

ANTIFUNGAL PROPERTIES OF CHITOSAN MICROCAPSULES CONTAINING CINNAMON OIL AND LEMONGRASS OIL AGAINST *ASPERGILLUS FLAVUS* ISOLATED FROM STORED RICE

Yashodha L. Paragodaarachchi^a, Prarthana Subasinghe^b and
Suranga R. Wickramarachchi^{a*}

^a*Department of Chemistry, University of Kelaniya, Dalugama, Kelaniya, Sri Lanka*

^b*Postgraduate Institute of Science, P.O. Box 25, Peradeniya, Sri Lanka*

Abstract: Essential oils have long been attracted as substitutes for synthetic chemical pesticides because of their antimicrobial properties, low mammalian toxicity and wide public acceptance. Essential oils of lemongrass and cinnamon leaf were encapsulated using chitosan, a biodegradable polymer by emulsion formation/ionotropic gelation technique. *A. flavus* was isolated from stored rice. In-vitro antifungal efficacy of oil loaded microcapsules against *A. flavus* and its time profile were determined.

Based on morphological and molecular characteristics the fungus was identified as *Aspergillus flavus*. Both lemongrass and cinnamon leaf oil and their respective microcapsules were fungicidal against *A. flavus*. The Minimum inhibitory oil load of lemongrass and cinnamon leaf oil microcapsules were 0.5 g and 0.75 g respectively. Lemongrass showed a comparatively higher activity than cinnamon against the test fungi. However, cinnamon possessed the antifungal activity for a longer duration than lemongrass. Encapsulation of oil within chitosan may effectively reduce the evaporation rate of oil thus increasing its bioavailability. Microcapsules of cinnamon and lemongrass oil have the potential to be developed as a natural fungicidal formulation to control *A. flavus*.

* Suranga, Wickramarachchi, e-mail: suranga@kln.ac.lk