



Incidence and epidemiology of *Notocotylus attenuatus* diesing, 1839 in Mallard ducks (*Anas platyrhynchos*) in various wetlands of Pampore, Kashmir, Jkut, India

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Abstract

The present study was carried out to determine the prevalence of *Notocotylus attenuatus* (trematode) in mallard ducks of Chatlum, Fashkoori, Manibug, and Kranchoo wetlands in the Pampore area of Kashmir. For this purpose, 37 mallard ducks collected from wetlands were examined in which 13 were found positive for trematode infection *Notocotylus attenuatus* (35.13% prevalence). Prevalence with respect to the study area and sex was also recorded during the present study.

Keywords: Epidemiology, mallard duck, wetland

Introduction

Little is known about the parasites harbored by waterfowl from various wetlands of Kashmir, India. A study was undertaken to know the incidence of *Notocotylus* species of waterfowl Mallard duck during wintering season in various wetlands of Kashmir. Parasitism is common in wild waterfowl (Atkinson et al., 2008). Waterfowl are considered one of the vertebrate groups with the greatest diversity of parasites (Barrera-Guzmán and Guillén-Hernández, 2008; Leung and Koprivnikar, 2016). This diversity may be explained due to the natural history of their bird hosts, the great diversity of feeding habits (Graves and Fedynich, 2013), migratory (Garvon et al., 2011), and seasonal patterns (Wallace and Pence, 1986), as well as the complexity of the digestive tract of waterfowl species (Poulin, 1995). The mallard duck (*Anas platyrhynchos*), a species of waterfowl of the family Anatidae is the world's most widespread duck. They do not generally dive when in search of food but prefer to dabble only in the front part of the body.

Material and methods

The samples were collected in four wetlands namely Chatlum, Fashkooori, Manibug, and Kranchoo in the Pampore area of Kashmir. These wetlands are home to thousands of migratory birds that arrive during the winters from different parts of the world. The study examined the gastrointestinal tract of 37 ill and dead mallard ducks collected from various wetlands of Pampore. The investigation was carried out for a period of 5 years 2015-2021 in which different parts of the study area were surveyed for the collection of 37 gastrointestinal tracts for parasitological investigation. The gastrointestinal tracts were separated anatomically, then each organ was opened separately and its contents and mucosa were washed in water to remove all parasites as shown in figure 1. The trematodes collected were processed and preserved (70% alcohol) and were identified as per Solusby (1982) and Yamaguti (1959).



Figure 1. Screening of gastrointestinal tract of a mallard duck

Results and discussion

Only 13/37 caecum (intestinal caeca) were infected with *Notocotylus attenuatus* as shown in table 1. The highest infection was recorded in the year 2016 and 2018 (37.5%). The quantitative

assessment of trematode infestation is given in tables 1 and 2. The study explored the prevalence of *Notocotylus attenuatus* in mallard ducks as 35.13%.

Table 1. The overall prevalence of Trematode worm in mallard ducks during the period 2015-2021.

year	number of hosts examined	number infected	infection percentage
2015	6	3	50
2016	8	3	37.5
2017	9	2	22.22
2018	8	3	37.5
2021	6	2	33.33
Total	37	13	35.13

Table 2. Wetland-wise prevalence of Trematode parasite

s. no.	wetland	no. of mallards examined	no. positive	prevalence percentage
1	Chatlum	13	5	38.45
2	Fashkooori	7	1	14.28
3	Manibug	6	3	50
4	Kranchoo	11	4	36.36
Total		37	13	35.13

The study revealed that the sex of the mallard duck showed an association with the prevalence of the trematode parasite. It was observed females are more infected than males as shown in Table 3. The influence of sex on the susceptibility of mallard to infections could be attributed to genetic predisposition.

Table 3. Prevalence on the basis of the sex of the host.

Sex	No. Examined	No. Positive	Percentage
Males	23	8	34.78
Females	14	5	35.71
Total	37	13	35.13

Taxonomically this study increased the knowledge of the inventory of trematodes associated to winter migratory birds in these wetlands. As a result of our research, the trematode *Notocotylus attenuatus* was reported for the first time in the wetlands of Pampore. The genus *Notocotylus* as it stands today consists of a large number of species described from various parts of the world but full description of many species is not fully complete. The preliminary account of *Notocotylus* species in Kashmir goes to Fotedar and Kaw (1965). Ahmad and Chishti also studied the Avian Trematode parasites of Kashmir: Part II – Genus *Notocotylus* Diesing, 1839. Tanveer and Chishti (2001) described Notocotylid Trematode genus *Paryphostomum* (Luhe, 1909) in domestic fowl and common coot in Kashmir with the description of a new species. Kharoo (2011) carried out

studies on monosomies from the winter migratory birds in Kashmir in which besides presenting brief history of monosomies, two genera with three species were also reported including *Notocotylus* species.

In conclusion, the presence of trematode infestation in mallard ducks brings to fore the fact that both terrestrial and water birds suffer from helminthosis. Better management to reduce worm burden is the need of the hour. From the present study, it is clear that migratory ducks-mallards are no exception from the rest of the world regarding the parasitic load of *Notocotylus* species. The present study will be of great importance while facilitating the identification of this parasite in future taxonomic studies.

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