International Journal of Zoology Studies
ISSN: 2455-7269
Impact Factor: RJIF 5.14
www.zoologyjournals.com
Volume 2; Issue 6; November 2017; Page No. 20-23

Ecological studies on trematode infection of three species of birds at Sidhi Dist. (M.P.)

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Abstract
During the present investigation the author has collected the helminth parasites the digenetic trematodes from bird vertebrate host from Sidhi Distt. (M.P.) in which the Indian species of digenetic trematodes were predominant helminth parasites. This deals with the host parasites relationship in the light of recent researches. the recent development in the study of ecology has been the recognition of the fact that the biotic and abiotic components of nature are not only interrelated but both these components function in an orderly manner as a definitive system. Thus, structure and function should be studied together for fuller understanding of this vast nature, like many contemporary fields of biology, ecology is multi-disciplinary and almost bundless in its concern.

Keywords: ecological, trematode infection, birds, Sidhi district

1. Introduction

The knowledge of helminths in India is very old. Helminthology is one of the most significant branches of parasitology, which constituent a large number of worms, free living as well as parasitic occurring widely, in invertebrates and vertebrates. Although there has been accumulated and extensive literature in the field of parasitology, which is scattered through thousands of publications in almost all the prominent languages of the world yet our present knowledge about the morphology and life history of trematodes, cestodes and nematodes parasites is too meager and fragmentary to be of greater use for taxonomic purpose. So, the need for extensive studies to acquaints with the whole pictures of morphological characters along with taxonomy and ecology is imperative for the present investigation.

Helminthology is only one of the significant branches of parasitology. Parasitism figures prominently in the Zoological curriculum at the present time and it is a topic that can be illustrated fully by the study of trematodes of different localities along with the environmental biology of the host, viz. topography, ecology (climate, rain fall, pH, temperature etc.), where the hosts are residing. As a parasites, which by definition must have a host, is dependent on the ability of another animal to supply it with food, shelter and ability to reproduce.

In all living materials, the bioplasm must have the property, necessary to survive and adopted to its environment but equality the environment must have also the properties necessary for the organism to survive. This is the basis of host specificity, which in its essence is not different from that, underlying the survival and ecology of the free living, terrestrial, fresh water and marine animals. This is achieved as a result of evolution of suitable mechanism within the parasites to enable its cells to live in a medium, which itself is changing slowly (as the host adopts to a changing external environment) i.e. evolution can be seen in action in case of parasites, if the ecology is altered the parasite population may also differ.

Limited published information is available on the digenetic trematodes from Vindhya region and adjoining areas. During the course of present studies of helminth parasites, plenty of data had been piling up from various areas. The present work deals with the study of digenetic trematodes harbouring mostly the groups of vertebrates (fishes, amphibians, reptiles, birds and mammals) and their ecology of Sidhi Distt. Helminthological researches in India have been conducted by several investigators and contributions have been published on Indian digenetic trematodes.

2. Material and Methods

Sidhi of Rewa Commissionary centre situated at $24^{0}32'$N latitude and $81^{0}18'$E longitude. It is 365.7 meters above the mean sea level. It is situated in the South-East corner of Madhya Pradesh. North border touching the Uttar Pradesh, east having U.P. and West by Shahdol District. All these four districts together form Rewa division of Madhya Pradesh. The experimental site is quite rich in its fauna and flora with beautiful climate.

The proposed research work will be carried out in 2012-13 with the help of following methodologies: During the study, water samples will be collected at seasonal interval from 4 different places in the lake and mix them to make a composite sample. Water temperature shall be recorded in the lake with the help of mercury thermometer. The pH will be recorded with pH meter in the laboratory. Salinity and total dissolved solids (TDS) will be measured with the titration method in laboratory. Total hardness of carbonate and bicarbonate, Chloride, and Alkalinity will be determined by titration with EDTA, Silver nitrate and hydrochloric acid in the laboratory. For fecal coliform bacteria examination, samples will be collected in 125 ml pre sterilized (at 121ºC) borosil bottle and will be analyzed with multiple tube fermentation technique using Mc-Conkey broth media within 6 hours of sample collection. A standard plot will be made for counting and assessing the bacterial load by pure plate technique.

3. Observation

In this paper the author has described the ecology, distribution, host parasite relationship and the seasonal variations of trematode infection of three species of birds at Sidhi Distt. (M.P.). Ecology is the most important branch of zoology which deals with the study of all the complex interrelations referred by Darwin as a pre-condition for struggle for existence. The two components of for struggle for existence. The two components of nature, organisms and environment are not only much complex and dynamic but also interdependent, mutually reactive the inter-related. Ecology, relatively a new branch of science, thus dealing with the various principles which governs such relationships between organisms and environment. The term ecology was coined by combining two Greek words Oikos (means house or dwelling place) and Logas (means 'the study of) to denote such relationships between the organisms and their environment. Thus, literally ecology is the study of organisms at home.

Although, there is uncertainty about the original coining of the term. Haeckel, although appears to have first used the term in 1886, defined ecology of the first time in 1870 as "By ecology we mean the body of knowledge concerning the economy of nature the investigation of the total relations of the animals both, to its inorganic and to its organic environment, including above all, its friendly and inimical relation with those animals and plants with which it comes directly and indirectly into contact. Haechel's definition, involving the concept of interrelationships of organisms and environment, has had somewhat different and perhaps more incisive interpretations placed upon it by investigation since 1900.

The soil is the placenta of life, the soil system is an integral part of the biosphere, vital to the transfer paths of energy and equally essential to the biological cycling of nutrients. Some of the unique to the soil environment and the remainder include nearly all the naturally occurring organic materials, which sooner or later find their way into soil. Living organisms of considerable variety and at times almost unbelievable abundance transform the insert geological material into dynamic and instantly changing part of the organic world.

The soil is the seat of abundance of the earth. A massive machinery for keeping the chemical stuff of the plant in constant circulation. There can be no life without soil and no soil without life. They are inseparable. Every complex thing that lives and then dies returns to the soil, where it is reduced to the simplest common dominatures. The physicochemical properties of the soil of this area includes pH of the soil, bulk density, true density, sand, silt, clay, infiltration, electrical conductivity and water holding capacity.

Some of the significant ecological parameters

In general the effect of temperature is measured in terms of influence on the rate of enzymetically catalyzed metabolic activities. The Sidhi tank has aquatic vegetation. It is well known fact pH values of any water body is as a result of equilibrium between the calcium carbonates, calcium bicarbonates, magnesium carbonates and magnesium bicarbonates and amount of carbon dioxide. The value of oxygen ppm also shows a fluctuating trend.

Ecological relationships are manifested not in a vacuum but in physicochemical setting, sets of non-involving or abiotic environment substances and gradients. It is against the abiotic back drop that the biotic components plats, animals and microbes interact in a rudimentally energy dependent fashion. A critical review of this concept of interrelationship between animals and their environment reveals that animals are not completely hammed in by their environment in any simple sense, but are nearly always prevented from occupying neighbouring habitat by certain limiting factors.

Various physicochemical parameters of the water of Sidhi tank for ecological variations for digeneans have been done during this investigation the findings are given in Tables from 1 to 2.

Table 1: Mean value of physico-chemical parameters of the water at five sampling Sites (2012-2013).

S. No	Temp. of water (^{0}C)	Temp. of atomos (^{0}C)	pH value	Turbidity (NTU)	Alkalinity CO_3 (mg/l)	Alkalinity HCO_3 (mg/l)	Total Alkalinity (mg/l)
S_1	28.6	31.2	7.9	48	20	105	125
S_2	30.0	32.7	7.5	92	20	98	119
S_3	29.4	32.6	8.2	203	28	136	163
S_4	31.0	33.0	8.7	232	27	125	150
S_5	30.9	33.1	7.5	100	20	91	111

Table 2: Rang value of physico-chemical parameters of the water at five sampling Sites (2012-2013).

S. No.	Hardness (mg/l)	Total Hardness (mg/l)	DO (mg/l)	BOD (mg/l)	COD (mg/l)
S_1	221	85	7.3	16	29
S_2	219	84	7.5	16	34
S_3	272	128	5.0	243	287
S_4	255	92	3.8	501	591
S_5	209	72	6.8	39	56

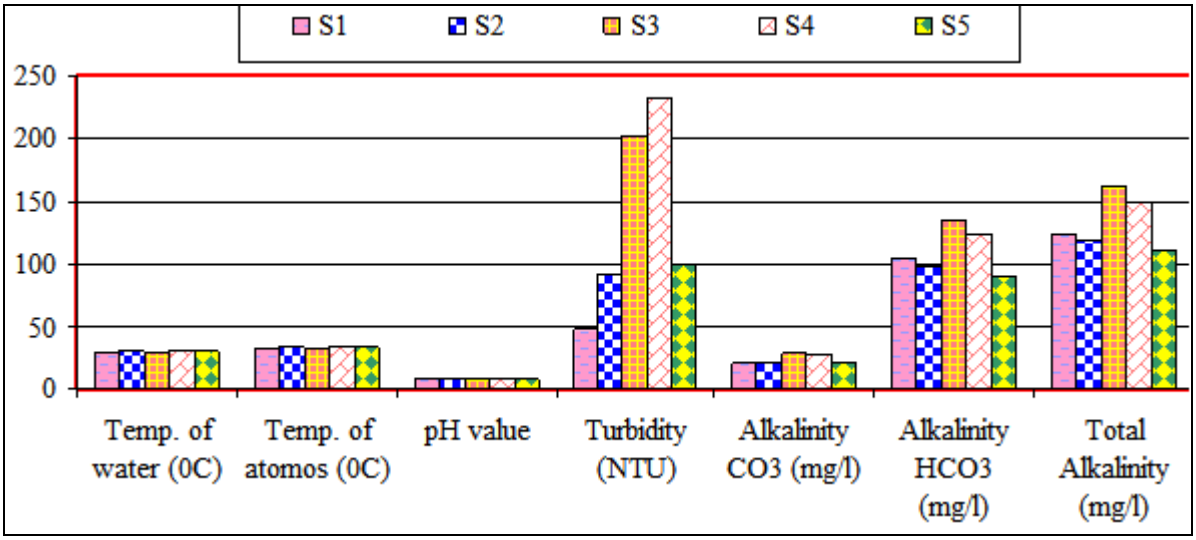

Fig 1: Graph analysis physico-chemical parmeters of the water at five sampling sites

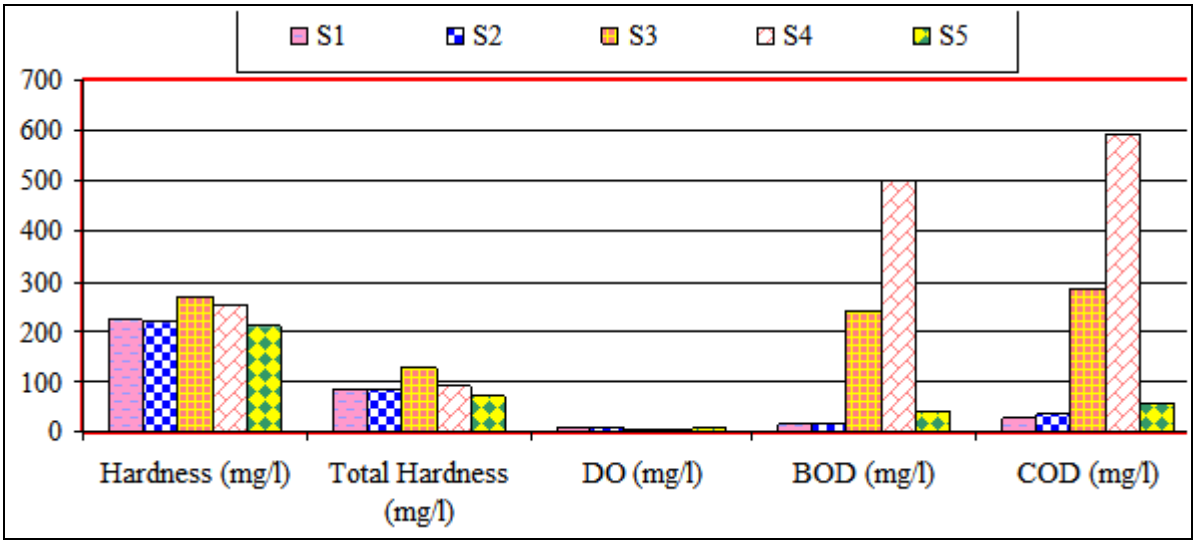

Fig 2: Graph analysi physico-chemical parameters of the water at five sampling sites

The influence of season or annual, incidence and maturity rhythms of helminths is often too well marked many species are restricted in their activity to certain types of seasons. The significance of annual variations in weather conditions on incidence cycle of cestodes infesting vertebrate hosts of tropical countries has been discussed by Chapman, R.N. (1931) [1] Animal Ecology with special reference to insects; Elton, C.S. (1927) [2] - Animal Ecology; Janzen, D.H. (1975) [3] - Ecology of Plants in the Tropics : Studies in Biology; Kannan, L. (1996) [4] - Application of remote sensing technique of Coastal Wetland Ecology of Tamil Nadu; MacArthur, R.H. (1972) [5] - Geographical Ecology; Odum, E.P. (1971) [6] - Fundamentals of Ecology; Poole, R.W. (1974) [7] - An Introduction to Quantitative Ecology and Trabaud, L. Grosman, J. & Walter, T. (1985) [8] - Forest ecology and management. Although the knowledge of physiology is not always necessary for the solution of ecology problems, but it is sometimes of use, especially in cases where the animals with which we are dealing belong to the class which find its habitat by producing large number of young ones, so that only these survive which find a suitable spot. This is also true for many parasites including flukes and tapeworms which exhibit excessive egg production in their life cycle.

4. Discussion & Conclusion

However, the recent development in the study of ecology has been the recognition of the fact that the biotic and abiotic components of nature are not only interrelated but both these components function in an orderly manner as a definitive system. Thus, structure and function should be studied together for fuller understanding of this vast nature, like many contemporary fields of biology, ecology is multi-disciplinary and almost bundless in its concern.

Every animal is closely linked with a number of other animals living around it, especially the food relationship in an animal community. It is very important to realise quite clearly that most parasites are in their feeding habits essentially something as carnivores, except that while carnivore destroys its pray, the parasite does not do so, or at any rate does not do so immediately or completely for its own existence. A parasitic

existence is usually an elaborate compromise between extracting sufficient nourishment to maintain and propagate itself and not impairing too much the vitality or reducing the number of its host, which is providing it with a home and free ride. A parasite usually destroys only small portions of its host at any time, which can often be replaced by re-energies of its host in more subtle ways, as when it subsists on the food which the host has collected with great expenditure of time and energy. The different between the methods of a carnivore and parasite is simply that the latter lives on capital and the former on income of food, the general result is the same, although the methods employed are different.

The host parasite relationship in helminths is a Quite complex one involving interactions between at least two and sometimes more genetical systems, namely those of parasite, its intermediate and its definite host. Thus, a trematode if it is to survive must be suitability adapted to the morphology, physiology, biochemistry, immunology and ecology of its.

The present work includes problem that have been tackled from three broad angles. Primary the taxonomy of trematode parasites, secondly the possible estimation of morphology of different species for possible taxonomic interpretations and lastly an attempt has been made to analyse various aspects of ecology, trematode parasites in 3 species of birds. The account herein includes data on different aspects of parasite's population dynamics related directly to seasonal changes, climatic oscillations and other meteorological parameters.

5. Acknowledgement

The authors are greatly indebted to Principal of Govt. S.G.S.P.G. College, Sidhi (M.P.) who permitted to carry out this work at the centre.

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