

PARTIAL PREPARATORY STAGES OF SMERINTHUS  
OPHTHALMICUS, BD.

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*After First Molt.*—Length .45 inch. Cylindrical, head with an elevated point upwards, in a subpyramidal point, the top in two points and about a third higher than the body; when at rest the jaws under back part of head with the point obliquely forward. Eight transverse wrinkles to each joint; green studded with pale green points; a subdorsal pale line, as usual converging to caudal horn; on sides, oblique pale lines that nearly coincide with a series on the dorsum; the pale parts yellowish-green; caudal horn reddish tinted; head with a pale stripe on each side of face, the two coming together above. Previous to the next moult, smooth, the oblique lines showing very pale; the oblique stripe and caudal horn creamy-white; the anterior base of horn reddish. Duration of this period 5 days.

*After Second Molt.*—Length .90 inch. Colour green, a little dull and rather blue-tinted; each joint with 8 transverse folds that are studded with yellowish-green points that are but little lighter than the ground, a subdorsal line made of these points; a dorsal line and oblique stripe of the darker green without points, these lines defined by the points, on the sides below subdorsal line a similar stripe defined posteriorly by a row of these points more yellowish than the dorsal, the stripe that runs to the caudal horn creamy-white, as is also the caudal horn; the latter short hairy. Head pointed above as before and also the side of the face with a line of points more yellow than the last oblique stripe; thoracic feet red-tinted. Duration of this period 5 days.

*After Third Molt.*—Length 1.25 inches. Green, slightly bluish; head still pointed but not quite so prominent as in preceding stages, the stripe rounding at the top; bluish-green, stripes yellow; stripes on back and sides as before; caudal horn pale bluish purple, more blue at base, the stripe from this down the sides very pale lemon-yellow; prolegs concolorous; thoracic legs paler, red tipped, stigmata black ringed, centre creamy. Duration of this period 5 days.

*After Fourth Molt.*—Length 1.40 inches. Bright green of a yellowish tint; head blue-green; granulations more white; side stripes yellowish-green, the one that extends to the caudal horn creamy, with a

slight greenish tint ; caudal horn purple-blue, except the sides which are a continuation of the lateral stripe ; jaws black, clypeus and anterior feet pale red ; head blunt, stripe yellow ; stripes on anal appendages yellow. Duration of this period 6 days.

*Chrysalis*.—Length 1.35 inches ; to the back of wing cases, .64 inch ; and this extends to posterior part of joint 5 ; depth through joint 5, .42 inch ; through 4, .40 inch ; through 3, .39 inch ; through 2, .37 inch ; end of tongue case, .55 inch from the anterior end. Cylindrical, tapering gradually back from joint 5, cremaster triangular tuberculate, especially on the dorsal part and on sides at base, round dorsally and flattened ventrally, no hooks but slightly forked terminally ; head rounded. Colour chestnut-brown, nearly uniform ; wing, tongue and leg cases a little darker than the rest ; the abdomen slightly punctured. Duration of this period 15 to 17 days.

A comparison of the pupæ of this species with *Geminatus* shows the following differences:—The cremaster on *Geminatus* is triangular, more slender, less roughly tuberculate dorsally and laterally ; this in *Ophthalmicus* having a distinct tubercle each side at the base that is lacking in *Geminatus*. The cremaster in *Geminatus* is nearly conical by reason of its being only slightly flattened ventrally, while in *Ophthalmicus* it is distinctly flattened ventrally, and dorsally is contracted at the base. A chrysalis of *Geminatus* measures as follows : Length 1.15 inches ; depth through joint 5, .40 inch ; joint 4, .38 inch ; joint 3, .37 inch ; length to end of wing cases, .60 inch ; to end of tongue case, .48 inch. A comparison of these figures with the measurements of *Ophthalmicus* shows a different proportion between the two pupæ. The pupa skin is about twice as stiff in *Geminatus* as it is in *Ophthalmicus*. Besides this, the larva of *Ophthalmicus* differs from that of *Geminatus* in being less cylindrical, the third and fourth joints being enlarged, thereby making it resemble the larvæ of *Everyx Myron*.

The food plant is the same as that of *Geminatus*.

The larvæ from which the above descriptions were made were received from the Hon. C. F. McGlashan, of Truckee, California. They were sent as eggs June 17th, 1889, but were received hatched June 22nd. The imagines were produced August 2nd and 3rd of the same year, making a total period from egg to imago, of the summer brood, of 47 days. The time of hatching shows that there are two broods in a season,