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SEX DETERMINATION OF LEPIDOPTEROUS PUPAE^{1/}

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Sexual characteristics differentiating male from female lepidopterous pupae were noted by Jackson (1) and Poulton (2) in the latter half of the 19th century. This knowledge, however, has only recently been utilized in the field of applied entomology. Flaschentrager, Jarczyk, and Hafez (3) sexed pupae of Prodenia litura F. in sex attractant studies. Solomon (4) sexed pupae of the elm spanworm Ennomos subsignarius (Hübner) in investigations on this hardwood forest defoliator.

Because of currently expanding research on insect sex attractants and chemosterilants and the sterilization of insects by irradiation, there is an increasing need for the rapid sexing of large numbers of insects.

Comparative drawings indicating sexual differences found on the terminal abdominal segments of the pupae of eight important lepidopterous pests of field crops are shown in figures 1 to 8. In each species the 8th

^{1/} In cooperation with the Texas Agricultural Experiment Station.

segment of the female pupa is divided by the 9th segment on the ventral median, and the opening of the bursa copulatrix is visible in this segment. The 8th segment of the male pupa is not divided and the 9th segment has two rounded pads, one on each side of the middle ventral line. These pests are the pink bollworm (Pectinophora gossypiella (Saunders)), bollworm (Heliothis zea (Boddie)), cabbage looper (Trichoplusia ni (Hübner)), southern armyworm (Prodenia eridania (Cramer)), tobacco budworm (Heliothis virescens (F.)), cotton leafworm (Alabama argillacea (Hübner)), salt-marsh caterpillar (Estigmene acrea (Drury)), and yellow-striped armyworm (Prodenia ornithogalli Guenée).

The following designations are used in the figures:

BC = bursa copulatrix

P = Pad

VIII = 8th segment

IX = 9th segment

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Figure 1.--Pink bollworm (Pectinophora gossypiella (Saunders)).

Figure 2.--Bollworm (Heliothis zea (Boddie)).

Figure 3.--Cabbage looper (Trichoplusia ni (Hübner)).

Figure 4.--Southern armyworm (Prodenia eridania (Cramer)).

Figure 5.--Tobacco budworm (*Heliothis virescens* (F.)).

Figure 6.--Cotton leafworm (*Alabama argillacea* (Hübner)).

Figure 7.--Salt-marsh caterpillar (Estigmene acrea (Drury)).

Figure 8.--Yellow-striped armyworm (Prodenia ornithogalli Guenée).

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