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Sex Determination of Pupae of Sorghum Stalk Borer, *Chilo zonellus* (Swinhoe)

Sex determination in insects becomes a pre-requisite for studies such as sex attractants and sterility induction, wherein there is need for rapid sexing of large numbers of insects. In Lepidoptera, pupae are known to possess differences in external characteristics between the sexes (Jackson, 1890; Poulton 1890). Such differences have been first made use of in sexing the Egyptian cotton leaf worm (*Prodenia litura* F.) by Flaschantrager *et al.* (1958). Characters such as position of genital openning, number of visible or movable abdominal segments, color and location of the spiracles seem to be useful (Solomon, 1962). With this background, attempt was made to identify sexual differences in the pupae of the sorghum stalk borer, *Chilo zonellus*, for sterilization studies and the observations are presented herein

The insect was cultured on a semi-synthetic medium, which was a modification of the one suggested by Laxminarayana and Soto (1971). Three day old pupae were chosen fot the observations. The female pupae were generally bigger in size. Their genital (vulval) openings were located in the anterior region of the eighth abdominal segment mid-ventrally, in the form of a dot-like cleft. The male pupae were shorter and marginally narrower. The genital opening was located in the posterior region of the ninth abdominal segment and was flanked by a pair of pads. Differences in the position of genital openings have been used earlier in sexing the pupae of the elm spanworm, *Ennomus subsignarius* (Solomon, 1962) and the Codling moth. *Carpocapsa pomonella* (Peterson, 1967)

The size of the pupae of either sex, was recorded in terms of length and diameter on 100 pupae each, and the relative difference in dimension are brought out in Fig. 1. Both the dimensions differed significantly between the sexes (Table 1)

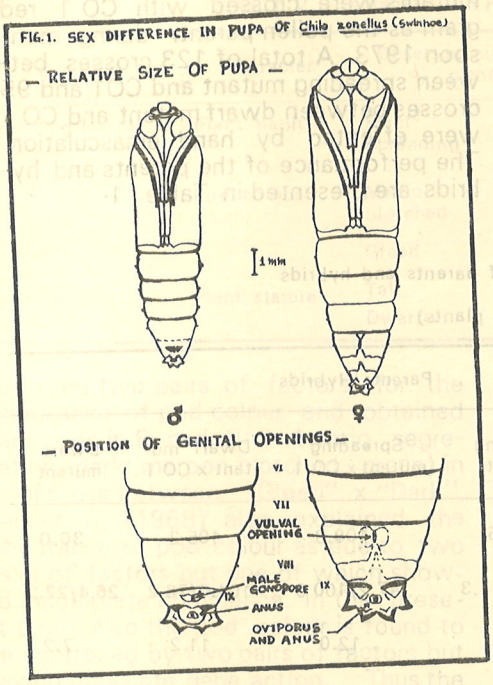
TABLE 1. Sexual differences in the dimensions of the pupae of Chilo *zonellus*

Characters	Male	Female	't'
Length (mm)	10.74	13.65	15.90**
Diameter (mm)	2.51	3.25	21.14**

TABLE 2. Relationship between length and diameter in male and female pupae

Details	Male	Female
Correlation coefficient (r)	+ 0.6785**	+0.779**
X_1 =	$2.74X_2 + 3.87$	$4.37X_2 - 0.55$
X_2 =	$0.15X_1 + 0.90$	$0.14X_1 + 1.34$

X_1 = length X_2 = diameter



Simple correlations between the length and diameter were worked out and were found to be significant for both sexes. The relationship between the length and diameter has been brought out in Table 2.

The positive correlation between the length and diameter was stronger in the female.

Thus, the existence of external sexual characteristics in the pupae of the sorghum stalk borer and the significance of the dimensions of the pupae, may serve as reliable bases for sexing at the pupal stage.

S. SITHANANTHAM
T. R. SUBRAMANIAM

Department of Entomology
Tamil Nadu Agricultural University,
Coimbatore-641003.

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