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AKADÉMIAI KIADÓ

Platycranus metriorrhynchus: A new Mediterranean plant bug in Hungary (Heteroptera: Cimicomorpha: Miridae: Orthotylinae)

Péter Kóbor[1,2*]

[1] Plant Protection Institute, Centre for Agricultural Research, HUN–REN, Budapest, Hungary

[2] Department of Integrated Plant Protection, Institute of Plant Protection, Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő, Hungary

RESEARCH ARTICLE

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ABSTRACT

Platycranus metriorrhynchus Reuter, 1883, the first representative of the predominantly Holomediterranean plant bug genus, *Platycranus* Fieber, 1870 is reported as a new element of the Hungarian true bug fauna. Diagnostic characters and bionomics of the species are discussed.

KEYWORDS

Heteroptera, true bugs, new record, faunal changes, mediterranization

INTRODUCTION

The cimicomorphan family Miridae Hahn, 1833 with its approximately 11,000 described species is one of the eleven hyper-diverse insect families of the World (Cassis and Schuh, 2012).

* Corresponding author. E-mail: kobor.peter@atk.hun-ren.hu

Representatives of the family are distributed in all biomes with temperate and warm climate and play diverse roles in ecosystems (Henry and Wheeler, 2019). Several species among them are of agricultural importance either as pests of cultivated crops or beneficial control agents of harmful weed or arthropod populations (Wheeler, 2000, 2001). Furthermore, new data elucidated the role of some species in pollination of dicotyledonous plants (Etl et al., 2022; Garcia et al., 2023). However, the true scale of the importance of plant bugs is hard to assess due to the deficiencies in taxonomic and faunistic knowledge of the mirid true bugs in many regions which is a prerequisite of exploratory and applied ecological studies.

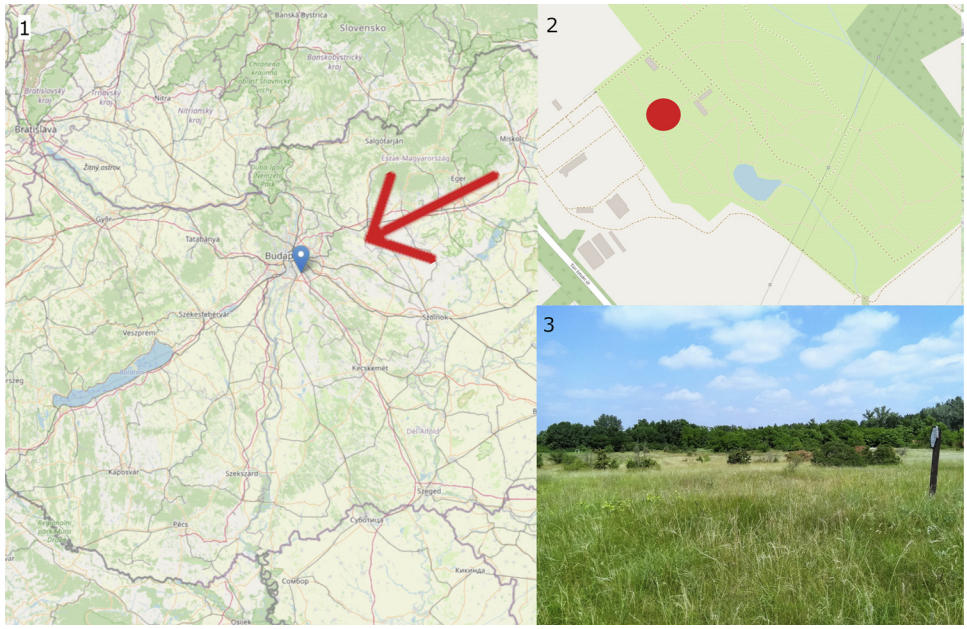
The Pannonian biogeographic region can be considered as one of the less known territories in terms of its plant bug diversity because in course of the nearly 150-years research history of the Heteroptera fauna of the Carpathian basin the study of this family was virtually neglected. Besides the authoritative enumerations of the heteropteran insects of the Hungarian Kingdom by Horváth (1897), and the most recent checklist of the Heteroptera of Hungary (Kondorosy, 1999, 2005), knowledge regarding the composition of mirid true bug fauna of the county was resulted by faunistic surveys of specific areas, study of insect assemblages colonizing particular plant cultures, and data resulting from conservation and community ecological studies with the occasional reports of new faunal elements as reviewed by Kóbor (2021). Currently 291 species of family Miridae are recorded from Hungary which accounts for approximately one-third of the total Heteroptera fauna. However, this number will certainly increase in the future by 1) recording previously unnoticed indigenous species; 2) human-mediated introduction of alien species; and 3) area expansion of Mediterranean species as a result of climate change (Bale et al., 2002; Rabitsch, 2008a, b; Régenière et al., 2012; Putshkov, 2013; Tabak et al., 2017).

The representatives of the genus *Platycranus* Fieber, 1870 are small to medium-sized true bugs belonging to the subfamily Orthotylinae Van Duzee, 1916. The genus is currently consisting of two subgenera – *Platycranus* Fieber, 1870 and *Genistocapsus* Wagner, 1955 – with 13 currently valid species after the profound revisionary work of Knyshov and Konstantinov (2013). Species included are associated with the legume tribe Genistae (Fabaceae; sensu Polhill, 1976) and are distributed mostly in the Euromediterranean region, except *Platycranus bicolor* (Douglas and Scott, 1868) known from Western Europe with the northernmost records from Ireland and *Platycranus remanei* Wagner, 1955 with its distribution reaching Ukraine in the East (Knyshov and Konstatinov, 2013).

The present study reports the first occurrence of the species *Platycranus metriorrhynchus* Reuter, 1883 as the first known representative of the genus and the northernmost record of the species from Hungary with notes on its bionomics, importance and possibility of the occurrence of further *Platycranus* species.

MATERIAL AND METHODS

The specimen studied was collected in course of the monitoring of the Heteroptera fauna in the Soroksár Botanical Garden, Budapest, Hungary (GPS: 47°23′58.4″N 19°09′14.1″E; Figs 1–3). The specimen is deposited in the author's personal collection (PCPK – Personal Collection of Péter Kóbor, HUN–REN Centre for Agricultural Research, Plant Protection Institute, Budapest, Hungary).



Figs 1–3. Collection site of *P. metriorrhynchus* in Hungary: 1. Location of the Soroksár Botanical Gardens; 2. map of the study site; 3. photo of the sand steppe habitat fragment (map source: https://www.openstreetmap.hu/; habitat photo was taken by the author)

Exoskeletal characters were studied, and photomicrographs were done with Kern Optics OZL 466 stereoscopic microscope. Photomicrographs were done with Keyence VHX 5000 digital microscope.

The specimen was identified, and the morphology was adapted from Wagner (1974) and Knyshov and Konstatinov (2013). Bibliographic, distribution and host plant data were compiled based on Kerzhner and Josifov (1999), Aukema et al. (2013), Knyshov and Konstantinov (2013), and the Plant Bug Planetary Biodiversity Inventory (Schuh, 2023). Terminology for chorotypes was adapted from Heiss and Josifov (1990).

RESULTS

Family **Miridae** Hahn, 1833
Subfamily **Orthotylinae** Van Duzee, 1916
Tribe **Orthotylini** Van Duzee, 1916
Genus ***Platycranus*** Fieber, 1870
Type species: ***Platycranus erberi*** Fieber, 1870: 252 (by monotypy)

Diagnosis. *Platycranus* can be readily distinguished from other Hungarian representatives of Orthotylinae with the combination of the following characters: head conspicuously wide (almost as wide as pronotum in males) with relatively flat vertex and transversal keel at base; pubescence

consisting of the combination of short, semierect and longer scale-like setae. Detailed generic diagnosis is provided in the revision of Knyshov and Konstantinov (2013).

Distribution. Predominantly Euro-Mediterranean with northernmost records from Ireland, westernmost records form the Canary Islands and Portugal, and easternmost records from Ukraine, Israel and Jordan.

Notes. The genus was subdivided into two subgenera, i.e., *Platycranus* and *Genistocapsus* by Wagner (1956) based on the combination of the following characters: labium in subgenus *Platycranus* short, at most slightly surpassing fore coxae (in *Genistocapsus*, labium at least reaching middle coxae); in *Platycranus* head elongate with vertex flat (in *Genistocapsus* head short, declivent with vertex and clypeus somewhat concave); eyes in *Platycranus* large compared to the width of head (ratio: 1: 0.9–1.9) and protruding above vertex in males (eyes in males of *Genistocapsus* smaller compared to the width of head (ratio: 1: 1.5–2.7), not protruding above vertex).

Subgenus ***Genistocapsus*** Wagner, 1956: 421, 424

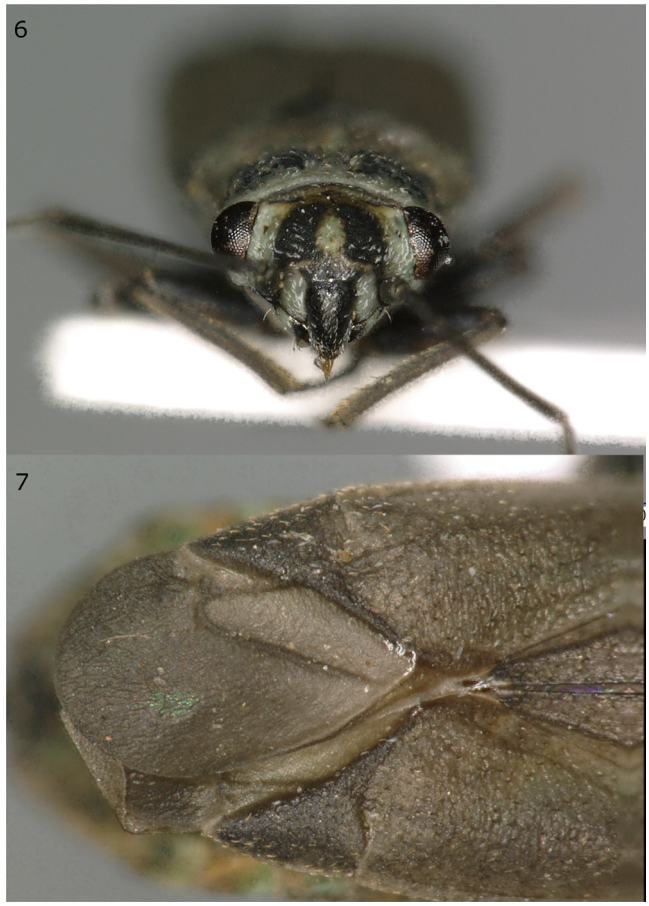
Type species: ***P. metriorrhynchus*** Reuter, 1883 (by original designation)

P. metriorrhynchus Reuter, 1883: 252

Figs 4–7.

Studied material: "Soroksár Botanical Gardens, Budapest, sweep netting in sand steppe, 30. vi. 2023" (1f, PCPK).

Figs 4–5. Dorsal habitus (4) and lateral view (5) of *P. metriorrhynchus* (female, PCPK)



Figs 6–7. Detail pictures of *P. metriorrhynchus* (female, PCPK): 6. pattern of head in frontal view; 7. cuneus and membrane of hemelytron (images are not to scale)

Diagnosis. Head mostly pale green with irregular spots at base of vertex adjacent to compound eyes, a large blackish region on the anterior part of vertex and clypeus interrupted by a pale green drop-shaped spot medially (Fig. 6). Antennomere I black, antennomere II brown with apex blackish, antennomere III-IV dark brown. Labiomeres fuscous. Thorax predominantly greenish brown. Pronotum with anterior margin pale green and pronotal callosities black. Cuneus with irregular dark brown spot continuing in a fading band along the apical margin of corium (Fig. 7). Femora black with apex brown, tibiae fuscous, tarsomeres black. Abdomen mostly pale green with irregular ochraceous markings on segments. Habitus moderately elongate, integument covered with yellow scale-like pubescence; total body length: 3.93 mm. Head triangular in dorsal view, vertex and clypeus roundly declivent in lateral view. Ratio of antennomere I to width of vertex: 1: 0.45; ratio of antennomere II to width of vertex: 1: 1.59. Labiomeres reaching the middle coxae. Pronotum trapeziform, anterior margin obscuring the collar dorsally. Pronotal callosities

well-defined, slightly bulging. Pronotum width to length ratio: 1: 1.91; ratio of width of pronotum to width of head: 1: 1.15. Macropterous, hemelytra reaching apex of abdomen. Membrane with a large and small, almost indistinct closed cell; integument finely wrinkled. Tarsal claws evenly curved with pulvilli reaching almost the midline; parempodia strap-like, converging apically.

Similar species. Another species subgenus *Genistocapsus* having records from the region and possibly occurring in Hungary is *P. remanei* Wagner, 1955, known from Slovenia (Knyshov and Konstantinov, 2013) which can be readily distinguished from *P. metriorrhynchus* based on the lack of extended brown pattern of dorsum (dorsum of *P. remanei* is uniformly greenish yellow.).

Distribution. South European with known area ranging from Portugal (West) to Bulgaria (East) with northernmost records from Trentino-Alto Adige and Friuli-Venezia Giulia regions of Italy; generally considered as montane species (Kment, 2013; Knyshov and Konstatinov, 2013).

Host plant associations. *P. metriorrhynchus* is known from multiple legume species belonging to genera *Cytisus*, *Genista*, and *Sarothamnus* (for a detailed list see Knyshov & Konstantinov 2013).

DISCUSSION

The present study reports the first occurrence of the plant bug species *P. metriorrhynchus* – as well as of the genus *Platycranus* itself – from Hungary. Though the study of genital character – which are considered as pivotal in species-level identification of mirid true bugs – was not (only one female was collected), other diagnostic characters (e.g., coloration pattern of antennae, proportions of body parts) were consistent with those discussed in available literature (e.g., Wagner, 1974; Knyshov and Konstatinov, 2013). Considering the circumstance of collecting, i.e., the distance between the study site and the northernmost previously published records in Italy, Central Dalmatia and Serbia (Protíc, 2011; Kment, 2013; Knyshov and Konstantinov, 2013) the presence of host plants in the Hungarian flora, e.g., *Genista tinctoria* and *Cytisus scoparius*; and the South European chorotype of the species with northernmost occurrences south of the line of the Alps mountain range the appearance of the species can be explained either by older but unnoticed presence or more recent northwards expansion. The former can be attributed to deficient knowledge regarding the mirid true bug fauna of Hungary, while the latter can be explained by the northward expansion of Mediterranean species, i.e., the phenomenon of "mediterranization" in Central European insect faunas (Rabitsch, 2008b; Putchkov, 2013). On the other hand, the possibility of translocation with ornamental plants also cannot be excluded though it is rather unlikely because none of the host plants of the species – viz. *Cytisus* and *Genista* species – were not planted in the past years (Mária Höhn, pers. comm.).

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