

## Brood cannibalism by *Brettus cingulatus* (Araneae: Salticidae: Spartaeini)

Manjunath S<sup>1</sup>, David E. Hill<sup>2</sup> and Naveen Iyer<sup>3</sup>

<sup>1</sup> Manjunath S, 3rd Main Road, Gandhinagar, Tumkur, *email* manjunathsag@gmail.com, *Instagram* @manjunath\_wildshades

<sup>2</sup> 213 Wild Horse Creek Drive, Simpsonville SC 29680, USA, *email* platycryptus@yahoo.com

<sup>3</sup> 350, Jnanabharathi 1st Block, RVCE post, Bangalore - 560059, *email* naveen.iyer55@gmail.com, *Instagram* @naveen\_iyer

Brooding by female *Brettus cingulatus* Thorell 1895, to include occupation of a single nest site by a series of different females, has been documented previously (Ahmed et al. 2017, 2018; Abhijith & Hill 2019). Although males of this species may cohabit with a penultimate female prior to mating (Pai & Hill 2020), they may also mate with previously mated females as these females guard their eggs on the nest (Abhijith & Hill 2019). In one instance of *conspecific oophagy* or *egg cannibalism*, a female *B. cingulatus* was observed as she took over the nest and fed on the eggs of its previous inhabitant (Harshith & Hill 2020). Here (Figures 1-3) we provide a new record of mating on the nest, as well as *brood cannibalism* by a female *B. cingulatus*. Since *filial cannibalism* usually applies to situations where parents feed on their own offspring (DeWoody et al. 2001; Klug & Bonsall 2007), here we prefer to use the term *brood cannibalism* to describe predation on the non-filial brood of a conspecific. Unlike filial cannibalism, the evolutionary argument for brood cannibalism, like that for cannibalism in general, is not controversial. Among other things, it can improve the fitness of the predator at the same time that it reduces competition from conspecifics (Fox 1975; Snyder et al. 2000; Mayntz & Toft 2006; Wise 2006; Richardson et al. 2010).

On a sunny day at his home garden in Tumkur (Tumakuru), Karnataka (3 June 2022, 14:30 IST), the senior author (MS) observed a male *Brettus cingulatus* mating with a female as she guarded a recently deposited cluster of eggs, covered with silk fibers and white flecks, in a coconut sapling (Figure 1:1-4). After several minutes the male departed and the female continued to guard her eggs (Figure 1:5-8, 3 June 2022, 14:56 IST). After 2 days (5 June 2022, 11:15 IST), a male (perhaps the same male) approached this brooding female and courted her by extending his long legs I, with pedipalps held to the side to expose the front of each paturon (Figure 2). This male mounted the female and after her abdomen was raised they mated for about 40 minutes before the male departed.

5-6 days later (10 June 2022, 08:58 IST), this female continued to guard the brood that had been deposited before 3 June 2022. At this time unpigmented first instar spiderlings had started to emerge from their egg shells, still under the silk layers placed by their mother (Figure 1:9-12). On the morning of the next day (11 June 2022, 06:45 IST), the female was still guarding her brood. However, when the nest was checked in the afternoon of that day (11 June 2022, 13:00 IST), the female could not be seen, and only the brood remained.

Over the next 4 days the brood continued to develop. By 15 June 2022 (10:00 IST), the prosoma and opisthosoma, but not the appendages of the instar I spiderlings, were dark black. Although still blind, these spiderlings had started to move outside of the nest (Figure 1:13-16).

Early in the morning of the next day (16 June 2022, 08:00 IST) a different and clearly well-fed female *Brettus cingulatus* was seen near this nest and brood, feeding on the now defenseless instar I spiderlings (Figures 1:17-31, 3). Comparison of Figure 1:12, showing the first female with a patch of scales removed from the right, dorsal side of the carapace just behind and eye region, with Figure 1:26 shows unambiguously that the second female, engaging in brood cannibalism, was not the female that produced this brood.

Hill & Abhijith (2021) previously suggested that the flecks of silk added to the nest by brooding *B. cingulatus* females might provide nutrition to the early (I-II) instar spiderlings. However there was no evidence here that the instar I spiderlings fed on these flecks, which remained intact during the week that they developed in the absence of the brooding female. It is still possible that these provide nutrition to either the instar II spiderlings, or to the brooding female.



**Figure 1 (continued on next page).** Sequential photographs taken at a *Brettus cingulatus* nest site. 1-4, Mating pair on the nest of a brooding female. The inflated tegulum (or *bulb*) of the left pedipalp of the male can be seen clearly. The eggs were recently deposited.





**Figure 1 (continued from previous page, continued on next page).** Sequential photographs taken at a *Brettus cingulatus* nest site. 5-8, Female guarding her nest with recently laid eggs after mating. 9-10, Female guarding her hatching instar I spiderlings one week later.





**Figure 1 (continued from previous page, continued on next page).** Sequential photographs taken at a *Brettus cingulatus* nest site. **11-12**, Female guarding her hatching instar I spiderlings. **13-16**, Instar I spiderlings 5 days later, in the absence of the female.





**Figure 1 (continued from previous page, continued on next page).** Sequential photographs taken at a *Brettus cingulatus* nest site. **17-22**, A different (second) female feeding on a series of defenseless instar I spiderlings. At this point perhaps half of the brood (~14/28 spiderlings) were lost.





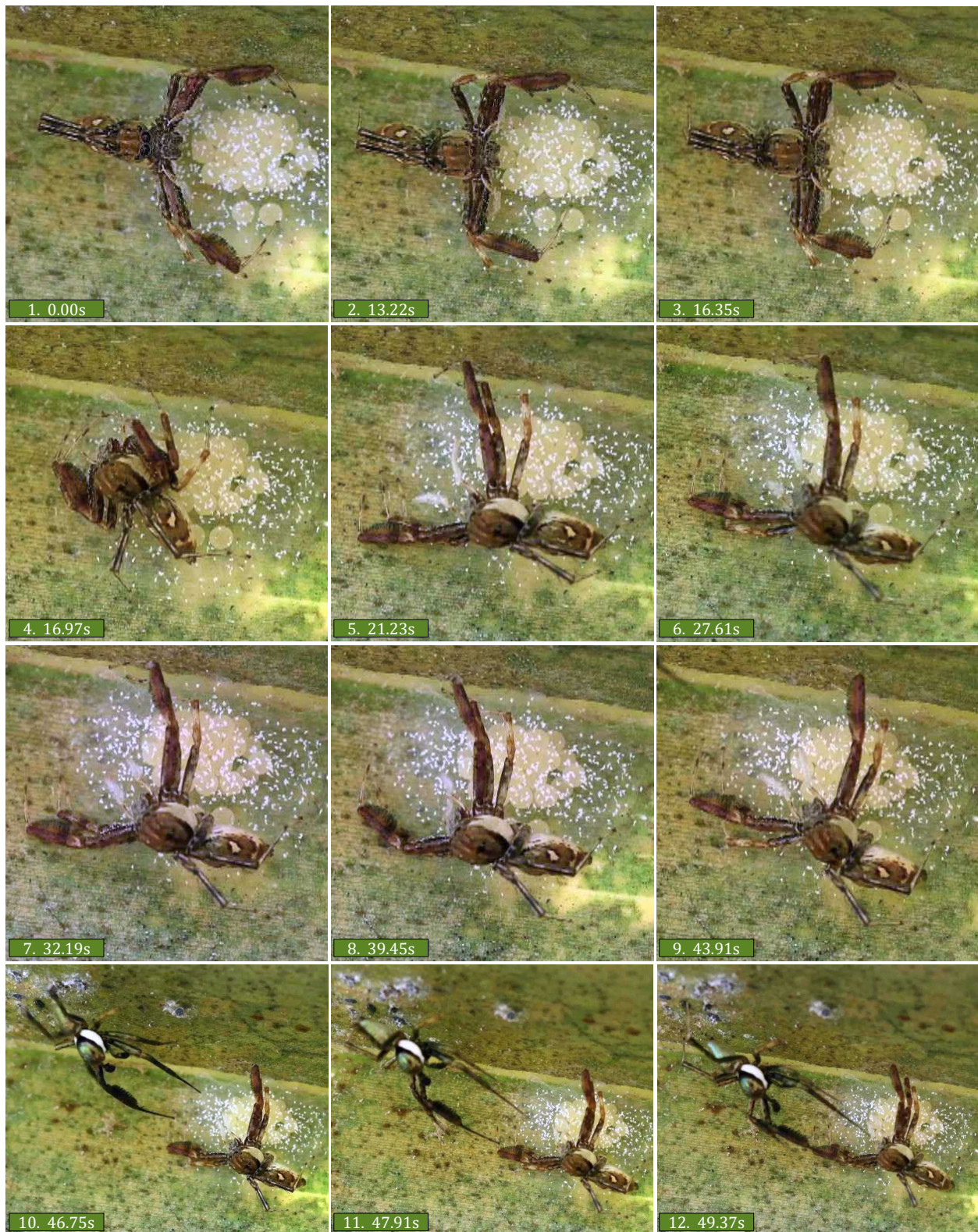
**Figure 1 (continued from previous page, continued on next page).** Sequential photographs taken at a *Brettus cingulatus* nest site. 23-27, Second female feeding on a series of defenseless instar I spiderlings, at least two at a time.





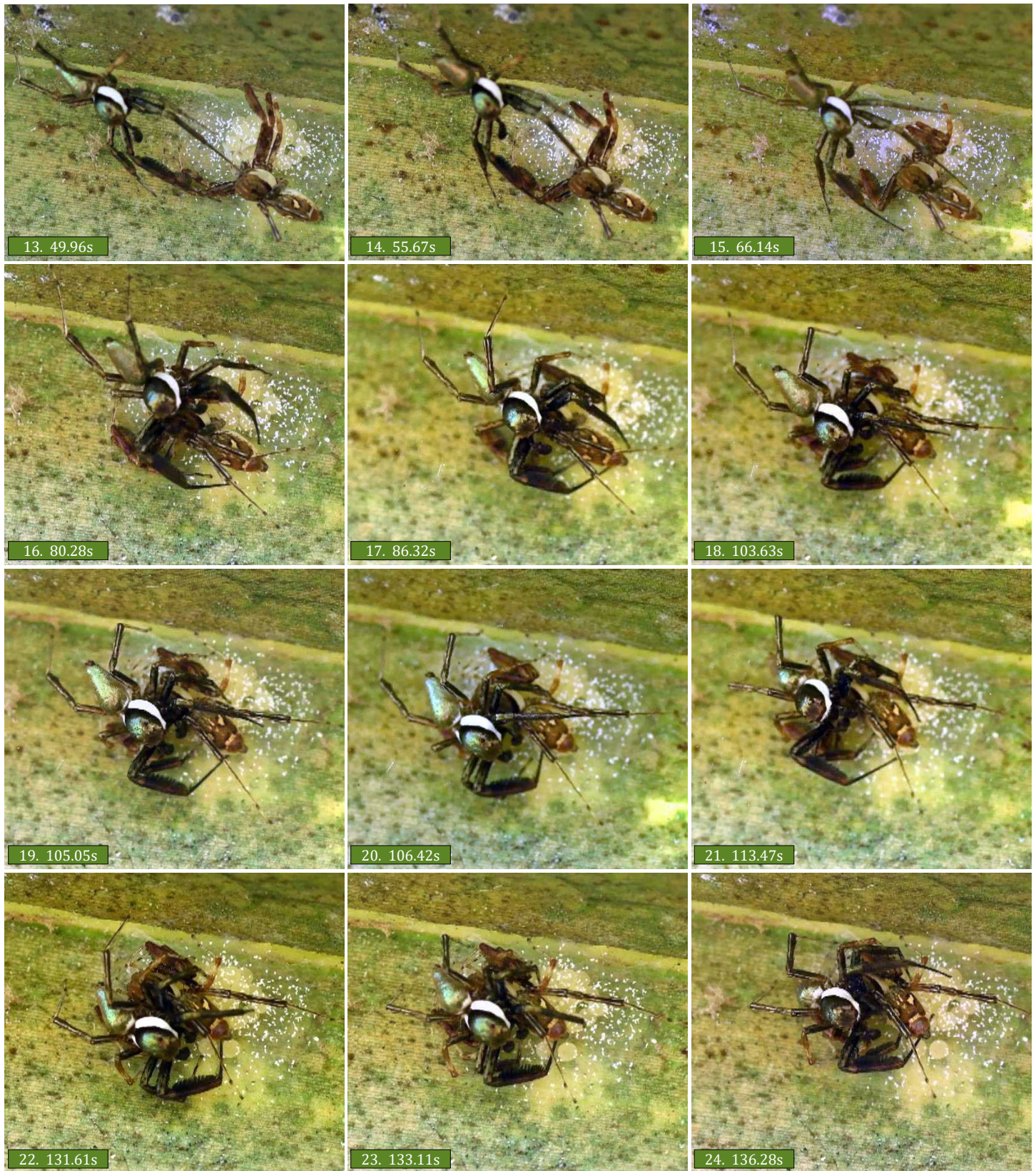
**Figure 1 (continued from previous page).** Sequential photographs taken at a *Brettus cingulatus* nest site. **28-31**, Second female feeding on a series of defenseless instar I spiderlings.





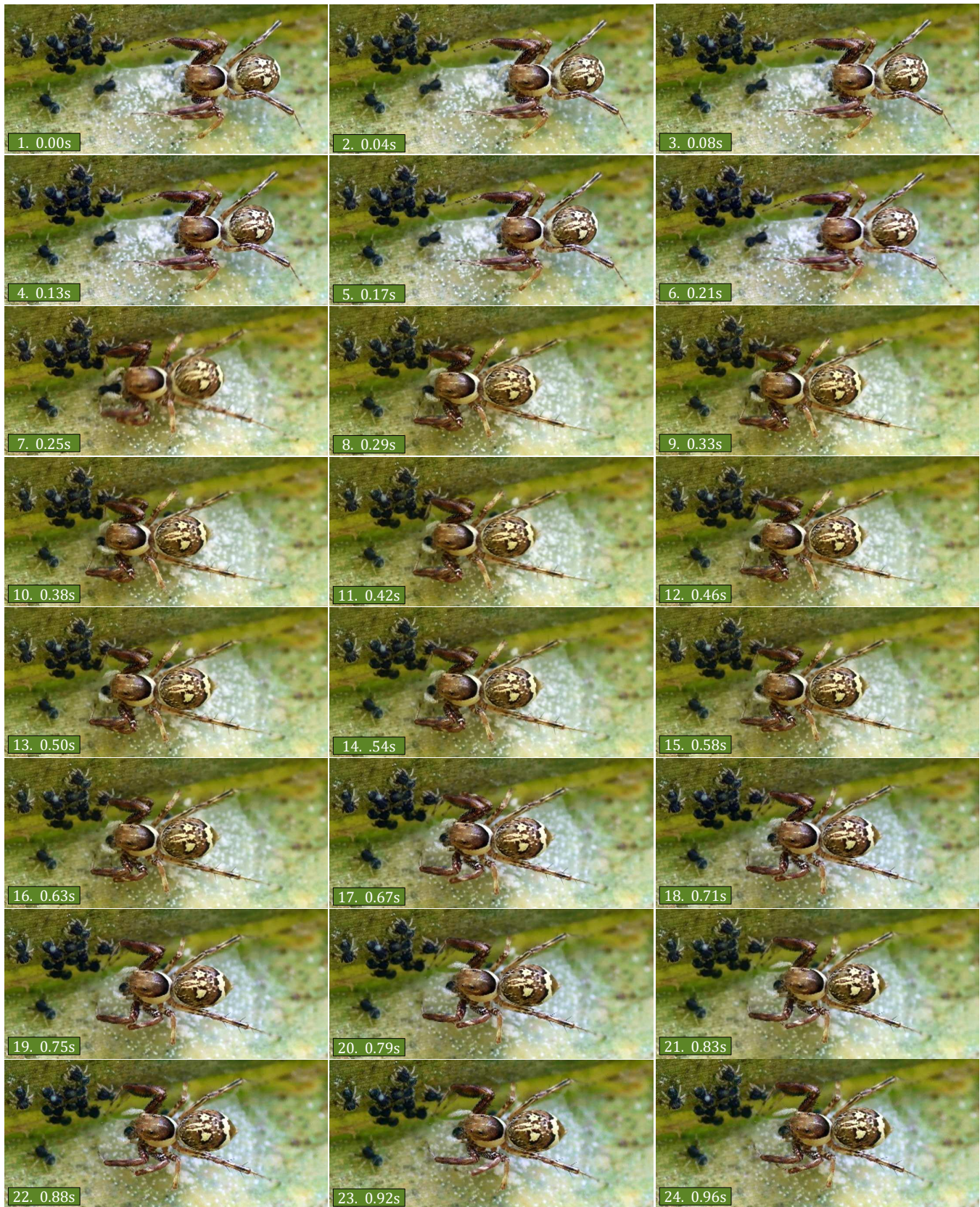
**Figure 2 (continued on next page).** Selected sequential frames from a 23.98 fps video of a male approaching the nesting *Brettus cingulatus* to mate (5 June 2022, 11:15 IST). **1-3**, The alert female guarding her brood. **4**, Female turning to face the courting male. **5-9**, Female in elevated position with extended legs I, turning to face the male. Note the separation and movement of the bright white pedipalps of this female. **10-12**, Male approaching female with outstretched legs I and separated pedipalps.





**Figure 2 (continued from previous page).** Selected sequential frames from a 23.98 fps video of a male approaching the nesting *Brettus cingulatus* to mate (5 June 2022, 11:15 IST). **13-15**, The male continued to approach the female and to touch her with extended legs I. **16-24**, After mounting the female, the male attempted to get her to rotate or raise her abdomen in preparation for mating on the left side.





**Figure 3.** Consecutive frames from a 23.98 fps video showing a female *Brettus cingulatus* capturing an instar I spiderling in the unattended brood (16 June 2022, 08:00 IST). 1-6, Approaching the intended victim. 7-8, Jump to capture the spiderling. 9-24, Slowly moving to the rear to feed on the captured spiderling.



## Acknowledgements

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