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# Incidence of endoparasites in Murrah Buffaloes of Buffalo Research Station of West Godavari region of Andhra Pradesh

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**Abstract**
The present study was aimed to report the incidence of endoparasites in Murrah buffaloes reared in the Buffalo Research Station (BRS), Venkataramannagudem of Andhra Pradesh, India. A total of 139 dung samples were collected from different age groups of animals in the farm. Microscopic screening of the dung samples revealed presence of *Buxtonella sulcata* cysts in higher number and helminthic infections of amphistomes and strongyle worms. Mixed infections were very few observed only in a diarrhoeic calf and was not found in healthy feces. An overall incidence of the gastrointestinal parasites was found to be 17.98%, among which the incidence of *Buxtonella sulcata* was higher (16.55%) when compared to other endoparasites (1.43%). In this study, *Buxtonella sulcata* cysts were comparatively more in young buffaloes when compared to adult buffaloes. From the above study, it could be summarised that *Buxtonella sulcata* is a common inhabitant of gastrointestinal tract of buffaloes and responsible for diarrhoea in association with other helminths or mixed infections.

**Keywords:** *Bubalus bubalis*, Endoparasites, *Buxtonella sulcata*, Andhra Pradesh

## Introduction
According to 19th Livestock Census of India, Andhra Pradesh holds 10.6 million buffaloes and placed 4th in India for buffalo milk production constituting nearly 7.4 million metric tonnes (Sivaji *et al*., 2018) [11]. Murrah buffaloes are well known for their high lactation yield nearly 1360 to 2270 kg per lactation (Suresh, 2013) [13]. Presently the Buffalo research station, recorded a total milk production of 97,204.5 kg from the milch animals during the year 2018-19. Safe guarding the health of the buffaloes from various factors especially gastrointestinal parasites should be done regularly. Gastrointestinal parasites play a vital role in degrading the health of domestic animals and leading to severe economic losses (Grisi *et al*., 2014) [5]. They mainly include *Fasciola gigantica*, *Paramphistomum cervi*, *Schistosoma nasale*, *S. indicum*, *S. spindale*, *Toxocara vitulorum*, *Strongyloides papillosus*, Strongyle group of worms, *Eimeria* sp., *Buxtonella sulcata*, etc. *Buxtonella sulcata* a general inhabitant of gastrointestinal tract of cattle appears morphologically similar to *Balantidium coli* present in pigs. It was first reported and nomenclature was given by James Anderson (1926) [9]. Based on the severity of endoparasitic infection, it leads to malabsorption of minerals and vitamins in the gastrointestinal tract, reduced appetite, delayed calving interval, decreased milk production and finally the efficacy of cattle production diminishes (Hamid *et al.*, 2016) [6]. The presence of endoparasites in a farm may become a predisposing factor for the spread of infection among the healthy animals. Assessment of a farm status is mainly predicted by the individual animal's health performance. The present study was aimed for a routine screening of the dung samples to investigate for the presence of any endoparasites in buffaloes.

## Materials and Methods
**Study area:** Buffalo research station is located in Venkataramannagudem of Tadepalligudem mandal *, West Godavari District, Andhra Pradesh, India. The geographical coordinates of Venkataramannagudem are 17.4° 48' 52.2864″N and 78.48° 31'35.6048″E.

### Collection and microscopic examination of dung samples
A total of one hundred and thirty nine dung samples (n=139) were collected for the present study as given in table 1.

**Table 1:** Collection of Dung samples

| Category | Calves (Below 1 year) | Heifers ( 1-2.5 years) | Adults (Above 2.5 years) | Total no. of samples |
|---|---|---|---|---|
| Number of Animals | 39 | 47 | 53 | 139 |

The dung samples were collected from the rectum in the early hours of dawn in sterile plastic containers and stored at a refrigeration temperature of 4°C until the samples were processed for microscopic examination using binocular microscope. Both direct smear and sedimentation methods (Soulsby, 1982) [12] were followed for the identification of parasites eggs, cysts and trophozoite forms. Direct smear examination was performed by placing a little amount of dung sample on a clean glass slide and equal quantity of water was added and mixed thoroughly with wooden stick and a thin smear was prepared and observed under 10X and 40X objective for better clarity under microscope. Sedimentation method required nearly 1-2gm of fresh dung sample emulsified in 10 ml of water and later strained and centrifuged at 2000 rpm for 3-5 minutes. A drop of sediment was placed at centre of slide and cover slip was placed with care avoiding air bubbles and observed under low power and high power objectives. The microscopic measurements were made for the parasitic eggs, protozoan cysts and trophozoites using the ocular micrometer. Besides dung samples randomly a few blood samples from marginal ear vein were also collected to detect the presence of blood protozoans by wet blood film examination.

## Results and Discussion

On thorough examination of the dung samples employing both direct smear and sedimentation techniques, the total endoparasitic infections in the Murrah buffaloes noted the highest presence of *Buxtonella sulcata* (17.98%) (fig.1), followed by Strongyle eggs (7.19%) (fig 2) and Amphistome eggs (0.71%) (fig.3). The results of the detected endoparasites were given based on animals grouped as age wise in Table 2.

**Table 2:** Age wise incidence of endoparasites in Murrah Buffaloes

| Age | No. of samples screened | Parasites recorded | No. of positive samples | Incidence percentage |
|---|---|---|---|---|
| Calves (Below 1 year) | 39 | *Buxtonella sulcata* cysts | 14 | 35.89% |
| | | Strongyle eggs | 3 | 7.69% |
| | | Amphistome eggs | 1 | 2.56% |
| Heifers ( 1-2.5 years) | 47 | *Buxtonella sulcata* cysts | 9 | 19.14% |
| Adults (Above 2.5 years) | 53 | *Buxtonella sulcata* cysts | 2 | 3.77% |
| | | Strongyle eggs | 7 | 13.2% |

In the diarrhoeic buffalo calf dung samples, *Buxtonella sulcata* cysts and amphistome eggs were identified. Results of the present study revealed that *Buxtonella sulcata* cysts were commonly observed in the dung samples of healthy buffaloes but not as heavy infestation. Earlier reports of *Buxtonella sulcata* incidence in India, Karnataka (Mamatha and Placid, 2006) [9], Jammu (Ganai *et al.* 2015) [4] and abroad, Iraq (Aayiz, 2005) [1], Nepal (Adhikari *et al.* 2015) [2] recorded a variation of 21 to 71% (Biswas *et al.*, 2014) [3]. Other gastrointestinal parasites included amphistomes along with *Buxtonella sulcata i.e.*, mixed infections in a diarrhoeic calf and presence of Strongyle eggs in calves and adult heifers. The presence of *Buxtonella sulcata* cysts were found comparatively higher in number in calves on comparison with adults and the murrah buffaloes were apparently healthy except one diarrhoeic case of mixed infection with amphistomes. Wet blood smears screening was done randomly among the buffaloes for detection of blood protozoans but there was no evidence of any infection.

**Table 3:** Occurrence of different endoparasites in healthy and diarrhoeic murrah buffaloes

| Status of Buffalo | Total dung samples | *Buxtonella sulcata* cysts positive | Strongyle positive | Mixed infections |
|---|---|---|---|---|
| Healthy animals | 138 | 25 (18.11%) | 10 (7.24%) | 10 (7.2%) |
| Diarrhoeic animals | 1 | 1 | - | 1 |
| **Total** | 139 | 26 | 10 | 11 |

**Different endoparasites observed in the feces of Murrah Buffaloes**

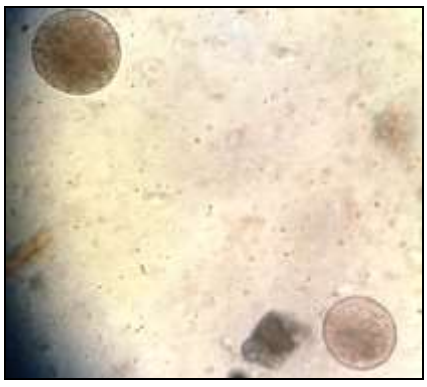

**Fig 1:** *Buxtonella sulcata* cysts

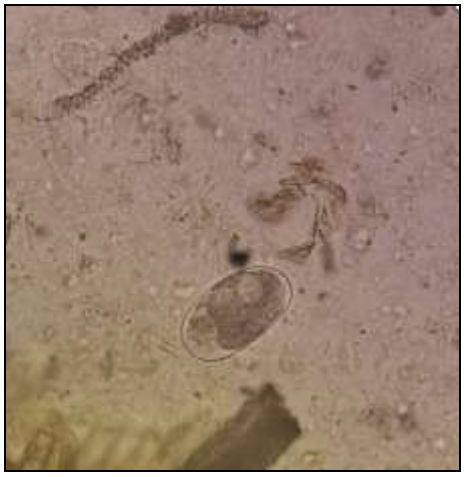

**Fig 2:** Strongyle eggs

**Fig 3:** Amphistome eggs

*Buxtonella sulcata*, a ciliated protozoan is a general inhabitant of the gastrointestinal tract of cattle is usually non-pathogenic in nature and acts as a commensal aiding in the process of digestion of plant matter (Tomczuk *et al.*, 2005; Kumar *et al.*, 2017) [14, 8]. It was also reported by few authors the pathogenic nature of *Buxtonella sulcata* (Roy *et al*., 2011) [10] in causing chronic diarrhoea. Along with *Buxtonella sulcata*, lesser percentage of other parasitic eggs like amphistomes and strongyles were detected but the infection is very meagre. The reason for less parasitic infection in the farm might be due to clean hygienic managemental practices maintained in the farm and also environmental conditions. Kumar *et al*. 2017 [8] also reported less incidence of parasitic infection internally due to better hygienic practices of Jaffarbadi buffaloes maintained in Gujarat farm. The incidence of *Buxtonella sulcata* in Murrah buffaloes with respect to age was slightly higher in calves when compared to adult buffaloes. The findings were in accordance to Ganai *et al*. 2015 [4] who reported that *Buxtonella sulcata* was common in young animals but contradictory to Kumar *et al.* 2017 [8] who reported that the incidence was higher in older animals. The varying reasons could be due to the climatic conditions prevailing in the geographical region of farm, besides environmental conditions, care and managemental practices followed in the maintenance of farm also play a key role for the growth and incidence of the parasites.

In the present study, from the observations it can be summarized that the incidence of ciliated protozoa *Buxtonella sulcata* was revealed but not to level of causing chronic diarrhoea except in case of mixed infection with amphistomes causing diarrhoea in calves. Other helminthic infections like amphistomes and strongyle eggs were very few and thus it could be concluded that the care and managemental practices carried out in the organised farm were effective in safeguarding and controlling the endoparasites in Murrah buffaloes.

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