



Section D

401/D

Antifeedant properties of endophytic fungi of *Cyperus iria* on *Plutella xylostella* (Diamond Black Moth) larvae

S.D.Herath,¹S.U.Rajapaksha,¹J.M.N.M. Jayasundara,¹P.B. Ratnaweera,^{1*}K.M.D.W.P.Nishantha,² and E.D. de Silva³

¹Department of Science and Technology, Uva Wellassa University, Badulla, Sri Lanka,

²Horticultural Crop Research and Development Institute, Gannoruwa, Sri Lanka,

³Institute of Biochemistry, Molecular Biology, Biotechnology, University of Colombo, Sri Lanka

Plutella xylostella is a destructive pest that affects cabbage cultivations in Sri Lanka causing economic loss. Continuous application of synthetic insecticides has produced environmental and health hazards, while the insects have developed resistance. Thus, there is a crucial need for new environmentally friendly alternatives. Endophytic fungi of grasses and sedges are known to possess insect repellent activities. Hence, this study was designed to investigate the antifeedant properties of endophytic fungi of the sedge, *Cyperus iria*, against *P. xylostella* larvae. Endophytic fungi were isolated from surface sterilized healthy tissues of *C. iria* and their ethyl acetate extracts were subjected to no choice leaf disc assay against *P. xylostella* 2nd instar larvae at 200 µg/cm². Feeding deterrence indexes (FDI) were calculated using the consumed area after 24 hr while larval mortality percentage was also evaluated by counting the number of dead larvae after 24, 48 and 72 hr of incubation. The experiments were conducted in triplicate and the data were statistically analyzed using Minitab 16. The isolated endophytic fungi, five from roots and twelve from aerial parts, were identified using molecular techniques. Out of these, five extracts showed high (FDI>60%), four extracts each, showed medium (30%<FDI<60%) and low ((FDI< 30%) feeding deterrence, while another four extracts exhibited feeding stimulant activity. The highest feeding deterrence was exhibited by *Khuskia oryzae* extract (FDI = 98%) while both *K. oryzae* and *Diaporthe miriciae* (FDI = 96.74%) extracts showed a similar antifeedant activity ($p>0.05$) to that of the positive control (neem-1% EC). *Schizophyllum commune* extract showed the highest feeding stimulant activity. Further, 66.67 % larval mortality was recorded for the *K. oryzae* extract while no larval mortality was recorded for *D. miriciae* extract, after 24 hr of incubation. Thus the highest feeding deterrence shown by *K. oryzae* extract may have aroused due to the mortality of the larvae. Therefore the best extract with antifeedant properties is *D. miriciae* while *K. oryzae* extract demonstrates good larvicidal properties. In conclusion, the potent antifeedant and larvicidal properties exhibited by several endophytic fungal extracts of *C. iria* demonstrate their potential to be developed as effective antifeedants and larvicides.

Keywords: endophytic fungi, feeding deterrence, leaf disc no-choice bioassay, *Plutella xylostella*,

Acknowledgment: Financial assistance by National Science Foundation, Sri Lanka, Research Grant (RG/2016/EB/03)

pamoda.b@gmail.com

0718400236