

MATING BEHAVIOUR OF BRACON *BREVICORNIS* WESMAEL (HYMENO-
PTERA: BRACONIDAE), A LARVAL PARASITE OF *NEPHANTIS*
SERINOPA MEYRICK, THE BLACK HEADED CATERPILLAR
OF COCONUT

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Studies on the biology and behaviour of the entomophagous insects often provide basic information for efficient biological control programmes. *Bracon brevicornis* Wesmael is one of the biological control agents employed against *Nephantis serinopa*, the black headed caterpillar pest of coconut in S. India. Apart from the preliminary observations made by Hase (1922), Genieys (1925) and Taylor (1932), no detailed studies have been made on the biology and behaviour of *Bracon brevicornis* V. and hence the present study on the mating behaviour has been undertaken. In the laboratory *B. brevicornis* were reared on *Corcyra cephalonica* larva in glass tubes of 1" × 4" to 1" × 6". Adults were fed with 50% honey. Immediately after their emergence males and females were separated to different tubes.

A short pre-mating period exists in *B. brevicornis*. While about 80% of the males were found mating approximately after one hour, in a very few cases they mated prior to this duration. Females become receptive only 4-5 hours after their emergence from the cocoon. Freshly emerged and mated females prevented mating attempt of males by bending the abdomen downwards. An excited male performs a rapid movement within the tube with its wings half opened buzzing them at intervals. A definite chasing behaviour is absent in *B. brevicornis*. Fanning of wings by excited male had been reported in *Agathis gibbosa* (Odebiyi and Oatman, 1972). Grosh (1947) described a similar "wing beat" in *Microbracon hebetor* Say, which Whitting (1932) has called mating reaction.

By chance the male comes near the female, the former recognises its mate and with a jump, hold and mount on it. In many cases due to its speedy action male may mount on the body of the female in the false direction and later may correct its position. As the male mounts on the female the male rapidly buzzes its wings which lasts about 1-2 seconds. The male's position on the body of the mate is in such a way that its head is just above the metathorax of the female. Soon after mounting on the female the male curves and extends his abdomen downwards, so that its tip will be directed to the genital opening of the female. The buzzing of wings stops when the male starts curving his abdomen downwards. A receptive female keeps her abdomen almost horizontal with the

ovipositor slightly deflected sideways, thus preventing its interruption in the mating. The male thrusts forward its penis to the already opened hypopygium of the female and then it reaches the genital opening. During the mating time, the male vibrates its head up and down rapidly touching the metathoracic region of the female. When mating is over, the female moves forward and the male loses its grip on the female's body and fall backward. Occasionally the male was dragged forward a little by the female soon after mating, when the male failed to separate itself from the female immediately.

After mating both male and female remain still for few seconds and then clean their mouth parts, antennae etc. Often male tried for a second mating immediately after the first one. A mated female behaves non receptive by bending her abdomen downward and moving the hind legs in a characteristic kicking way which prevents mounting of the male. Out of the 53 instances of mating observed, 11, 13, 16, 9 and 4 insects showed mating duration in the range of 3-5, 5-7, 7-9, 9-11 and 11-13 seconds respectively. The 99.7% confidence limit of the population mean value are found to be 7.32 ± 1.003 .

Following emergence, the initial discovery of a female by the male *B. brevicornis* depended mainly upon a chance encounter. Males whose antennae are amputated recognized the female as in normal case and mating took place successfully indicating that in the case of male, *B. brevicornis* olfactory sense has a less important role than the visual sense. Grosch (1948) observed that in *Habrobracon jugulandis* Ash. mating reaction is influenced by olfactory sense. Based on his observations he considered that his conclusions substantiate the "general view" that the mating reaction of Parasitic hymenoptera has an olfactory basis. The result of our studies indicates that the "general view" is based on the observation of a few species.

Mating takes place in about one hour after emergence in the case of males and about 4-5 hours after the emergence of females. The age of male and female seemed to be not an important factor determining mating behaviour in *B. brevicornis*. Several individuals of different ages were used for establishing this aspect. Adult females of various ages ranging from one day old to thirty days old were found mating readily. in the case of males also the same phenomenon has been observed. Temperature varying from 18-40°C has a uniform effect in the mating of *B. brevicornis*. Fresh adults were inactive at low temperature from 12-14°C for several days. Immediately after raising the temperature by 3-4°C they get activated.

സംഗ്രഹം

തെങ്ങാലപ്പുഴയിന്റെ ഒരു എരി പ്രാണിയായ 'സ്രാക്കോൺ ബ്രെവികാർണിസ്' എന്ന കീടത്തിന്റെ ഇണചേരലിനെക്കുറിച്ചു വിശദമായി രാമകൃഷ്ണൻ (1960) നീരീക്ഷണങ്ങളാണ് ഈ ലേഖനത്തിൽ പ്രതിപാദിക്കുന്നത്.

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