

Cercariae infection in ponds of desert area Bikaner, Rajasthan

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Abstract

In monsoon season different molluscs of gastropods and pulmonates increases in number as their high amount of water and food become available in village pond ecosystem. Cercariae infection noted in desert village ponds, Sagar and Devikund Sagar of Bikaner. The increased amount of nutrients also influences the growth of all aquatic living being surviving in desert ponds. The number of not only molluscs but also the cercariae count recorded as high in this period. Different molluscs have the different type of cercariae in their body as they are secondary host of the fasciola. Furcocercous, Gymnocephalous and Xiphidio cercariae noticed from different molluscs.

Keywords: gastropod, pulmonate, infection, desert, host, furcocercous, gymnocephalous, xiphidio cercariae.

Introduction

Desert area of the Bikaner, Rajasthan have few small patches of water body which spread very scanty having water for nearby animals, houses, for small scale works and also the organism surviving in it. Desert area like Bikaner having several peculiar drastic conditions which does not found in the remaining part of the India. All over the world, as living being we are facing so many problem like drought, floods, swanami, earth quake, acid rains but now a days we are facing pandemic effect of covid-19, that originated from any part of the world. India faced several diseases like malaria, polio, small pox etc. but this covid-19 have a different mean of spreading (touching) due to which India goes in lock down period by different rules and phases.

According to needs, almost most of the countries adopted lock down with different rule and regulations. The effect of such lock down can be seen in all parts, in all organisms of all areas. The effect of lock down can also reflects in lentic environment habit and habitat. No doubt, these all working habits (work from home) reflects in lowering the pollution level (air, water, soil), growth of species and population of several organism. In recent the air pollution level of Delhi, Mumbai, Jaipur, and so many cities become lower down as it become very clean. The Yamuna river of Delhi become more clean in compare to the previous to the covid-19, water become more clear and the fish fauna moving and growing can be easily seen.

Water is an elixir of life; it is the unique component of nature that has played an important role in the evolution of life from molecules. In arid environment the aquatic community lead to isolated due to discontinuous and transient freshwater bodies. Further, such waters offer harsh environmental condition for all living being such as phytoplankton, zooplankton, nekton, neuston, benthos, molluscs, etc.

Study area

8 km. east of the Bikaner city, village pond Sagar and Devikund Sagar are situated, where this study after the lockdown, unlock down -III, was carried out.

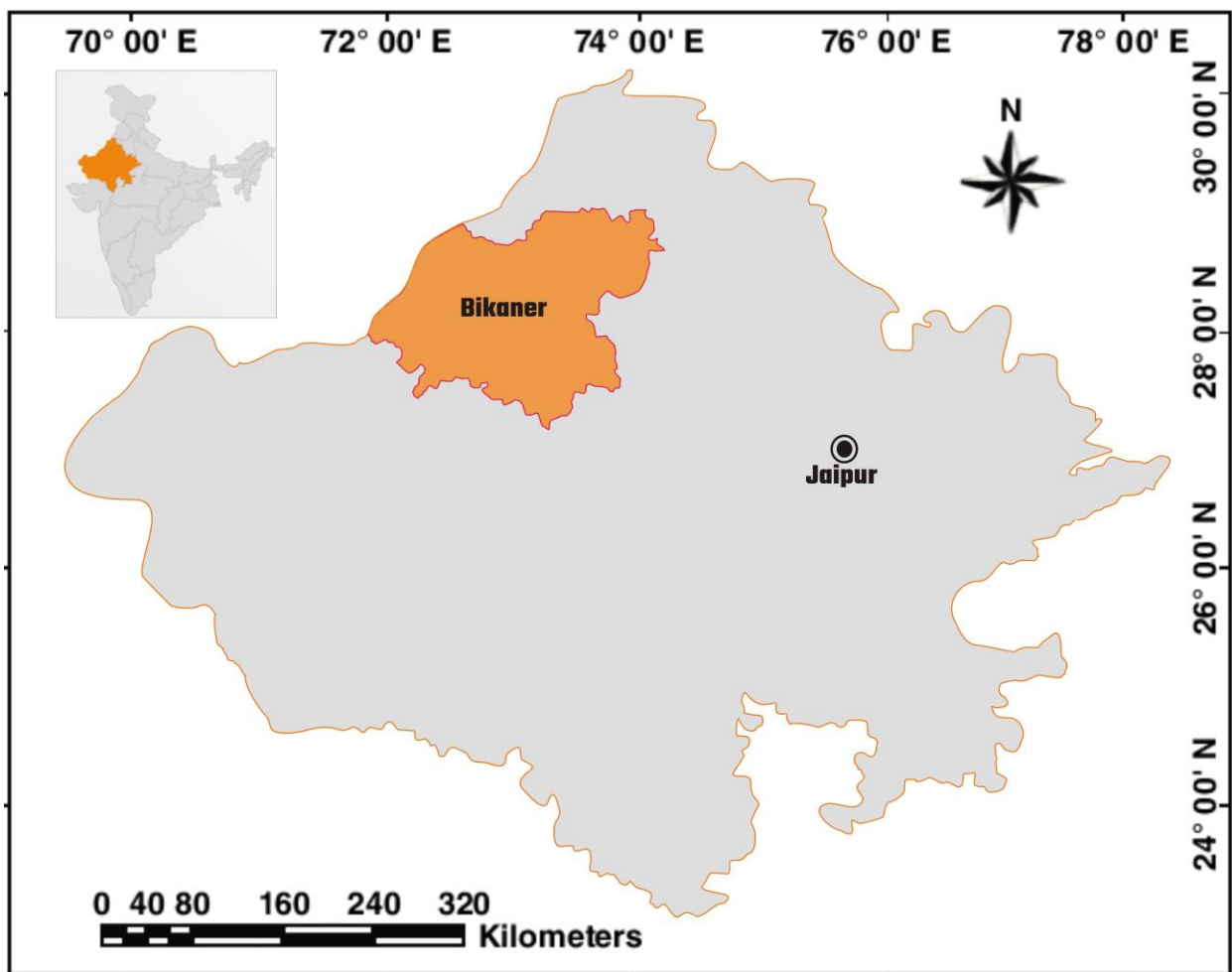


Figure 1: Location Map of Bikaner, Rajasthan, India



Figure 1: Devikund Sagar Pond

The catchment area of these ponds receives rain water during the monsoon as well as in other season has surround from three sides by bricked wall.

The pond is utilised by village people for the purpose of washing and bathing. A number of tankers or bullock and camel carts are filled and transported from here. The clay of pond bottom is used for brick making on the bank sides. The colour of pond water is light green, some birds including dab chicks and black-winged stilts are seen. Near the pond royal crematorium with several ornamental cenotaphs or 'chhatris' built in the memory of the Bika dynasty rulers is situated which is very important from tourist point of view.

Methodology

Water samples were collected from a depth of 0.5m at monthly intervals. Since the water was shallow, no samples could be collected from greater depths. The sampling was carried out during morning hours between 06.00-9.30 Hrs. The samples were collected with the help of a plastic bucket of 15 litre capacities, and were transferred to well rinsed polyethylene bottles for the analysis of physical and chemical parameters. Transparency was recorded with the help of a standard Secchi disc.

For study of molluscs diversity and cercariae, mud sample from two station of both ponds was collected with the help of quadrat of known dimension (ie 500 cm²). As the water was shallow, the mud from this quadrat was taken out with the help of a shovel and transferred to dully labeled polythene bags. This mud was filtered through a sieve of 2 mm mesh size, with adding some water, and snails were picked up mechanically. The samples were transported to the laboratory for examination of physical-chemical variables and for benthic populations. Different forms of molluscs collected by sieving method get preserved in spirit and studied under stereoscopic binocular microscope and bull lens. The forms were identified and counted by following Subha Rao [1], Needham JG and Needham PR [2]. The results were expressed in terms of No. /m².

The live gastropod specimens were subjected to examination for larval trematode infection. This was made following illumination technique [3] as well as by dissection and examining the smear prepared from the viscera of the snail. The type and intensity of infection was ascertained for each species and its seasonality and host specificity were taken special notice of. The

identification of larval trematodes was made following Erasmus [4].

Results and Discussions

From the molluscs fauna, only of the members of class Gastropoda was recorded in both water bodies. The prosobranch namely, *Gabbia orcula* Frauenfied, *Lymnea acuminata*, *Digoniostoma pulchella* (Benson), *Bellamya bengalensis* (Lamarck) and *Thiara (Melanoides) tuberculata crebra* Lea. The pulmonate snails represented by *Indoplanorbis exustus* and *Gyraulus rotula*. Present results show *I. exustus* as the most abundant trematode host snail in the arid region of Rajasthan also concordance Saxena [5]. Maximum (peak) infection of larval trematode parasites in different snails' species in a particular season is result of simultaneously triggering of life cycles of digenetic trematode and their intermediate snail hosts, similar to that of Choubisa, [6]. Present study and Choubisa & Sharma [7] and Choubisa [8] also observed furcocercous cercariae to be the most common and severe infection among most of the gastropods species.



Figure 2: Different Cercariae

Conclusion

During present investigation, only Distome cercariae belonging to sub-groups Leptocercous cercariae (Gymnocephalous cercariae and Xiphidiocercariae) and

Furcocercous cercariae were recorded. The cercarial infection indicates towards the severe fasciolopsis and schistosomiasis among primary hosts which should be looked upon as a threat to animal husbandry requiring urgent attention.

1. Only two species, namely pulmonate *Indoplanorbis exustus* and prosobranch *Gabbia orcula* were found to act as trematode hosts in the desert waters under study.
2. The infection was evaluated in terms of infestation percentage (No. of infested snails/100) and infestation intensity (average No. of cercariae/snail); besides its seasonality.
3. Although the infestation percentage was almost at par in snails *I. exustus* and *G. orcula* (20-30%), the infestation intensity varied between the two.
4. Three types of cercariae were recorded, namely Gymnocephalous, Xiphidio cercariae and Furcocercous cercariae. While *I. exustus* hosted Gymnocephalous and Furcocercous cercariae, *G. orcula* hosted only Xiphidiocercariae.
5. Intensity of infestation was considerably greater in *I. exustus* compared to *G. orcula*.
6. The snails in Devikundsagar and Sagar were infected with Xiphidiocercariae and Furcocercous cercariae; infection intensity being most serious in latter case (upto 8580 Furcocercous cercariae/snail). The snails in Sagar pond harboured Gymnocephalous cercariae and Xiphidio cercariae.
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Conflicts of interest: The authors stated that no conflicts of interest.

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