



Checklist of the Hungarian species of family Macrochelidae (Acari: Mesostigmata)

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ABSTRACT: All published Hungarian records of the macrochelid mites are summarized. Occurrences of four species were deleted from list due to misidentification. Currently 34 macrochelid species are known from the area of Hungary.

Keywords: Macrochelidae, occurrences, Hungary.

Zoobank: <http://zoobank.org/F882F08A-BA8B-4C5A-9E5F-120E17CBFFDD>

INTRODUCTION

The members of the family Macrochelidae are large and fast-moving predators, they are inhabiting soil substrates, litter and decomposing organic matter where feed on nematodes, eggs and larvae of insects or weakly sclerotized mites, and very often live in association with some groups (like flies, beetles) of insects (Mašán, 2003). The family of Macrochelidae is relatively well known in some countries of Europe, like: British Isles (Evans and Brown-ing, 1956; Hyatt and Emberson, 1988), Germany (Karg, 1993), Austria (Johnston, 1970) and Slovakia (Mašán, 2003). But the information about their occurrences in the area of Hungary is insufficient.

The first paper about the Hungarian macrochelids was published by Erőss and Mahunka (1971a), who listed numerous macrochelid mite species from several regions of Hungary, but in same year Erőss and Mahunka (1971b) presented another paper to concentrate for the species living in dung substrate and here they did not get any names of the localities, perhaps the name of the localities originated from the previous presented one (Erőss and Mahunka 1971a). Later Kandil (1983) presented 14 species during the survey of the fauna of the Hortobágy National Park, Ambros (1993) investigated another Hungarian protected area, and listed three small mammal associated species in Bükk National Park. Ten years later, new occurrences of numerous species were added by faunistic surveys of Salmane and Kontschán (2005, 2006), and Kontschán (2005). One year later, Kontschán (2006) summarized the knowledge of the Hungarian macrochelid mites, which contained records of 32 macrochelid species. Subsequently, Kontschán (2015) mentioned three species from urban habitat from the capitol (Budapest) of Hungary and one year later, Ács and Kontschán (2014) added several new occurrences to the Hungarian species and recorded firstly three species from Hungary. After that several new data to the mites of agricultural soils with some records of members of family Macrochelidae are reported by Kontschán et al. (2014, 2015a, 2016). In same time, Kontschán et al. (2015b) presented their results about the mites of the highways rest station and listed

some macrochelid mites from these disturbed areas. Some years later, Kontschán (2018) described a new species in association with a flower beetle and Kontschán and Hornok (2019) presented a macrochelid species associated with stable fly.

MATERIALS AND METHODS

I gathered all the published papers about the Hungarian macrochelid mites. I gave only the synonymous names mentioned in Hungarian literatures of the species with the firstly published names by the original author together with the published records of occurrences. I also illustrated all Hungarian occurrences on maps (Figs 1-9).

The Hungarian specimens deposited in the Hungarian Natural History Museum of *Macrocheles moneronicus* Bregetova and Koroleva, 1960 (coll. number: HNHM Meso-5146), *Macrocheles violovitschi* Bregetova and Koroleva, 1960 (coll. number: HNHM Meso-5189), *Macrocheles caucasicus* Bregetova and Koroleva, 1960 coll. number: HNHM Meso-2289) and *Macrocheles kolpakovae* Bregetova and Koroleva, 1960 (coll. number: HNHM Meso-5216) are also investigated, but these specimens are in poor conditions, several characters were not visible).

RESULTS

List of the taxa

Macrochelidae Vitzthum, 1930

Dissoloncha Falconer, 1923

Dissoloncha Falconer, 1923: 151.

Dissoloncha superbus (Hull, 1918)

Macrocheles superbus Hull, 1918: 71.

Occurrence. Bataapáti (Salmane and Kontschán, 2006).

Geholaspis Berlese, 1918

Geholaspis Berlese, 1918: 145.

Geholaspis berlese Valle, 1953

Geholaspis berlese Valle, 1953: 332.

Occurrences. Velem, Szentmargitfalva (Kontschán, 2006).

***Geholaspis longispinosus* (Kramer, 1876)**

Gamasus longispinosus Kramer, 1876: 100.

Occurrences. Barcs (Kontschán, 2005), Oroszlány (Vértes) (Salmane and Kontschán, 2005), Budapest, Kőszeg, Magyarhertelend, Nagyréce, Regéc, Vidosnyaszőlős, Szarud, Szigetbecse (Kontschán, 2006), Stajerházak (Ambros 1987).

***Glyphtholaspis* Filipponi and Pegazzano, 1960**

Glyphtholaspis Filipponi and Pegazzano, 1960: 136.

***Glyphtholaspis americana* (Berlese, 1888)**

Holostaspis marginata var. *americana* Berlese, 1888: 195.

Macrocheles americana Berlese, 1888: Kandil, 1983.

Macrocheles vagabundus Berlese, 1889: Eröss and Mahunka, 1971a.

Occurrences. Dunavecse, Fertőszentmiklós, Isaszeg, Nagybárcány, Örvényes, Sukoró (Eröss and Mahunka, 1971a), Balmazújváros, Egyek, Kunmadaras, Újszentmargita (Kandil, 1983), Budapest (Kontschán, 2015).

Notes. This species was collected from dungs of horse, cattle and fowl (Eröss and Mahunka, 1971b), and from soil (Kandil, 1983).

***Glyphtholaspis confusa* (Foá, 1900)**

Holostaspis confusa Foá, 1900: 137.

Macrocheles plumiventris Hull, 1925: Eröss and Mahunka, 1971a.

Occurrences. Kiskunfélegyháza, Kopáncs, Lajosmizse, Töltéstava, Velence, Zamárdi (Eröss and Mahunka, 1971a), Szekszárd (Kontschán, 2005), Budapest (Kontschán, 2015).

***Glyphtholaspis saprophila* Mašán, 2003**

Glyphtholaspis saprophila Mašán, 2003: 125.

Occurrences. Szada (Kontschán et al., 2014).

Notes. Only one population was recorded from the leaf litters of a bamboo brush (Kontschán et al., 2014).

***Holostaspella* Berlese, 1903**

Holostaspella Berlese, 1903: 241.

***Holostaspella exornata* Filipponi and Pegazzano, 1967**

Holostaspella exornata Filipponi and Pegazzano, 1967: 230.

Occurrences. Oroszlány (Salmane and Kontschán, 2005).

***Holostaspella ornata* (Berlese, 1904)**

Holostaspis ornatus Berlese, 1904: 277.

Occurrences. Nyíregyháza (Kontschán, 2005).

***Longicheles* Valle, 1953**

Longicheles Valle, 1953: 343.

***Longicheles hortorum* (Berlese, 1904)**

Holostaspis hortorum Berlese, 1904: 265.

Geholaspis hortorum: Kontschán, 2005, 2006, Kontschán et al., 2015b.

Occurrences. Vokány (Kontschán, 2005), Szigetbecse (Kontschán, 2006), Letenye (Kontschán et al., 2015b).

***Longicheles longulus* (Berlese, 1887)**

Holostaspis longulus Berlese, 1887: 9.

Occurrences. Aggtelek (Ács and Kontschán, 2014).

Note. This species was collected in cave habitat (Ács and Kontschán, 2014).

***Longicheles mandibularis* (Berlese, 1904)**

Holostaspis mandibularis Berlese, 1904: 263.

Geholaspis mandibularis: Salmane and Kontschán, 2005, Kontschán, 2006.

Occurrences. Zsujta (Salmane and Kontschán, 2005), Gánt, Velem (Kontschán, 2006).

***Macrocheles* Latreille, 1829**

Macrocheles Latreille in Cuvier, 1829: 282.

***Macrocheles decoloratus* (C. L. Koch, 1839)**

Gamasus decoloratus C. L. Koch, 1839: 14.

Occurrences. Dány, Mecsek Mts (Eröss and Mahunka, 1971a), Újszentmargita (Kandil, 1983).

***Macrocheles glaber* (J. Müller, 1860)**

Holostaspis glabra J. Müller, 1860: 178.

Occurrences. Dobogókő, Lajosmizse, Zebegény, Békéscsaba (Eröss and Mahunka, 1971a), Miskolc (Ambros, 1993), Dömös (Kontschán, 2005), Budapest (Kontschán, 2015), Gyöngyös (Ács and Kontschán, 2014), Oroszlány (Kontschán et al., 2016), Mátraalmás (Ambros, 1987).

Notes. This species was collected usually from soil, but it was found in association with *Cetonia aurata* beetle (Ács and Kontschán, 2014).

***Macrocheles insignitus* Berlese, 1918**

Macrocheles insignitus Berlese, 1918: 158.

Occurrences. Isaszeg, Töltéstava (Eröss and Mahunka, 1971a), Tiszacsege (Kandil, 1983).

***Macrocheles kekensis* Kontschán, 2018**

Macrocheles kekensis Kontschán, 2018: 98-102.

Occurrences. Kék (Kontschán 2018).

Note. This species was collected in association with cetoniin beetle.

***Macrocheles mammifer* Berlese, 1918**

Macrocheles mammifer Berlese, 1918: 171.

Macrocheles pavlovski Bregetova and Koroleva, 1960: Eröss and Mahunka, 1971a.

Occurrences. Fertőszentmiklós, Isaszeg, Sámsonháza, Zamárdi (Eröss and Mahunka, 1971a).

Notes. This species was collected from dungs of horse, cattle and pig (Eröss and Mahunka, 1971b).

***Macrocheles matrius* (Hull, 1925)**

Nothrolaspis matrius Hull, 1925: 212.

Occurrences. Zamárdi, Dömösd, Fertőszentmiklós, Kőszeg, Perkáta, Sári, Sukoró, Törek, Zalavár, (Eröss and Mahunka, 1971a), Nagyvisnyó (Ambros, 1993), Tihany (Salmane and Kontschán, 2005), Bakonybél (Kontschán, 2006), Polgár, Ecséd, Kisbag (Kontschán et al., 2015b).

Notes. This species was collected mostly from soil samples, but also from dungs of horse (Eröss and Mahunka, 1971b).

***Macrocheles merdarius* (Berlese, 1889)**

Holostaspis merdarius Berlese, 1889: 1.

Occurrences. Dobogókő, Dömösd, Dunabogdány, Dunavecse, Isaszeg, Kopáncs, Kőszeg, Lajosmizse,

Nagybárcány, Perkáta, Sámsonháza, Sári, Töltéstava, Vác, Zamárdi (Erőss and Mahunka, 1971a).

Notes. This species was collected from dung of horse, cattle, pig, fowl and from soil (Erőss and Mahunka, 1971b).

***Macrocheles muscaedomesticae* (Scopoli, 1772)**

Acarus musca domesticae Scopoli, 1772: 157.

Occurrences. Budapest, Dunavecse (Erőss and Mahunka, 1971a), Balmazújváros, Nagyiván (Kandil, 1983), Bataapáti (Salmane and Kotschán, 2006).

Notes. Besides specimens found in soil samples (Kandil, 1983, Salmane and Kotschán, 2006), this species was collected from dung of cattle and from human faces (Erőss and Mahunka, 1971b).

***Macrocheles nataliae* Bregetova and Koroleva, 1960**

Macrocheles nataliae Bregetova and Koroleva, 1960: 140.

Occurrences. Aggtelek, Dunavecse, Isaszeg, Sukoró, Szababattyán, Tátika, Zamárdi (Erőss and Mahunka, 1971a), Egyek, Nagyiván, Tiszacsege, Újszentmargita (Kandil, 1983).

Notes. This species was collected from dungs of horse and cattle (Erőss and Mahunka, 1971b), and from soil (Kandil, 1983).

***Macrocheles penicilliger* (Berlese, 1904)**

Holostaspis penicilliger Berlese, 1904:

Occurrences. Nadap, Sukoró, Zamárdi (Erőss and Mahunka, 1971a), Egyek, Nagyiván, Újszentmargita (Kandil, 1983) Tihany (Salmane and Kotschán, 2005) Bataapáti, Oroszlány (Salmane and Kotschán, 2006), Lipót (Kotschán, 2006), Anna-hegy (Kotschán et al., 2015b).

***Macrocheles perglaber* Filipponi and Pegazzano, 1962**

Macrocheles perglaber Filipponi and Pegazzano, 1962: 221.

Occurrences. Dömösd, Dunabogdány, Dunavecse, Fertőszentmiklós, Isaszeg, Misina, Nagybárcány, Perkáta, Pócsmegyer, Kopáncs, Sámsonháza, Sukoró, Szababattyány, Töltéstava, Vác, Velence, Zamárdi, Zebegény (Erőss and Mahunka, 1971a).

Notes. The differences between the *M. glaber* and *M. perglaber* is very weak based on female morphology (Halliday, 1986), but Mašán (2003) listed some characters (e.g. shape of some dorsal setae) of female which can help to separate these two species, but investigation without the males seems to be very uncertain. Erőss and Mahunka (1971a,b) collected this species from dung of cattle, horse and pig, but they did not give information about the sexes of the collected specimens. Therefore the Hungarian occurrence of this species needs to be confirmed.

***Macrocheles punctoscutatus* Evans and Browing, 1956**

Macrocheles punctoscutatus Evans and Browing, 1956: 18.

Occurrences. Lajosmizse, Sukoró, Velence (Erőss and Mahunka, 1971a), Újszentmargita (Kandil, 1983).

***Macrocheles punctatissimus* Berlese, 1918**

Macrocheles punctatissimus Berlese, 1918: 171.

Occurrence. Aggtelek (Ács and Kotschán, 2014).

Note. This species were collected in cave habitat (Ács and Kotschán, 2014).

***Macrocheles robustulus* (Berlese, 1904)**

Holostaspis subbadius var. *robustus* Berlese, 1904: 264.

Macrocheles robustulus Berlese, 1904: Kandil, 1983.

Macrocheles punctillatus Willmann, 1939: Erőss and Mahunka, 1971a.

Occurrences. Dunabogdány, Dunavecse, Fertőszentmiklós, Isaszeg, Nagybárcány, Sámsonháza, Töltéstava, Dabas (Erőss and Mahunka, 1971a), Egyek (Kandil, 1983).

Notes. This species was collected from dung of horse, cattle and pig (Erőss and Mahunka 1971) and from soil (Kandil, 1983).

***Macrocheles rotundiscutis* Bregetova and Koroleva, 1960**

Macrocheles rotundiscutis Bregetova and Koroleva, 1960: 116.

Occurrences. Tátika (Erőss and Mahunka, 1971a), Egyek, Kunmadaras, Nagyiván, Újszentmargita (Kandil, 1981) Tihany, Villány (Kotschán, 2005).

***Macrocheles subbadius* (Berlese, 1904)**

Holostaspis subbadius Berlese, 1904: 264.

Macrocheles vernalis Schweitzer, 1961: Kandil, 1983.

Occurrences. Dömösd, Jósavfő, Misina, Nógrádverőce, Perkáta, Tác, Zalavár (Erőss and Mahunka, 1971a), Újszentmargita (Kandil, 1983).

Notes. This species were collected on soil and leaf litter, but some specimens were found in association with stable flies (Kotschán and Hornok, 2019).

Macrholaspis Oudemans, 1931

Macrholaspis Oudemans, 1931: 272.

***Macrholaspis opacus* C. L. Koch, 1839**

Gamasus opacus C. L. Koch, 1839.

Occurrences. Sopron, Tátika (Erőss and Mahunka, 1971a).

Notes. This species were collected from soil (Erőss and Mahunka, 1971a).

***Macrholaspis similiopacus* (Mašán, 2003)**

Macrocheles similiopacus Mašán, 2003: 71–73.

Occurrences. Aggtelek (Ács and Kotschán, 2014).

Notes. This species was found in cave (Ács and Kotschán, 2014).

***Macrholaspis recki* (Bregetova and Koroleva, 1960)**

Macrocheles recki Bregetova and Koroleva, 1960: 104.

Occurrences. Tátika (Erőss and Mahunka, 1971a), Anna-hegy, Férihegy, Ecséd, Budaörs, Velence, Törek, Letenye (Kotschán et al., 2015b).

***Neopodocinum* Oudemans, 1902**

Neopodocinum Oudemans, 1902: 24.

***Neopodocinum meridionalis* (Sellnick, 1931)**

Coprolaelaps meridionalis Sellnick, 1931: 760

Occurrences. Tatabánya (Kotschán, 2006), Visegrád (Ács and Kotschán, 2014).

Note. This species was collected from *Geotrupes* beetle (Kotschán, 2006).

***Neopodocinum mrciaki* Sellnick, 1968**

Neopodocinum mrciaki Sellnick, 1968: 253.

Occurrences. Mátraalmás (Ambros, 1984).

Note. This species was collected on *Apodemus flavicollis* mouse species.

Nothrolaspis Berlese, 1918

Nothrolaspis Berlese, 1918: 169.

Nothrolaspis carinatus (C. L. Koch, 1839)

Gamasus carinatus C. L. Koch 1839: 16.

Occurrences. Budapest, Diósjenő, Nadap, Sári (Erős and Mahunka 1971a), Várgesztes (Kontschán, 2006).

Nothrolaspis montanus (Willmann, 1951)

Macrocheles montanus Willmann, 1951: 158.

Occurrences. Aggtelek, Balatonszentgyörgy, Budapest, Csákvár, Diósjenő, Nadap, Sopron, Sukoró, Tátika, Törek, Vác (Erős and Mahunka, 1971a), Egyek (Kandil, 1981), Nagyvisnyó, Miskolc (Ambros, 1993), Zempléni Mts and Paks (Salmane and Kontschán, 2005), Mecsek, Bataapáti (Salmane and Kontschán, 2006), Villányi Mts (Kontschán, 2005), Várgesztes, Budapest, Szigetbecse, Nagyréce (Kontschán, 2006).

Nothrolaspis tardus (C.L. Koch, 1841)

Gamasus tardus C. L. Koch, 1841: 14.

Occurrences. Bátorliget, Kaposvár, Kőszeg, Lillafüred, Sári, Sopron, Szár, Velence, Zalavár, (Erős and Mahunka, 1971a), Oroszlány (Salmane and Kontschán, 2005), Kőszeg, Nagyréce, Tatárszentgyörgy, Lipót, Villány (Kontschán, 2006).

DISCUSSION

Present paper contains proved occurrences of 34 macrochelid mite species from Hungary. Four species are deleted from these previously presented records. These four species are reported in Erős and Mahunka (1971a), which are misidentifications. The reason of the misidentification can be the poorly known literatures of these mites in the previous century. In the second half of the XX. century, in several cases only the Russian literatures were only available for the Hungarian researchers, therefore some species described from Russia were also presented from Hungary. *Macrocheles moneronicus* Bregetova and Koroleva, 1960 were listed in Erős and Mahunka (1971a) and in Kandil (1983) as well, but the specimens belong to species *M. subbadius*. Several setae were broken from the idiosoma, but the ornamentation of the sternal shield refers to *M. subbadius* and not to the *M. moneronicus*. *Macrocheles violovitschi* Bregetova and Koroleva, 1960 was reported by Erős and Mahunka (1971a), but the sternal setae are apically pilose (as in species *M. matrius*) and not smooth in the case of *violovitschi*. Besides of the morphological differences, these two species was described from Sakhalin (Easter Part of Russia), which is far from Hungary and was not found in other part of the Palearctic region. *Macrocheles caucasicus* Bregetova and Koroleva, 1960 was also mentioned by Erős and Mahunka (1971a). This species was reported only from Caucasus, the Hungarian occurrence was questionable. During the study of the deposited specimens the ornamentation of sternal shield and shape of setae *j5*

(as in *M. montanus*) and not smooth (in *M. caucasicus*). The fourth species, *Macrocheles kolpakovae* Bregetova and Koroleva, 1960, was also reported by Erős and Mahunka (1971a). This species was found only in Dagestan and later was not mentioned from Europe; in the investigation of this specimens it is clear this species is belong to the genus *Geholaspis*, and not to the *Macrocheles*. All characters are not visible well, but the specimens seem to be belonging to species *Geholaspis pontina* Fillipova and Pegazzano, 1960 (based on narrow *z6* setae and ornamentation of the idiosoma) and not to other *Geholaspis* species.

Seven species of the listed 34 macrochelids were collected from dung of different animals, three species were found in cave habitats and three species occurred in association with insects. Two species lived in soil of agricultural habitats, other species were reported from soil, moss and leaf litter of natural habitats, often from protected areas.

Regarding to the Slovakian fauna, from where 48 species are reported (Mašán, 2003), the Hungarian fauna seems to be poorly investigated. Contrary with the six newly described macrochelids from Slovakia (Mašán 2003), only one species, *Macrocheles kekensis* is discovered and described from Hungary.

Acknowledgements

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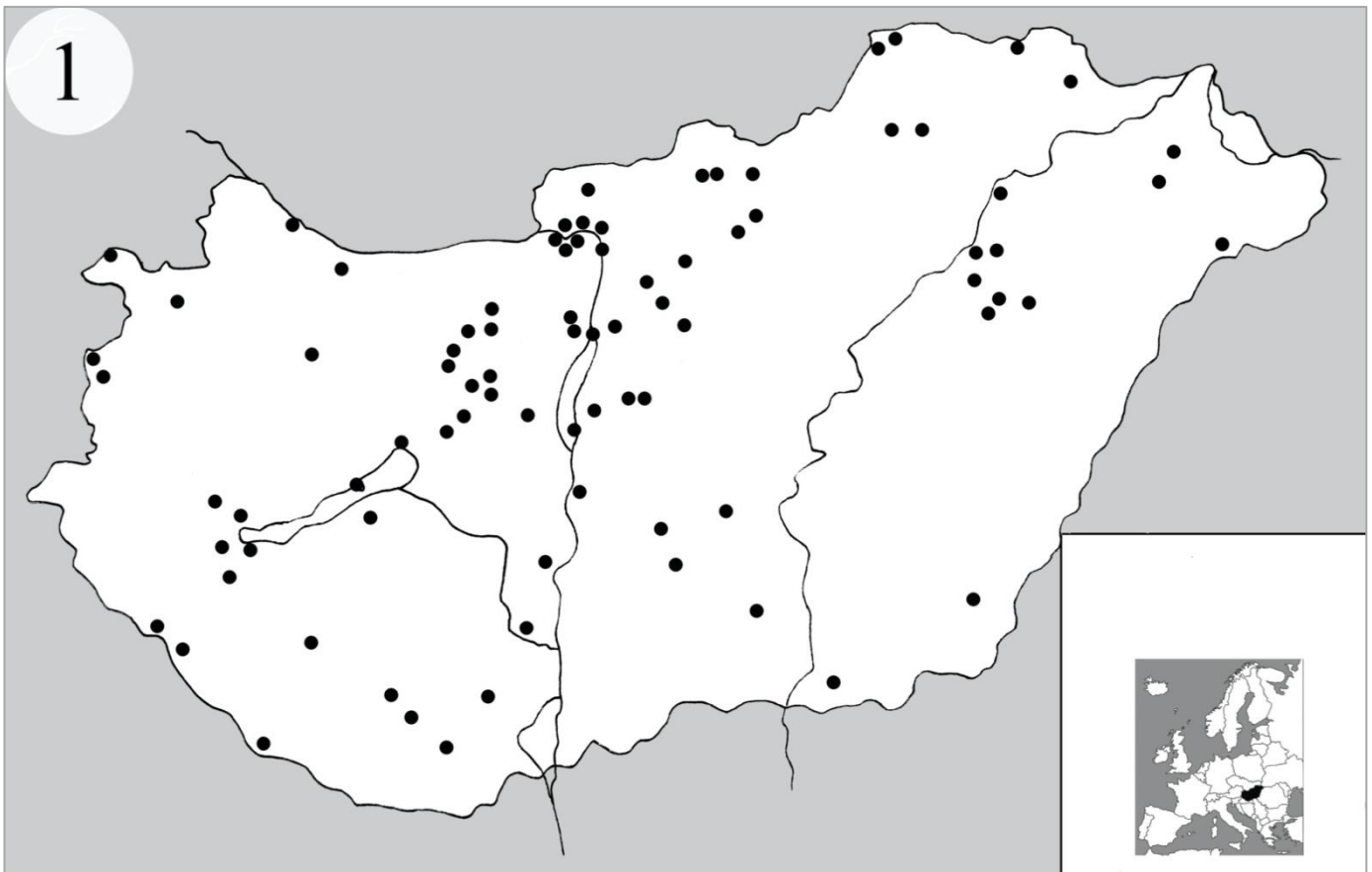


Figure 1. Occurrences of macrochelid mites in Hungary.

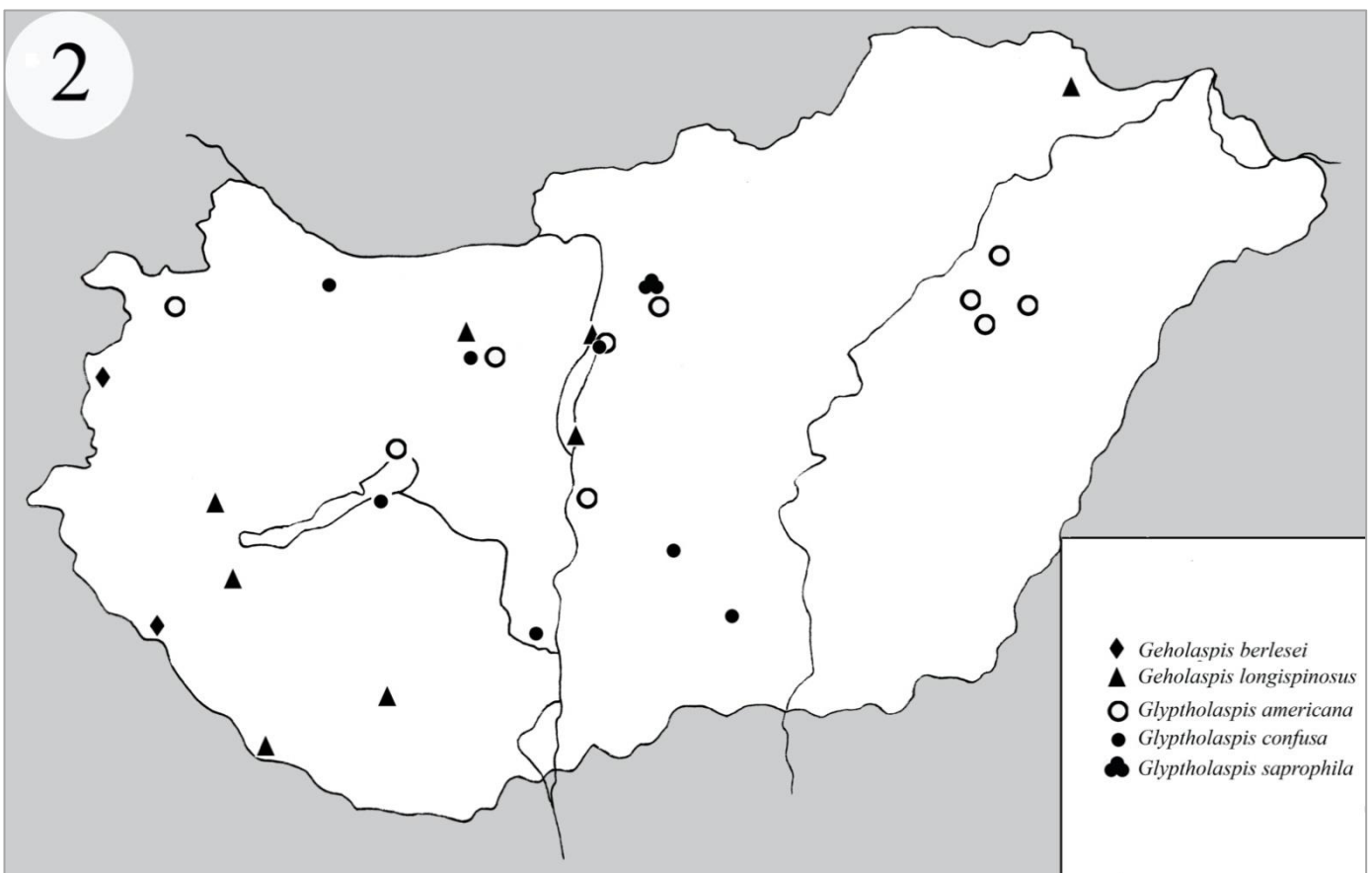


Figure 2. Occurrences of *Geholaspis* and *Glypholaspis* species in Hungary.

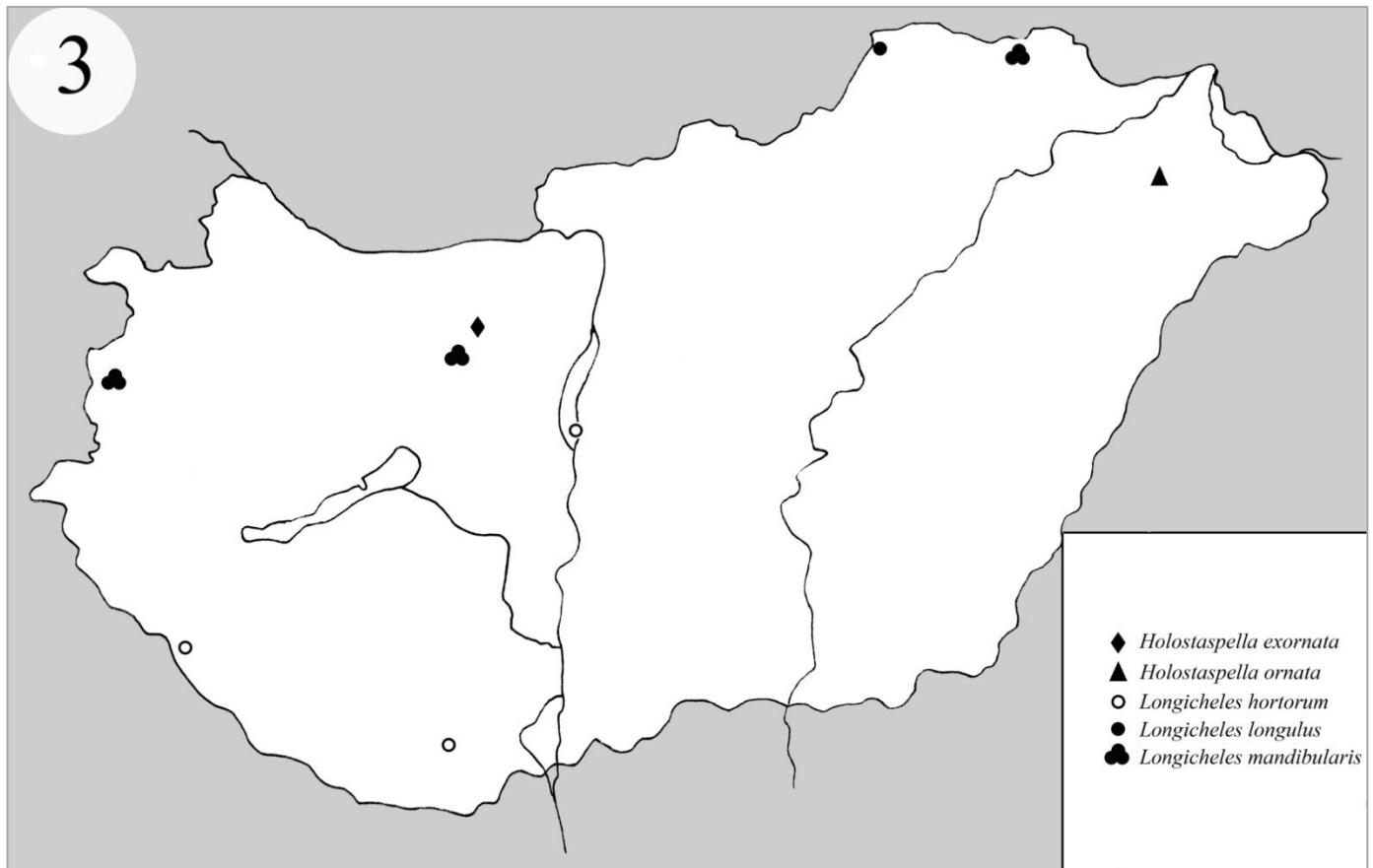


Figure 3. Occurrences of *Holostaspella* and *Longicheles* species in Hungary.

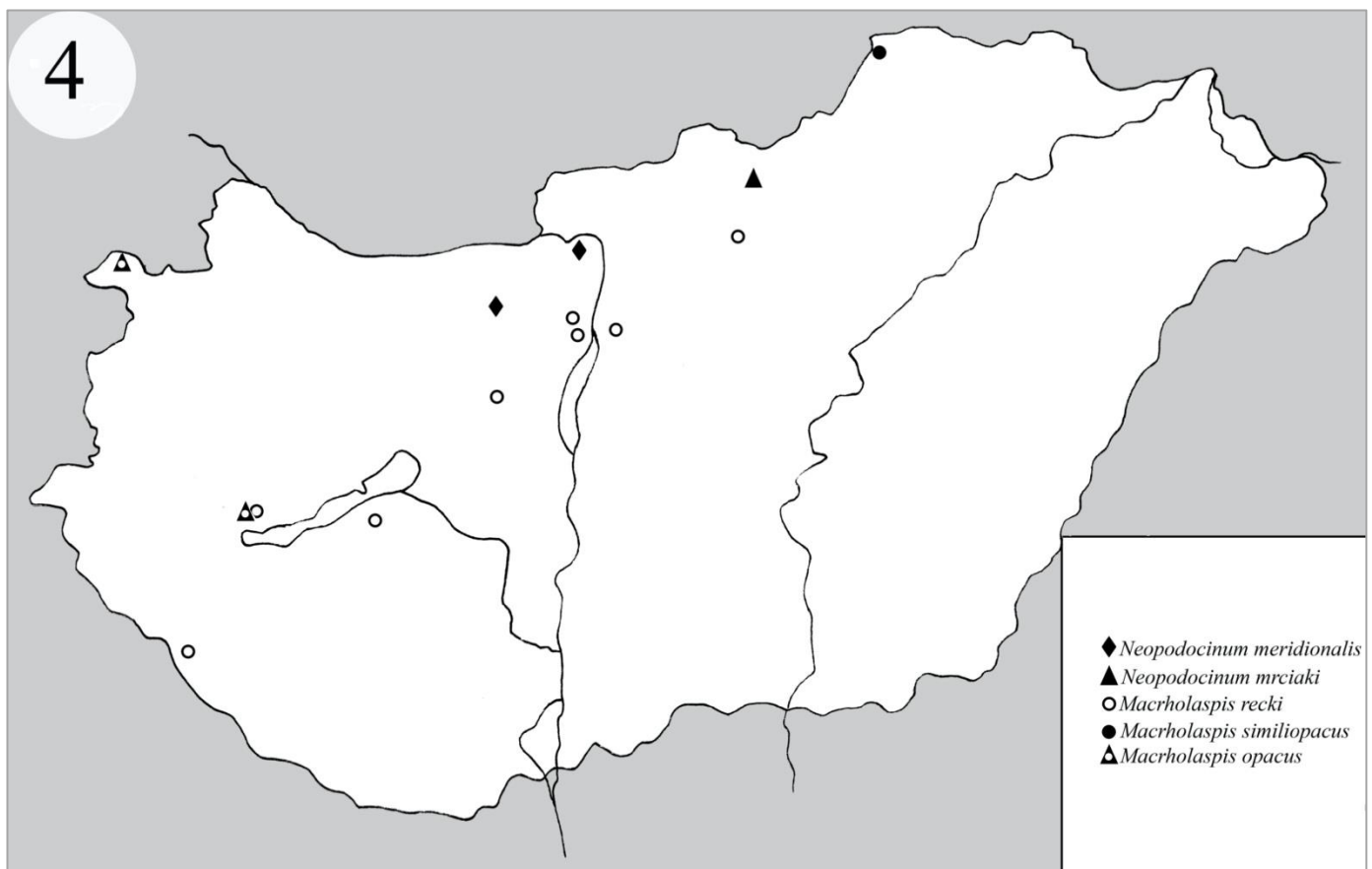


Figure 4. Occurrences of *Neopodocinum* and *Macrholaspis* species in Hungary.

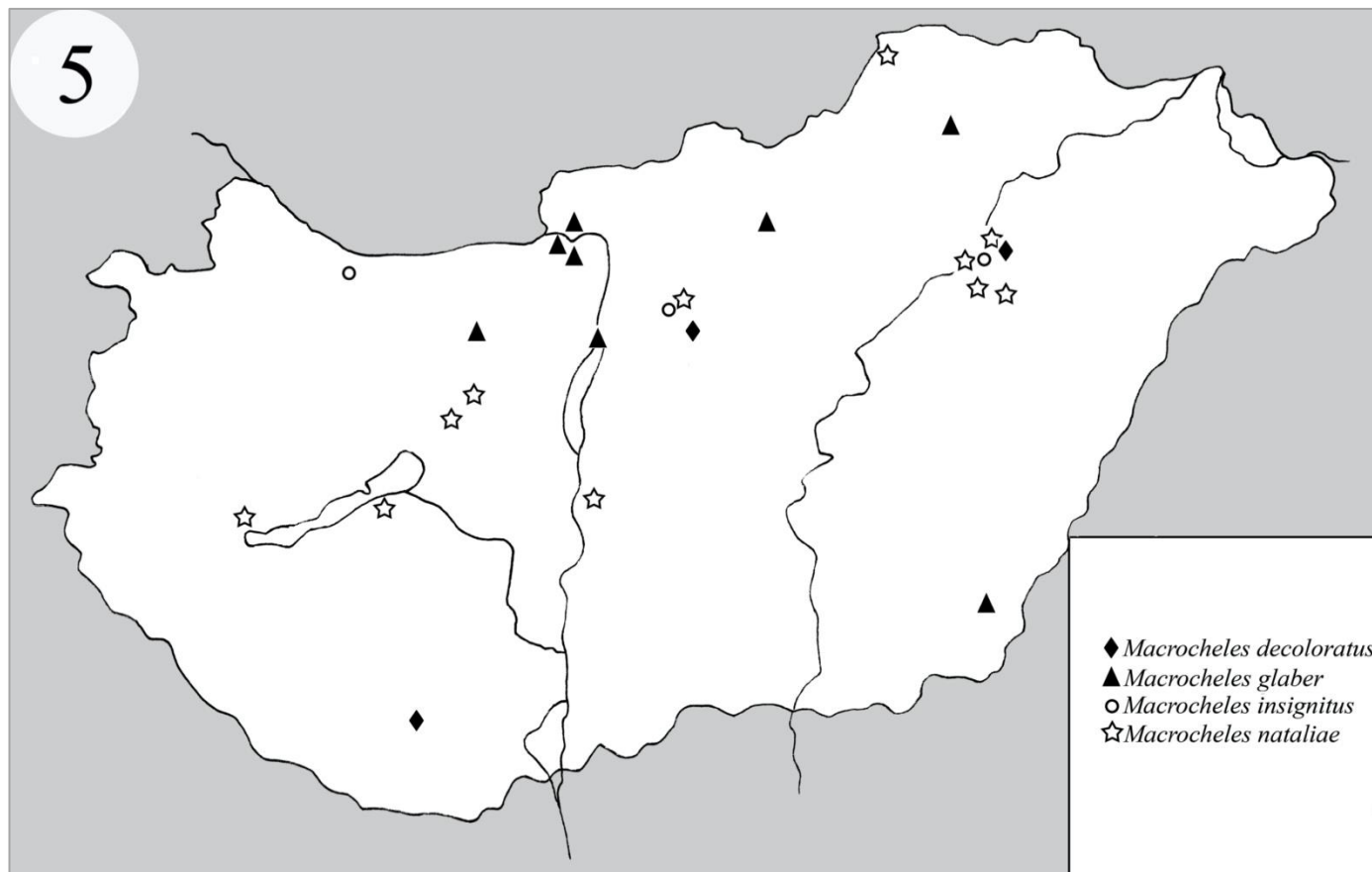


Figure 5. Occurrences of *Macrocheles* species (I) in Hungary.

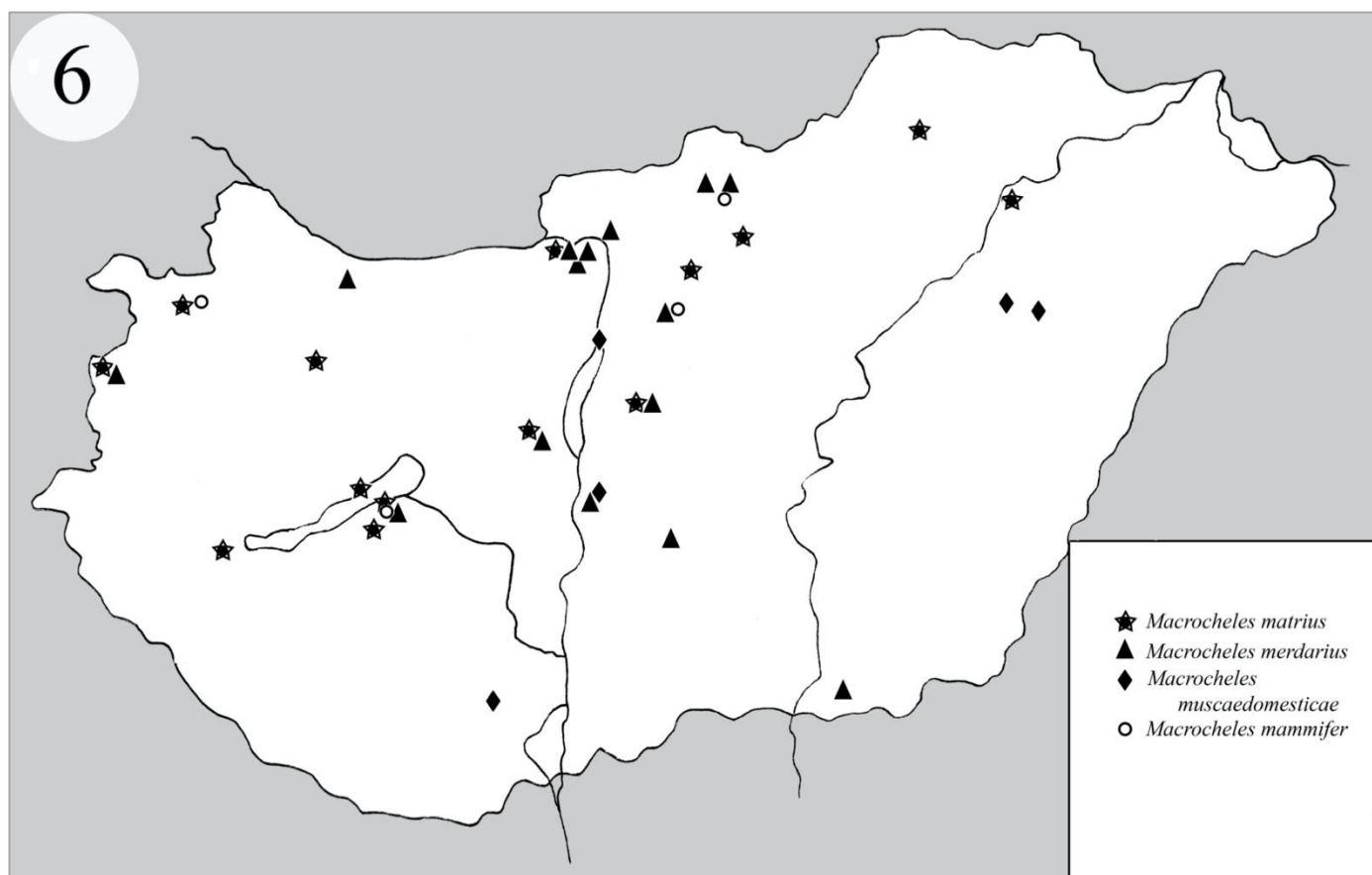


Figure 6. Occurrences of *Macrocheles* species (II) in Hungary.

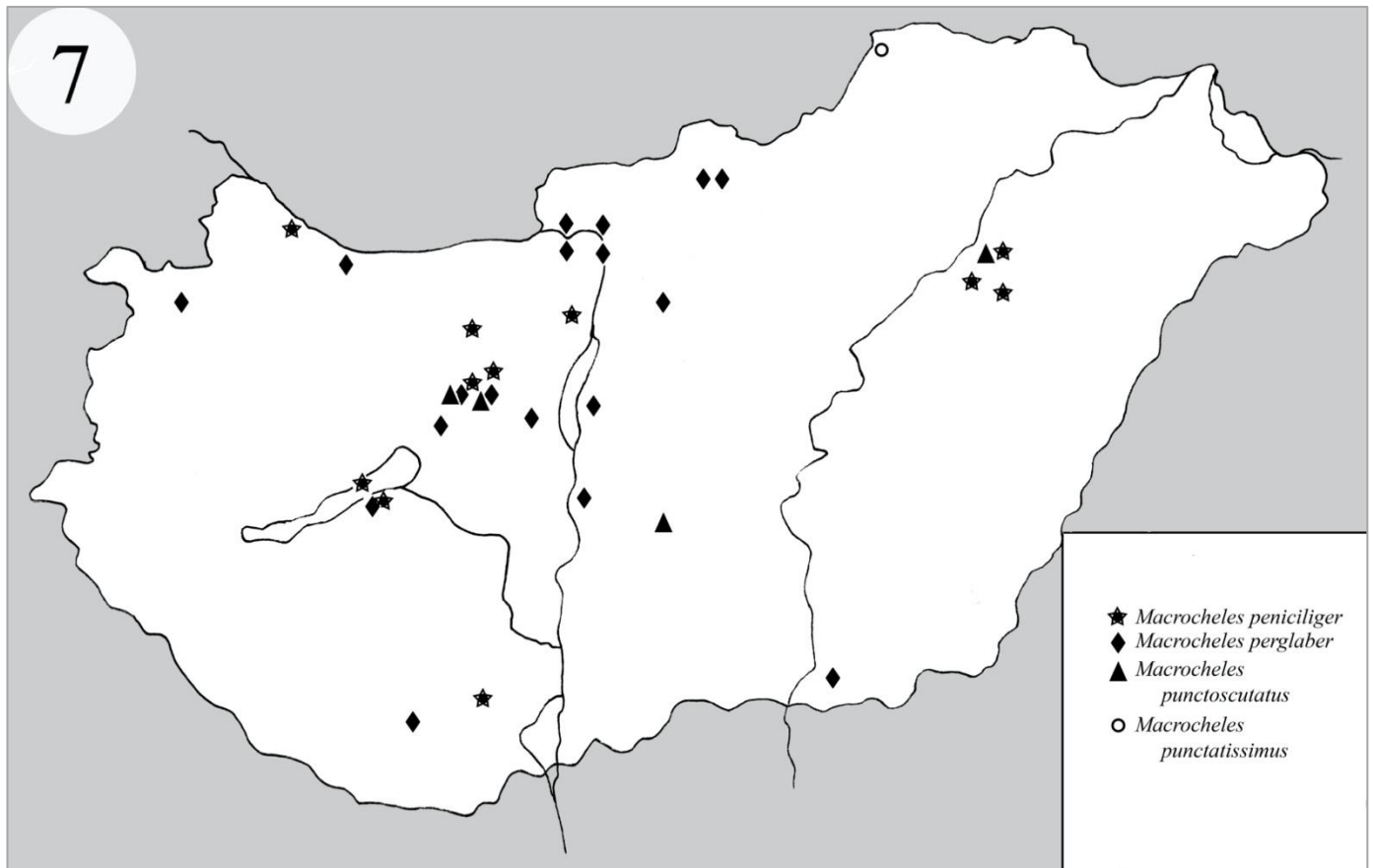


Figure 7. Occurrences of *Macrocheles* species (III) in Hungary.

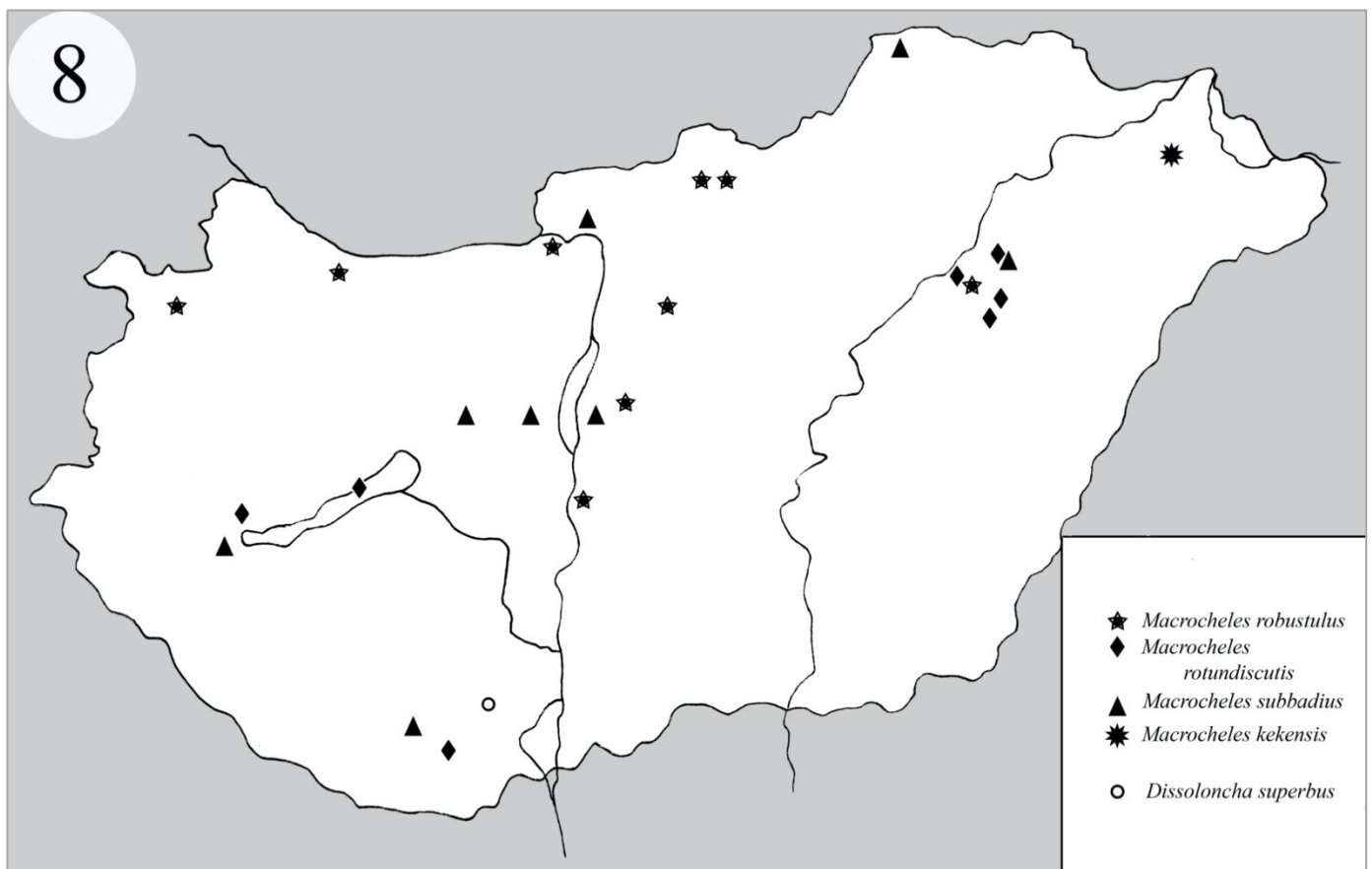


Figure 8. Occurrences of *Macrocheles* and *Dissoloncha* species in Hungary

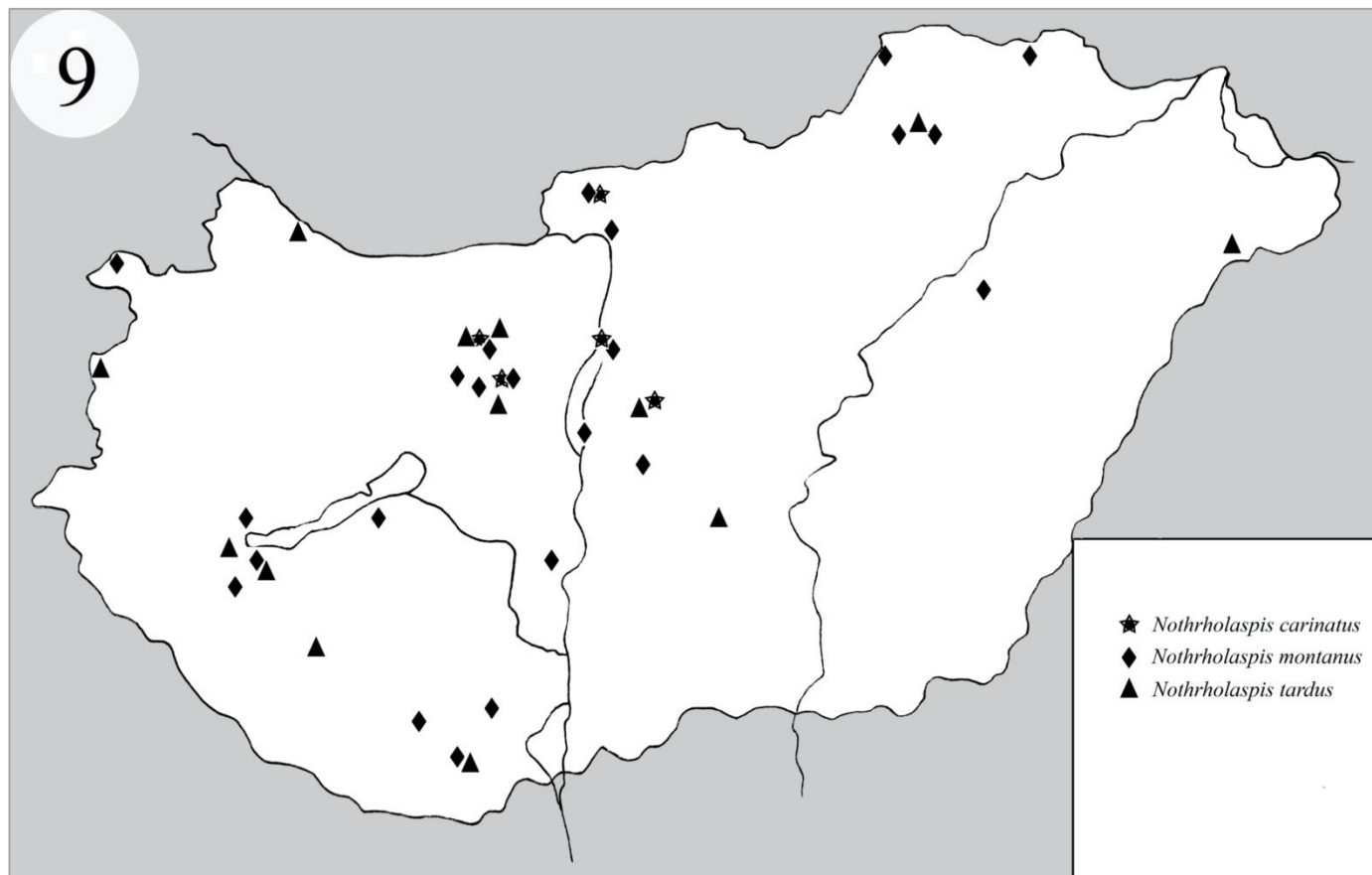


Figure 9. Occurrences of *Northrolaspis* species in Hungary.

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