

NATURAL HISTORY OF *HYPNA CLYTEMNESTRA* CR.  
(NYMPHALIDAE) IN COSTA RICA

With the exception of several old reports (e.g., Muller, 1886, Zool. Jahrb. Zeitschr. Syst. Geogr. Biologia der Tiere, Jena 1:417-678; Rober, 1914, *In* Seitz, Macrolepidoptera of the World, Vol. 5, Stuttgart, A. Kernan Verlag, 516 pp.) and a few recent studies (e.g., Muysshondt, 1973a, J. Lepid. Soc. 27:294-302; Muysshondt, 1974, J. Lepid. Soc. 28:81-89; Muysshondt, 1975, J. Lepid. Soc. 29:168-176), little has been published on the larval host plants and early stages of the Neotropical Charaxinae or Charaxidae (Nymphalidae). Emphasis is given to this fact by the statement of Rober (op. cit.) that only the pupa stage is known for the three species of *Hypna*. It is generally known, however, that the closely allied genus *Anaea* exploits a variety of larval host plants in different families, including the Lauraceae, Flacourtiaceae, and Euphorbiaceae (Muysshondt, 1973a, 1974, 1975, op. cit.; Young, 1981a, Acta Oecologia 2:17-30), and it would therefore, not be surprising to discover a similar feeding pattern for *Hypna*. In this note I report the description of larval and pupal stages of *Hypna clytemnestra* Cramer from one locality in Costa Rica, and also report the larval host plant to be *Croton* sp. (Euphorbiaceae). Both Rober (op. cit.) and Riley (1975, A field guide to the butterflies of the West Indies, London, Quadrangle, 224 pp.) confirm the lack of data on larval host plants of the genus as well as information on the early stages.

In Costa Rica, *H. clytemnestra* is very rare on the eastern slopes of the Cordillera Central (based on observations by Young, 1968-1982). I have captured a few adults at "Finca La Tigra," near La Virgen (10°23'N, 84°07'W; 220 m elev.), Heredia Province, during the short dry season (February-March). On 19 February 1981 a single "*Anaea*-type" caterpillar was discovered on a 4-meter tall *Croton* sapling (Fig. 1) at the edge of a steep forest ravine at Turrialba (9°54'N, 83°41'W; 602 m elev.), Cartago Province. As with the La Tigra site, this region is classified as Premontane Tropical Wet Forest. This caterpillar was subsequently reared by confining it with fresh host plant cuttings in a large clear-plastic bag. The single host plant individual was searched for additional caterpillars, but none were found. At the time of its discovery, the caterpillar was in the third instar. The ant, *Zacryptocerus scutulatus* (F. Smith), was abundant on the leaves and stems of the plant but did not interact with the *Hypna* caterpillar.

The single individual of *Croton* sp. with the caterpillar was the only one found within a 400-meter strip of the forest perimeter checked.

Following eclosion, the butterfly was identified as *Hypna clytemnestra* and probably the subspecies *clytemnestra* Cramer, given discussion of geographical distribution (e.g., Comstock, 1961, Butterflies of the American tropics, the Genus *Anaea*, Lepidoptera, Nymphalidae, New York, Amer. Mus. Nat. Hist., 214 pp.). In captivity the larva molted twice, suggesting that it was in the third instar at the time of discovery, since related forms typically have five instars (Muysshondt, 1973a, 1974, 1975, op. cit.; Young, 1981a, op. cit.). The third instar grew from 15 mm to 23 mm in five days and remained mottled in shades of green and brown. The head is studded with tiny whitish tubercles and one pair of stubby horns on the apex of the epicrania (Fig. 2). Alternating thoracic and abdominal segments bear bulbous tubercles of varying size and studded with tiny tubercles (Fig. 2). The spiracles are black. Third and fourth instars construct a silk-encased perch from the exposed midrib of a mature leaf of the food plant (Fig. 2). The larva rests and feeds from this perch (Fig. 2). In the fifth instar, which attains a length of 41 mm by the time of pupation, the thoracic and abdominal tubercles are reduced in size, but now each one bears a thick black spine (Fig. 2). The head is laterally flattened, with many tubercles (Fig. 2). In this instar the larva, in captivity, rests on the ventral side of the leaf. When disturbed or walking, the larva typically wobbles from side to side, walking forward a bit, and then backwards a bit, before moving ahead. The "wobbling" motion is also exhibited when the larva is reinforcing its silken perch with additional threads of silk. The head capsules of the fourth and fifth instars are shown in Fig. 3.

Pupation involves the larva assuming the "J" position, in this instance from the stem



FIG. 1. The sapling-size individual of *Croton* sp. (Euphorbiaceae) where a single third instar larva of *Hypna clytemnestra* was discovered. The plant in question is shown here immediately above the butterfly net. Note the large heart-shaped leaves of the sapling. See text for locality and habitat information.

of a leaf. As a prepupa the larva remains tightly curled, and the pupa is initially uniform green. Within twenty-four hours, however, the pupa (Fig. 4) turns dark green and develops a patchwork of silvery pubescence, particularly on the wing pads (Fig. 4). The pupa measures 20 mm long by 13 mm at its widest girth and laterally. The head is slightly forked, spiracles are yellow, and the cremaster red. At the posterior edge of

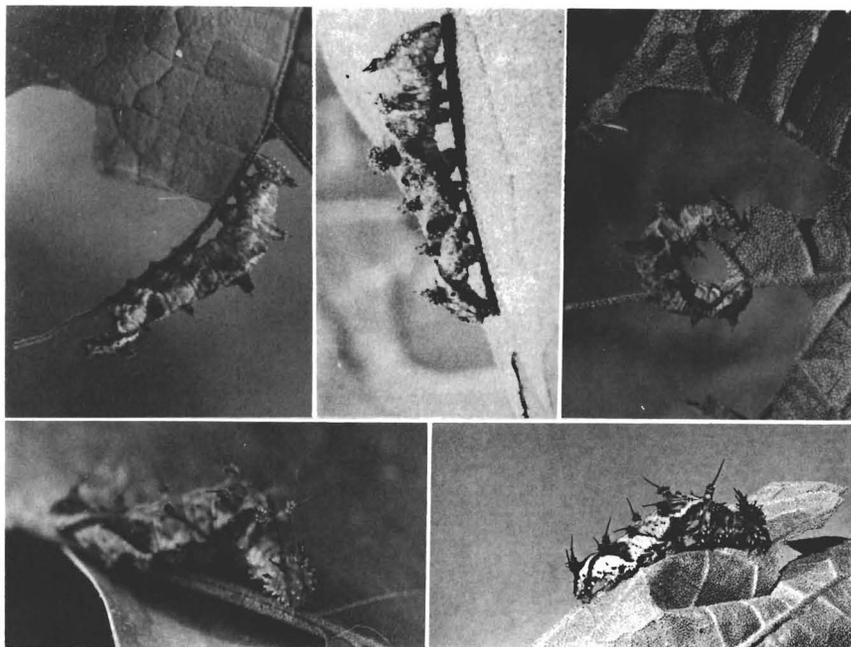


FIG. 2. The larva of *Hypna clytemnestra* and habits. **Top**, left to right: third instar in resting and feeding positions on the midrib perch at the tip of a leaf. **Bottom**, left to right: fifth instar.

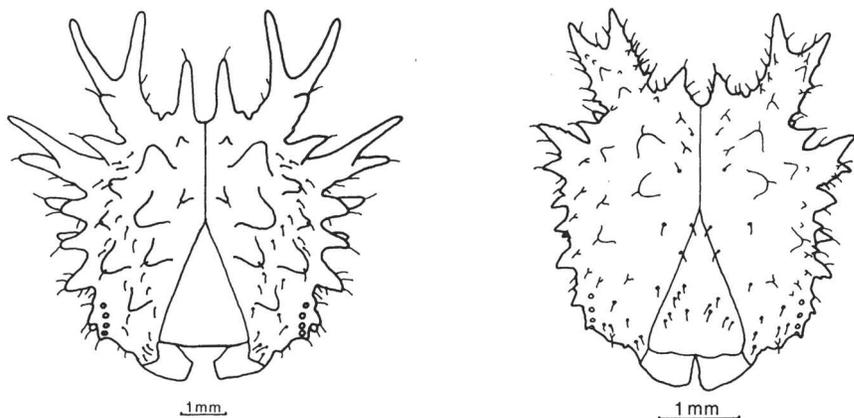


FIG. 3. Frontal view of head capsules of fourth (rt.) and fifth instars of the larvae of *Hypna clytemnestra*.

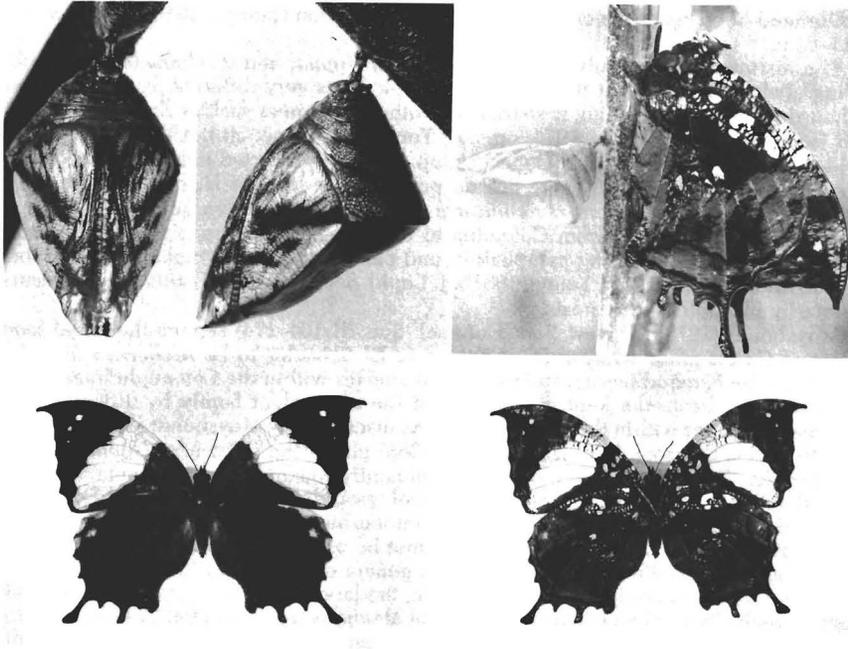


FIG. 4. Pupa, eclosion, and adult *Hypna clytemnestra*. **Top**, left to right: pupa ventral and lateral views respectively, and newly-eclosed adult resting adjacent to empty pupa shell. **Bottom**, left to right: dorsal and ventral views of the single reared adult.

the fifth abdominal segment there is a prominent ridge, marked by a thin line of gold color. On the day of eclosion the adult butterfly is seen clearly through the cuticle. The pupa stage lasted 16 days at the Milwaukee Public Museum room temperature (about 23°C at 3 PM). Eclosion (Fig. 4) is rapid, lasting about three hours. The adult obtained was a male with forewing length of 42 mm (Fig. 4).

This report constitutes the first description of the larval and pupal stages of *H. clytemnestra* and a larval food plant record. The Neotropical Charaxinae exploit a variety of plant families as larval food plants (Ehrlich & Raven, 1965, *Evolution* 18:586–608; Muysshondt, 1973a, 1974, 1975, op. cit.; Young, 1981a, op. cit.) and Muysshondt (1975, op. cit.) reported *Anaea* (*Memphis*) *pithyusa* R. Felder feeding on *Croton* in El Salvador. Other genera or subgenera are associated with other plant families. To this list we add that *Hypna*, although very distinct from *Memphis* in terms of the appearance and behavior of the early stages (larva and pupa) as well as adult characteristics, also exploits *Croton*. Furthermore, some genera or subgenera within the Charaxinae or Charaxidae may be associated with more than a single plant family. Young (1981a, op. cit.) found *Anaea* (*Memphis*) *morvus* feeding on *Nectandra* sp. (Lauraceae) in Costa Rica, while *A. (M.) pithyusa* feeds on *Croton* (Euphorbiaceae) in El Salvador (Muysshondt, 1975, op. cit.). Geographical changes in larval food plant associations at the genus or subgenus levels, or changes in such associations for different species may be operative, although further studies are required. Such data points to the difficulty in using food plant data in the determination of evolutionary lineages at levels lower than families or subfamilies in the Lepidoptera. Contemporary selection pressures may have

obliterated or changed the original food plant association (Janzen, 1980, *Evolution* 34: 611–612).

The distinctive dorsal tubercles of the larva of *Hypna*, and its characteristic “wobbling” behavior, represent two other phenotypic traits very different from most other Charaxinae. Midrib-perching is shared with other subgenera such as *Zaretis* and *Consul* (see Muysshondt, 1973a, 1974, op. cit.; Young, 1981a, op. cit.). Although *Hypna* is widespread in South America (Comstock, op. cit.) it is predicted to be associated with *Croton* through its range. There are no published records of *H. clytemnestra* from Costa Rica, although the form *clytemnestra clytemnestra* is known from Nicaragua and Panama, and also ranges from Colombia to Brazil (Comstock, op. cit.). As with most other tree or vine-exploiting nymphalids, and particularly the Nymphalinae and Charaxinae or Charaxidae (e.g., Young, 1981b, *J. Lepid. Soc.* 35:155–157), this species occurs primarily in tropical wet forests.

Muysshondt (1973b, *J. New York Entomol. Soc.* 81:164–174) reports the larval food plant of *Catonephele numilia esite* Felder in El Salvador to be *Alchornea latifolia* Swartz in the Euphorbiaceae, and places this species within the Catonephelinae. Such discoveries indicate the joint exploitation of the same plant family by different evolutionary lineages within the Nymphalidae. As discussed by Muysshondt (1975, op. cit.), Rydon (1971, *Entomol. Rec. J. Var.* 83:219–388) places the subgenera *Hypna*, *Anaea*, *Polygrapha*, *Consul*, and *Memphis* in the subfamily Anaestinae as full genera. As mentioned above in terms of geographical and ecological determinants of larval food plant associations in Neotropical nymphalids, the euphorbiaceous-feeding habit of the larval stages of *Hypna* and *Memphis* probably cannot be used to support the view of a close evolutionary association between these two genera or subgenera (the latter, adopting Comstock's 1961 classification). Furthermore, the larva of *Hypna* is quite distinct both morphologically and behaviorally from that of *Memphis* (see Muysshondt, 1975, op. cit.). The pupa stage of *Hypna* is closer in general appearance to that of *Consul* (Muysshondt, 1974, op. cit.) than it is to that of *Memphis*, yet *Consul* is a piperaceous-feeder (Muysshondt, 1974, op. cit.).

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