



## BOVINE MYCOTOXICOSIS - A REMARKABLE DISEASE IN RICE-GROWING AREAS OF INDIAN SUBCONTINENT

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### ABSTRACT

Degnala disease, which is assumed to be a mycotoxicosis, has clinical syndrome similar to chronic ergotism and is predominantly characterised by development of oedema, necrosis and gangrene of the legs, tail, and ears. A concise study conducted to know the prevalence of Degnala disease in rural parts of Andhra Pradesh concluded the disease's occurrence and its relation with crops grown in the region.

**KEY WORDS:** Degnala, Paddy straw, Storage practices, fungal contamination.

### INTRODUCTION

A widespread occurrence of the disease has been reported from rice growing areas all over the India which caused considerable economic losses. Formerly, the disease was known to exist in Indo-Pakistan border as more number of cases was occurred stemming from a monsoon rain water stream in the area of murdike near Nala deg river in Pakistan. Andhra Pradesh state posses a total of 9.7 million tonnes of paddy straw available as feed for livestock (AP.Go. 2010-11; 2011-12; 2012-13). Further, the state is considered as “Bejewelled rice bowl of India” due to the excessive paddy cultivation. In addition, the improper storage practices followed by the rural farmers make it more likely to spoil with fungal contamination. And hence, the Degnala incidence rate is very high in rural areas of Andhra Pradesh. It is believed that degnala disease to be caused by mycotoxicosis resulting from ingestion of rice straw contaminated with *Aspergillus flavus*, *Aspergillus niger*, and *Penicillium notatum* fungi (Bhatia *et al.*, 1986; Maqbool *et al.*, 1996). This disease is characterized by necrosis, followed by gangrene of the dependant parts of the body (Sikdar *et al.*, 2000). Because of this, the animals not only become weak and emaciated, but also at times more or less become crippled causing enormous economic losses due to decreased productivity and functional capacity in the form of reduced milk production and draught capacity. Further, the disease is being ignored by the farmers and mostly misdiagnosed by the paravets, as the condition is confused as foot and mouth disease and/or mange. Hence a brief study is conducted to know the prevalence of the Bovine Mycotoxicosis and/or Degnala in rural parts of Andhra Pradesh and its correlation with crops grown and improper

storage managemental practices followed in the respective areas.

### MATERIALS AND METHODS

Cattle and Buffaloes with suspected lesions, arriving at the selected Veterinary Dispensaries in the state were monitored for the disease, during the entire September month of 2016. The animals showing symptoms like necrosis followed by gangrene of dependant parts (tail and legs), and oedematous swelling of the lower part of the leg resulting in lameness were treated as Bovine Mycotoxicosis cases. The paddy straw samples fed to the respective animals were checked for the mould growth and fungal contamination. Further, the respective feed (rice straw) samples were collected from the owners of bovines with skin lesions of suspected Bovine mycotoxicosis disease, in sterile polythene bags. Scrapings from the fungal-infested portions of the straws were used for direct cultural examination on Mortin Rose Bengal agar medium.

### RESULTS & DISCUSSION

A total of 15 positive cases were reported in a month period in the 8 dispensaries under study. Among them ten were buffaloes and five were cattle. The most prominent clinical signs observed in bovines with degnala disease were generalized skin lesions (fig 2.0) edematous swelling of the hind limbs (fig 4.0), disinclination to move, lameness, cracks on the skin of the limbs, Ulcerative wounds at inter digital space of hooves (fig 5.0) and gangrene of the tail (fig 3.0). The clinical symptoms and gross features of lesions recorded were in close conformity with the findings of earlier workers (Sikdar *et al.* 2000; Jadhav *et al.* 1997; Irfan, 1971; Basak *et al.*, 1994). The

hallmark manifestations of degnala disease in bovines were clinical signs attributed to mycotoxicosis related cutaneous vasoconstriction (Irfan *et al.*, 1984). Loss of body weight in animals fed with infested paddy straw could be due to Anorexia and increased tissue catabolism (Radostits *et al.*, 1983). The progressive posterior weakness may be due to degenerative changes of adjoining musculature (Weaver *et al.*, 1978). Cultural

isolation and identification of the scrapings of the mouldy rice straw revealed *Asperigillus flavus*, *Aspergillus niger*, *Pencillium notatum* and *ocraceous* species (fig 6.0). These findings were in agreement with the earlier reports (Maqbool *et al.*, 1998; Basak *et al.*, 1994; and Karki *et al.*, 2008).



**FIGURE 1:** Fungal infected paddy straw sample



**FIGURE 2:** Degnala disease with generalized skin lesions



**FIGURE 3:** Degnala disease with gangrene of tail



The animals had a history of being fed with moldy paddy straw in the recent past. Close inspection of the paddy straw fed to the animals revealed, fungal contamination (fig 1.0), which might be due to improper storage at high moisture conditions. Karki *et al.* (2008) reported that the Degnala disease appear to be associated with the feeding of mouldy paddy straw, as it was suspected to play some role, directly or indirectly in the development of disease. Further, Sikdar *et al.* (2000) and Jadhav *et al.* (2003) observed that the occurrence of the disease was coincided

with the winter season during which lush green fodder with high moisture content was fed to the animals. Furthermore, as the occurrence of Degnala has been associated with the feeding of rice straw, selenium toxicity is suspected to play some role (Sharma, 1984; Bhatia *et al.*, 1986). The rice growing parts of India and other parts of the world with similar climatological condition, has been shown the prevalence of Bovine Mycotoxicosis disease (Jadhav *et al.*, 1997; Hokonohara *et al.*, 2003).



**FIGURE 4:** Edematous swelling of hock joint in Degnala disease



**FIGURE 5.** Ulcerative wounds at inter digital space of hooves in Degnala disease



**FIGURE 6:** Fungal growth on 8<sup>th</sup> day from the infected Paddy straw sample**CONCLUSION**

Degnala is a cause of concern to the farmers and shows a severe impact on rural economy. It is often overlooked and misdiagnosed as Foot and mouth disease and/or mange infection. The field investigation and prevalence studies of Degnala disease suggest the possible involvement of mycotoxins. However, further investigations need to be done to understand nature of the toxic factors involved in production of the Degnala disease.

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