

A REVIEW OF THE *PHLOXIPHAGA* GROUP OF THE  
GENUS *HELIOTHIS* (NOCTUIDAE: HELIOTHENTINAE\*)  
WITH DESCRIPTION OF A NEW SPECIES

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**ABSTRACT.** The name *Heliothis phloxiphaga* at present embraces three distinct species: *H. phloxiphaga* G. & R., which is distributed throughout temperate North America, *H. acesias* F. & R., which occurs from Nevada and Idaho eastward to Ontario, and *H. australis*, new species, which is distributed from southern Mexico northward to New Mexico and Arizona.

**Additional key words:** taxonomy, cryptic species, *Heliothis acesias*, *Heliothis australis*, genitalia.

For several decades, *Heliothis acesias* F. & R. has been considered only a color form of *Heliothis phloxiphaga*. Although the valvae of the male genitalia show no evident differences, the everted vesica of the penis of the male and the bursa copulatrix of the female do show consistent differences. A third member of the group, a predominantly Mexican species, is larger than either *H. phloxiphaga* or *H. acesias* and also differs from these in the conformation of the basal portion of the vesica and of the bursa copulatrix.

*Heliothis phloxiphaga* G. & R.

Figs. 1, 4, 5, 8

*Heliothis phloxiphaga* Grote & Robinson (1867:187).

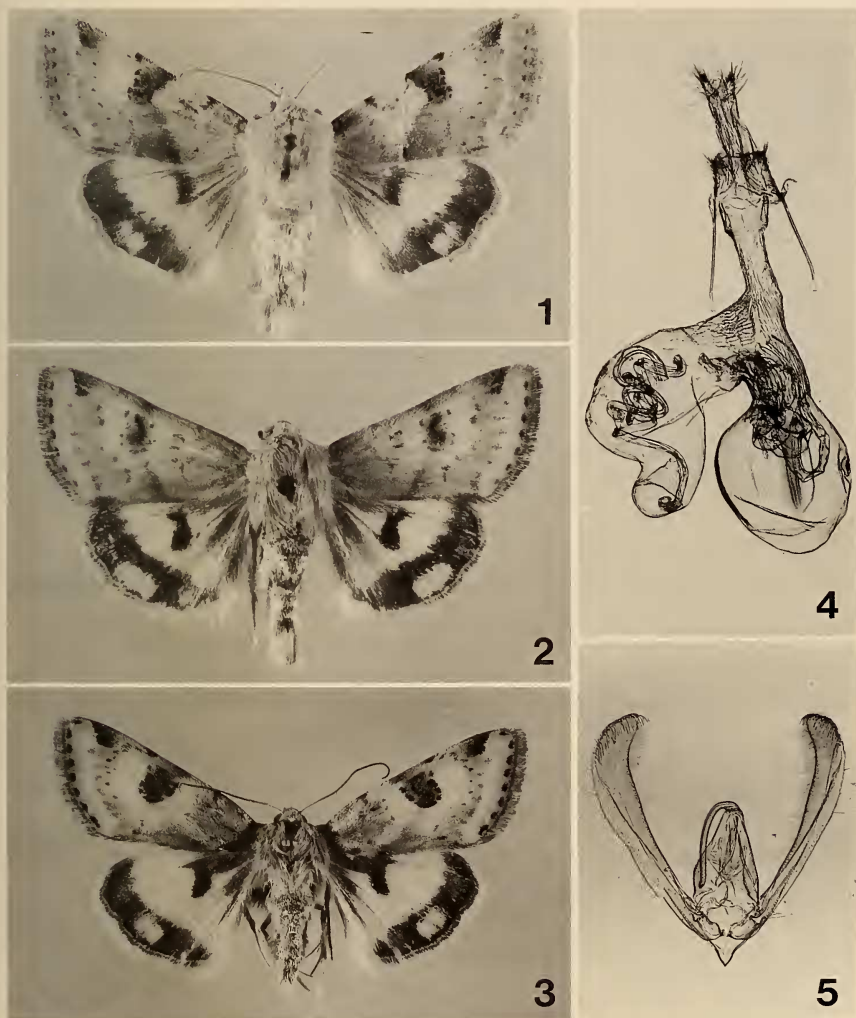
*Heliothis interjacens* Grote (1880:30).

*Heliothis phloxiphaga* is one of North America's most common heliothentines; it is distributed throughout the United States and southern Canada and feeds on the flower and seeds of a wide variety of plants. The species is in flight throughout the summer months.

The forewing is light brown without a strong yellow suffusion. The median shade of the forewing (Fig. 1) angles outward from the trailing margin to the reniform spot, then is abruptly angled inward before continuing to the costal margin. The central area of the hindwing of

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\* Steyskal (1971) clearly demonstrated that Heliothentinae is the correctly derived name for the group. According to Opinion 1312 of the International Commission on Zoological Nomenclature, however, the name Heliothinae is to be made a conservandum as a subfamily name. This Opinion is without validity. When the submission was made by I. B. Nye in 1980, with a supporting addendum by the then-Secretary, R. V. Melville, I submitted a defense of the term Heliothentinae. My comments were suppressed by the Secretary and never submitted to the Commissioners. In view of this cavalier action, I requested of his successor as Secretary, P. K. Tubbs, that the matter be reopened. He refused. In his supporting addendum to Nye's submission, Melville noted that a noctuid moth, being nocturnal, "would be most unlikely to be exposed to the sun," and that Ochseneimer's name was due to a printing error. This, of course, is completely fallacious. Obviously, Ochseneimer was quite aware that the components of his proposed genus were often diurnally active.



FIGS. 1-5. Adults and genitalia of *Heliothis* spp. 1, *Heliothis phloxiphaga* G. & R., Aweme, Manitoba; 2, *H. acesias* F. & R., Spanish Fork, Utah; 3, *H. australis* n. sp., paratype, Lomas de Chapultepec, D.F., Mexico; 4, Female genitalia of *H. phloxiphaga*; 5, Valves of male genitalia of *H. phloxiphaga*.

the species is white. In the male genitalia (Figs. 5, 8), there are two elongate basal diverticula on the vesica, the one on the right noticeably stouter than the one on the left. In the female genitalia, the appendix bursae is slightly shorter than the fundus bursae (Fig. 4), and terminates in a short, slender, curving tail.

Expanse (Mean  $\pm$  SD): 34.3  $\pm$  1.57 mm (n = 30).

*Heliothis acesias* F. & R.

Figs. 2, 6, 9

*Heliothis acesias* Felder & Rogenhofer (1872:pl. 108, fig. 42).*Heliothis luteitinctus* Grote (1875:426).

The known distribution of *Heliothis acesias* extends from north-eastern Nevada and southern Idaho, northward to southern Alberta, thence eastward to southern and eastern Ontario. It has been collected on dates between the middle of June and the end of September.

The species is of comparable size to *H. phloxiphaga*, but has yellowish-fawn forewings that are usually somewhat broader for their length than those of *H. phloxiphaga*. The median shade of the forewing (Fig. 2) is broadly excurved between the trailing and costal margins of the wing. The emarginating dots around the reniform and orbicular spots are usually more prominent than those of *H. phloxiphaga*. The central area of the hindwing is usually light yellow, less commonly white. In the male genitalia (Fig. 9), the base of the vesica is provided with only two shallow eversions. In the female, the appendix bursae (Fig. 6) is long and recurves anteriorly around the distal end of the fundus bursae.

Expanse:  $33.0 \pm 1.88$  mm (n = 24).

*Heliothis australis* Hardwick, new species

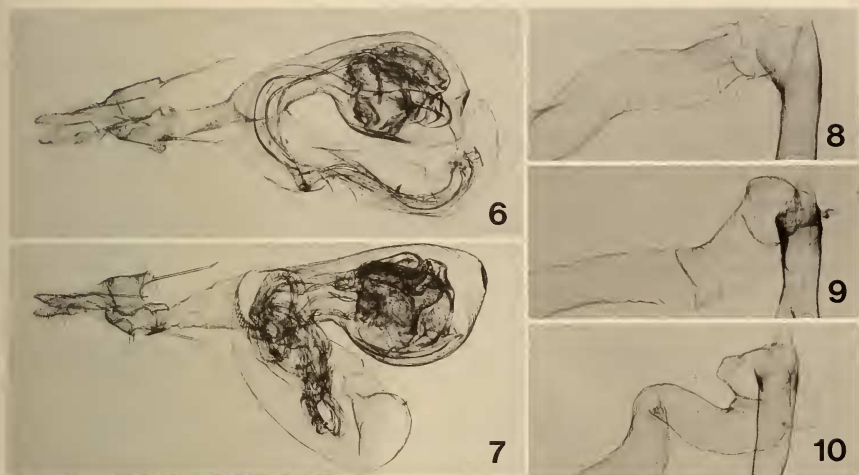
Figs. 3, 7, 10

Species usually larger than either *H. phloxiphaga* or *H. acesias*. Male with vestiture of head and thorax varying from reddish brown to olive-brown. Forewing light reddish brown, paler centrally than peripherally, with a very large and prominent reniform spot (Fig. 3). Median shade rather acutely excurved but not usually conspicuous. Central area of hind wing medium to dark yellow. In male genitalia, base of vesica (Fig. 10) provided with two stout diverticula, the left noticeably longer than right.

Female with maculation and coloring as in the male. Female genitalia (Fig. 7) with appendix bursae approximating fundus bursae in length.

Expanse:  $37.2 \pm 2.46$  mm (n = 17).

**Type material.** Holotype, male: San Cristobal de las Casas, 7200 ft., Chiapas, Mexico, 5 May 1969 (J. E. H. Martin). Paratypes, 20 males, 6 females: Lomas de Chapultepec, D.F., Mexico, 9 May 1939, male; 10 June 1940, male; 18 June 1935, male; 28 June 1935 (2 males); 16 August 1976, male (T. Escalante). San Jacinto, D.F., Mexico, 24 July 1932, female; 19 October 1932, male; 2 October 1935, male. 24 mi. E El Salto, 7500 ft., Durango, Mexico, 15 & 17 July 1964, 2 males (J. E. H. Martin). Mexico, Mexico, 2 females. Bent, New Mexico, male, female. 13 mi. SE Cloudcroft, 7100 ft., New Mexico, 9 September 1975,



FIGS. 6-10. Genitalia of *Heliiothis* spp. 6, Female of *H. acesias*; 7, Female of *H. australis*; 8, Apex of aedeagus and base of vesica of *H. phloxiphaga*; 9, Aedeagus and vesica of *H. acesias*; 10, Aedeagus and vesica of *H. australis*.

male, female (Lafontaine & Bowen). Cedar Crest, Sandia Mts., Bernalillo County, New Mexico, 4 July 1993, male (R. H. Leuschner). Prescott, Arizona, female. Alpine, White Mts., Apache County, Arizona, 24-25 July 1965, 2 males (R. H. Leuschner). Greer, 8300 ft., White Mts., Apache County, Arizona, 4 August 1969, 2 males (R. H. Leuschner). Springerville, Apache County, Arizona, 18-24 July 1971, male. Two males without data.

Holotype in the Canadian National Collection. Paratypes in the C.N.C., the U.S. National Museum, the Los Angeles County Museum, and the collection of R. H. Leuschner.

*Heliiothis australis* is distributed from the state of Chiapas in southern Mexico northward to southern New Mexico and Arizona. The species has been collected on dates between early May and mid-October.

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#### LITERATURE CITED

- FELDER, R. & A. F. ROGENHOFER. 1865-1875. Reise der Osterreichischen Fregatte Novara um die Erde. Wien.  
 GROTE, A. R. 1875. On North American Noctuae. Proc. Acad. Nat. Sci. Philadelphia 27:418-427.  
 ———. 1880. Descriptions of new Noctuidae. Bull. Brooklyn Entomol. Soc. 3:29-31.

- GROTE, A. R. & C. T. ROBINSON. 1867. Descriptions of American Lepidoptera—No. 2. Trans. Amer. Entomol. Soc. 1:171–192.
- STEYSKAL, G. C. 1971. On the grammar of the name *Heliothis* Ochseneimer (Noctuidae). J. Lepid. Soc. 25:264–265.

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