

Original papers

Recent data on *Demodex rosus* Bukva, Vitovec et Vlcek, 1985 (Acari, Demodecidae) from oral cavity of yellow-necked field mouse, *Apodemus flavicollis* (Rodentia, Muridae)**Joanna N. Izdebska, Sławomira Fryderyk**

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ABSTRACT. Until now, *Demodex rosus* has been only recorded in the Czech Republic; however, as many as 81 specimens of this species have been observed in 7 yellow-necked field mice collected from Gdansk Pomerania, Poland (prevalence 35%, mean intensity 11.6). This is the first observation of that species in Poland. In Polish fauna, *Apodemus flavicollis* proved to be a new host of mites belonging to Demodecidae. All specimens of *D. rosus* have been found in the mouse oral cavity.

Key words: *Demodex rosus*, Demodecidae, oral cavity, rodents, infestation

Introduction

Demodecidae (Acari, Prostigmata) are mites that demonstrate not only host but also topical specificity. Most of the known species of Demodecidae inhabit various microhabitats of mammalian skin, such as hair follicles, glands and their excretory ducts, and external layers of epidermis [1]. However, demodectic mites of some species are also endoparasites, inhabiting anterior fragments of the alimentary tract [2,3]. *Demodex rosus*, which was found in yellow-necked field mouse in the Czech Republic, belongs to that small group of demodectic mites. Besides their occurrence in the oral cavity and esophagus, these mites were also found in tissues of alimentary tract and these localizations were confirmed histologically [3]. Until now, there has been lack of reports about occurrence of this species beyond the Czech Republic. Recently, *D. rosus* has been also found in *Apodemus flavicollis* from Gdansk Pomerania (Poland).

Material and methods

As many as 20 yellow-necked field mice *Apodemus flavicollis* (Melchior, 1834) were

studied. These mice originated from several stands of Gdansk Pomerania (54°15'N/18°14'E and 54°13'N/18°56'E) and were collected during 2009 and 2010. Sections of skin from various parts of body, including head (regions of eyes, ears, nose, lips, chin), abdomen, back, legs, genital-anal region, also from oral cavity (internal side of cheek, tongue) and esophagus, were analyzed for the presence of topical mites with the use of method of digesting skin fragments [4,5]. Digested fragments were decanted and analyzed with the use of phase contrast microscope. *Demodex* specimens were measured and permanent specimens were prepared in Faure's fluid.

For determination of the hosts' infection level, basic parasitological parameters, such as prevalence, infestation (number of individuals of a host species infested with a particular parasite species to number of hosts examined) and mean intensity (mean number of individuals of a particular parasite species per infested host in a sample) were calculated [6].

Results and discussion

As many as 81 specimens of *Demodex rosus* Bukva, Vitovec et Vlcek, 1985, including

Table 1. Body size of *Demodex rosus* (μm)

	Male N=27	Female N=34
Length of gnathosoma	19.6 (18.8–22.3) SD 1.2	21.7 (19.2–24.3) SD 1.9
Width of gnathosoma (at base)	27.1 (23.5–29.1) SD 2.5	27.7 (24.8–29.9) SD 1.5
Length of podosoma	71.3 (65.0–79.9) SD 3.4	72.2 (67.5–82.2) SD 5.4
Width of podosoma	61.2 (57.5–65.1) SD 3.2	58.4 (49.8–66.1) SD 5.9
Length of opisthosoma	110.5 (95.6–123.6) SD 8.9	107.2 (101.3–120.0) SD 8.9
Width of opisthosoma	56.6 (54.9–61.1) SD 5.1	54.6 (47.9–60.8) SD 5.3
Total length of body	201.4 (184.9–220.3) SD 10.9	201.2 (186.3–219.8) SD 11.1

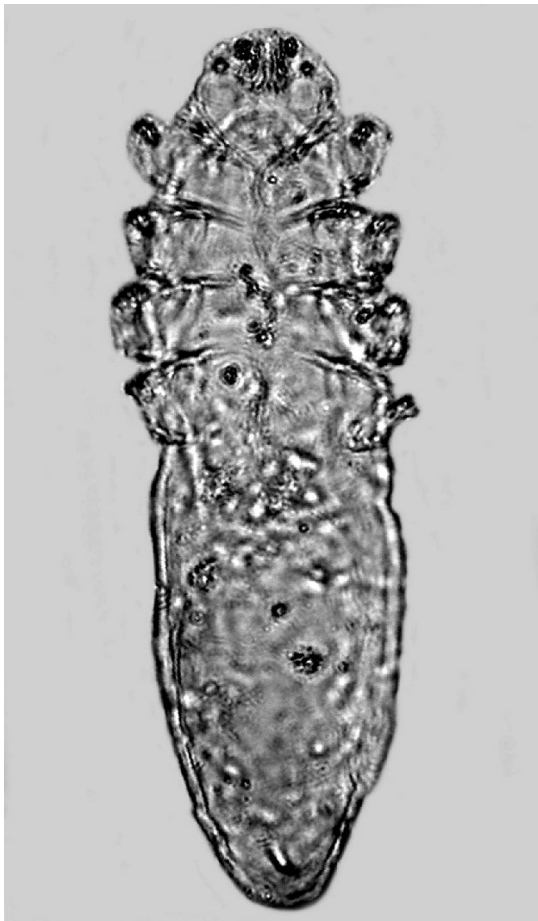
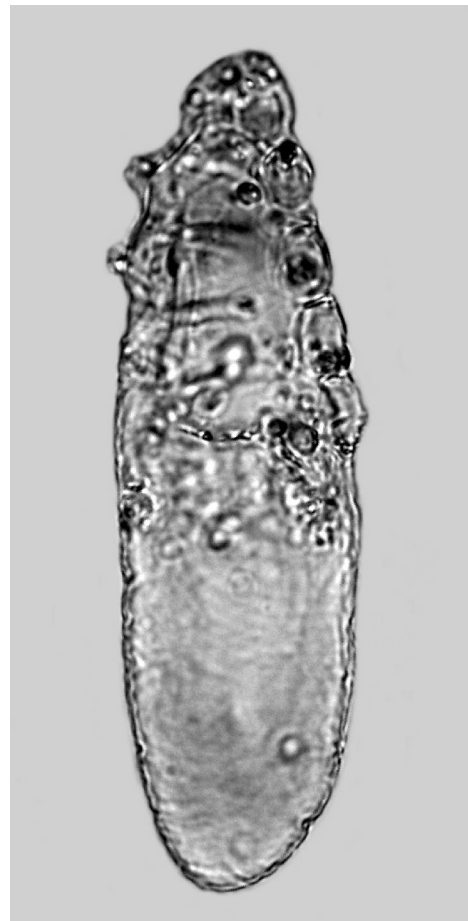
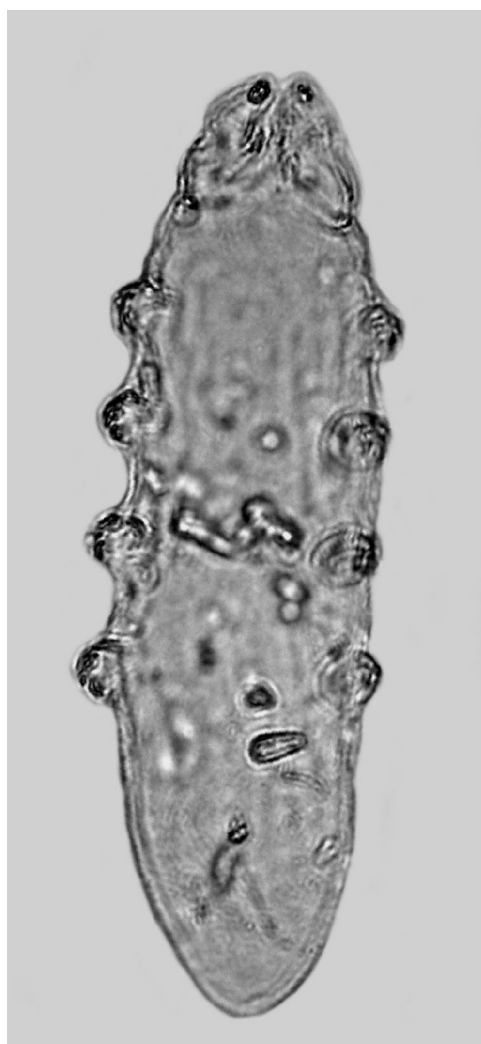
Fig. 1. *Demodex rosus*, femaleFig. 2. *Demodex rosus*, male

Table 2. Size and body proportions of *Demodex rosus* according to different studies

Body size and proportion	Bukva et al. [3]	Present study
Total length of male (μm)	231.3	201.4
Width of male (μm)	69.9	61.2
Ratio of length to width – male	3.3	3.3
Ratio of length opisthosoma to body length (%) – male	58	55
Total length of female (μm)	222.0	201.2
Width of female (μm)	66.8	58.4
Ratio of length to width – female	3.3	3.4
Ratio of length opisthosoma to body length (%) – female	54	53

Fig. 3. *Demodex rosus*, nymph

34 females, 27 males, 7 nymphs, 5 protonymphs, 8 larvae, and 12 eggs, were recorded (Table 1, Figs. 1–4) in seven yellow-necked field mice. Adults of this parasite species had distinct sexual dimorphism expressed with localization of the IV pair of legs (Figs. 1,2), and poor manifestation in body sizes and proportions. On average, Demodecidae were slightly smaller than the

Fig. 4. *Demodex rosus*, egg

specimens observed in the Czech Republic [3] and had insignificant differences in sizes and proportion of tagmata (Table 2).

All specimens were obtained from the mouse oral cavity (including tongue). This observation corresponded with localization observed in previous studies [3] where *D. rosus* was mainly established in the oral cavity and esophagus. Similar localization was ascribed to *D. buccolis*, out of known *Demodex* species that was collected from bank vole, *Myodes* (= *Clethrionomys*) *glareolus* (Rodentia, Cricetidae) and *D. leucogasteri* from *Onychomys leucogaster* (Rodentia, Cricetidae) [7].

The yellow-necked field mouse is a common rodent inhabiting almost entire Europe and a part of Asia. This mouse occurs in brushwood of deciduous and mixed forests and parks. During winter, the mouse moves to human residences demonstrating a tendency toward synantropization. The generality of its occurrence indicates that the mouse should be relatively well studied on its parasitological side. On the contrary, *D. rosus* was the only species described from among Demodecidae so far. However, two to

Table 3. Occurrence of demodecids in murid rodents from Poland

Host	Species of Demodecidae	References
<i>Apodemus agrarius</i> (Pallas, 1771)	<i>Demodex agrarii</i> Bukva, 1994 <i>Demodex apodemi</i> (Hirst, 1918) (= <i>Demodex arvicolae apodemi</i> Hirst, 1918)	[9]
<i>Apodemus flavicollis</i> (Melchior, 1834)	<i>Demodex rosus</i> Bukva, Vitovec et Vlcek, 1985	Present study
<i>Mus musculus</i> Linnaeus, 1758	<i>Demodex flagellurus</i> Bukva, 1985 <i>Demodex musculi</i> (Oudemans, 1898) (= <i>Demodex arvicolae musculi</i> Oudemans, 1898)	[11,13]
<i>Rattus norvegicus</i> (Berkenhout, 1769)	<i>Demodex nanus</i> Hirst, 1918 <i>Demodex norvegicus</i> Bukva, 1995 <i>Demodex rattii</i> Hirst, 1917	[4,12]

four species of mites from this group were detected in other common species of rodents. In European Muridae, thirteen species of Demodecidae have been described, with only seven of them found in Poland [8,9] (Table 3).

The level of infestation (prevalence 35%, mean intensity 11.6) by mites seems to be high. However, significant part of infection seems to be a characteristic trait of many Demodecidae species [10]. A number of species specific to various rodents of Muridae occurs commonly in populations of their hosts. As an example, *Demodex* spp. has been recorded at the same location in half of population of house mice, striped field mice, or brown rats that were studied previously [4,9,11–13].

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