Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(3): 1018-1020

Received: 24-03-2019
Accepted: 25-04-2019

IM Allaie
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

RA Shahardar
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

A Prasad
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

SR Tramboo
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

ZA Wani
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

SS Kubra
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

I Maqbool
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

Correspondence
IM Allaie
Division of Veterinary Parasitology, FVSc & AH, SKUAST-K, Shuhama Alusteng, Srinagar, Jammu and Kashmir India

Prevalence of snails in central Kashmir, India

IM Allaie, RA Shahardar, A Prasad, SR Tramboo, ZA Wani, SS Kubra and I Maqbool

Abstract
The present study revealed the presence of different snail genera in central Kashmir. A total of seven genera of snails comprising of *Lymnaea auricularia*; *Indoplanorbis exustus*; *Bithynia tentaculata*; *Lymnaea stagnalis*; *Zootecus* spp.*; Corbicula* spp. and *Macrochlamys indica* were identified during a period of six months in central Kashmir.

Keywords: Central Kashmir, prevalence, snails

Introduction
Malacological surveys are useful to trace the dynamics of molluscan populations of an area. Snails belong to a large and highly diverse group of invertebrates known as the phylum - Mollusca, class - Gastropoda and order - Stylommatophora. Snails are the obligatory intermediate hosts of digenetic trematodes and also obligatory in the life cycle of some nematodes. The presence of susceptible snail host is a primary requirement for the perpetuation of snail borne infections. In order to evolve a long term strategic control measures against snail-borne parasitic diseases, it is necessary to know the distribution pattern of snail vectors. There has been well documented information on the snail vectors prevalent in various parts of the country [1-7]. In Jammu and Kashmir there are some studies on record till date [8-19]. These workers had reported the prevalence of different snail species from Kashmir, Jammu and Ladakh divisions of the state. Therefore, the present work was undertaken to determine the prevalence of snail intermediate hosts in and around central Kashmir.

Materials and Methods
The study was conducted in central Kashmir comprising of three districts viz Ganderbal, Srinagar and Budgam. Ganderbal, Srinagar and Budgam are situated 34.14^0N latitude and 74.47^0E longitude, $34^005'$N latitude and $74^050'$E longitude and $34^01'$ $12''$ N latitude and $74^046'48''$ E longitude, respectively. In central zone of Kashmir Valley summers are usually mild with good little rain, but relative humidity is generally high and the nights are cool. The precipitation occurs throughout the year and no month is particularly dry. The hottest month is July (mean minimum temperature 6 °C, mean maximum temperature 32 °C) and the coldest is January (mean minimum temperature −15 °C, mean maximum temperature 0 °C).
The snails were collected by hand picking using gloves to prevent from cercarial infection from different locations of the study area for a period of six months. The collected snails were then transported in polythene bags to the Divisional laboratory where they were washed properly and separated according to their genera. The snails were identified as per the standard shell morphological keys provided by Gupta *et al.* [20] and Rao (1989) [21].

Results
A total of 750 snails were collected from different locations of the central Kashmir. Based on the morphological characters the snails belonged to seven genera (Fig. 1). Genera wise prevalence in descending order was found as *Lymnaea auricularia* (44.40%); *Indoplanorbis exustus* (17.07%); *Bithynia tentaculata* (15.60%); *Lymnaea stagnalis* (9.07%); *Zootecus* spp. (8.53%); *Corbicula* spp. (4.67%) and *Macrochlamys Indica* (0.67%).
Lymnaea auricularia has dextral shell, thin with short acuminated spire and very oblique and greatly inflated body whorl. Whorls of spire 3-4, convex, rapidly increasing in size from above downwards. *Indoplanorbis exustus* has moderately large, thick, depressed discoidal, sinistral shell which is concavely flattened on both the sides.

Whorls are convex, three in number, spirally coiled in one horizontal plane. In *Bithynia tentaculata* shell is small, ovately spindle shaped, colourless and smooth. The whorls are more or less convexly inflated. *Lymnaea stagnalis* shell is brown in colour and has 4.5-6 weakly convex whorls. The upper whorls are pointed, the last whorl is suddenly inflated, so that its diameter is more than a continuous increase of that of the upper whorls. *Zootecus* spp. has small shell, many whorled, cylindrical or oblong-cylindrical. In *Corbicula* spp. shell is small or large, subtrigonal to cordiform, umbones prominent and concentrically grooved. *Macrochlamys Indica* has pale brown, perforate shell with smooth and polished surface. It has five and half whorls and low spire. Last whorl much wider than the rest and rounded at the periphery.

Fig 1: Snails prevalent in central Kashmir

Discussion

Hora *et al.* [11] recorded *Indoplanorbis, Valvata* and *Gyraulus* genera prevalent in aquatic fauna of Kashmir Valley while as Dhar *et al.* (1985) [15] reported the prevalence of seven snail species viz *Lymnaea stagnalis; L. luteola; L. auricularia sensu stricto; Bithynia* spp.; *Indoplanorbis exustus; Gyraulus compressus* and *Planorbis planorbis* in Kashmir Valley. *Lymnaea stagnalis* and *Lymnaea auricularia sensu stricto* were the most common snail species reported in their study. The exact identity of the snail vector for fascioliosis in Kashmir is not known as snails of the variety *L. auricularia* var *rufescens* have not so for been reported from Kashmir Valley and it is postulated that *L. auricularia var sensu stricto* may be responsible for transmission of fascioliosis in Kashmir (Dhar *et al.*) [15].

Sharma *et al.* [18] reported prevalence of 11 taxa of fresh water molluscs from Jammu division of the state. The workers recorded the prevalence of these taxa from class Gastropoda and Bivalvia. *Pissidium mitchelli* (Bivalvia) was the most abundant taxa followed by *Melanoides tuberculata* (Gastropoda). *Lymnea luteola*, *Bellamya bengalensis*, *Physella acuta*, *Gyraulus ladacensis* showed less frequent appearance whereas *Lamellidens corrianus* and *Corbicula cashmeriensis* were recorded as rare taxa in their study. In Ladakh division of Jammu and Kashmir, Boominathan & Ramachandra [19] reported the prevalence of *Radix brevicauda*, *Radix lagotis*, *Valvata piscinalis* and *Gyraulus* spp. from Pangong Tso Lake (Merak Village).

In the neighbouring state of Himachal Pradesh, Biswas *et al*. [22] reported 25 species of molluscs from different districts of the state. Among these species, eight species [*Bithynia (Digoniostoma) pulchella*, *Melanoides tuberculata*, *Lymnaea (Pseudusuccinea) acuminate*, *Physa acuta*, *Macrochlamys indica*, *Macrochlamys (Euaustenia) cassida*, *Ariophanta interrupta* and *Indoplanorbis exustus*] were reported from the Kangra district of which *Physa acuta*, *Macrochlamys indica* and *Ariophanta interrupta* had been recorded for the first time from Himachal Pradesh.

In this study several snail species were found in and around central Kashmir that may act as an intermediate host for different trematode parasites infecting livestock of the Valley. The snail species belonging to the genera *Zootecus*, *Corbicula* and *Marochlamys* were reported for the first time from Kashmir Valley. Suitable control measures may be adopted by the farmers of the Central Kashmir to reduce the prevalence of these snail vectors thereby reducing the incidence of snail borne diseases in the livestock.

Acknowledgement

Sincere thanks are due to Dr Mohammad Maroof Shah and Mr. Ghulam Rasool Wani of the Division for assisting in snail collection.

References

1. Bhalerao GD. The trematode parasites of Indian elephant, *Elephus indicus.* Indian Journal of Veterinary Sciences and Animal Husbandry. 1932; 3:103-115.
2. Ray HC, Mukherjee A. Mollusca fauna of Rajasthan, India. Records of Zoological Survey of India, 1963, 403-433.
3. Pande KC, Agarwal N. Larval trematodes and their seasonal variation in snails of Kathanta Tal, Lucknow. Indian Journal of Parasitology. 1978; 2:139-143.
4. Bali HS, Sing S, Gill JS. Some observations on the distribution and life cycle of anoperculate snail *Bulinus tentaculata* (Linn) Var Kashmirensis (Gastropoda: Hydrobidae) in Punjab. Indian Journal of Ecology. 1986; 13: 342-346.
5. Deka JK. Epidemiological studies on Schistosoma nasale, Rao, in and around Azara, near Guwahati. M.V.Sc. Thesis, Assam Agricultural University, Guwahati, 1933-1999.
6. Devi P, Islam S, Das M. Prevalence of freshwater snails in Assam. Journal of Veterinary Parasitology. 2006; 20(1):81-84.
7. Tigga MN, Bauri KR., Deb AR, Kullu SS. Prevalence of snail's intermediate host infected with different *Trematodes cercariae* in and around Ranchi. Veterinary World. 2014; 7:630-634.
8. Woodward, SP. On the land and freshwater shells of Kashmir and Tibet, collected by Dr. T. Thomson. Proceedings Zoological Society of London. 1856-1856, 185-187.
9. Theobald W. Notes on the land and freshwater shells of Kashmir, more particularly of the Jhelum Valley below Srinagar and the hills north of Jammu. Journal of Asiatic Society of Bengal. 1878; 47(2):141-149.
10. Prashad B. On a collection of land and freshwater fossil molluscs from the Karewas of Kashmir. Records of Geological Survey of India. 1928; 56(4): 356-360.
11. Hora SL, Mulik GM, Khajuria H. Some interesting features of the aquatic fauna of the Kashmir Valley. Journal of Bombay natural History Society. 1955; 53(1):140-143.
12. Rajagopal AS, Subba Rao NV. Aquatic and amphibians Molluscs of the Kashmir Valley, India. Proceedings of Symposium on Mollusca, 1968, 95-120.
13. Rajagopal AS, Subba Rao NV. Some land molluscs of Kashmir, India. Records of Zoological Survey of India. 1972; 66(1-4):197-212.
14. Kaul V, Pandit AK, Fotedar DN. Ecology of freshwater snails (*Gastropod molluscs*) in Haigam, a typical wetland of Kashmir. Tropical Ecology. 1980; 21(1):32-46.
15. Dhar DN, Bansal GC, Sharma RL. Studies on the aquatic snails of Kashmir Valley with particular reference to *Lymnaea auricularia sensu stricto*. Indian Journal of Parasitology. 1985; 9:241-44.
16. Dutta SPS, Malhotra YR. Seasonal variations in the macrobenthic fauna of Gadigarh stream (Miran Sahib) Jammu. Indian Journal of Ecology. 1986; 13(10):138-145.
17. Dey A, Mitra SC. Molluscs of the Himalaya. Records of Zoological Survey of India. 2000; 98(2):5-50.
18. Sharma KK, Sharma SP, Sawhney N. Distribution and ecology of some fresh water molluscs of the Jammu division of J&K State. Journal of Environmental Bio-Sciences. 2009; 23(2):179-181.
19. Boominathan M, Ramachandra, TV. Molluscs of Pangong Tso, A High Altitude Brackish Water Lake In Ladakh. Symposium on Lake 2010: Wetlands, Biodiversity and Climate Change. IIS, Bangalore, 2010.
20. Gupta RP, Yadav CL, Ruprah NS. Studies on the bionomics of some aquatic snails and their cercarial fauna of Haryana state. Indian Veterinary Medecine Journal. 1987; 11(6):77-83.
21. Rao NVS. Hand Book of Fresh Water Molluscs of India. Zoological Survey of India, Calcutta, 1989.
22. Biswas TB, Tripathy K, Valarmathi, Sajan SK. Taxonomy, Distribution and Conservation of Molluscs in Kangra District of Himachal Pradesh: Three New Records from the State. Ambient Science. 2015; 02(2):18-24.