

First record of *Acherontia styx* (Lepidoptera: Sphingidae) larva feeding on *Withania somnifera* in Pune District, Maharashtra, India

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Abstract

This Study reports the first record of larval feeding of *Acherontia styx* (Westwood, 1847) (Lepidoptera: Sphingidae) on *Withania somnifera* (L) Dunal in Pune District, Maharashtra, India. A larva was observed feeding on cultivated *W. somnifera* during routine field surveys at the BAIF Central Research Station, Urali Kanchan. Identification was based on characteristic sphingid larval features, including a robust body, oblique lateral stripes, and a distinct curved caudal horn. Although Species of *Acherontia* are known to utilize a wide range of host plants, particularly within Solanaceae, there are no previous confirmed records of *W. somnifera* as a host for *A.styx*. This observation expands the known host range for the species and highlights its ecological adaptability in agroecosystems.

Keywords: Agro ecosystem, host association, medicinal plants, Sphingidae, larval ecology, *Withania somnifera*

Introduction

The family Sphingidae comprises a diverse group of moths commonly known as hawk moths, recognized for their strong flight ability and ecological importance as pollinators and herbivores (Kitching & Cadiou, 2000; Diniz, U. M., *et al.*, 2025) [3, 4]. Larval host plant relationships in this group are often well defined, yet many species exhibit flexibility in host utilization depending on habitat and resource availability (Robinson *et al.*, 2010) [8].

The genus *Acherontia*, commonly referred to as death's head hawk moths, includes species known for their distinctive morphology and association with honeybee colonies, from which they occasionally rob honey. Among them *Acherontia styx* is widely distributed across Asia and has been reported from diverse habitats ranging from edges to agricultural landscapes. Larvae of *A. styx* are typically associated with plants belonging to families such as Solanaceae, Oleaceae, and Verbenaceae (Robinson *et al.*, 2010) [8]. However, documentation of host plant association remains incomplete, particularly in agro ecosystems where plant diversity and cropping patterns may influence insect behaviour. *Withania somnifera*, commonly known as Ashwagandha, is an important medicinal plant cultivated widely in India for its pharmacological properties (Subhadrata P *et al.*, 2021) [5]. Despite its economic importance, interactions between *W. somnifera* and lepidopteran herbivores are not well documented. The present study reports a novel observation of *A. styx* larva feeding on *W. somnifera* in Pune district, Maharashtra, thereby contributing to the understanding of host plant expansion in this species.

Field observations were conducted at the BAIF Central Research Station, Urali Kanchan, Pune District, Maharashtra, India (18.504639599414816, 74.1477910072752), within a cultivated agroecosystem comprising medicinal crops and mixed vegetation. During routine monitoring of *Withania somnifera* plots, a large lepidopteran larva was observed feeding on the foliage. The larva was photographed in situ, and morphological identification was carried out based on external diagnostic characters using standard taxonomic references (Kitching &

Cadiou, 2000) [4]. Key identification features included body size, colour pattern, presence of oblique lateral stripes, and a prominent curved caudal horn, which are characteristic of sphingid larvae. No specimen was collected, and the observation was recorded under natural field conditions to avoid disturbance. Larva of *Acherontia styx* was observed actively feeding on leaves of *Withania somnifera*. The larva was large, robust, and displayed a greenish to brownish body with distinct oblique lateral markings. A well-developed, curved posterior horn was present on the eighth abdominal segment, consistent with sphingid morphology. The individual was located on a healthy plant within a cultivated field and showed continuous feeding activity during observation. No visible signs of disease or parasitism were noted. The surrounding habitat included mixed cropping systems and *Apis florea* honey bee colonies. The feeding damage was characterized by partial defoliation of leaves, on the plant surface, a behaviour typical of many sphingid larvae

The present observation provides the first evidence of *Withania somnifera* serving as a host plant for *Acherontia styx* in India. Although previous studies have documented a wide range of host plants for *Acherontia* species, particularly within the family Solanaceae, there are no prior reports of *W. somnifera* as a larval host (Robinson *et al.*, 2010) [8].

Host plant plasticity in hawk moths is often influenced by environmental conditions, availability of suitable vegetation, and ecological interactions within an agroecosystem (Agosta 2006) [1]. The occurrence of *A. styx* on *W. somnifera* suggests that the species may utilize a broader range of Solanaceae hosts than previously recognized.

The proximity of honeybee colonies in the study area is also noteworthy, as adult *Acherontia* Moths are known to interact with bee hives for nectar feeding. Although larval and adult behaviour are distinct, such habitat features may influence species presence and local population dynamics. From an ecological perspective, the presence of *A. styx* larvae in medicinal crop systems highlights the need to understand insect-plant interactions beyond traditional crop

species. While the larval feeding observed did not result in severe damage, further studies are required to assess potential economic implications under high infestation levels.

This record also emphasizes the importance of field-based biodiversity observations in identifying undocumented ecological associations. Agro ecosystems, particularly those integrating diverse plant species, can support a wide range of insect taxa, including species with previously unknown host relationships (Altieri, 1999; Nicholls & Altieri, 2013) [6].

The study documents a new host association of *Acherontia styx* larva feeding on *Withania somnifera* in Pune district, Maharashtra. The finding expands the known host range of the species and highlights the ecological adaptability of hawk moths in agroecosystems. Continued monitoring and systematic studies are necessary to better understand the ecological and economic significance of this interaction.



Photo: Larva of *Acherontia styx* feeding on *W. smnifera*

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