

Cohabitation and mating by *Brettus cingulatus* (Araneae: Salticidae: Spartaeini) in Karnataka

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Brettus cingulatus Thorell 1895 was only recently reported from India as the male corresponding to the female (now a synonym) *B. albolimbatus* Simon 1900 (Ahmed et al. 2017; Patil & Uniyal 2018). This is the most widely distributed member of the genus, with a range that extends from south India to Sumatra (Ahmed et al. 2017). Emergent (2nd instar) juvenile *B. cingulatus* resemble the adults in colouration, but intermediate instars to include penultimates are orange (Ahmed et al. 2017; Abhijith & Hill 2019). Jackson & Hallas (1986) gave a detailed list of some of the positions assumed by a courting male *B. cingulatus* in an open arena, in the laboratory. The cohabitation of males with penultimate females, as well as mating between an attending male and a female guarding her eggs in the nest, has also been described previously (Abhijith & Hill 2019), in nature. Here we document one more example of an adult male attending to or guarding a nearby penultimate female in nature, in this case mating with that female soon after she completed her final moult to adulthood. Although mating just after the final moult may be obligatory in certain brachuran crabs (Hartnoll 1969; Moyano & Gavio 2012), the previous studies of *B. cingulatus* suggest that mating by *B. cingulatus* can take place at any time after that moult.

On a night walk in his garden in Sanoor village, Udupi district, Karnataka (21 JUN 2020, 21:00) the senior author (MJP) observed an adult male *B. cingulatus* several cm away from a penultimate female of the same species, both on the thin silk fabric of a retreat on the underside of a leaf (Figure 1:1-2).

On the next day (22 JUN 2020) this male was seen adding silk strands to the retreat, still at a distance of several cm from the female. Several hours later this male continued to watch the female as she moulted (Figure 1:3-4). After moulting the more colourful female began to stretch her legs and groom them with her chelicerae.

Several minutes later, the male moved toward the female to mate (Figures 1:5-6, 2). Initially the male displayed by moving quickly from side to side as the female observed him. With these movements the female moved further away from the male. This interaction continued for about 10 minutes. Both male and female held their positions for about 5 more minutes, and then the male moved closer and started to poke the female with his long legs I, slowly mounting her and positioning. At this point the female lowered her carapace and the male moved a pedipalp to the epigynum. Several minutes later the female raised her abdomen to a vertical position and they remained in this position, mating, for about 80 minutes. After this the pair separated (Figure 1:7), but the male returned to mate once more after about 10 minutes had elapsed. After the second mating, the male departed and could not be found in the vicinity of the female.



Figure 1. Sequential (1-7) photographs of male and female *Brettus cingulatus* in retreat under a leaf in Sanoor village, Udupi district, Karnataka state, India. **1**, Male (at left) waiting on the thin silk fabric of this retreat near a penultimate female. **2**, Detail of male from (1). **3**, Male (at left) attending to the female as she moulted. **4**, Detail of moulting female from (3). **5-6**, Mating. **7**, Male (at upper left) stepping away from female after mating. Photographs copyright © by M. Jithesh Pai.



Figure 1 (continued on next page). Sequential (1-23) frames selected from 25fps video clips of the courting male and female *Brettus cingulatus*. **1-2**, Frames from a 75s clip showing the male watching the female as she completed her moult. **3-8**, Frames from a 130s clip showing the male advancing toward the female after her moult. Photographs copyright © by M. Jithesh Pai.



Figure 1 (continued from previous page). Sequential (1-23) frames selected from 25fps video clips of the courting male and female *Brettus cingulatus*. 9-23, Frames from a 219s clip showing relative positions of the male and female as the male advanced to contact the female and assume a mating position. Photographs copyright © by M. Jithesh Pai.

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