

## **Efficacy of Citronella (*Cymbopogon nardus*) Leaf Extract on Maize Weevil (*Sitophilus zeamize*) Infestation for Stored Maize in Sri Lanka**

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Damage of *Sitophilus zeamize* on stored maize is a concern among Sri Lankan maize growers, traders and consumers. With the increased awareness on health and environmental consequences associated with synthetic insecticides there is growing demand for alternate insect control strategies. Use of botanicals with essential oils can be considered as a potential alternate therefore Citronella grass (*Cymbopogon nardus*) was identified as a potential plant species for controlling of *S. zeamize*. This study was conducted with the objective of evaluating the efficacy of Citronella grass aqueous leaf extract against Maize weevil, *S. zeamize*. Area preference bioassay was conducted for the laboratory scale repellency analysis under five treatments that was a dilution series of the citronella aqueous leaf extract; 15, 20, 50 and 100  $\mu\text{L}/\text{mL}$  and control (distilled water). Repellency index was developed and three dilutions with higher repellency index were selected for storage trial. Selected three treatments (20, 50 and 100  $\mu\text{L}/\text{mL}$ ) were tested using distilled water as the control. Experiment was conducted under temperature  $32^{\circ}\text{C} \pm 1.4$  and RH  $60\% \pm 7$ . Mass loss due to insect damage was considered as the main parameter for the analysis of insect damage until loss of marketability. Experimental results revealed that the insect damage was significant for all the treatments ( $P < 0.05$ ) and it was significantly increased with the storage time period. Furthermore, no significant difference of mass loss due to insect damage ( $P > 0.05$ ) among the treatments and control was observed after one month, two months and three months of storage periods. Hence, it can be concluded that, selected dilutions of citronella aqueous leaf extract were not effective in controlling maize weevil. Most probably, it may be due to the volatile nature of active compounds of citronella grass leaf extract. Future research could be planned to investigate the same volatiles coupled with a slow volatile release mechanism.

**Keywords:** Botanicals, Citronella, Insect damage, Maize weevil, Storage pests