

DEMODEX SPP. (ACARI: DEMODECIDAE) IN BROWN RAT (RODENTIA: MURIDAE) IN POLAND

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ABSTRACT. The study on the demodecid fauna of the brown rat (*Rattus norvegicus*) revealed the presence of three species: *Demodex nanus*, *D. norvegicus*, and *D. ratti*, all three new for the fauna of Poland.

Key words: Demodecidae, hair follicle mites, *Rattus norvegicus*.

INTRODUCTION

Of the demodecid species described so far, almost one-third is comprised by rodent parasites. They are usually host-specific, although some of them have been found in some other related rodent species; for example, *Demodex sabani* has been found in 7 rodent species in Malaysia (Desch et al. 1984). On the other hand, numerous hosts support synhospital species; for example, the brown rat (Norway rat, *Rattus norvegicus*) has been so far recorded as a host for 4 demodecids: *D. nanus*, *D. norvegicus*, *D. ratti*, *D. ratticola*, *D. nanus* occurring also in *Rattus rattus* (Desch 1987, Bukva 1995).

Among the Polish rodents, members of the Demodecidae have been known so far from the house mouse (*Mus musculus*) only (Izdebska 2000, 2002).

MATERIALS AND METHODS

In 2002-2004, a total of 70 rats caught in the Tri-City area (including Wejherowo and Tczew), some being supplied by pest-control firms. The presence of demodecids was detected by digesting them from skin samples. About 2 cm² skin sections were collected from several representative body areas such as the head (from around eyes, cheeks, chin, ear, around the nostrils), neck, back, abdomen, anterior and posterior armpits, fore and hind legs, and genital-anal areas. The sections were

preserved in 70% ethanol and digested in 8% potassium hydroxide, rinsed with ethanol, and examined under phase contrast of the optical microscope. The specimens found were measured and permanently mounted in the Faure-Berlese fluid.

RESULTS AND DISCUSSION

The rats examined were found to host the following three demodecid species: *Demodex nanus* Hirst, 1918, *D. norvegicus* Bukva, 1995, and *D. ratti* Hirst, 1917. A total of 56% of the rodents examined were infested. The most frequent demodecid was *D. nanus* with 29% prevalence, while *D. norvegicus* and *D. ratti* were revealed in 21% and 7% of the rats examined, respectively. The number of mites in the skin sections was usually low, averaging 3 *D. nanus* and 2 *D. ratti* and *D. norvegicus* each.

Hair follicle mites are usually biotope-specific, preferentially located in certain tissues (e.g., in various glands and modified glandular organs, skin hair follicles, etc.) and various parts of the body. *D. nanus* was found in the armpits, on the abdomen, and in the genital-anal area; *D. ratti* stayed on the head (around the eyes), while *D. norvegicus* dwelled in the genital-anal area only. A similar location on host was reported by Bukva (1995) for the brown rat demodecids studied in the Czech Republic.

A higher prevalence was typical of male rats, which was particularly pronounced in *D. norvegicus* (found in more than half of the males and in as few as one-fifth of the female rats examined), located mainly in the genital-anal area and, consequently, sexually transmitted (Bukva 1990, 1995; Izdebska 2000).

Considering the usual mode of demodecid transmission in host populations (inter-individual contacts) that are 100% infected by some mites, the extent of infestation of *Rattus norvegicus* by the demodecids found does not seem to be high. However, transmission pathways depend also on the mammalian skin topography. It seems that the mites preferring location on the head disperse faster, those situated in the genital-anal area showing a lower prevalence. This contention would be supported by a comparably lower percentage of house mice (*Mus musculus*) infested by *D. flagellurus* (about 5-7% prevalence) (Bukva 1985, Izdebska 2000).

The demodecid-infested rats showed no skin symptoms that could be regarded as demodecosis. The lack of observable symptoms resulted most likely from the low extent of infestation (i.e., its low prevalence and intensity).

LITERATURA

- Bukva V. 1985. *Demodex flagellurus* sp. n. (Acari: Demodecidae) from the preputial and clitoral glands of the house mouse, *Mus musculus* L. *Folia Parasitologica* 32: 73-81.
Bukva V. 1990. Transmission of *Demodex flagellurus* (Acari: Demodicidae) in the house mouse, *Mus*

- musculus*, under laboratory conditions. *Experimental and Applied Acarology* 10: 53-60.
- Bukva V. 1995. *Demodex* species (Acari: Demodecidae) parasiting the brown rat, *Rattus norvegicus* (Rodentia): redescription of *Demodex ratti* and description of *D. norvegicus* sp.n. and *D. raticola* sp.n. *Folia Parasitologica* 42: 149-160.
- Desch C.E. 1987. Redescription of *Demodex nanus* (Acari: Demodecidae) from *Rattus norvegicus* and *R. rattus* (Rodentia). *Journal of Medical Entomology* 24: 19-23.
- Desch C.E., Lukoschus F.S., Nadchatram M. 1984. A new demodicid (Acari: Demodicidae) from Meibomian glands of Southeast Asian rats (Rodentia: Muridae). *Tropical Biomedicine* 1: 55-62.
- Izdebska J.N. 2000. Nowe gatunki *Demodex* spp. (Acari, Demodecidae) u *Mus musculus* w Polsce. *Wiadomości Parazytologiczne* 46: 277-280.
- Izdebska J.N. 2002. Demodecidae (Acari, Actinedida): the current status and perspectives of research in Poland. In: *Postępy polskiej akarologii*. (Ed.: S. Ignatowicz.), Wyd. SGGW Warszawa: 215-223.

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