

# **First Record of *Armadillidium nasatum* Budde-Lund, 1885 (Isopoda, Oniscidea: Armadillidae) from Hungary**

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This is the first report on the occurrence of *Armadillidium nasatum* in Hungary.

Keywords: *Armadillidium nasatum*, greenhouse pests, Oniscidea.

This species has probably spread out from Italy (Gruner, 1966) where it is very common. From there it expanded through France to north Spain then along the Atlantic coast into Belgium and Holland from where its distribution turns back to the south at the western border of Switzerland. It has been introduced to Germany, Denmark, Sweden, Finland, Poland, Austria, eastern Switzerland, the Czech Republic and Slovakia (Flasárová, 1995, 1996, 1997, 2000), to England, North America, Canada and the northern states of the USA. In these countries it lives mainly in greenhouses. In the southern states of the USA it lives out in the wild, being one of the most common woodlouse species in North Carolina. It is most frequent in wet places, mostly along water courses. It prefers open areas and is seldom found in forests. In countries with cold climate its active expansion is impossible because of the thermosensitivity of the animal. It can be definitely harmful in greenhouses and synantropic places, by feeding on the young shoots.

Material examined: 11 males, 12 non-gravid females, 13 gravid females. The specimens were collected by hand sampling (Forró and Farkas, 1998) on 5th and 25th May 2000 in the greenhouse of the Botanical Garden of the University of Pécs.

Description of the collected specimens (Gruner, 1966; Sutton et al., 1972; Hopkin, 1991): There are minute depressions on the animals' surface which give them a finely spotted appearance. There are point-like protuberances on the body segments. On the anterior edge of the segments there is a narrow dark band. The animals are brownish grey, with a lateral and a central light band extending on the segments. Between the light stripes there is a light pattern over dark background, slightly protruding, with no spotting. The alteration of dark and light bands makes the animals appear as having a longitudinal striping. Males are more pigmented and appear darker than females. The head is wide, with the *linea frontalis* ending at the frontal triangle. The upper part of the frontal triangle

continues as a high plate which is maximum twice as wide as its height, with slightly rounded corners. Behind the frontal plate there is a deep and narrow gap. Antenna lobes are only slightly recurved. The segments of the flagellum are approximately the same length. The front corners of the first tergite segment curve outward, thus exposing its almost entire inner surface when examined ventrally. The telson is wider than its length, with a definitely rounded tip.

## Acknowledgement

The research was sponsored by the Hungarian Academy of Sciences (Bolyai János Research Scholarship; BO/00304/01).

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# New Data to the Knowledge on the Eriophyoid Fauna on Grasses in Hungary (Acari: Eriophyoidea)

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*Aculodes dubius* (Nalepa), *Aculodes mckenziei* (Keifer) and *Aceria tosichella* Keifer were recorded for the first time in Hungary. *Festuca pratensis*, *Phleum phleoides* and *Bromus inermis* were found as new host-plants of *Aculodes dubius*, although other plant species in these genera are known to be hosts of this mite. *Aceria tulipae* (Keifer) was identified on *Phleum pratense* and *Aceria tenuis* (Nalepa) on *Phleum phleoides*, which were also new host-plants for them.

Keywords: Graminea, *Aculodes*, *Aceria*.

The eriophyoid mites are frequent on monocotyledons and dicotyledons, and the number of known species increases continuously. However, the researchers mainly give report on the eriophyoid fauna of woody plants in Hungary (Balás, 1939; Dellei and Szendrey, 1988, 1989; Györffy, 1987, 1992; Ripka, 1997; Ripka and de Lillo, 1997). In addition to the description of several mites, Farkas (1965, 1966) gave short characterization on the species occurred on monocotyledons in Central Europe. The imperfect knowledge of the Hungarian eriophyoid fauna on grasses needs further examinations.

## Materials and Methods

In 2000 and 2001 investigations were carried out to study the eriophyoid fauna on grasses in Gödöllő and Környe. Whole plants were collected, and the occurrence of mites were examined by Leica Wild mounting microscope. The cleaning of mites was performed by lactic acid, the staining of cuticula by Keifer's intermediate mixture (1954) and the preserving by Keifer's permanent medium (1954). The solution of Heinze (Boczek, 1999) was also used for mounting. The identification of mites was carried out by using Olympus BX-41 microscope with phase contrast and immersion lens. The genera were identified by the keys of Boczek et al. (1989). The species were recognized by using the catalogue of Davis et al. (1982) and Amrine and Stasny (1994), and on the basis of the original and cited descriptions (Keifer, 1938, 1944, 1966, 1969, 1970; Farkas, 1965, 1966; Proeseler, 1972; Jeppson et al., 1975).

## Results

From grasses five eriophyoid species were identified (see *Table 1*). Three of them – *Aculodes dubius*<sup>1</sup> (Nalepa), *Aculodes mckenziei*<sup>2</sup> (Keifer) and *Aceria tosichella* Keifer – were recorded for the first time in Hungary. *Festuca pratensis*, *Phleum phleoides* and *Bromus inermis* were found as new host-plants of *Aculodes dubius*, although other plant species in these genera are known to be hosts of this mite. *Aceria tulipae*<sup>3</sup> (Keifer) was found on *Phleum pratense* and *Aceria tenuis*<sup>4</sup> (Nalepa) on *Phleum phleoides*, which were also new host-plants for them.

**Table 1**

Eriophyoid mites collected from grasses

Plant species	Mite species
<i>Festuca pratensis</i>	<i>Aculodes dubius</i> (Nalepa)
<i>Festuca rubra</i>	<i>Aculodes dubius</i> (Nalepa) <i>Aculodes mckenziei</i> (Keifer)
<i>Lolium perenne</i>	<i>Aceria tulipae</i> (Keifer) <i>Aculodes dubius</i> (Nalepa)
<i>Phleum pratense</i>	<i>Aceria tulipae</i> (Keifer) <i>Aculodes dubius</i> (Nalepa)
<i>Phleum phleoides</i>	<i>Aceria tenuis</i> (Nalepa) <i>Aculodes dubius</i> (Nalepa)
<i>Arrhenatherum elatius</i>	<i>Aceria tosichella</i> Keifer <i>Aculodes dubius</i> (Nalepa) <i>Aculodes mckenziei</i> (Keifer)
<i>Bromus inermis</i>	<i>Aculodes dubius</i> (Nalepa) <i>Aculodes mckenziei</i> (Keifer)
<i>Triticum aestivum</i>	<i>Aculodes mckenziei</i> (Keifer)

## Discussion

*Aculodes dubius* was a new species on *Festuca pratensis*, *Phleum phleoides* and *Bromus inermis* and in the Hungarian fauna. This mite also occurred on *Festuca rubra* and *Lolium perenne*. According to the catalogue of Amrine and Stasny (1994), this species was originally described on *Helichotrichon pratensis* = *Avena pratensis*, then it was also found on *Bromus mollis* and *Bromus sterilis*. Davis et al. (1982) mentioned *Aculodes dubius* on

<sup>1</sup> Syn.: *Phytocoptes*, *Phyllocoptes*, *Aculops*

<sup>2</sup> Syn.: *Vasates*

<sup>3</sup> Syn.: *Eriophyes*

<sup>4</sup> Syn.: *Phytoptus*, *Eriophyes*

*Agropyron repens* and *Bromus mollis*. However, Skoracka (1999) observed this species on even more plants, on *Agrostis vulgaris*, *Alopecurus aequalis*, *Alopecurus pratensis*, *Arrhenatherum elatius*, *Bromus mollis*, *Bromus sterilis*, *Bromus tectorum*, *Corynephorus canescens*, *Dactylis glomerata*, *Festuca arundinacea*, *Festuca rubra*, *Holcus lanatus*, *Lolium perenne*, *Phleum pratense*, *Tymotka kolankowata*, *Poa annua* and *Poa pratensis*.

*Aculodes mckenziei* was identified for the first time in Hungary on *Festuca rubra*, *Arrhenatherum elatius*, *Bromus inermis* and *Triticum aestivum*. In 1944 Keifer described the species on the leaves of *Elymus triticoides* and named *Vasates mckenziei*. In the catalogue of Davis et al. (1982) and Amrine and Stasny (1994) *Agropyron repens*, *Agropyron smithi*, *Arundo donax*, *Distichlis stipata* and *Triticum* spp. are among the host-plants of this mite. According to Skoracka's (1999) results, the *Aculodes mckenziei* occurs on *Agropyron repens*, *Agrostis alba*, *Arrhenatherum elatius*, *Bromus mollis*, *Bromus sterilis*, *Bromus inermis*, *Calamagrostis epigeios*, *Dactylis glomerata*, *Festuca arundinacea*, *Festuca rubra*, *Phalaris arundinacea*, *Poa pratensis* and *Puccinellia capillaris* in Poland.

*Aceria tosichella* was also recorded for the first time in Hungary. It was described by Keifer (1969) on *Triticum sativa*, then Skoracka (1999) also found the species on *Agropyron repens*, *Festuca arundinacea*, *Festuca rubra*, *Agrostis vulgaris*, *Arrhenatherum elatius* and *Bromus inermis*.

*Aceria tulipae* is common in the Hungarian fauna. It was collected on *Lolium perenne* and *Phleum pratense*. This mite has many host-plants, but the *Phleum pratense* was new among them. Originally, Keifer (1938) described the species as *Eriophyes tulipae* on tulip bulbs, but later it was ranked among the members of *Aceria* genus (Keifer 1944). Farkas (1965, 1966) mentioned the occurrence of *Aceria tulipae* on onion, *Tulipa gesneriana* and Liliaceae. On the basis of Davis et al. (1982) and Amrine and Stasny (1994), the host-plants of this species are *Allium cepa*, *Allium sativum*, *Ornithogalum* spp., *Agropyron* spp., *Avena pratensis*, *Bromus* spp., *Digitaria sanguinalis*, *Elymus canadensis*, *Festuca* spp., *Hordeum* spp., *Lolium* spp., *Muhlenbergia racemosa*, *Setaria* spp., *Triticum* spp., *Xerophyllum tenax* and *Zea mays*.

*Aceria tenuis* also common in Hungary, but the *Phleum phleoides* – on which it were found – was a new host for this mite. According to Davis et al. (1982) and Amrine and Stasny (1994), *Aceria tenuis* can be found on *Agropyron repens* var. *maritimum*, *Agrostis* spp., *Aira* spp., *Alopecurus* spp., *Anthoxantum odoratum*, *Avena pratensis*, *Avena pubescens*, *Briztia media*, *Bromus* spp., *Calamagrostis* spp., *Cynosurus cristatus*, *Dactylis glomerata*, *Deschampsia caespitosa*, *Deschampsia flexuosa*, *Elymus arenarius*, *Elymus repens*, *Festuca* spp., *Lolium perenne*, *Melica nutans*, *Melica uniflora*, *Milium effusum*, *Molinia coerulea*, *Phalaris arundinacea*, *Phleum pratense*, *Poa* spp., *Sesleria coerulea*, *Sieglindia decumbens* and *Triticum* spp.

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# Acta Phytopathologica et Entomologica Hungarica

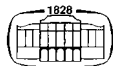
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Volume 37



Akadémiai Kiadó, Budapest  
2002