

Nematofauna of ducks of the genus *Melanitta* (Mergini, Anseriformes) from the south Baltic Sea

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ABSTRACT. A total of 10 individuals each of the common scoter (*Melanitta nigra*) and the velvet scoter (*M. fusca*) were examined for parasites. The scoters are marine ducks wintering at the south-western coast of the Baltic Sea. The scoters were found to be infected with 5 nematode species. While the common scoter supported *Amidostomoides monodon*, *Epomidiostomum uncinatum*, *Tetrameres* sp. and *Echinuria hypognatha*, the velvet scoter were hosts to *A. monodon*, *E. hypognatha*, and *Streptocara crassicauda*. This is the first record of *Echinuria hypognatha* in Poland.

Key words: *Melanitta fusca*, velvet scoter, *M. nigra*, common scoter, Nematoda, Baltic Sea.

Introduction

The common scoter (*Melanitta nigra*) and the velvet scoter (*Melanitta fusca*) are fairly large aquatic birds of the family Anatidae. In summer, they inhabit lakes and slowly rolling tundra rivers and taiga wetlands. In winter, they move to large lakes and sea coasts, including the south-western coast of the Baltic Sea. Parasites of the scoters occurring in Poland are not well known, mainly because both scoter species are protected by law. The reports published so far have been based on examination of one to several velvet scoters which were found to support 8 digenean (Digenea) species [1] and 4 species of nematodes (Nematoda) [2]; the only common scoter specimen examined so far has been found to contain 3 digenean species [1] and one cestode species [3].

Results of the author's earlier research, carried out on 15 *Melanitta* scoters and published in her D.Sc. thesis only [4] suggest that the birds support a very interesting and specific nematofauna. Therefore, the present paper was aimed at presenting results of new research and comparing them with earlier data.

Materials and methods

The ducks, 10 dead individuals of each species, were obtained in 2004–2005 from fishermen operating from Dziwnów and Międzyzdroje on the Baltic Sea coast. The birds were subjected to full parasitological examination; the parasites isolated were fixed and stored in 70% ethyl alcohol. Prior to microscopic examination, the nematodes were cleared in 80% lactic acid [5–8] and identified based on keys and numerous original descriptions. The full list of infection parameters and methods used to calculate them were given in an earlier paper [4]. The results of this study were compared with data obtained in 2001–2003 by examining 15 *Melanitta* ducks (11 common and 4 velvet scoters).

Results and discussion

***Melanitta nigra,* n=10**

The previous study on 11 common scoter individuals [4] revealed the presence of helminths in 10 (96.0%) individuals. While nematodes had infected most of the birds examined, much fewer scoters hosted trematodes and cestodes, although the cestode frequency was the highest (86.0%) and the trematodes and nematodes were present in 8.3 and 5.8% of the birds, respectively. The highest infection intensity was typical of cestodes (1 022.3), much lower values being recorded for trematodes (73.8) and nematodes (20.5). The relative density of those parasitic taxa showed a similar pattern. The

Table 1. Nematode fauna of *M. nigra* against the background of the entire helminth fauna of the species

Nematodes	Prevalence		Frequency		Intensity		Relative density	Dominance
	n	%	n	%	$\bar{x}$	min.-max.		
Helminths	10	100.0	923	100	92.3	2–772	92.3	x
Nematoda	9	90.0	860	93.2	95.6	2–772	86	x
Digenea	3	30.0	62	6.7	20.7	1–54	6.2	x
Cestoda	1	10.0	1	0.1	1.0	1	0.1	x
A. monodon	7	70.0	71	8.3	10.1	1–34	7.1	4.97
E. uncinatum	2	20.0	11	1.3	5.5	1&10	1.1	0.22
Tetrameres sp.	3	30.0	13	1.5	4.3	2–8	1.3	0.39
E. hypognatha	2	20.0	765	89.0	382.5	1&764	765	15.30

common scoter nematode fauna consisted of 6 species: *Amidostomoides monodon* (Linstow, 1882) Lomakin, 1991; *Epomidiostomum uncinatum* Skrjabin, 1915; *E. ryzhikovi* Lomakin, Zinovjeva et Suvorova, 1985; *Tetrameres fissispina* (Diesing, 1861) Travassos, 1914; *Echinuria uncinata* (Rudolphi, 1819) Soloviev, 1912, and *Streptocara crassicauda* (Creplin, 1829). In addition, representatives of two genera (*Tetrameres* sp. and *Streptocara* sp.) and 14 specimens identified to the phylum only were found as well. Out of the 205 nematodes, as many as 129 represented *A. monodon*. There were much fewer nematodes of the genus *Tetrameres* and *S. crassicauda*. The highest infection intensity was assigned to the *Tetrameres nematodes* not identified to species, followed by *Streptocara* and Nematoda gen. sp. Also, they were recorded in a few individuals, hence the remaining infection parameters pertaining to those species (relative density and dominance) were not particularly high. *A. monodon* was a distinct dominant in the common scoter nematofauna (relative density of 11.7; dominance much 8.53, i.e., much higher than 1.0). *T. fissispina* and *E. uncinatum* were classified as influents, the remaining nematode species and higher taxa being rare.

In this study, nematodes were found to dominate among the helminths (frequency exceeding 93%); digeneans were much less common (frequency 6.7%), and only a single cestode individual (*Fimbriaria* sp.) was isolated. The nematodes were dominated by *A. monodon* (dominance index 4.97) and *Echinuria hypognatha* Wehr, 1937 (dominance index 15.3); this is the first record of *E. hypognatha* in Poland, the species being absent from the Fauna Europaea database. The high dominance of *E. hypognatha* resulted from the fact that, although the parasite was present in two common scoter only, one of them hosted 765 individuals (Table 1). In addition to the two nematode species, the alimentary tract of *M. nigra* contained *Epomidiostomum uncinatum* and the *Tetrameres* nematodes (most probably *T. fissispina*), which turned out to be influents.

***Melanitta fusca*, n=10**

Results of the author's previous research [4] involving four velvet scoter individuals showed *M. fusca* to be the only duck the helminth fauna of which consisted solely of nematodes (23 individuals). As expected, *A. monodon* (20 individuals) were the most abundant nematodes. The remaining species (*Tetrameres somateriae* Ryzhikov, 1963 and *Echinuria pamirica* Ryzhikov et Borgarenko, 1965) were represented by much fewer individuals (2 and 1, respectively). Like in the common scoter, *A. monodon* turned out to be a distinct dominant (relative density 5.0 nematodes in a duck; dominance index 3.75). The nematode *E. pamirica* turned out to be an influent, while *T. somateriae* was a rare species.

Alimentary tracts of the *M. fusca* examined in the present study were found to contain, in addition to nematodes (177 individuals), also trematodes (20 individuals; Table 2) The distinct domination of *A. monodon* was repeated (dominance index 0.12). Besides, the alimentary tracts of the velvet scoter supported also a few *E. hypognatha*[1] and *S. crassicauda* (14 and 6 individuals, respectively).

Summing up

Results of earlier and recent research on two *Melanitta ducks* (the common and velvet scoters)

[1] It seems highly probable that the only individual identified as *Echinuria pamirica*, found in the velvet scoter in the study referred to [4] was in fact a representative of *E. hypognatha*.

Table 2. Nematode fauna of *M. fusca* against the background of the entire helminth fauna of the species

Nematodes	Prevalence		Frequency		Intensity		Relative density	Dominance
	n	%	n	%	x	min.-max.		
Helminths	9	90.0	197	100	21.9	4–43	19.7	x
Nematoda	9	90.0	177	89.8	19.7	2–36	17.7	x
Digenea	6	60.0	20	10.2	3.3	1–9	2.0	x
A. monodon	6	60.0	152	85.9	25.3	5–36	15.2	9.12
E. hypognatha	1	10.0	14	7.9	14.0	14	1.4	0.14
S. crassicauda	1	10.0	6	3.4	6.0	6	0.6	0.06
Nematoda gen. sp.	2	20.0	5	2.8	2.5	2&3	0.5	0.10

wintering at the north-western coast of the Baltic Sea allowed to determine, with a high probability, the composition of their nematode fauna. The common scoter acted as hosts to *Amidostomoides monodon*, *Epomidiostomum uncinatum*, *E. ryzhikovi*, *T. fissispina*, *Echinuria uncinata*, *E. hypognatha*, and *Streptocara crassicauda*, while the velvet scoter supported *Amidostomoides monodon*, *Tetrameres somateriae*, *Echinuria hypognatha*, and *Streptocara crassicauda*.

Despite their phylogenetic affinity and biological similarities, the common scoter (*M. nigra*) and the velvet scoter (*M. fusca*) seemed to differ in the nematode fauna. Although both species supported three nematodes species: *A. monodon*, dominant in all the Mergini ducks; the cosmopolitan and polyxenic *S. crassicauda*; and the host-specific *E. hypognatha*, the composition of the remaining part of the nematofauna was different. In addition to the species mentioned above, the common scoter were found to host *Epomidiostomum uncinatum*, *E. ryzhikovi*, *Tetrameres fissispina*, and *Echinuria uncinata*; in contrast, the velvet scoter supported *Tetrameres somateria* only. The low number of host individuals examined shows, however, that the helminth fauna of wild ducks in the north-western Poland merits further study.

Acknowledgements

I wish to extend my heartfelt thanks to Professor Lidia Smogorjevskaya, Ph.D., D.Sc. of the Department of Parasitology, Institute of Zoology, National Academy of Sciences of Ukraine, for her assistance in nematode identification.

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Wpłynęło 29 stycznia 2008
Zaakceptowano 10 lutego 2008