

Tapeworms (Cestoda) and digeneans (Digenea) of veterinary importance in wild waterfowl of northern Poland

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Wild waterfowl, in contrast to domesticated birds, are often hosts for internal parasites, which are found in their tissues and organs. Some species of parasites whose reservoirs are wild birds are of veterinary importance; when they infect domesticated birds, they can induce disease symptoms and thus economic losses. The Southern Baltic Coast in Poland, a strip of coastal lowlands, is a region with very attractive natural features and includes areas of importance in the European system of bird migration. Every year from autumn to spring, the waters of the Baltic as well as coastal lagoons and lakes are the site of wintering and seasonal migration of large numbers of wild birds.

In 2014–2016 a parasitological study of 18 species of wild birds was carried out. The birds were acquired from the waters of the Bay of Pomerania, the Gulf of Gdansk, and the Szczecin Lagoon. They were represented in the highest numbers by the long-tailed duck *Clangula hyemalis* (95), greater scaup *Aythya marila* (85), great crested grebe *Podiceps cristatus* (46), velvet scoter *Melanitta fusca* (25), common goldeneye *Bucephala clangula* (22), and tufted duck *Aythya fuligula* (20) and in smaller number by other species, such as the common merganser *Mergus merganser*, common pochard *Aythya ferina* and Eurasian coot *Fulica*

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The alimentary tracts of the ducks contained tapeworms of the genera *Dicranotaenia* Railliet, 1892; *Diorchis* Clerc, 1903; *Sobolevicanthus* Spasskii and Spasskaya, 1954; *Cloacotaenia* Wolffhugel, 1938; *Fimbriaria* Frölich, 1802; *Ligula* Bloch, 1782; and *Schistocephalus* Creplin, 1829. The vast majority were located in the birds' intestines. The tapeworm *Cloacotaenia megalops* (Nitzsch in Creplin, 1829) was found in the cloaca. It is difficult to diagnose tapeworm infection in ducks because the symptoms are not specific. These parasites, by attaching themselves to the intestine, mechanically damage its mucosa and induce inflammation. Infected birds may exhibit lethargy, weight loss, increased thirst, and ruffled feathers. In young birds, loss of subcutaneous fat and muscle weakness are observed. In the case of high intensity of infection, tapeworms can lead to obstruction or even rupture of the intestine.

Many digeneans (Digenea) species that have been found in the digestive system of birds are also of veterinary importance, such as *Echinostoma revolutum* (Fröhlich, 1802), *Echinoparyphium recurvatum* (Linstow, 1873), *Notocotylus attenuatus* (Rudolphi, 1809) and *Apatemon gracilis* (Rudolphi, 1819). These flukes are mainly associated with

freshwater environments and are common in free-living populations of various species of birds, which allows them to spread and remain in the environment (e.g. in the tufted duck, greater scaup and common goldeneye). The sources of infection for birds are components of their diet, including freshwater invertebrates and fish, some of which may be intermediate hosts of flukes. Domesticated birds can be infected when they use water bodies

where wild birds and intermediate hosts of flukes are found. In these birds, flukes can be the cause of intestinal trematodosis, often caused by infection with multiple species of these parasites. In the case of intensive infection, mainly in young birds, clinical symptoms are observed, including diarrhoea, appetite loss, emaciation, and others, due to inflammation of the intestinal mucosa.