

**Electroantennogram and behavioural responses of male and female *Callosobruchus maculatus* (F.) to essential oil of lemongrass *Cymbopogon citratus* (Stapf).**

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**ABSTRACT**

Pulses are a good source of dietary proteins and other essential nutrients. However, post harvest insect infestations severely affect quality and storability of pulses. Cowpea weevil *Callosobruchus maculatus* (F.) is one of the economically important storage pests and mainly attacks stored cowpea and mung bean. Toxicity of essential oils of lemongrass to *C. maculatus* has already been studied. The present study was undertaken to investigate antennal responses (using EAG assay) and behavioural responses (using an Olfactometer) of *C. maculatus* to essential oils of lemongrass. Since flavours of cowpea attract *C. maculatus*, dichloromethane extract (cold extraction) of cowpea seed was used as a standard stimulant. In the EAG assay for the cowpea seed extract, the highest responses of  $0.992 \pm 0.124$  mV and  $0.595 \pm 0.045$  mV were observed at the dose of 3.0 mg for female and male bruchids respectively. Behavioural assay was carried out using a Y shaped Olfactometer for the seed extract. The results revealed that the dose of 5 mg showed a response of 65.5 % and the highest response of 89.6 % was observed at 25 mg of seed extract. The essential oil of lemongrass showed the highest EAG amplitude of  $1.186 \pm 0.074$  mV and  $0.631 \pm 0.071$  mV for male and female bruchid respectively at a dose of 0.20 mg. The EAG amplitude of male bruchids was significantly higher than that of the female responses in a dose range from 0.05 - 0.30 mg of essential oil ( $p < 0.05$ ). The results of the Olfactometer bioassay with the essential oils clearly indicated that the number of bruchids that respond decreased with increasing doses of essential oils. Since the present study indicates repellent activity of the essential oils of lemongrass, future studies will be continued to identify active components of lemongrass oil using GC-EAG.

Key words; Lemongrass, cowpea seed, *Callosobruchus maculatus*, EAG

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## Effect of the essential oil of *Cymbopogon nardus* on *Aspergillus flavus* Link isolated from Sri Lankan paddy and rice

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### ABSTRACT

*Aspergillus flavus* Link is a prominent pest of stored rice. Previous reports suggest that the essential oils could be used to control stored grain pests. The effect of *C. nardus* oil on the mycelial growth, sporulation and aflatoxin production was studied with the view of using this essential oil as a stored paddy/rice protectant against fungi.

*Aspergillus flavus* was isolated from paddy and rice samples obtained from the Kurunegala district. The frequency of occurrence of *A. flavus* was 2.4% - 83.5% and 0.22% - 1.3% in rice and paddy respectively.

The fungicidal efficacy of the oil of *C. nardus* evaluated in SMKY liquid medium indicated an increase in the inhibition of mycelial dry weight from 50% to 95% with the increase in the concentration of oil from 1.0 - 1.8 mg/ml. Minimum Inhibitory Concentration and Minimum Lethal concentration of the oil were 2 and 4 mg/ml respectively. No aflatoxin could be detected at or above 0.6 mg/ml of test oil in medium although the mycelial growth was not completely inhibited ( $p > 0.05$ ).

*Aspergillus flavus* grown on Potato Dextrose Agar in McCartney bottles was subjected to the vapour action of oil (0.13 - 2.8 mg/ml) added to the sponges inserted underside of the lids. Complete fumigation effect on spores was noted at 2.8 mg/ml. Therefore a potential exists in utilizing volatiles of *C. nardus* as a fungicide to control *A. flavus* stored paddy / rice. Investigations on the toxic and organoleptic aspects of oil treated grain samples are being carried out.

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