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Gross Pathology of *Sorghum bicolor* Poisoning in Bovines

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Abstract

A necropsy of buffalo and cattle calves were performed at the site of death on emergency call from animal owner with history of ad libitum grazing on immature *Sorghum bicolor* plantlets. The affected animals showed clinicals signs mainly such as respiratory distress, staggering gait and muscular tremors before death. The necropsy revealed presence of bright cherry red discolouration of various organs. Ruminal content and crushed *Sorghum bicolor* leaves from grazed field found positive for hydrocyanic acid by sodium picrate paper test. The confirm history, clinical signs, necropsy and laboratory findings confirmed the diagnosis of *Sorghum bicolor* poisoning.

Key Words: *Sorghum bicolor*, Prussic Acid, Hydrocyanic Acid, Poisoning, Postmortem Lesions.

Sorghum and Sudangrasses should not be grazed when they are in an immature or early stage. During early or immature stage, the sorghum plant reported to have a high content of cyanogenic glucoside which liberates HCN in the rumen and may be fatal to ruminants. These forages must be allowed these to attain a height of 15 to 18 inches before grazing. The HCN content in these forages decreases with plant maturity (Pandey *et al.*, 2011; Yildiz *et al.*, 2017). The present paper describes clinical signs, gross pathological lesions and laboratory detection of hydrocyanic acid poisoning in bovines which were grazed adlib tum on immature *Sorghum bicolor* field.

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Materials and Methods

A necropsy of buffalo (n=1) and cattle (n=1) calves were performed at the site of death on emergency call from animal owner. According to the history from owner, these animals escaped unknowingly from sight of herdsman while grazing into the adjacent immature *Sorghum bicolor* field (fig. 1a). Both animals died before reaching to the site and administering treatment. The detailed necropsies of animals were conducted as per standard protocol and gross lesions were recorded in various organs or systems. The ruminal content and crushed *Sorghum bicolor* leaves from the same field where affected animals grazed were collected and subjected to sodium picrate paper test for detection of hydrocyanic acid as per protocol described by Schwarze (2009) and Constable *et al.* (2017).

Results and Discussion

As per the history obtained from animal owner, the affected animals were started to show clinical signs within 1-2 hours after ad libitum grazing on immature *Sorghum bicolor* plantlets such as excessive salivation, restlessness, labored and quick breathing, stumbling or staggering gait, muscular tremors, recumbency, bloat, voiding of urine and faces frequently.

The detailed necropsy examination of dead animals revealed presence of marked bloating of carcasses, bright red mucous membranes, rhomboid shaped areas of congestion or haemorrhages over abdominal fascia (fig. 1a), bitter almond odour of ruminal content, excessive cherry red discoloration of abomasal

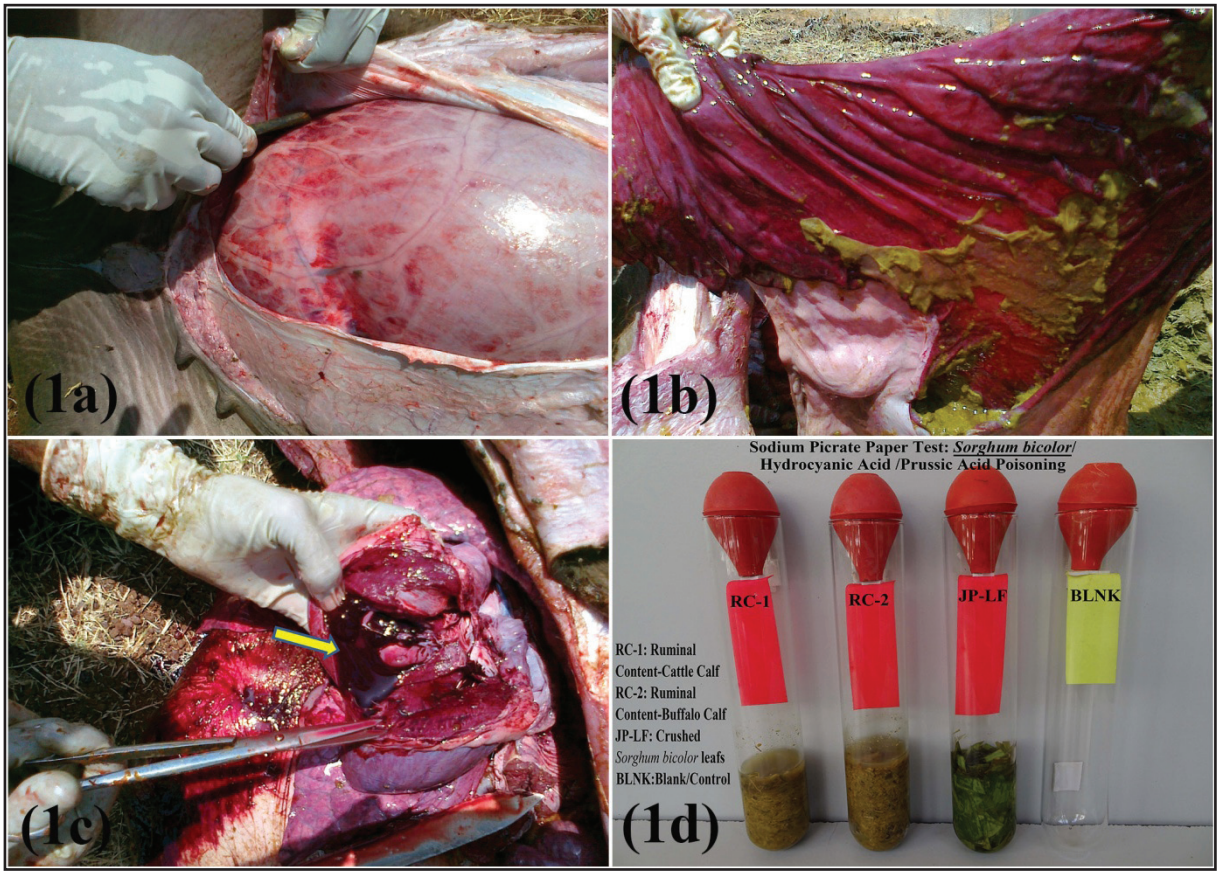

Fig.1: Postmortem lesions of *Sorghum bicolor* poisoning in buffalo calf: 1a) Rhomboid shaped areas of congestion or haemorrhages over abdominal fascia. 1b) Dark cherry red discoloration of abomasal mucosa. 1c) Presence of dark cherry red bright colour unclotted blood within heart chambers. 1d) Sodium Picrate Paper Test (RC-1: Positive test for ruminal content of cattle calf, RC-2: Positive test for ruminal content of buffalo calf, JP-LF: Positive test for crushed *Sorghum bicolor* leaves, BLNK: Blank Control: Negative Test).

(fig. 1b) and intestinal mucosae, liver, lungs and presence of dark cherry red bright colour unclotted blood within heart chambers (fig. 1c). The laboratory evaluation of ruminal contents and crushed *Sorghum bicolor* leaves from same field where animals grazed found positive for hydrocyanic acid by sodium picrate paper test (fig. 1d).

Cyanide ions reacts with Fe^{+3} (ferric) ion of cellular cytochrome oxidase to form a stable complex. Conversion of Fe^{+3} to Fe^{+2} is thereby prevented so that electron transport and cellular respiration are stopped. The blood is oxygenated, but cannot be utilized by the cells. The lack of oxygen utilization in chemoreceptors and/or neurons of the brain triggers increased respiratory efforts and the blood becomes hyper-oxygenated ("bright cherry red"). End result is nevertheless a functional tissue anoxia and death (Beasley, 1999). Cyanide kills tissues by lowering their ability to use oxygen resulting into the arrest of aerobic metabolism and death from histotoxic anoxia. Tissues that heavily depend on aerobic metabolism such as the heart and brain are particularly susceptible to these effects (Cope, 2016).

There are no characteristic histopathological changes. Most tests for the presence of cyanogenic glycosides can be conducted in the laboratory but suspected plants or ruminal contents can be tested in the field by the Henrici (picric acid) test (Cope, 2016; Constable *et al.*, 2017). The case history, clinical signs, postmortem lesions and laboratory findings of present investigation were found consistent with the findings and mechanisms of hydrocyanic acid

poisoning reported by these above mentioned earlier research workers.

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Efficacy of Ethno Veterinary Medicine in the Treatment and Control of Sheep Pox Outbreak in an Organized Sheep Farm

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Abstract

This study aimed to investigate the outbreak of sheep pox in an organized sheep farm in the Hosur District of Tamil Nadu and to assess the efficacy of Ethno Veterinary Medicine in the treatment and control of the disease during July 2021 and November 2021. Out of 376 animals, 93 were affected (24.73 %) and 72 died (Mortality 77.41 %) during the first investigation. Based on history, clinical examination and necropsy findings clinically the flock was diagnosed to have sheep pox and PCR testing helped to confirm the diagnosis. Along with the symptomatic and supportive therapy, Ethno Veterinary Medication was followed for the affected animals. On the second investigation of the herd, out of 138 animals, 55 animals recovered from the previous sheep pox infection without any mortality. Along with the symptomatic line of treatment, Ethno-Veterinary medicine helped in the speedy recovery of ailing animals and the reduction of mortality percentage.

Key words : Ethno-Veterinary medicine, Sheep pox, PCR

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