



A Review On Insect Pests Of Medicinal Plants With Special Reference On The Pest Management Of Ashwagandha, *Withania Somnifera* (Linn.)

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ABSTRACT

Withania somnifera, an important medicinal plant known for its rejuvenating properties is called Indian Ginseng. Roots, leaf and occasionally seeds of *W. somnifera* are used in Ayurvedic and Unani medicines. Roots contain several alkaloids and withaniols prescribed in medicine for hiccup, several female disorders, rheumatism, dropsy, lung inflammation, stomach and skin diseases. It is also an ingredient of tonics prescribed for curing disability and sexual weakness in males. Like other crops, Ashwagandha is also infested by many insect pests. The larvae of *Deilephila nerii* Linn. were found defoliating the leaves of Ashwagandha. Three species of Coleopterans were found feeding on the leaves of Ashwagandha. *Henosepilachna vigintioctopunctata* (Coleoptera: Coccinellidae) was predominant at early stage of the crop both adults and grubs cause damage to the leaves and tender parts by scraping the epidermal layer in a very characteristic manner leaving a netted pattern. The incidence of *Epilachna* beetle resulted incomplete skeletonized leaf during heavy infestation at later stage of the crop growth. Finally the plants dried and wither up. Green plant bug, *Nezara viridula* Fab. is a polyphagous pest, where nymphs and adults were observed to suck the sap from leaves, buds of Ashwagandha *Helicoverpa* sp. was found feeding on leaves and also boring into buds, flowers and fruits with its head.

Key Words: medicinal plant, *Withania somnifera*, *Epilachna* beetle.

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INTRODUCTION

In India, the use of different parts of several medicinal plants to cure specific ailments has been in vogue from ancient times. The indigenous system of medicine namely ayurvedic, sidda and Unani have been in existence for several centuries. This system of medicine caters to the needs of nearly 70% of our population residing in the villages. Apart from India, these systems of medicines are prevalent in Korea, China, Singapore, West Asia and many other countries. India has the leading position in the production and world trade in plant drugs and intermediaries obtained from opium poppy, isabgol, senna, rauwolfia, cinchona, periwinkle, *Gloriosa*, papaya (papain) and ipecac.

Withania somnifera, an important medicinal plant known for its rejuvenating properties The plant is native to Mediterranean region and found growing naturally in forest particularly in drier regions of India. It is considered as an important medicinal cash crop in Mandsaur district of Madhya Pradesh, adjoining areas in Rajasthan villages and Garhwal hills. Among the sucking pests and defoliators recorded on medicinal plants some of the important pests recorded are aphids, mites, scales, mealy bugs and hadda beetle (Mathur and Srivastav, 1964). *Henosepilachna vigintioctopunctata*. Fab is one of the major pests on Ashwagandha causing severe damage to the crop. The beetle skeletonize the leaves in severe condition affects the growth of the crop.

REVIEW OF LITERATURE

Srinivasan and Prasad (1978) noticed the large scale occurrence of Sphingid *Dilephila nerii* Linn. on *Catharanthus roseus* in Bangalore causing extensive damage to the foliage. Quinalphos 25 EC (Ekalux) 0.025 per cent sprayed once in 15 days gave the good control.

Lecheva *et al.* (1996) reported a total of 38 species of insect pests belonging to 7 orders and 14 families on various medicinal and aromatic plants in Bulgaria. Out of which coleopterans were most abundant (34.2%) followed by Lepidoptera (22.4%) and Hemiptera (20%).

Rani and Sridhar (2005) conducted survey during 2001 to 2002 in Bangalore, Karnataka to record various pests and their seasonal incidence on Kalmegh. Observations on pest incidence and plant parts attacked were recorded from 5 randomly selected beds (5 plants per bed) at 15 days interval. Brown Scale, *Parasaisettia nigra*, was found causing significant damage, as the affected plants exhibited stunted growth and drying, followed by semilooper, *Panilla albopenstata* which damaged the plants by feeding on young leaves, flowers buds and tender pods. This was thought to be first record of arthropod pests on Kalmegh from India. recorded on medicinal plants.

Meshram (2005) investigated the insect pests damaging *Rauvolfia serpentina* and *Withania somnifera*, in a survey conducted at the Medicinal and Aromatic Plant Nursery of Centre for Forestry Research and Human Resource Development Chhindwara (Madhya Pradesh, India) from September to October 2003. During the course of the study, *R. serpentina* was observed to be infested by a new insect pest (with 40% incidence), which was later identified as *Psilogramma menephron*. This insect fed on the leaves in the early morning and evening. When fully grown, it wandered some distances before pupating. The pupa rested underneath the covering leaves and debris or in the soil. On the other hand, *W. somnifera* also suffered badly from a new insect pest, which was later identified as *Holotrichia serrata*. Approximately 20% incidence of this pest was recorded. The grub fed on the roots and rootlets, then the adult beetles emerged from the soil soon after the monsoon showers in June. This is thought to be the first report of defoliator *P. menephron* damaging *R. serpentina*, and *H. serrata* on the roots of *W. somnifera* in Satpura plateau of Madhya Pradesh. *Psilogramma menephron* can be controlled by foliar spraying of 5% Neemgard at 15-day intervals. Neem cake at 10 kg per bed was effective against *Holotrichia serrata*.

Kumar (2007) recorded eight species of phytophagous pests on Ashwagandha 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.

Kulkarni *et al.* (2008) reported leaf roller *Glyphodes suralis* as a major pest on Sarpagandha, along with larvae of Sphinx moth *D. nerii* (L) was observed on leaves of Sarpagandha. During survey 13 species of pest including a species of snail were recorded on medicinal plants.

Kumar *et al.* (2009) reported that most favorable period for population buildup of *H. armigera* Hübner and *E. vigintioctopunctata* on *W. somnifera* Linn. was from 12th to 14th standard week and 10th to 12th standard week, respectively during which highest population and activity were recorded. The larval population of *H. armigera* and beetle population of *E. vigintiocto punctata*, and plant infestation due to both pests were positively influenced with fluctuation of temperature and sun shine hours but negatively influenced with relative humidity, rainfall and number of rainy days.

Chaudhary and Saravanan(2011) recorded Spotted beetle, *Henosepilachna vigintioctopunctata* (F.) (Coleoptera: Coccinellidae) as one of the major pest of ashwagandha in Gujarat. Its seasonal incidence in cultivated ashwagandha during 2008-09 & 2009-10 along with biology was studied. Spotted beetle was active from last week of September to mid of December with a peak population (7.8 grubs/plant) and (1.73 grubs/plant) in 2nd week of October (41 SMW) during both the years of observation. Population of spotted beetle showed significant positive correlation with atmospheric temperature (Maximum, Minimum & Mean), however, relative humidity had no effect on development of various stages of the pest beetle. The pest completed its life cycle in 20.08+0.24 days on ashwagandha after passing through four larval instars. The longevity of male and female adults of the pest was 67.79+3.96 and 67.20+3.85 days, respectively. The gravid females laid 562.54+76.16 eggs in several batches during the ovipositional period of 45.67+5.19 days.

Sharma and Pati (2011) reported that, cowbugs were found on aerial apical parts of Ashwagandha (*W. somnifera*) plants in the Punjab. The cowbugs fed on apical portions of the stem, making them rough and woody in appearance, brown in colour that gradually leading to drying off and finally shedding. These cowbugs were identified as *Oxyrachis tarandus* (Hemiptera: Membracidae), to the best of our knowledge, which was the first report of *Withania somnifera* (L.) Dunal as a new host for *O. tarandus* in Punjab province of Northern India.

Vijay and Suresh (2011) recorded Coccids (Scales and mealy bugs) as attaining serious pest status on a wide range of host plants. They have been recorded from 60 plant species of flower and medicinal crops. Most of these belonged to Malvaceae, Solanaceae, Asteraceae, Euphorbiaceae, and Amaranthaceae families, where in economic damage was observed on these flower and medicinal crops. Major species observed included *Phenacoccus solenopsis* Tinsley, *P. madeirensis* (Green), *Rastrococcus iceryoides* (Green), *Nipaecoccus viridis* (Green), *Dysmicoccus brevipes* (Ckll.), *Coccidohystrix insolita* (Green),

Labioproctus polei (Green), *Saissetia coffeae* (Walker), *Saissetia oleae* (Bernard), *Parasaissetia nigra* Nietner, *Ceroplastes ceriferus* (Fabricius), *Megapulvinaria maxima* (Green), *Eucalymnatus stellatus* (Signoret), *Cerococcus indicus* Maskell, *Ceroplastodes cajanii* (Maskell).

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