



Status of Diversity of Cestode Parasites of Domestic Fowl (*Gallus Gallus Domesticus*) from Nanded District, Maharashtra State

KEYWORDS

Diversity, Gastrointestinal parasites; Nanded District, Prevalence.

Dhanraj Balbhim Bhure

Assistant Professor, Research and PG Department of Zoology, Yeshwant Mahavidyalya, Nanded-431602 M.S.India.

Sanjay Shamrao Nanware

Assistant Professor, Research and PG Department of Zoology, Yeshwant Mahavidyalya, Nanded-431602 M.S.India.

Namrata V. Sunnap

Research and PG Department of Zoology, Yeshwant Mahavidyalya, Nanded-431602 M.S.India

ABSTRACT

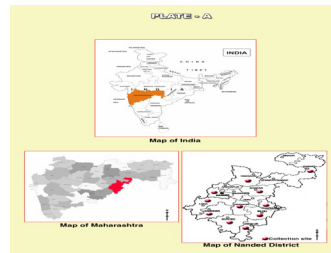
A study was conducted to investigate prevalence and diversity of cestode parasite of *Gallus gallus domesticus* in and around Nanded district, M.S.India during March, 2012 to August, 2013. Five genera viz. *Cotugnia*, *Daivenia*, *Railletina*, *Vallipora* and *Mogheia* belonging to Class Cestoda were recorded during this investigation from different localities of Nanded District. The high prevalence were recorded during Summer seasons followed by winter seasons where as low prevalence were reported during Monsoon Seasons. The high prevalence were reported due to infection of cestode parasite, *Cotugnia* sp. as compared to other cestode infection. The prevalence of gastrointestinal parasites of *Gallus gallus domesticus*, the genera of helminth parasites, species and the severity of infection also vary considerably depending on local environmental conditions such as humidity, temperature, rainfall, vegetation and management practices.

Introduction

Parasitism is a natural way of life, among the large number of organism and parasitic diseases are the major public health problem, which results into morbidity and mortality in tropical countries, particularly in the socioeconomically under developed societies in the world.

Livestock animals like domestic fowl, *Gallus gallus domesticus* have a great Socio-economic importance than other animals domesticated by humans. It is an important item of human food as well as the source of income due to the production of meat, fiber and other substances. Farmers of Marathwada Region used fertilizer which is formed from domestic fowl in their fields to increase soil fertility. But these domestic fowl are infected with helminth infection which is responsible for mortality and economic losses in a number of instances. Humans get automatically infected at the time of eating the infected and uncooked flesh of chicken. The parasitic diseases occur due to the infection of cestode parasites such as *Cotugnia* Sp., *Railletina* Sp., *Davenia* Sp., *Vallipora* Sp.etc.

The identification of parasite is the first step of controlling the parasitic infection of *Gallus gallus domesticus*. In the present project PI analyzed the diversity of tapeworm of *Gallus gallus domesticus* from different localities of Nanded District (M.S.), India. The study is helpful to newcomers to learn the fundamentals of diagnostic procedures and how to use a microscope to identify parasites by using new designed protocols.



Materials and Methods

Study area- The study was conducted from different collection sites of Nanded district. It is situated in the south eastern part of Maharashtra state. The Nanded district lies between 18.15 to 19.55 North latitudes and 97.07 to 98.15 East longitude. It covers an area of 10,528 sq. km.

In the present study, a survey on cestodes was conducted on 74 intestines of chickens, examined for cestode parasites during the period of February, 2012 to January, 2013 from different localities of Nanded District, Maharashtra State India. The intestines of freshly slaughtered chickens were collected to the laboratory and examined for cestode infection. Cestode parasites were collected, preserved in hot 4% formalin, washed with saline and water, dehydrated in various alcoholic grades, stained with Harris haematoxylin and Borax carmine, cleared in xylene, mounted in D.P.X. and drawings are made with the aid of camera lucida.

Table1- Diversity and Distribution pattern of avian tapeworms from Nanded District Maharashtra

S.N.	Name of species	Name of host	Habitat of Parasite	Locality
	<i>Cotugnia digonopora</i> (Pasquale, 1890), Diamare, 1893.	<i>Gallus gallus domesticus</i>	Intestine	Nanded, Loha, Kandhar, Mahur
	<i>Cotugnia bahli</i> , Johri, 1934	<i>Gallus gallus domesticus</i>	Intestine	Nanded, Mudkhed, Bokar
	<i>Cotugnia aurangabadensis</i> , Shinde, 1969	<i>Gallus gallus domesticus</i>	Intestine	Ardhapur, Nanded
	<i>Cotugnia yamagutii</i> , Shinde, 1985	<i>Gallus gallus domesticus</i>	Intestine	Degloor, Kandhar
	<i>Cotugnia alii</i> , Shinde et.al., 2002	<i>Gallus gallus domesticus</i>	Intestine	Biloli, Bhokar, Nanded

	<i>Cotugnia hafezzi</i> Nanware et. al., 2010	<i>Gallus gallus domesticus</i>	Intestine	Nanded, Loha, Mahur
	<i>Cotugnia indiana</i> Kasar et. al., 2010	<i>Gallus gallus domesticus</i>	Intestine	Degloor, Nanded
	<i>Cotugnia orientalis</i> Nanware et. al., 2011	<i>Gallus gallus domesticus</i>	Intestine	Bhokar, Umri, Naigaon
	<i>Cotugnia tetragona</i> Nanware et. al., 2011	<i>Gallus gallus domesticus</i>	Intestine	Mukhed, Degloor
	<i>Cotugnia diamarei</i> Nanware and Bhure, 2012	<i>Gallus gallus domesticus</i>	Intestine	Nanded, Mahur
	<i>Davainea indica</i> , Shinde, 1972	<i>Gallus gallus domesticus</i>	Intestine	Kinwat, Mahur
	<i>Davainea shindei</i> Jadhav et.al., 2008	<i>Gallus gallus domesticus</i>	Intestine	Nanded
	<i>Davainea ibisae</i> Kalyankar and Nanware, 2010	<i>Gallus gallus domesticus</i>	Intestine	Nanded, Mahur, Kinwat
	<i>Davainea gunjotensis</i> Pathan, 2010	<i>Gallus gallus domesticus</i>	Intestine	Nanded
	<i>Davainea yamagutii</i> Dhondge et.al., 2011	<i>Gallus gallus domesticus</i>	Intestine	Bhokar
	<i>Raillietina (R.) friedbergeri</i> Linstow, 1877	<i>Gallus gallus domesticus</i>	Intestine	Kandhar, Degloor
	<i>Raillietina (R.) tetragona</i> Fuhrmann, 1920	<i>Gallus gallus domesticus</i>	Intestine	Kinwat, Mahur, Himayatnagar
	<i>Raillietina (R.) microscolecina</i> (Fuhrmann, 1908) Nanware et.al., 2010	<i>Gallus gallus domesticus</i>	Intestine	Nanded
	<i>Raillietina (R.) rostellata</i> Nanware et.al., 2012	<i>Gallus gallus domesticus</i>	Intestine	Degloor, Nanded
	<i>Raillietina (R.) domestica</i> Bhure and Nanware, 2012	<i>Gallus gallus domesticus</i>	Intestine	Bhokar, Umri
	<i>Valipora mutabilis</i> , Linton, 1927	<i>Gallus gallus domesticus</i>	Intestine	Degloor, Nanded
	<i>Valipora marathwadensis</i> Sonune and Shinde, 1990	<i>Gallus gallus domesticus</i>	Intestine	Kinwat, Mahur, Himayatnagar
	<i>Valipora macrorostatum</i> Dhondge et. al., 2011	<i>Gallus gallus domesticus</i>	Intestine	Kandhar, Degloor
	<i>Valipora singhii</i> Kasar et.al., 2012	<i>Gallus gallus domesticus</i>	Intestine	Ardhapur, Nanded
	<i>Mogheia guptai</i> , Gupta and Parmar, 1988	<i>Gallus gallus domesticus</i>	Intestine	Nanded, Kinwat, Mahur, Himayatnagar.
	<i>Mogheia hydrabadensis</i> , Jadhav et.al., 1994	<i>Gallus gallus domesticus</i>	Intestine	Loha, Kandhar, Degloor
	<i>Mogheia passerae</i> V.B. Garad and Sanjay S. Nanware, 2006	<i>Gallus gallus domesticus</i>	Intestine	Kinwat, Bhokar
	<i>Mogheia ausae</i> Gore et.al., 2008	<i>Gallus gallus domesticus</i>	Intestine	Kinwat, Mahur, Himayatnagar

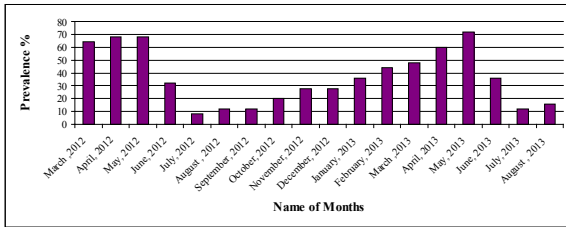
Diversity of avian tapeworms includes 28 species of five genera. twelve species of genus *Cotugnia*, five species of *Davainea*, five species of *Raillietina*, four species of genus *Valipora* and four species of *Mogheia* were reported from *Gallus gallus domesticus*.

Table 2. Prevalence of Cestode parasites of from *Gallus gallus domesticus* during the year March, 2010 to February, 2011.

Sr. No	Month & Year	No. of dissected hosts	No. of infected hosts	Prevalence %	No. of cestode parasites collected
1	March ,2012	25	16	64.00	23
2	April, 2012	25	17	68.00	25
3	May, 2012	25	17	68.00	28
4	June, 2012	25	08	32.00	12
5	July, 2012	25	02	08.00	04
6	August , 2012	25	03	12.00	06
7	September, 2012	25	03	12.00	07

8	October, 2012	25	05	20.00	10
9	November, 2012	25	07	28.00	13
10	December, 2012	25	07	28.00	15
11	January, 2013	25	09	36.00	15
12	February, 2013	25	11	44.00	18
13	March ,2013	25	12	48.00	19
14	April, 2013	25	15	60.00	21
15	May, 2013	25	18	72.00	23
16	June, 2013	25	09	36.00	13
17	July, 2013	25	03	12.00	05
18	August , 2013	25	04	16.00	07
	TOTAL	450	166	36.88	264

Graph 1. Prevalence of Cestode parasites of *Gallus gallus domesticus* from Nanded District Maharashtra State, India during March, 2010 to February, 2011.



Discussion

The twenty eight species of cestode parasites of avian host *Gallus gallus domesticus* from different localities of Nanded District M.S. India includes 05 genera. All these species are differs from each other in general topography of organs.

The high prevalence were recorded during Summer seasons followed by winter seasons where as low prevalence were reported during Monsoon Seasons of Nanded districts. The development of hosts as well as parasites should be needed high temperature and sufficient moisture. According the Kennedy (1976) the temp, humidity and rainfall, feeding habits of host, availability of infective host and parasite maturation. Such factors are responsible for influencing the parasitic infections. It is more in warm seas than in cold ones. Jadhav and Bhure,2006 explained the development of parasites should be needed high temperature, low rainfall and sufficient moisture. Hence the high prevalence occurs in summer followed by other season. Feeding activity of the host also be one of the reasons for the seasonal fluctuation of infections (Pennuyuick1973). These findings were similar to results obtained by Bhure et. al.,2010 studied the population ecology of *Rhabdochona* Ralliet, 1916 (Nematoda-Rhabdochoniidae) from *Labeo rohita* (Ham. and Buch.) his result indicate that the high incidence of infection (51.78%), intensity of infection (1.18%) and density of infection (0.613%) of *Rhabdochona* sp. occur in summer season followed by winter season and rainy season.

The examined domestic fowls during this study showed clinical signs in the form of dullness, emaciation, weakness, reduced growth, uneven body weights, reduction in voluntary food intake, loss of productivity, diarrhoea and decreased egg production. Meanwhile, the postmortem examination revealed gross lesions in the form of emaciation, chronic catarrhal enteritis, hemorrhagic enteritis, nodular enteritis, and mucoid diarrhea. These findings were similar to results obtained by (Levine, 1938), (Botero and Reid, 1969), (Nadakil and Nair, 1979), and (Calneck et al., 1997). Considerable work has been done on the cestode parasites of chicken in other part of world as well as other part of country except Nanded Region. Result of the present study, therefore, are

expected to be helpful for future research on the cestode parasites of domestic fowl in this area. Nair and Nadakil,1981 explained the chicken infected with cestode parasites shows retarded growth, decreased egg production, reduced weight gain, significant haemoglobin depression. Kurkure et.al., 1998 observed villous atrophy, catarrhal enteritis, granuloma formation in duodenum, desquamation of villi and sub mucosal gland congestion, inflammatory reaction vacuolation of epithelial villi. Avian cestodiasis constitutes one of the most common endoparasitism causing serious troubles in chicken production. Chicken cestodiasis not only cause loss of body weight of the raised chickens but also may cause several problems in affected flocks such as enteritis, loss of blood, loss of production, nervous manifestations and death (Calneck et al., 1997). Also, cestodes specially *Davainea* spp. penetrate deeply into an intestinal mucosa and produce marked enteritis which is frequently hemorrhagic in heavy infestation (Soulsby, 1982).

The examined domestic fowl infected with cestode parasites during this study showed clinical signs in the form of dullness, emaciation, weakness, reduced growth, uneven body weights, reduction in voluntary food intake, loss of productivity, diarrhoea and decreased egg production

Conclusion

Parasitic infections are a major constraint on livestock production in our country and still parasitism is one of the major health problems confronting the poultry industry. The study clearly suggests that, *Gallus gallus domesticus* are susceptible to intestinal helminths in Summer, winter and rainy seasons and most of the parasites recovered are associated with the production of variable degree of pathological lesions. Gastro-intestinal parasitic infection is the major cause of stunted growth of *Gallus gallus domesticus* and may lead to death which in term results heavy economic loss. That is why animals should be dewormed at regular interval with an appropriate anthelmintic. Management system and overall hygiene conditions should be improved for better growth of domestic fowl and to improve overall hygiene conditions should be improved for better growth of domestic fowl and to improve overall production performances.

This study will add more to our knowledge about the avian tapeworms from Nanded. The PI has tried his level best to represent the Biosystematics, diversity, and incidence of avian cestodes and made a detailed survey of cestode parasites *Gallus gallus domesticus* from Nanded, (M.S.) India.

Acknowledgements

DBB is indebted to S.R.T.M.University, Nanded for sanctioning the Research Project No. APDS/Uni MRP-III/2011-12/3039 Dated March 09/11, 2012 for financial assistance. The authors are indebted to Dr. N.V.Kalyankar, Principal, Yeshwant Mahavidyalaya Nanded for their kind help, inspiration and providing necessary laboratory facilities.

REFERENCE

- Chandrashekhar Rameshwar Kasar, Dhanraj Balbhim Bhure, Sanjay Shamrao Nanware and M.B. Sonune 2010: Taxonomic observation of *Cotugnia indiana* Sp. Nov. (cestoda: Davaineidae, Fuhrmann 1907) from *Columba livia*. The Asian Journal of Animal Science. Vol. 5(2) pp 193-198. | C. R. Kasar, D. B. Bhure and S. S. Nanware 2012: Morpho-taxonomic observation on new cestode of the Genus *Valipora* Linton, 1927 (Dilepididae-Wardle, Mcleod and Radinovsky, 1974) from *Columba livia* Life Science Bulletin, Vol. 9(1) :73-75. | Diamare V. 1893: Note sur cestodi. Bull, Soc, Nature, Nepoli, 7: 9-13. | D.B. Bhure, S.S.Nanware, R.M.Dhondge and S.P.Kardile 2010: Diversity of helminth parasites of freshwater fishes from Maharashtra State. The Ecosphere (An International Biannual Journal of Environment and Biological Sciences). Vol.1(1) pp-97-99. | Dhanraj Balbhim Bhure and Sanjay Shamrao Nanware 2013: Biosystematic studies on *Raillietina* (R.) *domestica* (Davaineidae Fuhrmann, 1908) from *Gallus gallus domesticus*. Asian Journal of Bio Science. Vol.8(1) pp 86-90. | Fuhrmann, O. 1920: Consideration generates surlas *Davainea Restschrigt fur. Zschokke Bale* 1920: 19 pp. | Gore Ghansham, Nanware Sanjay and Jadhav B.V., 2008: Studies on Anoplocephalidean cestode genus *Mogheia* (Lopez-Neyra, 1944) from *Milvus migrans* with description of a new species. Uttar Pradesh J. Zool., 28 (1): 125-127. | Gupta V. and Parmar S. 1988: Cestode parasites of vertebrates IV. *Mogheia gupti* sp. nov. From a bird *Argya caudata* (Dument) from Lucknow India Ind. J. of Hel. 35(2) 155-158 | Herlich, H., 1978: The importance of helminth infections in ruminants. Wld. Anim. Rev., 26: 22-26. | Jadhav Baba and Nanware Sanjay 1994: A new tapeworm *Mogheia*, Lopez-nera, 1944 from *Passer domesticus* from Hyderabad (A.P) India. Indian Journal of Parasitology 17(1) pp 53-55. | Jadhav B.V., Shivesh Pratap Singh, D.B. Bhure and N.D. Padwal. 2008: Biosystematic studies on *Davainea shindei* N.sp. from *Gallus domesticus*. Nat. Acd. Sci. Letter.Vol.31 No-7& 8: 119-122. | Johri, L.N. 1934: Report on a collection of cestodes from Lucknow. Rect. Ind. Mus. 36: 135-177. | Kennedy, C.R. 1971: The effect of temperature on the establishment and survival of the cestode *Caryophyllaeus laticeps* in orfe, *Leuciscus idus* Parasitol., 63: pp. 59-66. | Kennedy, C. R. 1976: Ecological aspects of parasitology. North Holland publishing company Amsterdam 10x ford. | Linstow, O.F.B. 1877: *Enthelminthologica*. Arch. Naturg. 43, 173-197. | R.M.Dhondge, S.S.Nanware and D.B.Bhure 2011: Systematic Studies on the genus *Davainea* from *Columba livia* with description of a new species. Flora and Fauna An International Research Journal of Biological Sciences. Vol. 17 (1) pp 109-1148 | Ramesh Mohanrao Dhondge, Sanjay Shamrao Nanware and Dhanraj Balbhim Bhure 2012: Studies on the cestode genus *Mogheia* Lopez-Neyra in 1944 (Cestoda: Thysanosomidae) from *Passer domesticus* The Asian Journal of Animal Science Vol. 7(2) pp 145-150. | Sanjay Shamrao Nanware, Ramesh Mohanrao Dhondge and Dhanraj Balbhim Bhure 2010: *Cotugnia hafeezi* Sp. Nov. (Cestoda: Davaineidae, Fuhrmann 1907) from *Gallus gallus domesticus*. The Ecosphere Vol. 1, No.1, 2010 pp.118-124 | Sanjay Shamrao Nanware, Ramesh Mohanrao Dhondge and Dhanraj Balbhim Bhure 2010. Taxonomic observation of avian tapeworm *Raillietina* (R) *microscolecina* Fuhrmann, 1908. The Ecosphere 1(1):127-129. | Sanjay Shamrao Nanware, R. M. Dhondge and Dhanraj Balbhim Bhure 2010: Taxonomic studies on Dilepididae cestode genus *Valipora* Linton, 1927 (Dilepididae -Wardle, Mcleod and Radinovsky, 1974) From *Columba livia*. The Asian Journal of Animal Science. Vol. 5(2) pp 135-138. | Sanjay Shamrao Nanware, Ramesh Mohanrao Dhondge and Dhanraj Balbhim Bhure 2010: Taxonomic observation of avian tapeworm *Raillietina* (R) *microscolecina* Fuhrmann, 1908. The Ecosphere (An International Biannual Journal of Environment and Biological Sciences). Vol.1(1) pp-127-129. | S.S. Nanware, R.M.Dhondge and D.B. Bhure 2011: Biosystematic studies on *Cotugnia tetragona* Sp.Nov. (Cestoda: Davaineidae) from *Columba livia*. Recent Research in Science and Technology. Vol. 3(9) pp. 8-12. | Sanjay Shamrao Nanware, Ramesh Mohanrao Dhondge and Dhanraj Balbhim Bhure 2011: Biosystematic studies on *Cotugnia orientalis* sp. Nov. (cestoda: Davaineidae, Fuhrmann 1907) from *Gallus gallus domesticus*. The Bioscan An International Quarterly Journal of Life Science. Vol. 6(1): 71-75. | S.S.Nanware, S.M.Shinde and D.B.Bhure 2012: Studies on a new avian tapeworm *Raillietina* (R) *rostellata* Sp.Nov. (Cestoda: Davaineidae) from *Gallus gallus domesticus* Journal of Environment and Sociobiology Vol. 9(2) 151-156. | Sanjay Shamrao Nanware and Dhanraj Balbhim Bhure 2013: Studies on avian cestode genus *Cotugnia* Diamare, 1893 (Cestoda: Davaineidae Fuhrmann, 1907) from *Gallus gallus domesticus*. Asian Journal of Bio Science. Vol.8(1) pp 120-128. | S.M.Shinde, S.S.Nanware and D.B.Bhure 2012: Morpho-Taxonomy of avian tapeworm *Cotugnia domestica* Sp.Nov. (Cestoda: Davaineidae) from *Gallus gallus domesticus* Journal of Environment and Sociobiology Vol. 9(2) 141-150. | Shinde G.B. 1969: A known and two new species of the genus *Cotugnia*, Diamare, 1893, from the Columbiformes birds in Maharashtra, India. Riv. Di. Parasit. Vol.30 (1): 39-44 (Italian Summary 43-44). | Shinde, G.B. 1972: A species of cestode *Davainea indica* (Davainea) from fowl *Gallus domesticus* in India. Ibid, 8 (1): 85-87. | Shinde, G.B., Jadhav, B.V. and Kadam, S.S. 1985. Some avian cestodes from Maharashtra region. Riv. Di Prasiat, Vol. II (XLVI) April 1985, PP. 141-152. | Shinde, G.B., Pawar, S.B. and Garad, V.B. 2002. A new cestode *Cotugnia allii* n.sp. (Eucestoda: Davaineidae) from *Columba livia* at Yermala M.S. India. Uttar Pradesh J. of Zool. 22 (1), 105-107. | Soulsby, E.J.L. 1982: Helminths, Athropods and Protozoa of Domesticated Animals. 7th Edition. 809 pp. Baillière Tindall, London, UK. | Sonune, M.B. and Shinde, G.B., 1990: Two new species of *Valipora* (Cestoda: Dilepididae) from Aurangabad, Indian J. Helminth 42(1) pp 9-12. |