THE EFFECTS OF NEROLIDOL, ALICIN AND BERENIL ON THE MORPHOLOGY OF *Trypanosoma evansi* IN MICE:

A COMPARATIVE STUDY USING LIGHT AND ELECTRON MICROSCOPIC APPROACHES

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ABSTRACT

Cell morphological changes are normally considered as the indirect evidence of the effect of test materials on targeted cells. In this study, the effects of nerolidol (C\textsubscript{12}H\textsubscript{26}O) and alicin (C\textsubscript{3}H\textsubscript{5}SS(O)C\textsubscript{3}H\textsubscript{5}) extracted from cardamon (*Elettaria cardamomum*) and garlic (*Allium sativum*) respectively, were compared with the effect of berenil (standard anti-trypanosomal drug) on the morphological changes of a protozoan parasite *Trypanosoma evansi* in mice, determined by light microscope and electron microscopy. Groups of male ICR mice strain were subjected to infection with and without the parasite trypanomastigote (5.0 × 10^\textsuperscript{-5})
T. evansi per mouse), treated with nerolidol and allicin, and treated with berenil or distilled water as the control. Blood samples were collected and prepared both for the observation under light and electron microscopes. Parasites observed at the trypomastigote stage had adverse morphological changes due to berenil treatment and after the 2nd – 3rd hour post-treatment, the parasites became stiffened and tapered at both ends and distorted with fractured flagella and loss of undulating membranes before totally disintegrated and cleared from the blood at the 6th – 7th hour post-treatment. The morphological changes in the nerolidol-treated group only appeared after the 23rd day post-treatment and continued gradually until the 25th day post-treatment when the parasites became stiff, lost their undulating membrane but the free flagella remained intact. Total disfigurement was only observed at the 27th day post-treatment. On the other hand, parasites in the allicin-treated group also showed marked morphological changes, although not as profound as changes due to berenil. Changes started to occur only after the 18th day post-treatment, and gradually intensified up until the 90th day post treatment although the treatments were terminated on day 30th. The parasite also became crescent in shape and lost their undulating membranes and cytoplasm where total disfigurement was only observed in the 95th days post-infection. All mice in the negative group (untreated-infected) succumbed to infection with drastic increase of parasitaemia while all the infected and berenil-treated mice survived the infections for more than 100 days post-infection. These observations indicate that, to a certain extent, nerolidol and allicin showed convincing and promising anti-trypanosomatidal activity against the morphology of T. evansi in mice. Further studies are required to elucidate the mechanism(s) of action of these compounds.

Key words: nerolidol, allicin, berenil, Trypanosoma evansi

REFERENCES


Ogunlana, E.O., Hoeglund, S., Onawunmi, G. & Skoeld, O. 1987. Effects of lemongrass oil on
the morphological characteristics and peptidoglycan synthesis of Escherichia coli cells. International Microbiology, 50: 43-59.


