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LIFE HISTORY NOTES FOR THE PALLID EMPEROR MOTH, *CIRINA FORDA* (SATURNIIDAE) IN NIGERIA

Additional key words: phenology, hostplants, Africa.

Cirina forda Westwood has long been known as a serious pest of the sheanut tree, *Vitellaria paradoxa* (Sapotaceae) in Nigeria (Golding 1929). Packard (1914) described the larva, and Boorman (1970) and Leleup and Beams (1969) provided brief accounts of the biology and phenology of this moth. Leleup and Deams (1969) reported *Erythropheum africanum* as a larval host in northern Zaire, but that the tree does not occur in Nigeria. The dried larvae of *C. forda* are referred to locally as “manimani,” and are of economic

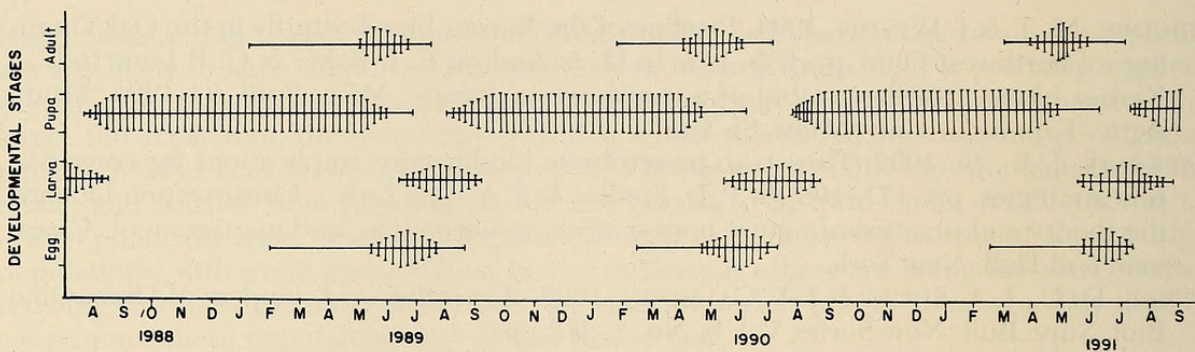
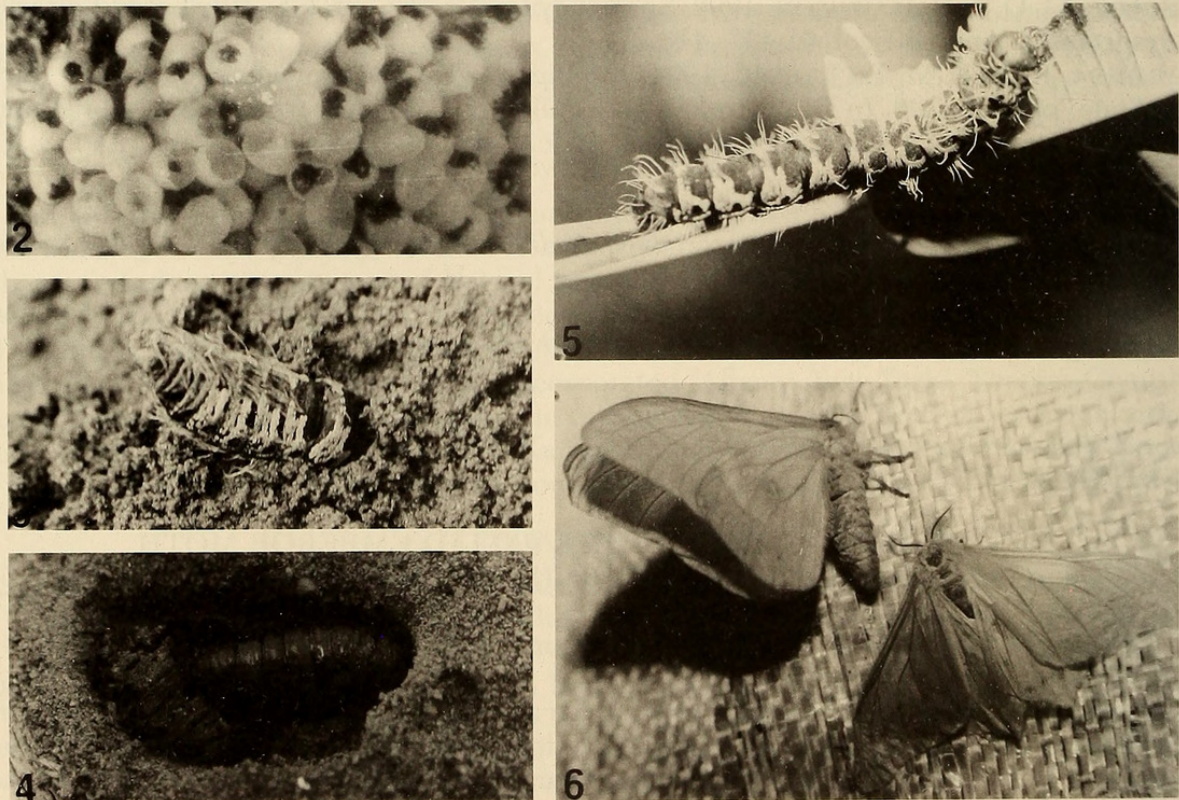


FIG. 1. Phenology of *Cirina forda* in Nigeria, 1988–1991.

importance as a food item among the Nupe tribe of Nigeria. For many decades, wild larvae have been collected, dried and sold to neighboring states within and outside the country, and the insect is considered a delicacy (Ande 1991, Fasoranti & Ajiboye 1993). We report here on the life history and biology of *C. forda* in Nigeria, and its association with *Vittellaria paradoxa*.

About 900 late instar *C. forda* were collected from *V. paradoxa* plants in August 1988, between km 107 and 108 on the Mokwa-Bida road in Niger State, Nigeria (9°05'N, 5°59'E). Subsequently, rearings were conducted in the laboratory at the University of Ilorin between 1989 and 1991. Egg clusters laid in the laboratory were observed daily for hatching. Larvae from the same egg clutch were reared separately on cut and potted twigs of *V. paradoxa* and again on *V. paradoxa* plants outside in an ornamental garden. Twigs were replaced as necessary to maintain freshness, and larvae were transferred carefully by hand and placed on the mid rib or leaf margin of new foliage. A wooden cage (30 cm × 30 cm × 50 cm) with ten compartments was filled to a depth of 20 cm with soil. Ten larvae were then placed in each compartment. As soon as pupation began, the soil was in all compartments examined for pre-pupae and pupae. Pre-pupa duration was defined as the pe-



FIGS. 2–6. 2, egg cluster. 3, pre-pupa. 4, fully formed pupa. 5, late instar. 6, adults (female above, male below).

riod between soil penetration and actual pupation (in days). Subsequently, 30 pre-pupae were randomly selected and placed individually in soil 10 cm deep, each in cylindrical paper eclosion chambers (8 cm diam \times 15 cm deep \times 2 cm thick). The open end of the cylinder was covered with a nylon mesh secured by a rubber band. Each compartment was examined daily for emerging adults. Pupal duration was calculated as the mean number of days between pupal formation and date of adult emergence. Notes were also kept on adult longevity.

Fig. 1 shows the phenology of *C. forda* for the period between 1988 and 1991. Adult moths lived for between 36 and 48 hours (mean = 39.7) and were found primarily in May, with peak oviposition at the end of the month. Figs. 2–6 show the immature stages of *C. forda*. The egg (Fig. 2) hatches after an incubation period of 30 to 34 days (mean = 31.8) into an active and voraciously feeding larva, and passes through 5 to 6 instars (Fig. 5) in 42 to 50 days (mean = 47.5) between June and August. By the first few days in August, most of the larvae reach the pre-pupal stage (Fig. 3) and burrow into the soil. The pre-pupa develops into a pupa (Fig. 4) in 6–7 days and remains in diapause for 9 months (261 to 296 days, mean = 267.5). Adult moths (Fig. 6) emerge in May of the following year.

The life cycle of *C. forda* is tightly linked to the biology of its host, *Vittelaria paradoxa*. The only savannah species of the family Sapotaceae in Nigeria, *V. paradoxa* blossoms fully between May and August when mature fruits become available, and sheds leaves between November and February (Kaay et al. 1964). May and August is when the majority of *C. forda* larvae are developing in the field, and pupation takes place during the dry months of November and April. *C. forda* is univoltine in Nigeria and the phenology reported here agrees with those given by Golding (1929) and Boorman (1978). However, Leleup and Deams (1969) indicate that the active period for *C. forda* in Zaire is between June and September during dry months. In Nigeria, the active periods occur during the wet months of May and August.

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