Incidence of *Buxtonella sulcata* in bovines in R.S. Pura, Jammu

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Abstract Incidence of *Buxtonella sulcata* was recorded as 20.9 % in bovines ($n = 374$) of R.S. Pura, Jammu with cattle showing higher infection rate (23.6 %) than the buffaloes (18.5 %). The infection was significantly ($p < 0.0001$) higher in young animals (33.1 %) than the adults (13.9 %). Animals with diarrhoeic faeces had a significantly higher ($p < 0.0001$) infection rate (38.5 %) than the animals with normal faeces (9.9 %), suggesting the influence of protozoan on the incidence of diarrhoeal symptoms in bovines.

Keywords Buffaloes · *Buxtonella sulcata* · Cattle · Incidence · Jammu

Introduction

Various enteric protozoa (*Cryptosporidium*, *Eimeria* and *Giardia* spp.) are responsible for causing diarrhoea and even death in neonatal and young bovine calves (Soulsby 1982; Urquhart et al. 2003). In this regard, *Buxtonella sulcata* is considered as an opportunistic ciliate protozoan inhabiting colon of bovines (Levine 1985; Bhatia 2000). In neonates and immunocompromised calves it multiplies fast, become virulent and cause clinical disease, characterised by debilitating diarrhoea that sometimes become severe and life threatening in untreated

animals (Fox and Jacops 1984; Goz et al. 2006; Al-Zubaidi and Al-Mayah 2011). Although sporadic reports have appeared in literature from the Indian subcontinent (Mamatha and Placid 2006), it often misdiagnosed as *Balantidium coli*, a ciliate protozoan found in caecum and colon of pigs, humans and nonhuman primates (Al-Saffar 2010; Mohammad et al. 2011). The present study determined the prevalence of *B. sulcata* in bovines at R.S. Pura, Jammu, India.

Materials and methods

The faecal samples of cattle (174) and buffaloes (200) brought to the Division of Veterinary Parasitology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura during January 2012–April 2013 were examined for the presence of *B. sulcata* using direct smear and sedimentation techniques (Soulsby 1982). The faecal samples were divided into two groups viz. diarrhoeic and non-diarrhoeic. The data were recorded in two groups viz. young (below 1 year of age) and adults (above 1 year of age) and analysed using χ^2 test with a p value of less than <0.05 considered to be significant.

Results and discussion

The results of the study are presented in Tables 1 and 2. A total of 374 faecal samples of bovines were examined, out of which 20.9 % of animals were found to be infected with *B. sulcata*. The cattle had higher infection rate (23.6 %) than the buffaloes (18.5 %), however, the observations were statistically not significant ($p = 0.229$). The young

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Table 1 Influence of age on the prevalence of *B. sulcata* in bovines

Age	Cattle		Buffaloes	
	Examined	Infected (%)	Examined	Infected (%)
Young (below 1 year)	62	23 (37.1)	74	22 (29.7)
Adults (above 1 year)	112	18 (16.1)	126	15 (11.9)
Total	174	41 (23.6)	200	37 (18.5)

Table 2 Relationship of *B. sulcata* with faecal consistency in bovines

Consistency	Examined	Infected	% Of infection
Diarrhoeal faeces	143	55	38.5*
Normal faeces	231	23	9.9
Total	374	78	20.9

* Significantly different ($p < 0.0001$)

Fig. 1 Showing cysts of *B. sulcata* ($\times 10$)

animals showed significantly ($p < 0.0001$) higher infection rate (33.1 %) than the adults (13.9 %). No other parasitic infections were recorded in the examined bovine samples.

The animals with diarrhoea had a significantly higher ($p < 0.0001$) infection rate (38.5 %) than the animals with normal faeces (9.9 %). Although the role of *B. sulcata* in the origin of diarrhoea has not been studied yet, the results of the study clearly indicate the influence of protozoan on the incidence of diarrhoeal symptoms in bovines. Earlier, (Tomczuk et al. 2005) reported that when the intensity of *B. sulcata* exceeds 500 cyst per gram of faeces, the frequency of diarrhoea incidence decidedly increases, reaching 100 % of cases at the intensity exceeding 2000 cysts in 1 g of faeces. The ability of this parasite to cause diarrhoea is not

related to the invasiveness of the trophozoite in the intestinal mucosa rather the metabolic products which result from rapid multiplication of the parasite (Tomczuk et al. 2005).

B. sulcata is considered as a commensal of intestinal tract of ruminants and helps in the digestion of plant materials and therefore, it is common to find higher rate of infection with *B. sulcata* in bovines (Hong and Youn 1995; Al-Zubaidi and Al-Mayah 2011). Morphologically, *B. sulcata* is similar to *B. coli* of pig and man. The cysts of *B. sulcata* were oval or round in shape, yellowish-green in color and measured 54.8–96.2 μm in diameter with a mean of $67.3 \pm 11.1 \mu\text{m}$ (Fig. 1). These cysts were surrounded by a double layered capsule, showing macronucleus and contractile vacuoles. In conclusion, more detailed studies are required to assess the losses caused by *B. sulcata* in bovines and to sustain the optimal growth and productivity of bovines in the region.

References

- Al-Saffar TM, Suliman EG, Al-Bakri HS (2010) Prevalence of intestinal ciliates *Buxtonella sulcata* in cattle in Mosul. Iraqi J Vet Sci 24:27–30
- Al-Zubaidi MT, Al-Mayah KS (2011) Prevalence of *Buxtonella sulcata* in neonatal and young calves in Al-Nasir station and some regions in Baghdad (Al-Shuala and Gazaliya). Iraqi J Sci 52(4):420–424
- Al-Zubaidi MT, Al-Zubaidi KS (2011) Prevalence of *Buxtonella sulcata* in neonatal and young calves in Al-Nasir station and some regions in Baghdad (Al-Shuala and Gazaliya). Iraqi J Sci 52:420–424
- Bhatia BB (2000) Textbook of veterinary protozoology, 1st edn. Indian Council of Agricultural Research, Pusa, pp 336–337
- Fox MT, Jacobs DE (1984) Patterns of infection with *Buxtonella sulcata* in British cattle. Res Vet Sci 41:135–138
- Goz Y, Altug N, Yuksek N, Ozkan C (2006) Parasite detected in neonatal and young calves with diarrhea. Bull Vet Inst Pulawy 5:345–348
- Hong KO, Youn HJ (1995) Incidence of *Buxtonella sulcata* from cattle in Kyonggi-do. Korean J Parasitol 33:135–138
- Levine ND (1985) Veterinary Protozoology. Iowa State University, Ames, IA, p 414
- Mamatha GS, Placid EDS (2006) Gastrointestinal parasitism of cattle and buffaloes in and around Bangalore. J Vet Parasitol 20:846–874
- Soulsby EJJ (1982) Helminths, arthropods and protozoa of domesticated animals, 7th edn. ELBS and Bailliere Tindal, London
- Tomczuk K, Kurek L, Stec A, Studzinska M, Mochal J (2005) Incidence and clinical aspects of colon ciliate *Buxtonella sulcata* infection in cattle. Bull Vet Inst Pulawy 49:29–33
- Urquhart GM, Armour J, Duncan JL, Dunn AM, Jennings FW (2003) Veterinary Parasitology, 2nd edn. Blackwell Science LTD, Osney Mead 276