

light-brown rims. Thoracic legs pale cream, suffused with brown distally and with green proximally.

Head width: 1.64 ± 0.09 mm (25 larvae).

Duration of stadium: 3.5 ± 0.7 days (46 larvae).

Fifth-Stadium Larva (Figs. 3, 4). Head flesh-colored, inconspicuously mottled with pale fawn. Arcs free of mottling diverging upward and outward from centre of face. Prothoracic shield pale cream or white, mottled with pale greenish-grey; a median and a pair of submarginal lines free of mottling. Suranal shield pale greyish-green, mottled with white or pale cream. Maculation of trunk highly unusual, and with normal zonation of dorsum difficult or impossible to distinguish. Dorsum creamy-white with a confusing array of circles, bars, and undulating lines of greyish-green. Spiracular band creamy-white. Suprapodal area greyish-green mottled with cream. Mid-ventral area paler green than suprapodal area. Spiracles with light-brown rims. Thoracic legs cream, weakly suffused with green.

Head width: 2.52 ± 0.08 mm (11 larvae).

Duration of stadium: 4.9 ± 0.8 days (46 larvae).

Pupa (Figs. 4, 6, 7). Uniform mahogany brown. Spiracles on abdominal segments 5, 6 and 7 borne in shallow oval pits; spiracular sclerites moderately projecting. Anterior marginal areas of abdominal segments 5, 6 and 7, with a narrow band of fine but rather conspicuous pitting. Proboscis terminating well anterior to apexes of wings. Cremaster consisting of an elongate conical prolongation of the tenth abdominal segment bearing apically four elongate slender setae.

Length from anterior end to posterior margin of fourth abdominal segment: 9.2 ± 0.3 mm (14 pupae).

ACKNOWLEDGMENTS

I am grateful to Mr. John E. H. Martin of this Institute for assistance in the field and for the photographs accompanying this paper. I appreciate the help of my associate, Mr. Eric Rockburne, who measured the immature stages and drew the cremaster area of the pupa.

LITERATURE CITED

- COMSTOCK, J. A. 1931. Studies in Pacific Coast Lepidoptera. Bull. So. Calif. Acad. Sci. 30: 15-20.
- GROTE, A. R. AND C. T. ROBINSON. 1870. Description of American Lepidoptera, No. 5. Trans. Amer. Entomol. Soc. 3: 176-182.
- HARDWICK, D. F. 1958. Taxonomy, life history, and habits of the elliptoid-eyed species of *Schinia* (Lepidoptera: Noctuidae), with notes on the Heliiothidinae. Can. Entomol. Suppl. 6. 116 p.
- MUNZ, P. A. 1963. A California Flora. University of California Press, Berkeley. 1681 p.

LIFE HISTORY NOTES ON *CALLOSAMIA SECURIFERA* (SATURNIIDAE)

On 29 August 1970, three 2nd instar larvae and nine eggshells of *Callosamia securifera* (Massen) were found on a low shrubby example of its foodplant, *Magnolia virginiana* L. (Sweet Bay). The larvae were found approximately eight miles north of McClellanville, Charleston County, South Carolina. The area is typical of coastal South Carolina, with many of the swampy pine forests where *M. virginiana* is common. The

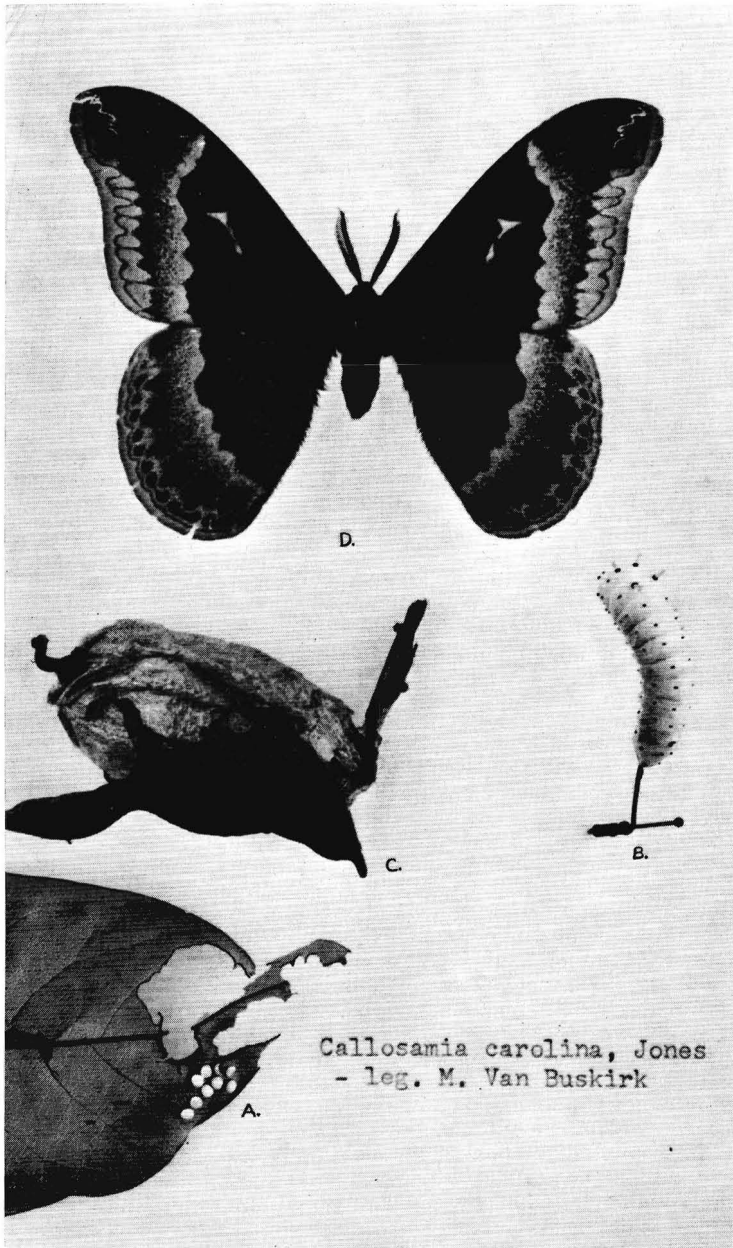


Fig. 1. *Callosamia securifera* (Massen): A, ova shells; B, 5th instar larva; C, cocoon; D, adult male.

McClellanville area is of special interest, as it is one of the few areas in the U.S. where all three species of *Callosamia* fly sympatrically: *C. angulifera* Walker in association with *Liriodendron tulipifera* L. (Tulip Tree), *C. promethea* Drury in association with *Symplocos tinctoria* L'Hérit (Horse Sugar), and *C. securifera* in association with *M. virginiana*.

The three larvae were found singly on the undersides of the leaves, resting on the midrib. The eggshells were all on the underside of one leaf, located near the tip in a small cluster. Perhaps the ova are usually deposited in this manner, but this is only conjecture, as no other eggs have been found. Even after stripping the shrub to the ground, there was no trace of the other six larvae. Evidently the attrition rate to parasites and predators is quite high. Interestingly, these three larvae seemed to have lost the usual gregarious tendencies so prevalent with early instar *Callosamia* larvae, as they were all found some distance apart on the plant. The larvae from previous laboratory-reared broods of the three *Callosamia* species invariably remained gregarious until third instar.

According to all known records, this is the first instance of *C. securifera* larvae being found in the natural state, although the cocoons are often found in the McClellanville area during the winter months. Since F. M. Jones's original description of the adults and larvae (1909, Entomol. News 20: 49-52), little has been published on *C. securifera*. It is now known to be a distinct species and not a subspecies of *C. angulifera* as believed previously. The totally different foodplant, sympatric flight with *C. angulifera*, distinctive reproductive habits, and unique cocoon leave no doubt that *C. securifera* is indeed a valid species.

The larvae were reared outdoors on caged examples of *M. virginiana*, but unfortunately only one of the three was reared through to an adult. One larva escaped, while a second fell prey to a stinkbug in late 5th instar. (However it was vacuum-freeze dried and preserved for the accompanying figure.) Due to normal limits of variation, the larvae are impossible to distinguish from those of *C. angulifera*. Hopefully more careful observation of these two species in the larval stages will yield some distinguishing characters. The single remaining larva spun a cocoon in early October of 1970.

The cocoon is perhaps the most distinctive aspect of the life history of *C. securifera*. The always large, baggy, pendant cocoon is wrapped in several leaves and attached securely to a twig of the foodplant. When freshly spun the cocoon is of a beautiful silvery tan but fades somewhat with weathering. The cocoon from the last remaining larva, an excellent example, is shown on the accompanying figures. While the length of the cocoon's peduncle varies, as does the irregular shape, it never resembles the conical, compact cocoon of *C. promethea* or the loosely woven dark brown cocoon of *C. angulifera*.

A male emerged from the cocoon on 22 March 1971, shortly after sunrise. The premature emergence (4-6 weeks early) of the adult was puzzling, since it was reared under natural conditions and left outdoors throughout the winter until it emerged. The normal flight period for the first brood of *C. securifera* is from late April into early May, depending on weather conditions. There is a second brood in early to mid-August. These late summer adults of *C. securifera*, like those of summer brood *C. angulifera*, are much darker than the spring adults.

More careful notes were not taken on the life history of these first wild larvae, in anticipation of another, more detailed paper on this species by Dr. Richard B. Dominick and Mr. Charles R. Edwards of the Charleston Museum, Charleston, South Carolina. These men have spent the better part of two years thoroughly studying the habits and life history of *C. securifera*. Their paper, now in preparation, will have a wealth of previously unknown facts concerning the life history and ecology of this rare and beautiful silk moth. I extend my sincere thanks to these close friends who kindly took time out from an unbelievably busy schedule to photograph the figures for this article.

MICHAEL D. VAN BUSKIRK, 4512 47th S.W., Seattle, Washington 98116.