PECKHAMIA 172.1, 28 October 2018, 1—8
urn:lsid:zoobank.org:pub:F2E27581-540F-45F0-9B20-2CC30398B4EE (registered 26 OCT 2018)
ISSN 2161—8526 (print)
ISSN 1944—8120 (online)

Asemonea cf. *tenuipes* in Karnataka (Araneae: Salticidae: Asemoneinae)

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Abstract. Field observations of *Asemonea* cf. *tenuipes* in Karnataka are documented. These include a possible case of oophagy by a nesting female as well as corroboration of earlier studies that described the tendency of females to deposit their eggs in straight lines within a simple shelter on the underside of leaves. Changes in colour of the female opisthosoma that include the appearance of a pair of iridescent blue lines are discussed.

Key words. *Asemonea tenuipes*, colour change, India, jumping spider, *Lyssomanes viridis*, Lyssomaninae, mimicry, nesting, oophagy, organic farming

The Afroeurasian salticid subfamily Asemoneinae was recently recognized as the sister group of the Neotropical salticid subfamily Lyssomaninae, both subfamilies comprising a clade that is in turn the sister group of the subfamily Spartaeinae (Maddison et al. 2014; Maddison 2015; Maddison et al. 2017). Within the Asemoneinae the genus *Asemonea* presently includes 25 species, all from tropical Afroeurasia (Wanless 1980; WSC 2018).

Asemonea tenuipes (O. Pickard-Cambridge 1869) is the type species and best-known representative of the genus *Asemonea*, ranging from India and Sri Lanka to Singapore (Roy et al 2016; WSC 2018). Hawes (2017) recently documented how the eggs of this species were deposited in regular rows in simple retreats comprised of thin silk sheets laid down under mango leaves (*Mangifera indica*) from May to October in Chonburi Province, Thailand. These regular rows were previously documented by Jackson & Macnab (1991) for *A. tenuipes* in Sri Lanka. *A. murphyi* females have also been observed with strings of eggs between thin silk sheets laid down under leaves in Kenya; female *A. murphyi* remained in these silk retreats and captured nearby insects, but oophagy by this species was not observed (Jackson 1990). Studies of the interactions between male and female *A. murphyi* and *A. tenuipes* support the hypothesis that males are attracted to female pheromones that may be embedded in their silk lines (Jackson & Macnab 1991; Nelson et al. 2012). Male *A. tenuipes* flex their opisthosoma either vertically or to the side as they approach females, and in some instances they will also cohabit with immature females until the latter mature (Jackson & Macnab 1991).

Figures 1-8 document, in chronological order, a series of recent field observations of spiders that are most likely *A. tenuipes* (*Asemonea* cf. *tenuipes*) living on the farm of Abhijith A. P. C. (*Indraprastha Organic Farm*) at Mysuru, Karnataka, India. This farm includes 13 densely vegetated acres where a collection of more than 3000 plant species are grown without any chemical insecticides or pesticides, to maintain a high level of biodiversity.

Figure 1 (29 JUL 2018). Female with mosquito prey (Diptera: Nematocera) near simple shelter on the underside of a *Colocasia* leaf. Note the dark brown colour of this female's opisthosoma.

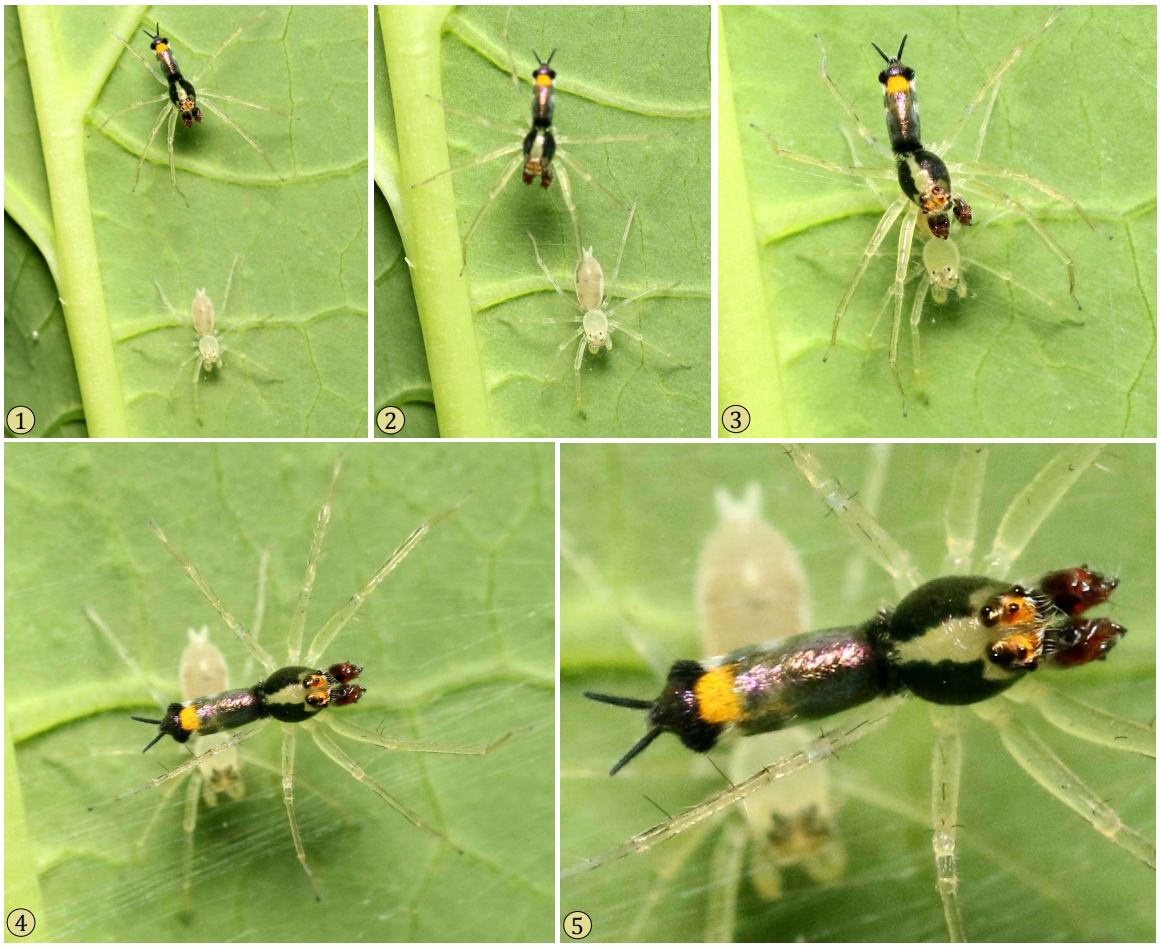

Figure 2 (30 JUL 2018). Male approaching and cohabiting with a female resting in her shelter beneath a *Carica papaya* leaf. Note the false "insect head" at the rear of the male, ornamented with orange scales in the eye region and at the rear of the dorsal opisthosoma behind a wide band of iridescent purple or violet scales. **5,** Detail of (4). Mating was not observed.

Figure 3 (1 AUG 2018). Penultimate male. Immature males resemble females with respect to their light green, translucent colouration. The penultimate male has a light yellow patch at the rear of the opisthosoma, where the adult has a patch of bright orange scales. Note also the black marginal band at the front of the opisthosoma.

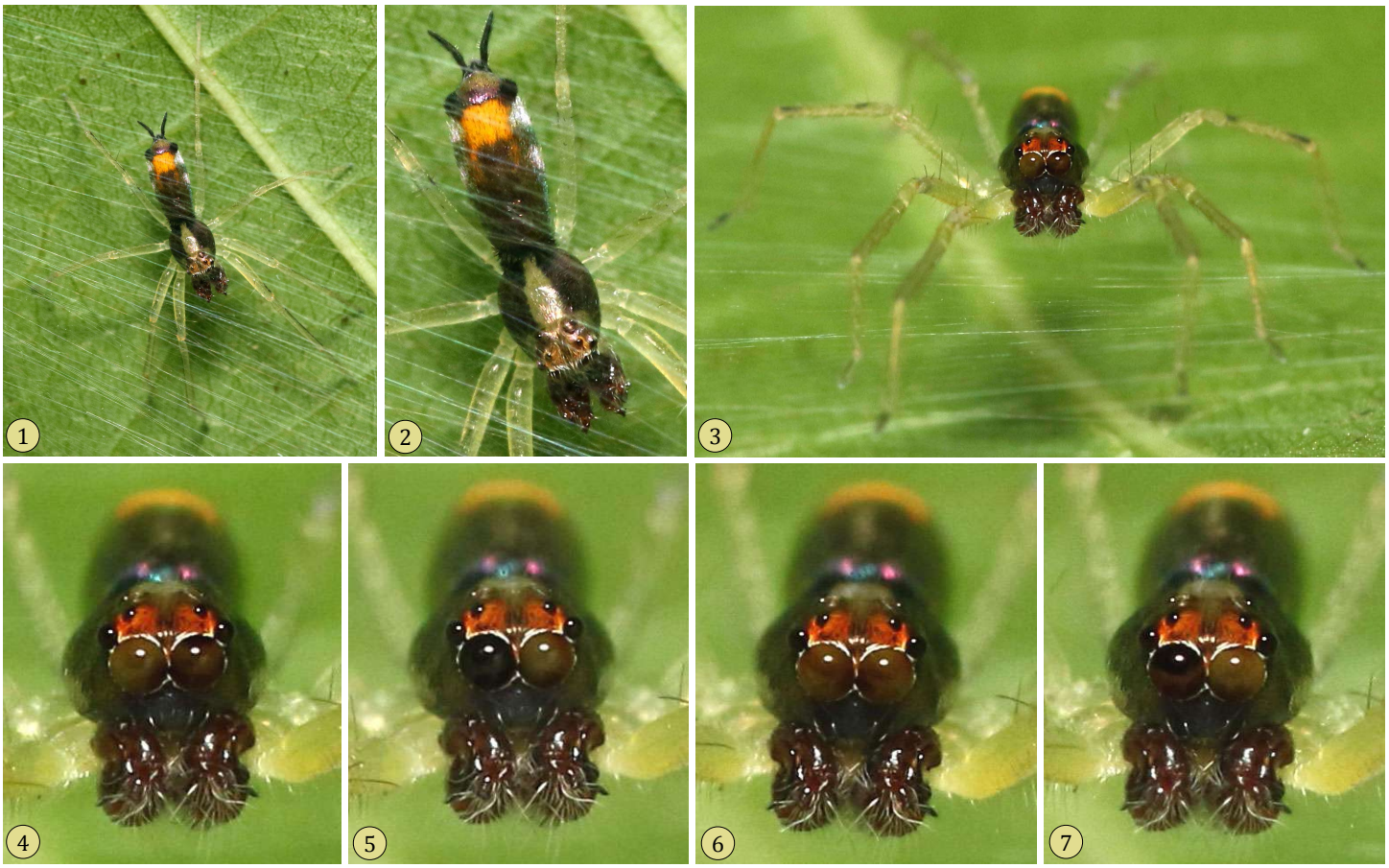

Figure 4 (10 AUG 2018). Adult male resting within a shelter comprised of a thin fabric of parallel silk fibers. **2,** Detail of (1). **4-7,** Sequence showing changes in the colouration of the AME as the AME eye tubes are rotated within the prosoma. When the eye tube of an AME is aligned with the gaze of the observer that eye appears black (5, 7, right AME). Also note the large PME.

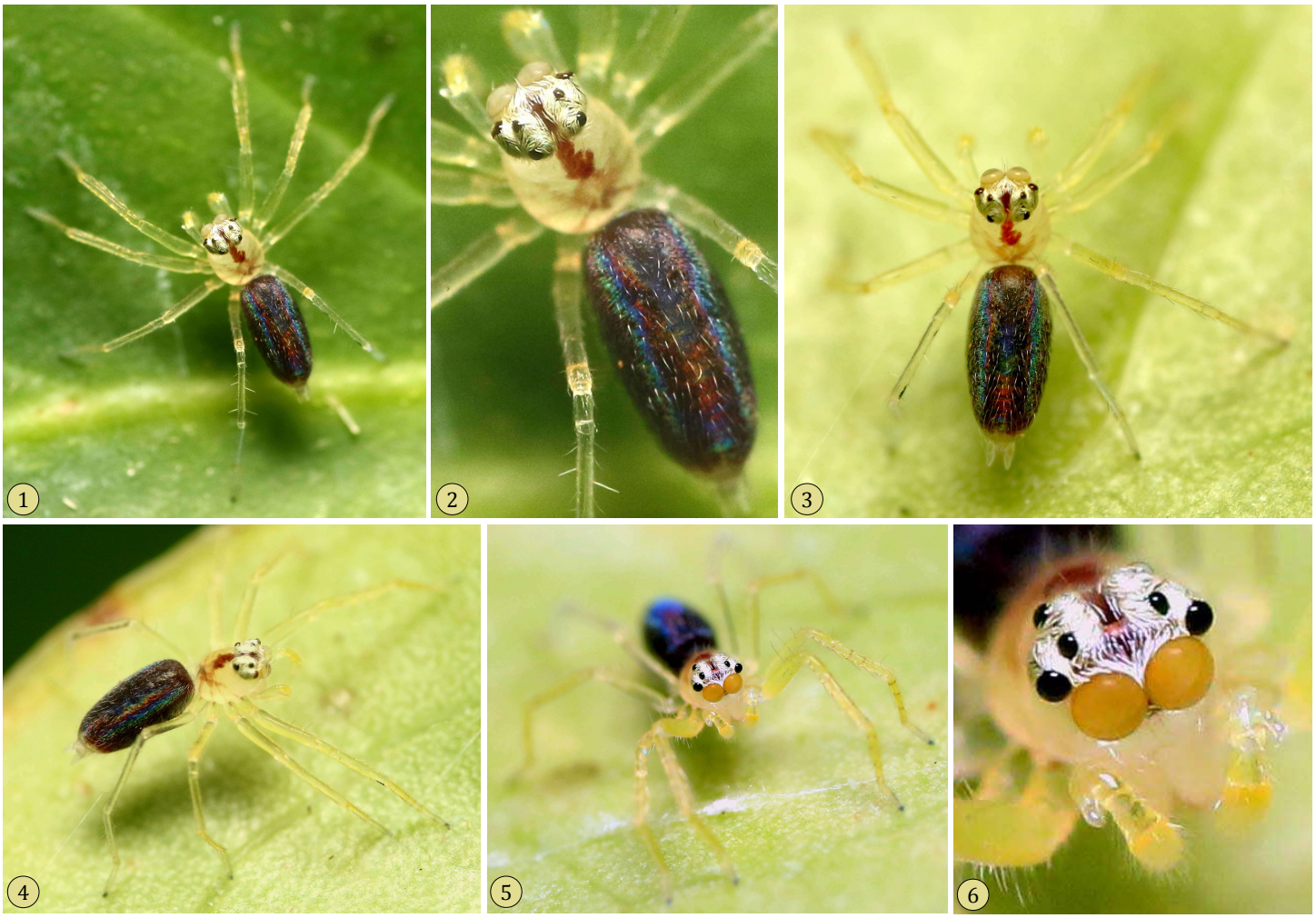

Figure 5 (11 AUG 2018). Female with dark opisthosoma and visible red colour in midgut diverticulae of the prosoma. Although females are usually translucent green they may assume this dark colouration, perhaps as a result of feeding. The dark red-purple lines flanked by iridescent blue lines on the opisthosoma may, however, represent a more complicated physiological response. **2,** Detail of (1). **6,** Detail of (5). Note the large PME characteristic of the genus *Asemonea*.

Figure 6 (2 SEP 2018). Female with small clutch of 5 eggs in shelter. One of the eggs (2, arrow) may have been preparing to hatch. Note the dark purple and blue colouration of the opisthosoma of this female.

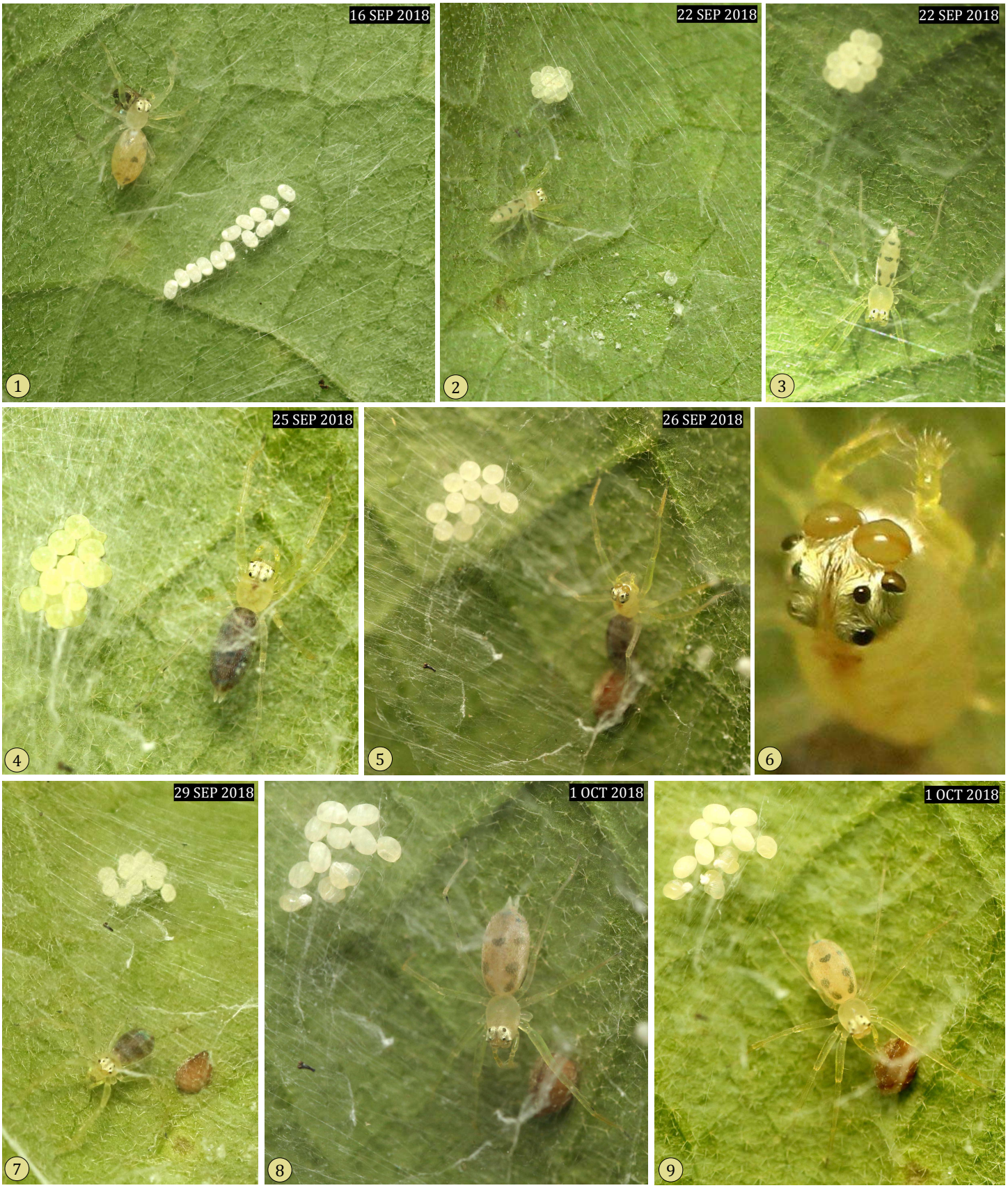

Figure 7 (16 SEP–5 OCT 2018, continued on next page). Series of photographs following colour changes of a female (identified by missing leg L2) in a shelter beneath the leaf of a potato tree (*Solanum macranthum*). **1,** The female built her thin shelter comprised of mostly parallel silk lines above a cluster of eggs deposited 6 days earlier (10 SEP 2018) by a moth (Lepidoptera: Erebidae: Aganainae). The moth eggs resembled those of this female but were ovoid.

Figure 7 (16 SEP—5 OCT 2018, continued from previous page). Series of photographs following colour changes of a female (identified by missing leg L2) in a shelter beneath the leaf of a potato tree (*Solanum macranthum*). **2-3,** After 6 days the moth eggs were gone and this female had deposited a globular cluster of 14 eggs. After laying her eggs the opisthosoma of this female returned to its normal light green colour with a distinctive pattern of black spots. The fate of the moth eggs is not known and given the small size of the female's opisthosoma it seems unlikely that she was feeding on them, although it is possible that some of them were consumed. Remnants of these moth eggs can be seen below the female in (2). **4,** After feeding on unknown prey the opisthosoma of this female was once again enlarged, this time with a dark red-purple colour and iridescent blue lines. **5,** One day later a dark brown object that appeared to represent the abdominal segments of an insect, perhaps prey of this spider, was visible at the center of the shelter. At this time only 11 of the original 14 eggs remained, and they were more loosely distributed. **6,** Detail of (5) showing large PME. **7,** After 3 more days the opisthosoma of the female was still dark in colour. **8-9,** The eggs of the original cluster began to hatch. At this time the opisthosoma of the female was still enlarged but was returning to its normal green colour with black spots. **10-16,** After 4 more days the spiderlings that had emerged from the original cluster continued to develop, but most of the eggs of this cluster had not hatched (10, detail). The female, now much reduced in size, had deposited a second batch of 14 eggs near the opposite side of her shelter, this time in two parallel rows, and generally occupied a central position near the insect fragment (16, arrow). One day later (6 OCT 2018) the area was visited by heavy rains and this leaf, already turning yellow, fell down. The subsequent fate of this female and her two broods is not known.

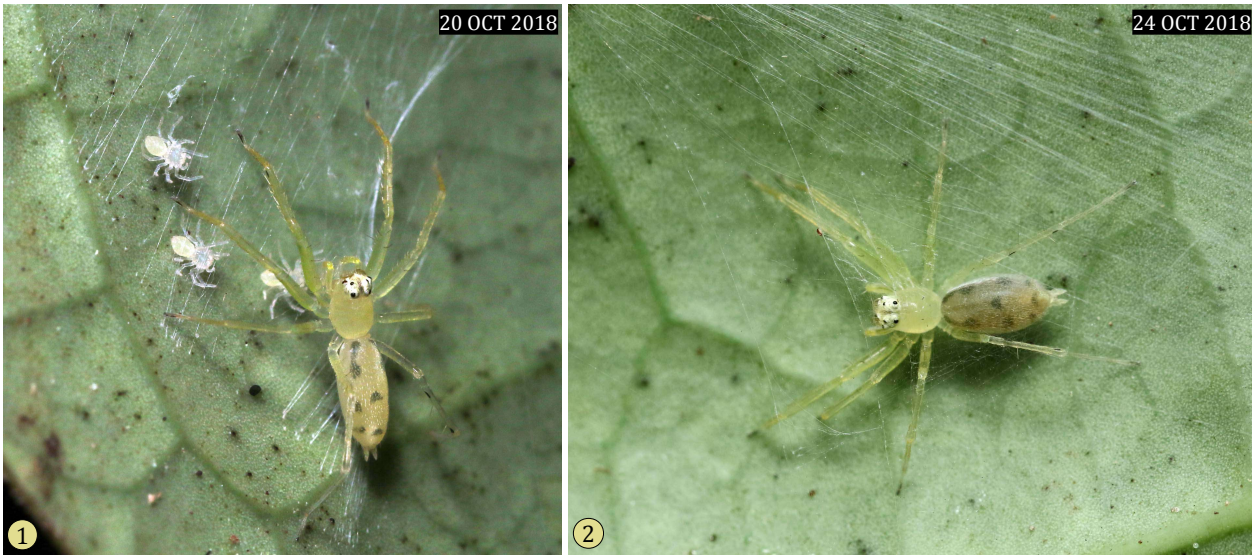

Figure 8 (20—24 OCT 2018). Female at shelter observed on two different days. **1,** Female with three spiderlings. **2,** Same female without spiderlings, but with a darker opisthosoma that was probably the result of feeding.

Discussion. Oophagy by *Asemonea* is not known (Jackson 1990) but remains a possibility since one female (Figure 7:1) was observed to construct her shelter directly over a group of moth eggs. A number of salticid species are known to eat insect eggs on occasion (Ahmed et al. 2018b). Unless a different egg predator broke into the nest of the female shown in Figure 7, the rearrangement and loss of several eggs observed here (Figure 7:5) suggests that a female *Asemonea* might consume some of her own eggs on occasion, a behaviour reported recently for the spartaeine *Neobrettus* (Ahmed et al. 2018a). The colour change of females of this species, although similar to that observed in other translucent salticids including the Neotropical genus *Lyssomanes* (Figure 9), is remarkable with respect to the appearance of iridescent blue stripes on a dark red-purple background. This colour change is associated with enlargement of the opisthosoma after feeding but the structural or physiological basis of this change is not known.

Figure 9. Adult female *Lyssomanes viridis* from Greenville County, South Carolina. **1,** Gravid female with normal green colour. Inset detail shows the small PME characteristic of the Lyssomaninae. **2,** Female just after feeding with dark opisthosoma. Like *Asemonea*, *Lyssomanes* females occupy simple shelters of layered silk laid down beneath large leaves (Jackson 1990).

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