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THE ROLE OF CERCI AND OVIPOSITORS IN THE FEMALE MANTID *EUANTISSA PULCHRA* (FABRICIUS) (DICTYOPTERA : MANTIDAE)

U. KARUPPANAN

The functions of the cerci and the ovipositors in the female mantid *Euantjssa pulchra* (Fabricius) is presented.

The cerci in insects are considered as the sense organs at the posterior end of the body. Though their functions are not fully understood, yet they assist the nymphs in from the egg case (Sharp, 1968); in successful mating (Rau and Rau, 1913; Kumar, 1973); to select a suitable place for ootheca deposition (Kershaw, 1910; Williams and Buxton, 1916; Mathur, 1934; Hinton, 1961) and in shaping the outer dimension of ootheca is fasioned by the organs at the extremity of the body (Rau and Rau, 1913; Williams and Buxton, 1916; Essig, 1942; Sharp, 1968). On the basis of the above reports, an attempt has been made to know whether the cerci are the sense organs or the organs for ootheca construction.

MATERIALS AND METHODS

Ten females and males of newly emerged adult mantids *Euantissa pulchra* (Fabricius) were callected from stock culture in the laboratory which were fed on alive houseflies.

The mantids were grouped into two main categories. (1) The cerci of the 5 female mantids *E. pulchra* were amputated as soon as they emerged from penultimate nymphal stages (experiment). In order to prevent the oozes of haemolymph from the cut end of cerci, molten wax was applied. (2) Another group of 5 females were reared without amputation of the cerci (control). Both the groups of females were allowed to copulate with males and deposite the oothecae.

RESULTS AND DISCUSSION

Each species of mantids constructs its ootheca which may characteristically different from other species (Richards and Davies, 1977; Essig, 1942). The mating and oviposition behaviours as well as the external structures of the oothecae of mantid *E. pulchra* including the eclosion zone and emergence area on the dorsal side were similar in both the categories. It implies that the cerci are not mainly participating in shaping the ootheca. The observation ciffers from the investigations done in *Gongylus gongyloides* (Williams, 1904), *Hierodula saussurii* (Kershaw, 1910), *Stagmomantis carolina* (Rau and Rau, 1913) and in some

Department of Zoology, Government Arts College, Coimbatore - 641 018.

other mantids (Arora and Singh, 1957). The cerci of the contorl mantids *E. pulchra* during oviposition are incessantly touching the outer or lateral margins of the ootheca.

The ovipositor is well developed at the posterior extremity of the female mantid with which the oothecal materials at the time of oviposition are uniformly distributed as well as the eggs in the materials are properly fixed. The observation differs from the views of Williams (1904) who has reported that the cerci in *G. gongyloides* are the major organs for the equal distribution of the oothecal materials. The ovipositors by their regular movements are molding the external structures of the ootheca. It is in accordance with the observations done in *Mantis religiosa* Linnaeus (Slingerland, 1900), *Stagmomantis guttata* Thunb (Williams and Buxton, 1916) and generally in mantids (Essig, 1942; Bandsma and Brandt, 1963, Sharp, 1968; Hinton, 1981).

The cerci are predominantly larger and more complicated in structure and function in the female mantid *E. pulchra* than in the male. It is observed that the cerci of the female mantid *E. pulchra* are used to find out a suitable substratum for the ootheca deposition. Since the cerci touch the lateral sides (or lateral margins) of the oothcea during oviposition, it is concluded that they are incessantly feeling the extension, margins as well as width of the ootheca. It is also noted that the ootheca is fairly constructed only in between the touching points of the cerci on the substratum. Hence they are treated as sense organs.

The ovipositors in both the categories of mantids *E.pulchra* are singularly molding and shaping the ootheca. The external specific structures namey the eclosion zone and emergence areas on the drorsal side of the ootheca are shaped by ovipositors. These are the sole organs for maintaining the size of the ootheca, to distribute the oothecal substances uniformly throughout the case and to fix the eggs properly in the oothecal material. Hence the conctruction of oothece is mainly performed by the ovipositors.

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SPACING STUDIES IN TURMERIC

P. V. BALASHANMUGAM and K. VANANGAMUDI

A spacing experiment was conducted with CO 1 turmeric to determine the optimum spacing for obtaining maximum yield of fresh rhizome, The study indicated that a wide spacing of 50 X 50 X 15 cm was found to be optimum for recording 48, 800 kg of fresh rhizome/ha.

Spacing plays an important role in turmeric yield per unit area. A close spacing of 30 cm between rows gave higher yield (Anjaneyulu and Krishnamurthy, 1979). contrarily, a spacing of 45-60 cm between rows was also found to be the optimum (Aiyadurai, 1966), This study was conducted at Agricultural Research Station, Bhavanisagar to determine the optimum spacing for turmeric growing areas of periyar and Coimbatore districts of Tamil Nadu.

MATERIALS AND METHODS

The experiment was carried out during June 1983 using randomised block design with five replications The variety chosen for this study was CO 1. The details of the spacing treatments are shown in Table 1

The plot size was 6 m X 4m .The number of plants per 24 sq. m plot were 480, 440, 400, and 360 for S_1 S_2, S_3, and S_4, respectively. Broad ridges aud furrows were prepared to plant the seed rhizomes. Uniform