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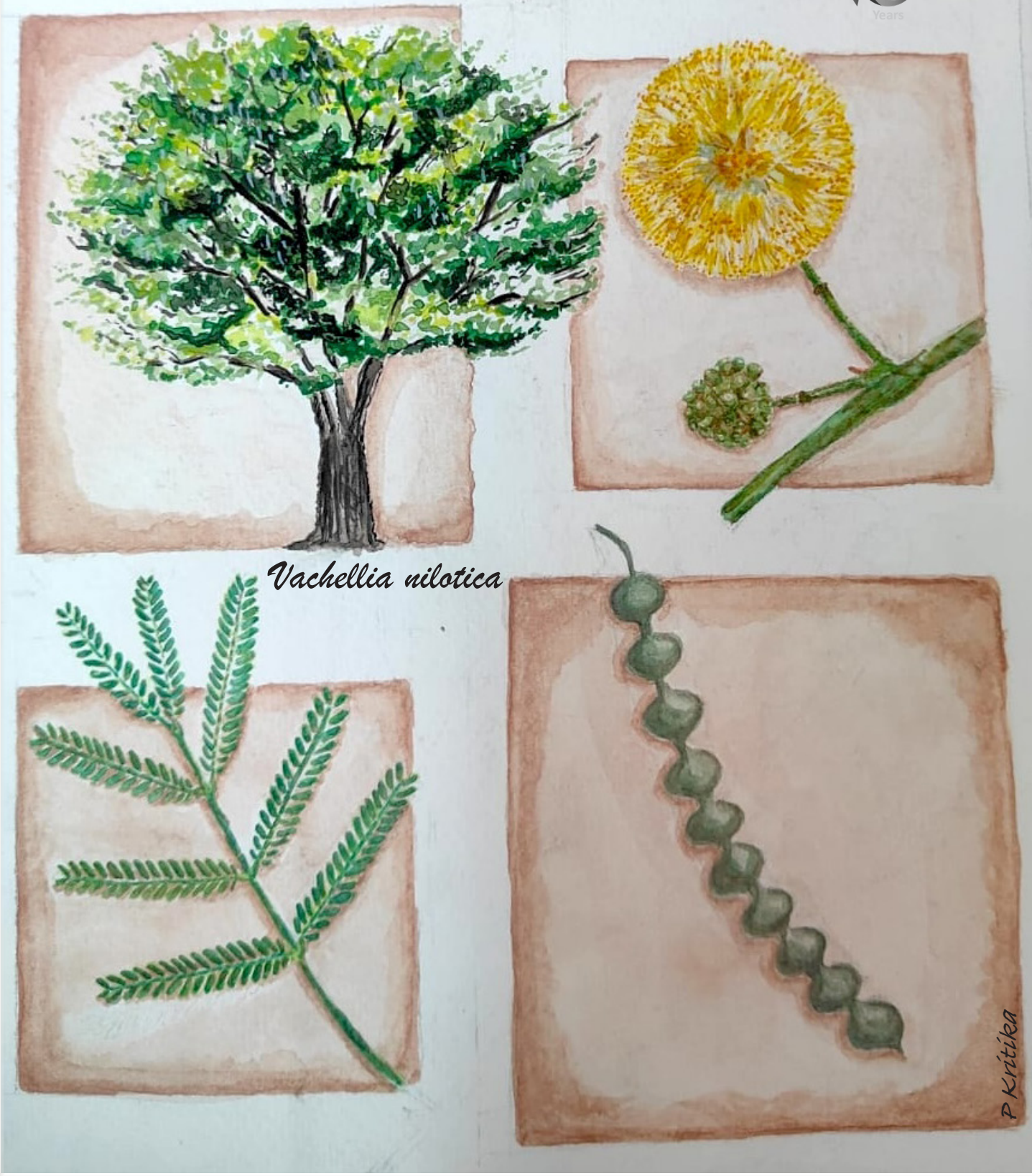

Vachellia nilotica

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Cover: Parts of *Vachellia nilotica*, medium - watercolours. © P Kritika

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NOTE

Predation record of the hornet *Vespa basalis* Smith, 1852 (Hymenoptera: Vespidae) by the orb-weaver spider *Nephila pilipes* (Fabricius, 1793) (Araneae: Araneidae)

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Interactions between spiders and wasps represent a classic predator-prey arms race. Numerous hymenopteran lineages are associated with spiders through diverse ecological strategies. While pompilids, several crabronids, and sphecids actively hunt spiders, other families such as Ichneumonidae, Scelionidae, Encyrtidae, Eupelmidae, Eulophidae, and Pteromalidae primarily exploit spiders or their egg sacs as parasitoids or egg predators (Nyffeler & Birkhofer 2017). Conversely, some spiders, including jumping spiders (*Phidippus audax*), tarantulas (*Hysterocrates gigas*), wolf spiders (*Hogna carolinensis*), and orb-weavers (*Araneus trifolium*, *Argiope* spp. and even *Nephila* spp.) are known to opportunistically prey on wasps (Bristowe 1941; Tso et al. 2004; Foelix 2010; Noguchi & Ikeda 2022). Although orb-weaving spiders (Araneidae) occasionally prey upon hymenopterans (Tso et al. 2004), predation on large hornets (Vespinae), among the most formidable Hymenoptera, is exceedingly rare. Noguchi & Ikeda (2022) reported only a few cases involving *Argiope aurantia*, *A. amoena*, *A. bruennichi*, and *A. florida* preying on vespine wasps. In contrast, hornets (*Vespa* spp.) are efficient generalist predators, exploiting a wide range of prey, including other wasps as well (Ojha & Negi 2025). Predation by hornets on orb-weaving spiders, particularly by *Vespa mandarinia*, *V. crabro*, *V. simillima*, *V. analis*, *Vespula vulgaris*, *Ve. flaviceps*, *Ve. consobrina*, *Ve. pensylvanica*, *Ve. germanica*, and others, is frequently reported (Noguchi & Ikeda 2022). Additionally, kleptoparasitic interactions have also been recorded, such as *V. crabro* stealing prey from *Argiope bruennichi* webs (Davis 2011).

Here, we report a rare observation of a Giant Golden Orb Weaver *Nephila pilipes* (Fabricius, 1793) female capturing and immobilizing a Black-bellied Hornet *Vespa basalis* Smith, 1852, at the Dehradun Zoological Park (30.3899° N, 78.0765° E), Uttarakhand, India, on 10 November 2024. The spider was identified as an adult female *Nephila pilipes* (yellow morph) based on its external morphology, including the elongated opisthosoma with a broad yellow dorsal longitudinal band and the characteristic female epigynum with paired lateral indentations and a distinct posterior depression, following Sankaran et al. (2020). The hornet was identified as *Vespa basalis* based on its predominantly dark brown to black metasoma and diagnostic colour pattern, following Smith-Pardo et al. (2020). At 1408 h, a *V. basalis* hornet was observed entangled in the

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upper section of a large female *N. pilipes* web struggling vigorously. The spider cautiously approached the entangled hornet and promptly bit it with its chelicerae while skillfully avoiding the sting by manipulating and orienting the prey with its pedipalps and forelegs (Image 1). Following the initial bite, the spider wrapped the prey in situ before cutting it free from the web, the spider then transported the immobilized prey to the web hub using its chelicerae, where it was suspended within the hub silk (Image 2). The entire interaction lasted approximately 2–3 min (1408–1410 h); however, feeding was not observed because the observation ended shortly after prey immobilization. The observation was made within the Dehradun Zoo campus, a semi-urban green space characterized by mixed vegetation and scattered mature trees. The female *Nephila pilipes* occupied a large vertical orb web measuring approximately 1 m in diameter, suspended between adjacent Sal trees. The spider was estimated to be ≈50 mm in body length, while the captured *Vespa basalis* measured approximately ≈22 mm. Several additional mature female *N. pilipes* occupying large orb webs and free-flying *V. basalis* individuals were also observed in the surrounding area, which indicates that opportunities for such interactions are present within the study area.

Orb-web building spiders utilize a range of tactics to capture insects that are restrained in the web, and the choice of tactic varies among species and with prey type (Robinson & Mirick 1971). Most documented interactions between orb-weavers and vespine wasps involve species of the genus *Argiope* (Noguchi & Ikeda 2022), whereas records involving giant *Nephila* species are exceedingly scarce. This may be linked to the differences in hunting strategies between species of both genus: unlike *Argiope* spp., which typically immobilizes prey by rapidly wrapping before delivering a bite, *Nephila* spp. generally bite prey first and subsequently apply silk (Robinson & Mirick 1971). Such a strategy can be risky as it exposes the spider directly to the prey's defenses, particularly when the prey possesses effective defensive structures such as a sting (Foelix 2010). However, the apparent rarity of such interactions may also reflect limited observational studies rather than their actual frequency in nature.

The present observation therefore provides unique insight into the prey-handling behavior of *Nephila pilipes*, documenting a large female successfully capturing and immobilizing a large vespine hornet. The observed sequence of prey capture closely resembled the long bite and pull-out strategy followed by post-immobilization wrapping (Type I) described by Robinson & Mirick (1971). This observation indicates that large female *N. pilipes* are capable of subduing large vespine wasps despite their well-developed defensive structures. To our

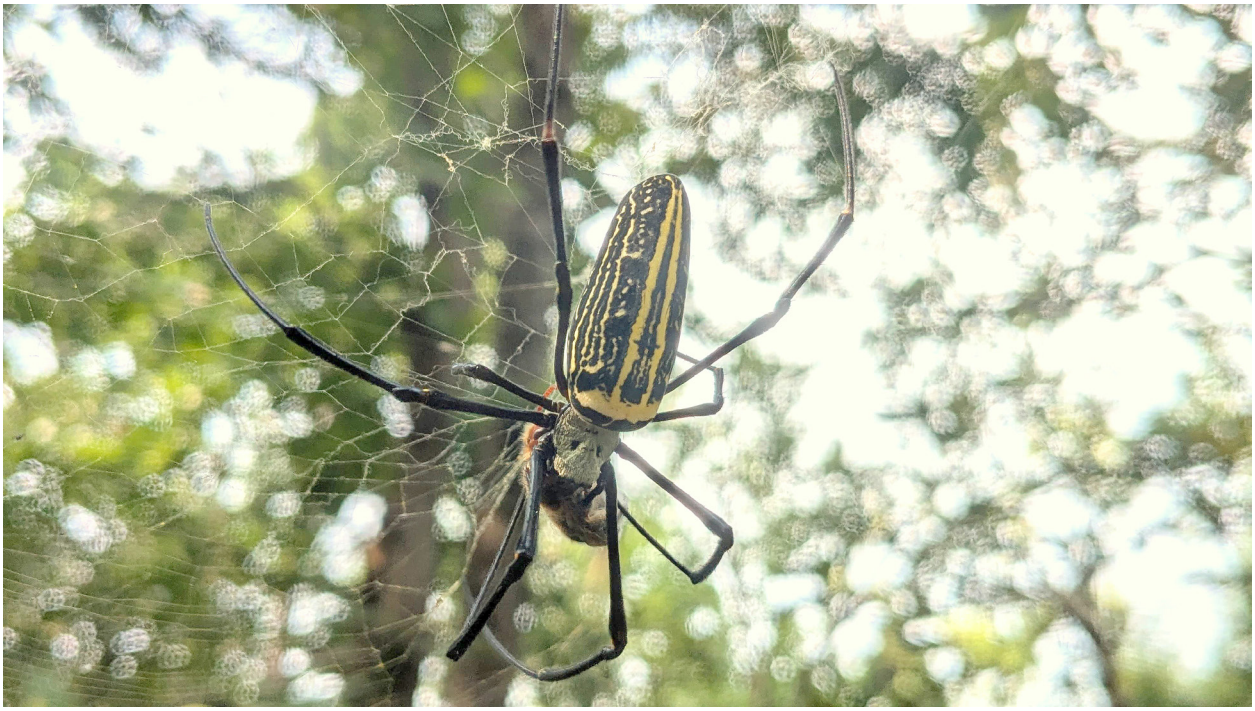

Image 1. Adult female *Nephila pilipes* delivering an initial bite to the entangled *Vespa basalis* at the capture site. © Gautam.

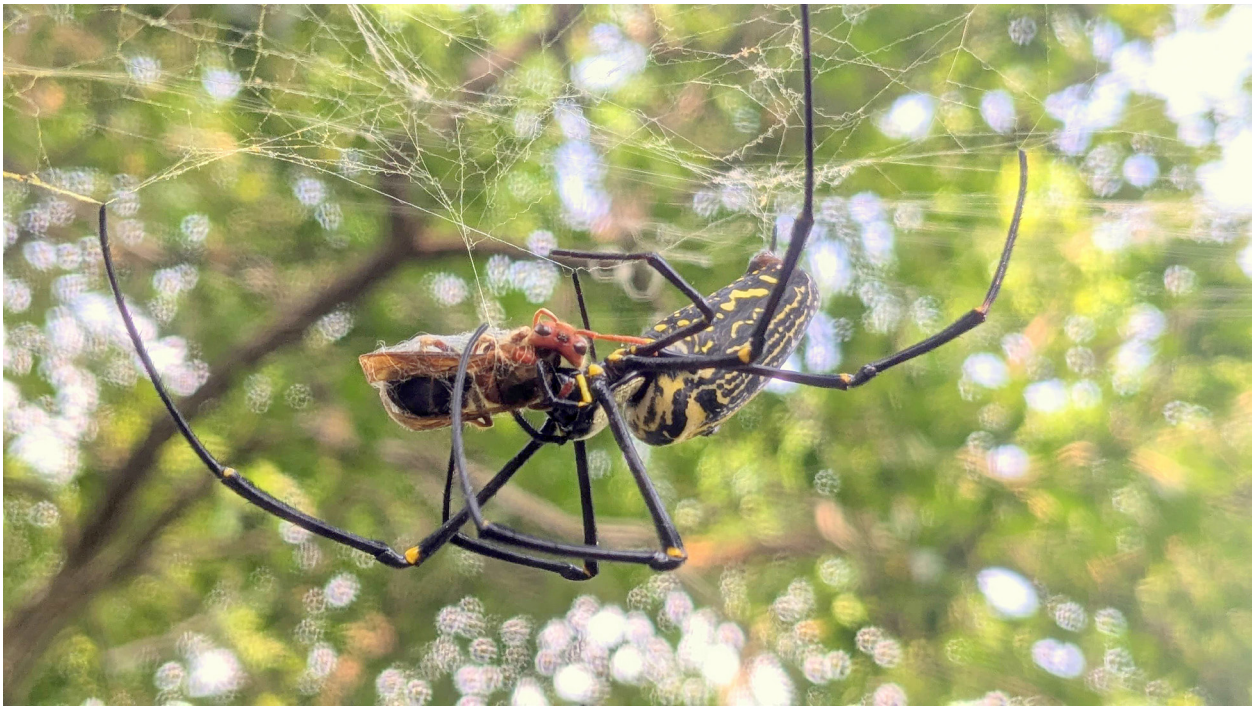

Image 2. Post-immobilization prey handling, during which the spider manipulated the hornet and delivered successive bites before wrapping. Note the disturbance of the web caused by the struggle between predator and prey. © Gautam.

knowledge, this represents the first documented record of an interaction between *N. pilipes* and *Vespa basalis* from India, contributing to our understanding of spider-wasp interactions in the region and demonstrating that *N. pilipes* webs are capable of retaining and facilitating the capture of relatively large hymenopteran prey.

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