

Synonymic, taxonomic and geographical notes on *Bembidion (Peryphanes) dalmatinum hybridum* APFELBECK, 1904 and *B. (P.) adygorum* BELOUSOV & SOKOLOV, 1996 (Coleoptera, Carabidae, Bembidiini)

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Abstract

The following synonymy is proposed: *Bembidion (Peryphanes) dalmatinum hybridum* APFELBECK, 1904 = *B. (P.) dalmatinum dalmatinum* DEJEAN, 1831 n. syn. The specimens from Turkey, formerly identified as *B. (Peryphanes) dalmatinum hybridum*, actually have to be referred to *B. (P.) adygorum* BELOUSOV & SOKOLOV, 1996, therefore the distribution of this species is extended to northern and eastern Turkey.

Zusammenfassung

Synonymie, Taxonomie und Bemerkungen zur Verbreitung von *Bembidion (Peryphanes) dalmatinum hybridum* APFELBECK, 1904 und *B. (P.) adygorum* BELOUSOV & SOKOLOV, 1996 (Coleoptera, Carabidae, Bembidiini). Die folgende Synonymie wird vorgeschlagen: *Bembidion (Peryphanes) dalmatinum hybridum* APFELBECK, 1904 = *B. (P.) dalmatinum dalmatinum* DEJEAN, 1831 n. syn. Früher aus der Türkei als *B. (Peryphanes) dalmatinum hybridum* identifizierte Exemplare sind dagegen zu *B. (P.) adygorum* BELOUSOV & SOKOLOV, 1996 zu stellen. Das Verbreitungsgebiet letzterer Art bezieht damit auch die nördliche und östliche Türkei mit ein.

Key words: Greece, Turkey, lectotype designation, synonymy

Introduction

MÜLLER-MOTZFELD & MARGGI (2011) referred to *Bembidion (Peryphanes) dalmatinum hybridum* APFELBECK, 1904 as “questionable”. Through examination of the literature, the type series, and material from Balkan Peninsula, our proposed goal is to ascertain the validity of the taxon under discussion.

In addition, based on extensive material collected in Anatolia, we are now able to present new data on the true distribution of *B. (P.) adygorum* BELOUSOV & SOKOLOV, 1996.

Material and Methods

The systematic treatment of the Bembidiina follows MADDISON (2012). The material examined is preserved in the following Collections:

CTVR: coll. LUCA TOLEDANO, Verona
HNHM: Hungarian Natural History Museum, Budapest
IG: coll. IVO GUDENZI, Forlì
MNB: Museum für Naturkunde, Berlin
NHMB: Naturhistorisches Museum, Basel
NHMW: Naturhistorisches Museum, Wien

MNHN: Muséum National d'Histoire Naturelle, Paris
PN: coll. PAOLO NERI, Forlì
SDEI: Senckenberg Deutsches Entomologisches Institut, Müncheberg
SMTD: Senckenberg Museum für Tierkunde, Dresden

Bembidion (Peryphanes) dalmatinum dalmatinum DEJEAN, 1831

New synonymy. *Bembidion nitidulum hybridum* APFELBECK, 1904: 96, n. syn.

Historical notes. APFELBECK (1904) described *Bembidion nitidulum hybridum* from Central Greece: Chani Panetsu bei Varybopi (locus classicus); the subspecies, sympatric with *dalmatinum* DEJEAN, 1831, is distinguished from the type form of *nitidulum* (MARSHAM, 1802) because it is larger in size and for the longer elytra microsculptured only at the apex (microsculptured at least in the apical half in the typical *nitidulum*, now called *deletum* SERVILLE, 1821); it is distinguished from *dalmatinum* of Central Greece by the flatter eyes, the narrower humeri, the less parallel elytra showing coarser striae and apex evidently microsculptured.

MÜLLER (1918), states that *hybridum* (Greece, Asia Minor and Caucasus) is much closer to *dalmatinum* than to *nitidulum* and that it is distinguishable from *dalmatinum* almost only by the distribution of the elytral microsculpture. NETOLITZKY (1943) agrees with MÜLLER's (1918) opinion and mentions it only from Greece and Turkey. HIEKE & WRASE (1988), after examination of the genitalia of a "syntype" of *hybridum* (preserved in SMTD, in the paper there is no mention of the collecting locality), assign the subspecies *hybridum* to *dalmatinum*, confirming the presence of microsculpture at the elytral apex. BELOUSOV & SOKOLOV (1996), agree with HIEKE & WRASE (1988), and think that the Caucasian specimens of *hybridum*, mentioned by MÜLLER (1918), are different from those from Greece and describe *Bembidion* (*Peryphanes*) *adygorum* BELOUSOV & SOKOLOV, 1996 (Krasnodar Prov., Abkhazia, Georgia, Armenia, Azerbaidjan); also *nitidulum* ab. *reticulatum* IABLOKOFF-KHNZORIAN, 1976 is placed into synonymy with *adygorum*.

Recently MARGGI et al. (2003) rank *hybridum* as subspecies of *dalmatinum* and mention the species from Greece, Serbia and Montenegro; LORENZ (2005) agrees. Then, as already mentioned above, MÜLLER-MOTZFELD & MARGGI (2011), while mentioning the presence of two subspecies of *dalmatinum* from Greece (typical form and *hybridum*), refer to the subspecies *dalmatinum hybridum* as "questionable".

Material. Requests were made to several museums preserving material of the APFELBECK Collection regarded or designated as belonging to the type series of *nitidulum hybridum*. We received seven specimens labelled as "Holotypus, Type, Cotyp., Typus, Cotype". This unusual abundance of type specimens has been explained to us by BERND JAEGER (curator at MNB), who writes us in an e-mail: «According to APFELBECK (1904) *hybridum* should be from Middle Greece and therefore the specimens from Turkey mentioned above cannot belong to the type series. The handwritten labels which indicate "Cotype" or "Type" were not written by APFELBECK. I found labels with the same handwriting (including "Cotype") also in other *Bembidion* species described by DANIEL or REITTER, and collected in Anatolia by BODEMEYER. I guess the labels were written by E. or B. BODEMEYER both collected in Anatolia and were insect sellers who sold their collections subsequently to different European museums. The term "Cotype" on one of the labels was probably used in sense of REITTER, who regarded specimens which were subsequently (after the description) seen/identified by the species author as "Cotypes"» (BERND JAEGER, personal communication). We are unaware of any papers where a holotypus or lectotypus has been designated. We retain as "Type material" only the following four specimens, all from the type locality mentioned in the original description (Chani Panetsu bei Varybopi: Attika):

- 1 female, with dissected spermatheca and four

labels: "Apfelbeck / Varipopi / Ch. Panetsu [printed] // TYPE [pink, printed] // ♀ [handwritten] // Col. Prof. Dott. Noesske / Ankauf 1947 [printed]" (SMTD). The specimen lacks the left antenna and left anterior leg.

- 1 immature male with five labels: "Apfelbeck / Varipopi / Ch. Panetsu [printed] // ♂ [printed] // COTYPE [pink, printed] // *dalmatinum* / *hybridum* Apf. [handwritten] // Col. Prof. Dott. Noesske / Ankauf 1947 [printed]" (SMTD).

- 1 immature female with dissected spermatheca and four labels: "Apfelbeck / Varipopi / Ch. Panetsu [printed] // Coll. Apfelbeck [printed] // Holotypus [handwritten] 1904 / *Bembidion nitidulum* / ssp. *hybridum* / Apfelbeck [red edges, label printed in red] // *hybridum* Apflb. / Typ. [handwritten]" (HNHM). The specimen lacks part of the fore tarsi and of the posterior right tarsi.

- 1 male with dissected aedeagus and five labels: "Apfelbeck / Varipopi / Ch. Panetsu [printed] // ♂ [printed] / Sammlung / Apfelbeck [printed] // Type [pink, printed] // *nitidulum* / v. *hybridum* / Typus! ♂ apf [handwritten]" (NHMB).

We here designate this male specimen as the Lectotypus of *nitidulum hybridum* and we add the following red label: *Bembidion nitidulum hybridum* Apfelbeck, 1904 – LECTOTYPUS – P. Neri & L. Toledano des. 2015.

To the remaining three specimens, we add the following label: *Bembidion nitidulum hybridum* Apfelbeck, 1904 – PARALECTOTYPUS – P. Neri & L. Toledano des. 2015.

The following specimens labelled as "Cotype or "Typus" do not come from the type locality mentioned in the original description, therefore they do not belong to the type series:

- 1 immature male with dissected aedeagus and three labels: "Apfelbeck / Jannina / Emin Aga H. [printed] // COTYPE [pink, printed] // Col. Prof. Dott. Noesske / Ankauf 1947 [printed]" (SMTD).

- 1 male with dissected aedeagus and six labels: "Asia-minor / Sabandja / v. Bodemeyer [printed] // *nitidulum* / v. *hybridum* m. [handwritten] // TYPUS [pink, printed] // O. Leonhard [printed] // *B. nitidulum* / v. *hybridum* / Apflb. [handwritten] // DEI Müncheberg / Col-04722 [printed]" (SDEI).

- 1 female with dissected spermatheca and three labels: "Asia – Minor / Goek – Dag / v. Bodemeyer [printed] // *Bembidium* / *nitidulum* / var. nov. / *hybridum* / Cotyp. Apfelbeck [handwritten] // Museum für Naturkunde / Berlin / (MNB) [printed]" (MNB). The specimen lacks the right anterior leg and some antennomeres of the right antenna.

- 1 male with dissected aedeagus and three labels: "Asia – Minor / Goek – Dag / v. Bodemeyer [printed] // *nitidulum* / v. *hybridum* / Apfl. Type [handwritten] // Museum für Naturkunde / Berlin / (MNB) [printed]" (MNB).

To the four specimens mentioned above has been

added the following label: “Non typus – P. Neri & L. Toledano vid. 2015”.

The last three specimens from Turkey have been redetermined and so labelled: *Bembidion* (*Peryphanes*) *adygorum* Bel. & Sok., 1996 – P. Neri & L. Toledano det 2015. The reasons will be explained later.

We have also received ten specimens, all bearing the same printed label with collecting data (Apfelbeck // Jannina // Emin Aga H.), originally coming from the Apfelbeck Collection, and all formerly retained or labelled as *hybridum* (4 females, 1 male from SMTD, 1 female from MNHN [Coll. Pic], 1 male 1 female from MNB and 2 males from SDEI).

Also, we have checked numerous specimens of *brunnicornis* DEJEAN, 1831 from the Balkan Peninsula and *dalmatinum* from Balkan Peninsula and Turkey (MNB, PN).

We have also examined many specimens from Turkey identified as *dalmatinum hybridum* actually showing elytra with complete microsculpture, more or less impressed (PN, NHMW, MNB [coll. Korge]); all the specimens from Turkey mentioned above have been redetermined and labelled as follows: *Bembidion* (*Peryphanes*) *adygorum* Bel. & Sok., 1996 – P. Neri & L. Toledano det 2015.

Discussion and conclusions. As the genitalia of the three dissected specimens of *dalmatinum hybridum* belonging to the type series are identical to those of the nominotypical form of *dalmatinum*, we need to check the diagnostic characters mentioned by APFELBECK (1904) in the original description: *hybridum* is recognizable from *dalmatinum* from Central Greece by the flatter eyes, the narrower humeri, the less parallel elytra showing coarser striae and evidently microsculptured apex.

Regarding the first four mentioned characters, from the comparison of many specimens of the type form of *dalmatinum* (including specimens from Dalmatia, Zara) with the type series of *hybridum*, we do not find differences of subspecific value; regarding the elytral microsculpture, we see that according to APFELBECK (1904) and MÜLLER (1918) *dalmatinum* f. typ., in both sexes, is completely smooth, not microsculptured; the following authors (MÜLLER-MOTZFELD, 2004; NITZU, 2006; MÜLLER-MOTZFELD & MARGGI, 2011) state that the elytral microsculpture may be present at the apex or at the extreme end of the apex. Furthermore MÜLLER (1918) says that the only difference he found between the two subspecies is the elytral microsculpture; during this study we ascertained that the elytral microsculpture in *dalmatinum* f. typ. may be completely missing or present in the apical fifth; since this microsculpture is variable, this character, used to distinguish *dalmatinum* f. typ. and *hybridum* must be considered as only intraspecific variability.

After this examination we conclude *dalmatinum hybridum* is a synonym of *dalmatinum* f. typ. and we formally state the following synonymy (with junior

synonym listed first):

Bembidion (*Peryphanes*) *dalmatinum hybridum* APFELBECK, 1904 = *Bembidion* (*Peryphanes*) *dalmatinum dalmatinum* DEJEAN, 1831 n. syn.

To all the specimens from Greece mentioned above has been added the following label: *Bembidion* (*Peryphanes*) *dalmatinum dalmatinum* Dejean, P. Neri & L. Toledano, 2015 det.

***Bembidion* (*Peryphanes*) *adygorum* BELOUSOV & SOKOLOV, 1996**

Type material examined. Paratype, male, with two printed labels: “W Caucasus / Krasnodar prov. / Sochi, Solokhau / Shakhe River / 21.VI.86 / leg. A. G. Koval // PARATYPUS / *Bembidion* (*Peryphanes*) / *adygorum* sp. n. / Belousov & Sokolov 1996 [red]” (CTVR).

Additional material examined. 1 female, Krasnod. Kr. NW, Cauc. Temnolesskaia nr. Mezmai, 850 m 9.VI.1999, A. Smetana (CTVR); 1 male, Georgia NE, Zemo Artani, N of Tbilisi 13.6.2014, N of Tianeti, Snížek lgt. (CTVR); 1 male, NE Turkey Cankurtaran, Geçidi 20 Km E Hopa, 700 m, 4123N 4133E, 26-27. VI.1999, lgt. E. & P. Hajdaj (CTVR); 1 female, Turkey NE 24-26.VI.1999, Altindere Mili Parki, Maçka env 1600-1900 m, T. Lackner lgt. (CTVR); 2 females, Tr. or. bor., Cankurtaran pass., dep Artvin, 1000 m 16-17.7.1997, lgt. T. Kopecky (CTVR).

The following specimens from Turkey, actually belonging to *adygorum*, were wrongly identified as *dalmatinum hybridum*:

1 male, Turchia Vil Ordu, Passo a S di Aybasti m 1430, 5.V.1987, P.M. Giachino leg. (PN); 1 female, Asia-Minor, Goek – Dag, v. Bodemeyer (SDEI); 1 female, Asia-Minor, Goek – Dag, v. Bodemeyer (NHMW); 1 male, Asia-Minor, Goek – Dag, v. Bodemeyer (MNB); 3 male 5 females, Anatolia bor., Abant – Geb. bei Bolu, 30.V.1964, leg. H. Korge (MNB); 6 females, Bolu, As. Min., Waldbach, 20.VII.1963, leg. H. Korge (MNB); 1 female, Anatolia bor., Kulakkaia bei, Giresun 1450 m, leg. H. Korge ((MNB); 1 male, Anatolia bor., Abant – Gebirge, Waldzone, 11.VII.1970, leg. H. Korge (MNB); 1 male 1 female, Asia minor, Abant – Geb., 1100-1500 m, 8.8.1963, leg. H. Korge (MNB); 1 male, Anatolia bor., Ilgaz - dagl. 1800 – 2200 m, 23.7.1963, leg. H. Korge (MNB).

We have also examined three specimens labelled as “Paratypus” that actually do not appear in the original description and therefore are not part of type series:

- 1 female, with dissected spermatheca, with three printed labels “female // W Caucasus / Abkazia / Bzybian Mt. R / Mt. Turetskaya Shapka / 8.VIII.88 h 1000 / leg. A. G. Koval // PARATYPUS / *Bembidion* (*Peryphanes*) / *adygorum* sp. n. / Belousov & Sokolov 1996 [red]” (CTVR).

- 1 male, with two printed labels: “W Caucasus /

Abkazia / Bzybian Mt. Range / Mt. Turetskaya Shapka / 2.VIII.88 h 800 / leg. A. G. Koval // PARATYPUS / *Bembidion* (*Peryphanes*) / *adygorum* sp. n. / Belousov & Sokolov 1996 [red]” (CTVR).

- 1 female, with dissected spermatheca, with three printed labels: “female // W Caucasus /Abkazia / Bzybian Mt. Range / Mt. Turetskaya Shapka / 2.VIII.88 h 800 / leg. A. G. Koval // PARATYPUS / *Bembidion* (*Peryphanes*) / *adygorum* sp. n. / Belousov & Sokolov 1996 [red]” (PN).

Historical notes and conclusions. BELOUSOV & SOKOLOV (1996), in the description of *adygorum*, already correctly stated that the Caucasian specimens attributed to *dalmatinum hybridum* actually must be assigned to *adygorum*; with the synonymy of *hybridum* with *dalmatinum* we still need to understand to which species the Turkish specimens identified as *hybridum* belong.

The specimens from Turkey are identical to the examined paratype of *adygorum* and to the other specimens identified by Belousov & Sokolov as *adygorum* (fully microsculptured elytra in both sexes, even though sometimes almost invisible in the anterior elytral half; identical male genitalia; identical external characters); this allows us to extend to Northern and Eastern Turkey the presence of *Bembidion* (*Peryphanes*) *adygorum* BELOUSOV & SOKOLOV, 1996. Also the record for Turkey of *deletum* SERVILE, 1821 (= *nitidulum* MARSHAM, 1802) mentioned by NERI & GUDENZI (2013), in the keys for the *Peryphanes* of Turkey, must be referred to *adygorum*; in those keys, *adygorum* must be assigned to the n.13 and n.16 and *deletum* must be removed; obviously the text should be modified. At present we do not know of *deletum* from Asian Turkey.

Note. In MARGGI et al. (2003) and LORENZ (2005) *nitidulum* ab. *reticulatum* IABLOKOFF-KHNZORIAN, 1976 is still reported as a synonym of *deletum*; its synonymy with *adygorum* has already been stated by BELOUSOV & SOKOLOV, 1996.

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