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Research Article

Biodiversity and prevalence of cestode parasites of *Capra hircus* in and around Dhule District, Maharashtra, India

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Abstract: Rearing of goats is mainly done for obtaining meat. It plays an important role in providing animal protein for the diet. They also serve as an intermediate host for a number of parasites. Cestodes found in gut are acquired by eating contaminated food or water. The effect of these parasites is mainly dependent on the number of parasites and nutritional status of the animal they are infecting. Cestode Parasites are a major cause of health problems in goats. The pathogenic effects of these parasites may be sub-clinical or clinical. The clinical symptoms are weight loss, reduced food intake, diarrhea and reduced yield. Due to parasitism, the animals become susceptible to other health problems which can lead to death. They caused the increase of mortality rate and the decrease in livestock productions (Soulsby, 1982). Keeping in mind the economic importance and food value of the goats, the author has decided to carry out the work on biodiversity and prevalence of cestode parasites of *Capra hircus*. The scope of the experiments is to understand the core sources of infection, in order to eradicate, control and prevention of an existence cestodes, it is essential to know the identification of worms so as to reduce impact factor and degradation.

The present study deals with the diversity and prevalence of cestodes infection in *Capra hircus* during period of June 2013 to May 2014 in and around Dhule District (M.S.)

Out of 254 hosts intestine samples examined, 101 (39.76 %) found to be infected with the cestode parasites, total 829 cestode parasites were collected. Four genera i.e. *Moniezia*, *Aliezia*, *Avitellina* and *Stilesia*have been reported. *Stilesia* show the highest incidence, intensity, density and index of infection followed by *Aliezia*, *Moniezia*, and *Avitellina* species respectively.

The incidence of infection was found more in winter followed by monsoon and summer season respectively because of favorable

conditions for the development of larvae in the host and availability of intermediate host.

Keywords: biodiversity, prevalence, cestodes and *Capra hircus.*

INTRODUCTION

Goats are important source of animal protein gastrointestinal parasitic infections in goats are of much economic importance because small ruminants rearing has been a major source of income especially to the marginal farmers of the country (Pathak and Pal, 2008). Recurring losses in productivity due to widely prevalent parasitic infection is an important and common problem for small ruminant production in most parts of the world (Gall, 1981).

Biological invasions are one of the major threats to biological diversity in ecosystems, and parasites might play a role in determining invasion outcomes (Combes, 1996). These worm infections may cause considerable damage and great economic loss to the host due to malnutrition; decreased feed conversation ratio, weight loss and death in young goats. Gastrointestinal parasitism are harmful to animal life, they cause low productivity and occasional death in farm animals. The incidence of cestode infection varies with age, sex, season and agro climatic conditions. Epidemiological survey of cestode infection is an important tool in controlling losses due to cestodes by adopting effective control measures like deworming the herd by selecting proper broad spectrum and helminthic drug (Singh, 2001).

The present work has been undertaken to study the biodiversity and prevalence of cestode parasite infection in *Capra hircus*in and around Dhule district.

MATERIALS AND METHODS

For the study of biodiversity and prevalence of cestodes parasites, irrespective of age, sex and breed, a total number of 254 intestines of *Capra hircus*were collected from different regions of Dhule, during the period from June 2013 to May 2014.The intestines were examined for cestode infection, covering the three different seasons of the year i.e. winter, summer and monsoon. The collected 829 cestodes were preserved in 4% formalin. Similar structured worms were sorted out and some of them are stained with Harris Haematoxylin (Mallory, 1944) passed through various alcoholic grades, cleared in Xylol, mounted in DPX and whole mount slide were prepared for anatomical studies, and microphotographs were taken by digital camera. The identification of these parasites was made by using keys "Systema Helminthum**"** (Yamaguti, 1959) and "Advances in the Zoology of tapeworms, 1950-1970" (Wardle, McLeod and Radinovsky, 1974). Also record the number of infected and non-infected intestines for further study. Data was collected month wise and the Incidence, intensity and density of parasites calculated seasonally.

Incidence of Infection =B x 100/A
Intensity of Infection =C / B
Density =C / A
Index of Infection = B x $C/(A)^2$

Where, A stands for number of host examined, B stands for number of host infected and C stands for number of parasites collected.

RESULTS AND DISCUSSION

Helminthes parasite infection is the common problem of goats all over the world. The study is related to only statistical application and population study of cestodes parasites. The collection of the cestodes was carried out from the host *Capra hircus* at different places of Dhule region during study period i.e. June 2013 to May 2014.

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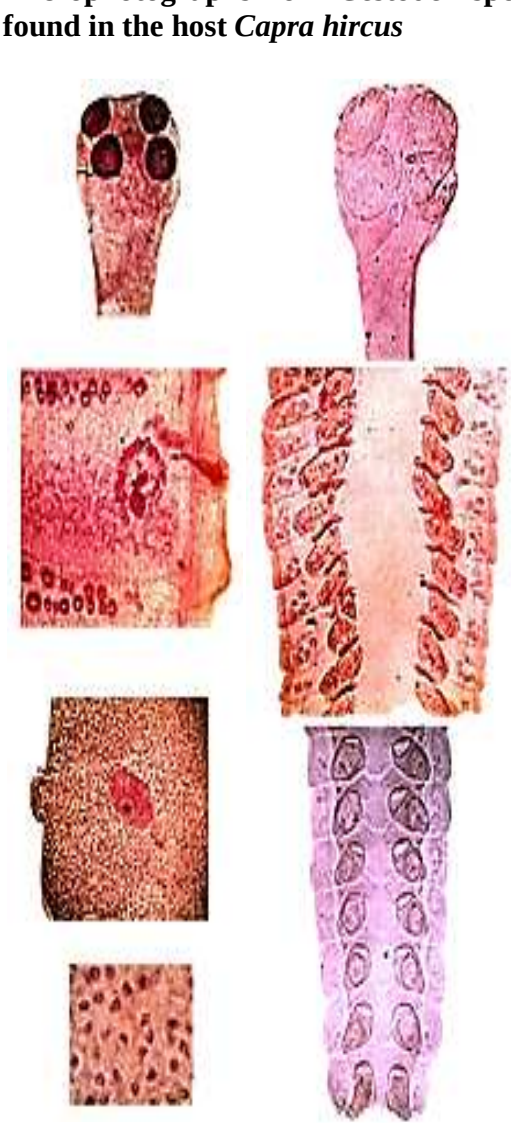
After closer observation the collected cestodes were found belongs to the genus, *Moniezia* (Blanchard l891), *Aliezia* (Shinde1967), and *Stilesia* (Railliet 1896).

Microphotographs of Cestode species found in the host *Capra hircus*



Moniezia sp. ***Aliezia sp.***

Avitellina sp. ***Stilesia sp.***

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Table: 1 - Recorded data of cestode species from June 2013 to May 2014

S. No	Month & Year	No. of Intestine examined	No. of infected Intestine	No. of Cestode collected	No. of *Moniezia* found	No. of *Aliezia* found	No. of *Avitellina* found	No. of *Stilesia* found
1	June 13	31	08	25	08	07	00	10
2	July 13	25	10	100	15	45	00	40
3	Aug. 13	18	07	75	20	30	01	24
4	Sept. 13	15	06	50	18	13	00	19
5	Oct. 13	16	08	70	14	24	02	30
6	Nov. 13	20	12	120	15	27	03	75
7	Dec. 13	21	13	80	13	23	04	40
8	Jan. 14	30	14	155	30	40	05	80
9	Feb. 14	15	04	24	04	08	01	11
10	Mar.14	25	07	60	10	20	01	29
11	Apr. 14	20	06	40	10	14	01	15
12	May 14	18	06	30	11	09	00	10
	Total	254	101	829	168	260	18	383

From the recorded data it shows that, out of 254 no. of intestine examined about 101(39.76%) intestine are infected with 829 cestode parasites. The overall infection with *Moniezia* was 168 (20.27%)), *Aliezia* 260 (31.36%), *Avitellina* 18 (2.17%) and *Stilesia* 383 (46.20%).

Table 2: Incidence, Intensity, Density and Index of infection in cestode parasites during June 2013 to May 2014

S. No.	Month & Year	No. of Intestine examined 'A'	No. of infected Intestine 'B'	No. of Cestode Collected 'C'	Incidence of Infection (%)	Intensity of Infection (%)	Density of Infection (%)	Index of Infection
1	June 2013 to May 2014	254	101	829	39.76	11.58	3.26	1.30

Beside this, the study also throws light on the incidence, intensity and density of infection in cestodes of *Capra hircus*as- The incidence of infection was 39.76 %, intensity of infectionwas 11.58 % and density of infection was 3.26% observed.

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Table 3: Seasonal variation of Incidence, Intensity, Density and Index of cestode infection during June 2013 to May 2014

S. No	Genus	No. of Intestine examine **'A'**	No. of infected Intestine' **B'**	No. of Cestode collected **'C'**	Incidence of Infection (%)	Intensity of Infection (%)	Density of Infection (%)	Index of Infection
1	*Moniezia*	254	101	168	39.76	1.66	0.66	0.26
2	*Aliezia*	254	101	260	39.76	2.57	1.02	0.41
3	*Avitellina*	254	101	18	39.76	0.18	0.07	0.03
4	*Stilesia*	254	101	383	39.76	3.79	1.51	0.60

The seasonal variation of cestode parasite infection for three seasons i.e., monsoon, winter and summer shows that, the higher incidence, intensity, density and index of infection occurs during the winter season followed by monsoon and summer season respectively.The seasonal variation of parasite population dynamics has been described in a number of studies in Africa (Assoku 1981). The rapid translation of eggs occurs throughout most of the rainy season and grazing animals acquires the highest infection during this time and parasites come at maturity in winter season. The seasonal fluctuation in number and availability of the infective larval stages are also influenced by level of contamination.

Table 4: -Table showing Incidence, Intensity, Density& Index of infection in different cestode genus during June 2013 to May 2014

Sr. No	Season	No. of Intestine examine 'A'	No. of infected Intestine' B'	No. of Cestode collected 'C'	Incidence of Infection (%)	Intensity of Infection (%)	Density of Infection (%)	Index of Infection
1	Monsoon	89	31	250	34.83	8.06	2.80	0.97
2	Winter	87	47	425	54.02	9.04	4.88	2.64
3	Summer	78	23	154	29.48	6.69	1.97	0.58

From the recorded data it shows that, the incidence, intensity, density and index of infection in genus *Stilesia*was highest followed by both *Aliezia and Moniezia* and very low in *Avitellina* respectively.

Conclusion: After the analysis of data, it can be concludedthat the high infection of cestodes was occurred in winterseasons followed by monsoon and slightly low in summer.The rapid translation of eggs occurs throughout most of the rainy season and grazing animals acquires the highest infection during this time and parasite comes at maturity in winter season. The seasonal fluctuation in number and availability of the infective larval stages are also influenced by level of contamination. It is due to favorable condition for growth, availability of

intermediate host i.e. Oribatid mite, dense vegetation and feeding habit of host *Capra hircus*. This type of results indicates that environmentalfactors influencing the seasonality of parasitic infection either directly or indirectly.

Keeping in view the above results some control measure for gastrointestinal parasites can be undertaken to reduce the intensity of the parasitic infection. In this regard it is suggested that practice of separating grazing of animals with low stocking rate may be adopted. Furthermore, during the rainy season climatic factors like temperature and humidity are favorable for the development and survival of pre-parasitic stages of cestodes. It is therefore suggested that anthelmintic treatment on quarterly basis may be implemented to reduce the risk of reinfection.

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