NATURAL ATTRACTION OF LIVESTOCK TICS BY THE LEAVES OF A SHRUB

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SUMMARY

During examination of leaves of different plants on Rusinga Island, Kenya, ticks were commonly found on the leaves of a plant identified as Acalypha fruticosa Forsk. var. villosa Hutch (Euphorbiaceae). Larvae of Rhipicephalus appendiculatus were the predominant ticks encountered, found quiescent on the undersurface of the leaves. Laboratory investigations showed that significant numbers of ticks were attracted by odours from this plant. It was concluded that the leaves of A. fruticosa are attractive to this tick and have potential for use as a trap to control ticks.

INTRODUCTION

The role of plants in integrated tick control has received attention as a result of the research for alternative methods of tick control (Dipeolu et al., 1992). Thompson et al. (1978) identified 2 species of molasses grass which reduce survival of Boophilus microplus. Mount (1981) partially removed the overstory, understory and frequent mowing to maintain the height of grasses at <15 cm, to control Amblyomma americanum. Wilkinson (1977) reported that herbicidal killing of shrubs did not significantly decrease the numbers of adult Dermacentor andersoni. Sutherst et al. (1982) reported that 2 species of Stylosanthes immobilised and killed B. microplus; subsequently, Zimmerman et al. (1984) tested 15 genotypes of Stylosanthes and concluded that its use could be a component of an integrated pest management approach to tick control. Plants attractive to ticks could be used in such control and we report on a plant attractive to Rhipicephalus appendiculatus under field and laboratory conditions.

MATERIALS AND METHODS

Field investigation

This was conducted between January and December 1990 on Rusinga Island (34° 10’E and 0° 25’S), Kenya. The geographical location, ecological classification, soil topography and climate have been described (Punyua et al., 1991). Leaves of several plants within the bush surrounding the grazing fields were examined for the presence of ticks, 3 times a day i.e. (09.00 to 10.00 h, 14.00 to 15.00 h and 17.00 to 18.00 h).

Laboratory investigations

Four round holes, 0.5 cm in diameter, were drilled into the side of a petri dish. Four glass tubes of the same diameter, 9 cm long and open at both ends, were fitted into the holes. A hole of the same diameter was drilled into the centre of another petri dish and another glass tube fitted into it (Fig. 1). Fresh leaves of Acalypha fruticosa and leaves of 3 other plants were squeezed into the outer open ends of each of the 4 side tubes. The plants were Ipomoea spathulata, Solanum incanum and Gynandrop-
Fig. 1. Plastic petri dish with 5 glass tubes (9 × 0.5 cm diameter). Leaves of plants placed in A–D. E connected to flowmeter.

 sis gynandra. Leaves were used within 3 min of collection. R. appendiculatus ticks were released into the middle of the petri dish carrying the 4 glass tubes and leaves then immediately covered with the petri dish carrying the glass tube at its centre. The latter was immediately connected to a water flowmeter to suck air from inside the petri dish at the rate of 100 cm³/min. The numbers of ticks which moved towards the tubes carrying the leaves were counted after 10 min and thereafter every 30 min for 3 hours. Only ticks which had reached the open end of the glass tube or had moved into the tube towards the leaves were counted as having been attracted. Three replicates were set up for each instar of R. appendiculatus. The experiment was repeated with the observation made for 5 h using only larvae and replacing the leaves of G. gynandra with cotton wool. Results were analysed by Duncan’s multiple range test.

RESULTS

Field observations

Ticks were consistently found on the undersurface of the leaves of A. fruticosa which is a common plant in all grazing areas on Rusinga Island. It is one to 3 m high, green all year, has an aromatic odour and is not palatable to cattle but eaten by sheep and goats. On 86 leaves examined, 634 larvae of R. appendiculatus were counted, with a range of 0–26 (x̄ = 7.4/leaf) and 9 nymphs with a range of 0–3 (x̄ = 0.1/leaf). Of the 10 adults found, 5 were males and 5 were females. Other tick species found were 2 larvae of Rhipicephalus evertsi evertsi and one larva each of Amblyomma variegatum and Boophilus decoloratus. Larvae were found in clusters at the tip of the undersurface of the leaves whereas nymphs and adults were found singly. On all occasions ticks were quiescent. They were always found on leaves whose stem was up to half a metre from the ground level.