

THE LIFE HISTORY OF *SCHINIA FELICITATA* (NOCTUIDAE)

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Schinia felicitata (Smith)¹ feeds in the larval stage on the buds, blossoms and seed capsules of *Oenothera deltoides* Torr. The little heliothidine moth was described by Smith from southwestern Utah, and was subsequently redescribed by Barnes and McDunnough (1911) from the Imperial Valley of California as *Chlorocleptria imperialis*. It was from near the latter locality, in the Indio area of southern California, that material was obtained for developmental studies in the spring of 1955.

S. felicitata is distributed from the Colorado Desert of southern California, northward to Inyo County, California, and eastward to Phoenix, Arizona. It is in flight between the first of March and the middle of April. During 1955 the species proved to be common in those areas of southern California in which its food plant was abundant and in blossom.

The forewing of some specimens of *felicitata* is suffused with pink, and this color phase bears a close resemblance to the eastern and central North American *Schinia florida* (Guenée)², which feeds in the larval stage on *Oenothera biennis* L. Although *felicitata* is smaller and darker than *florida*, the similarity between the two species, noted by Smith in his original description of *felicitata*, is often striking. The reason for the development and maintenance of the pink suffusion is probably the same in both species: the coloring of the forewings in their resemblance to the pink dying petals of both food plants probably affords the adults considerable protection from predators when the moths are resting among the buds and blossoms at the apex of the plant during the daylight hours.

BEHAVIOR

Although at least some adults of *felicitata* are protectively colored in their resemblance to dying petals and others bear at least a casual resemblance to the buds and seed pods, the habit of resting at the apex of the food plant is evidently much less highly developed than it is in many species of *Schinia*. Although the first female from which eggs were obtained was taken in the early morning from a still-open blossom of *O. deltoides*, a subsequent search of several hours duration yielded only a single male nestled among leaves and buds. At the time of this search,

¹ *Alaria felicitata* Smith, 1894, Trans. Amer. ent. Soc., 21: 86. *Schinia felicitata*, Hardwick, 1958, Canad. Ent., Suppl. 6: 14.

² *Rhodophora florida* Guenée, 1852, Hist. Nat. Ins. Lep., 6: 171. *Schinia florida*, Hardwick, 1958, Canad. Ent., Suppl. 6: 10.

numerous adults were being taken in light traps, and eggs could be found in abundance at the apex of the food plant.

The females are apparently similarly unspecialized in depositing their eggs. The eggs are scattered on the buds, blossoms and apical leaves of the plant (Fig. 2). Captive females confined with buds of the food plant frequently oviposited on the floor of the container and occasionally inserted their ovipositors through the mesh lid of the cage and deposited their eggs on the wire screening.

Five wild-caught females deposited a mean of 116 eggs, and the maximum deposited by one was 161. The majority of eggs hatched on the fifth day after deposition, a few on the sixth day. All larvae that were individually reared completed their development in five stadia.

The newly hatched larva wanders about the apex of the plant for some time before boring into the side of a flower bud. Usually the bud is perforated near the base. Not infrequently the young larva bores into the pedicel and tunnels through it up into the bud, within which it feeds on the sexual parts of the plant. During the third or fourth stadia, the larva quits the first bud and tunnels into a second. In the fourth stadium, the larva commonly ceases to secrete itself within an individual bud and feeds on the contents from a position on the outside. Fourth and fifth stadium larvae often feed on the seed capsules, but even in these later instars, the buds are the most commonly attacked parts of the plant. The mature larva enters the ground to pupate.

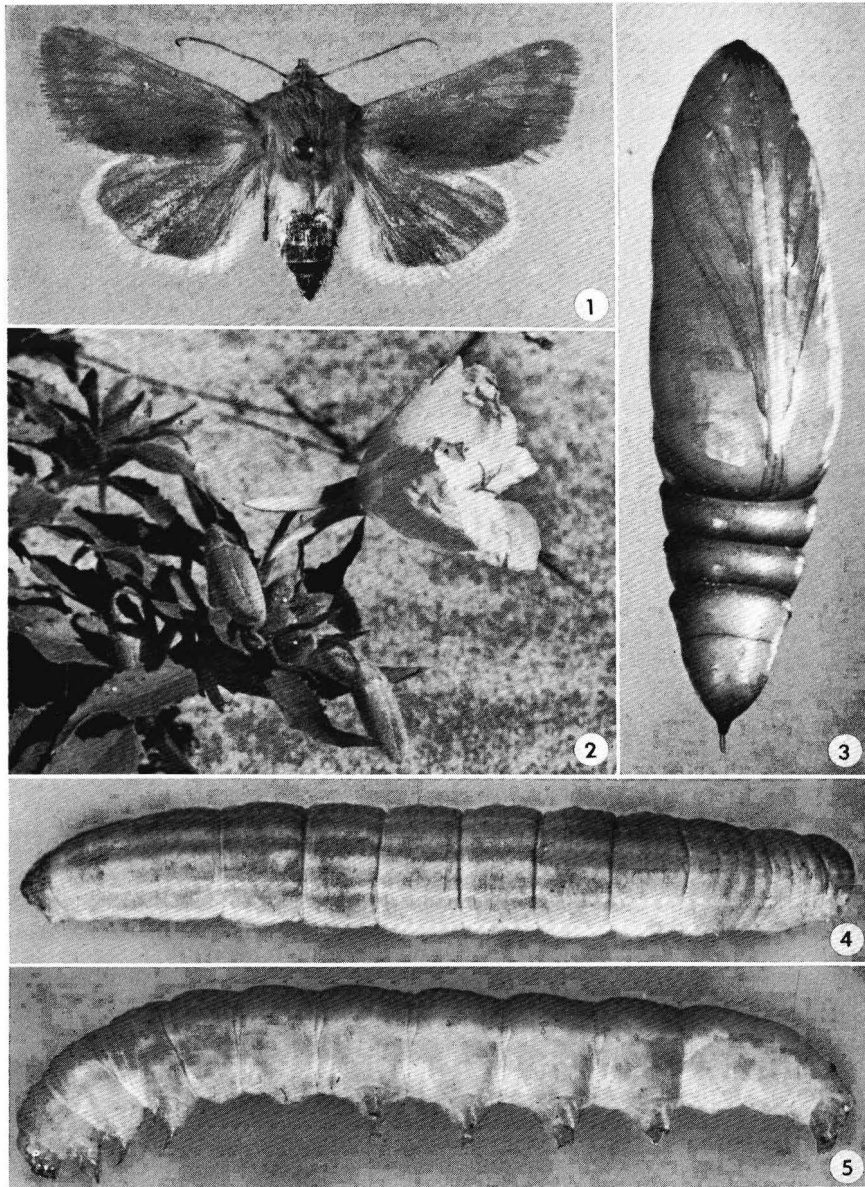
Rearing techniques employed in obtaining larvae for descriptions were those outlined by Hardwick (1958).

DESCRIPTIONS OF STAGES

ADULT (Fig. 1). Head and thorax pale fawn, occasionally suffused with pink. Abdomen pale fawn-gray to silvery gray. *Forewing upperside*, pale creamy fawn to medium fawn, variably suffused with pink in basal, median and subterminal spaces. Forewing usually almost immaculate. Transverse anterior line absent. Transverse posterior line often vaguely indicated by a darkening of the ground color between median and subterminal spaces. Subterminal line usually undefined; in specimens suffused with pink, however, s.t. line often well defined by color change between pink of subterminal space and fawn of terminal space. Orbicular spot absent. Reniform spot often indicated as a darker shade. Fringe concolorous with terminal area of wing. *Hindwing upperside*, occasionally gray with smoky brown outer-marginal band and discal spot; in most specimens, however, hindwing so heavily suffused with smoky brown as to practically obliterate darker markings. Fringe pale gray. *Underside*, pale fawn-gray along costal, outer and inner margins. Central triangle of wing grayish brown to light chocolate-brown. Reniform usually indicated as a darker brown spot. Hindwing uniform pale fawn-gray. Fringes of both wings concolorous with wings. In specimens suffused with pink on upperside, often much pink scaling along costal margins of both wings on underside.

Expanse: 27.7 ± 1.4 mm³ (100 specimens).

³ Standard deviation.



Figs. 1-5. *Schinia felicitata* (Smith), La Quinta, Riverside Co., Calif. 1, Adult. 2, Eggs on buds and apical leaves of *Oenothera deltoides* Torr. 3, Ventral aspect of pupa. 4, Dorsal aspect of larva. 5, Left lateral aspect of larva.

EGG. Pale creamy white when deposited, remaining unchanged for one day. A pink flush becoming evident at micropylar end on second day. Entire micropylar half of egg darkening to reddish brown on third day; the two hemispheres sharply defined. Little change during fourth day except posterior half of egg becoming yellowish fawn. On fifth day reddish coloring of micropylar half fading and larva becoming visible through chorion.

Dimensions of egg: length, 0.72 ± 0.05 mm; width, 0.66 ± 0.07 mm (20 eggs).

FIRST STADIUM LARVA. Head very dark brown or black. Prothoracic shield dark brown. Suranal shield medium grayish brown. Trunk creamy white to pale gray. Rims of spiracles, setal bases, and thoracic legs medium grayish brown.

Head width: 0.33 ± 0.02 mm (20 larvae).

Duration of stadium (at room temperature): 4.0 ± 1.5 days (54 larvae).

SECOND STADIUM LARVA. Head medium brown to dark blackish brown. Prothoracic and suranal shields somewhat paler brown than head capsule. Trunk creamy white or pallid gray; occasionally a pair of paler lines evident on dorsum. Setal bases grayish brown. Rims of spiracles and thoracic legs dark grayish brown.

Head width: 0.55 ± 0.03 mm (20 larvae).

Duration of stadium: 3.0 ± 1.1 days (54 larvae).

THIRD STADIUM LARVA. Head fawn, variably mottled with medium brown, often heavily, largely obscuring fawn. Prothoracic and suranal shields grayish fawn or greenish fawn, variably, usually lightly marked with medium brown; prothoracic shield most heavily marked along lateral and posterior margins. Middorsal band green, grayish green, or yellowish green. Subdorsal area with yellow marginal lines and a median band of somewhat paler green than middorsal band. Supraspiracular area broad, concolorous with median band of subdorsal area. Spiracular band narrow, yellow, not sharply defined. Spiracles with medium brown rims. Ventral region essentially concolorous with green of dorsal area, occasionally of a grayer shade. Setal bases grayish fawn. Thoracic legs grayish fawn, variably suffused with medium brown.

Head width: 0.85 ± 0.04 mm (20 larvae).

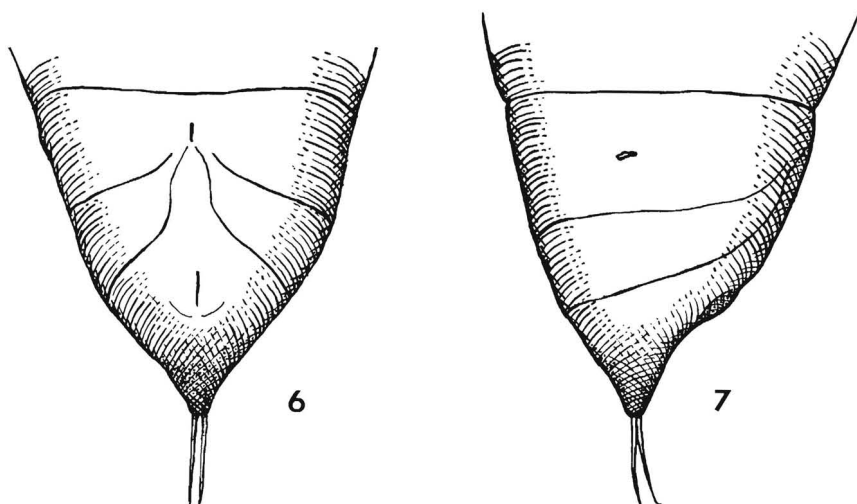
Duration of stadium: 3.1 ± 1.1 days (54 larvae).

FOURTH STADIUM LARVA. Head pale creamy white, mottled dorsally with pale fawn. Prothoracic and suranal shields cream to greenish yellow. Trunk medium green to light greenish yellow. Dorsal area of paler specimens often suffused with pale pink or mauve. Middorsal band usually somewhat darker than remainder of trunk. Subdorsal area with a broad, green median band and narrower marginal bands of pale yellow or cream. Supraspiracular area concolorous with median band of subdorsal area. Spiracular band pale yellow or cream. Spiracles with light brown rims. Suprapodal area concolorous with supraspiracular area. Midventral area grayish green. Immediate apices of setal bases medium brown, remaining portions concolorous with ground color. Thoracic legs cream to very pale fawn, often suffused with light green.

Head width: 1.4 ± 0.6 mm (20 larvae).

Duration of stadium: 2.6 ± 0.8 days (54 larvae).

FIFTH STADIUM LARVA (Figs. 4, 5). Head cream, fawn or fawn-gray, often with slightly darker fawn mottling. Prothoracic and suranal shields not distinguished from trunk except by absence of longitudinal lines. Trunk beautiful pastel shades of pink, mauve or green. Maculation not sharply defined. Middorsal band narrow. Subdorsal area with narrow marginal bands of pale yellow or cream, and a broader median band concolorous with, or only slightly paler than, middorsal band. Supraspiracular area concolorous with median band of subdorsal area. Spiracular band cream or pale yellow. Spiracles with light brown rims. Suprapodal area concolorous with supraspiracular area. Midventral area greenish gray in green specimens, fawn-gray in pink and mauve specimens. Setal bases concolorous with trunk. Thoracic legs pale cream, tinged with green or pink.



Figs. 6, 7. *Schinia felicitata* (Smith), apical abdominal segments of pupa. 6, Ventral. 7, Right lateral.

Head width: 2.10 ± 0.09 mm (20 larvae).

Duration of stadium: 4.1 ± 1.1 days (54 larvae).

PUPA (Fig. 3). Orange-brown. Spiracles essentially level with general surface of cuticle or only weakly projecting above it. Anterior areas of abdominal segments 5, 6 and 7, moderately pitted. Apex of proboscis usually extending slightly beyond apices of forewings. Cremaster (Figs. 6, 7) usually consisting of two elongate, slender, straight or weakly curved spines borne at the apex of a conical prolongation of the tenth abdominal segment. In one of twenty pupae examined, however, a pair of short spines flanking median pair.

Length to posterior margin of fourth abdominal segment: 11.7 ± 0.5 mm (20 pupae).

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