V. SUMMARY

Eleven plant species belonging to family Verbenaceae were investigated for feeding deterrent materials to the 5th instar nymphs of Schistocerca gregaria (Forskål).

The plant species examined were, Verbena supinaa, Verbena hybrida, Citharexylum quadrangulare, Tectona grandis, Caryoptris incana , Lantana camara, Vitex angus-castus, Clerodenderon inerme, Clerodenderon splendens, Duranta plumieri and Lippia nodiflora.

In Verbena supina and Lippia nodiflora whole plant were used. In the other nine species, leaves and stems were examined. Whenever, possible flowers and fruits were also investigated. The dry powder of plant organs under study were used to prepare a 10 per cent ethanol extract. Filter papers were impregnated with the extract, sprayed with sugar solution 0.25M weighed and offered to starved 5th instar locust nymphs. For control, filter papers sprayed with sugar solution only were used. The weight consumed from filter papers impregnated with the different extracts in comparison with control was used as an indication for the presence or absence of feeding deterrents.

The extracts which produced more than 90 per cent feeding deterrence were those of the stem of Tectona grandis, stem of Citharexylum quadrangulare, the fruit of T. grandis, leaves of Lantana camara and the leaves of Verbena hybrida respectively.

Different solvents were used for the extraction of feeding deterrents from the plant species which gave good deterrence with the ethanol extract. Results revealed that polar solvents are better than non-polar ones in extraction of feeding deterrents in these species, a nd the best results were obtained with ethanol. Benzene also was effective in many cases, but not significantly, while chloroform, n-hexane and diethylether were less effective in most cases.

Ethanol extract of dry powder of Lantana camara leaves was partitioned with petroleum ether, ethyl acetate and chloroform respectively, all the partioning solvents contained significant amounts of feeding deterrents, while the residue did not.

The dry powder of the leaves of Lantana camara was extracted five times with petroleum ether, then

five times with ethanol, both the ethanol and petroleum ether extracts contained enough feeding deterrents to give statistically significant results.

A petroleum ether extract was prepared, the solvent evaporated and the residue applied to a silica gel column. The column was eluted with petroleum ether, petroleum ether and ether 1=1, ether only ether and chloroform 1:1, chloroform alone, chloroform-methanol 9:1 and 1:1 and methanol only respectively.

All the above fractions were bioassayed for their feeding deterrent activity, the best results were obtained by fractions 1 and 2 and methanol fraction.

Fraction one of the chromatographic separation was used for phytochemical screening. Tests for glucosides, carbohydrates and alkaloids were negative. Lieberman-Burchard's test for sterols and/or triterpenoids was performed, it gave positive results, which was further confirmed by Solkowski's test which indicate that the active ingredient in Lantana camara is an unsaturated sterol or a triterpenoid compound.

The biological activity of fraction no.1 of the column fractionation was bioassayed of larvae of the cotton leaf worm and roaches for feeding deterrent activity. The results were positive with the cotton leaf worm larvae and negative with the American Cockraches.

The above mentioned fraction was sprayed on a natural food plant of locusts and it gave good deterrent results. It was added to the soil pots containing the food plant and results indicated that the active material can be absorbed and translocated in the plants.