

APPRAISAL ON INSECT-PESTS OF MEDICINAL AND AROMATIC PLANTS

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Introduction

The ancient Indians were having a vast knowledge of medicinal plants. The plants have been used to cure diseases since antiquity. The ancient Indians were having a vast knowledge of medicinal plant. In India, the Ayurvedic system of medicines flourished from vedic period down to the invasion by Mohammadans. Medicinal plants products consumed all over the India to healing specific ailments have been in vogue from ancient period of time. Indian traditional system of medicine namely ayurvedic, sidda and unani have been in existence for several centuries. Kumar (2007) recorded eight species of phytophagous insect fauna on Ashwagandha, these have been classified as foliage feeder (4 species), sap sucking insects (3 species) and flower & fruit consumer (1 species) based on their feeding nature. Same author recorded 11 species of phytophagous insects infesting coleus and these have been categorized as defoliators (6 species) and sucking insects (4 species) based on their feeding habit. (Ramanna *et al* 2010)

Scenario of medicinal plants and crop plants

Medicinal and Aromatic Crop Plants: Development of medicinal industry takes palce at the rate of 7-15% yearly. According to estimate of conservation, the medicinal plants value in India trade of about Rs 5,000 crores per annum ,while the world trade is about 62 billion US dollars. (Sharma *et al* 2014)

Production of developing countries is about 55% followed by developed countries (10%). 1.16. The Indian ancient researcher has recognized approx 1500 medicinal plants, and more than 500 species are used as a major component of drugs. The medicinal plants contribute to attend 80% of the raw materials used in the preparation of various drugs. The effectiveness and their performance of these drugs mainly based upon the proper use and sustained availability of virtual raw materials.

Requirement (more than 90%) of Indian medicinal drug industries for medicinal plants are still collected from natural sources. Medicinal plants mostly cross pollinated; these

cannot ensure consistent quality due to lot of genetic variability found in the natural populations. Moreover, the collection of plants from the wild has many disadvantages like improper supply, unreliable botanical identification, expensive post harvest handling and higher chances of adulteration and substitution. 1.17. Paradoxically, there is hardly any reliable data available on area, production and productivity of cultivated medicinal species since these are not recorded. (Sharma *et al* 2014)

Insect Pests of medicinal plants

India has the leading position in the production and world trade in plant drugs and intermediaries obtained from opium poppy, isabgol, senna, rauvolfia, cinchona, periwinkle, Gloriosa, papaya (papain) and ipecac. Cultivation of medicinal plants has been done on a large scale away from their natural conditions, in cultivated fields. These plants in a new situation may prove ideal food for indigenous herbivores, thus, constituting pest problems. The cultivation of these plants in the large scale in state may face the problem of sudden appearance of large populations of various insect pests in a single crop. Like other plants, medicinal plants too have to bear the devastating effects of injurious insect-pests, those are not only harmful for the plant but also, deteriorate the quality of the produce, thus hampering its medicinal value. The information regarding the occurrence of insect-pests on medicinal and aromatic plants of the state is scanty. Hence these studies were undertaken to record the insect-pests related with important medicinal plants in the state. In India, use of different parts of several medicinal plants to cure specific diseases. (Sharma *et al* 2014)

Kumar *et al* (2007) recorded eight species of phytophagous pests on Ashwagandha, these have been categorized as defoliators (4 species), sucking insects (3 species) and flower & fruit feeder (1 species) based on their feeding habit. Same author recorded 11 species of phytophagous insects attacking coleus and these have been categorized as defoliators (6 species) and sucking insects (4 species) based on their feeding habit. Survey was undertaken to know different insect pests on selected medicinal plants viz., Ashwagandha, Coleus, Shathavari, Amruthaballi and Solanum viarum were recorded

during cropping season in KRCCH, Arabhavi (Belgaum district) from August 2008 to March 2009. (Sharma *et al* 2014)

Incidence and population levels of different insect pests of cultivated medicinal plants have been studied by various workers. Survey on insect pest incidence on different medicinal plants have been attempted by various workers. Fletcher (1917) reported *Heliothis armigera* Hubn., *Agrotis ypsilon* Rott., *Prodenia litura* Fab., *Chrotogonus* sp., *Euxoa segetum* Schf., *Atmetonychus peregrinus* Olivier, to be pests of *Papaver somniferum* Linn. and *Heliothis armigera* Hubn., *Pempheres affinis* Fst. and *Diacrisia obliqua* Walk. as serious defoliators of *Cannabis sativa* Linn. Different pests recorded on randomly selected medicinal plants such as Ashwagandha, Coleus, Amruthaballi, Sathavari and *Solanum viarum*. Eleven species of phytophagous pests on Ashwagandha belonging to different orders viz., Hemiptera (5 species), Coleoptera (3 species), Lepidoptera (3 species) and Acarina (1 species). (Sharma *et al* 2014).

1. *Withania somnifera* Dunal (Ashwagandha)

Seven insect pests species were found on *Withania somnifera*. The leaf feeding beetle (hadda beetle), *Henosepilachna vigintioctopunctata* (Fabr.) was recorded at Baldook (Hamirpur) with a population of 3.5 beetles per plant.

The occurrence of *H. vigintioctopunctata* on *W. somnifera* has also been reported by Parjhar *et al.*, (1997). The Coleopteran beetles and grubs were appeared on the epidermal layer of leaves, which presented a web-like appearance. *H. vigintioctopunctata* in general is reported to be a pest of Solanaceae and Cucurbitaceae in South East Asia (Shirai and Katakura, 1999). Sap sucking bugs viz., green potato bug, *Nezara viridula* (Linn.), red cotton bug, *Dysdercus cingulatus* (Fabr.) and one unknown pentatomid bug were recorded feeding on *W. somnifera* at Baldook (Hamirpur) with population of 1.3, 1.2 and 1.4 adults per plant, respectively (Sharma *et al* 2014).

The nymphs and adults of *N. viridula* and *D. cingulatus* were observed damaging leaves and inflorescence by sucking the cell sap. Some of the leaves on the plant were observed drying up gradually.

The larvae of polyphagous insect pest, gram pod borer, *Helicoverpa armigera* (Hübner) were recorded on *W. somnifera* in farmer's field at Berthin (Bilaspur) with population of 1.4 larvae per plant. The pod borer, *H. armigera* was found to cause low degree of damage to *W. somnifera* leaves and flower buds.

2. *Rauwolfia serpentina* Benth. ex Kurz (Sarpagandha)

At herbal garden, Jogindernagar, mango mealy bug, *Drosicha mangiferae* (Green) (with a population of 35.8/plant) were found damaging leaves and apical twigs of the plants. The adults/nymphs were recorded on inflorescence, apical stem

and leaves. The population of mealy bugs was concentrated on apical portion of the plant, covering the plant with cottony mass and gradually resulted in drying up of the plant. The mango mealy bug is widely distributed in the Indo-Gangetic plains from Punjab to Assam. Besides mango, it also attacks 62 other host plants including trees like jack fruit, the banyan, guava, papaya, citrus, jamun etc. (Atwal and Dhaliwal, 2005).

3. *Bacopa monerii* (Linn.) (Brahmi)

Brahmi, *Bacopa monerii* is damaged by Tobacco caterpillar, *Spodoptera litura* (Fabr.), the damaging the leaves with a population of 1.6 larvae per plant. *S. litura* is a polyphagous pest occurring throughout the country. It is mainly a pest of tobacco but it also attacks tomato, potato, castor, jowar, maize, cabbage, gram, legumes, groundnut, jute etc.

4. *Aegle marmelos* (Correa Ex. Roxb.) (Bael)

Trifoliate Bael plant they are highly affected by various leaf feeder insect pests. The bael plants at Panthaghati (Shimla) were found an affected by *Papilio* sp. (3 larvae/plant). The larvae damaged the leaves from the margins and. The larvae of *Papilio* sp. were recorded feeding on leaves of *A. marmelos* in medium intensity. The larvae of citrus butterfly have been reported all over the citrus growing area in India and cause very hug damage in all varieties of Rutaceae family plants (Atwal and Dhaliwal, 2005).

5. *Digitalis lanata* (Ehrh.) (Woolly foxglove)

An unidentified species of scale was found associated with foxglove, *D. lanata* plants at Panthaghati (Shimla) with a population of 25.4 nymphs per plant. Leaves lower portion affected by sucking insect pests they suck cell sap. Damaged leaves were observed to be brownish and gradual drying. The association of scale, *Coccus* sp. on *Digitalis* has already been reported (www.fao.org). *Aphis nerri* is a hemipterus sucking pest was also found associated with this plant in some localities. (Sharma *et al* 2014)

6. *Celastrus paniculatus* (Wild) (Mal-kangani)

Pyrrhocorid bugs were damaging this plant. Eggs were observed to be laid in groups and nymphs on hatching started feeding on plants gregariously. Nymphs and adults damaged leaves and developing seeds. The pest population was observed to be 2.0 adults per plant.

7. *Saussurea costus* (C.B. Clarke) (Kuth)

Various species of insect pests were found on *Saussurea costus*, to be founded at different locations. Among these, semilooper, *Thysanoplusia orichalcea* was recorded at three locations i.e. Panthaghati (Shimla), Shilly (Solan), Brundhar (Kullu). The different instars of the pests were observed feeding on leaves by biting round holes. *T. orichalcea* was

found associated with Kuth at four different locations in the state damaging the leaves of the plants in low intensity.

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