



## Effect of Chromatography with "Jha" on Lepidopteran Pest (One Medicinal Plant – *Cleome viscosa* Two Larva *D. Obliqua* .*E.Fabia*.)

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### ABSTRACT

A new approach to insect pest control is the use of substances that adversely affect insect growth and development. These substances are classified as "insect hormone mimics" or "insect growth regulators"(IGRS) due to effect of chromatographic techniques used for separation of compound on certain physiological regulatory processes essential to the normal development of insect or their progeny of column chromatography by different solvent systems. These are several known insect JHAs. synthesized and secreted from the corpora allata of juvenile Hormone analogues JHA I other peptide and steroid hormone.

### Chromatographic techniques used for separation of compound

In the present study separation of the compound were carried out with help of column chromatography by using different solvent systems which were followed by thin layer chromatography applying the same solvent systems and R<sub>f</sub> (Retention factor) value were noticed and compared it along with the authentic marker's well known compound.



Fig. 5 Thin layer chromatography of *Cleome viscosa* plant extracts.



Fig. 4 Column Chromatography of *Cleome viscosa* plant extracts.

### Column Chromatography of the plant extract

Column chromatography was done according to Stock and Rice (1974) in which solvent was used as the mobile phase while a finely divided solid surface of silica was used as the stationary phase which adsorbs the components of the mixture to varying degrees. AS THE SOLUTION containing the mixture has passed over the adsorbent, the components have distributed between the solvent and adsorbent surface.

### Thin Layer Chromatography of the plant extract

In thin layer chromatographic separations, different substances are partitioned differently between two phases: viz. a mobile phase and a stationary phase. In thin layer chromatography (TLC), the mobile phase is a liquid and the stationary phase is a solid adsorbent. The adsorbent (Silica) is coated onto a solid support as a thin layer (about 0.25 mm thick). Silica coated alumina plates were available in the laboratory. Spectral analysis of the plant extract solvent or mixture of solvents, called the eluent or solvent systems were used which moves up the plate by capillary action. The spot on the thin

layer plate must be positioned above the level of the solvent in the container. If it is below the level of the solvent, the spot get washed off the plate into the developing solvent. The solvent, which is in the bottom of the container, creeps up the layer of adsorbent, passes over the spot and as it continues up, effects a separation of the materials in the spot which develops the chromatogram. When the solvent front has nearly reached nearly the top of the adsorbent, the thin layer plate was removed from the container. In TLC, the distance travelled by a substance, relative to the distance travelled by the solvent front, depends on the molecular structure of the substance. TLC can be used to identify substances as well as to separate them. The relationship between the distance travelled by the solvent front and the substance is usually expressed as the R<sub>f</sub> (Retention factor) value by the formula of Brimley and Barrett (1953) mentioned below:

$$R_f = \frac{\text{Distance moved by the solute or substance}}{\text{Distance moved by the solvent front}}$$

The R<sub>f</sub> values are strongly dependent upon the nature of the adsorbent and solvent. Therefore, experimental R<sub>f</sub> values and literature values do not often agree very well. In order to determine whether an unknown substance is the same as a substance of known structure, it is necessary to run the two substances side by side in the same chromatogram, preferably at the same concentration. In the present study, the solvent system toluene: ethyl acetate: glacial acetic acid (5:5:0.3) was finally used for the TLC and spots were counted for the calculation of R<sub>f</sub> value.

For spectral analysis the active fractions obtained from the extract of cleome viscosa where send to SAIF(Sophisticated Analytical Instrumentation facility) CDRI Lucknow to get IR, UV,HNMR, CNMR and spectral analysis. Obtain a graph were interpreted with the help of the Phytochemist and Juvenile hormones in analogue (JHA) like active principle was elucidated.

Systematic position and general descriptions of testis animals

1. *Diacrisia oblique*.

Phylum - Arthropoda

Class- insecta

Sub-class-Pterygota

Division- Endopterygota

Oder- Lepidoptera

Superfamily – Noctidae

Family – Arctiidae

Genus – *Discrisia*

Species – *Obliquis*(Walker)

The Bihar hairy caterpillar *Diacrisia oblique* Walker is an important and destructive pest of variety of crops particularly in soya bean which causes damage to Soya bean, jowar, groundnut, Jute and many vegetables. When grown they disperse all over the field and eat the leaves and top shoot. The young caterpillars feed on the epidermis of leaves and then spread over the whole area causing serious damage to the plants. It is distributed almost throughout India. The caterpillar feeds gregariously parenchymatous cells of host plant and ultimately whole leaf plant destroyed. The larvae were collected from the agriculture field of Soya bean near St. Mary P.G College Vidisha and were reared on fresh Soya bean leaves in the laboratory at 27<sup>0</sup> ± 1<sup>0</sup>C and 75 plus±5 percent relative humidity (RH) and 2<sup>nd</sup> insect larvae measuring 5.00 mm plus± 0.1 were used for experimental bioassay.

2. *Eariasfabia Stoll*

Phylum - Arthropoda

Class- insecta

Sub-class- Pterygota

Division - Endopterygota

Oder- Lepidoptera

Superfamily – Noctidae

Family – Nolidae

Genus – *Earia*

Species – *Fabia*(Stoll)

The Bindi or Okra Hibiscus pest well known as pest of Okra which deformed pods and damaged seeds, due to borer infestation, decrease the seed yield and its quality. Hence, it seriously affects the yield of okra crops. Besides this the *Eariasfabia* infest different plant in many regions. A laboratory culture of *Eariasfabia* was started with several infected okra pod collected from vidisha surrounding area and were reared on fresh leaves and pod in the laboratory at 27<sup>0</sup> ± 10<sup>0</sup> and 75±5 percent relative humidity (RH) and 2<sup>nd</sup> instars larvae measuring 5.00mm±0.1 were used for experimental bioassay.

## Experimental Bioassay

For the experimental bioassay *Diacrisia oblique* and *Eariasfabia* paste were collective from the agricultural area of the Vidisha district (M.P) and where brought in to paste control and Ayurvedic Drug research laboratory, Department of Zoology S.S.L Jain College at Vidisha which were reared in the insectary. *Diacrisia oblique* Walker was reared on the leaves of Glycine Max. The Larvae *Eariasfabia* which is a polyphagous pest and were collective from Okras field of Vidisha and reared in the insectary maintained at 27±10<sup>0</sup>RH 75±5% and elder oil upon 12 hour.

The extracts in different concentration where are tested on the abdominal segment of caterpillar of the both the insects. 1µl crude extract of *Cleome viscosa* extract was applied topically to the abdominal 5th instar Larvae different concentration of tested substance. Growth index Juvenomimicstages and feeding activity along with behavioral changes were worked out for both the test insects.

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