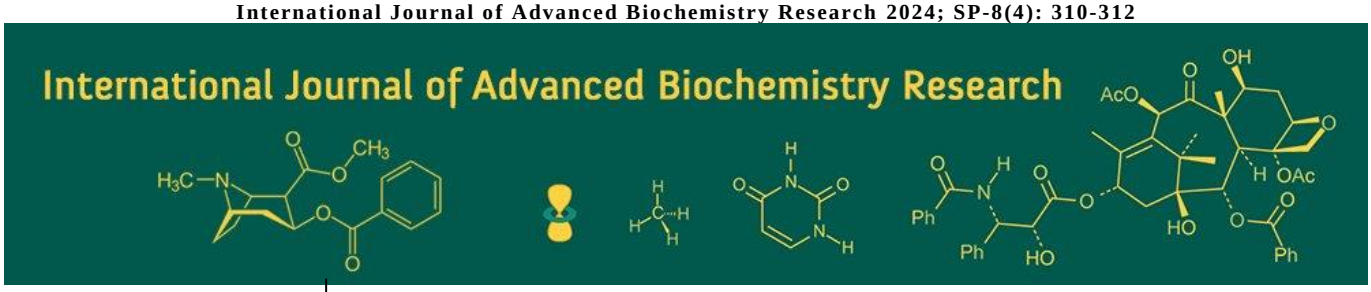

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First record of the white-spotted leaf beetle, *Monolepta signata* (Olivier) (Coleoptera: Chrysomelidae) on Ashwagandha, *Withania somnifera* (L.) Dunal

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Abstract
During mid-October 2021 to mid-March 2022, the white-spotted leaf beetle was observed on Ashwagandha in the experimental field at Jabalpur. The adults were found feeding during the entire crop stages *viz.*, vegetative to maturity stage. The pest was identified as *Monolepta signata* (Olivier) (Coleoptera: Chrysomelidae) by the Zoological Survey of India, Jabalpur. From the literature and to the best of our knowledge, this is the first report of this pest infesting *Withania somnifera* in Jabalpur, Madhya Pradesh, India and most probably worldwide.

Keywords: Ashwagandha, medicinal, pest, *Monolepta signata*

Introduction
Withania somnifera (Linn.) Dunal (Family: Solanaceae), commonly known as Ashwagandha, Gandharva gandha and Vaagi gandha in Ayurvedic, Indian ginseng or Indian Winter Cherry in English, is a high value medicinal plant and have been employed in Indian traditional systems of medicine, Ayurveda and Unani to cure various body ailments (Farooqi and Khan, 1991) [4]. It is an erect branching under shrub reaching about 1.50 m in height. It grows in dry and sub-tropical regions. Being hardy and drought tolerant species and having enormous bio compounds, it holds monopoly in many parts of India, especially in Madhya Pradesh, where it is cultivated in more than
5000 ha area. Rajasthan, Punjab, Haryana, Uttar Pradesh, Gujarat, Maharashtra and Madhya Pradesh are the major Ashwagandha producing states of the country (Patra *et al*., 2004) [5].
It contains several types of alkaloids like 'Withanine' (antibacterial and anti-tumour properties) and 'Somniferine'. The paste made from its leaves is used to treat tubercular gland irritation, and roots are used to treat skin conditions, bronchitis and ulcers. Fruits and seeds are diuretic in nature (Bhattacharjee, 1998) [3]. Some work has been carried out by the workers against phototactic insect pests of medicinal plants through light trap (Sharma *et al.*, 2022; Bhargava *et al.*, 2019; Sharma *et al.*, 2015) [7, 2, 8], but very little information is available on insect pests of medicinal plants in field conditions. Ashwagandha suffers attack by many insect pests, therefore, the present study was aimed to identify various pests infesting *W. somnifera* and to study their population dynamics under natural field conditions. It appears to be the first reported case of White-spotted leaf beetle, *Monolepta signata* (Olivier) infesting *Withania somnifera* (Ashwagandha) in Jabalpur, Madhya Pradesh, and possibly worldwide, as per the knowledge up to April, 2022.

Materials and Methods
The experiment was carried out in the field of All India Coordinated Research Project on Medicinal, Aromatic Plants and Betelvine at Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (Madhya Pradesh), India during *Rabi* 2021-2022 (October 2021 to April 2022). Jabalpur is located in the central part of Madhya Pradesh and is situated between 22°49' and 24°8' North latitude and 78°21' and 80°58' East longitude and at an altitude of 411.78 metres above the mean sea level with a total area of 5198 km^2.To record the observations on succession of insects on unprotected *W. somnifera*, ten plants were randomly selected and observations were recorded twice in a standard meteorological week (SMW) and computed

as mean population per plant per week. The population of the pest was recorded by counting the number of insects per plant (Punasiya, 2020) [6] and was initiated from the first appearance of the insect and continued till their availability. The identification of insect was assisted by Zoological Survey of India, Jabalpur (M.P.).

Results and Discussion

The adult white-spotted leaf beetle, *Monolepta signata* (Coleoptera: Chrysomelidae) was first observed when the crop age was about 46 days old. The beetle has black scutellum; reddish brown head, pronotum, legs and abdominal segments and the antennal segments are blackish except the three brown basal segments (Azad *et al*., 2015) [1].

Fig 1: *Monolepta signata* infesting *W. somnifera*

The white-spotted leaf beetle appeared during the entire observation period *i.e.* from vegetative stage (18th October, 2021) till maturity stage (11th March, 2022) on the crop. First incidence of the pest was recorded on 18th October, 2021 (42nd SMW *i.e.* 15th to 21st October, 2021) and the population density was 2.8 beetles per plant. Thereafter, the infestation increased and attained its first peak (4.5 beetles per plant) during 45th SMW (*i.e.* 5th to 11th November, 2021). After 45th SMW, there was a gradual decrease in the pest population upto 2nd SMW (*i.e.* 8th to 14th January, 2022). Subsequently, the population increased gradually and attained second peak (3.4 beetles / plant) during 8th SMW (*i.e.* 19th to 25th February, 2022). Thenceforth, the pest population declined and was available upto the crop harvest stage. Table 1 indicates the incidence of White-spotted leaf beetle, *Monolepta signata* on Ashwagandha, *W. somnifera* during *Rabi*, 2021-22.

Table 1: Incidence of White-spotted leaf beetle, *Monolepta signata* on Ashwagandha, *W. somnifera* during *Rabi*, 2021-22.

SMW	Mean population per plant (A)
42	2.8
43	3.3
44	4.4
45	4.5*
46	4.4
47	3.8
48	2.95
49	2.75
50	2.4
51	2.15
52	1.7
01	0.95
02	0.3
03	0.9
04	2.4
05	2.75
06	2.85
07	3.0
08	3.4
09	2.95
10	2.7

SMW = Standard Meteorological Week, *Peak population, A = Adult

Conclusion

The white-spotted leaf beetle, *M. signata* was active from mid-October 2021 (42nd SMW) to mid-March 2022 (10th SMW) on Ashwagandha. Review of the literature revealed that the white-spotted leaf beetle has not been reported on Ashwagandha earlier. This is the first report of *Withania somnifera* (L.) Dunal as a new host for the White-spotted leaf beetle, *Monolepta signata* (Olivier).

Since research work on insects of Ashwagandha is scanty, therefore a well-planned and long term research is required on the incidence, extent of damage, seasonal abundance, their potent bioagents and also the impact of infestation on the biocompounds. Further, their economic threshold level and damage intensity should also be analysed so as to develop appropriate economically viable and environmentally safe management strategies on Ashwagandha.

The present study is a part of M.Sc. Thesis research work of the corresponding author.

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