IDENTIFICATION OF SEX PHEROMONES OF *Leucania anteoclara* SM. AND *Leucania commoides* GN. (LEPIDOPTERA: NOCTUIDAE: HADENINAE)

J. R. BYERS* and C. E. HERLE

Research Centre, Agriculture and Agri-Food Canada
P.O. Box 3000,
Lethbridge, Alberta, Canada
T1J 4B1

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Abstract—The sex pheromone components of two species of *Leucania* that occur sympatrically in western Canada were identified in abdomen-tip extracts from calling female moths. (Z)-11-hexadecenyl acetate was the main component and (Z)-9-tetradecenyl acetate the second component in both species. The third component necessary for specific attractancy was (Z)-11-hexadecenyl aldehyde for *L. anteoclara* and (Z)-11-hexadecenyl alcohol for *L. commoides*. The third component for each species was an attractant inhibitor when added as a fourth component to the attractant blend for the reciprocal species. The most effective synthetic blend for the attraction of males in the field was Z9-14:Ac/Z11-16:Ac/Z11-16:Ald in a ratio of 1:10:4 for *L. anteoclara* and Z9-14:Ac/Z11-16:Ac/Z11-16:OH in a ratio of 5:4:1 for *L. commoides*.

Key Words—*Leucania anteoclara*, *Leucania commoides*, Lepidoptera, Noctuidae, sex pheromone, (Z)-11-hexadecenyl acetate, (Z)-9-tetradecenyl acetate, (Z)-11-hexadecenyl aldehyde, (Z)-11-hexadecenyl alcohol, seasonal flight period, abundance.

INTRODUCTION

The genus *Leucania* is represented in North America by 26 species (Hodges et al., 1983) and although some of the species are widespread and common, the

*To whom correspondence should be addressed.
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larvae that feed on grasses and sedges (Forbes, 1954; Crumb, 1956; Godfrey, 1972) are rarely noticed. During a program to develop sex attractants for monitoring the abundance of pest species of noctuids in western Canada, two species of *Leucania* commonly occurred as contaminants in pheromone traps baited with attractants developed for two of the pest species (Byers and Struble, 1987). *Leucania anteodara* Sm. was a major contaminant (17%) of catches in traps baited for the bertha armyworm, *Mamestra configurata* Wlk., and *L. commoides* Gn. was a minor contaminant (2%) of catches in traps baited for the variegated cutworm, *Peridroma saucia* (Hbn.). Investigation of the pheromones of the two *Leucania* species was undertaken in an attempt to identify inhibitory sex pheromone compounds whose inclusion in the sex attractant for the respective target pest species would enhance specificity.

*L. anteodara* is a western species occurring on the northern Great Plains and intermountain areas of southern British Columbia and the northwestern United States (J. D. Lafontaine, personal communication). *L. commoides* is more widespread, occurring across southern Canada from Nova Scotia to British Columbia and south to Florida and New Mexico (Forbes, 1954). Color depictions of the moth of *L. commoides* are shown in Holland (1968) and Rockburne and Lafontaine (1976), and a description of the larva is given in Godfrey (1972).

**METHODS AND MATERIALS**

The moths used were from isofemale lines originating from gravid female moths collected in 1992 and 1993 in a light trap at Lethbridge, Alberta. Larvae were reared on densely planted wheat seedlings grown in 15.5-cm-diameter plastic pots in a greenhouse at 22 ± 3°C and 16:8D photoperiod. The larvae were confined on the plants by a 15.2-cm-diameter × 45-cm-high plastic cylinder with a screened cap and side vents. Attempts to rear the larvae on an artificial diet (Hinks and Byers, 1976) produced few mature larvae. *L. anteodara* required about 45 days from hatching to pupation and *L. commoides* about 60 days. Both species had a preoviposition period of 10–14 days and the eggs hatched in about seven days.

Pheromone gland extracts were obtained from calling females kept at 17 ± 2°C, ca. 40% relative humidity, and 16:18-D photoperiod. Calling by females peaked between 3 and 4 hr into scotophase for *L. anteodara* and 1 and 3 hr for *L. commoides*. Ovipositors were everted by gently squeezing the moths and the abdomen tip removed under 10× magnification with fine forceps. Adherent abdominal tissue was removed and the tips soaked in *n*-hexane for about 2 hr. Extracts were filtered and reduced to 0.5 female equivalents (FE)/μl under N₂ without further cleanup. Extracts contained material from 30 to 75 moths. Sep-