

## Pharmacokinetic Interaction of *Bauhinia variegata* L. Stem Bark Powder with Intravenous Ceftriaxone in Chronic Caprine Mastitis

J R Dash<sup>1</sup>, T K Sar<sup>2</sup>, I Samanta<sup>3</sup>, G.P. Mandal<sup>4</sup>, T K Mandal<sup>2</sup>

<sup>1</sup>Department of Pharmacology and Toxicology, College of Veterinary Science, OUAT, Odisha, India

<sup>2</sup>Department of Pharmacology and Toxicology, West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal, India

<sup>3</sup>Department of Veterinary Microbiology, West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal, India

<sup>4</sup>Department of Animal Nutrition, West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal, India  
E-mail: tapas.sar@rediffmail.com

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**Abstract**—The objective was to study the pharmacokinetic interaction of *Bauhinia variegata* L. stem bark powder as adjunct therapy in chronic *Staphylococcus aureus* mastitis in goat. Mastitis was induced by intracisternal inoculation of coagulase positive *S. aureus* (J638) at the concentration of 2000 colony forming units. Group I animals were injected with single dose of ceftriaxone at 20 mg/kg intravenously and Group II animals were treated with single dose of ceftriaxone at 20 mg/kg intravenously and once daily oral administration of *B. variegata* L. stem bark powder at 6 g/kg for 7 days. The kinetic behavior of ceftriaxone @ 20 mg/kg body weight followed 'two compartment open model' in goats of both groups. Elimination half-life of ceftriaxone in presence of *Bauhinia variegata* L. stem bark powder in chronic mastitis increased significantly. It's major metabolite Cefprozime detected in plasma from 1 h to 48 h pd in Gr I (mastitic goats without bark powder) and from 1 h to 96 h pd in Gr II (mastitic goats with bark powder) respectively. The concentration of the metabolite followed an increasing and decreasing pattern in both the groups. Cefprozime persisted with a significantly higher concentration in Gr II (mastitic with bark powder @ 6g/kg) from 48 to 96 h pd compared to Gr I (mastitic without bark powder). Half life of distribution ( $t_{1/2\alpha}$ ) significantly increased ( $p < 0.05$ ) in mastitic goats of Gr II (with bark powder @ 6 g/kg). Elimination half life ( $t_{1/2\beta}$ ) with significantly decreased  $CL_B$  ( $0.005 \pm 0.003$  h)

*value suggested longer persistence of ceftriaxone in mastitic goats of Gr II (receiving bark powder @ 6 g/kg once daily for 7 days). In milk, only ceftizoxime but not ceftriaxone could be detected in mastitic goats (Gr I) without bark powder. However both ceftriaxone and ceftizoxime recovered in milk samples of mastitic goats (Gr II) receiving kanchan stem bark powder @ 6 g/kg. Stem bark powder of Bauhinia variegata L. at 6g/kg oral dose once daily potentially increase the bioavailability of ceftriaxone and its metabolite ceftizoxime in plasma and milk along with increased distribution in systemic circulation may be beneficial in treatment of chronic caprine mastitis with cephalosporin group of antibiotics especially with ceftriaxone/ ceftizoxime.*