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"Towards securing human welfare through management of insect diversity in a changing world"

"Vers une amélioration du bien-être humain grâce à la gestion de la diversité des insectes dans un monde en mutation"

"نحو تأمين الرفاهية البشرية من خلال إدارة تنوع الحشرات في عالم متغير"



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“TOWARDS SECURING HUMAN WELFARE THROUGH MANAGEMENT OF
INSECT DIVERSITY IN A CHANGING WORLD”

“VERS UNE AMÉLIORATION DU BIEN-ÊTRE HUMAIN GRÂCE À LA GESTION
DE LA DIVERSITÉ DES INSECTES DANS UN MONDE EN MUTATION”

“نحو تأمين الرفاهية البشرية من خلال إدارة تنوع الحشرات في عالم متغير”



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ST-8.09. Phytochemical Investigation of Four *Turraea* (Meliaceae) Plant Extracts Towards Management of *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae)

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Abstract

Tropical plants were used for centuries as manure and for pest management on various crops against different insects. They are sources of bioactive compounds with diverse modes of action. The aim of this study was to evaluate the insecticidal activities of four *Turraea* (Meliaceae) plant species on the invasive tomato pest *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae). Plant parts were extracted with hexane, dimethyl ether, acetone, chloroform and methanol and administered on second-instar larvae of *T. absoluta*. The methanolic extract of *T. abyssinica* leaves was most active with LD₅₀ of 270.78 ppm and showed 30% antifeedant effect on the larvae at 50 ppm. Bioassay guided separation of the extract led to isolation of three limonoids. The structures of the compounds were elucidated by 1D and 2D NMR analyses and by comparison with reported data. The compounds 1,7,12-triacetoxy-4-carbomethoxy-11-hydroxy-14,15-epoxyhavanensin, 11-epi-21-hydroxytoonacilide and 11,12-diacetoxycedrelone (**3**) showed varying levels of larvicidal activity. 1,7,12-triacetoxy-4-carbomethoxy-11-hydroxy-14,15-epoxyhavanensin, was the most potent (LD₅₀ = 4.62 ppm),] more potent than azadirachtin (7.8 ppm). All of the isolated constituents showed lower (≤ 10%) antifeedant activity compared to the crude extract (> 50%) at 100 ppm. The results showed that *Turraea abyssinica* can be a promising source of phytochemicals for controlling *Tuta absoluta*.

Keyword: *Turraea* species, larvicide, *Tuta absoluta*, antifeedant, limonoids.

ST-8.10. Intercropping System: Potential for the Control of Bean Flower Thrips with Masking of Lemongrass and Mexican Marigold

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Abstract

Cowpea (*Vigna unguiculata*) is an important food and forage legume in Africa. The bean flower thrips (*Megalurothrips sjostedti*) is one of the major pests of cowpea in Sub-Saharan Africa, reducing crop yield. Chemical pesticides remain the main control strategy, even with their negative impact on human and environmental health. Intercropping with maize as a visual barrier is commonly used by the smallholder farmers to reduce pest populations on cowpea. The use of host and no-host volatiles is another alternative method to reduce thrips pest populations in IPM strategy. The objective of this study was to evaluate the effect of semiochemical interactions between cowpea and two repellent plants, *Cymbopogon citratus* and *Tagetes minuta*, on the behaviour of *M. sjostedti*. Initially, we evaluated the attractiveness of vegetative parts and flowers of four cowpea varieties (KK1, K80, M66 and eL) to male and female *M. sjostedti* using Y-tube olfactometer. With the exception of flower of cowpea variety KK1 which were attractive to female *M. sjostedti*, all the varieties induced repellence or neutral responses to both sexes of the pest. Combination of KK1 flower with either *C. citratus* cut leaves or *T. minuta* plant were less attractive than cowpea flower alone (KK1) for females. However, the inhibitory effect of *C. citratus* cut leaves disappeared after 24hours. Overall, these results highlight the potential of exploiting volatile compounds from repellent plants to reduce *M. sjostedti* infestation in cowpea cropping systems.

Keywords: Semiochemicals, *Megalurothrips sjostedti*, *Cymbopogon citratus*, *Tagetes minuta*, Y-tube olfactometer