

**Mite species (Acari: Mesostigmata) new and rare to Polish fauna,  
inhabiting the soil of broadleaved forests dominated  
by small-leaved lime (*Tilia cordata* Mill.)  
in Kwidzyn Forest District (N Poland)**

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**Abstract:** During a two-year study on mites of the order Mesostigmata in broadleaved forest stands dominated by small-leaved lime (*Tilia cordata* Mill.), 117 mite species were identified. Among them, 3 had been so far rarely recorded in Poland (*Haemogamasus nidi*, *Stylochirus rovenensis* and *Eugamasus crassitarsis*) and 2 were classified as new to the Polish fauna (*Veigaia sibirica* and *Digamasellus perpusillus*).

**Keywords:** Acari, Mesostigmata, new species, rare species, Polish fauna

## INTRODUCTION

The Mesostigmata include approximately 8000 mite species that have been described to date and found in all the continents and climatic zones (HALLAN 2011). Those mites inhabit mostly the soil, especially within the hemiedaphic zone. Apart from soil dwellers, some mesostigmatids live on plants or are scavengers, ectoparasites or endoparasites of vertebrates or invertebrates. In Poland, 824 Mesostigmata species were recorded by BOGDANOWICZ et al. (2008).

This paper presents the ecology and occurrence of rare species of Mesostigmata (some of them new to the Polish fauna) within broadleaved forest stands in northern Poland. Among the 117 species recorded in the study area, 3 are rare in Poland, and 2 are new to the Polish fauna.

## STUDY AREA

The study was performed in Kwidzyn Forest District, within the limits of Iława Lake District and Kwidzyn Valley (KONDRACKI 2009). We investigated 6 forest stands of various ages (16, 35, 57, 80, 102, and 125 years old), all dominated by small-leaved lime (*Tilia cordata* Mill.) and classified as the plant association *Tilio-Carpinetum* Tracz., 1962 (subcontinental broadleaved forest).

## MATERIAL AND METHODS

Samples for research were collected in autumn (2006 and 2007) and spring (2007 and 2008). There were 100 samples (50 cm<sup>3</sup> each) collected from each plot: 20 samples from the litter horizon (labelled as L) and 20 from each of the 4 artificially designated organomineral levels (labelled as subscripted OM) that were 5 cm thick, to the depth of 20 cm. The number next to 'plot' indicates the age of the forest stand.

Overall, 2400 samples were collected, and after a 6-day extraction in Tullgren funnels, 25 995 mites were obtained from the samples. These included 4272 Mesostigmata, which were identified to the species level, including all the developmental forms (D = deutonymph; ♀ = female; ♂ = male).

## RESULTS AND DISCUSSION

Within the study area, *Veigaia sibirica* and *Digamasellus perpusillus* were new to the Polish fauna.

Family: Veigaiidae Oudemans, 1939

***Veigaia sibirica* Bregetova, 1961**

Samples in which the species occurred: plot 57, OM<sub>1</sub> – 1 ♀.

*Veigaia sibirica* was previously found exclusively in the soil and litter in the former Soviet Union (BREGETOVA 1977).

Family: Digamasellidae

***Digamasellus perpusillus* Berlese, 1905 = *Digamasellus punctum* Berlese 1904**

Samples in which the species occurred: plot 57, OM<sub>3</sub> – 1 ♀.

*Digamasellus perpusillus* is considered to be in a phoretic relationship with beetles of the genus *Geotrupes* and previously occurred frequently in manure, compost, and decomposing organic matter: in the former Soviet Union (BREGETOVA 1977), Germany (KARG 1993), and United States (KRANTZ & WALTER 2009). Its presence in the studied soil sample from a broadleaved forest is most probably accidental.

Rare species in the Polish fauna within the study area were: *Haemogamasus nidi*, *Stylochirus rovenensis*, and *Eugamasus crassitarsis*.

Family: Laelapidae

***Haemogamasus nidi* (Michael, 1892)**

Samples in which the species occurred: plot 80, L and OM<sub>4</sub> – 2 ♀.

*Haemogamasus nidi* is clearly associated with small mammals, especially rodents, and their nests. It was previously recorded on e.g. *Myodes rutilus*, *M. glareolus*, *Microtus oeconomus*, *M. arvalis*, *M. subterraneus*, *M. gregalis*, *Mus spicilegus*, *M. musculus*, *Apodemus sylvaticus*, *A. flavicollis*, *A. agrarius*, and *Arvicola terrestris* (KOYUMIDJIEVA 1974, 1982; KOYUMIDJIEVA & YANEVA 1980; KARG 1993; MASAN & STANKO 2005; KRASNOW et al. 2010). Sporadically, it was also found in soil and litter (KARG 1993). In Poland, it was previously recorded in the Tatra National Park (CICHOCKI 1984; GWIAZDOWICZ 2010) and the Pieniny Mountains (SKORUPSKI & GWIAZDOWICZ 1996). The presence of this species in the studied soil samples of a broadleaved forest is most certainly accidental.

Family: Rhodacaridae

***Stylochirus rovenensis* G. et R. Canestrini, 1882**

Samples in which the species occurred: plot 35, L – 1 ♂; plot 102, OM<sub>2</sub> – 1 ♀. To date, *Stylochirus rovenensis* was recorded in moss, peatlands, and young pine forests (BREGETOVA 1977). In Poland, the first locality of this species was the peatland reserve ‘Wielkie Torfowisko Batorowskie’ (KACZMAREK et al. 2006). Our study area in Kwidziny Forest District is the second locality of this species in Poland.

Family: Parasitidae

***Eugamasus crassitarsis* (Halbert, 1923)**

Samples in which the species occurred: plot 102, OM<sub>1</sub> – 1 ♀. *Eugamasus crassitarsis* occurs in litter, arable lands, and pastures on sandy soil (HYATT 1980). In Poland, it was recorded in postindustrial wastelands (MADEJ 2004), arable lands near Warsaw (MICHERDZIŃSKI 1969), the soil of a seasonally flooded meadow (KACZMAREK et al. 2010), and in the litter of ash-alder riparian forest *Fraxino-Alnetum* (KACZMAREK et al. 2012). Our study area is the first locality of this species in the soil of subcontinental broadleaved forest *Tilio-Carpinetum*.

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