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Distribution and morphometrical variability of *Ptomaphagus* (*Merodiscus*) *validus* (Coleoptera: Leiodidae: Cholevinae)

Rozšíření a morfometrická variabilita druhu *Ptomaphagus* (*Merodiscus*) *validus* (Coleoptera: Leiodidae: Cholevinae)

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Abstract. New data on the distribution of *Ptomaphagus* (*Merodiscus*) *validus* (Kraatz, 1852) from Central and south-eastern Europe are presented. The known distributional range is extended as the species is reported from northern Hungary (in the present delimitation), Slovenia, Croatia and Bulgaria for the first time; further records from Serbia and Romania are given. All available distributional records are mapped. The variability of an additional character of certain diagnostical importance (ratio of antennomere III to II) is discussed. This ratio is positively correlated to the total body size (represented by the pronotal width) in *P.* (*M.*) *validus*, and its values overlap in the latter species and in the closely related *P.* (*M.*) *biharicus* Jeannel, 1934.

The genus *Ptomaphagus* Illiger, 1798 with 129 described species has recently been divided into 7 subgenera (Gnaspini 1996). The subgenus *Merodiscus* Jeannel, 1934 is distributed in Central and south-eastern Europe and contains only 2 known species (Růžička 1993) - *P.* (*M.*) *validus* (Kraatz, 1852) and *P.* (*M.*) *biharicus* Jeannel, 1934. A redescription of both species, a key to their identification and illustrations of important morphological characters were given by Růžička (1993).

In this paper, new data on the distribution of *P.* (*M.*) *validus* are presented, based on the recently studied material from different museum and private collections. All known localities are mapped (Fig. 1). Moreover, morphological variability of an additional character of certain diagnostical importance in this species is discussed.

The recent locality names are standardised according to Anonymus (1996). Original names from locality labels are given in round brackets and quotation marks (if different from the recent ones); names of collectors are retained in the text as given on locality labels. Additional explanations and comments, not present on original locality labels, are given in square brackets.

Only specimens not listed in Růžička (1993) are given under material examined. As regards literature data, only further localities that were not covered in the recently studied material (for exhaustive list of references, see Růžička (1993)) are presented.

The following abbreviations for material depositories are used in the text: JRUC - collection of Jan Růžička, Praha; NHMB - Naturhistorisches Museum, Basel (M. Brancucci); MGFT - collection of G. Frey in NHMB; MMBC - Moravské zemské muzeum, Brno (J. Kolibáč); MNHM - Természettudományi Muzeum, Budapest (O. Merkl); PMOC - collection of Pavel Moravec, Litoměřice; RROC - collection of Rudolf Rous, Praha; ZMAS - Zoological Museum, Academy of Sciences, St. Petersburg (M. G. Volkovitsh); ZSMC - Zoologische Staatssammlung, München (M. Baehr).

Ptomaphagus (*Merodiscus*) *validus* (Kraatz, 1852)

Material examined. Slovakia: Slavec - Gombasek, 9.v.[19]72, A. Sobota lgt., J. Gottwald det. 1974, W. Szymczakowski revid. 1975, 1 ♂ (NHMB); **Hungary:** Aggteleki Nat. Park, Égerszög,



Fig. 1. Distribution of *Ptomaphagus* (*Merodiscus*) *validus* (Kraatz) in Central and south-eastern Europe: 1 – Slavec env., Gombasek, 2 - Égerszög, Soltész-szomboly, 3 - Szin, Szelcepuszta, 4 - Szögliget, Patkós-völgy, 5 - Rtanj planina, 6 - Romăneşti nr. Făget, 7 - Bocşa nr. Reşiţa, 8 - Reşiţa, 9 - Semenic mt., 10 - Oraviţa, 11 - Dealu Cosiu mt., 12 - Mehadia, 13 - Băile Herculane, 14 - Domogled mt., 15 - Ludbreg, 16 - Ledenika. The record from Ukraine: Purkary is not figured.

Obr. 1. Rozšíření druhu *Ptomaphagus* (*Merodiscus*) *validus* (Kraatz) ve střední a jihovýchodní Evropě: 1 – Slavec env., Gombasek, 2 - Égerszög, Soltész-szomboly, 3 - Szin, Szelcepuszta, 4 - Szögliget, Patkós-völgy, 5 - Rtanj planina, 6 - Romăneşti nr. Făget, 7 - Bocşa nr. Reşiţa, 8 - Reşiţa, 9 - Semenic mt., 10 - Oraviţa, 11 - Dealu Cosiu mt., 12 - Mehadia, 13 - Băile Herculane, 14 - Domogled mt., 15 - Ludbreg, 16 - Ledenika. Údaj z Ukrajiny (Purkary) není zobrazen.

Soltész-szomboly [cave], 151 m-re a bejárattól [151 m from the entrance], 1965-1967, D. Bajomi lgt., 1 ♀ (MNHM); Aggteleki Nat. Park, Szögliget, Patkós-völgy [valley], Melittidi-Fagetum, v.-viii.1987, L. Ádám & Gy. Szél lgt., tajaczapda [pitfall trap], 3 ♂♂ 2 ♀♀ (MNHM, JRUC); Aggteleki Nat. Park, Szin, Szelcepuszta, Waldsteinio-Querco-Carpinetum, vi.1987-2.iv.1988, O. Merkl lgt., tajaczapda [pitfall trap], 1 ♀ (MNHM); **Slovenia:** "Carniolia" [without precise locality], Reitter [lgt.], 1 ♀ (RROC); **Croatia:** Ludbreg, Apfelbeck [lgt.], 2 ♀♀ (MNHM); **Serbia:** Rtanj planina, Breit [lgt.], 2 ♀♀ (MGFT); "Serbien" [without precise locality], coll. Cl. Müller, 2 ♂♂ (ZSMC); "Serbien" [without precise locality], Kiesenwetter [lgt.], coll. Cl. Müller, 1 ♂ (ZSMC); **Romania:** Poiana Ruscăi mts., Romăneşti nr. Făget ("Rumunyest"), 1882, Pável lgt., 1 ♀ (MNHM); Aninei mts., Reşiţa env. ("Resicza-bánya"), coll. E. Csiki, 1 ♀ (MNHM); Cernei mts., Mehadia nr. Băile Herculane ("Krassó-Szörény m[egye] [= district], Mehádia"), 17.iv.1915, Dr. J. Fodor lgt., 1 ♂ 2 ♀♀ (MNHM); Băile Herculane ("Herkulesbad"), v. Bodemeyer lgt., 1 ♂ (coll. K. Mazura, MMBC); ditto, Breit lgt., 1 ♂ 3 ♀♀ (MGFT); ditto, 1932, Dr. Mertens [lgt.], 1 ♂ 1 ♀ (MGFT); ditto ("Herkulesfürdő"), vii.1907, Wachsmann [lgt.], 1 ♂ (MNHM); ditto, v.1925, Victor Stiller [lgt.], 1 ♂ (MNHM); ditto, v.1931, Victor Stiller [lgt.], 1 ♂ 1 ♀ (MNHM); Mehedinţi mts., Domogled mt. nr. Bile Herculane ("Domuglet"), Frivaldszky [lgt.], 1 ♂ (MNHM); Mehedinţi mts., Cerna valley, Dealu Cosiu mt., 350-450 m, 28.vi.-3.vii.1996, [baited pitfall trap placed deeply in mesocavernous shallow stratum (MSS)], Fagetum, Pavel Moravec lgt., 1 ♂ (PMOC); "Nagy Bogsán" [not located], [18]94, [E.] Merkl [lgt.], coll. Dr. K. Daniel, 1 ♂ (ZSMC); "Hungaria merid." [without precise locality], coll. Reitter, 2 ♀♀ (MNHM); ditto, Dr. Weber [lgt.], coll. Reitter, 2 ♂♂ (ZSMC); ditto, [E.] Merkl [lgt.], 1 ♀ (MGFT); "Hungaria" [without precise locality], [No.] 2061, coll. E. Frivaldszky, 1 ♂ 1 ♀ (ZSMC); ditto, coll. v. Seidlitz, 1 ♂ (ZSMC); ditto, 1 ♀ (MGFT); **Bulgaria:** Vračanska planina, Ledenika [village], 26.-28.v.1996, T. Růžička lgt., [pitfall trap baited with ripe cheese, in a sinkhole on a pasture], 1 ♀ (JRUC).

Literature data. Romania: Oraviţa ("Oravitza") - Kuthy (1897); Semenic mts., Semenic mt. ("Petra Semenicu"); Docnecei mts., Bocşa nr. Reşiţa ("Német Bogsán") - both Růžička (1993); **Ukraine:** Bilhorod-Dnistrovs'kyj ("Akkerman, Purkary") - Růžička (1993).

Distribution. The species is known from southern Slovakia, northern Serbia, south-western Romania and southern Ukraine (Růžička 1993 and references therein). The material labelled "Hungaria" and "Hungaria merid." was probably collected in south-western Romania (formerly, this region formed a part of Hungary). The species is reported from northern Hungary (and from Hungary in the recent delimitation at all), Slovenia, Croatia and Bulgaria in this paper for the first time. It was erroneously reported from Moldavia (Perkovsky 1990), based on incorrectly interpreted specimens from Bilhorod-Dnistrovs'kyj ("Akkerman, Purkary") that are deposited in ZMAS (see Material examined). Altogether, 17 localities of *P.* (*M.*) *validus* have been found, based on 39 specimens studied. The map of all available distributional records is presented in Fig. 1.

Bionomy. The distributional pattern indicates a close affinity of the species to karst regions. All specimens (adults) were collected from April to August.

Morphological variability. The closely related *P.* (*M.*) *biharicus* was described after a single minute female specimen from Detunata mt. (Jeannel 1934). Later, Růžička (1993) associated another minute female specimen from Slovakia, Dolný vrch ridge with *P.* (*M.*) *biharicus*. According to Jeannel (1934, 1936) and Růžička (1993), *P.* (*M.*) *validus* can be distinguished from *P.* (*M.*) *biharicus* mainly by the proportions of antennomeres: antennomere III is ca. 2.5 times as long as antennomere II in *P.* (*M.*) *validus*, but only ca. 2.0 times in *P.* (*M.*) *biharicus*.

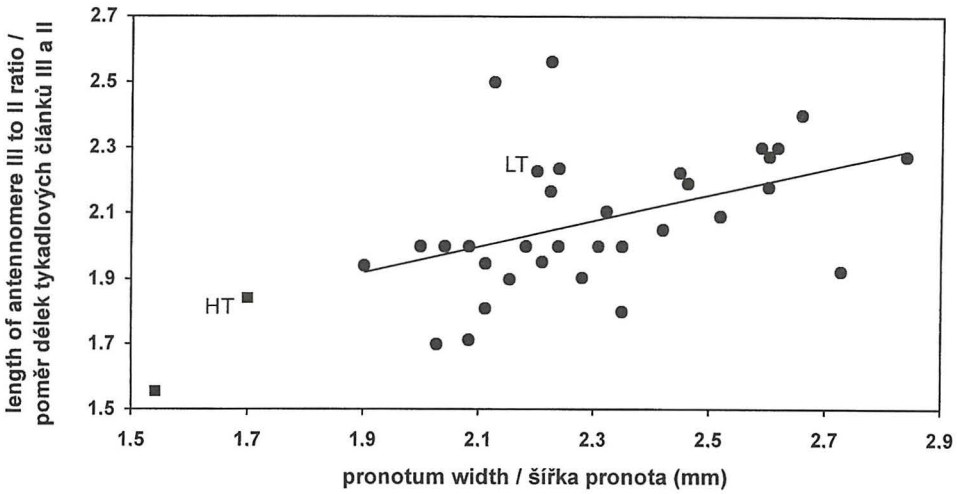


Fig. 2. Correlation between the antennomere III / antennomere II length ratio and width of pronotum in *P.* (*M.*) *validus* (Kraatz) [solid circles; Spearman rank correlation coefficient used, see text for details; LT = lectotype of *P.* (*M.*) *validus*] and *P.* (*M.*) *biharicus* Jeannel [solid squares; HT = holotype of *P.* (*M.*) *biharicus*].
Obr. 2. Korelace poměru délek třetího a druhého tykadlového článku se šířkou pronota u druhů *P.* (*M.*) *validus* (Kraatz) [plná kolečka; hodnoceno pomocí Spearmanova korelačního koeficientu, blíže viz text; LT = lektotypus druhu *P.* (*M.*) *validus*] a *P.* (*M.*) *biharicus* Jeannel [plné čtverečky; HT = holotypus druhu *P.* (*M.*) *biharicus*].

However, in the material of *P.* (*M.*) *validus* examined here (n = 33 specimens), the ratio of length of antennomere III to antennomere II varies between 1.7-2.6 (mean 2.1, standard deviation 0.2). This variable is positively correlated with the total body size, represented here as the width of pronotum ($r_s = 0.502$, $p < 0.01$, Spearman rank correlation coefficient; Fig. 2). The holotype specimen of *P.* (*M.*) *biharicus* is very small, with pronotum only 1.7 mm wide, compared to 1.9-2.8 mm (mean 2.3 mm, standard deviation 0.3 mm) in *P.* (*M.*) *validus*. The validity of *P.* (*M.*) *biharicus* thus needs further confirmation, it is possible that the holotype of *P.* (*M.*) *biharicus* is only an extremely minute specimen of *P.* (*M.*) *validus*.

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SOUHRN

Práce shrnuje nové údaje o rozšíření druhu *Ptomaphagus* (*Merodiscus*) *validus* (Kraatz, 1852) ve střední a jihovýchodní Evropě. Druh byl do současnosti znám z jižního Slovenska, severního Srbska, jihozápadní části Rumunska a z jihu Ukrajiny (Růžička 1993). [Starý materiál, lokalizovaný „Hungaria" nebo „Hungaria merid." byl ale pravděpodobně sbírán na jihozápadě Rumunska (dříve bylo toto území částí Maďarska)]. Poprvé jsou uvedeny nálezy *P.* (*M.*) *validus* ze severního Maďarska, Slovinska, Chorvatska a Bulharska. Celkem bylo studováno 39 exemplářů, druh je nyní znám ze 17 konkrétních lokalit (obr. 1). Svým rozšířením se druh *P.* (*M.*) *validus* zdá být vázaný na krasové oblasti. Všechny nálezy pocházejí z rozmezí dubna až srpna.

Blízce příbuzný druh *P.* (*M.*) *biharicus* Jeannel, 1934 byl popsán podle jediné drobné samice, nalezené v Bihoru na hoře Detunata (Jeannel 1934). Později byl k tomuto druhu přiřazen i další malý samičí exemplář ze Slovenska (Slovenský kras: Dolný vrch; Růžička 1993). Podle prací Jeannela (1934, 1936) a Růžičky (1993) spočívá hlavní rozdíl mezi oběma druhy zejména v poměru délek tykadlových článků III a II – poměr je cca 2,5 u *P.* (*M.*) *validus*, ale pouze cca 2,0 u druhu *P.* (*M.*) *biharicus*.

Na základě zde studovaného materiálu druhu *P.* (*M.*) *validus* (n = 33 ex.) byl ale zjištěn poměr délek třetího a druhého tykadlového článku v rozmezí 1,7-2,6 (průměr 2,1, směrodatná odchylka 0,2). Navíc je tato hodnota pozitivně korelována s celkovou velikostí těla, reprezentovanou jako šířka pronota ($r_s = 0{,}502$, $p < 0{,}01$, Spearmanův korelační koeficient; obr. 2). Holotypus druhu *P.* (*M.*) *biharicus* je velmi malý, s pronotem pouze 1,7 mm širokým, ve srovnání s druhem *P.* (*M.*) *validus*, u něhož šířka pronota dosahuje hodnot 1,9-2,8 mm (průměr 2,3 mm, směrodatná odchylka 0,3 mm). Validita druhu *P.* (*M.*) *biharicus* tedy žádá další potvrzení a je možné, že holotypus tohoto druhu je pouze extrémně malý exemplář druhu *P.* (*M.*) *validus*.