

Dangerous companions: Ant-mimicking jumping spiders (Araneae: Salticidae: *Myrmarachne plataleoides*) that shelter beneath the web of an orb-weaver (Araneae: Araneidae: *Herennia multipuncta*)

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The jumping spider *Myrmarachne plataleoides* (O. Pickard Cambridge 1869), widely distributed in the tropical forests of south and southeast Asia, is well-known as a likely *Batesian mimic* of the Green Tree Ant, *Oecophylla smaragdina* Fabricius 1775 (Caleb 2016; Ramachandra & Hill 2018; Abhijith & Hill 2021; Subramaniam, Tamma & Uma 2021). *O. smaragdina* workers may prey on *M. plataleoides*, yet these spiders appear to be obligate associates of these dangerous ants, although they are not known to prey on them (Ramachandra & Hill 2018). Larger spiders, including some that feed on ants, also prey on *M. plataleoides*, which in turn include smaller spiders in their diet (Abhijith, Hill & Pai 2020; Abhijith & Hill 2021).

Orb-weavers of the genus *Herennia* have a largely Australasian distribution, and they use *ladder webs* cast over tree trunks to capture their prey; *H. multipuncta* is widely distributed and synanthropic, thus a likely invasive species (Kuntner 2005). *H. multipuncta* females are readily identified by the presence of a distinct, orange V-shaped mark at the center of the carapace, and prominent lobes on either side of the flattened opisthosoma (Figures 2-3, 22-26).

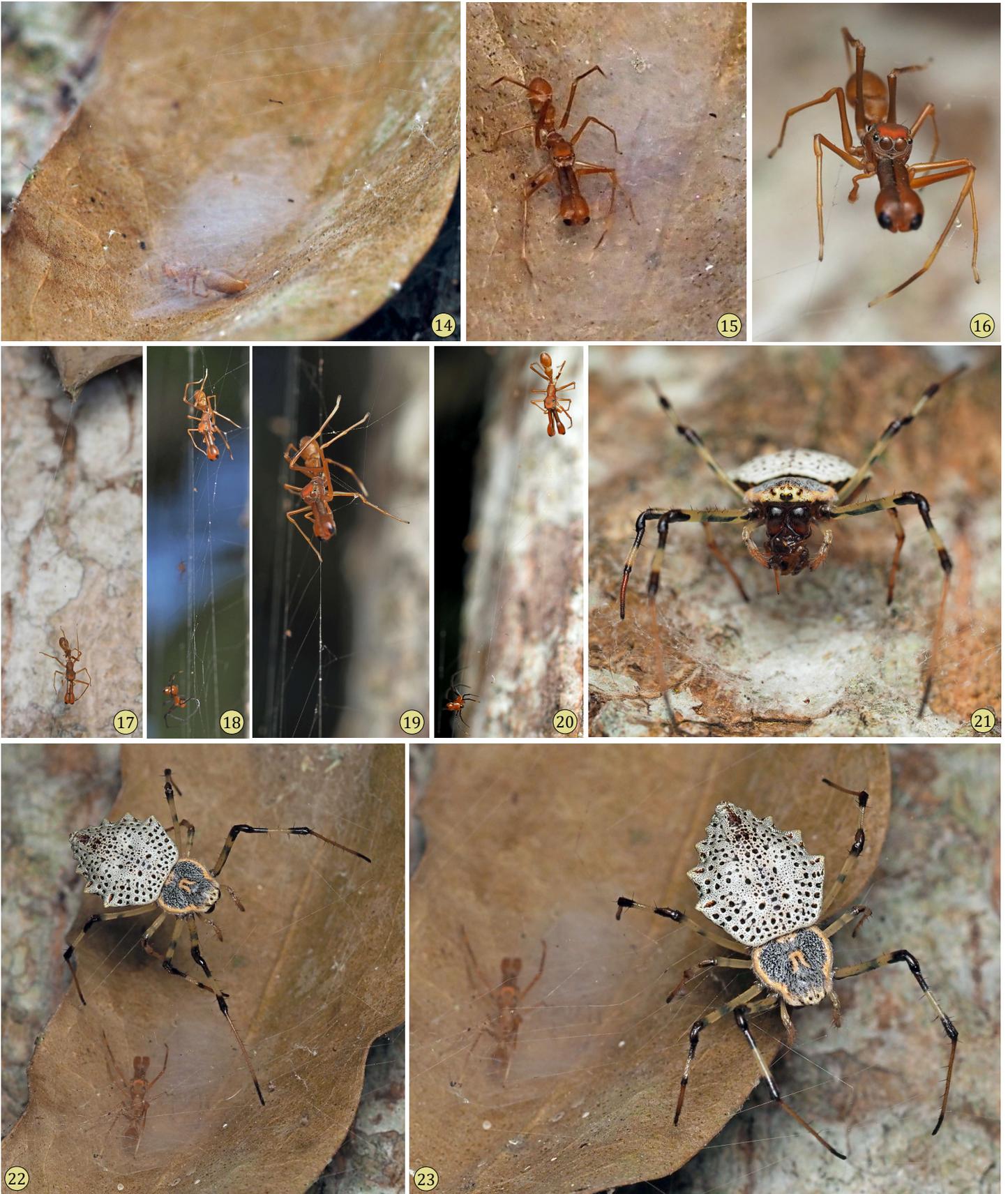
Here (Figures 1-35) we document several events in the life of *M. plataleoides* males and females that were recently observed as they sheltered in a dry *Tabebuia* leaf captured beneath the web of an adult female orb-weaver *Herennia multipuncta* (Doleschall 1859), on the trunk of a Mango Tree (*Mangifera indica*) at the *Indraprastha Organic Farm* of the senior author in Karnataka. Although the *Herrenia* web covered the leaf (Figures 4, 12), *M. plataleoides* were able to move in and out of their shelters below the web. Initially a male *M. plataleoides* was observed on the leaf (Figures 5-7), as a female *M. plataleoides* occupied a concealed shelter near the top of the leaf (Figure 1, nest #1; Figures 8-10). Later, a different female made a shelter in a lower position on the leaf (Figure 1, nest #2; Figures 11, 14). Males were observed guarding the females in their nests (Figures 12, 15). After a fight between two of the males, the loser was trapped in the *Herrenia* web as it fled (Figures 16-20), only to be captured and eaten by the attending *Herrenia*, apparently responding to its vibrations (Figure 21). The *Herrenia* moved directly over the lower *M. plataleoides* nest (#2) to repair its web (Figures 22-23), and to capture prey (Figures 24-27). Later, after part of the *Tabebuia* leaf broke off, both female *M. plataleoides* continued to occupy it in adjoining shelters or nests (Figures 31-32) and, still later, one of the females continued to shelter beneath this leaf fragment (Figures 33-35).



Figures 1-4. 1, Overview of local environment. To the left, an adult female *Herrenia multipuncta* rested at the center of her web, constructed over bark of a Mango Tree (*Mangifera indica*). Two nests occupied by female *Myrmarachne plataleoides*, often guarded by males, were constructed on the dry *Tabebuia* leaf, at center, beneath the *Herrenia* web. Green Tree Ants (*Oecophylla smaragdina*) frequented this site, with a major vertical route on a vine to the right, populated by rapidly moving ants. An old nest with detritus may have been previously occupied by an *M. plataleoides*, but this occupation was not observed. 2, *Herrenia* at the center of her web. 3, *Herrenia* feeding on a captured caterpillar. Note the two small *Argyrodes* at upper right. 4, Lateral view showing how the *Tabebuia* leaf was covered by the web of this *Herrenia*.



Figures 5-13. 5-7, Male *Myrmarachne plataleoides* near bottom of the *Tabebuia* leaf. 8-10, Female *M. plataleoides* occupying the upper shelter (nest #1), later feeding on what appears to be a small spider (9-10). 11, A second female *M. plataleoides* has moved into a shelter (nest #2) in a lower position on the *Tabebuia* leaf. 12, Male *M. plataleoides* attending female in nest #1. 13, Old nest and debris near the middle of the *Tabebuia* leaf.



Figures 14-23. 14, Female *Myrmarachne plataleoides* in lower shelter (nest #2). 15, Male *M. plataleoides* guarding female in nest #2. 16-20, Male *M. plataleoides* trapped and struggling unsuccessfully to escape from the *Herrenia* web, after losing an agonistic contest with another male. 21, *Herrenia* feeding on the captured male *M. plataleoides* at the center of her web. 22-23, *Herrenia* moving over the *Tabebuia* leaf to repair her web.



Figures 24-32. 24-26, *Herrenia* moving over nest #2, occupied by a male *Myrmarachne plataleoides* tending a female, to capture a leafhopper (25, lower right). 27, *Herrenia* feeding at the center of her web. 28-29, *Herrenia* wrapping a different prey at the center of her web. 30, Two female *M. plataleoides* on the lower part of the *Tabebuia* leaf (nest #2 at top), before this leaf was broken. 31-32, Two female *M. plataleoides* occupying adjoining shelters on a fragment of the broken *Tabebuia* leaf.



Figures 33-35. Female *Myrmarachne plataleoides* sheltering beneath fragment of the broken *Tabebuia* leaf.

The entire site for these observations was occupied by many foraging Green Tree Ants (*Oecophylla smaragdina*), with a major vertical route on a thick vine to the right side of the *Herrennia* web (Figures 1, 36-38).



Figures 36-38. Foraging *Oecophylla smaragdina* near the *Herrennia* web. **36**, Beneath the *Tabebuia* leaf occupied by *Myrmarachne plataleoides* males and females. **37-38**, Carrying captured prey on a nearby vine.

Although it is clear that the *Herrennia* web, like the tree ants, represented a continuous danger to these salticids, it, like the ants, may also have provided some protection to them. The aggregation of both males and females at this site is of interest, and suggests that, at least for females, there is some tolerance of nearby conspecific *M. plataleoides*. Although it would be dangerous for these salticids to join *Argyrodes* (Figures 39-40) as web kleptoparasites, brooding by the *Herrennia* may also provide a food source to *M. plataleoides*, as these salticids are known to feed on young spiders (Figures 41-44).



Figures 39-44. 39-40, Male (39) and female (40) *Argyrodes*, kleptoparasites in the *Herrenia* web. 41, Emergent *Herrenia* brood, with small spiderlings moving on silk above the egg case attached to the bark. 42, Female *Myrmarachne plataleoides* watching an *Argiope* brood over a man-made surface at a different site. 43-44, Female *M. plataleoides* capturing and feeding on the *Argiope* spiderlings.

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