

A review of the plant bug genus *Macrotylus* distributed in Hungary (Heteroptera: Miridae)

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RESEARCH ARTICLE

Received: September 27, 2021 • Revised manuscript received: October 22, 2021 • Accepted: October 26, 2021

Published online: November 19, 2021

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ABSTRACT

An overview on the representatives of the host plant specialist phyline genus *Macrotylus* Fieber, 1858 (Hemiptera: Heteroptera: Miridae: Phylinae) distributed in Hungary is presented, including key, diagnoses, along with taxonomic, biogeographic, and ecological notes to the discussed species. First occurrences of *Macrotylus quadrilineatus* (Schrank, 1825) in Hungary are reported.

KEYWORDS

Macrotylus, Miridae, Phylinae, new record, key

INTRODUCTION

The family Miridae (Hemiptera: Heteroptera: Cimicomorpha) – commonly known as plant bugs – is one of the least studied heteropteran families in terms of the biodiversity research of the Carpathian Basin. After Horváth's (1897) extensive enumeration of the heteropteran insects of the former Kingdom of Hungary, the study of this family mostly consisted of new faunistic records of species (e.g. Rédei, 2006; Varga et al., 2014; Korányi et al., 2018). Faunistic studies concerning certain areas within Hungary (e.g. Kondorosy, 2001; Bakonyi et al., 2002; Kondorosy, 2011; Lőrinczi et al., 2011) or assemblages colonizing particular plant species or cultures

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(e.g. Kondorosy and Kutyaáncsánin, 2001; Kolics and Kondorosy, 2007) have also been published. Further knowledge was resulted by biomonitoring, conservation and community ecology studies, in which true bugs receiving an increasing attention (e.g. Torma and Császár, 2013; Torma et al., 2014, 2017, 2019; Deák et al., 2020). Kondorosy (1999) compiled a checklist of 276 mirid species occurring in Hungary. Subsequently 11 species were added in a supplement of the above checklist (Kondorosy, 2005) and further three species were reported thereafter (Rédei, 2006; Varga et al., 2014; Korányi et al., 2018). The current list of plant bugs occurring in Hungary accordingly contains 289 species, which means that plant bugs represent approximately one third of the country's Heteroptera fauna, but due to lack of aimed surveys specifically focussing on this diverse and taxonomically difficult family, the ongoing faunal transformations driven by climate change (Bale et al., 2002; Régnière et al., 2012) and anthropogenic introductions (Tabak et al., 2017), this number will certainly increase in the future.

The genus *Macrotylus* Fieber, 1858 with its 69 valid species is the largest genus of the phylinae subtribe Cremonorrhinina Reuter, 1883 (Miridae: Phylinae: Cremonorrhinini) (Schuh and Menard, 2013; Menard et al., 2014). Representatives of *Macrotylus* are mostly distributed in the Holarctic Region, although three species are known exclusively from South Africa (Schuh, 1974; Salas and Schuh, 2018). The Palaearctic fauna of the genus consists of 57 species, of which 36 are distributed in the Euro-Mediterranean region (Wagner, 1974; Schuh, 2020). Representatives of the genus are mono- or oligophagous herbivores (Göllner-Scheiding, 1972; Wagner, 1974). The authoritative Catalogue of the Heteroptera of the Palaearctic Region (Kerzhner and Josifov, 1999) listed five species from Hungary. Occurrence of further species is plausible because of their presence in neighbouring countries.

The present study reviews the representatives of the genus *Macrotylus* distributed or potentially occurring in Hungary, including the first record of *Macrotylus quadrilineatus* (Schrank, 1785) from the country.

MATERIAL AND METHODS

Specimens of *M. quadrilineatus* were collected by József Vikár and were deposited in the personal collection of the author (PCPK). Comparative material was borrowed from the Hemiptera collection of the Hungarian Natural History Museum, Budapest (HNHM).

Bibliographic and distribution data was compiled based on Kerzhner and Josifov (1999) and the Plant Bug Planetary Biodiversity Inventory (Schuh, 2020). Distribution types were adapted from Heiss and Josifov (1990) and Vinokurov (2020).

Specimens were studied and imaging was done with the use of Levenhuk DTX 90 digital microscope controlled with MicroCapture 1.1 software. Photo stacking for habitus images was done with CombineZP software, post-processing was done with GIMP software. Habitus photos for *M. elevatus* and *M. atricapillus* were provided by Attilio Carapezza (University of Palermo, Italy). Morphological terminology, diagnoses and keys were adapted from Wagner (1969, 1974), Carapezza (1997) and Schuh and Menard (2013).

RESULTS

Genus *Macrotylus* Fieber, 1858

Type species: *Macrotylus luniger* Fieber, 1858 (now junior synonym of *Cimex quadrilineatus* Schrank, 1785) by monotypy.



Diagnosis. *Macrotylus* can be readily distinguished from other representatives of the sub-family Phylinae by the combination of the following characters: head moderately elongate, clypeus projecting anteriorly, vertex conspicuously arched; claws evenly and sometimes strongly curved with well-defined tooth-like process basally.

Distribution. Representatives of *Macrotylus* are distributed throughout the Holarctic biogeographic realm apart from three species which occur exclusively in South Africa. Most of the species are Palearctic and more than half of them are distributed in the Euro-Mediterranean region.

Remarks. The genus is currently divided into three subgenera (sensu Wagner, 1969): *Macrotylus* Fieber, 1858; *Alloeonycha* Reuter, 1904 and *Pontodemus* Wagner, 1969. *Pontodemus* is monotypic and it can be readily distinguished by the arrangement of the tarsal claws. *Macrotylus* and *Alloeonycha* can be separated based on the characteristics of male genitalia: a *Macrotylus*-type vesica is bent in U-shape with apical part explanate and bifurcate and the secondary gonoporal process stems from a single spike, whilst the apical part of *Alloeonycha*-type vesica is slender without conspicuous appendages, the secondary gonoporal process stems from two or three at most slightly diverging spikes. The above discussed characters were accurately illustrated by Wagner (1969, 1974).

Ecology. Members of the genus *Macrotylus* are obligate phytophages feeding on herbaceous dicotyledonous plants. Most of the species are mono- or oligophagous host plant specialists.

KEY TO SUBGENERA AND SPECIES OF MACROTYLUS DISTRIBUTED IN THE CARPATHIAN BASIN

1. Body length greater than 5 mm. Male genitalia *Macrotylus*-type (Subgenus *Macrotylus*)..... 2
- Body length at most 5 mm. Male genitalia *Alloeonycha*-type (Subgenus *Alloeonycha*) 3
2. Dorsum uniformly black with whitish irregular, transverse decoration at base and apex of cuneus (Fig. 3). Antennomere II longer than basal width of pronotum. Pronotum with narrow but well-defined collar at anterior margin. Pronotal callosities not separated. *Macrotylus (Macrotylus) quadrilineatus* (Schrank, 1785)
- Dorsum greenish to yellowish, but never uniformly black. Antennomere II subequal in length to basal width of pronotum. Pronotum without collar at anterior margin. Pronotal callosities separated. *Macrotylus (Macrotylus) herrichi* (Reuter, 1873)
3. Apex of antennomere I and base of antennomere II with blackish annulation. 4
- Antennomeres I and II unicolorous, without annulation. 7
4. Antennomere II conspicuously thickened, almost twice as broad as antennomere IV. *Macrotylus (Alloeonycha) elevatus* (Fieber, 1858)
- Antennomere II slender, diameter of antennomeres II and IV subequal. 5
5. Body length at most 2 mm . . . *Macrotylus (Alloeonycha) attenuatus* Jakovlev, 1882
- Body length always more than 2 mm. 6
6. Upper margin of posterior opening of pygophore elevated. Right paramere oval, ratio of length to width as 1: 1.5. *Macrotylus (Alloeonycha) paykulli* (Fallén, 1807)
- Upper margin of posterior opening of pygophore flat. Right paramere elongate, ratio of length to width as 1: 2.5. *Macrotylus (Alloeonycha) atricapillus* (Scott, 1872)



7. Blackish spot at apex of cuneus rounded. Femora with blackish maculae apically.
 *Macrotylus (Alloeonycha) horvathi* (Reuter, 1876)
 - Blackish spot at apex of cuneus elongate. Femora without blackish maculae apically.
 *Macrotylus (Alloeonycha) solitarius* (Meyer-Dur, 1843)

Subgenus *Macrotylus* Fieber, 1858

Macrotylus (s. str.) quadrilineatus (Schränk, 1785)

Figures 1 and 2.

Material studied: Zalabér, Zala County, on *Salvia glutinosa*, 30.viii.2019, leg. J. Vikár (1 m, 2 f, PCPK)

Diagnosis. Blackish species with characteristic whitish decoration on base and apex of cuneus (Fig. 2A, C); dorsum covered with dark pubescence. Vertex of head with a pair of dark ochraceous wedge-like spots (Fig. 2A). Antennae uniformly blackish. Head width greater than length; ratio eye width to width of vertex 1: 2.1 in males, 1: 2.2 in females. Length of antennomere II subequal to pronotum width. Apex of labium surpasses metacoxae. Male pygophore big, conical; tapered suddenly near base and bearing two moderately protruding tubercles



Fig. 1. *Macrotylus quadrilineatus* feeding on *Salvia glutinosa* near Batyk municipality, Zala county, Hungary (photo: J. Vikár)

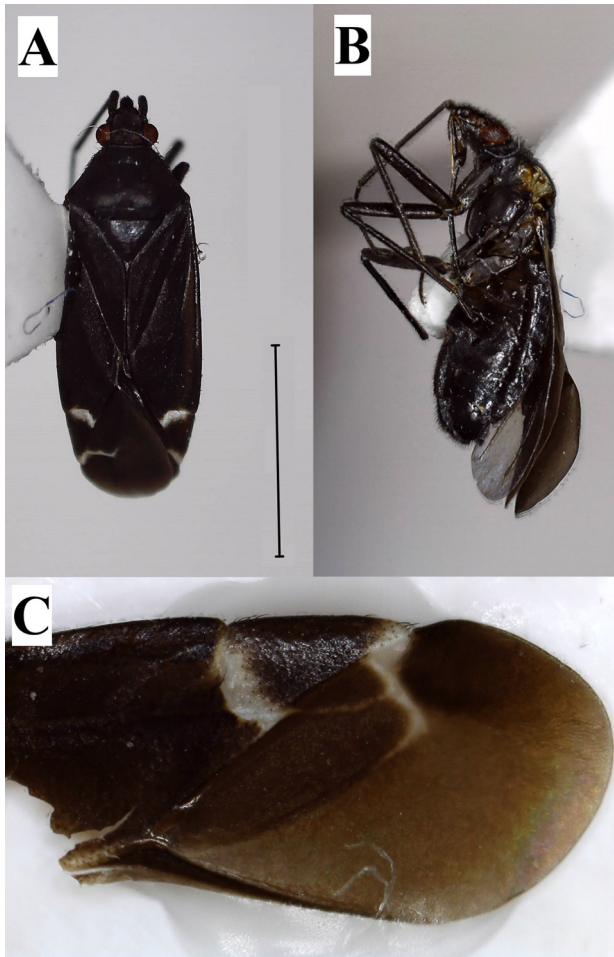


Fig. 2. *M. quadrilineatus* (female, PCPK): A. dorsal habitus; B. lateral view; C. characteristic pattern of hemelytron (A–B. scale bar: 2.5 mm; C. image is not to scale)

subbasally. Vesica bent in U-shape, widened, bifurcate apically. Genitalia of male were accurately illustrated by [Wagner \(1974\)](#) and [Matocq \(1996\)](#).

Similar species: *M. quadrilineatus* is the first representative of *Macrotylus* species with blackish colouration recorded in the Pannonian region. A key to similar-looking black species (*M. quadrilineatus*) was published by [Matocq \(1996\)](#); some of the other included species might also occur in Hungary.

Distribution. Montane-Mediterranean species, known mostly from mountainous areas of the Balkans, the Alps, and Carpathian mountain-range. The first occurrences in Hungary were recorded from Batyk, Zala County, West-Hungarian hill region ([Fig. 3](#)) and near Kékestető, Heves County, North-Hungarian mountains.





Fig. 3. Ruderal scrub with *Salvia glutinosa*, collection site of the first specimens of *M. quadrilineatus* in Hungary (photo: J. Vikár)

Ecology. Phytophagous. Host plant: *Salvia glutinosa* (Lamiaceae) (Wagner, 1974). The author collected adults and nymphs from *S. officinalis* near Himarë municipality (Vlorë county, Albania; GPS: 40.144586 N, 19.656803 E; 233 m asl.; 18.v.2021), which suggests that the species is more likely to be associated with multiple species of the genus *Salvia*.

Remarks. The first specimens of *M. quadrilineatus* were collected in a ruderal scrub near Zalaszentgrót, western Hungary (Fig. 3). In course of preparation of the manuscript the author was informed about five additional adults from the vicinity of Kékestető, Mátra Mountains, northern Hungary, recorded in the database of the citizen science database izeltlabuak.hu; those individuals were found on *Salvia glutinosa* (izeltlabuak.hu, 2021).

Macrotylus (s. str.) *herrichi* (Reuter, 1873)

Figure 4A

Diagnosis. Colouration variable from pale yellowish to greyish. Dorsum covered with conspicuous black pubescence. Head mostly blackish, vertex sometimes with a pair of dark ochraceous markings. Antennae uniformly blackish. Pronotum with a wide, blackish transversal band basally, which might be missing. Scutellum with a darker, irregular spot medially. Radius of



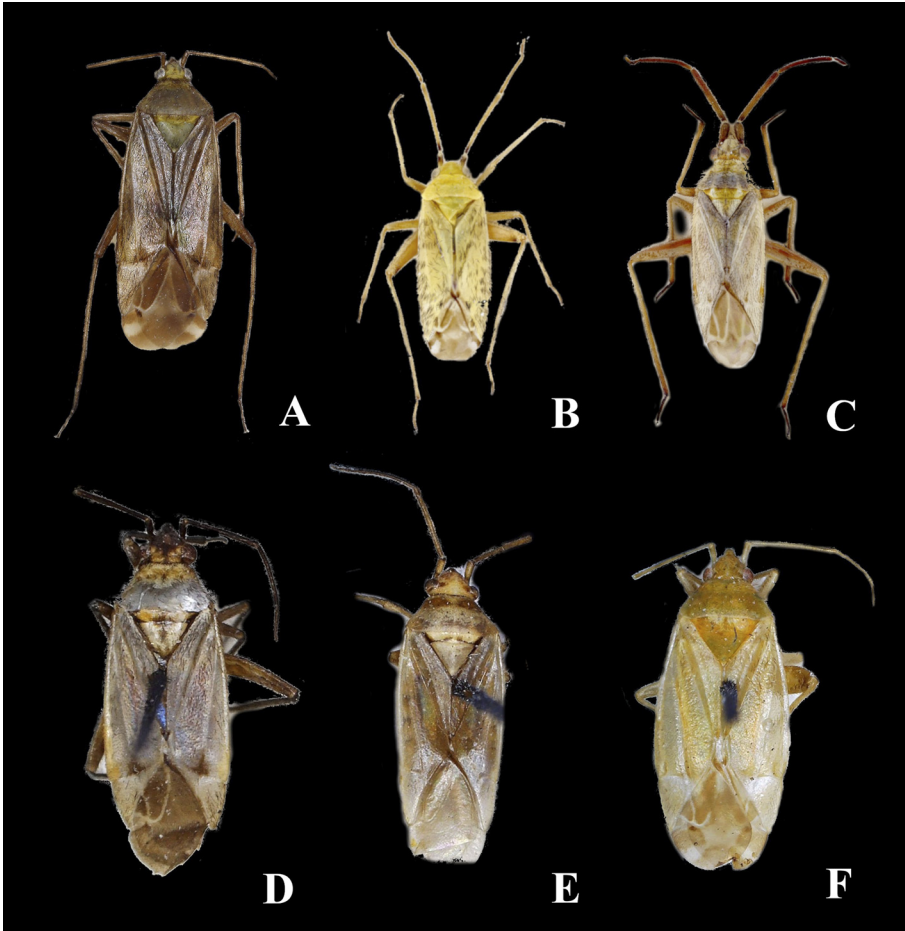


Fig. 4. Habitus photo of discussed *Macrotylus* species. A. *M. herrichi* (male, HNHM); B. *M. atricapillus* (male; collection of A. Carapezza, University of Palermo); C. *M. elevatus* (male; collection of A. Carapezza, University of Palermo); D. *M. horvathi* (male, HNHM); E. *M. paykulli* (male, HNHM); F. *M. solitarius* (male, HNHM) (images are not to scale)

corium with a small, blackish spot. Membrane greyish or brownish with pale spots at apex of cuneus. Head shorter than wide; ratio of eye width to width of vertex 1: 1.5 in males; 1: 2.0 in females. Ratio of basal width of pronotum to length of antennomere II: 1: 0.8–0.9. Labium surpassing metacoxae. Male paramere slender without protrusions. Male vesica stout, broadened apically, armed with a long spike; outer part of vesica with a membranous lobe which is proximally followed by a curved spike. Male genitalia were accurately illustrated by [Wagner \(1974\)](#).

Distribution. Western Euro-Siberian species with an area ranging from the Iberian Peninsula to the Asian part of Kazakhstan.

Ecology. Phytophagous. Host plant: *Salvia* sp. ([Göllner-Scheiding, 1972](#)). Overwinters as egg; adults emerge between June and July ([Wagner, 1974](#)).



Subgenus *Alloeonycha* Reuter, 1904

Macrotylus (Alloeonycha) atricapillus (Scott, 1872)

Figure 4B

Diagnosis. Colouration yellowish greenish. Antennomere I with blackish annulus subapically, antennomere II blackish at base; antennomeres III and IV unicolorous. Membrane greyish with blackish spot reaching margin of membrane, surrounded by two pale spots. Legs uniformly pale yellowish. Ratio of width of eye to width of vertex 1: 2.7 in males, 1: 3.0 in females. Labium surpassing metacoxae. Upper margin of posterior opening of male pygophore elevated; right paramere elongate (width to length 1: 2.5); sensory lobe of left paramere bifurcate. Male genitalia were accurately illustrated by Carapezza (1997) and Wagner (1974).

Similar species: *M. paykulli* and *M. attenuatus* are similar in appearance, but males can be distinguished by the structure of the pygophore and right paramere (Carapezza, 1997); *M. attenuatus* is remarkably smaller in size.

Distribution. Euro-Mediterranean species with northernmost occurrences in Central Europe.

Ecology. Phytophagous. Host plant: *Inula viscosa* (Asteraceae) (Ribes, 1982). Overwinters as egg; adults emerge between May and July (Wagner, 1974).

Remarks. This species was recorded from the historical Hungary by Horváth (1897), but those localities presently belong to Croatia due to the border changes following World War I, as noted by Kerzhner and Josifov (1999). On the other hand, the species' northernmost records are from the Czech Republic, thus its presence in Hungary is possible.

Macrotylus (Alloeonycha) attenuatus Jakovlev, 1882

Diagnosis. Colouration pale yellowish. Body covered with dense, black pubescence. Antennomere I with blackish annulation at its middle, antennomere II blackish at base and apex, base of antennomere III suffused with brownish. Membrane greyish with veins white; whitish spot at apex of cuneus with a small blackish spot posteriad. Tibiae basally with blackish annulation. Ratio of width of eye to width of vertex 1: 2.7 (in both sexes). Ratio of basal width of pronotum to antennomere II 1: 0.7. Labium reaches but not surpasses metacoxae. Male vesica slightly curved. Secondary gonoporal process widened subapically and encompassed by 3 sub-parallel spikes. Male genitalia were illustrated by Wagner (1974).

Similar species: *M. paykulli* and *M. atricapillus* are similar in general facies, but *M. attenuatus* can be readily recognized by its minute size (it is the smallest representative of the genus).

Distribution. Ponto-Turanian species, known from South Russia, Ukraine, and Turkey.

Ecology. Phytophagous. Host plants: *Helianthemum* sp. (Cistaceae) (Wagner, 1974); *Potentilla astrachanica*, *P. taurica* (Rosaceae) (Kerzhner, 1964).

Remarks. The species is not yet recorded from Hungary; however, based on records from the Ukraine it is suspected to be present in the northeastern part of the country. No specimens suitable for imaging were available, thus photos of this species are not included.

Macrotylus (Alloeonycha) elevatus (Fieber, 1858)

Figure 4C

Diagnosis. Colouration pale yellowish. Pubescence blackish. Antennomeres ochraceous; antennomere II paler in hue with dark basal annulation; antennomere III and IV dark brownish. Pronotum with three dark longitudinal stripes. Ratio of width of eye to width of vertex 1: 1.60–



1.67 in males, 1: 2.0 in females. Ratio of basal width of pronotum to antennomere II 1: 1.1 in males, 1: 1.0 in females. Width of vertex to basal width of pronotum 1: 1.40–1.45. Tibial bristles half as long as diameter of tibia. Tarsomere III shorter than tarsomere II. Male vesica bent in U-shape. Secondary gonoporal process widened subapically, membranous part without spike. Male genital characters were illustrated by Wagner (1974).

Distribution. West-Central Palearctic species. Known area of the species extends from South France to Asian part of Kazakhstan.

Ecology. Data not available.

Macrotylus (Alloeonycha) horvathi (Reuter, 1876)

Figure 4D

Diagnosis. Pale yellowish-greenish species. Pubescence pale yellowish mixed with sparse blackish setae. Antennae yellowish green with apex often darker. Membrane greyish with pale spots and rounded, blackish spot posteriad to cuneus. Legs yellowish, femora with brownish maculae apically. Head relatively elongate, width only slightly greater than length. Ratio of eye width to width of vertex 1: 2.0 in males, 1: 3.0 in females. Antennomere II slightly longer than width of pronotum in males; length of antennomere II is subequal to width of pronotum in females. Apex of labium reaches metacoxae. Male vesica bent in S-shape, secondary gonoporal process widened and sharply pointed. Right paramere straight, margins subparallel; hypophysis small but distinct. Male genital characters were illustrated by Wagner (1974).

Similar species: *M. solitarius* is similar in general facies, but the blackish spot of the membrane (rounded in *M. horvathi*; elongate in *M. solitarius*) and the maculae on subapical part of femora (present in *M. horvathi*; absent in *M. solitarius*) allow an easy identification of the two species.

Distribution. West-Central Palearctic species. The known area of the species extends from France to Azerbaijan.

Ecology. Phytophagous. Host plants: *Ballota nigra* (Göllner-Scheiding, 1972), *Stachys* sp. (Lamiaceae) (Göllner-Scheiding, 1972; Josifov, 1974). Overwinters as egg. Adults emerge between July and September (Wagner, 1974).

Macrotylus (Alloeonycha) paykulli (Fallén, 1807)

Figure 4E

Diagnosis. Colouration pale or yellowish green. Blackish pubescence of dorsum forming small patches on head. Antennomere I blackish, antennomere II basally pale with blackish annulation subbasally, antennomere II blackish basally, sometimes antennae almost entirely blackish. Pronotal callosities often decorated with blackish spots. Membrane of hemelytra greyish with a subquadrangular blackish spots surrounded by two pale spots posteriad to cuneus. Femora blackish subbasally. Upper margin of posterior opening of male pygophore flat; right paramere oval (width to length 1: 1.5); sensory lobe of left paramere conical. Male genitalia were accurately illustrated by Carapezza (1997).

Similar species: *M. atricapillus* and *M. attenuatus* are similar in general facies, but they can be separated by the structure of their pygophore and parameres; *M. attenuatus* is remarkably smaller in size. Head length subequal to its width, antennae slender. Vesica simply curved, secondary gonoporal process broadened subapically, armed with a single spike.

Distribution. West Central-Palearctic species with an area ranging from Great Britain to Kyrgyzstan and Azerbaijan.



Ecology. Phytophagous. Host plant: *Ononis* sp. (Fabaceae) (Péricart, 1965; Göllner-Scheid-ing, 1972).

Remarks. *M. paykulli* is the most variable among the discussed species in terms of colouration and pattern. Available names have been proposed for three “forms” or “varieties” of this species (*f. fuscnotata* Stichel, 1933; var. *nigriceps* Reuter, 1894 and var. *nigripes* Puton, 1874) based on differences in the colouration of the antennomeres and legs. Among them, var. *nigripes* has formally been downgraded to a junior synonym of *M. paykulli* by Carapezza (1997). According to the Article 45.6.4. of the International Code of Zoological Nomenclature (ICZN, 1999), the remaining two names should be considered as subspecies. However, as so far, all authors listed them as of infrasubspecific rank (e.g. Wagner, 1974) or junior synonyms of *M. paykulli* (e.g. Kerzhner and Josifov, 1999), and I also do not see any reason for recognizing them as of subspecies rank, they are considered as synonyms with *M. paykulli* here.

Macrotylus (Alloeonycha) solitarius (Meyer-Dür, 1843)

Figure 4F

Diagnosis. Greyish or greenish yellow species, dorsum covered with relatively dense, dark pubescence. Antennae uniformly pale yellowish. Scutellum paler than pronotum and hemelytra. Membrane dark greyish with irregular pale spots near cuneus and subapically; with an elongate, blackish spot posteriad to cuneus. Legs uniformly yellowish. Width of head subequal to its length. Ratio of eye width to width of vertex 1: 2.0 in males, 1: 2.6 in females. Length of antennomere II subequal to width of pronotum. Right paramere slender, without conspicuous hypophysis. Vesica bent in S-shape, apically broadened. Secondary gonoporal process emerges from between two spikes and a slightly sclerotized, serrated area.

Similar species: *M. horvathi* is similar in general facies, although the blackish spot of the membrane (rounded in *M. horvathi*, elongate in *M. solitarius*) and the maculae on subapical part of femora (present in *M. horvathi*, absent in *M. solitarius*) allow a relatively easy distinguishing of the two species.

Distribution. West Central-Palaearctic species. Known area of the species extends from the British Islands to the Central Russian steppes and to Azerbaijan (Kerzhner and Josifov, 1999).

Ecology. Phytophagous. Host plants: *Stachys recta*, *Stachys sylvatica* (Lamiaceae) (Ehanno, 1968; Göllner-Scheid-ing, 1972; Pagola-Carte et al., 2004). Overwinters as egg. Adults emerge from June to August.

Remarks. Wagner (1947) defined the *M. solitarius* species group within the subgenus *Alloeonycha*; the group was later elaborated by Carapezza (1994). It includes *M. solitarius*, *M. horvathi*, *M. colon* Reuter, 1880, *M. mayri* (Reuter, 1904), *M. montandoni* Reuter, 1900 and *M. ribesi* Carapezza, 1994. *M. colon* and *M. ribesi* are known exclusively from Spain. *M. montandoni* was synonymized with *Acrotelus caspicus* (Reuter, 1879) by Josifov (1993), *M. mayri* with *M. solitarius* by Pagola-Carte et al. (2004). A thorough revision of the species group would be needed to resolve controversies and uncertainties in concern of the included taxa.

DISCUSSION

The Hungarian fauna of *Macrotylus* currently consists of 6 species. According to literature data on the neighbouring countries, two additional species (*M. atricapillus* and *M. attenuatus*) are likely to be present. Furthermore, it is to be assumed that climate change-induced northwards



expansion of Mediterranean taxa will result in the occurrence of further species, as observed in several recent cases of various heteropteran species, e.g. *Oxycarenus lavaterae* (Fabricius, 1787) (Kondorosy, 1995) or *Acrostenum heegeri* Fieber, 1861 (Károlyi and Rédei, 2017). Further species may occur because of the revision of collection materials of natural history museums considering novel taxonomic knowledge, e.g. in the case of *Macrotylus (Alloeonycha) nasutus* Wagner, 1958. This species forms a homogeneous species group with *M. atricapillus* and *M. paykulli* based on the high similarity of their male genitalia; individuals of these species are easily misidentified (Carapezza, 1997). The species is thought to be of West-Mediterranean distribution (area ranging from Sicily to Spain in Europe and from Morocco to Libya in North Africa) with its north-easternmost records from Slovenia, but due to identification problems its area is uncertain (Carapezza, 1997) and the Slovenian specimens should be reexamined.

The *Macrotylus*-fauna of Hungary consist mostly of species widely distributed throughout Europe: four of them are of West Central-Palaearctic distribution (*M. elevatus*, *M. horvathi*, *M. paykulli* and *M. solitarius*) and one is West Euro-Siberian (*M. herrichi*). The two so far unrecorded species probably occurring in the country are of Euro-Mediterranean (*M. atricapillus*) and Ponto-Turanian (*M. attenuatus*) distribution. The newly reported species, *M. quadrilineatus*, is restricted to mountainous areas of the Mediterranean Region. The distribution of the discussed species in Hungary and adjacent countries is summarized in Table 1.

Four of the discussed species, *M. quadrilineatus*, *M. herrichi*, *M. horvathi* and *M. solitarius*, are associated with host plants belonging to the plant family Lamiaceae; *M. atricapillus* was recorded to feed on *Inula viscosa* (Asteraceae); and *M. paykulli* is associated with the representatives of the plant genus *Ononis* (Fabaceae). *Macrotylus attenuatus* was recorded to feed on *Helianthemum* sp. (Cistaceae) and *Potentilla* sp. (Rosaceae). No data are available on the host plant association of *M. elevatus*.

The present review of the representatives of the phyline genus *Macrotylus* distributed in Hungary, including the first record of *M. quadrilineatus* from the country and new host plant record for this species from Albania, concluded that an extensive aimed study is needed to clarify the biodiversity of plant bugs in Hungary and the Pannonian ecoregion. Such study may involve taxonomic (e.g. revision of diagnostic characters or taxa of uncertain status) and biological or ecological (e.g. host plant association or feeding preferences) aspects and will significantly contribute to the knowledge on European plant bugs.

Table 1. Representatives of genus *Macrotylus* Fieber, 1858 distributed in Hungary and the neighbouring countries. Asterisk indicates new faunistic record. (Country codes: HU – Hungary; AT – Austria; SK – Slovakia; UK – Ukraine; RO – Romania; SR – Serbia; CR – Croatia; SL – Slovenia)

Species	HU	AT	SK	UK	RO	SR	CR	SL
<i>M. atricapillus</i> (Scott, 1872)						x	x	
<i>M. attenuatus</i> Jakovlev, 1882				x				
<i>M. elevatus</i> (Fieber, 1858)	x			x	x			
<i>M. herrichi</i> (Reuter, 1873)	x	x	x	x	x	x	x	x
<i>M. horvathi</i> (Reuter, 1876)	x	x	x	x	x	x	x	x
<i>M. paykulli</i> (Fallén, 1807)	x	x	x	x	x	x	x	x
<i>M. quadrilineatus</i> (Schrank, 1785)	x*	x	x	x	x	x	x	x
<i>M. solitarius</i> (Meyer-Dür, 1834)	x	x	x	x	x	x		x



ACKNOWLEDGEMENTS

The author would like to express his gratitude to József Vikár for the specimens and photos and to Ádám Mészáros (ELKH Centre for Ecological Research, Budapest) for the citizen science record. The author would like to thank the comments and advises of Előd Kondorosy (Hungarian University of Agriculture and Life Sciences, Keszthely), Dávid Rédei (National Chung Hsing University, Taichung) and two anonymous reviewers in course of preparation of the manuscript. Furthermore, the author would like to express his gratefulness to Attilio Carapezza (University of Palermo) for the habitus photos provided.

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