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EARLY STAGES AND NATURAL HISTORY OF *SEA SOPHRONIA* (LEPIDOPTERA: NYMPHALIDAE: EURYTELINAE)

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ABSTRACT.– Natural history notes are given for *Sea sophronia* (Godart) (Nymphalidae: Eurytelinae), covering aspects of behavior, development and descriptive notes of early stages. *Plukenetia penninervia* (Euphorbiaceae) is reported as the host plant in northern Venezuela. Time of development of 7 field collected eggs was of 32-34 days (eggs = 6 days, larvae = 17-18 days, pupae = 9 days).

KEY WORDS: biology, *Catonephele*, *Ectima*, egg, *Eunica*, Euphorbiaceae, *Hamadryas*, *Heliconius*, hostplant, immature stages, larva, morphology, *Myscelia*, Neotropical, pupa, South America, Venezuela.

In 1989, two butterfly pupae were found by the author in riparian forest habitat on grounds of the "Parque Nacional Henri Pittier", at about 800m above sea level, north of the city of Maracay in northcentral Venezuela. The pupae yielded two adults of *Sea sophronia* (Godart). Further visits to the locality allowed a general survey of the vegetation in close vicinity to where the pupae were found. Among the plants observed, the scandent vine *Plukenetia penninervia* Mull. Arg. (Euphorbiaceae), seemed most likely to be the probable hostplant, since *Sea sophronia* is taxonomically close to *Hamadryas, Myscelia*, *Catonephele*, *Ectima*, *Eunica* and other Euphorbiaceae-feeding nymphalid genera (see Jenkins, 1983, 1984, 1985a, 1985b). A year later, *Plukenetia penninervia* was confirmed as the host of *Sea sophronia*, when in December 1989, a group of early instar larvae, obviously a product of a mass oviposition, was found feeding gregariously on the tender leaves of a growing shoot of this plant. Since then, the species has been reared on different occasions, allowing confirmation and further observations of aspects of its natural history which are reported here. Voucher specimens have been deposited at MIZA (Museo del Instituto de Zoología Agricola, Facultad de Agronomía, Maracay).

EARLY STAGES, BEHAVIOR AND DEVELOPMENT

The use of tender tissues in growing shoots of climbing host plants for oviposition has been recorded for different Nymphalidae (see, e.g. meristem-using *Heliconius* in Benson *et al.*, 1976) and has been observed in at least one more Eurytelinae species: *Hamadryas amphinome* (L. D. Otero, unpublished) in which mass oviposition also occurs in the form of pendant chains (Muyshondt and Muyshondt, 1975; Jenkins, 1983). In *Sea sophronia* the eggs are laid side by side on a tender leaf near the shoot tip. Numbers of individuals per mass range betweeen 12 and 40, as recorded from seven groups of eggs or early instar larvae collected in the field. Time of development was recorded for seven surviving individuals of a batch of twelve eggs found on the upper surface of a tender leaf.

EGGS

The eggs are of the upright type, white when freshly laid and nearly cylindrical in shape, slightly tapered towards the top and sculptured in the form of longitudinal carenae that thicken as they reach the micropile (Fig. 1), giving the egg a daisy-like appearance when seen from above. Hatching of eggs, reared in ambient room temperature, took place six days (n=7) after collection in the field.

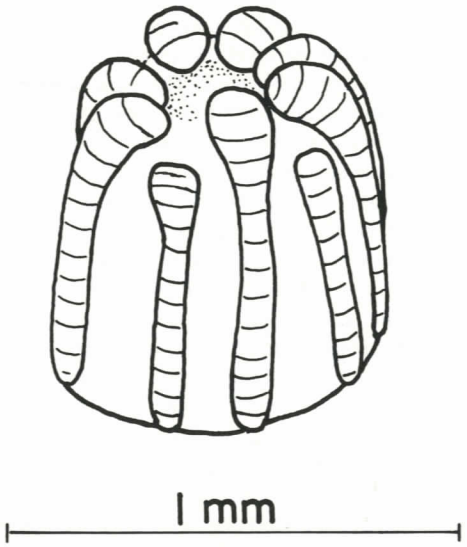

Fig. 1. Egg of *Sea sophronia* [greatly enlarged].

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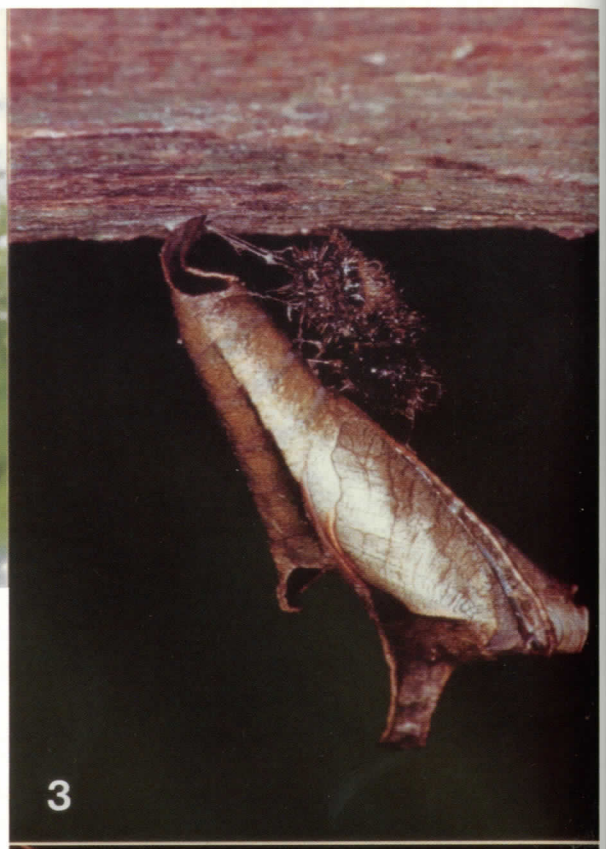

Fig. 2-4. *Sea sophronia*: 2) last instar larva; 3) pupa; 4) adult.

LARVAE

First to fourth instar: The first instar head capsule and body bear setae on the surface, but none of the chalazae and scoli found on later instars. Except for the dark head capsule, the small larvae acquire a greenish-yellow color after the ingestion of their first hostplant meal. The larvae remain side by side while feeding in small groups on the tender leaves of the shoot, and do not assume isolated perches as commonly done by other nymphalids (see notes on larval behavior in Aiello, 1984); however, they do place fecal pellets on their dorsum as they grow. Recorded duration of first instar is three (n=6/7) to four (n=1/7) days. Second instar larvae develop secondary body scoli and chalazae, and in addition, two short horns on the head capsule, similar in form and relative size to those observed in the mature larva (Fig. 2). With advancing development of the second instar, larvae begin to disperse as they consume the tender leaves of the shoot. Recorded duration of the second instar is 3 days (n=7). Third and fourth instars each last 3 days (n=7). Head capsule measurements are given in Table 1.

Fifth Instar: Full-grown fifth instar larvae measure about 30-35mm in length; they are usually a dark red ground color with dark markings (Fig. 2); an apparently unusual dark-yellow ground color form was also observed in one of the groups reared. The dark head capsule (width given in Table 1) shows chalazae and two short horns with five or six spines (Fig. 5). The body is covered with scoli arranged in longitudinal rows: one row of dorsal scoli and two rows of subdorsal, supraspiracular and subspiracular scoli, one of each on each side of the body. The position of the scoli on the body segments varies: dorsal scoli can be located on the anterior (A1-A7), or the posterior part of the segment (A7-A8); subdorsal and supraspiracular scoli are placed anteriorly, slightly in front of the spiracle or lined up with its axis; subspiracular scoli are positioned slightly behind the spiracular axis. Other than these, smaller scoli and spines are visible below the spiracular line. The number of spines on the scoli is variable. This account is based on alcohol-preserved larvae (n=3), and photographic slides.

The prothoracic shield bears two large single spines anteriorly, one on each side of the mid dorsal line, and two groups of spines at a subdorsal position are made of two large and one to three smaller spines which are all joined on a prominent base; supraspiracular scoli with 2-5

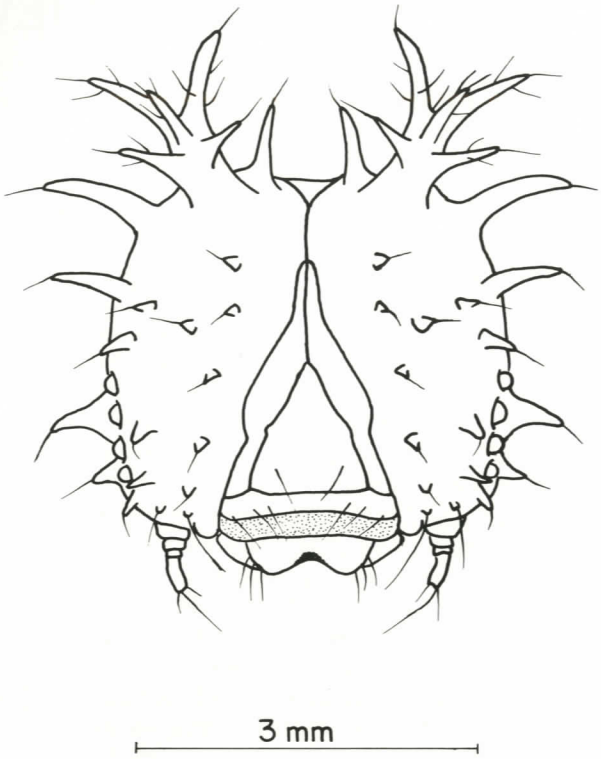

Fig. 5. Head capsule of 5th instar larva of *Sea sophronia*.

TABLE 1. Width of larval head capsules in *Sea sophronia*.

INSTAR	OBSERVED RANGE (mm)	n
I	0.5	3
II	0.9	2
III	1.5-1.7	6
IV	2.3-2.6	3
V	3.6-3.7	3

spines are also present. Segment T2 bears subdorsal scoli with 6 spines, and scoli on the supraspiracular line bear 5-6 spines. Segment T3 has similar scoli in a subdorsal position, each with 6 to 8 spines, and scoli which are slightly displaced below the supraspiracular line, and bear 2-5 spines. Observed spination of scoli on abdominal segments is summarized in Table 2.

PUPAE

Pupation takes place five days after moulting into fifth instar. Prior to pupation, larvae adopt a peculiar upturned-U position, by holding with their prolegs to silk previously spun onto a more or less vertical surface and letting their front end hang to one side. However, they abandon this position to pupate, adopting the normal head-down position, held by the hind pair of prolegs onto a silk button where the cremaster of the pupa will be attached. The pupa (Fig. 3) is light brown in color, darker on the dorsum, with two mid-dorsal projections, a longer one on the mesothorax, which is flattened, and a second one on segment 2A, much smaller and ending in a hook. The pupae normally hang at an angle of about 55° from the vertical. The pupal stage lasts from 9 (n=4/7) to 10 (n=3/7) days until adult emergence.

TABLE 2. Abdominal chaetotaxy of 5th instar larvae of *Sea sophronia* (nomenclature after Aiello, 1984; Jenkins, 1983, 1984, 1985a, 1985b, 1990), with the number of spines on each scolus.

	ABDOMINAL SEGMENTS							
SCOLI	A1	A2	A3	A4	A5	A6	A7	A8
Dorsal anterior	4-5	3-5	4-5	4-5	4	4-5	4-5	-
Dorsal posterior	-	-	-	-	-	-	4-5	5-6
Subdorsal	4-6	4-5	5	5	5	5	5-6	5-6
Supraspiracular	3-5	4	4-5	5	4-5	4-5	4-5	4
Subspiracular	4	4	4	4	4	4	4-5	4-6

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