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NOTES ON A COSTA RICAN "MONKEY SLUG" (LIMACODIDAE)

Little is known about the life cycles, larval food plants and other aspects of natural history of neotropical limacodids (Dyar 1924, Limacodidae, *in* Macrolepidoptera of the World, Vol. 6. American Heterocera [A. Seitz, ed.], A. Kernan Verlag, Stuttgart). Herein I describe the final instar caterpillar, some aspects of caterpillar behavior, and one larval food plant for *Phobetron hipparchia* Cramer in northeastern Costa Rica. Dyar mentions that *P. hipparchia* caterpillars feed on "different forest trees" and that this species occurs in Mexico, Panama, Ecuador, Colombia, Venezuela, Guiana, Brazil, and Argentina.

On 27 February 1985, two late-instar caterpillars of *P. hipparchia* were collected from one 6 m tall *Gliricidia sepium* (Jacq.) Steud. (Papilionoideae: Galegeae, Robiniinae) supporting vanilla vines at "Finca La Tirimbina," near La Virgen, Sarapiqui District, Heredia Province (10°23'N, 84°07'W; 220 m elev.). The tree was one of several thousand *G. sepium* planted there for vanilla production (Allen & Allen 1981, The Leguminosae: A source book of characteristics, uses and nodulation, Univ. of Wisconsin Press, Madison, Wisconsin, 812 pp.). The caterpillars were placed in a clear-plastic bag, along with cuttings of *G. sepium,* for rearing to adulthood.

A thorough search of the *G. sepium* having the caterpillars revealed no other individuals of *P. hipparchia,* as was also the case for an additional eight trees of this species examined in the same area. Both caterpillars were discovered on the dorsal (upper) exposed surfaces of old, tough leaves (Fig. 1), and about 1 m apart at eye level (about 1.8 m above the ground). At the time of discovery, the majority of *G. sepium* trees at the site were without flushes of new (fresh) leaves. From a distance of about 1 m, the caterpillars resembled curled, dry leaves (Fig. 1).

Within three days after collection, both caterpillars molted to the final instar, exhibiting little change in overall appearance from the previous instar. The final instar lasted only a few days; both caterpillars formed loose silken cocoons in the leaves by 7 March. Each cocoon (Fig. 1) consisted of a thin sheet of silken mat across several leaves, and dorsally mostly the larval tubercles shed during spinning. The pupal stage lasted about one month (under laboratory conditions of 65–70°C and 30–40% RH). Both adults emerged between 1500–1600 h. One was female, the other a male (Fig. 1).

At the time of discovery, the caterpillars were both about 24 mm long and 20 mm wide, including the greatest expanse of the laterally positioned "horns" (Fig. 1). When the caterpillar was motionless on a leaf, the horns were held laterally against the leaf surface (Fig. 1). When moving, the caterpillar appeared to be rocking back and forth, with a slight rotation of the horns. The squarish, angular body profile of a motionless caterpillar on a leaf (Fig. 1) became spherelike when the caterpillar was disturbed: the caterpillar curled itself into a ball, and partially tucked in and interlocked some of the lateral horns. Several sustained prods with a forceps were needed to ellicit this curling behavior.

The overall color of the caterpillar consisted of a patchwork of brown shades. Cramer (1791, Uitlandsche Rupsen, Supplement) reported the larva (Plate XVIII) of *P. hipparchia* to be light-brown in color. As in all Limacodidae, the head capsule (about 4 mm diam) was small and hidden at all times. Both the head capsule and thoracic legs were glossy orange. The first two thoracic segments were almost translucent, and without prominent tufts of setae or lateral extensions of the cuticle. The third thoracic segment had a ringlet of six bulbous, orange tufts of hairs. The lateral horns were present on the first three abdominal segments (one pair per segment), and dorsally were darker brown than below. The horns of the third segment were dorsally more markedly brown than those of the previous two segments. Those of the fifth abdominal segment were dark brown dorsally, while those of segments 7–9 were light brown (tan) dorsally. No lateral horns were present on abdominal segments 4 and 6. The lateral horns appeared to be extensions of the cuticle, and were covered with short setae (see Dyar 1896, J. New York Entomol. Soc. 4:167–190). Dorsally, each abdominal segment had a dark brown rectan-

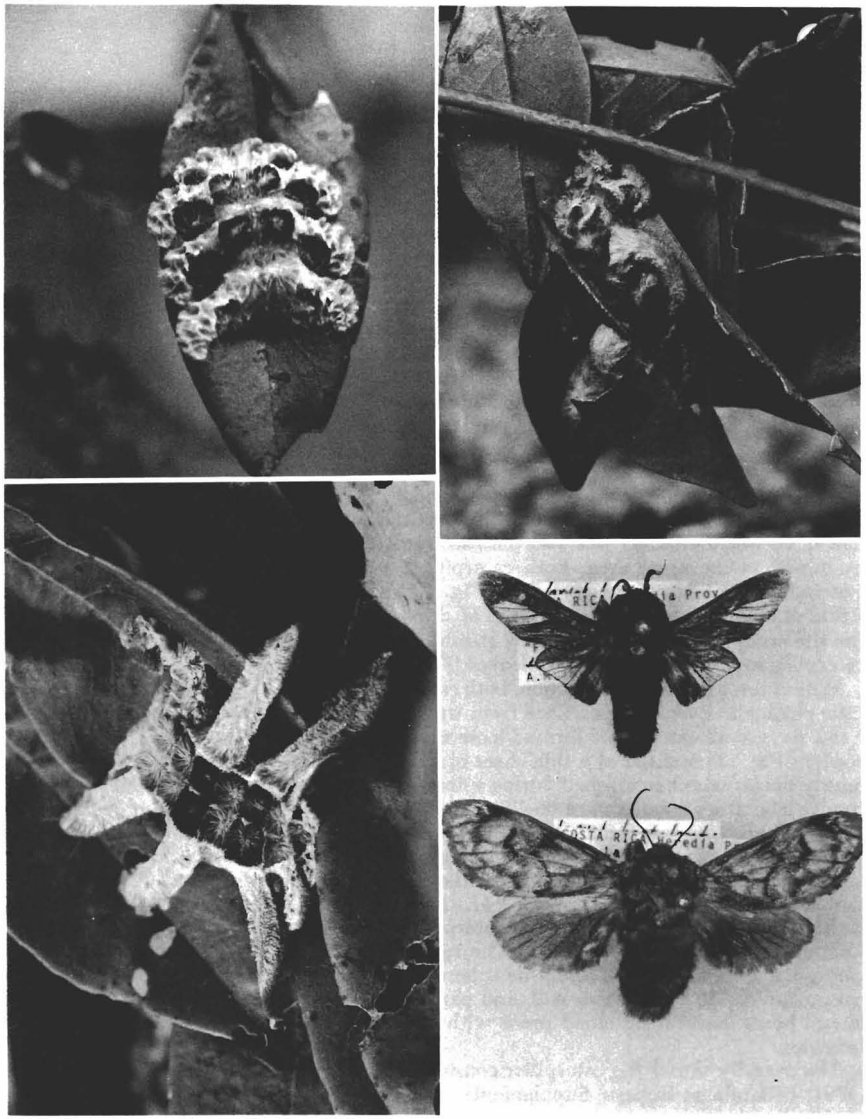

FIG. 1. *Phobetron hipparchia*. Left top and bottom: Final-instar caterpillars on leaves of *Gliricidia sepium*. Right top: Cocoon. Right bottom: Reared male (above) and female (below).

gular patch, with a light spot in the center and even darker borders (Fig. 1). A dorsal-medial raised line of tan-colored setae ran lengthwise on both thoracic and abdominal regions. The body of the caterpillar was 8 m wide at the thickest point within a day of cocoon formation. Following cocoon formation there was no noticeable change in the colors of the larval cuticle, even though it became part of the cocoon.

Phobetron hipparchia, the single species of the genus represented in the neotropical region, apparently gets the name "monkey slug" from the curiously shaped caterpillar stage. One of the two North American species of the genus, *P. pithecium* (J. E. Sm.) is the "hag moth," and its caterpillars feed on a broad range of trees, none of which apparently is within the Leguminosae (Papilionoideae) (Covell 1984, A field guide to the moths of eastern North America, Houghton Mifflin Co., Boston, 496 pp.). Dyar (1896, op. cit.) noted that *P. pithecium* larvae perch on the undersides of leaves until the last instar, and that *Phobetron* larvae in general cryptically resemble dead leaves. Even though perched on the upper sides of leaves, the final-instar larva of *P. hipparchia* appears cryptic, resembling the yellow, brown, and green blotch pattern of older *G. sepium* leaves. The observed pattern of cocoon construction, in which cast-off tubercles are added to the silk during spinning, is considered typical by Dyar for New World *Phobetron,* enhancing crypsis of the pupal stage.

Of the several genera and species of North American Limacodidae discussed in Covell, none apparently utilize legumes as larval food plants. Yet an outstanding feature of these moths in general appears to be their highly polyphagous food habits as caterpillars (Dyar 1924, op. cit.; Covell, op. cit.). Several genera and species of Limacodidae feed on legumes in Australia.

McFarland (1979, J. Lepid. Soc. 33: Supplement, 72 pp.) reports that Australian limacoids are associated with *Acacia* and other legume genera, and that caterpillars of some species invariably occur on old, tough leaves and stems of food plants as in the present observations. Within the neotropical region, the limacodid *Sibine apicalis* (Dyar), or "gusano montura," sometimes defoliates banana (*Musa* spp.) trees (Jaramillo & Jimenez 1974, Turrialba 24:106–107). Thus both dicotyledenous and monocotyledenous larval food plants for the Limacodidae are known from the neotropical region. Cramer reported *P. hipparchia* on *Granadilla* (Passifloraceae). *Eucalyptus* spp. (Myrtaceae) are major larval food plants for the Limacodidae in Australia and Africa (McFarland; Sevastopulo 1983, J. Lepid. Soc. 37:91, respectively). But in East Africa some limacodids feed on indigenous legumes (*Acacia* spp.), but not introduced species of the family. *Gliricidia* is endemic to the neotropical region, and given the great evolutionary diversification of the papilionoid legumes in tropical America (Richards 1964, The Tropical Rain Forest, The Univ. Press, Cambridge, England, 437 pp.), one might expect to discover several other legume larval food plants for *P. hipparchia. Gliricidia* is widely distributed throughout the American tropics, both in natural habitats, as a result of its extensive use as a shade tree for cacao and coffee, and as a support for vanilla vines.

In spite of several years of casual observation during both dry and rainy seasons, I did not notice other *P. hipparchia* caterpillars on the trees.

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ALLEN M. YOUNG, *Invertebrate Zoology Section, Milwaukee Public Museum, Milwaukee, Wisconsin* 53233.