

PREPARATORY STAGES OF CATOCALA AMATRIX, Hubn.

By G. H. FRENCH, Carbondale, Ill.

EGG.—Somewhat spheroidal in shape, the longitudinal diameter being .02 inch and the transverse .035 inch. They are ridged longitudinally, 14 of these reaching the punctured area at the apex, these alternating with shorter ones that do not reach so far. The base is scarcely more flattened than the apex. Color very pale dull olive. Duration of this period from 200 to 249 days.

YOUNG LARVA.—Length .12 inch. Color brown, one dorsal and three lateral stripes a little darker than the rest of the body, hairs and head concolorous, the number of feet 12. Toward the close of this period the sides are more of a brownish yellow with four reddish brown stripes, the lower or substigmatal not clearly discernible at first, and on the venter dark brown spots in the centre of joints 4 to 8. Duration of this period six days.

After first Moults.—Length .35 inch. Color of the dorsum brownish buff, the sides dark purplish brown; by transmitted light it may be seen divided into four more or less distinct lines, the pale alternate lines narrow and faint. Head brown not very dark, with faint traces of lines. Scarcely a trace of the centre of the dorsum being lighter than the rest of the dorsum. Venter pale, joints four to eight with each a central black spot. First and second abdominal legs about one-fourth the size of the others. Duration of this period four days.

After second Moults.—Length .65 inch. More striped than before, a dorsal stripe somewhat moniliform, the centre purplish brown on a yellow field or the outer part of the stripe yellow. Subdorsal line yellow, between this and the dorsal stripe a stripe the color of the centre of the dorsal stripe. Joint 8 a little raised and all but the centre blackish. Subdorsal region two stripes, the upper like the second dorsal, the lower almost black; the substigmatal line and the one separating the two stripes gray. Head striped with a number of blackish longitudinal lines. Thoracic feet yellow, the others yellow with a black base. The black is a smoky purplish black and not clear. Venter pale yellow with the usual black spots. Duration of this period three days.

After third Moults.—Length .75 inch. As before, the dorsal space is composed of three stripes, and each side to the lower part of stigmata two. The central of the three dorsal stripes somewhat elliptical on each joint, the central part pale dull reddish yellow, outside of this clear pale yellow. The division between this and the next stripe a more or less distinct black line composed of a series of dots, a similar series of dots, marking the division between the reddish yellow and

the yellow portions of the dorsal stripe. The second stripe dull pale yellowish red. Subdorsal line another series of black dots, but more nearly a continuous line. Below this line of dots a pale yellow line bordered below with another line of dots, a similar pale yellow line and bordering lines of dots separating the two lateral stripes, the series of dots next the lower stripe more prominent. The centre or body of the lateral stripes the same as the dorsal in color. Substigmatal line pale yellow bordered with black. These black lines are so fine that they make but little of the color of the surface except the lower lateral one. Joint 8 elevated in the region of the posterior dorsal piliferous spots, back part of the elevation on back and sides mostly black, except the pale yellow lines; more black also on posterior part of joint eleven. Piliferous spots rather prominent, orange, the hairs black. Head paler than the body, a black stripe on each side, and two on each side of the front. Quite a prominent fleshy fringe along the side. Toward the last of this period the general color changes to a grayish red with a yellow tinge between the joints. Duration of this period three days.

After fourth Moulting.—Length 1.05 inches. Pale reddish gray, the stripes as before but faint, indicated principally by the rows of dots. Sides of posterior and anterior parts tinged with black. Duration of this period eight days.

After fifth Moulting.—Length 1.40 inches. Ground color very pale lilac-white, the body still having some of the appearance of stripes between the joints, but the general appearance is of a uniform color with rows of black dots. Joint 8 still elevated, and the posterior pair of piliferous spots on joint 11 more prominent than the others, pointing back and with an oblique black mark from behind them forward. Middle of joint 8 yellowish with black mottlings on the sides running back to abdominal legs on joint 9. Head nearly a clear color, a black line down the sides of the cheeks and another fine one back, a little brown in front. Stigmata pale brown, finely ringed with black. A little faint yellowish along the back, head and legs with faint brownish tinge.

MATURE LARVA.—Length 3 inches; width of head .17 inch; of joint 8, .35. Height of joint 1, .15 inch; of joint 8, .35, tapering gradually each way from joint 8, the place where the measurements taken being a little elevated. More distinctly striped than at the beginning of the period, there being three dorsal and three lateral to each side; the central dorsal pale, the parts on each joint somewhat elliptical, the broad part between the joints the narrow in the centre. The whole body dotted with fine black dots that seem to be as during other periods. The second stripe on dorsum darker, more intensified on joint 8. The darker stripes are made darker by the slightly darker ground color. First lateral stripe pale, the dots gathered in its centre in slightly elliptical

masses, much as in the dorsal, wider than the next. Stigmatal stripe dark, including the dark brown stigmata. Below this a pale stripe that reaches to the fringe. Color of all the stripes gray, slightly flesh colored in the paler ones. Elevation of joint 8 more distinctly black in the dark stripes, the central fulvous on the elevation without the black dots. Piliferous spots orange, rather inconspicuous except the posterior dorsal pair of joint 11, which are prominent and project backward. Head mottled with pale brownish, otherwise as at beginning of period. Three of the ocelli black. Legs pale. Venter pale without the black dots, the centres of joints 4 to 8 with purplish black spots, traces of same on other joints. Duration of this period twenty-five days.

CHRYsalis.—Length 1.25 inches, length of wing and tongue cases .65 inch, these reaching to the posterior part of joint 5. Shape to joint 5 cylindrical, the rest of the way conical. Depth of thorax .40 inch, of joints 2 to 4 .38. Head, thorax and wing cases chagreened, rather coarsely, the head end rounded, eye cases not very prominent. Abdominal joints punctured, tip ending in six hooks in three sets of two each as to length, the two longer turning outward, the two short at the base turning inward. Color dark chestnut-brown, covered with a glaucous powder. Duration of this period from twenty-eight to thirty-four days.

October 14, 1882, a female *Amatrix* was brought to me, from which I obtained the next day 261 eggs. These began hatching May 3rd, 1883, and continued hatching to June 21st, making the egg period from 200 to 249 days. Only the few that hatched first were fed, and the greater part of those failed to reach maturity, owing mainly to a form of bacterian disease that has prevailed in the most of the species of caterpillars I have attempted to raise this year, and it has not been confined to the breeding cages, but has been as destructive in the fields. Two imagines were raised, one pupating June 21, and producing the imago July 25, the other pupating July 8, and hatching August 3. This gives us a minimum period of 277 days from the egg to the imago. Supposing that the difference in hatching of the eggs noticed here is their usual way, this accounts for fresh specimens being found in the woods from August to October, and I think very likely with a sufficient number of eggs other species would show a similar trait. I am of the opinion that all our species are single brooded, this being based on observations of different species in the woods, and rearing three different species.

This species was fed most of the time on Cottonwood, though they were fed for a few days on Lombardy Poplar. In pupating they spun leaves together, lining the leaves with a very thin cocoon of silk. Both specimens obtained were males, one with the fore wings the uniform gray, the other with the dark longitudinal shade through the middle of the wings.

NOTES ON MEXICAN LEPIDOPTERA WITH DESCRIPTIONS OF NEW SPECIES.

BY HENRY EDWARDS.

It has recently been my privilege to examine a magnificent collection of Lepidoptera, captured chiefly in the State of Vera Cruz, Mexico, by Mr. William Schaus, Jr., many species in which appear to me to be new to science. It is, however, ~~im~~possible that some of those now characterized may have been described in the "Biologia Centrali-Americana," but as that magnificent work is inaccessible to me, I venture to put upon record my own descriptions, even at the risk of creating a few synonyms. For the following species I have searched in vain through the recent publications of Walker, Butler, and others, and unless they are known to the authors of the "Biologia," I think I am justified in my present course. It is a matter of great personal regret, and a great loss to science, that Mr. Schaus has, for the present at least, been compelled to leave Mexico, and abandon his observations upon the insect fauna of the interesting region explored by him. He had already done much toward a knowledge of the transformations of many rare species, and had exhibited so much zeal and intelligence in his work, that his cessation from labor in this enchanting field is greatly to be deplored. In a few years Mr. Schaus would undoubtedly have become one of our foremost entomologists, and it is earnestly to be hoped that he may yet be enabled to follow the study of the science he has done so much to illustrate. The types of the species now noticed are either in my own collection or in that of Mr. B. Neumoegen. I hope to continue the description of other forms in future numbers of "PAPILIO."

SPHINGIDÆ.

Amphonyx cluentius, Clem.—Palpi dull buff, blackish above. Antennæ sordid white, shading into brownish at their base. About the base of the legs are some dull buff hairs—the tibiæ are reddish brown, the tarsi a little darker. Thorax and head blackish brown, the former without distinct stripes, but with buff hairs intermingled, a roundish blotch on the sides, and a streak of the same color at the base of the wings. Abdomen blackish, a gray shade on disc, and a narrow black discal line on four posterior segments. The lateral spots are five in number, bright orange, margined in front with black, and reduced in size posteriorly as in all the genus. Primaries blackish brown, with a fawn-colored shade along the internal margin, widest at base, and enclosing some rather broad velvety-black waved lines.



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