

Christella parasitica toxicity in crossbred male calves

N B SHRIDHAR¹, B R VARADARAJU² and K NARAYANA³

Karnataka Veterinary Animal and Fisheries Sciences University, Hebbal, Bengaluru, Karnataka 560 024 India

Received: 15 October 2008; Accepted: 3 September 2009

Key words: Calf, *Christella parasitica*, Fern, Toxicity

Consumption of toxic plants by animals accidentally often results in death. The plant-induced etiology were reported. *Christella parasitica* (*C. parasitica*) is a fern belonging to the family *Thelypteridaceae* and is distributed in arecanut garden as a major weed in Western Ghat region of Karnataka (Rajagopal and Bhat 1998). Much study is conducted on the *Pteridium aquilinum* (bracken fern). However, information on the toxicity of this fern in the literature is lacking. Hence, the present study was carried out with the aim of establishing the toxicity of this fern in crossbred male calves and also to study the phytochemical nature of the plant extracts.

Fresh fronds of *C. parasitica* were collected and dried under shade for 5 days for preparing the extracts. Dried plant was finely powdered and stored in air-tight container. Petroleum ether (60–80°C), diethyl ether, chloroform, and methanol extracts were prepared using Soxhlet extractor. Phytochemical analysis of various extracts of the plant *C. parasitica* was done for the presence of steroids, alkaloids, glycosides, flavonoides, saponins and tannins (Harborne 1991). Picrate paper and diphenylamine tests were performed for the presence of cyanide and nitrate respectively (Bark 1963, Householder *et al.* 1966).

Crossbred (HF×zebu) male calves (8) aged 6–8 months were selected for the study. Calves were offered fresh aerial fronds of *C. parasitica* @ 180 g/kg body weight *ad lib.* twice daily for 30 days. All the experimental calves were monitored daily for clinical signs, rectal temperature, pulse, heart rate, respiratory rate, condition of the mucus membrane, urine colour, oral and nasal cavity lesions and faecal consistency. The blood sample (5 ml) was collected from jugular vein from each calf on day 0, 6, 12, 18, 24 and 30 for the estimation of concentrations of haemoglobin (Hb), total erythrocyte count (TEC), total leucocyte count (TLC), differential leucocyte count (DLC) and the concentrations of serum creatinine, blood urea nitrogen (BUN), serum alanine amino transferase (ALT) activity, serum aspartate amino transferase activity (AST), total protein, glucose, cholesterol, calcium,

magnesium and potassium. The data were statistically analysed by one-way ANOVA with Dunnett's post test using GraphPad Prism version 4.01 for Windows, GraphPad Software, San Diego California, USA (Snedecor and Cochran 1980).

Fresh fronds of *C. parasitica* were negative for either nitrate or cyanide. Phytochemical analysis of the chloroform, methanol, aqueous, diethyl ether and petroleum ether extracts of dried fronds of *C. parasitica* were negative for the presence of steroids, alkaloids, saponins, tannins and flavanoids. Work on this aspect of the problem is scarce in the literature.

There was no significant ($P>0.05$) change in the haematological parameters like Hb, TEC, TLC and DLC in calves fed the fresh fronds of *C. parasitica*.

There was no significant ($P>0.05$) change in the concentration of serum creatinine, BUN, ALT, AST and total protein, glucose, cholesterol, calcium, magnesium and potassium when compared to day 0 control values.

Feeding of *C. parasitica* fresh fronds (180 g/kg) for 30 days, there was no observable clinical signs of toxicity was observed in the calves. The present study revealed the non-toxic nature of *C. parasitica* in calves.

SUMMARY

No clinical signs of toxicity were observed in calves fed fresh fronds of *Christella parasitica* 180 g/kg for 30 days and there was no significant ($P>0.05$) change in haematobiochemical parameters Hb, TEC, TLC, DLC, creatinine, BUN, cholesterol, AST, ALT, total protein, glucose and calcium, magnesium and potassium. The present study revealed the non-toxic nature of *C. parasitica* in calves fed fresh fronds of *C. parasitica* for the dose and duration fed.

ACKNOWLEDGEMENTS

The authors thank Government of Karnataka for sponsoring the project entitled 'Cattle Disease and Death in Malnad Areas: Studies on Plant-Induced Etiology' and also thank Dr Sunilchandra, Veterinary Officer, Veterinary Hospital, Belthangadi for his co-operation during the study.

Present address: ¹Assistant Professor, Department of Pharmacology and Toxicology, ^{2,3}Veterinary College (e-mail: sridhar_vet@rediffmail.com).

REFERENCES

- Bark L S. 1963. Review of methods for cyanide analysis. *Analyst* **88**: 751.
- Harborne J B. 1991. *Phytochemical Methods – Guide to Modern Techniques of Plant Analysis*. 2nd edn, Pp.56–65. Chapman and Hall, Madras.
- Householder G T, Daollalite M W and Hulse R. 1966. Diphenylamine test for diagnosis of nitrate intoxication. *Journal of Veterinary Medical Association* **48**: 662–65.
- Rajagopal P K and Bhat K G. 1998. Pteridophytic flora of Karnataka State, India. *Indian Fern Journal* **15**: 1–28.
- Snedecor G W and Cochran W B. 1980. *Statistical Methods*. pp 56–63. Oxford and IBH Publications, New Delhi.