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

DAVID F. HARDWICK
Research Associate, Centre for Land and Biological Resources Research, Agriculture Canada, Ottawa K1A 0C6, Canada

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

* 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 Ochsenheimer's name was due to a printing error. This, of course, is completely fallacious. Obviously, Ochsenheimer was quite aware that the components of his proposed genus were often diurnally active.
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 ± SD): 34.3 ± 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 northeastern 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 hind wing 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 recurs 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 ($n = 17$).

FIGS. 6–10. Genitalia of Heliothis 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*.


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.

*Heliothis 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.

ACKNOWLEDGMENTS

I am grateful to J. Donald Lafontaine and Eugenie Krelina of the Centre for Land and Biological Resources Research for assistance in preparing genitalia slides and arranging for the photography of specimens. Julian Donahue and Ron Leuschner provided distributional data on *Heliothis australis*.

LITERATURE CITED


Received for publication 17 July 1993; revised and accepted 24 October 1993.