



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Insecticidal Effects of *Parthenium hysterophorus* Extracts Rich in Terpenoids and Phenolic Acids

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Abstract

According to the International Parthenium Research Group, the origin of the weed *Parthenium hysterophorus* is considered to be Mexico, America, Trinidad and Argentina. It is a fast-maturing annual weed that may reach a height of 2 m. Its leaves are pale green, branched and covered with soft fine hairs. Although it was first recorded in Natal, South Africa, in 1880, it appears to have become common and troublesome only since the 1980s. It is an aggressive colonizer of wasteland, roadsides, cultivated fields, and overgrazed pastures. *Parthenium* is an extremely prolific weed and causes severe economic loss, health problems and habitat destruction. It is known to release allelochemicals that inhibit the germination and growth of pasture grasses and other plants. We wanted to know if such substances also show insecticidal efficacy against insect pests.

In a field study water extracts from shade dried *Parthenium* leaves have been applied to *Brassica juncea*, for controlling mustard aphid, *Lipaphis erysimi* (Kaltenbach). Population density was noted three days after extract application. The extract of *Parthenium* exhibited a tremendous reduction (down to 29 % of the initial infestation) in the number of *L. erysimi*, one of the most important pests of *B. juncea*, may be due to the effect of phenolic acids.

In contact laboratory experiments with methanolic extract against *Harpalus* sp. (Carabidae) and *Aphis fabae* (Aphidae) we could not find any insecticidal effect. However, in choice experiments where insects could choose between treated and untreated plant material, the extracts revealed a strong repellent effect.

To understand differences in results for different extracts we are going to analyse secondary plant components using acidified methanolic extracts from different aerial parts of *Parthenium*. The terpenoid parthenin and different phenolic acids are redissolved in acetonitrile and in 20 % ethanol for HPLC analysis.

Keywords: Ethiopia, insecticidal effect, parthenin, *Parthenium hysterophorus*, phenolic acid