

05-7-83
UNIVERSITY OF COLOMBO LIBRARY

CR

A STUDY ON TOXIC EFFECTS OF SOME LOCAL

PLANT OILS ON *Sitotroga Cerealella* (Olivier)

(LEPIDOPTERA : GELECHIIDAE)

by

SARAVANAMUTHU RASIAH KRISHNARAJAH

B.Sc. (Ceylon)

Thesis

submitted in fulfilment of the requirements

for the Degree of

MASTER OF PHILOSOPHY

in

Science

of

THE UNIVERSITY OF COLOMBO

SRI LANKA

Department of Zoology

University of Jaffna

Jaffna

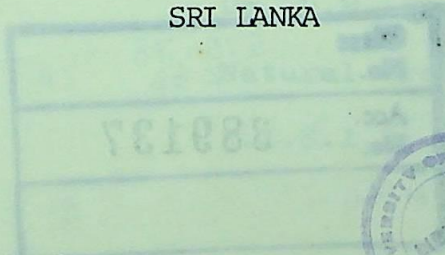
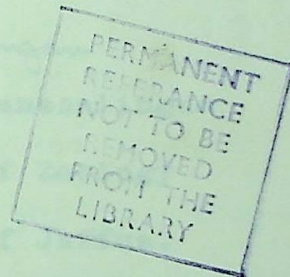
Sri Lanka.

November, 1983

UCLIB



389137



ABSTRACT

Investigations on the effects of various plant oils and their components on repellency, toxicity and the mating of Sitotroga cerealella (Olivier) were carried out in this study.

Citronella oil, lemongrass oil, lime leaf oil and Vitex negundo oil were isolated by steam distillation. The components of the different oils were separated and identified by chromatographic techniques.

The two major fractions of the plant oils namely terpene hydrocarbons and oxygenated terpenes and their respective components were also tested in this study.

Of the oils used, Vitex negundo oil was found to be the most effective repellent. Among the terpene hydrocarbons the most effective repellent was β -pinene. Among the oxygenated terpenes, citronellal and α -terpineol were most effective. As far as the synergistic effect of the constituents of terpene hydrocarbons is concerned the combination of p-cymene : β -pinene (2 : 1) proved to be the most effective. Among the oxygenated terpenes α -terpineol : camphor (3 : 1) and citronellal : citral (3 : 1) were effective. Similar studies with mixtures of components from the terpene hydrocarbons and

oxygenated terpenes showed maximum repellency in the case of camphor : p-cymene (1 : 4).

Citronella oil was found to be the most effective plant oil causing knock down, inactivation and mortality. Of the components of terpene hydrocarbon p-cymene is the most effective compound. While among the oxygenated terpenes, citronellal is the most effective compound in this respect. p-cymene : β -pinene (2 : 1) and citronellal : citral (3 : 1) proved to be the most effective synergistic combinations in the toxicity studies.

The vapours of all the oils studied and their individual components inhibited the mating behaviour of this moth. The susceptibility of the mated moths was found to be greater than in the case of the unmated ones.

These studies point to the possibility of using some of these plant derivatives such as camphor : p-cymene (1 : 4) or α -terpineol : camphor (3 : 1) in the control of this important paddy pest in the storage.