International Journal of Zoology Studies
ISSN: 2455-7269; Impact Factor: RJIF 5.14
www.zoologyjournals.com
Volume 2; Issue 2; March 2017; Page No. 50-52

Study on helminth parasites of some fresh water fishes

Dr. Shiva Narayan Yadav

Associate professor, Department of Zoology, M. M. A. Multiple Campus, Biratnagar, Nepal

Abstract
58 (fifty eight fresh water fishes (Heteropneustes fossilis = 22, Clarias batrachus = 20, and Mystus vittatus = 16) were collected from different fresh water ponds in the Takuwa-11, Rangeli municipality; morang eastern Nepal and brought to the department of zoology lab. All fishes were examined and investigated helminth parasites. The study revealed that all (100%) H. fossilis were infected with acanthocephalon- Pomphorhynchus sp. 80% only 16. C. batrachus infected with one cestoda-Lytocestus and 75% of 12 of M. vittatus infected with nematodes Rhabdochona magna. The mean intensity of infection was 15.27 in H. fossilis, 6.25 in M. vittatus and 7.5 in C. batrachus. The results indicate that the parasite intensity is high. It may due to the physical factors that favour the completion of life cycles of these parasites.

Keywords: fresh water fishes, fish helminth parasites, intensity, prevalence, Morang Eastern Nepal

1. Introduction
There are many fresh water ponds to the local communities for fish farming. Such developments have brought with them benefits that can be exploited by the locals such as commercial and or subsistence fishing activities. This is a stimulated study in fish ecology (Payne, 1986) [13]. These ponds are managed by local people for fish raising. Cultivated fishes in Nepal is of highest significance because of highly nourishing and souce of protein for human are consumed as white meat. Parasitic diseases of fish are very common throughout the world. Infections which are caused by viruses, bacteria and parasites among fishes in natural and man-made culture system are harmful for fish health and growth. The parasitic infections are sometimes very fatal and can cause high mortalities (Ahmed, 1994) [2]. Fishes serve as definitive and or intermediate hosts in the life cycles of many helminth parasites (Schimidt, 2000) [16]. Among fresh water fishes, there are 1211 species of different parasites representing 5 phyla and 11 classes of invertebrates (Bykovskaya *et al.*, 1964) [4]. The major parasitic groups found in fresh water fishes are trematodes, cestodes, acanthocephalon and nematodes that complete their life cycle through intermediate hosts like piscivorous birds (Schmidt, 1990). In Nepal the study of parasites is very scanty. The review of recent literature work on various aspects of parasites have been done by Gupta R (1996) [5], Muhammad *et al* (2007) [11], Nimbalkar R. K., *et al* (2010) [12], Awharitoma *et al* (2012) [3], Yadav, S. N. (2013) [18]. The need to asses the parasitic infection arises because the fish suffering from parasitic infection or disease result into severe damage to the pisciculture. For successful prevention and elimination of such infections which are extremely important to achieve for pisciculture.

2. Materials and Methods
A total of 58 samples of 3 species fishes comprising Clarias batrachus (n = 20), Heteropneustes fossilis (n = 22), Mystus vittatus (n = 16) was obtained from different fresh water ponds found in the Takuwa-11, Rangeli municipality near Biratnagar Morang eastern Nepal. The fish were collected in June to September 2015. The fishes were killed and brought in the laboratory, Debt. Of zoology alive in a small container. Each was then given a number length and weight were recorded. Fishes were dissected one by one exposing their visceral organs. The stomach and the intestine were cut open lengthwise as to expose the lumen. The lumen was washed gently with distilled water in petriplates and observed under dissecting microscope.
All the parasites were preserved in 70% alcohol. Worms were cleared in lactophenol before identification. They were cleaned and kept in small vials for the study of their attachment were also recorded. External and internal morphological characters of each worm were recorded for further species identification using standard keys [Bykovskaya, *et al* (1964) [4], Hine & kennedy 1974 [7]; Zaidi and Khan 1976 [19]; Akram, 1988b Khalil, 1991] [9]; Parpena, 1996.

3. Results
From the sample, all (100%) species of H. fossilis were found infected with acanthocephalan, Pomphorhynchus sp. The total number was collected acanthocephala from 22 fish 336 parasites and the mean intensity of parasites was 15.37. Out of 20 species of C. batrachus only 16(75%) were found infected with cestode, Lytocestus indicus. The total number of cestodes carried from 16 fishes of C. batrachus was 120 cestodes parasites. The mean intensity of parasites was 7.5. Out of 16 species of M. vittatus only 12 (75%) were infected with nematodes, Rhabdochona magna. The total no. of nematodes 75 parasites. The mean intensity of parasites was 6.25.

Table 1: Various helminth parasites found in the gut of some fresh water fishes

Fish species	Length (cm)	Weight (gm)	Parasite location	Helminth parasites			
				Trematode	Cestode	Nematode	Acanthocephalans
C. batrachus (n=20)	48.3±6.4 (31.5-5.1)	1078.9 ±187.3 (506-1220)	Stomach		Lytocestus indicus		
H. fossilis (n=22)	17.25 ±2.51	117.50 ±7.50	Intestine				Pomphorhynchus
M. Vittatus (n=16)	14.00 ±0.81	114.37 ±9.66	Foregnt			Rhabdochona magna	

Table 2: Prevalence and Intensity of Various Parasites Occurs In Fresh Water Fishes

Fish Species	Parasites sp.	Total No. of parasites	Prevalence %	Mean parasite intensity
C.batrachus	Lytocastus sp.	120	80	7.5
H.fossilis	pomphorhynchus	336	100	15.27
M.vittatus	Rhabdochona magna	75	75	6.25

4. Discussions

Helminth parasites are generally found in fresh water fishes. The prevalence and mean intensity of parasites depend on many factors like parasites and its life cycle host and its feeding habits and the physical factors of water body where the fish lives. It also depends upon the presence of intermediate host such as piscivorous birds because most helminthes complete their life cycle in the bird host for the spread of parasites infection (Zaidi and Khan, 1976) [19]. Hoffman (1967) [6] reported that in the mud habitat second intermediate hosts of many fish digeneans such as larvae of aquatic insects and various crustacean are found and part of the diet of fishes. Kennady (1976) [8] observed the factors such as distribution and environment of the host the diet and mode of feeding, often play important role to limit a parasite to a particular host species as well as high prevalence. The study areas are small ponds where generally water fulfil by rain water or by pumpsets. The amount of water is always variable due to rainfall. When water level is low and changes the physic-chemical quality of water significantly. These ponds are used to visit animals from the neighbouring villages. Most of time buffaloes sit in these ponds and contaminate water of their excreta. Due to decaying of the organic matter in the bottom of ponds dissolved oxygen content deplete and water-quality characteristics are altered. The ponds hygienic conditions favour the existence and propagation of many parasites. Development of parasites requires high temperature, low humidity and less rainfall which is the best environment for the growth of parasites contributed by like Tubangii (1931) [17]. The variation can be attributed to changes in physico-chemical parameters or variation in food habits of the host. Among the H. fossilis those from ponds morang district were observed to be more heavily infected by the acanthocephalan. Moller and Anders (1986) [10] concluded that fish from more polluted water tend to harbour more helminth parasites than those from less polluted waters. If the water level is very shallow allows many birds to visit for fish as food. These birds always living in the vicinity of these ponds. These birds acts as intermediate host for parasites. When life cycle of parasites as completed its prevalence and intensity increases significantly. The present study revealed that acanthocepha infection was highest in all fishes sample.

Hereteropneustes fossilis which was the most heavily infected and observed to feed mainly zooplankton and other small fishes. H. fossilis is a bottom dweller carnivorous fish which mostly infected with acanthocephalon-Pomphorhynchus sp. These zooplankton (crustacean) play important role in transmission of acanthocephalon Pomphorhynchus infection in H. fossilis Clarias batrachus is feeding on insects and their larval crustacean and small fishes. C. batrachus is bottom dweller and omnivorous. This feeding habit has increased the possibility of ingesting food and infected with parasites. The chances of ingesting infected fish are relatively low in prevalence of cestode than acanthocephalan. Mystus vittatus is feeding on crustaceans (copepods) daphnia and cyclops, smaller fishes and tadpoles and mostly depend on mid water such species also called column of the pond. Since this fish is carnivorous which mostly infected with nematode. The chance of ingesting infected fish are relative low and prevalence of nematode is also low than cestode of C. batrachus infection may be discontinuity of the pond itself. Since these ponds are not permanent one. They get dry or very shallow water. When rain water is not available and the life cycle of parasites disturbed. This is why the onwards transmission of parasites stopped resulting into low prevalence and intensity of parasite.

5. Acknowledgement

The author is very much thankful to the Head Dept. of Zoology, Prof. Dr. Damodar Thapa Chetri who encourage to me for this article and also our sincere gratitude goes to lab boy Fekan khatway and shanti kamat and Anil kamat for helping me in the laboratory during this work.

6. References

1. AKRAM M. on the subfamily Procamallaninae(Yeh, 1960). Part-11. Erection of two new and rediscription of two known species of the genus spirocamallanuss (Calsen, 1952) 1979 along with Malaya carnal/anus. Jolly and Fernando 1971 (Nematoda: Camallanidae). Karachi University J. Sc. 1988; 17:125-150.
2. Ahmed, MS. Trypanosoma in common carp, Cyprinus carpio L. Ph. D. thesis, zoological Institute, Catholic University Leuen, Belgium, 1994, 12.
3. Awharitoma AO. *et al.* Helminth parasites from some rivers in southern Nigeria.African Scientists. 2012; 13(2):65-69.
4. Bykovskaya *et al*. key to parasites of fresh water fish of the U.S.S.R Isrel program for scientific Translations, Jerusalem, 1964.
5. Gupta R. Effects on length(age) of H. fossilis on the abundance of two helminth parasites. T.U. Journal. 19,83-87.
6. Hoffman GL. Parasites of North American fresh water fishes; University of California Press, Berkeley, 1967.
7. Hine PM, Kennedy CR.The population biology of the Acanthocephala, Pomphoshynchuslaevis (Muller) in the river Avon. J. Fish Bio, 1974; 6:665-679.

8. Kennady CR.Ecological aspects of Parasitolgy. North Holland Publishing Company Amsterdam. 1976, 1-474.
9. Khalil LF. Techniques for identification and investigative helminthology. Helminthology manual International Institute of Parasitology, St. Albans, 1991.
10. Moller H, Anders K. Kiel: Moller 365, 1986.
11. Muhammad, Y *et al*, 2007.
12. Nimbalkar RK *et al*.A Survey on Helminth Parasites of Fishes from Jaikwadi Dam, Maharashtra State of India. Journal of Ecobiotechnology. 2010; 2(8):38-41.
13. Payne AI. The ecology of Tropical lakes and rivers. John Wiley and sons, New York Lowe-Mc Connell, R. H., Fish communities in tropical waters. Cambridge University Press. U.K, 1986.
14. Parpena I. Parasites, infections and diseases of fishes in Africa. An update FAO/CLFA Technical paper. 1996; 31:130-199.
15. Schimidt GD. Essential of Parasitology (4thed) W. M. C. Brown Publishers, 1990.
16. Schimidt GD, Roberts LS. Foundations of parasitology. 6th edition. McGraw-Hill international Editions, Boston, 2000.
17. Tubangii MA. Philipp. J. Sci. 1931; 44:417-424.
18. Yadav SN. Effects of length (age) of H. fossilis on the abundance of Pomphorhynchus sp Research cell, 2013.
19. Zaidi DA, khan D. cestodes of fishes from Pakistan. Biologia (Lahore). 1976; 22:157-179.