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New data on the occurrence of *Demodex lacrimalis* (Acari, Demodecidae)
of the wood mouse *Apodemus sylvaticus* (Rodentia, Muridae)

Nowe dane o występowaniu *Demodex lacrimalis* (Acari, Demodecidae)
z myszy zaroślowej *Apodemus sylvaticus* (Rodentia, Muridae)

SUMMARY

Demodex lacrimalis Lukoschus et Jongman, 1974, has been observed for the first time in Poland – a species specific to the Meibomian glands of the wood mouse *Apodemus sylvaticus*, so far noted only in the Netherlands and Italy. At the same time it is the first finding of the mites of *Demodecidae* in this host in Poland. All the specimens of *D. lacrimalis* were found in the area of eye skin of the mouse.

STRESZCZENIE

Po raz pierwszy w Polsce stwierdzono *Demodex lacrimalis* Lukoschus et Jongman, 1974, gatunek specyficzny dla gruczołów tarczowych myszy zaroślowej *Apodemus sylvaticus*, notowany dotychczas tylko w Holandii i Włoszech. Jest to zarazem pierwsze stwierdzenie roztoczy z *Demodecidae* u tego żywiciela w Polsce. Wszystkie okazy *D. lacrimalis* zostały znalezione w skórze okolic oczu myszy.

Keywords: *Demodex lacrimalis*, *Apodemus sylvaticus*, wood mouse, *Demodecidae*, rodents, infestation

INTRODUCTION

The wood mouse *Apodemus sylvaticus* (Linnaeus, 1758) is a common rodent of the family *Muridae*, associated with forest, bush, park and field environment; in the winter it may move to the places of human residence. It inhabits Europe,

North Africa, but it is also noted in Middle and South-West Asia and in the Himalayas (4, 12, 15, 17). So far three species of the family *Demodecidae* (*Acari, Prostigmata*) have been described in the wood mouse, which showed both host and topical specificity. The first species – *Demodex longior* Hirst, 1918, described in Great Britain, inhabits the region of vibrissae (5). The others – *D. lacrimalis* Lukoschus et Jongman, 1974, described in the Netherlands and Italy, and *Ophthalmodex apodemi* Bukva, Nutting et Desch, 1992 from the Netherlands and the Czech Republic are related to the area of eye skin (2, 14). In addition, *D. arvicolae apodemi* Hirst, 1918 has been noted in the host, a subspecies found also in the striped field mouse *Apodemus agrarius* (Pallas, 1771), inhabiting follicles of common hairs (5). However, the forms of *D. a. apodemi* that come from different hosts, show clear distinctness and require verification (6, 10). Until now, no mites of *Demodecidae* have been found in Poland in the wood mouse. Admittedly, *D. a. apodemi* has been noted, but only in the striped field mouse (9). At present, *D. lacrimalis* has been observed in the wood mouse from the area of Gdańsk Pomerania.

MATERIALS AND METHODS

As many as 20 wood mice (*Apodemus sylvaticus*) were studied. These mice originated from Poland, Gdańsk Pomerania (54°15'N/18°14'E) and were collected in 2009 and 2010. Sections of skin from various parts of body, including head (regions of eyes, ears, nose, vibrissae, lips, chin), abdomen, back, legs, genital-anal region, were analyzed for the presence of topical mites with the use of the method of digesting skin fragments (7, 11). Digested 1 cm²-fragments of skin were decanted and analyzed with the use of phase contrast microscope. *Demodex* specimens were measured and permanent specimens were prepared in Faure's solution.

RESULTS AND DISCUSSION

Seventeen *Demodex lacrimalis* Lukoschus et Jongman, 1974 have been found in 3 wood mice, including 9 females, 2 males, 3 nymphs and 3 larvae, and, additionally, 6 eggs (Tab. 1, Figs. 1, 2).

All the specimens came from the area of the eyelids, which is related to the above-described topical specificity of these mites, inhabiting exclusively the Meibomian glands (14). Mites of *Demodecidae* usually display host and also topical specificity. A range of species is related to the follicles of common and sensory hairs, different types of glands, epidermis; they may also be endoparasites inhabiting the oral cavity, tissues of the tongue and the esophagus (1, 3, 8, 16). Among the species related to glands, some mites inhabit the Meibomian glands. Such a location can be observed e.g. in *D. molossi* Desch, Nutting et Lukoschus,

1972, *D. longissimus* Desch, Nutting et Lukoschus, 1972, *D. melanopteri* Lukoschus, Jongman et Nutting, 1972 of neotropical bats, or *D. ghanensis* Oppong, Lee et Yasing, 1975 and *D. bisonianus* Kadulski et Izdebska, 1996 of ungulates (8, 14). There are also species of analogous location in rodents, e.g. *D. gapperi* Nutting, Emejuaiwe et Tisdell, 1971 of the neartic vole *Myodes* (= *Clethrionomys*) *gapperi* (Vigors, 1830), *Demodex peromysci* Lombert, Lukoschus et Whitaker, 1983 of the white-footed mouse *Peromyscus leucopus* and *D. huttereri* Mertens, Lukoschus et Nutting, 1983 of the striped field mouse *Apodemus agrarius*, recently found in Poland (10, 13, 14).

Topographical preferences are related to topical specificity, hence inhabiting constant body areas by mites. And thus species related to follicles of common hairs (e.g. *D. a. apodemi* in the wood mouse and the striped field mouse) sometimes can be found in different regions of hairy skin of the whole body, while species related to the Meibomian glands (e.g. *D. lacrimalis* in the wood mouse and *D. huttereri* in the striped field mouse) occur only in the area of eyelid skin. Such a location of occurrence presumably may contribute to the limitation

Table 1. Size [μm] of *Demodex lacrimalis* according to different studies

Body size		Lukoschus and Jongman 1974	Present study
Male	length	271 [212–304]	268 [250–285]
	width	35 [27–44]	35 [33–37]
Female	length	225 [175–262]	249 [225–281]
	width	39 [32–46]	40 [33–49]
Nymph	length	292 [260–320]	242 [191–295]
	width	33 [23–38]	32 [29–36]
Larva	length	209 [156–271]	178 [165–189]
	width	29 [24–33]	27 [26–28]
Ovum	length	133 [114–145]	134 [125–149]
	width	31 [26–36]	35 [32–37]

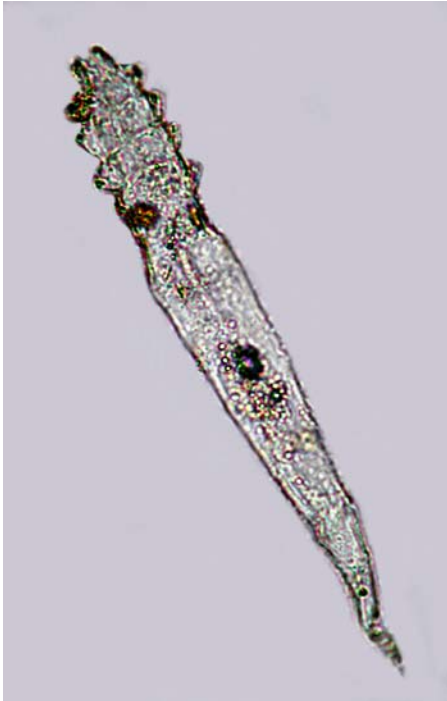


Fig. 1. *Demodex lacrimalis* from skin of wood mouse



Fig. 2. *Demodex lacrimalis*, egg

of mite transfer between hosts. Therefore at present *D. lacrimalis* has been noted only in 15% of the examined wood mice, which corresponds to the low level of infestation with an analogous species (*D. huttereri*) in the striped field mice from the same examined region. On the other hand, *D. a. apodemi* has been observed in 60–80% of the striped field mice of Pomerania (9, 10).

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