



Checklist of Helminth Parasites of Cyprinids from Poonch River and its Tributaries, Jammu and Kashmir, India

Mumtaz Ahmed¹, Anshu Chaudhary¹, Farooq Ahmed², Yougesh Kumar³
and Hirdaya S. Singh¹

¹Molecular Taxonomy Laboratory, Department of Zoology, Chaudhary Charan Singh University, Meerut (U.P.), 250004, India.

²Department of Zoology, Government Degree College, Poonch, 185101, Jammu and Kashmir, India.

³Department of Zoology, D.A.V. College, Muzaffarnagar (U.P.), India.

Corresponding author: mumtaznaz151@gmail.com

ABSTRACT

Parasitological studies on helminths of freshwater fish in district Poonch, Jammu and Kashmir, India is scarce that should be well-understood in order to assess their biodiversity. As compare to other regions in Jammu and Kashmir, India, less comprehensive studies is available with unpublished records. Here, we present a list of parasites that we have collected comprises a list of helminth parasites, their host species, and locality. This study contributes to the diversity of helminth parasites from River Poonch, Jammu and Kashmir, India that helps to identify the lacunae in our knowledge of this region.

Keywords: Helminthes, Parasite, Poonch River, Jammu and Kashmir, India.

INTRODUCTION

The Poonch River and its tributaries constitute the major wetland of the district Poonch, Jammu and Kashmir, India. It is one the remotest district of Jammu and Kashmir that spreads over an area of 1674 sq km. The Poonch River flow into upstream to downstream and flow into the Mangla Lake that is the reservoir of Mangla Dam. During the months of summer, high monsoon rain and snow melt cause highest flow of Poonch River. Government of Pakistan has declared the entire 10-15 km downstream stretch of the Poonch River as a national park (Poonch River Mahaseer National Park) for the conservation of economically important and endangered fish species, *Tor putitora* (Hamilton, 1822). In order to study the helminth fauna from fish of Poonch River, district Poonch and its tributaries (called as Suran Nallah, Betar Nallah and Mendhar Nallah) the study was performed. A total of 40 species were reported in Poonch River and its tributaries (Datta, 2003). *Tor putitora* (Hamilton, 1822), *Schizothorax richardsonii* (Gray, 1832), *Garra gotyla* (Hamilton, 1830), *Crossocheilus latius* (Hamilton, 1822), *Schizothorax progastus* (McClelland, 1839) and *Mastacembelus armatus* (Lacépède, 1800) are commonly available fish in the Poonch River and its tributaries. Few workers (Gupta et

al., 2014, Anjum et al., 2014, Ahmed and Sharma, 2016) have contributed significantly to the knowledge of helminth parasites from Poonch River. Here, we are summarized a list of the helminth parasites, collected during our survey i.e., the monogenean, digenean, acanthocephalan and nematode parasites.

MATERIALS AND METHODS

The present study was carried out on the Poonch River and its tributaries- Suran Nallah, Betar Nallah and Mendhar Nallah, Poonch district (33°.25' to 34°.01' N and 73°.58' to 74°.35' E), Jammu and Kashmir, India. Fish host were collected and transported live to the laboratory, Government Degree College, Poonch, Jammu and Kashmir, India. Host was dissected and various organs like gills, liver, body cavity and intestine were examined under microscope for the presence of parasites. Monogenean parasites from gills; *Allocaedium* sp., acanthocephalan and nematodes from intestine and *Clinostomum* sp. from body cavity were collected. For the morphological study, methods related to concerned species described by various workers was followed (Caffara et al., 2013; Verma et al., 2017; Amin et al., 2022, Moravec et al., 2022). The data for each helminth species is ordered alphabetically in the tables presented in results section.

Table 1. Species of Actinopterygii reported from the Poonch River, Poonch district, Jammu and Kashmir, India shows richness of related helminthes.

Class	Order	Family	Fish genera	Fish species	Helminth genera	Helminth species
Actinopterygii	Cypriniformes	Cyprinidae	04	05	08	18
	Synbranchiiformes	Mastacembelidae	01	01	01	01
Totals	02	02	05	06	09	19

Table 2. Species of helminthes reported from the Poonch River, Poonch district, Jammu and Kashmir, India. SR/nd and GG/nd shows species not identified; na = not available.

Phylum	Class	Order	Family	Genus	Species	References	
Acanthocephala	Eoacanthocephala	Neoechinorhynchida	Neoechinorhynchidae	<i>Neoechinorhynchus</i>	<i>poonchensis</i>	Amin et al., 2022	
Nematoda	Secernentea	Camallanida	Camallanidae	<i>Procamallanus</i>	<i>bilaspurensis</i>	Gupta and Duggal, 1973	
					<i>Physalopteroidae</i> sp. third stage larvae	Moravec et al., 2022	
	Chromadorea	Rhabditida	Rhabdochonidae	<i>Rhabdochona</i>	<i>indica</i>	Moravec et al., 2010	
					<i>turkestanica</i>	(Skryabin, 1917) Krepkogolskaya, 1927	
					<i>hospeti</i>	Thapar, 1950	
					<i>cf. chodukini</i>	Osmanov, 1957	
Platyhelminthes	Monogenea	Monopisthocotylea	Dactylogyridae	<i>Dactylogyrus</i>	<i>acinacus</i>	Gussev, 1976	
					<i>longicopula</i>	Bychowsky, 1936	
					<i>racotorabus</i>	Gussev et al., 1993	
					<i>sphyrnoides</i>	Gussev, 1976	
					<i>tori</i>	Gussev, 1976	
					<i>Dogielius</i>	<i>forceps</i>	Bychowsky, 1936
						<i>poonchensis</i>	Gupta et al., 2014
						SR/nd	na
Trematoda	Plagiorchiida	Allocreadiidae	<i>Allocreadium</i>	<i>tori</i>	Anjum et al., 2014		
				Diplostomida	<i>Clinostomum</i>	<i>schizothoraxi</i>	Kaw, 1950
						<i>complanatum</i>	Rudolphi, 1814
						GG/nd	na

RESULTS AND DISCUSSION

We have collected 19 species of monogenean, digenean, acanthocephalan and nematodes parasites from 09 genera of the Poonch River, Poonch district, Jammu and Kashmir, India. To date, only few parasites species from River Poonch have been reported (Gupta et al., 2014, Anjum et al., 2014, Ahmed and Sharma, 2016). Therefore, the richness of helminth species parasitizing cyprinid fish distributed in the Poonch River need to be explored for its helminth species richness. In addition, 09 helminths genera have been reported from 06 fish host belong to Actinopterygii and of family Cypriniformes and Mastacembelidae (Table 1 and 2). As Datta (2003) reported 40 species from Poonch

River, only few have been screened for helminth parasites. Thus, only 15-20% fauna of fish have been screened that shows scarcity of studies from Poonch River and its tributaries.

In the present helminthological record and in terms of the helminth groups represented, monogeneans are the most widely represented group, with 03 genera and 08 species *i.e.*, *Dactylogyrus* Diesing, 1850; *Dogielius* Bychowsky, 1936 and *Diplozoon* von Nordmann, 1832 (Table 2). Besides monogenean, nematodes are represented with *Procamallanus* (*Spirocamallanus*) Olsen, 1952; Physalopteridae Railliet, 1893 family sp. third stage larvae and *Rhabdochona* Railliet, 1916. In the present study, class Trematoda is represented by 04 species parasitizing 02 genera *i.e.*, *Allocreadium* Looss,

1900 and *Clinostomum* Leidy, 1856 respectively. Regarding the phylum Acanthocephala, only 01 species belongs to the genus *Neoechinorhynchus* Stiles and Hassall, 1905 was found *i.e.*, *N. poonchensis* Amin et al., 2022 (Table 2).

These results show that more helminthes species can be obtained by increasing the screening in the Poonch River and its tributaries. To determine the real richness of the helminthes from different hosts from Poonch River and its tributaries more sampling efforts are required to uncover their diversity. Moreover, this study clearly suggests that additional species of helminthes would be discovered with the help of molecular methods that can resolve their phylogenetic relationships with taxa from different regions worldwide and any kind of confusions related to their taxonomy. Only such studies make a comprehensive understanding of helminth fauna of the Poonch River, Poonch district, Jammu and Kashmir, India.

ACKNOWLEDGEMENTS

Thanks to the Head, Department of Zoology, Chaudhary Charan Singh University, Meerut for providing laboratory facilities. This work was supported by a grant to Ph.D. student (MA) by Chaudhary Charan Singh University, Meerut (U.P.).

REFERENCES

- Ahmed, F. and Sharma, K.K. 2016: First record of *Dactylogyrus recotorabus* (Monogenea) on *Gara gotyla* (Pisces, Cyprinidae) to India from Poonch River and its tributaries, district Poonch, Jammu and Kashmir. *International Journal of Recent Scientific Research* 7: 9402-9405.
- Amin O.M., and Ahmed M., Chaudhary A., Heckmann R.A., Singh H.S. 2022: The morphological and molecular description of *Neoechinorhynchus* (*Neoechinorhynchus*) *poonchensis* n. sp. from *Schizothorax richardsonii* (Gray) in Poonch, Jammu and Kashmir, India. *Folia Parasitol.* 69: 001.
- Anjum, A., Kumar, S., and Sharma, S. (2014). A new trematode parasite belonging to genus *Allocreadium* looss, 1900 from a new host fish *Tor putitora* from Poonch River of J&K state, India. *International Journal of Advanced Biological Research* 4:357-361
- Caffara, M., Locke, S. A., Gustinelli, A., Marcogliese, D. J., and Fioravanti, M. L. (2011). Morphological and molecular differentiation of *Clinostomum complanatum* and *Clinostomum marginatum* (Digenea: Clinostomidae) metacercariae and adults. *The Journal of Parasitology*, 97: 884–891.
- Dutta, S. P. S. 2003. Fish fauna of Poonch district, Jammu regions, Jammu and Kashmir state. *Aquaculture* 4: 241- 246.
- Gupta N.K., and Duggal C.L. 1973: On one new and one already known species of the subgenus *Procamallanus* (Baylis, 1923) Ali 1956 (Nematoda: Camallanidae) from the freshwater fish and a key to the species of the subgenus. *Riv. Parassitol.* 34: 295–304.
- Gupta, K., Gupta, N., Anjum, A., and Gupta, D. (2014). Taxometry and ecology of a new species of *Diplozoon nordman*, 1832 from the gills of *Schizothorax richardsoni*, inhabitants of Poonch River, Jammu and Kashmir state, India. *The Bioscan* 9: 917-923
- Gussev, A. V. 1976. Freshwater Indian Monogeneoidea. Principles of systematics, analysis of the world faunas and their evolution. *Indian J. Helminthology*, 25/26: 1–241.
- Gussev, A.V.; Ali, N.M.; Abdul-Ameer, K.N.; Amin, S.M. and Molnár, K. (1993). New and known species of *Dactylogyrus* Diesing, 1850 (Monogenea, Dactylogyridae) from cyprinid fishes of the river Tigris, Iraq. *Systematic Parasitology*, 25: 229-237.
- Moravec F., Chaudhary A., Ahmed M., and Singh H.S. 2022: New data on the morphology and taxonomy of some spiruridan nematodes (Spirurida) parasitising fishes in Jammu and Kashmir, India. *Folia Parasitol.* 69: 002.
- Moravec F., Scholz T., Ash A., and Kar P.K. 2010: New data on the morphology and taxonomy of three species of *Rhabdochona* (Nematoda: Rhabdochonidae) parasitizing fishes in India. *Folia Parasitol.* 57: 295–306.
- Osmanov S.O. 1957. A new nematode from fishes of the Amu-Darya. *Dokl. Akad. Nauk UzSSR*, No. 1, 63–65. (In Russian.)
- Skryabin K.I., and Sobolev A.A. 1964. Spirurata of Animals and Man and the Diseases Caused by Them. Part 2. Physalopteroidea. *Osnovy Nematodologii* 12. Nauka, Moscow, 334 pp. (In Russian.)
- Verma, C., Chaudhary, A., and Shanker Singh, H. (2017). Redescription of two species of *Thaparocleidus* (Monogenea: Dactylogyridae), with the description of *T. armillatus* sp. n. from *Wallago attu* and a phylogenetic analysis based on 18S rDNA sequences. *Acta parasitologica*, 62: 652–665.