorphic characters of both species groups (membranous sac for *Ocyturanus*, and tricorned body for *Terminophanes*).

Due to the presence of a short tubular flagellum and a relatively small sclerotized brush the *cordicolle* group resembles the *radians* group sensu TOLEDANO (2000) and *Peryphus*. On the other hand, the habitus of *B. cordicolle* and *B. nemrutdagi* sp.n. does not permit the inclusion within any one of these groups. Therefore, while waiting for a definitive placement of the subgenus *Ocydromus* s.l., unfortunately still very far from being completed, we believe that the best way to deal with this argument is to isolate *B. cordicolle* and *B. nemrutdagi* sp.n. in a group of species within *Ocydromus* s.l.



Figs. 1–3: Habitus of 1) *Bembidion cordicolle*, specimen from Crete; 2) *B. nemrutdagi*, holotype; 3) *B. nemrutdagi*, paratype.



Figs. 4–5: Median lobe of the aedeagus of 4) *Bembidion cordicolle*, specimen from Crete; 5) *B. nemrutdagi*, holotype.

Key to the species of the *Bembidion cordicolle* group

- 1 Two discal elytral pores in the third interval, adjoining stria 3; femora slender; Greece (Crete), Bulgaria, Turkey (Fig. 1)..... ***cordicolle***
- Five discal elytral pores, the anterior one in the fifth interval, the second in the fourth interval, the third about on stria 3, the fourth and the fifth two in the interval 3; femora thicker; Turkey (Figs. 2–3)..... ***nemrutdagi* sp.n.**

***Bembidion (Ocydromus) cordicolle* DUVAL, 1851**

(Figs. 1, 4)

Bembidion (Peryphanes) veldkampii KIRSCHENHOFER, 1994

SYSTEMATIC NOTE: KIRSCHENHOFER (1996) synonymized *B. veldkampii* KIRSCHENHOFER, 1994 with *B. cordicolle*. After examination of some topotypical specimens of *B. veldkampii* we can confirm here this synonymy.

DIAGNOSIS: A brown to dark green species from Greece (Crete), Bulgaria and Turkey, length about 5 mm, pronotum narrow, cordiform, elytra oval, but with square shoulders, with two discal elytral pores in the third interval adjoining stria 3 and aedeagus with simple internal sac including two sclerites, an oblique, strongly sclerotized central brush and a short flagellum.

MATERIAL EXAMINED:

B U L G A R I A: 3 exs., Akhtopol, 19.VII.1988, Cernoch lgt. (CR); 2 exs., Akhtopol, 7.–18.VII.1987 (CR).
 G R E E C E (CRETE): 2 exs., Agia Irini, 9.VI.1998 (CT); 1 ex., Agia Marina env., 15.–24.VI.2003, L. Danek lgt. (CR); 3 exs., Meronas, 12.VI.1998 (CT); 3 exs., Kastellion, 18.VII.1978, Moret lgt. (CM, CT); 1 ex., Lefka Ori, 600 m, Thériso env., 8.–9.IV.1990, R. Borovec lgt. (CR); 1 ex., Rethimno, 2.VI.2003, J. Baros lgt. (CR); 4 exs., Chania env., 14.VIII.1999, K. Orszulik lgt. (CR); 1 ex., Chania dist., Omalos, ca. 1550 m, 22.–25.V.1090 (CF); 7 exs., Ierapetra env., Achlia, 9.VI.2001, K. Orszulik lgt. (CR); 2 exs., Plakias, 8.VI.2000, Dluhos lgt. (CR); 1 ex., Neapolis, 5.VI.1904 (NMW); 1 ex., Kournas, 23.V.2004, J. Janus lgt. (CR).
 T U R K E Y: 6 exs., “Türkei” (NMW); Prov. IZMİR: 7 exs., Yamanlar Dağ N Izmir, 18.V.1991, H. Schönmann & H. Schillhammer lgt. (NMW); 1 ex., Yamanlar Dağ, 700 m, near Izmir, 18.V.1991, S. Schödl lgt. (NMW); 9 exs., Kaz Dağ, Ayi Deresi, 650 m, 15.V.2005, P. Neri lgt. (CN); Prov. MUĞLA: 2 exs., N Dalaman, 27.V.1991, H. Schönmann & H. Schillhammer lgt. (NMW); 2 exs., Kargıçay River, 15 km NW Fethiye, 27.V.1991, M.A. Jäch lgt., S. Schödl lgt. (NMW); 2 exs., Marmaris, 26.V.1969, G. Wewalka lgt. (NMW); 4 exs., Marmaris, 20.V.1992, W. Veldkamp (NMW); Prov. ANTALYA: 2 exs., 30 km N Finike, W Çatallar, 23.V.1991, H. Schönmann & H. Schillhammer lgt. (NMW); 1 ex., Aslanbucak, Kemer, 28.VI.1997, K. Orszulik lgt. (CR); 1 ex., S Kemer, 25.V.1991, S. Schödl lgt. (NMW); Prov. KONYA: 1 ex., Karahasan Geçidi, Ermenek – Hadim, 4.VIII.1990, S. Schödl lgt. (NMW); Prov. İÇEL: 1 ex., 20 km N Silifke, 24.V.1981, G. Sama lgt. (CN); 1 ex., E Silifke, 18.V.1969, G. Wewalka lgt. (NMW).
 COUNTRY UNKNOWN: 1 ex., “Tipojras”, Weirather lgt. (NMW); 1 ex., “Avadochnik”, Weirather lgt. (NMW).

REDESCRIPTION: Length 4.62–5.28 mm. Body light brown to piceous-black, legs and antennomeres 1–3 red, remaining antennomeres infuscated, sometimes also articles 2 and 3 infuscated. Last antennomere with tip paler.

Head slightly narrower than pronotum with frontal furrows almost parallel, rather superficial, not extending to clypeus. Antennae elongate and femora normal.

Pronotum narrow ($pw/pl = 1.20–1.25$) ($ew/pw = 1.69–1.71$) and cordate with anterior margin evidently wider than basal one. Anterior transverse impression as a rule shallow, median line superficial, basal transverse impression uneven and very shallow. Sides strongly arcuate, with a seta at about the anterior third, and evidently sinuate near base. Hind angles square, acute, with a seta. Basal margin rectilinear basal foveae small, not deep, rugose-punctate, as the whole base, laterally limited by a very short and sharp carina.

Metaventral process with a thin border, becoming wider at the apex.

Elytra (el/ew = 1.48–1.49) oval, with rather square shoulders, with maximum width at about the posterior 3/5. Basal margin extending to the base of stria 5. Striae 1–6 distinctly but not deeply punctate, more superficial in the apical third but remaining distinctly visible almost up to the apex. Scutellar striola rather long, apical stria absent, with an isolated apical pore. Two discal elytral pores in the third interval, the anterior one adjoining stria 3, the hind one slightly more distant from the same stria.

Microsculpture absent on head, except for the superficial isodiametric sculpticells of the articulation of the neck, very faint in rare and superficial transverse sculpticells on the sides of pronotal disk, and superficial, in very thin, transverse sculpticells on elytra more evident in the apical half, where they produce a faint iridescence.

Male genitalia (Fig. 4): Median lobe of the aedeagus narrow, with almost rectilinear basal margin, base and apical end ventrally bent. Apical end rather elongate. Armature of the internal sac characterized by the presence of a sclerite (“central brush”, LINDROTH 1976) oblique, partially covered by another, rather short bisinuate tubular sclerite if seen from the left side. Both sclerites can be variously oriented (more or less angulated to one another) in the different specimens. A third sclerite, flat and poorly sclerotized, in basal position in respect to the main sclerites. Left paramere with four apical setae, right one with three apical setae.

Female genitalia: Reservoir of spermatheca “figure-8 shaped” formed by two rounded cavities of different dimensions. Annulus receptaculi weakly sclerotized.

DISTRIBUTION: Bulgaria, Greece (Crete), and Turkey.

AFFINITIES: As shown by the similarities in the habitus and in the male genitalia, the nearest relative is *B. nemrutdagi* sp.n. As already discussed by TOLEDANO & SCIAKY (2004) a different number of discal elytral pores does not necessarily exclude a close systematic relationship; *B. (Trichoplataphus) kara* ANDREWES, 1921 and *B. (T.) tambra* ANDREWES, 1923 have three discal pores on each elytron while other species no doubt strictly related to them (e.g. *B. (T.) proteron* NETOLITZKY, 1920 and *B. (T.) histeron* NETOLITZKY, 1943) have the normal pair of discal pores on each elytron. In case of *B. cordicolle* and *B. nemrutdagi* sp.n. the male genitalia seem to suggest that the external similarities are due to close phylogenetic relationships and not due to convergence.

***Bembidion (Ocydromus) nemrutdagi* sp.n.**
(Figs. 2, 3, 5)

DIAGNOSIS: Very similar to *B. cordicolle*, with five discal elytral pores.

TYPE LOCALITY: Nemrut Dağ, Karadut, Adıyaman Prov., Turkey.

TYPE MATERIAL: Holotype ♂, “TURKEY, Karadut, Nemrut Dagı Park, 1000m/m, 14.5.1997, lgt. J. Basta” (CR). Paratype ♀, “TURKEY mer. or. KARADUT env., (NEMRUT DAGI), 1993-07-02. Klima lgt.” (CT).

DERIVATIO NOMINIS: The name is derived from the type locality.

DESCRIPTION: Length 5.60–5.72 mm. Brown to piceous black, legs and antennomere 1 red, the others infuscated, except for the base of the articles 2 and 3, reddish in the female paratype. Last antennomere with tip paler.

Head normal slightly narrower than the pronotum with frontal furrows almost parallel, rather superficial, not extending to the clypeus. Antennae elongate and femora thicker than in *B. cordicolle*, especially so in the holotype.

Pronotum narrow ($pw/pl = 1.19\text{--}1.25$) and cordate, wider than in *B. cordicolle* in respect to the elytral width ($ew/pw = 1.59\text{--}1.65$), anterior margin evidently wider than the basal one. Anterior transverse impression as a rule shallow, median line superficial, basal transverse impression absent. Sides strongly arcuate, with a seta at about anterior third, and evidently sinuate near base. Hind angles square, acute, with a seta. Basal margin rectilinear, basal foveae small, deeper than in *B. cordicolle*, rugose-punctate as the whole base, which in the middle is more convex than in *B. cordicolle*. Basal foveae laterally limited by a very short and sharp carina.

Metaventral process as in *B. cordicolle*.

Elytra ($el/ew = 1.54\text{--}1.56$) oval, with rounded shoulders in the holotype (Fig. 2) and more developed shoulders in the paratype (Fig. 3), but always more rounded than in *B. cordicolle*, with maximum width about at the apical 3/5. Basal margin reaching as far as the base of stria 5. Striae 1–6 distinctly but not deeply punctate, more superficial at the apical third but remaining distinctly visible almost up to the apex. In the holotype, stria 3 laterally deflected in correspondence of the second discal elytral pore, almost in contact with it; in the paratype, stria 3 laterally deflected and stria 4 medially deflected, both touching the second discal pore, showing altogether an “X-shape”. Scutellar striola rather long, apical stria absent, with an isolated apical pore. Anterior discal elytral pore in the fifth interval at about the anterior sixth, second pore in the fourth interval at the anterior third, third pore touching stria 3, fourth pore in the interval 3, about at the posterior 3/5, fifth pore in the interval 3 in preapical position.

Microsculpture as in *B. cordicolle*, but even more superficial.

Male genitalia (Fig. 5): Median lobe of the aedeagus larger, more arcuate and thick than in *B. cordicolle*. Apical end less elongate than in *B. cordicolle*. Armature of the internal sac characterized by the presence of a larger, oblique central brush, tubular sclerite shorter and more rectilinear than in *B. cordicolle*, partially covering the central brush if seen from left view. Left paramere with four apical setae, right one with three apical setae.

Female genitalia as in *B. cordicolle*.

DISTRIBUTION: Known only from the type locality in Turkey.

Conclusions

The new species demonstrates that the number of elytral discal pores has no taxonomic value as a supraspecific character for the Bembidiina, as shown by other supraspecific groups (e.g. *Ocys* STEPHENS, 1828, *Trichoplataphus* NETOLITZKY, 1914 and *Ecuadion* MORET & TOLEDANO, 2002). In fact, the two species examined are very similar to each other in the habitus and in the male genitalia but they show a difference in the number of discal elytral pores which could seem to be the result of a simple mutation due to genetic drift in an isolated population.

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