Ultrastructural study on the morphological changes of Schistosoma mansoni after in vitro exposure to monoterpene rotundifolone

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Schistosomiasis, a parasitic disease caused by trematode flatworms of the genus Schistosoma, affects more than 200 million people worldwide, and its control is dependent on a single drug, praziquantel. Here, we report the in vitro effect of rotundifolone, a monoterpene isolated from Mentha x villosa (Lamiaceae), on Schistosoma mansoni adult worms. Concentrations of rotundifolone were evaluated in vitro against adult worms of S. mansoni. Ultrastructural changes on the tegument of these adult worms were evaluated using scanning electron microscopy (SEM). Using rotundifolone at concentrations of 3.5, and 7.0 μg/mL, no worm mortality was observed at any of the times examined. Regarding motility at a concentration of 7.0 μg/mL, minor loss of movement of the tail, suckers, and gynaecophoric canal membrane was observed after 96 h of exposure. At the concentration of 71 μg/mL, mortality and absence of movement of the worms were observed from 72 h onwards, at the concentration of 177.4 μg/mL from 48 h, at the concentration of 354.8 μg/mL from 24 h of exposure (100%). This monoterpene also caused death of all the parasites and the separation of coupled pairs into individual male and female at 354.8 μg mL⁻¹ after 24 h. Changes on the tegument of adult S. mansoni were evaluated using scanning electron microscopy (SEM). These results suggest that the rotundifolone is very promising for the development of new schistosomicidal drugs.