

**Bioassay-Guided Isolation of Active Phytochemicals Against *Tuta absoluta* (Meyrick) from *Turraea floribunda* and *Caesalpinia welwitschiana***

**Flaure Rosette Essoung Ehawa, Samira Abuelgasim Mohamed, Ahmed Hassanali, Sumesh Chander Chhabra**

**Abstract**

*Tuta absoluta* Meyrick is now one of the most harmful insect pests of Solanaceae in various parts of the world. Synthetic pesticides are the most used, current control method, but are associated with several problems including the development of resistance and negative ecological effects. These led to the search for more eco-friendly methods of controlling the pest, such as a search for phytochemicals that show subtle anti-pest properties. In the present study, the effects of the constituents of methanolic extracts associated with *Turraea floribunda* and *T. nilotica* leaves (Meliaceae) and those of *Caesalpinia welwitschiana* and *C. bonduc* roots (Fabaceae-Caesalpiniaceae) were evaluated on second instar larvae of *T. absoluta*. The extract from *T. floribunda* leaves was the most active (LD50 = 587.0 ng/μl), followed by *C. welwitschiana* (LD50 = 779.1 ng/μl). Bioassay-guided isolation of active compounds from these active extracts, using column chromatographic and preparative HPLC, led to the identification of twenty-two compounds. Their structures were established using spectroscopic techniques, including MS, 1 and 2D-NMR, and also by comparison with reported data. The methanolic leaf extract of *T. floribunda* yielded ten compounds ( $\beta$ -sistosterol, stigmasterol, ursolic acid, betulinic acid, a mixture of  $\beta$ -sistosterol-3-O- $\beta$ -D-glucopyranoside and stigmastreol-3-O- $\beta$ -D-glucopyranoside, fridelin, lupeol, 11-epi-21-hydroxytoonacilide and 11 $\beta$ , 12 $\alpha$ -diacetoxycedrelone). The methanolic roots extract of *C. welwitschiana* afforded twelve constituents, including apigenin, luteolin, afzelin, quercitrin, epiafzelechin-3-O-gallate, Kaempferol 3-O- $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 2)- $\beta$ -D-glucopyranoside, Kaempferol, dipteryx acid, neocaesalpin L, rutin, methyl gallate, and galic acid. Some of the isolates were tested on *T. absoluta* eggs. They showed varying levels of ovicidal effect, with quercitrin being the most active constituent at 81%. The results of the study showed potential of the phytochemicals of these plants in the management of *T. absoluta*.

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