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Chemical Composition and Insecticidal Activity of Essential oil obtained from DCM Extracts of *Psoralea corylifolia* against Agricultural pest

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ABSTRACT

The insecticidal activity of essential oils obtained from DCM extracts of *Psoralea corylifolia* (Fabaceae) against pupa of Epilachna insect was investigated in a series of laboratory experiments. Insecticidal activity was determined at 24 ± 4°C and 68 ± 5% R.H., in dark conditions. The DCM extracts of the dried seeds of the plants were subjected to Column chromatography and the oil obtained was then subjected to hydrodistillation using a Clevenger type apparatus. The major components in these essential oils are identified using GC-MS spectroscopy and their insecticidal activity was tested. The predominant components in the oil of *Psoralea corylifolia* are toluene, alpha-pinene, L-beta-pinene, beta-pinene, 3-carene, limonene, Gamma terpinene, terpinolene, alpha santolina alcohol, 4-terpineol, Cyclohexene, 1-methyl-4-(1-methyl ethenyl), caryophyllene, alpha caryophyllene, thumbergene. The mortality rate of the agricultural pests was checked against 1%, 5% and 10% conc. of essential oil. The essential oil from *Psoralea corylifolia* shows strong toxic effect against pupa of Epilachna insect. Finding insecticidal activity is of great importance as using plant extracts as insecticides, are biodegrable and do not leave toxic residues results in better crop and better human health.

Key words: *Psoralea corylifolia,* Fabaceae, Epilachna insect, Mortality rate.

INTRODUCTION

Psoralea corylifolia L. is an important medicinal plant found in the tropical and subtropical regions of the world. It was found to synthesize diverse phenyl propanoids such as furanocoumarins, isoflavonoids etc[1-2]. These compounds are mainly used to cure leucoderma, leprosy, psoriasis and inflammatory diseases of skin[3]. The review reveals that it possess important activities like antibacterial, anti-inflammatory, antitumour, hepatoprotective, antioxidant and antihelminthic[4]. The insecticidal activity is due to the presence of secondary metabolites. The wild population of this medicinally important plant exhibits high mortality of the seedlings, and plant populations decline very quickly due to indiscriminate and illegal collections, and destruction of habitats. Therefore, this species has been included in the list of endangered plants[5-6]. Thus the objective of the present study is to find out the insecticidal activity of essential oils against crop pests.

The herbal drugs have been used throughout the world have received greater attention in recent times, because of its diversity of curing diseases safety and well tolerated remedies compared to the conventional medicines. A rational approach is being developed to use medicinal plants as an insecticide. The insecticidal activity is due to the presence of active molecules[7].

MATERIALS AND METHODS

Collection and Identification

The seeds of the plant *Psoralea corylifolia* were purchased from an authentic seed shop of

Jammu District and Identified by Dr. Rajesh Manhas of University of Jammu, India.

Extraction

The seeds were dried on laboratory benches at room temperature for seven days, crushed, soxhlated with DCM to get crude extract which is than subjected to Column Chromatography and oil obtained from 1:1 Pet. Ether: DCM was hydro distilled with Clevenger type apparatus to get essential oil. The essential oil was stored in airtight glassware in refrigerator at 4p C until being used in the treatment[8].

GC-MS Analysis of Extracted Oil

The oily fraction was analyzed by using Varian 4000 GC-MS/MS unveiled the presence of following components:

Insecticidal Testing

The essential oils obtained were dissolved in distilled water at three different concentrations (1 %v/v, 5 % v/v, 10 % v/v).

Insect Assayed

The Epilachna insect were collected from the fields and identified by Entomologist Dr. Sudhakar Gupta of Zoology Department of Lovely Professional University.

Determination of Insecticidal Activity by Contact toxicity assay

The Wheat leaves are taken from the field, washed, dried and then dipped in the respective percentage of essential oils (i.e. 1%, 5%, 10% v/v) for two hours and then 10 insects are allowed to feed on these leaves in each jar under controlled conditions of temperature and humidity. Control dishes with DCM, distilled water and without solvent were performed separately up to 72 hours. Mortality was assessed after 3, 4, 7 and 12 h of the treatment. The calculation of mortality rate was corrected for control mortality according to Abbott's formula[9]:

$$Mc = (Mo-Mc/100-Me) * 100$$

RESULTS AND DISCUSSION

Controlled experiments have demonstrated no toxicity against the insects. The

Table 1: Toxicity of *Psoralea corylifolia* essential oils on Agricultural insect

S. No.	Plant Name	Insect	% of Extract	No. of Insects USED	No. of Insects dead (Hours)				Total No. of Insects dead	% Average Mortality	% Corrected Mortality
					3	4	7	12			
1.	*Psoralea corylifolia*	*Epilachna sp.*	1 %	10	-	-	6	10	10	100	100
2.	*Psoralea corylifolia*	*Epilachna sp.*	5 %	10	5	7	10	10	10	100	100
3	*Psoralea corylifolia*	*Epilachna sp.*	10 %	10	10	10	10	10	10	100	100

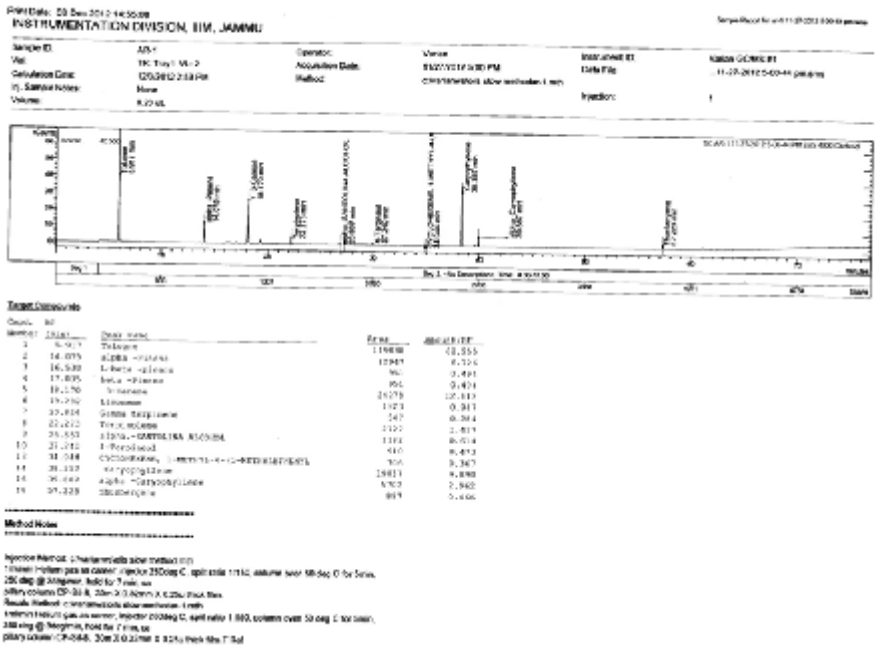

Fig. 1: Various components from Essential Oil of DCM Extracts

Fig. 2: Showing Mortality of pupa of Epilachna insect

results are mentioned below:

The essential oil from *Psoralea corylifolia* shows strong toxic effect against Epilachna sp.

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