

THREE NEW *SCHINIA* FROM THE WESTERN UNITED STATES (LEPIDOPTERA: NOCTUIDAE: HELIOTHINAE)

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ABSTRACT.— *Schinia hardwickorum* n. sp., *S. sanrafaeli* n. sp., and *S. mcfarlandi* n. sp., are described from specimens collected in Colorado, Utah, and Arizona, respectively. *Schinia sanrafaeli* has also been taken in western New Mexico. The three new species are compared to other taxa in their species groups.

KEY WORDS: Arizona, Asteraceae, Colorado, distribution, Fabaceae, hostplants, Nearctic, New Mexico, North America, *Schinia hardwickorum* n. sp., *Schinia mcfarlandi* n. sp., *Schinia sanrafaeli* n. sp., systematics, Utah, USA.

The species of *Schinia* were recently detailed by Hardwick (1996). New species are recognized based on a review of that work, consultation with specialists (Lafontaine, pers. comm.), and surveys of major institutional collections. Presently, the genus *Schinia* comprises more than 100 described species, all of which are restricted to the Nearctic faunal region (Hardwick, 1996). The richest areas in *Schinia* are in the southern Great Plains and Southwest. Within this relatively large geographic area, most species appear endemic to specific ecoregions, and are further restricted to certain habitat types and larval host plants (Hardwick 1996). Three new species are herein described from, (1) Colorado National Monument, Mesa County, Colorado; (2) the San Rafael rift, Emery and San Juan Counties, Utah and Grant County, New Mexico; and (3) the Patagonia Mountains, Cochise County, Arizona.

Terminology follows standards used in the description of many Noctuidae (Lafontaine, pers. comm.).

Schinia hardwickorum Opler, n. sp.

(Fig. 1-2)

Description.— MALE: forewing length 11.4-12.7mm (n = 2). **Head:** Vertex covered with white hair-like scales with a few black scales intermixed. Front covered with mixture of white and a few black elongate scales. Labial palpi porrect, covered with a mixture of elongate and hair-like white scales, a few black scales distally. Eyes globose, naked. Antennae orange thinly covered with flattened white scales and ventrally directed closely spaced short white setae. **Thorax:** densely covered dorsally with long hair-like cream-tan scales and covered ventrally with long hair-like white scales. Legs covered with mixture of flattened and hair-like white scales. **Forewing:** fringe of elongate magenta-tipped black scales, each scale divided apically into 6-7 sharp points. Dorsal surface has ground magenta and black with black-outlined median magenta band delineated internally by convex white transverse interior line and strongly arched transverse posterior white line. Ventral surface with ground orange with irregular black submarginal band, black reniform spot, and thin black basal dash. **Hindwing:** fringe as on forewing except scales orange-tipped. Ground orange with overlying orange hair-like scales at base. Discal lunule black and vertical; broad black marginal band. Ventral surface orange with black discal lunule and submarginal band black posteriorly and magenta anteriorly. **Abdomen:** covered dorsally with flattened orange scales. Venter covered with alternating flattened white and orange scale bands. **Male genitalia:** identical to that of *S. jaguarina* (Guenée). **Types.**— Holotype male: COLORADO.— Mesa Co., Colorado National Monument, Saddlehorn Picnic Area, T11S R2W, Section 18nw, 23 May 1991, M. Weissmann (J. D. Lafontaine genitalia preparation #11879).

Paratype: COLORADO.— Mesa Co., Colorado National Monument, west entrance (sewage lagoon), 30 Jun 1997 (1 ♂), u.v. light trap, B. Rodgers family. **Type deposition.**— Holotype deposited in Canadian National Collection, Ottawa Ottawa (on permanent loan from U. S. National Park Service); paratype deposited

in C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Ft. Collins.

Etymology.— The species is named in honor of David F. and Verna Hardwick, who spent much of their lives travelling through North America in search of *Schinia* moths, their larval host plants, and immature stages.

Distribution.— Known only from Colorado National Monument, Mesa Co., Colorado. The species is likely to occur in similar habitats on the northern portion of the Colorado Plateau.

Hosts.— Unknown. Since the host of *S. hardwickorum*'s close relative, *S. jaguarina* (Guenée), is *Psoralea* (Fabaceae), it is possible that its host is a local species of *Psoralea*.

Flight Period.— The two known specimens were collected on 23 May and 30 Jun. Since the male collected on 30 Jun is still fresh, the flight period may be presumed to be from mid-May through early July.

Diagnosis.— *Schinia hardwickorum* is very similar in appearance to *S. jaguarina*, a wide-ranging moth normally found east of the continental divide. *Schinia hardwickorum* differs from that species by its smaller size, magenta forewing ground color, less convex transverse anterior line, strongly bent transverse posterior line, deeper orange hindwing with smaller more vertical black discal lunule, and absence of black basal dash on ventral forewing. A comparison of the male genitalia of *S. hardwickorum* and *S. jaguarina* by J. D. Lafontaine, Agriculture Canada, Ottawa, revealed no substantial differences including comparison of the inflated vesicas. The male genitalia of *Schinia*, because of their similarities, are generally not useful for species separation (D. F. Hardwick, pers. comm.). *Schinia hardwickorum* is allopatric from *S. jaguarina*, the closest populations of the latter being found several hundred miles eastward along the eastern base of the Rocky Mountain front.

Schinia sanrafaeli Opler n. sp.

(Fig. 3)

Description.— Male forewing length 10.3-11.2mm (n = 3); female forewing length 9.5-11.7mm (n = 4).

MALE.— **Head:** vertex covered with appressed pale orange scales. Front covered with appressed yellow-tan scales. Labial palpi porrect, covered with yellow-tan scales. Eyes globose, naked. Antennae orange, thinly covered with flattened tan scales and ventrally directed closely spaced short setae. **Thorax:** densely covered dorsally with appressed long hair-like orange scales and covered ventrally with long shaggy, hair-like yellow-orange scales. Legs covered with flattened yel

low-orange scales. Femora ventrally with long shaggy hair-like pale orange scales. **Forewing:** fringe of elongate darkish-tipped tan scales. Dorsal surface ground tan with white-outlined median tan area delineated internally by slightly

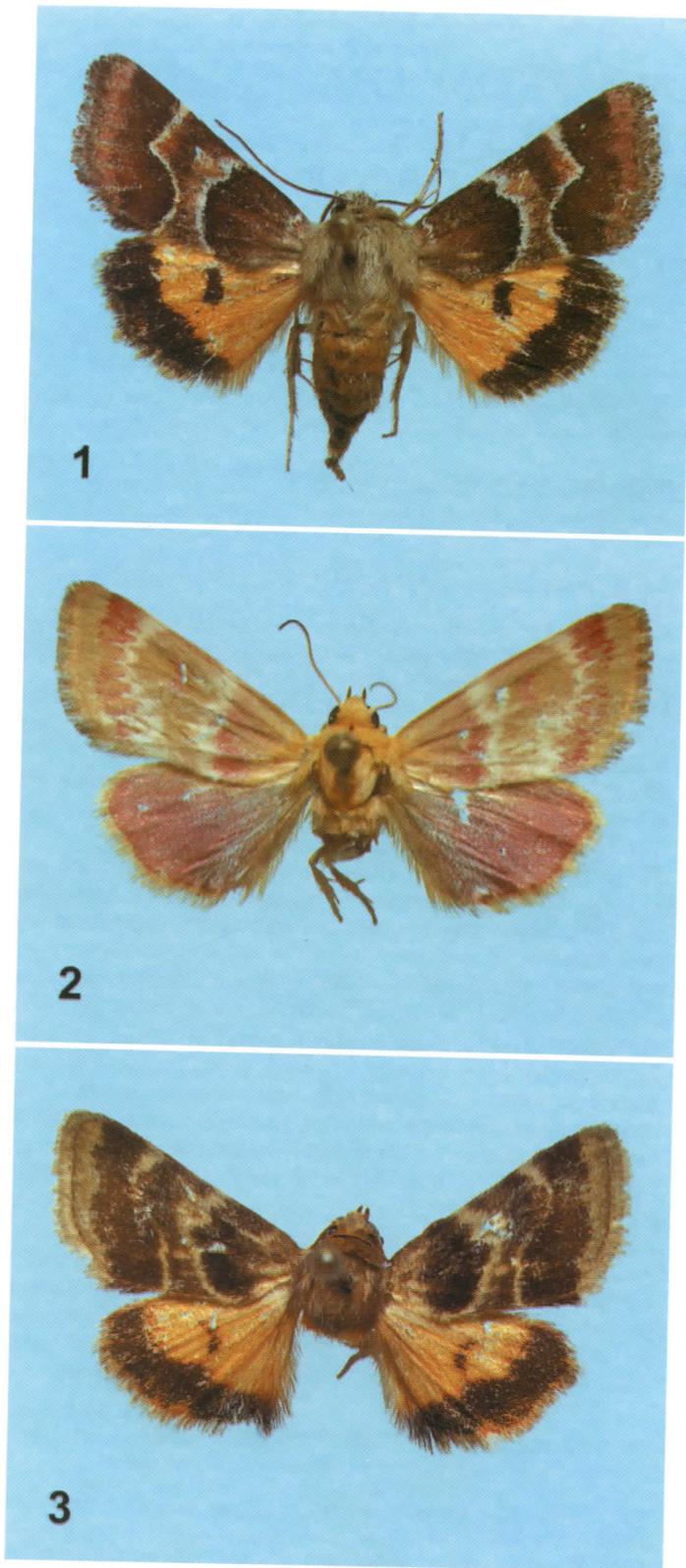


Fig. 1-3. Adults of *Schinia*: 1) *Schinia hardwickorum* Opler, holotype male, dorsal aspect. Colorado: Mesa County, Colorado National Monument, Saddlehorn Picnic Area, 23 May 1991, M. Weissmann. 2) *Schinia sanrafaeli* Opler, holotype male, dorsal aspect. Utah, Emery County, Goblin Valley State Park, 1 Jun 1997, P. A. Opler and E. Buckner, u.v. light. 3) *Schinia mcfarlandi* Opler, holotype male, dorsal aspect. Arizona, Santa Cruz County, Harshaw Creek, 7 miles southeast of Patagonia, Coronado National Forest, 5 Aug 1994, P. A. Opler, u.v. light.

convex transverse interior line and and strongly outwardly arched jagged transverse posterior white line. Median area with a few pink scales in discal cell. Diffuse pink submarginal band and tan marginal band. Ventral surface tan along costal and outer portions, pink on basal portion. *Hindwing*: fringe white. Wing predominantly reddish pink with scattered long black hair-like scales along anal margin. Abdomen: Covered dorsally with flattened tan scales. Venter covered with flattened off-white scales, distal segment ringed with yellow-orange scales. Male genitalia: Typical of those of the *volupia* species group. Vesica has four full coils.

FEMALE.— As for male except: head, thorax, and legs covered with tan scales. Antennae without short setae. Forewing dorsally without white t.i. and t.p. lines, pink spot in discal cell. Ventral surface dark gray instead of pink. Hindwing gray above instead of pink. Ventral surface mottled tan and pink. Abdomen dorsally with flattened gray scale. Genitalia not examined.

Types.— Holotype male: UTAH.— Emery Co., Goblin Valley St. Pk., 1 Jun 1997, P. A. Opler and E. Buckner, u.v. light (J. D. Lafontaine genitalia slide #11881).

Paratypes: NEW MEXICO.— *Grant Co.*, Mangas Springs, 4850', 13 Aug 1991 (1 ♀), C. D. Ferris. UTAH.— *Emery Co.*, Goblin Valley State Park, 1 Jun 1997 (2 ♂, 3 ♀, including allotype), P. A. Opler and E. Buckner, u.v. light; *San Juan Co.*, Canyonland National Park, south unit, ranger's residence, 4 Jun 1994 (1 ♂), Opler, Kondratieff, and Buckner, mercury vapor light.

Type deposition.— Holotype deposited in Canadian National Collection, Ottawa, Ontario, Canada; paratypes deposited in C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Ft. Collins; National Museum of Natural History; and National Park Service (deposited at Colorado State University).

Etymology.— This species is named after the San Rafael Desert of Emery and San Juan Counties, Utah where most individuals of the species were found.

Distribution.— Southeastern Utah and southwestern New Mexico. Undoubtedly occurs in Arizona and possibly in southwestern Colorado as well.

Hosts.— Unknown. Since the host of *S. sanrafaeli*'s closest relative, *S. fulleri* (McElvare), is a yellow composite, *Balduina angustifolia* (Pursh.) B. L. Robins., and since several *Gaillardia* spp. (Asteraceae), serve as larval hosts for *S. volupia* (Fitch) and *S. masoni* (Smith), it is likely that the host of *S. sanrafaeli* will prove to be a relatively robust composite (Asteraceae).

Flight period.— In Utah, collected only in the first week of June (1-4 Jun). Since some specimens are worn, flight probably begins in late May. One fresh female collected on 13 Aug in southwest New Mexico indicates either a later flight season there, or the possibility that *S. sanrafaeli* might have 2 flight periods.

Diagnosis.— *Schinia sanrafaeli* is a member of the *volupia* species-group that currently includes *Schinia volupia*, *S. masoni*, and *S. fulleri*. All four species differ significantly in wing maculation, and the newly described *S. sanrafaeli* seems closest to *S. fulleri* of the Southeast rather than the geographical more proximate *S. volupia* or *S. masoni*. *Schinia sanrafaeli* is quite variable in maculation, as is *S. fulleri*, but *S. fulleri* varies from pale yellow to deep yellow variably marked with reddish brown (Hardwick, 1996). In contrast, *S. sanrafaeli* is predominantly pink marked variably with yellow (see description). Male genitalia of all members of the *volupia* group were recently studied by J. D. Lafontaine (pers. comm.). The group, in addition to wing maculation and host plant similarities, has characteristic genital features. The only species-level distinction could be made for *S. masoni* which has 3 ½ coils in its vesica compared to 4 full coils for the other 3 species.

Schinia mcfarlandi Opler, new sp.

(Fig. 4)

Description.— Male forewing length 10.2mm (n = 2), female forewing length 9.9mm.

MALE.— *Head*: vertex covered with elongate pale tan scales. Front covered with elongate orange scales. Labial palpi porrect, covered with a mixture of elongate and hair-like orange scales. Eyes globose, naked. Antennae orange thinly covered with flattened orange scales. *Thorax*: densely covered dorsally with long cream-tan scales and covered ventrally with long tan scales. Legs covered with mixture of flattened orange and orange-brown scales. *Forewing*:

fringe of elongate pale tan scales, each scale divided apically into 6-7 sharp minute points. Dorsal surface has ground olive-brown and crossed by convex tan transverse interior line and strongly arched s-shaped transverse posterior tan line. Submarginal and basal areas pale tan. Ventral surface with basal 2/3 orange with black reniform spot, apical 1/3 black. Outer and costal margins with scattered reddish-orange scales. *Hindwing*: fringe as on forewing with scales tan with orange highlights. Ground orange with overlying orange and black hair-like scales at base. Discal lunule faint, black, and vertical.; broad shining black marginal band. Ventral surface orange with small black marginal patch and scattered reddish scales on costal and outer margin. *Abdomen*: covered dorsally with flattened tan scales. *Male genitalia*: similar to that of other members in *S. errans* species-group, but present species has only 3 full coils in vesica.

Types.— Holotype male: ARIZONA.— Santa Cruz Co., Harshaw Creek, 7 miles southeast of Patagonia, Coronado National Forest, 5 Aug 1994, P. A. Opler, u.v. light (J. D. Lafontaine genitalia slide #11880).

Paratypes: ARIZONA.— Santa Cruz Co., Harshaw Creek, 7 miles southeast of Patagonia, Coronado National Forest, 5 Aug 1994 (1 ♂), P.A. Opler, u.v. light.

Type deposition.— Holotype male deposited in Canadian National Collection, Ottawa; paratype deposited in C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Ft. Collins.

Etymology.— This species is named in honor of Noel McFarland, who has added so much to our knowledge of Arizona moths.

Distribution.— Known only from a single location along Harshaw Creek, 7 miles southeast of Patagonia, Coronado National Forest, Santa Cruz Co., Arizona.

Hosts.— Unknown. The host of *S. mcfarlandi*'s apparent closest relative, *S. errans* Smith, is also unknown. Since the larval host of the similar *S. tuberculum* (Hübner) and related *S. rufipenna* Hardwick is *Pityopsis* in the Southeast, possible larval hosts for *S. mcfarlandi* should be sought among related Asteraceae.

Flight period.— Both specimens were collected in early August, but the species may fly from late July through much of August.

Diagnosis.— *Schinia mcfarlandi* is most closely related to *S. errans* Smith, and is found within the range of the latter. In fact, one individual of *S. errans* was collected on the same night with the types of *S. mcfarlandi*. Other members of the *errans* species-group are *S. tuberculum* and *S. rufipenna*, both southeastern U.S. species. Comparison of the male genitalia of all four species (J. D. Lafontaine, pers. comm.) showed that all have similar valval shape and 12-14 setae on the corona. There are differences in the vesica in that *S. errans* has 5 full coils, *S. tuberculum* and *S. rufipenna* have 4 ½ coils, while *S. mcfarlandi* has only 3 coils.

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