

New Data on the Mesostigmatid Mite Fauna of Hungary (Acari: Mesostigmata)

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The authors give account of 7 new species, viz. *Proctolaelaps striatus* (Westerboer, 1963), *Hypoaspis kargi* Costa, 1968, *Hypoaspis fishtowni* Ruf and Köhler, 1993, *Neoseiulus zwölfperi* (Dosse, 1957), *Euseius stipulatus* (Athias-Henriot, 1960), *Neoseiulus subtilisetosus* (Beglyarov, 1962), *Neoseiulus pepperi* (Specht, 1968) belonging to the order Mesostigmata, which have not been recorded so far in the Hungarian fauna.

Keywords: Acari, Mesostigmata, Lealapidae, Ascidae, Phytoseiidae.

The faunistic investigations of predatory mites have been intensive over the past four decades in Hungary, taking into account the results of agricultural research as well as those of other faunistic studies. Significant knowledge has been gained especially on mesostigmatid mites, mainly on Phytoseiidae (Bozai, 1987; Komlovszky, 1987; Ripka, 2006; Szabó et al., 2010), Zerconidae, Macrochelidae and Uropodinae families (Kontschán, 2003, 2006).

In the present study the aim is to provide new data on the distribution of species belonging to the Lealapidae, Ascidae and Phytoseiidae families in Hungary.

Materials and Methods

As the result of numerous acarological studies carried out between 2009 and 2011, the authors found several mite species new to the Hungarian fauna. The site and date of collection of the specimens are given in (Table 1). Plant samples were collected in plastic bags. All the plant material was examined with binocular stereomicroscope (upper and lower surface of the leaves, buds, etc.) or with Tullgren funnels (mainly woody parts, such as the bark and spurs and roots). The mites found on the plant samples were put into

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Table 1

Collection data of mites (2009–2011, Hungary)

Species	Site	Place/plant/arthropod part	Plant/arthropod species	Date
<i>E. stipulatus</i>	Budapest	On leaves	<i>Pyrus calleryana</i>	May, 2011
<i>N. zwölferi</i>	Salföld	Woody parts	<i>Vitis vinifera</i> 'Pinot Gris'	Feb, 2011
<i>N. pepperi</i>	Soroksár	Aerial trap	<i>Malus domestica</i>	Aug, 2010
<i>N. subtilisetosus</i>	Soroksár	Aerial trap	<i>Malus domestica</i>	Jul, 2010
		Soil trap		Jun, 2010
<i>P. striatus</i>	Hetes	On the head, thorax, abdomen and legs, below the elytra	<i>Diabrotica virgifera virgifera</i>	Jul, 2009
<i>H. kargi</i>	Devecser	Roots	<i>Allium fistulosum</i>	Feb, 2011
<i>H. fishtowni</i>	Balatonederics	Roots, Csodabogyós cave	<i>Fraxinus ornus</i>	Jan, 2011

ethyl alcohol of 70%. The specimens were placed into Hoyer's medium. The slides were dried at 40 °C in incubator (for 2-4 weeks) and then sealed with commercial nail varnish. The species were placed in the collection of the Department of Entomology in Corvinus University of Budapest. To identify the mites, the identification keys of Karg (1993) and Westerboer (1963) were used.

The first site of collection of *H. fishtowni* in Hungary is Balatonederics. Several specimens were extracted with Tullgren funnel from the roots covering the ceiling of the "Csodabogyós" cave. The sample was collected by Lajos Katona, a geologist. The species was found during the investigations of Dr. Csaba Kutasi carried out on the fauna of Hungarian caves.

Results and Discussion

Proctolaelaps striatus was described by Westerboer in 1963. The species belonging to the Ascidae family was given the name of *Garmania striata*. According to Westerboer, it was not widely spread and was first collected from rotting apples around Erlangen in Germany (Westerboer, 1963).

Data of scientific literature confirm that the species lives together with Coleoptera species. The species appears to be widely spread all over the world, as it has been found in the galleries of *Ips calligraphus* in Greece, under the bark of conifer wood in Portugal, as well as on specimens of *Pissodes strobi*, a weevil species damaging conifers in the USA. Furthermore, it has occurred among the eggs of the angoumois grain moth, rotten fruits, and under elm bark (Lindquist and Hunter, 1965). According to Lindquist

and Hunter (1965) the name of *Garmania striata* is synonymous with the name of *Proctolaelaps bickleyi* which had been given earlier. The latter species also lives on beetles and several scientific data give account of the collection of the species. Garrett and Haramoto (1967) mention it on the faunistic list of the Hawaiian islands. McGraw and Farrier (1969) found specimens in large numbers on *Dendroctonus terebrans* and *Ips avulsus*, two species damaging *Pinus taeda*. Though also found on the larvae and pupae of *Dendroctonus frontalis*, it was not selected as a possible agent for biological control (Moser, 1975). It is also known in Central and South America; furthermore it occurred on coffee in Guatemala (Moser et al., 1974) and Brazil (Mineiro et al., 2009).

Hypoaspis kargi belonging to the *Geolaelaps* sub-genus of the Laelapidae was first described and named in honour of Professor Wolfgang Karg by Costa (1968). The female holotype was found in the litter of the Middle East blind mole rat (*Spalax ehrenbergi*) in the north of Israel (Akko junction). Little scientific data is available about the further distribution of the species. Salmane (1996, 1999) mentions its occurrence on the coast of the Baltic Sea as well as on the coast of the Bay of Riga in Latvia. Kaczmarek and Marquardt (2010) found it in the soil in south Croatia. In each case it was found as part of the soil fauna.

Hypoaspis fishtowni belonging to the *angusta* species group of the *Geolaelaps* sub-genus of the Laelapidae family was described by Ruf and Köhler (1993). The holotype was collected in a public park in Bremerhaven in the north of Germany, hence the name of the species. Regarding the distribution of the species, little scientific data have been available since its first mention. It was found in the soil samples of deciduous forests and dry meadows in Finland by Huhta et al. (2010). In Germany, it was collected from the soil of forests consisting of spruce and beech (Bury, 2008).

On the basis of literature, the distribution of *Neoseiulus zwölferti* is holarctic (Moraes et al., 2004). The holotype was found in Germany, but on apple and not on grapes (Dosse, 1957). In the view of Chant and McMurtry (2003), it is a member of the *paraki* sub-group of the *cucumeris* species group.

In the western Palaearctic region, only four species belonging to the *Euseius* genus occur, namely *E. finlandicus*, *E. scutalis*, *E. stipulatus*, and the most recently described *E. gallicus* (Tixier et al., 2010). In Hungary, only *E. finlandicus* has been found so far. The species is widely spread in Hungary, being one of the most common phytoseiid predatory mites. The recently collected *E. stipulatus* is distributed in the Mediterranean (Turkey, Greece, Italy and Spain) (Ferragut and Escudero, 1997). Although it is especially common on citrus fruits (McMurtry, 1977; Moraes et al., 2004), it is also present in vineyards (Kreiter et al., 2000) and on peach (Castagnoli et al., 1984). The species was collected first on citrus fruits in Algeria, later was found on other crops too (grape, cotton, bean, etc.) (Athias-Henriot, 1960).

Neoseiulus subtilisetosus belongs to the *womersleyi* species subgroup within the *barkeri* species group. The female collected from Convolvulaceae plant was described in Lazarev (Russia) (Beglyarov, 1962). Some authors suggest that *N. marginatus* is a synonym of the species (Chant and McMurtry, 2003). In the opinion of Karg (1993), the species is distributed in Eastern-Europe, occurring on apple and deciduous plants. According to Moraes et al. (2004), it is known to have occurred in Russia and Belarus.

The holotype of *Neoseiulus pepperi* was collected in 1957 from an oak tree in the vicinity of an apple orchard around Oxford in New Jersey by Specht, who did not find male specimens during the course of collection (Specht, 1968). The first male specimens were collected by Chant in 1958 from oak in Belleville in Canada (Chant and Yoshida Shaul, 1978). According to some authors, *N. pepperi* is the same as the predatory mite species of *N. astutus*, whereas Chant and McMurtry (2003) classify the first into the *cucumeris* species group and the latter into the *desertus* species group. Karg (1993) presents *A. pepperi* as a separate predatory mite species.

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