

## ANTI-INFLAMMATORY POTENTIAL OF THE CORAL TREE (ERYTHRINA ABYSSINICA): HISTOLOGICAL AND IMMUNOHISTOCHEMICAL EVIDENCE IN CHRONIC TRYPANOSOMIASIS MOUSE MODEL

Nasimolo J, Kiama SG, Makanya AN, Gathumbi PK, Kagira J

Human African trypanosomiasis is a protozoan disease prevalent in Sub-Saharan African countries that lie between 14° North and 29° south of the Equator. It is caused by a parasite of the genus *Trypanosoma*, which has several species and subspecies. *Trypanosoma brucei gambesience* occurs in West and Central Africa while *Trypanosoma brucei rhodesience* occurs in East and Southern Africa. In this region, close to 60 million people are at risk of infection. The neurological stage of the disease is characterized by neuroinflammation and 10% of patients treated with the recommended drug develop fatal post-treatment reactive encephalopathy (PTRE). Several attempts have been made to scientifically evaluate plants for anti-trypanosomal effect including modulation of the adverse neuroinflammation associated with tissue trypanosomes and PTRE. This study aimed at establishing the potential activity of *Erythrina abyssinica* in reducing neuroinflammation following infection with *Trypanosoma brucei brucei*. Swiss white mice were divided into ten groups, two control groups (infected and non-infected) and eight infected groups treated with *Erythrina abyssinica* extracts. Infected groups were separately treated with methanol or water extract of *Erythrina abyssinica* at 12.5, 25, 50 or 100 mg/kg body weight. Parasite counts were monitored in peripheral circulation from the third day post-infection up to the end of the study. Cerebrum samples were processed for histology, immunohistochemistry scanning and transmission electron microscopy. SDS-PAGE electrophoresis of the brain was also done to analyze brain proteins. Following infection, trypanosomes were observed in circulation three days post-infection, with the parasitaemia occurring in waves. In the cerebrum, astrocytosis, perivascular cuffing, infiltration of inflammatory cells and protein degradation were observed in infected mice. However, in animals treated with aqueous *Erythrina abyssinica* extracts, the neuro-inflammation was significantly reduced as noted by reduced astrocytosis, perivascular cuffing and infiltration by inflammatory cells, compared to non-treated mice. In addition, there was preservation of proteins by aqueous extract of *Erythrina abyssinica*. Trypanosomiasis degraded some brain proteins, which were conserved on treatment with *Erythrina abyssinica* extract. This study therefore documents anti-inflammatory and protein conserving properties of *Erythrina abyssinica* that may support its wide use as a medicinal plant by various communities in Kenya. Further studies are needed to ascertain the exact mode of action and whether the specific compounds act singly or in synergy.