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Source: Florida Entomologist, 88(4) : 536-537

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/0015-4040(2005)88[536:DOSIPO]2.0.CO;2

DETERMINATION OF SEX IN PUPAE OF *PHYCIODES PHAON* (LEPIDOPTERA: NYMPHALIDAE)

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The Phaon crescent butterfly, *Phyciodes phaon* (Edwards) is distributed from coastal North Carolina throughout the southern parts of the Gulf States to southern Texas and west to Southern California (Opler & Kruzek 1984). The only known host plants are *Phyla (Lippia) nodiflora* and *P. lanceolate,* which belong to the family Verbenaceae (Riley 1975). Data on biology and number of instars of the Phaon crescent, rearing on an artificial diet, and influence of lipids in the diet have been published (Genc et al. 2003; Genc & Nation 2004a, b). In the course of some of these studies, it was desirable to sex pupae and allow the sexes to emerge in separate cages. Various morphological characters have been reported for determining the sex of lepidopterous pupae (Beebe et al. 1960; Butt & Cantu 1962; Eaton 1988; Hughes et al. 1993; Anton & Garrido 1996; UW-Madison 2002), but the characters reported, although similar, are not exactly the same in all the species examined. No method for sexing pupae of the Phaon crescent has been reported. In this paper, I report a morphological detail in the external cuticle of pupae that is sex specific and allows sexing of pupae.

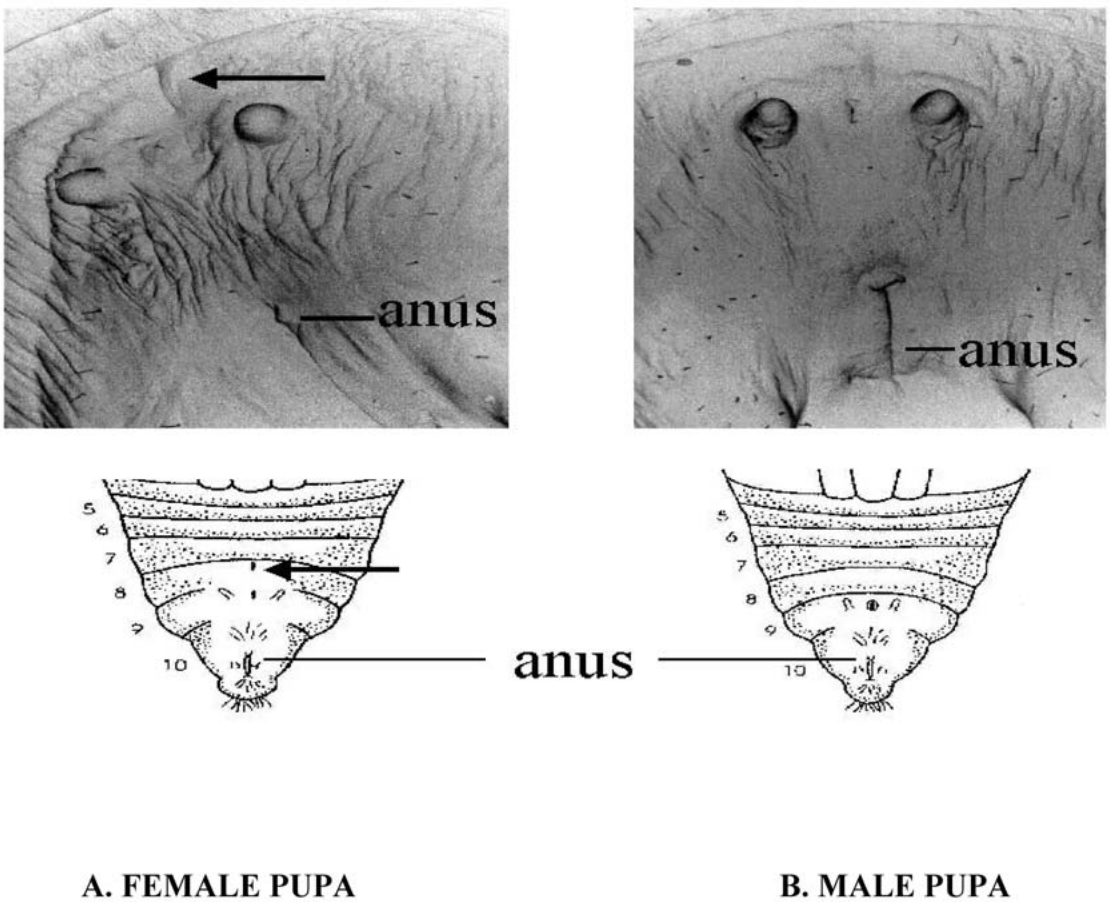

Fig. 1. Micrographs of *Phyciodes phaon* pupae. A. (Top) SEM of Female pupa. The arrow indicates the suture that is female specific; (Below) Drawing of female pupa. B. (Top) SEM of Male pupa; (Below) Drawing of male pupa.

Larvae of Phaon crescent were reared in the laboratory on its natural host (*Phyla nodiflora*) at 27°C and 16:8 (light:dark) hours photoperiod. Pupae (n = 58) were examined under a stereomicroscope for the morphological differences. I found that I could separate pupae into two groups based upon presence or absence of a suture (Fig. 1) on the genital plate. The ventral plate covers the entire eighth and anterior margin of the ninth abdominal segments. This sex-specific suture extends forward across the eighth segment to the posterior margin of the seventh abdominal segment. Pupae were followed to adulthood, and 100% of the pupae with the suture proved to be female and all without the suture were males. The presence of this suture provides easy and accurate sex differentiation of Phaon crescent pupae. Male pupae have a suture on segment 9 (Fig. 1), but no suture on segment 8. In both females and males, the anal opening is located on segment 10, as is the cremaster. I thank Dr. Sasha Shapiro and Dr. James Nation for micrographs of Phaon crescent pupae, and Kathy Milne for computer drawings and excellent technical assistance.

Summary

The sex of Phaon crescent pupae can be determined based on the presence or absence of a suture on the eighth abdominal segment. Female pupae have the suture and male pupae do not.

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