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A NEW SPECIES OF *SCHINIA* (NOCTUIDAE) FROM CENTRAL FLORIDA, WITH DESCRIPTION OF ITS LIFE HISTORY

D. F. HARDWICK

Biosystematics Research Institute, Ottawa, Ontario, Canada K1A 0C6

ABSTRACT. *Schinia rufipenna*, closely related to *Schinia tuberculum* (Hübner), is described as new. The species is a resident of central Florida and feeds in the larval stage on *Pityopsis graminifolia* (Michx.) Nutt. The life history of the new species is outlined and the immature stages described.

While undertaking field work at the Archbold Biological Station near Lake Placid, Florida, in the fall of 1979, my wife and I collected and reared a new species of *Schinia* closely related to *S. tuberculum* (Hübner, 1827).

Schinia rufipenna, new species

Description. Eyes full and globular as are those of *tuberculum*. Antennae filiform in both sexes. Inner side of foretibia with two apical spines and two or three additional marginal spines; outer side with a single apical spine and one or two marginal spines.

Maculation similar to that of *S. tuberculum* (Hbn.) (Figs. 3, 4) but better defined and usually with a strong reddish suffusion in both sexes. Species showing a sexual dimorphism similar to that of *tuberculum* with female being smaller, darker and with narrower forewings than male.

Vestiture of head and thorax dark orange, unlike the usual greenish-yellow of *tuberculum*. Upperside of abdomen black with a yellow band at posterior margin of each segment. Underside of body dark yellow or light orange.

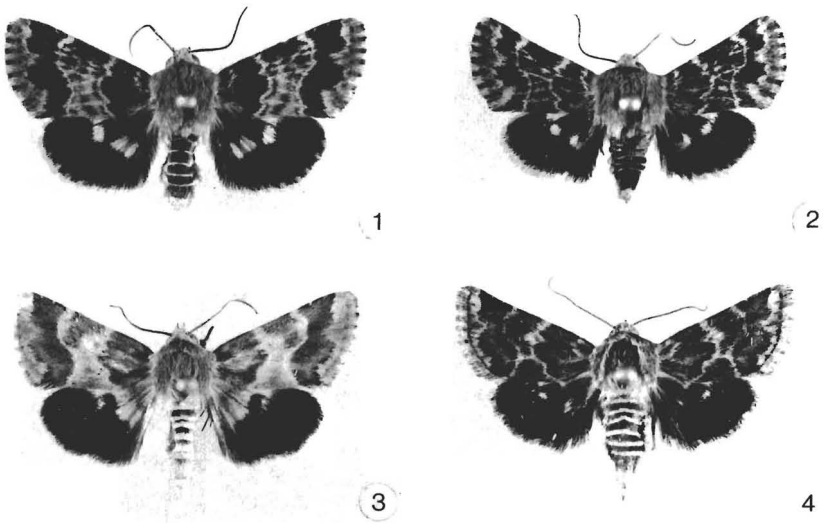
Male with forewing varying from bright reddish-brown to light chocolate-brown, without the olive suffusion generally evident on *tuberculum*, and with crisper maculation.

Transverse anterior line double, pale-filled, broadly excurved, shallowly triarcuate. Basal space reddish-brown to light chocolate-brown; usually a pale grey or pale cream basal line evident at costal margin. Transverse posterior line usually double, excurved around cell, then essentially straight to trailing margin. Median space white to pale yellow, variably suffused with reddish-brown to light chocolate-brown; a strongly defined brown shade along costal margin; inner half of median space usually lightly suffused with brown; often the suggestion of a brown median shade. Subterminal space concolorous with basal space. Terminal space light orange or white, of variable width. Fringe varying from orange to reddish-brown with a series of dark dashes.

Hind wing black with a narrow yellow outer marginal shade and a yellow median band; median band usually divided into two patches by apex of black discal spot. Fringe yellow.

Underside of forewing dark yellow with a basal black patch and a very large subterminal black patch; discal spot variably defined at inner margin of latter; basal and submarginal black patches often fused through discal spot, leaving only one or two pale median spots or patches. Underside of hind wing dark yellow with a dark patch at inner margin, a dark discal spot, and a dark post-median line expanding toward anal angle into a broad band. Discal spot often fused proximally with inner patch and distally with post-median band.

Female. Smaller, darker, and with narrower wings than male. Median space more



FIGS. 1–4. *Schinia* spp., Lake Placid, Florida: **1 & 2,** *S. rufipenna,* n. sp., holotype and allotype; **3 & 4,** *S. tuberculum* (Hübner), male and female.

heavily suffused than in male and usually with white lines evident along the veins. Median band of hind wing usually reduced to two rather small yellow spots.

Mean expanse. Male, 21.3 mm; female, 20.3 mm.

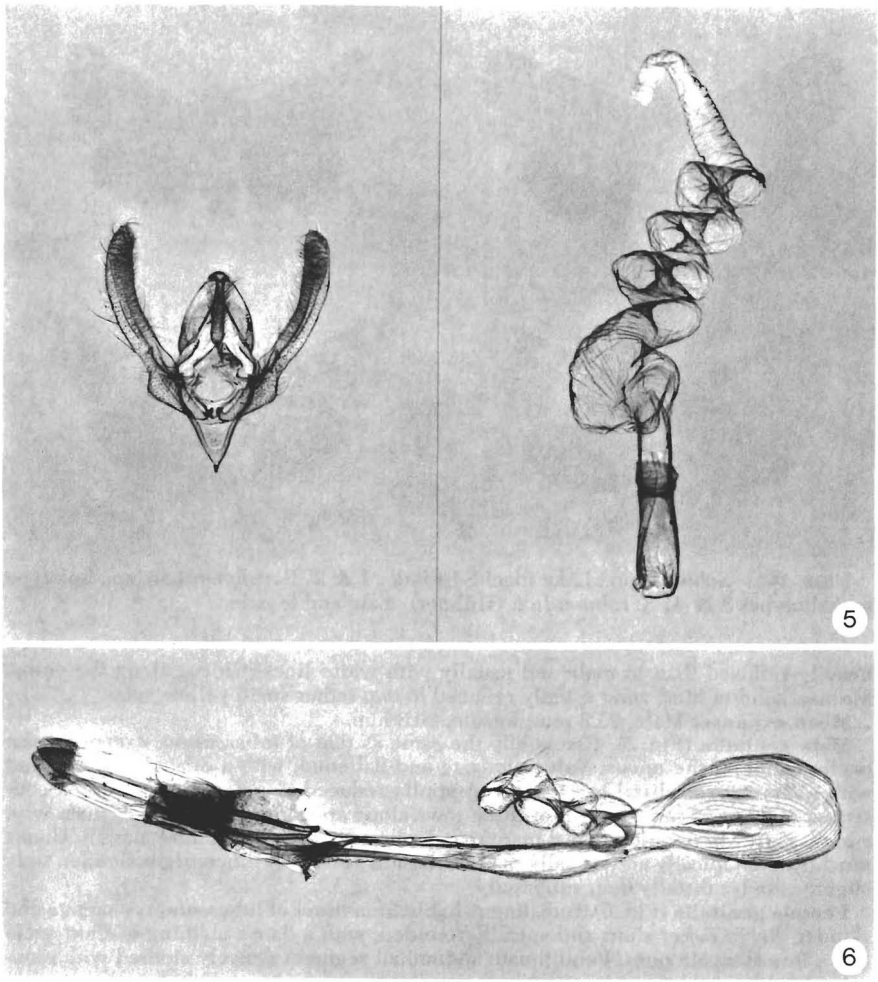
Male genitalia (Fig. 5). Essentially the same as that of *tuberculum,* except for the conformation of the uncus. Valve elongate and flattened, with a dilated sacculus and with a constriction distal to sacculus. Ampulla reduced to a short stub. Corona consisting of 20 to 25 setae in two or three rows along apical margin of valve. Juxta with a high, narrowly rounded dorsal margin and a broadly rounded ventral margin. Uncus much stouter apically and mesally than subbasally; uncus of *tuberculum* slender, only slightly stouter distally than subbasally.

Female genitalia (Fig. 6). Indistinguishable from those of *tuberculum*; elongate and slender. Valve rather short and apically rounded, with a dense clothing of short setae and a few elongate ones. Penultimate abdominal segment densely clothed with elongate slender spicules.

Type material. HOLOTYPE: ♂ (Fig. 1), Lake Placid, Fla., 8 Nov. 1979, D. and V. Hardwick. ALLOTYPE: ♀ (Fig. 2), same locality and collectors, 2 Nov. 1979. PARATYPES: 3 ♂♂ and 5 ♀♀, same locality and collectors, 1 Nov. to 24 Nov. 1979; 1 ♀, Orlando, Fla., Oct. 1942, D. F. Berry. Holotype and allotype and 8 paratypes in the Canadian National Collection (Type No. 16843). One paratype in the collection of the Archbold Biological Station.

Life History and Habits

Schinia rufipenna occurs sympatrically in central Florida with *S. tuberculum,* and the two species have the same food plant, *Pityopsis* (formerly *Heterotheca*) *graminifolia* (Michx.) Nutt. In the immediate area in which *rufipenna* was taken, about six miles west of the town



FIGS. 5 & 6. *Schinia rufipenna*, n. sp., male and female genitalia.

of Lake Placid, *tuberculum* was much the commoner species as indicated by both the number of adults and number of larvae taken. The behavior and pattern of development of the two is essentially the same. Although the full globular eyes of *rufipenna* would suggest at least partially nocturnal habits, the moths were only active in the oviposition containers during the late morning and afternoon, and no adults were taken in the light trap during the calendar period that the moths were flying.

FIGS. 7–10. Ultimate stadium larvae of *Schinia* spp. on *Pityopsis graminifolia* (Michx.) Nutt.: **7 & 8,** *S. rufipenna*, n. sp., dorsal and lateral; **9 & 10,** *S. tuberculum* (Hübner), dorsal and lateral.

As with most species of heliothentines the adults copulate on the flowering heads of the food plant. The female inserts her ovipositor into the open head of *Pityopsis* and deposits the eggs among the florets. The newly hatched larva feeds first on the florets and subsequently on the developing seeds. During one of the median stadia

the larva moves from one head to a second. The larva continues to secrete itself in a *Pityopsis* head at least until moulting into the last stadium. The last instar does not hide in the debris at the base of the plant as do many species of the genus but conceals itself along the stems of the plant. Its long slender shape probably renders it relatively inconspicuous in this position. The majority of reared larvae matured in five larval stadia, a few in six. The duration of the larval stage among reared individuals seemed unusually protracted, its mean duration of 37.4 days contrasting strongly with the normal three-week period recorded for other species of the genus (see Hardwick, 1958).

The mature larva burrows into the ground to pupate. The species is evidently univoltine, remaining in the pupal stage until the following fall, when its food plant again comes into blossom.

Immature Stages

Egg. Pearly white when deposited; remaining unchanged until the day prior to hatching when the ocelli and subsequently the whole head capsule gradually become visible through the chorion. Egg hatching five to seven days after deposition.

First instar. Head pale orange-brown, paler than that of *tuberculum*. Prothoracic and suranal shields medium smoky-brown. Trunk white, becoming stained with yellow as larva feeds. Mean duration of stadium, 8.1 days.

Second instar. Head orange suffused dorsally with brown. Ocelli dark brown. Prothoracic shield smoky-brown with three pale longitudinal shades. Suranal shield smoky-grey with a poorly expressed, somewhat darker grey mid-dorsal band and two or three evanescent grey subdorsal lines. Mean duration of stadium, 4.5 days.

Third instar. Head orange-brown with black ocelli; often a pair of blackish arcs diverging upward and outward from near apex of frontal triangle. Prothoracic shield grey with some brown suffusion mesally; with four black longitudinal bands, the median pair converging anteriorly; prothoracic shield usually noticeably elevated above cuticular surface of trunk. Suranal shield undistinguished from remainder of trunk. Trunk yellowish-grey with brown longitudinal bands. Mid-dorsal band narrow, brown, often with a pale median shade. Subdorsal area yellowish-grey with a brown median band somewhat paler than mid-dorsal band; in larger specimens, median band with a yellow median shade. Supraspiracular area brown with a broad, white or grey, median band. Spiracular band pale grey with a white ventral line and often a brown median shade. Spiracles dark brown. Suprapodal area pale grey. Mean duration of stadium, 4.5 days.

Fourth instar. Head light orange with dark brown ocelli; often a pair of dark brown arcs diverging upward and outward from near apex of frontal triangle. Prothoracic shield elevated above general surface of trunk; white with four longitudinal black bands, the median pair converging anteriorly and occasionally fused along anterior margin of shield. Suranal shield undistinguished in maculation from remainder of trunk. Mid-dorsal band chocolate-brown with a yellow median shade. Subdorsal area white with a median band of paler brown than mid-dorsal band; median band of subdorsal area with a dull yellow longitudinal shade. Supraspiracular area brown with a broad but discontinuous median white band. Spiracular band white with a weakly expressed, multi-arcuate, pale-brown median shade. Spiracles black. Suprapodal area light grey, suffused with brown dorsally. Mean duration of stadium, 7.3 days.

Fifth instar (Figs. 7, 8). Head orange, suffused with brown dorsally; ocelli dark brown; a pair of dark-brown arcs diverging upward and outward from near apex of frontal triangle. Prothoracic shield prominent, elevated above surface of trunk; white,

often suffused with light brown mesally; with four black longitudinal bands, the mesal pair converging anteriorly and sometimes fusing along anterior margin of shield. Suranal shield with maculation undistinguished from remainder of trunk. Overall color of trunk orange-brown with a distinctly checkered appearance due to segmental interruption of longitudinal banding. Mid-dorsal band pale orange with brown marginal lines; marginal lines darker and wider toward anterior margin of each segment. Subdorsal area white with a dull yellow median band; median band margined with brown lines anteriorly on each segment and with orange posteriorly. Supraspiracular area consisting of three longitudinal bands: a dorsal brown band fading to orange-brown toward posterior margin of each segment; an orange-brown ventral band usually fusing with dorsal band at posterior margin of each segment; a discontinuous white median band, wide at anterior margin of each segment but narrowing posteriorly and terminating at fusion of marginal brown bands. Spiracular band white with an inconspicuous, multi-arcuate, light-brown median shade. Spiracles black. Suprapodal area pale grey, suffused with brown dorsally along margin of spiracular band. Mean duration of stadium, 12.0 days.

Pupa. Well sclerotized and somewhat stouter than pupa of *tuberculum*; orange-brown and without characteristic green suffusion of *tuberculum*. Mesothoracic legs relatively long, terminating only a short distance anterior to apex of proboscis. Dorsum of fourth abdominal segment with a row of inconspicuous shallow pits. Anterior one-third of abdominal segments five to seven slightly elevated above remainder of segment and finely pitted; posterior row of pits the most prominent. Rims of spiracles high, forming short but definite tubes; spiracles on anterior abdominal segments on a plane with general surface of cuticle, those on segments five to seven borne in shallow oval pits at margin of raised anterior areas of these segments. Cremaster consisting of four spines borne in a single row at apex of a conical projection of tenth abdominal segment, the median pair slightly longer and stouter than the lateral pair.

DISCUSSION

From the third stadium onward the larva of *Schinia rufipenna* may be distinguished from that of *tuberculum* by the conformation of the two median dark bands of the prothoracic shield; in *rufipenna* these converge toward the anterior margin of the shield, whereas in *tuberculum* they meet the anterior margin at right angles. In the later stadia of *rufipenna,* the ground color of the trunk is reddish-brown; that of *tuberculum* greyish-mauve. Further, the last instar of *rufipenna* has a somewhat checked appearance because of the segmental interruption of the dorso-lateral banding of the trunk; the longitudinal banding of *tuberculum* (Figs. 9, 10) is continuous.

Schinia tuberculum is widely distributed in the southeastern United States. The limits of distribution of *S. rufipenna* are not known, but the species is probably confined to central Florida. The close similarity in structure and habits of the two species suggests some immediate common ancestry. During both the Aftonian and Yarmouth Interglacials of the Pleistocene, the peninsula of Florida was inundated by the Okefenokee Sea, and land areas in central Florida were reduced to a number of islands in the area now known as the Lake Wales Bridge (MacNeil, 1950).

The present competition for the same food plant between these two closely related species may suggest a fairly recent sympatry. It is possible that one population of the immediate ancestor of *tuberculum* and *rufipenna* evolved into the present day *rufipenna* during its insular isolation in the Pleistocene, whereas continental populations evolved into the contemporary *tuberculum*. With the re-establishment of land connections, *tuberculum* may have invaded the Floridian Peninsula resulting in the co-existence of the two species that we see today. Certainly, *tuberculum* is much commoner and more widespread in the Lake Placid area than is *rufipenna*. Further, on the basis of growth rates in simultaneous larval rearings, *tuberculum* is the more vigorous species. In the face of competition from its more successful relative, *rufipenna* may well represent a species on the threshold of extinction.

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