

Full Length Research Paper

Acaricidal activity of *Hypocrella raciborskii* Zimm. (Hypocreales: Clavicipitaceae) crude extract and some pure compounds on *Tetranychus urticae* Koch (Acari: Tetranychidae)

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The acaricidal activity of secondary metabolites from an entomopathogenic fungus, *Hypocrella raciborskii* Zimm. in controlling two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is explored in this study as a new agent for pest control. The crude extract was prepared in ethyl acetate. Secondary metabolites were elucidated using Nuclear Magnetic Resonance and High-Resolution Mass Spectrometry analysis. The major secondary metabolites of the crude extract were ergosterol, dustanin (15 α , 22-dihydroxyhopane) and 3 β -acetoxy-15 α ,22-dihydroxyhopane. The crude extract and pure compounds were used to determine their toxicity, repellency and oviposition deterrence against *T. urticae*, under the laboratory conditions. Crude extract of 3% w/v showed a strong contact toxicity (97% mortality, one day after treatment) and residual toxicity (80%, three days after treatment). Ergosterol induced 75% mite mortality in a residual toxicity bioassay. Females topically sprayed with 3% crude extract had their egg production reduced by 97%. Direct spraying of 3 β -acetoxy-15 α , 22-dihydroxyhopane and dustanin reduced egg production of *T. urticae* by 71 and 70%, respectively. Both crude extract and pure compounds had relatively slight repellency effect on *T. urticae*.

Key words: Fungal metabolites, bioassay, two-spotted spider mite.

INTRODUCTION

Fungi from genus *Hypocrella* are pathogens which belong to Division Ascomycota, Family Clavicipitaceae. They are known as entomopathogens infesting scale insects (Coccidae, Homoptera) and whiteflies (Aleyrodidae, Homoptera) and are quite common in

tropical region, especially in the moist old-growth forests where the epizootics normally occur on their hosts (Hywel-Jones and Evans, 1993; Chaverri et al., 2008).

Several entomopathogenic fungi produce secondary metabolites, many of which are reported to exhibit insecticidal, phytotoxic, cytotoxic, antiviral, antifungal antitumor and antibacterial activities (Krasnoff et al., 1996; Pelaez, 2004; Jin-Ming, 2006). However, there is a paucity of information regarding secondary metabolites or toxins produced by *Hypocrella* due to the lack of available

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