FIELD NOTE

Mating trophallaxis in *Diarrhegma modestum* (Fabricius) (Diptera: Tephritidae: Phytalmiinae)

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Mating trophallaxis is one of the courtship display behaviours shown by males of fruit flies to attract or influence a conspecific female. It involves regurgitation or exchange of a fluid or nuptial gift between male and female during copulation (Freidberg, 1981). It can be indirect when it is deposited on the surface and consumed by the female or exchanged directly through labellar contact. Sivinski *et al.* (1999) listed 21 species of fruit flies in subfamilies Phytalmiinae, Tephritinae and Trypetinae that exhibit this behaviour. In Phytalmiinae this behaviour was documented in six species, namely *Afrocneros mundus* (Loew) (Oldroyd, 1964), *Dirioxa pornia* (Walker) (Pritchard, 1967), *Felderimyia gombakensis* Hancock & Drew, *F. fuscipennis* Hendel and *F. flavipennis* Hancock & Drew (Dohm *et al*., 2008). *Diarrhegma modestum* (Fabricius) is a species in subfamily Phytalmiinae, tribe Acanthonevrini and this behaviour is being recorded here for the first time. Genus *Diarrhegma* Bezzi is Oriental in distribution with two described species, namely *D. modestum* (Fabricius) from India and Sri Lanka (Agarwal & Sueyoshi,2005; David & Ramani, 2011; Hancock, 2015) and *D. paritii* (Doleschall) from China, Vietnam and Thailand to Indonesia, Borneo and the southern Philippines (Norrbom *et al*., 1999; Hancock, 2015). *Diarrhegma modestum* is a brilliantly coloured fly with reddish brown scutum, broad yellow prescutellar patch, yellow scutellum and dark patterned wings with hyaline indentations. As is the case with most phytalmiines, *D. modestum* is also saprophytic in its habit; maggots of this species were found feeding on the frass/exudates from the trunk of the drumstick tree (*Moringa oleifera* Lam.: Moringaceae) damaged by a coleopteran borer, by the senior author in Bangalore.

Mating trophallaxis or nuptial gift behaviour of *D. modestum* was observed three times at ICAR-National Bureau of Agricultural Insect Resources, Yelahanka campus, Attur, Yelahanka, Bangalore. On 23.07.2021, a male fly was noticed on the ventral side of a teak leaf (*Tectona grandis* Linn. F.) after producing a frothy secretion near a female; the female moved towards the frothy secretion after nearly 30 seconds and started feeding on it; meanwhile, the male approached the female from behind, but the female retreated; this recurred twice and finally copulation started at the third attempt with the mating observed for 2−3 minutes; during the mating, the female fed on the frothy secretion. Since it was high up in the tree, it was difficult to document via digital photographs. Subsequently, on 30.07.2021, on the ventral surface of a leaf of *Scaveola taccada* (Gaertn.) Roxb. (Goodeniaceae), a male fly was seen producing a white frothy secretion of irregular shape from its mouth and a female fly was seen near the male; after the male stopped producing froth, it receded and waited for the female to accept the nuptial gift; as soon as the female started feeding, the male approached it from behind for copulation; although the female initially retreated, the male successfully copulated and mating lasted tor 3−4 minutes unless interrupted by wind (Fig. 1). On 03.08.2021, two males were observed on the ventral side of a *Scaveola* leaf; one of the males was seen warding off the other male aggressively until finally a single male occupied the leaf. A female was noticed on another old leaf of the same plant feeding on a nuptial gift that might have been produced days before and, although the male attempted to copulate, it was in vain.

Based on these observations, it is evident that a nuptial gift in *D. modestum* is essential for successful copulation. It serves the purpose of attracting a female and overcoming the tendency for it to fly away, thus facilitating mating.

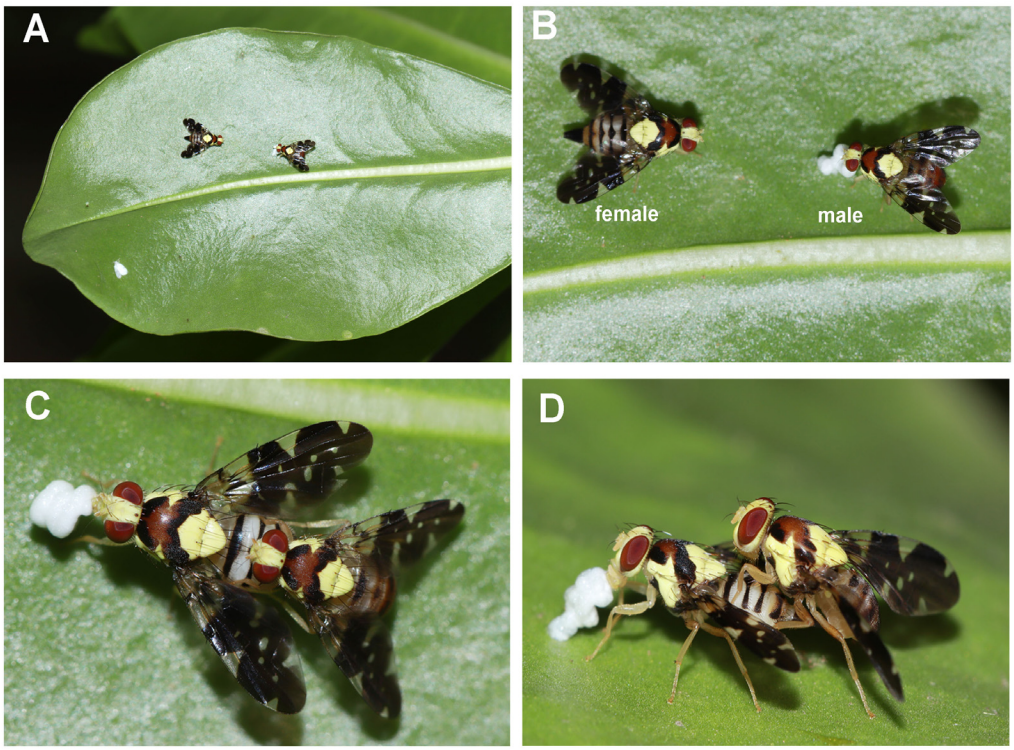

Figure 1. Mating trophallaxis in *Diarrhegma modestum* (Fabricius). A. Male secreting frothy substance on leaf surface and female awaiting; B, close-up view; C, female feeding on frothy secretion while mating (dorsal view); D, female feeding on frothy secretion while mating (lateral view)

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