International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2017): 7.296

Studies on Prevalence of *Toxocara vitulorum* Infection in Calves

Gunajit Das[1], Arabinda Phukan[2]

Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary Science Assam Agricultural University Khanapara, Guwahati-781022

Abstract: ***The present study was conducted on some aspects of prevalence of Toxocara vitulorum infection in calves in different localities in and around Guwahati during the period from January 2013 to December 2013 with the objectives to study the prevalence of Toxocara vitulorum infection in calves. A total of 1120 faecal samples collected from cattle calves were examined for detection of Toxocara vitulorum eggs by using floatation method, from different localities in and around Guwahati. The overall prevalence of Toxocara vitulorum was found to be 26.16 percent. The season-wise prevalence Toxocara vitulorum infection was found to be highest (33.71%) in monsoon season and lowest (15.25%) in pre-monsoon season. The sex-wise prevalence was higher (31.09%) in female calves than that of male (20.31%) calves. The age-wise prevalence was recorded highest (49.23%) in the age group of 0-30 days, followed by 31-60 days (39.38%), 61-90 days (29.82%), 91-120 days (18.85%), 121-150 days (12.93%), 151-180 days (9.23%) and above 180 days (2.33%) respectively. The breed-wise prevalence was higher (27.89%) in local calves than cross-bred (23.54%) calves.***

Keywords: Prevalence, *Toxocara vitulorum*, calves, floatation method

1. Introduction

A number of factors are responsible for the lower productivity of the animals, like poor management practices, lack of scientific husbandry, environmental factors, economic condition of the farmers etc. as majority of the farmers are poor and illiterate. Poor health coverage of the animals also plays an important role in lower productivity. Among different causes of lower production, infectious diseases cause a great loss in animal husbandry in our country. Unlike all other mammals, cattle are also susceptible to different infectious pathogens like bacteria, virus and parasites. Among different infectious diseases, parasitic diseases are very common in our country particularly in the north-eastern region because of the hot and humid climatic condition of the region. The north-eastern region especially Assam has a relative humidity of 80% and environmental temperature of 15-35^{0}C, which is highly conducive for multiplication and survival of different parasites [1]. More than 80% of diseases of this region are of parasitic origin. Among different endoparasitic infections Toxocariasis is a common problem in cattle mainly in the calves as it accounts for high morbidity and calf mortality. Toxocariasis in bovines is caused by the gastro-intestinal nematode *Toxocara vitulorum*, which mainly affects the younger calves, incidence being highest in calves below 3months of age [2].In epidemiological studies, information regarding the seasonal variation and pasture larval contamination in relation to climatic condition of the region is essential to ascertain the appropriate time for anthelmintic medication for control and prevention of the disease. For this proper diagnosis by screening is necessary. Diagnosis of Toxocariasis can be done primarily based on the history and clinical signs and confirmed by detecting the ova in faeces by using floatation method and evaluating the egg per gram (EPG) by using Stoll's dilution technique [3].Keeping in view all these facts, the present study was conducted to study the prevalence of *Toxocara vitulorum* infection in calves.

2. Materials and Methods

Studies on the prevalence of *Toxocara vitulorum* infection in calves were conducted for a period of one year i.e.; January 2013 to December 2013. Faecal samples were collected randomly from calves upto 6 months of age. Samples were collected from different localities in and around Guwahati.**Season:** Incidence of *Toxocara vitulorum* infection in various season were recorded and accordingly the entire period of study was divided into four seasons as per the data obtained from India Meteorological Centre, Borjhar, Guwahati, as follows:

Pre-monsoon : March, April & May.
Monsoon : June, July, August & September
Post-monsoon : October & November
Winter : December, January & February.

For study of age wise prevalence, calves up to 6 months of age were selected which belonged to different age groups i.e., 0-30 days, 31-60 days, 61-90 days, 91-120 days, 121-150 days, 151-180 days and above 180 days.Sex of the calves was recorded for the study of sex-wise prevalence of *Toxocara vitulorum* in calves.Faecal samples were collected from both local and cross-bred calves to find out the prevalence between breeds.

Collection of faecal samples: Faecal samples were collected directly from the rectum by backracking from individual animals and each sample were kept in separate sterile plastic containers and labeled properly. After collection of faeces from one animal and before collecting the next sample, hands were washed thoroughly to prevent cross contamination of helminthic eggs. After collection, samples were examined in the laboratory of Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Veterinary Parasitology and TVCC, C.V.Sc. AAU, Khanapara.

Examination of Faecal samples: Faecal samples were examined for the presence of *Toxocara vitulorum* eggs by

Licensed Under Creative Commons Attribution CC BY

floatation method as described by Soulsby [3]. Whenever eggs of *Toxocara vitulorum* were encountered, the corresponding faecal samples were recorded as positive.

Determination of eggs per gram of faeces (EPG): The numbers of eggs per gram of faeces (EPG) of all the positive samples were determined by Stoll's method [4].

In order to arrive at a meaningful conclusion, the data was analyzed by as per standard statistical procedures [5].

3. Results and discussion

Overall prevalence

A total of 1120 numbers of faecal samples of calves were examined for the presence of *Toxocara vitulorum* infection. Out of 1120 samples, 293 were found to be positive for *Toxocara vitulorum* infection, giving an overall prevalence of 26.16% (Table 1, Fig. 1). High incidence of *Toxocara vitulorum* infection in both cattle and buffalo calves also have been reported by Devi *et al.*, (34.14%) [5], Agnihotri and Katoch, (32.92%) [6], Kumari *et al.*, (38.33%) [7], Kumar *et al.*, (38.8%) [8], Raza *et al*, (37.50%) [9] and Islam *et al.*, (64.50%) [10] from different parts of India and abroad. The variation in the prevalence rate of the *Toxocara vitulorum* infection may be associated with different factors like different geo-climatic conditions, poor hygienic condition of the shed, health care management and sample variation.

Table 1: Overall Prevalence of Toxocara vitulorum infection in calves

Total no. of samples	Positive	Prevalence (%)
1120	293	26.16

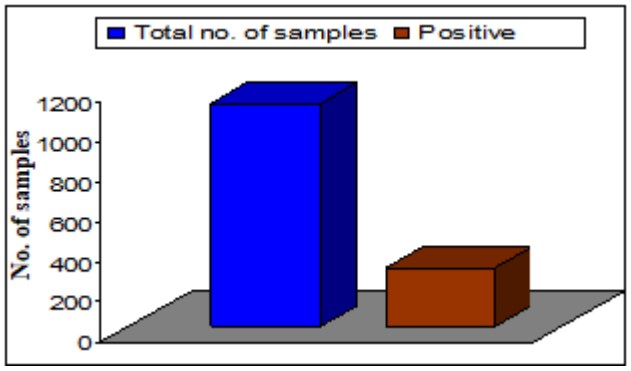


Figure 2: Overall Prevalence of Toxocaravitulorum infection in calves

Season-wise prevalence

A total of 282, 356, 192 and 290 samples were examined during Pre-monsoon, Monsoon, Post-monsoon and winter respectively and their corresponding percentage of infection were 43(15.25%), 120(33.71%), 52(27.08%) and 78(26.90%) respectively (Table 2, Fig 2). Prevalence of *Toxocara vitulorum* infection was found to be highest during Monsoon season (33.71%) followed by Post-monsoon (27.08%), winter (26.90%) and pre-monsoon (15.25%). Similar findings were also recorded by Hafiz *et al.*[11]in buffalo calves, Devi *et al.*[6], Rajkhowa and Hazarika [1], Sahoo *et al.*[12], Kumari *et al.* [8]and Bhattacharyya and Ahmed [13] in cattle calves.

Higher rate of incidence in monsoon season may be due to higher rainfall and relative humidity that favours the maximum embryonation, development and dissemination of the exogenous stage of the parasite. High rainfall provides suitable molarity of salt present in the soil, which is an important factor for ecdysis [3].

Table 2: *Season-wise Prevalence of Toxocara vitulorum infection in calves*

Season	*Months*	*No. of Samples*	*Positive*	*Prevalence (%)*
Pre-Monsoon	March	88	14	15.91
	April	91	13	14.29
	May	103	16	15.53
Total		282	43	15.25
Monsoon	June	90	29	32.22
	July	94	33	35.11
	August	82	27	32.93
	September	90	31	34.44
Total		356	120	33.71
Post-monsoon	October	95	25	26.32
	November	97	27	27.84
Total		192	52	27.08
Winter	December	85	21	24.71
	January	90	24	26.67
	February	115	33	28.69
Total		290	78	26.90

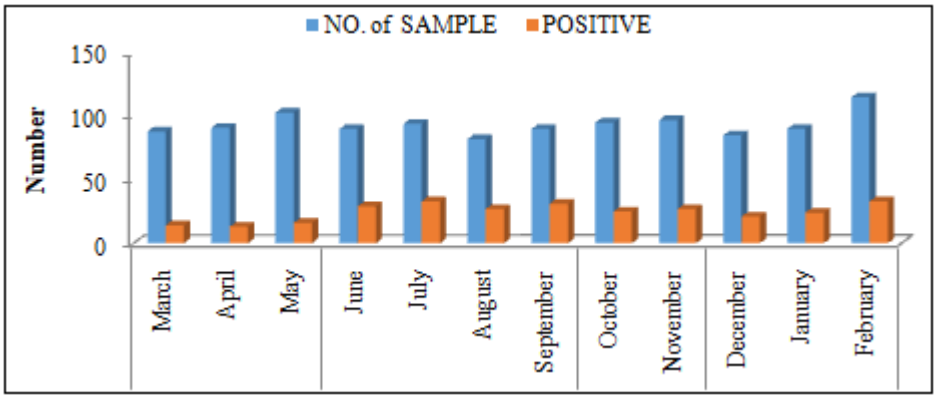


Figure 2: Season-wise Prevalence of Toxocara vitulorum infection in calves

Licensed Under Creative Commons Attribution CC BY

Sex-wise prevalence

Out of the total samples examined 512 numbers were from male and 608 were from female calves. Higher prevalence of *Toxocara vitulorum* infection was recorded in female calves (31.09%) than male calves (20.31%). Sex-wise prevalence is presented in Table 3 and Fig. 3. Similarly higher prevalence in female calves than male calves were reported by Devi *et al.*[6]and Raza *et al.*[10].But Srinivasa *et al.* [14]opined that sex of the calves had no significant influence on the incidence rate while Nasreen *et al.* [15]and Islam *et al.* [11]reported higher incidence in male calves than female calves. Though absolute reason for higher infection in females has not been well explained by previous workers, it is commonly believed that, since female calves are allowed to suckle frequently and more milk than that of male calves, they are more exposed to higher risk of infection through transmammary route. The reason for slightly more prevalence in female calves than male calves during the present study may also be attributed to the above fact and variation in the number of faecal samples examined.

Table 3: Sex-wise Prevalence of Toxocara vitulorum infection in calves

Sex	No. of Samples	Positive	Prevalence (%)
Male	512	104	20.31
Female	608	189	31.09
Total	1120	293	26.16

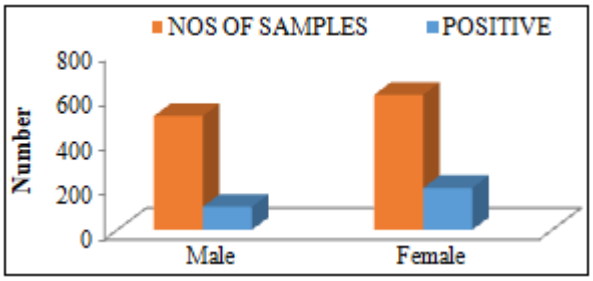


Figure 3: Sex-wise Prevalence of Toxocara vitulorum infection in calves

Age-wise prevalence

Age-wise prevalence of *Toxocara vitulorum* infection in different age group is presented in Table 4 and Fig. 4. Highest incidence was recorded in the age group of 0-30 days (49.23%) followed by 31-60, 61-90, 91-120, 121-150, 151-180 and above 180 days, the percentages being 39.38, 29.82, 18.85, 12.93, 9.23 and 2.33 respectively. The findings are comparable with the findings of Srinivasa *et al*. [14]. The cause for higher incidence of *Toxocara vitulorum* infection in the youngest age group in the present study may be due to pre-natal infection i.e.; there was transplacental infection at the later stage of pregnancy and transfer of 3rd stage larvae in colostrums and milk or due to post-natal infection due to poor managemental condition. The lower rate of incidence in older calves may be due to elimination of worm burden or due to immunity gained by the calves from repeated infection with the infective larvae through colostrums or milk [3].

Table 4: Age-wise Prevalence of Toxocara vitulorum infection in calves

Age Group (Days)	No. of Samples	Positive	Prevalence (%)
0-30	195	96	49.23
31-60	226	89	39.38
61-90	171	51	29.82
91-120	122	23	18.85
121-150	147	19	12.93
151-180	130	12	9.23
Above 180 Days	129	3	2.33
Total	1120	293	26.16

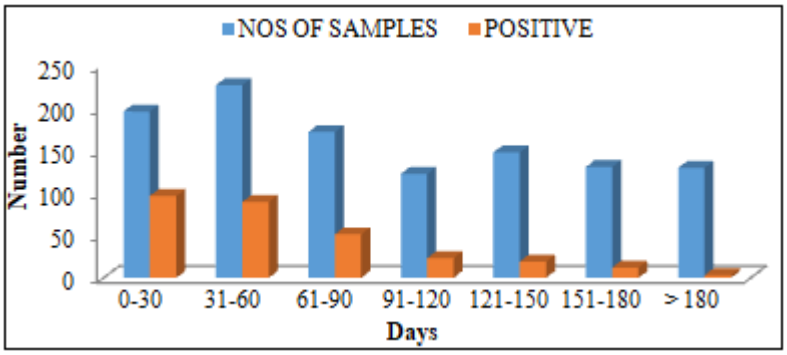


Figure 4: Sex-wise Prevalence of Toxocara vitulorum infection in calves

Breed-wise prevalence

Breed-wise prevalence of *Toxocara vitulorum* infection is presented in Table 5 and Fig 5. Prevalence of *Toxocara vitulorum* infection was found to be higher in local calves (27.89%) than cross-bred calves (23.54%). Though there are very scanty information on the breed susceptibility to *Toxocara vitulorum* infection, Sharma *et al.*[16]reported higher infection in indigenous calves than cross-bred calves while Rekwot *et al.* [3]and Srinivasa *et al.* [21] indicated that there was no breed susceptibility to *Toxocara vitulorum* infection. The higher prevalence recorded in local calves in the present study might be due to use of anthelmintics in cross-bred calves, geographical location, poor managemental practices in the village areas or due to variation in the number of faecal samples examined.

Licensed Under Creative Commons Attribution CC BY

Table 5: Sex-Wise Prevalence of Toxocara Vitulorum Infection in Calves

Breed	No. of Sample	Positive	Prevalence (%)
Cross-bred	446	105	23.54
Local	674	188	27.89
TOTAL	1120	293	26.16

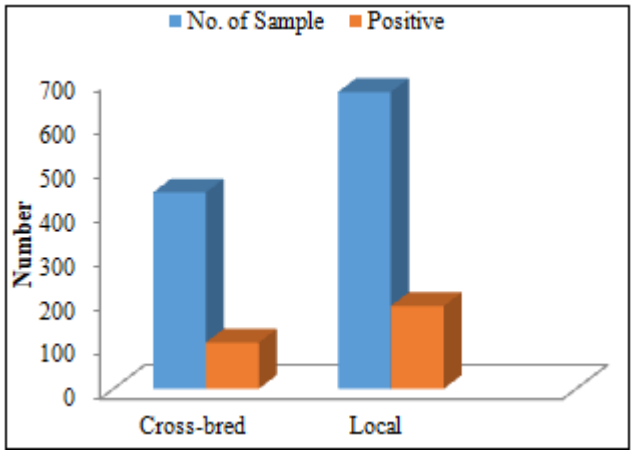


Figure 5: Sex-wise Prevalence of Toxocara vitulorum infection in calves

4. Conclusion

It is concluded that the overall prevalence of *Toxocara vitulorum* infection in Guwahati and nearby areas of Assam was found to be 26.16 percent.The season-wise prevalence was highest during monsoon season (33.71%) and lowest during pre-monsoon (15.25%) season.The age-wise prevalence of *T. vitulorum* infectionwas highest (49.23%) in the age group of 0-30 days and lowest (2.33%) in the age group above 180 days and sex-wise prevalence was found to be higher (31.09%) in female calves than male (20.31%) calves.

5. Acknowledgments

This study was funded by College of Veterinary Science, Khanapara, Assam Agricultural University, Jorhat, Assam. Authors are thankful to the staff of Teaching Veterinary Clinical Complex and Department of Veterinary Parasitology & Biochemistry at College of Veterinary Science, Khanapara, Assam Agricultural University, Jorhat, Assam aswell as animal-owners of different areas of Guwahati city for their valuable cooperation.

References

[1] Rajkhowa, S. and Hazarika, G.C. (2001) Prevalence of intestinal nematodes in female calves of greater Guwahati of Assam. *Indian Vet. J.* , 78: 449-451.
[2] Pradhan, K.B.; Thakur, D.K. and Sudhan, N.A. (1991) Incidence of gastrointestinal parasites in suckling calves in Ranchi. *Journal of Research,* Birsa Agricultural University. 3(1): 123.
[3] Soulsby, E.J.L. (1982) Helminthes, arthropods and protozoa of domesticated animals, 7th edition, ELBS and Bailliere Tindall, London.
[4] HMSO (1979) Manual of veterinary parasitological laboratory techniques. Ministry of Agriculture, Fisheries and Food, Reference Book 418. 3rd edition.
[5] Snedecor, C.S. and Cochran, W.G. (1994) Statistical methods, 8th Ed., The Iowa State University Press, Ames, Iowa, USA.
[6] Devi, H.U.; Ansari, M.Z.; Singh, S.K. and Devi, K.H.B. (2000) Prevalence and epidemiology of *Toxocara vitulorum* in cow and buffalo calves in and around Ranchi, Bihar. *Indian J. Anim. Sci.*,70(8): 817-819.
[7] Agnihotri, R.K. and Katoch, R. (2003) Prevalence of intestinal helminthic and coccidial infections in cow calves in Kangra valley of Himachal Pradesh. *Veterinary Practitioner*, 4(1): 13-15.
[8] Kumari, P.; Sinha, S.R.P.; Sinha, S.; Kumar, R.; Verma, S.B. and Mandal, K.G. (2004) Prevalence and control of *Toxocara vitulorum* in bovine calves. *Journal of Vet. Parasitol.*, 18(1): 47-49.
[9] Kumar, A. and Verma, S.P. (2006) Prevalence of gastrointestinal helminth infection in calves. *Indian J. Vet. Med.*, 26(1)43-44.
[10] Raza, M.A.; Murtaza, S.; Bachaya, H.A.; Qayyum, A. and Zaman, M.A. (2010) Point prevalence of *Toxocara vitulorum* in large ruminants slaughtered at Multan abattoir. *Pak. Vet. J.*, 30(4): 242-244.
[11] Islam, K.B.M.S.; Shil, N.K.; Islam, M.T. and Das, S.K. (2005) Incidence of ascariasis in calves reared under rural condition. *Bangladesh Journal of Veterinary Medicine*, 3(1): 21-23.
[12] Hafiz, A.; Rehman, A.; Hazarika, R.A.; Islam, S. and Bhattacharyya, D.K. (2009) Prevalence of gastrointestinal nematodiasis in swamp buffalo calves in an organized farm of Assam. *Indian J. Vet. Med*., 29(2): 119-120.
[13] Sahoo, N.; Mohanty, T.N. and Ray, T.K. (2003) Seasonal incidence of gastrointestinal helminthic infection in cattle of Phulbari district, Orissa. *Indian Vet. J.*, 80(7): 622-624.
[14] Bhattacharyya, D.K. and Ahmed, K. (2005) Prevalence of helminth infection in cattle and buffaloes. *Indian Vet. J.*, 82(7): 812.
[15] Srinivasa Rao, R.; Uday Kumar, M. and Ram Rao. (2000) Incidence of *Toxocara vitulorum* in buffalo calves around Hyderabad, India. *J. Vet. Parasitol.*, 14 (1): 79-80.
[16] Nasreen, A.; Mohammad, I.R.; Mirbahar, K.B. and Memon, M.I. (2000) Helminthiasis in buffaloes as influenced by age and sex. *Pakistan Veterinary Journal*, 20(3): 154-156.
[17] Sharma, K.; Roy, S.; Roy, M. and Sharma, M. (2005) Prevalence of bovine and bubaline toxocariasis in Chhattisgarh. *Intas Polivet.*, 6(2): 274-277.
[18] Rekwot, P.I. and Ogunsusi, R.A. (1985) Prevalence of *Toxocara (Neoascaris) vitulorum* infection in cattle around Zaria, Nigeria. *Journal of Animal Production Research*, 5(2): 201-207.

Licensed Under Creative Commons Attribution CC BY