

Abstract

This thesis describes the results of a study to assess the effect of ethnobotanical products on the behaviour of the brown ear tick *Rhipicephalus appendiculatus*, the main vector of East Coast fever in sub-Saharan Africa. Ethnoknowledge of the Bukusu people in western Kenya on tick control and management was evaluated to identify plants that affect livestock ticks, using participatory action research approaches. More than 150 plant species spread over 110 genera and 51 families were identified and documented. From these, eight plants were selected and their essential oils extracted and used for screening in the laboratory on their behavioural effects on ticks. From these, the plants *Tagetes minuta* and *Tithonia diversifolia* were chosen for further studies. The essential oils of these two plants were further extracted and used in laboratory and field bioassays. From the laboratory assay, using a dual-choice apparatus, it was found that essential oils of both *T. minuta* and *T. diversifolia* affect tick climbing behaviour, representing a repellent response. Dose response effects were observed. On steers, differential effects to the essential oils were observed with *R. appendiculatus*, which prefer to feed mainly inside the ears of the host animal. It was found that treatment of the ear region with the essential oils of both *T. minuta* and *T. diversifolia* significantly deterred ticks from reaching the ear. The essential oils of *T. minuta* and *T. diversifolia* were evaluated in the field and significantly shown to affect *R. appendiculatus* and other ticks naturally attached to the host animals. The essential oil of *T. minuta* affects *R. appendiculatus* and other ticks more than the essential oil of *T. diversifolia*. The results suggest the potential for essential oils to be incorporated in the on-host "push" and "push-pull" strategy for the control and management of *R. appendiculatus*, other affected livestock ticks and associated tick-borne diseases among the resource-limited livestock farming community in tropical Africa.