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Evaluation of Anti-typhoid Effects of Azadirachta indica L. Fractions

Abstract— The development of resistance to currently known conventional anti-typhoid drugs has necessitated search into cheap, more potent and less toxic anti-typhoid drugs of plant origin. Therefore, this study investigated the anti-typhoid activity of fractions of A. indica in Salmonella typhi infected rats. Leaves of A. indica were extracted in methanol and fractionated into n-hexane, chloroform, ethyl-acetate and aqueous fractions. The anti-salmonella potentials of fractions of A. indica were assessed via in-vitro inhibition of S. typhi using agar well diffusion, Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC) and biofilm assays. The biochemical and haematological parameters were determined by spectrophotometric methods. The histological analysis was performed using Haematoxylin and Eosin staining methods. Data analysis was performed by one -way ANOVA. Results of this study showed that S. typhi was sensitive to aqueous and chloroform fractions of A. indica and the fractions showed biofilm inhibition at concentrations of 12.50, 1.562 and 0.39 mg/mL. In the in-vivo study, the extract and chloroform fraction had significant ($p<0.05$) effects on the number of viable S. typhi recovered from the blood and stopped salmonellosis after 6 days of treatment of rats at 500 mg/kg b.w. Treatments of infected rats with chloroform and aqueous fractions of A. indica normalized the haematological parameters in the animals. Similarly, treatment with fractions of the plants sustained a normal antioxidant status when compared with the normal control group. Chloroform and ethyl-acetate fractions of A. indica reversed the liver and intestinal degeneration induced by S. typhi infection in rats. The present investigation indicated that the aqueous and chloroform fractions of A. indica showed the potential to provide an effective treatment for salmonellosis, including typhoid fever. The results of the study may justify the ethno-medicinal use of the extract in traditional medicine for the treatment of typhoid and salmonella infections.

Keywords— Azadirachta indica L., typhoid, salmonella infections, leave fractions