

MATING FREQUENCY IN WILD FEMALES OF  
*COPITARSIA CONSUETA* (LEPIDOPTERA: NOCTUIDAE)

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Successful mating in females of Lepidoptera is indicated by the presence of one or more spermatophores in the bursa copulatrix (Ouye et al. 1964). The determination of mating status in lepidopteran pests has been used in studies of mating disruption by pheromones or in control systems using sterile males (Spurgeon et al. 1994). *Copitarsia consueta* (Walker) (Lepidoptera: Noctuidae) is a polyphagous insect distributed from South America to Mexico (Angulo and Wiegert 1975). Mating frequency has not been described in the field. In Mexico, this pest is present all year in association with cabbage (*Brassica oleraceae* var. Capitata). The purpose of this work was to determine the mating frequency of wild *C. consueta* females.

The study was carried out in Montecillo and Chapingo, both sites in the state of Mexico. A white light trap (WLT) and black light trap (BLT) of 15 watts each were placed at different sites in a cabbage crop (0.5 ha) for 20 d. The traps were placed at a height of 1.3 m and were switched on from 8 pm to 6 am. The traps were emptied daily and captured insects were taken to the laboratory for identification using the keys of Artigas and Angulo (1973). The number of males and females of *C. consueta* in each collection was recorded, and females were dissected to count the number of spermatophores.

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A total of 71 females were captured in both sites, and all were mated. Eight females had 4 spermatophores, forty seven females had 3, eleven females had 2 and five females only had one spermatophore (Table 1). Chapingo was the site where the highest number of females was captured ( $n = 43$ ). Montecillo had less ( $n = 28$ ), but the difference was not significant ( $\chi^2 = 0.735$ ;  $df = 1$ ,  $P > 0.05$ ). The WLT captured 22 females in Chapingo and 13 in Montecillo, whereas the BLT captured 21 females in Chapingo and 13 in Montecillo (Table 1).

Mating frequency of female Noctuidae is not constant across species. For example, from 132 females of *Helicoverpa armigera* (Hubner) captured, most (117) did not mate, eleven of them only had a single spermatophore, and the rest contained between 2 and 3 spermatophores (Coombs et al. 1993). In *Helicoverpa punctigera* (Wallengren), most of the females did not mate (329 of 366), and the rest only had a single spermatophore (Coombs et al. 1993). Similar results to those found in the present study were reported for *Amphipyra pyramidea* (L.), where females mated between 2 and 4 times. However in other *Amphipyra* species, most females only mated a single time (Funakoshi 1992).

The data obtained in the present study confirm that *C. consueta* females copulate several times. Observations on the number of matings in wild females of *C. consueta* agree with those found by Rojas and Cibrián (1994) in the laboratory. In the field, *C. consueta* females mated an average of 2.7 times, while in the laboratory the average was 2.5 times. In a study of 13 species of *Euxoa*, Byers (1978) found that three species had the same frequency of mating in the field and laboratory. According to Byers (1978), the benefits of multiple mating may be to remedy an inadequate initial mating, improve genetic diversity, contribute a paternal nutritional investment and increase phenotypic variation. Although light traps may not capture a representative field population, the mean number of spermatophores per female was similar in both sites (Table 1).

## SUMMARY

Females of *Copitarsia consueta* were captured with light traps in cabbage fields in Mexico. The number of spermatophores in the bursa copulatrix determined the fre-

TABLE 1. FREQUENCY OF MATING DETERMINED BY THE NUMBER OF SPERMATOPHORES IN THE BURSA COPULATRIX OF *C. CONSUETA* FEMALES.

| Site       | Light trap | No. captured females | % Females w/spermatophores | No. spermatophores | No. captured males | Total moths captured |
|------------|------------|----------------------|----------------------------|--------------------|--------------------|----------------------|
| Montecillo | Black      | 13                   | 38                         | 1                  | 15                 | 28                   |
|            |            |                      | 62                         | 3                  |                    |                      |
|            | White      | 15                   | 20                         | 2                  | 19                 | 34                   |
|            |            |                      | 60                         | 3                  |                    |                      |
|            |            |                      | 20                         | 4                  |                    |                      |
| Chapingo   | Black      | 21                   | 38                         | 2                  | 18                 | 39                   |
|            |            |                      | 62                         | 3                  |                    |                      |
|            | White      | 22                   | 77                         | 3                  | 21                 | 43                   |
|            |            |                      | 23                         | 4                  |                    |                      |
| Total      |            | 71                   |                            |                    | 73                 | 144                  |

quency of matings. All captured females were mated and the highest number of spermatophores found was 4 per female ( $\bar{X} = 2.7 \pm \text{EEM } 0.058$ ).

The first author thanks the support from CONACyT for the realization of his master studies (register number 91489). We thank Dr. Gloria Dávila Ortíz (former head from CeProBi-I.P.N.) for support offered during the course of this study. We also thank Julio Rojas (Ecosur) for review of an earlier version of the manuscript.

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