

## Revised status of *Schinia unimacula* Smith including morphological comparisons with *Schinia obliqua* Smith (Lepidoptera: Noctuidae: Heliothinae)

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### Abstract

*Schinia unimacula* is resurrected from the synonymy of *S. obliqua* and is treated as a full species based on differences in maculation and male and female genitalic structures. *Schinia coolidgei* Hill remains a synonym of *S. unimacula*. Genitalia of both sexes of *S. unimacula* and *S. obliqua* are described and illustrated for the first time.

**Key words:** *Schinia unimacula*, *Schinia obliqua*, taxonomy, biology, host plant, *Ericameria nauseosa*

### Introduction

In his monograph of the North American Heliothinae, Hardwick (1996) synonymized *Schinia unimacula* Smith and *Schinia coolidgei* Hill with *Schinia obliqua* Smith. Previous to his monograph both *S. unimacula* and *S. obliqua* were treated as separate species. However, there are characters, in both the maculation and genitalia that separate *S. unimacula* and *S. obliqua*. We leave *S. coolidgei* a synonym of *S. unimacula*, as it has been in the literature (McDunnough 1938, Franclemont and Todd 1983, Poole 1989, Poole and Gentili 1996). We are treating *S. unimacula* as a full species by resurrecting it from the synonymy of *S. obliqua*. We also illustrate the male and female genitalia of both *S. unimacula* and *S. obliqua* for the first time, and note that the illustrations in Hardwick (1996) are *S. unimacula*, not *S. obliqua*. The biology of *S. obliqua* is unknown.

The adult images were taken with a Kodak DSC 315 digital camera. The genitalic images were taken through a Wild Photomakroskop dissecting microscope using a JVC KY-F70B digital camera. The genitalic images were then manipulated with AutoMontage and Photoshop 6.0.

***Schinia obliqua*** Smith

(Figs. 1-3, 7-8, 11, 13)

*Schinia obliqua* Smith 1883:229 —Smith 1893:276. —Dyar 1903:188. —Barnes and McDunnough 1917:39. —McDunnough 1938:105. —Todd 1982:154. —Franclemont and Todd 1983:159. —Poole 1989:896. —Poole and Gentili 1996:772. —Hardwick 1996:183 [syn.: *S. unimacula* Smith, *S. coolidgei* Hill]

**Diagnosis. Maculation:** Forewing of *obliqua* has distinct, basal, median, and subterminal bands that are light brown to grayish olive in coloration. The median band is sinuate around the reniform spot. The subterminal band is constricted opposite the reniform spot and can be contiguous or separate at this point. In *unimacula* the bands are less distinct, and the median band is straighter, resulting in a larger white area between the basal and median bands (Figs. 4-6). The subterminal band in *unimacula* is represented by a distinct subapical spot with the remainder of the band faint, becoming more distinct towards the posterior forewing margin. The reniform spot is usually larger and better developed in *unimacula* than in *obliqua*. **Male genitalia:** The uncus is longer and thinner in *unimacula* than in *obliqua*. The costal valve margin is gently curved in *unimacula* and distinctly angulate toward the apex in *obliqua*; the valve is narrower in *unimacula* than in *obliqua*; and the corona has fewer, stouter setae in *unimacula* than in *obliqua*. The saccus in *unimacula* is only slightly wider than in *obliqua*. **Female genitalia:** The papillae anales apex is pointed in *unimacula* and broadly rounded in *obliqua*, which can easily be seen without dissection. The setae on the distal margin of the seventh segment are large and numerous in *unimacula* and are weak and fewer in *obliqua*; smaller setae occur sparsely over the rest of the segment in *obliqua*, but are absent in *unimacula*.

**Description.** Male genitalia (Figs. 7-8): Uncus short (0.28 X valve length), robust. Valve elongate (length 7.5 X width), costal margin angulate at approximately 85% of length; ampulla short (0.04 X valve length); corona at apical 10% of valve length; sacculus well developed and 25% of valve length, dorsal margin distinct. Aedoeagus slightly curved; vesica with 2 coils and minute spicules. Female genitalia (Fig. 11): Papillae anales broadly triangulate, apex broadly rounded. Seventh segment with weak, elongate setae in a row along distal margin; smaller setae sparsely scattered on remainder of segment. Eighth segment with fine spicules. Ductus bursae moderately elongate. Appendix bursae coiled. Corpus bursae ovate; signa composed of 4 scobinate bars.

**Type material.** Lectotype male, in USNM designated by Todd (1982). Label data: (1) *S. obliqua* Smith (handwritten in black ink); (2) Collection J.B. Smith; (3) Type No. 288 USNM [red label]; (4) male genitalia on slide, Nov. 29, 1937, JFGC # 1382; (5) Genitalia slide male, JFGC, USNM 40062; (6) LECTOTYPE, *Schinia obliqua* Smith; (7) USNM ENT 00143254 [bar code].

**Larval host plant.** Unknown.

**Flight period.** July through September.

**Distribution (Fig. 13).** Western Texas, southwestern New Mexico, and southern Arizona.



**FIGURES 1-6.** Adults. 1, *Schinia obliqua*, f, Arizona, Pima Co., Madera Canyon, Santa Rita Mts., 17 Aug. 1943, USNM ENT 143043. 2, *Schinia obliqua*, m, Arizona, Pima Co., Redington, USNM ENT 143050. 3, *Schinia obliqua*, m, New Mexico, Luna Co., Deming, 8-15 Sep., USNM ENT 143072. 4, *Schinia unimacula*, Lectotype m [designated by Todd], Colorado, Type No. 33719 USNM, USNM ENT 143255. 5, Holotype m, *Schinia coolidgei* Hill [synonym of *S. unimacula*], California, San Diego Co., Jacumba, 28 Sep. 1924, USNM ENT 143256. 6, *Schinia unimacula*, f, Washington, Bar, 10 Aug. 1940, USNM ENT 143116.

**Material Examined.** Specimens were examined from the following states and counties: ARIZONA: Apache Co., Cochise Co., Graham Co., Maricopa Co., Pima Co., Santa Cruz Co. NEW MEXICO: Luna Co. TEXAS: Brewster Co., Jeff Davis Co.

**Discussion.** The intensity and color of the forewing bands are variable. The small black spots at the ends of the cells along the outer margin can be present or absent. The hindwing can be almost immaculate to quite well marked with a distinct discal spot and marginal band.

### *Schinia unimacula* Smith Revised Status

(Figs. 4-6, 9-10, 12-13)

*Schinia unimacula* Smith 1891:126. —Smith 1893:276. —Dyar 1903:188. —Barnes and McDunnough 1917:39. —McDunnough 1938:105. —Todd 1982:219. —Franclemont and Todd 1983:159. —Poole 1989:898. —Poole and Gentili 1996:772. —Hardwick 1996:183 [synonym].

*Schima* [sic] *coolidgei* Hill 1924:185. —McDunnough 1938:105 [synonym]. —Franclemont and Todd 1983:159 [synonym]. —Poole 1989:893 [synonym]. —Poole and Gentili 1996:772 [synonym]. —Hardwick 1996:183 [synonym].

**Diagnosis.** *Schinia unimacula* has a straight median band with a wide white area between the basal and median bands. The subterminal band consists of a distinct subapical spot, then becomes faint medially and more distinct on posterior margin. Reniform spot large and distinct. The male genitalia has a long and thin uncus and narrow valve with gently curved costal margin. The female papillae anales have a pointed apex. Large and numerous setae are present along the posterior margin of the seventh tergite.

**Description.** Male genitalia (Figs. 9-10): Uncus short (0.39 X valve length), thinner basally becoming broader toward apex. Valve elongate (length 8.1 X width), costal margin gently curved; ampulla elongate (0.10 X valve length); corona at apical 5% of valve length; sacculus well developed and 35% of valve length, distal margin not distinct and blends into valve. Aedoeagus slightly curved; vesica with 2 1/2 coils and minute spicules. Female genitalia (Fig. 12): Papillae anales triangulate, apex pointed. Eighth segment with fine spicules. Seventh segment with many large, robust setae in a row along distal margin; remainder of segment devoid of setae. Ductus bursae moderately elongate. Appendix bursae coiled. Corpus bursae ovate; signa composed of 4 scobinate bars.

**Type material.** *Schinia unimacula*, lectotype male, in USNM designated by Todd (1982). Label data: 1) Colo, Bruce (hand written in black ink); 2) *Schinia unimacula* Type Smith (hand written in black ink); 3) Type No. 33719 USNM [red label]; 4) Col. B. Neumögen; 5) LECTOTYPE, *Schinia unimacula* Smith; 6) USNM ENT 00143255 [bar code].

*Schinia coolidgei*, holotype male, in USNM. Label data: (1) Jacumba, 9. 28. 24, No. (Hand written in pencil); (2) HOLOTYPE male, *Schinia coolidgei* Hill, Jacumba Cal., E.

Piazza, Sept 28-24 (hand written in black ink), HILL Collection (printed); (3) Barnes Collection (printed in red); (4) USNM ENT 00143256 [bar code].

**Larval host plant.** Hardwick (1996) describes the life history and larvae of *S. unimacula* from the Mohave Desert in southern California where the larvae feed on *Ericameria paniculata* (A. Gray) Rydb. In the Great Basin the larvae presumably feed on *E. nauseosa* (Pallas) Britton (Hardwick 1996). We plotted the host plant distribution of *E. paniculata* (Fig. 13, dark shading) and it does not occur in the Mojave Desert of southern California as stated by Hardwick (1996), but it coincides with specimens collected in southern Nevada and northwestern Arizona. The host plant distribution of *E. nauseosa nauseosa* (Fig. 13, light shading) more closely coincides with the broader distribution of *S. unimacula*. Further field studies should be conducted to confirm these larval hosts as well as those in Oregon, Washington, and northern Idaho.

**Flight period.** End of July to early October with most records in August.

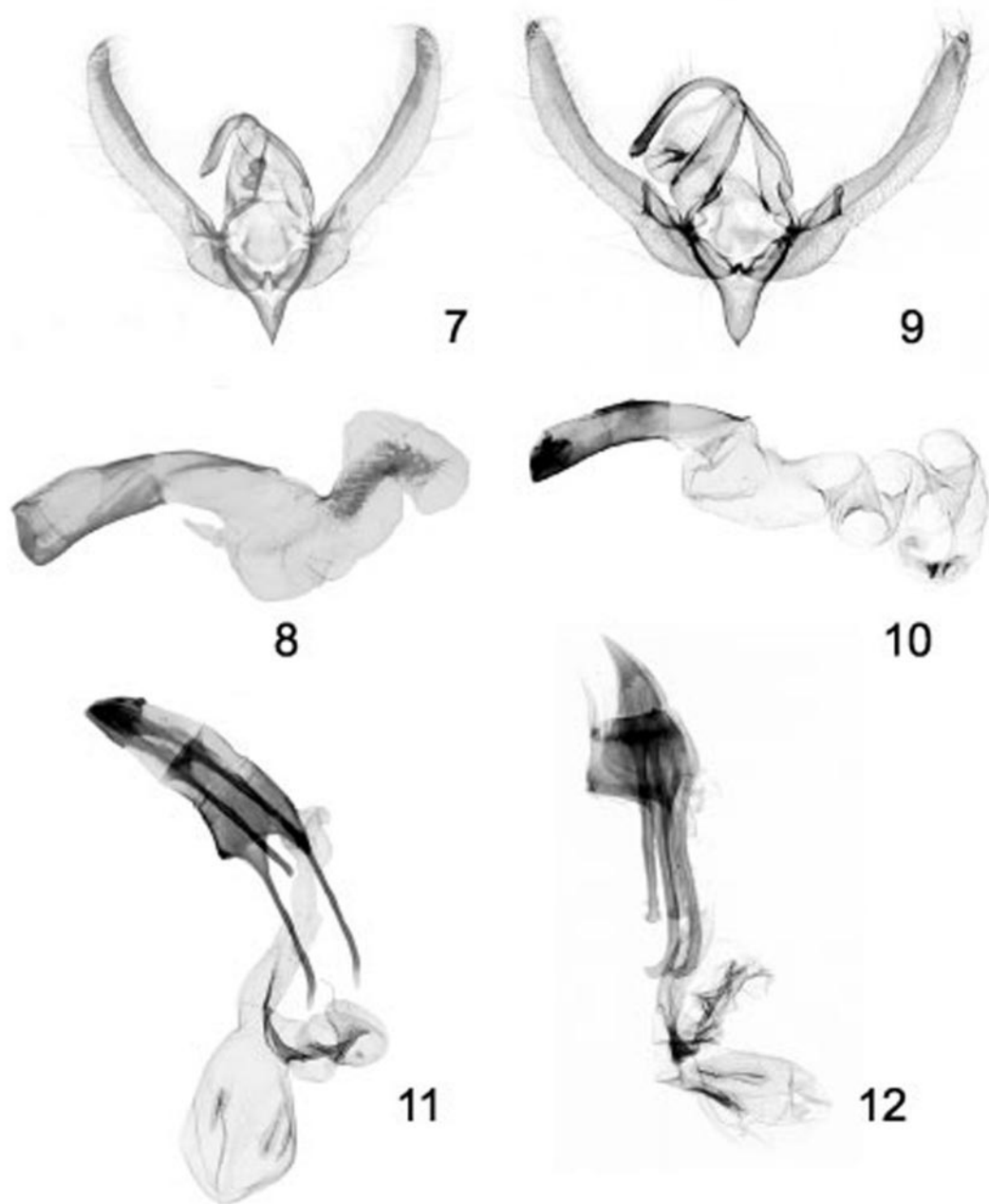
**Distribution (Fig. 13).** From central Arizona and New Mexico, north to Colorado, southwestern Wyoming and Utah, west to Nevada and California, and north to Oregon, Idaho, and Washington.

**Material Examined.** Specimens were examined from the following states and counties: ARIZONA: Mohave Co. CALIFORNIA: Inyo Co., Kern Co., Los Angeles Co., Modoc Co., Mono Co., Riverside Co., San Bernardino Co., San Diego Co., Tuolumne Co., Ventura Co. COLORADO: Adams Co., Alamosa Co., Arapahoe Co., Baca Co., Boulder Co., Denver Co., El Paso Co., Fremont Co., Huerfano Co., Jefferson Co., Kit Carson Co., La Plata Co., Larimer Co., Lincoln Co., Mesa Co., Moffat Co., Montezuma Co., Otero Co., Weld Co. IDAHO: Bonner Co. NEVADA: Clark Co., Eureka Co., Lander Co., Lincoln Co., Nye Co., Washoe Co. NEW MEXICO: Bernalillo Co. OREGON: Deschutes Co., Harney Co., Jefferson Co., Klamath Co. UTAH: Beaver Co., Daggett Co., Eureka Co., Garfield Co., Juab Co., Kane Co., Rich Co., San Juan Co., Sanpete Co., Sevier Co., Toole Co, Uintah Co., Utah Co., Washington Co. WASHINGTON: Okanogan Co. WYOMING: Lincoln Co., Uintah Co.

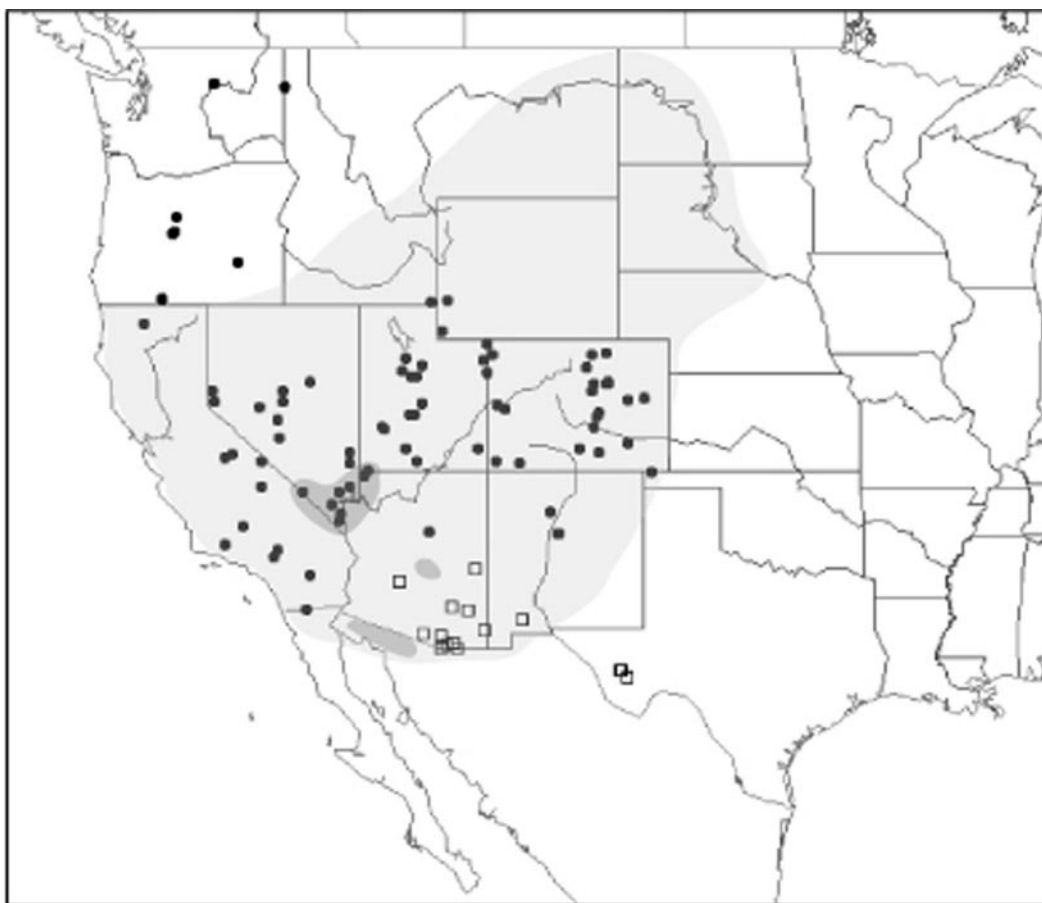
**Discussion.** The forewing maculation of *unimacula* can approach that of *obliqua*, but the shape of the papillae anales is diagnostic. Forewing maculation seems to be darker and more contrasting in some Colorado specimens than those throughout the rest of the range. The discal spot in the hindwing can be present or absent and the marginal band is faint to almost absent.

The holotype of *coolidgei* is a slightly more heavily marked individual than is typical of *unimacula*. The female paratype is typical of *unimacula*.

*Schinia unimacula* is widespread through western United States, approaching the range of *S. obliqua* only in the southeastern portion of its range, so in most areas the species can be identified by distribution alone.



**FIGURES 7-12.** Genitalia. 7, *Schinia obliqua*, m, Arizona, Pima Co., Redington, Genitalia slide USNM 46784, USNM ENT 143044. 8, aedeagus of same specimen. 9, *Schinia unimacula*, m, Utah, Utah Co., Vineyard, Genitalia slide USNM 46782, USNM ENT 143124. 10, aedeagus of same specimen. 11, *Schinia obliqua*, f, Arizona, Pima Co., Redington, Genitalia slide USNM 46785, USNM ENT 143052. 12, *Schinia unimacula*, f, Utah, Utah Co., Vineyard, Genitalia slide USNM 46783, USNM ENT 143127.



**FIGURES 13.** Collecting localities of *Schinia obliqua* (open squares) and *S. unimacula* (solid circles). Distribution of larval hosts of *S. unimacula*, *Ericameria paniculata* (dark shading) and *E. nauseosa nauseosa* (light shading).

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