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New Data to the Mite Fauna of Hungarian Bamboo Plantations

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Five different bamboo plantations were investigated on the basis of the leaf litter inhabiting mites. 11 Mesostigmata and 10 Oribatida are listed from the leaf litters, of which three species, e.g. *Vulgarogamasus kraepelini* (Berlese, 1905), *Nothrus parvus* Sitnikova, 1975, *Metabelba paravulverosa* Moritz, 1966 are new to the Hungarian fauna.

Keywords: Acari, Mesostigmata, Oribatida, bamboo leaf litter, new occurrences, Hungary.

Acarological researches have a long tradition in Hungary (Horváth et al., 2010), but most of the studies on the soil dwelling mites concentrated on the natural areas, and the agricultural soils and other habitats are scarcely investigated.

Bamboo plantings are common in Hungary in the urban areas, the most widely planted species include *Phyllostachys aureosulcata, P. flexuosa* and *Phyllostachys viridi-glaucescens*, but *P. aurea, P. vivax* f. *aureocaulis, P. nigra* and some *Pleioblastus* and *Sasa* taxa are also regularly offered by retail nurseries. While from specialist nurseries over 50 temperate bamboo taxa are available.

In the last years, several papers were presented about the mites collected on Hungarian bamboo plantings. Firstly Ripka (1998, 2006) listed phytoseiid mites found on bamboo plants, some years later Ripka (2011) discovered and described a new genus and a new species of the eriophyid mites from a *Phyllostachys* species. More recently Kontschán and Neményi (2013) found for the first time East-Asian spider mites on the leaves of *Phyllostachys aurea,* and one year later Kontschán et al. (2014) listed the first bamboo leaf litter dwelling mites with some leaf inhabiting ones.

This new paper contains our new results of the mites which were collected in the leaf litters of five Hungarian bamboo plantings.

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Materials and Methods

The collected bamboo leaf litters were placed in a plastic bag and transported quickly to a Berlese-funnel for extraction. After two weeks of extraction, the mites were removed, cleared in lactic acid and studied. After the investigation of the specimens, the mites were stored in alcohol and deposited in the Plant Protection Institute of the Centre for Agricultural Research of the Hungarian Academy of Sciences and in the Soil Zoology collection of the Hungarian Natural History Museum. Illustrations were made by using a drawing tube. For the identification of the mites we used the books of Karg (1993) and Weigmann (2006), the ecological and distributional data follow Mahunka and Mahunka-Papp (2004) and Karg (1993).

Investigated plantations

Loc. 1, *Phyllostachys iridescens* planting in Szada planted in 2009. The clone originates from plants imported from China by the Belgian Bamboo Society.

Loc. 2, *Phyllostachys flexuosa* planting in the botanical garden of Szent István University, Gödöllő, planted in 1959. The clone originates from stock cultivated at ELTE Botanical Garden, Budapest since the beginning of the 20th century.

Loc. 3, *Sasa palmata* planting in the botanical garden of Szent István University, Gödöllő, planted in the 1960s. The clone possibly originates from stock cultivated at the Kámoni arboretum since the beginning of the 20th century.

Loc. 4, unidentified *Phyllostachys* sp. planting in the botanical garden of the University of Szeged, where the leaf litter is collected regularly by the workers of the botanical garden. The origin and the age of this planting is unknown.

Loc. 5, *Phyllostachys aurea* planting in Budapest, near the road to Nagykovácsi, this planting is used as a pruned hedge (5 m × 0.5 m), it is situated close to a bus stop and is polluted by communal trashes. The plant is possibly of Italian nursery trade origin but the age of this planting is unknown.

Results

Twenty-three mite species were found in the five plantings, twelve of them belong to the order Mesostigmata, eleven species are Oribatida (Table 1). Three species (*Vulgarogamasus kraepelini* (Berlese, 1905), *Nothrus parvus* Sitnikova, 1975, *Metabelba paravulverosa* Moritz, 1966) were found for the first time in Hungary. Most frequently collected species were *Pergamasus crassipes* and *Veigaia nemorensis* which are very common predatory species in the Hungarian natural habitat as well (collected in three of the investigated plantings). Three other species *(Tetcocepheus sarekensis, Oppia denticulata, Holoparasitus calcaratus)* were collected in two plantings, *Holoparasitus calcaratus* is a very common predatory mite in the natural habitats, the two oribatid mites *(Tetcocepheus sarekensis, Oppia denticulata)* are very common in Hungary in several different areas.

Table 1

The list of mite species found in the five different bamboo plantings

	Loc1*	Loc2	Loc3	Loc4	Loc5
Order Mesostigmata					
Family Trachytidae					
Trachytes baloghi Hirschmann and Zirngiebl-Nicol, 1969		X			
Family Discourellidae					
Discourella modesta (Leonardi, 1899)		X			
Family Veigaiaidae					
Veigaia nemorensis (C. L. Koch, 1839)		X	X		X
Family Macrochelidae					
Pachyseius humeralis Berlese, 1910		X			
Family Zerconidae					
Zercon peltatus C. L. Koch, 1836		X			
Zercon hungaricus Sellnick, 1958		X			
Zercon foveolatus (Halasková, 1970)	X				
Family Parasitidae					
Holoparasitus calcaratus (C. L. Koch, 1839)		X	X		
Vulgarogamasus kraepelini (Berlese, 1905)		X			
Pergamasus crassipes (Linnaeus, 1758)			X	X	X
Family Eppicriidae					
Epicriopsis horridus Kramer, 1876					X
Family Podonocinidae					
Podocinum pacificum Berlese, 1895					X
Order Oribatida					
Family Nothridae					
Nothrus silvestris Nicolet, 1855		X			
Nothrus parvus Sitnikova, 1975		X			
Family Camisiidae					
Heminothrus targionii (Berlese, 1885)		X			
Family Gymnodamaeidae					
Gymnodaemeus bicostatus (C.L. Koch, 1835)		X			
Family Phenopelopidae					
Eupelops acromios (Hermann, 1804)		X			
Family Oppiidae					
Ramsella insculpta (Paoli, 1908)				X	
Oppia denticulata (G. Canestrini and R. Canestrini, 1882)		X			X
Family Archipteriidae					
Archipteria nitens (Nicolet, 1855)					
Family Euphthiracaridae					
Rhisotritia ardua (C. L. Koch, 1841)					X
Family Tectocepheidae					
Tetcocepheus sarekensis Trägårdh, 1910				X	X
Family Ceratozetidae					
Trichoribates novus (Sellnick, 1928)				X	
Family Damaeidae					
Metabelba paravulverosa Moritz, 1966					X

*Earlier records are presented in Kontschán et al. (2014)

Majority of the species found were collected from only one planting, they are not rare species, most have been collected in several regions of Hungary. There is very few information about the mites of the agricultural areas, one of the listed species *(Rhisotritia ardua)* is very commonly found in different agricultural soils (field crops, sunflower, etc.).

Short description of the newly found species

Vulgarogamasus kraepelini (Berlese, 1905)

(Fig. 1a)

Diagnosis: Tectum with three peaked branches, central branch shorter than the lateral ones. First sternal setae situated on membranous cuticle, genital shield apically peaked and bearing two lateral spines. Sternal shield with an incision on posterior margin.

Distribution: Europe.

Nothrus parvus Sitnikova, 1975

(Fig. 1b)

Diagnosis: Legs with only one claw. Setae on notogaster wide and v-shaped setae. Sensili smooth and peaked. Notogaster and prodorsum covered by irregular pits.

Distribution: This species occurs in Ukraine, Siberia, Czech Republic, Poland and Germany.

Metabelba paravulverosa Moritz, 1966

(Fig. 1c)

Diagnosis: Setae on notogaster very long, two rows of notogastral setae situated close to each other. Dorsal seta on femur I wide and serrate.

Distribution: Bulgaria, Czech Republic, Poland and Germany.

Discussion

Loc2 was the most diverse locality; it had the largest number of Oribatida and Mesostigmata. A total of 8 mesostigmatid and 6 oribatid mites were collected in this location. The other plantings had mites in fewer numbers (Table 1). The reason for the differences can be explained by the different shape of the leaves of the bamboos. The bamboo species planted in locality 2 has many small leaves which produced a thicker and more

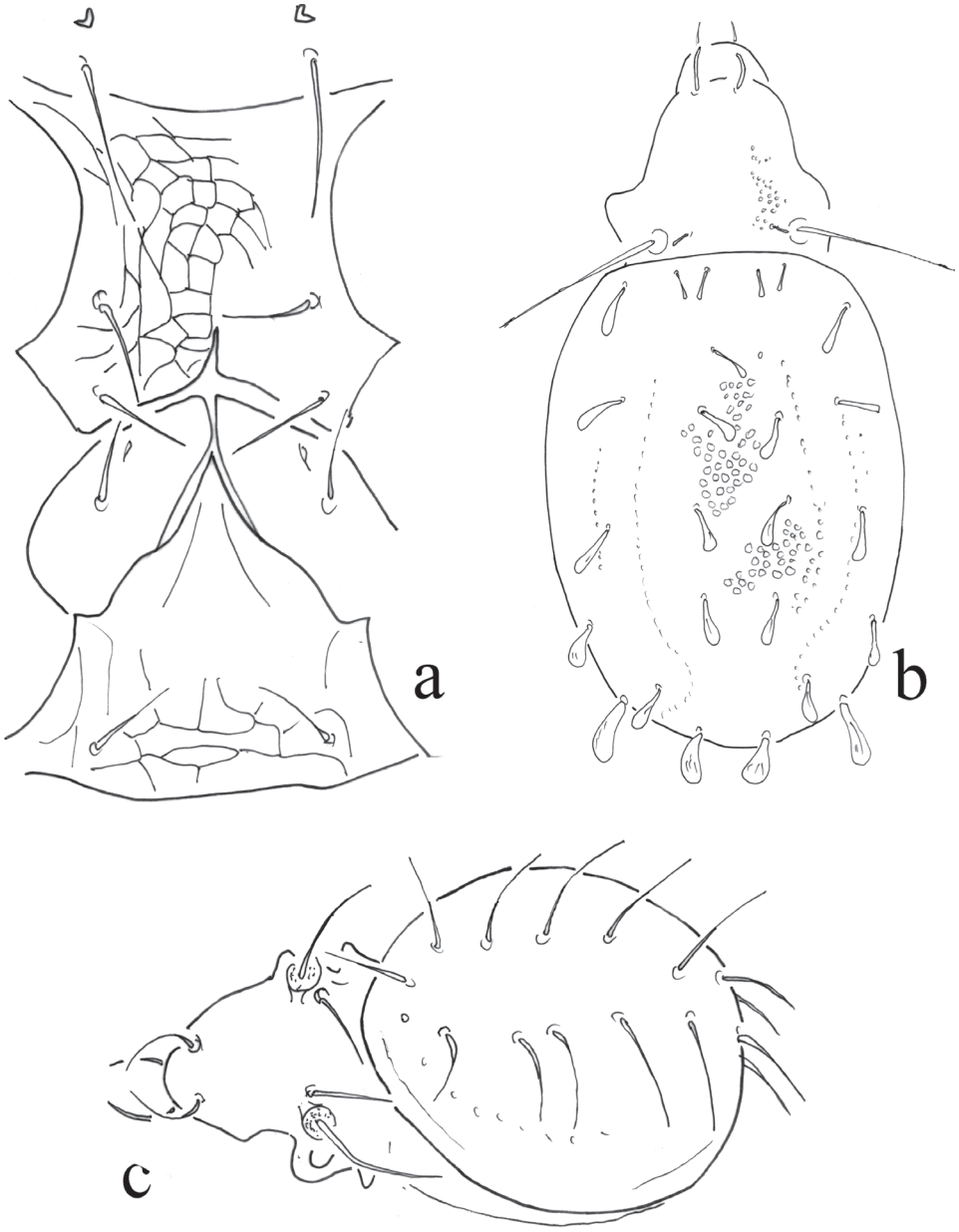

Fig. 1. Newly found mites in the bamboo leaf litters. a: intercoxal area *Vulgarogamasus kraepelini* (Berlese, 1905), b: dorsal view of *Nothrus parvus* Sitnikova, 1975, c: dorsolateral view of *Metabelba paravulverosa* Moritz, 1966

complex leaf litter, where the mites can find more possibilities in the search for preys or can find better hideaway from mite feeding predators. The thicker leaf litter can also produce wetter microhabitats where the leaf inhabiting fungi can proliferate which results in more food for the fungus-feeding mites.

The two turtle mite species found (*Trachytes baloghi* and *Discourella modesta*) are very common in the natural habitats in Hungary (Kontschán, 2008), on the basis of morphology their chelicerae (weak and bearing some teeth) these species seem to be fungivorous species, which can feed on hyphae of fungi living on bamboo leaf litter. The species from the suborder Gamasina are well known, fast moving predatory mites, which feed on larger (mites, springtails, maggots) or smaller (nematodes, small maggots) prey. The larger species *(Veigaia nemorensis, Pachyseius humeralis, Holoparasitus calcaratus, Vulgarogamasus kraepelini, Pergamasus crassipes)* have large, sclerotized and strongly denticulate chelicerae which is very important in the catching of the larger soil dwelling preys. The species of the family Zerconidae *(Zercon peltatus, Zercon hungaricus, Zercon foveolatus)* are small, but significant predatory mites of the soils. Their chelicerae are small and strongly dentate which are suitable for catching nematodes and small maggots and springtails.

The oribatid mites collected in the leaf litters of bamboo plantings are common and well known members of the soil faunas, the majority of Oribatida species have a major role in the decomposition of the leaf litters and in soil formation.

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Literature

Horváth, E., Kontschán, J. and Mahunka, S. (2010): Hungarian acarological literature. Opusc. Zool. Budapest 41, 97–174.

Karg, W. (1993): Raubmilben. Acari (Acarina), Milben, Parasitiformes (Anactinochaeta), Cohors Gamasina Leach. Die Tierwelt Deutschland 59, 1–523.

Kontschán, J. (2008): Magyarország korongatkái (Acari: Mesostigmata: Uropodina). [Turtle mites of Hungary (Acari: Mesostigmata: Uropodina)]. Állatt. Közlem. 93, 3–15.

Kontschán, J. and Neményi, A. (2013): Egy bambuszon élő, kelet-ázsiai takácsatka *Stigmaeopsis nanjingensis* (Ma and Juan, 1980) faj első előfordulása Magyarországon (Acari: Tetranychidae). [An East-Asian tetranychid bamboo inhabiting mite, *Stigmaeopsis nanjingensis* (Ma and Yuan, 1980) first occurrence in Hungary (Acari: Tetranychidae)]. Növényvédelem 49, 473–477.

Kontschán, J., Ács, A. and Neményi, A. (2014): Adatok a magyarországi bambuszok atkáihoz. [Data to the mite (Acari) fauna of bamboos in Hungary]. Növényvédelem 50, 339–343.

Mahunka, S. and Mahunka-Papp, L. (2004): A Catalogue of the Hungarian oribatid mites (Acari: Oribatida). In: Cs. Csuzdi and S. Mahunka (eds): Pedozoologica Hungarica, No. 2. Hungarian Natural History Museum and Systematic Zoology Research Group of the Hungarian Academy of Sciences, Budapest, 1–363.

Ripka, G. (1998): New data to the knowledge on the phytoseiid fauna in Hungary (Acari: Mesostigmata). Acta Phytopathol. et Entomol. Hung. 33, 395–405.

Ripka, G. (2006): Checklist of the Phytoseiidae of Hungary (Acari: Mesostigmata). Folia Entomol. Hung. 67, 229–260.

Ripka, G. (2011): A new genus, *Adventacarus* and a new *Abacarus* species from Hungary (Acari: Prostigmata: Eriophyoidea). Acta Phytopathol. et Entomol. Hung. 46, 139–149.

Weigmann, G. (2006): Hornmilben (Oribatida). Die Tierwelt Deutschland 76, 1–520.