

# First Record of 28-Spotted Ladybird Beetle, *Henosepilachna vigintioctopunctata* (F.) Infesting *Withania somnifera* (L.) Dunal in Punjab Province of Northern India

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## ABSTRACT

*Withania somnifera* (L.) Dunal is an important medicinal plant that is used to treat a large number of ailments. The present report records for the first time the presence of 28-spotted ladybird beetle on the leaves of *W. somnifera* plants in the Amritsar District of Punjab Province within the Northern Region of India. All stages of the insect life cycle were found on the leaves of *W. somnifera*. The larvae voraciously fed on the leaves, leaving behind a fibrous skeleton, reducing the commercial value of the plants. The pest was identified as *Henosepilachna vigintioctopunctata* (Coleoptera: Coccinellidae).

**Keywords:** Ashwagandha, Coleoptera, Coccinellidae, insect, plant pest

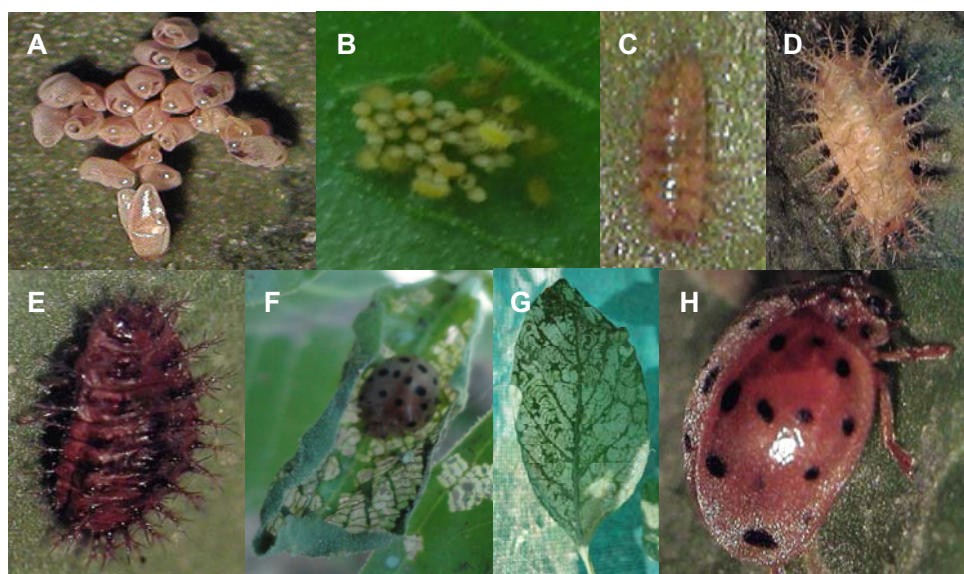
## INTRODUCTION

*Withania somnifera* (Ashwagandha) is a high value medicinal plant explored extensively in Ayurveda and Unani Systems of medicine. Leaves and roots of this plant are widely utilized in preparations of various herbal drugs or home-made remedies for its anti-cancerous, anti-proliferative, anti-oxidative, anti-inflammatory, anti-arthritis, antibacterial, anti-diabetic and anti-genotoxic properties (Rege *et al.* 1999; Kaur *et al.* 2004; Widodo *et al.* 2007). The leaf extract of Ashwagandha have been reported for the selective killing of cancer cells (Widodo *et al.* 2007). Of critical concerns are the diseases or pests infesting leaves of Ashwagandha which in turn affects its aesthetic and medicinal value. Therefore, the present study is aimed at identifying

various pests infesting *W. somnifera* L. Dunal in natural conditions. The present research note records the 28-spotted ladybird beetle, *Henosepilachna vigintioctopunctata* (F.) infesting *Withania somnifera* (L.) Dunal for the first time in Punjab Province of Northern India on a rather non-conventional medicinal plant crop.

## MATERIALS AND METHODS

The plants of *W. somnifera* were grown in earthen pots in a screen house (74°49'23" East longitude, 31°38'12" North Latitude, and 221 m above sea level) of the Department of Biotechnology, Guru Nanak Dev University, Amritsar, Punjab province, Northern India. Each earthen pot (26 cm diameter) contained 7.0 kg of a soil mixture (soil: silt: cow-dung manure, 2: 1: 1) and in total 120 pots



**Fig. 1** Various stages of *H. vigintioctopunctata* infesting *W. somnifera*. (A) Yellowish, elongated eggs in groups on the undersides of the leaves; (B) Larvae emerging from eggs; (C) Young larva; (D) Mature larva; (E) Pupa; (F) Adult feeding on leaves; (G) Damage to infested leaf; (H) Enlarged adult.

were maintained in natural seasonal conditions. Irrigation was applied on daily basis to achieve soil-water field-capacity level and earthen-pot management followed regular agricultural practices. All parts of the plant, especially leaves, were regularly observed for any infestation or symptoms of disease for more than two years (February, 2009 to May, 2011). In March-May (average minimum temperature 17°C, average maximum temperature 33°C), 28-spotted ladybird beetle was found on Ashwagandha plants feeding on the leaves. All the stages of this insect pest were collected from infested leaves (larvae and pupae) and net-traps (adults) during March-May, 2010. To study the life-cycle of this pest, the insects were cultured on detached leaves of *W. somnifera* in laboratory conditions at 25 ± 5°C in cylindrical glass-jars (20 × 15 cm<sup>2</sup>) covered with muslin cloth. Images were obtained using Sony cyber-shot DSC W350 and Stereo-microscope (Olympus corp., Japan) coupled Magnus image capturing system.

## RESULTS AND DISCUSSION

In March to May, when temperature ranges between 17 and 45°C, the 28-spotted ladybird beetle was observed as a voracious pest of *Withania somnifera*. All the Ashwagandha plants grown in earthen pots were severely attacked and leaves were extremely damaged by 28-spotted ladybird beetle. Up to 90-95% of the leaf area was extensively infested, leaving behind a fibrous skeleton. All stages of the insect life cycle were found on the leaves of *W. somnifera*. On the basis of morphological studies of its entire life cycle, the pest was identified as *Henosepilachna vigintioctopunctata* (F.) (Coleoptera: Coccinellidae).

The insect laid its yellowish, elongated eggs in groups on the undersides of the leaves (Fig. 1A), from which yellow larvae emerged after 4-6 days (Fig. 1B), with six rows of branched spines like projections on their back called scoli (two dorsal, two dorso-lateral and two lateral scoli). These scoli bear setulae (branching of spines) are slightly spatulate (Fig. 1C, 1D). They ate up the soft leaf tissue voraciously, grow quickly and become pupae (dark brown in colour, Fig. 1E) and they generally lie on the underside of a leaf. These pupae are emerged into 28-spotted adult ladybird beetles (Fig. 1F, 1G). Larvae, pupae and adults feed extensively on the leaves and the fed leaves are skeletonized and they gradually dry away (Fig. 1H), leaving a fibrous backbone of leaf veins. However, the larvae and adults are responsible for majority of leaf damage. Similar insect pest was reported from the Southern India from Karnataka province during the year 2004-05 on *W. somnifera* (Venkatesha 2006). Feeding of the pest was also observed on other members of the Solanaceae family (potato, tomato, brinjal, tobacco, datura, nightshade, etc.) and Cucurbitaceae (Mathur and Srivastava 1964; Mandai 1971; Mohansundaram and Uthamaswamy 1973).

Although Venkatesha (2006) compiled various reports

suggesting different insecticides for the control of *H. vigintioctopunctata*, he advocated that due to high level of larval parasitization by the pest, chemical control measures may not be required. Some plant-based herbal formulations for insect control have however been reported. Complete (100%) protection of cabbage leaves against *H. vigintioctopunctata* larvae was reported using 1% petroleum ether extracts of *Lantana camara*, *Azadirachta indica*, *Eucalyptus globulus* and *Ricinus communis* (Muralikrishana et al. 1990). Moreover, 90% mortality of *H. vigintioctopunctata* larvae was observed using *Nerium indicum* petroleum ether extract (Satpathi and Ghatak 1990). Regular monitoring of this voracious pest in relation to crop damage to *W. somnifera* plants will help in designing a viable integrated pest management strategy for this medicinally important crop in the Punjab region.

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