Revista Ceres 40(229): 230-234. 1993

(Z)-11-HEXADECENYL ACETATE, A NEW SEX PHEROMONE COMPONENT OF *Spodoptera latifascia* WALKER (LEPIDOPTERA: NOCTUIDAE) [1/]

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1. INTRODUCTION

The moth *Spodoptera latifascia* (Lepidoptera: Noctuidae, Amphypyrinae) usually occurs in low densities infesting economic plants such as soybeans, cotton, potatoes and cereals. Nevertheless, outbreaks causing economic damage are recorded in South Brazil (*4*).

The pheromones or male attractants of ten species of *Spodoptera* have been described in the literature (*1*). Recently, we identified, from a crude extract of virgin female glands, two components of the sex pheromone of *S. latifascia*, (Z)-9,(E)-12-tetradecadienyl acetate and (Z)-9-tetradecenyl acetate (*10*). This work describes the identification of an additional component from the extract of the sex pheromone glands.

2. MATERIALS AND METHODS

S. latifascia was reared in the laboratory at 25 oC, 70 % relativity humidity, and an inverse photoperiod of 14:10 light-dark.

Calling behavior was evoked by red light (0.5 lux), when females released the pheromone after a six hours scotophase (*7*). Sex pheromone glands of 2-4 day old females were dissected and extracted with 100 ul of CH_2 Cl_2. The extracts were analyzed applying the GC/MS system (Hewlett-Packard 5996A) with two capillary columns: 1) OV-101, (12m x 0.25mm i.d.) programmed from 80 oC to 180 oC at 5 oC min^{-1}, and (2) BP-20, (25m x 0.32mm i.d.), programmed from 70 oC to 190 oC at 4

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The binary mixture of the (Z)-9-tetradecenyl and (Z)-9,(E)-12-tetradecadienyl acetates, (3:1 v/v), were tested against the male of *S. latifascia*. One hundred micrograms of this mixture in the wind tunnel showed that 60% (n= 20 males) of the males in bioassay followed the plume when the source was released, and 40% (n= 20 males) of the total males used in the bioassay tried to couple with the lure saturated with these acetates. A tertiary mixture (100 ug) of the (Z)-9-tetradecenyl, (Z)-11-hexadecenyl and (Z)-9,(E)-12-tetradecadienyl acetates (7:2:1 v/v), was used in the bioassay. The same proportion was obtained with the insect glands when determined by Total Ion Current (TIC) (Figure 1A). The presence of the (Z)-11-hexadecenyl acetate did not induce changes in the bioassay. The bioassays conducted in the wind tunnel with virgin females under the same experimental conditions as the synthetic binary and tertiary mixture showed a response of 79% of the males in anemotatic flight in the direction of the females and 49% tried to couple with them (*7*). The results permit us to conclude that the (Z)-11-hexadecenyl acetate did not have synergistic effect on the attraction of male *S. latifascia* when the pheromonal mixture was released. However when the bioassay was conducted in cages like those described by KLUN *et alii (5)*, 60% (n= 20 males) of the males tested showed a sex response when stimulated with only (Z)-11-hexadecenyl acetate. Responses were stated by the exhibition of scent brushes and abdominal curvature with clasping.

(Z)-11-hexadecenyl acetate has also been described as a component of the sex pheromone of *Spodoptera frugiperda (12)*, *S. eridania (9)*, *S. sunia (2)* and *S. exempta (3)*.

Within the subfamily Amphypyrinae 26 species exhibit (Z)-11- hexadecenyl acetate as a component of the sex pheromones or male attractants. Similarly this component appears to be the second most wide-spread structure in these species (*8*). Two further components of the sex pheromone of *S. latifascia*, (Z)-9,(E)-12-tetradecadienyl acetate and (Z)-9-tetradecenyl acetate occur in 9 and 8 *Spodoptera* species respectively (*1*). Although many species of Lepidoptera are known to employ these sex pheromones as a means of communication, they release specific proportions and obey their own circadian rhythms of courtship activity.

The present findings permit the fixing of the exact ratio of these components, thus enabling us to devise monitoring programs.

4. SUMMARY

In Brazil *Spodoptera latifascia* infests economic plants such as soybeans, cotton and other cereals. Recently, we identified two components of the sex pheromone: (Z)-9,(E)-12- tetradecadienyl and (Z)-9-tetradecenyl acetates, from glands of virgin females. This paper describes the identificatión and the bioassays of a new component, (Z)-11-hexadecenyl acetate.

5. RESUMO

ACETATO DE Z-11-HEXADECENILA, UM NOVO COMPONENTE DO FEROMÔNIO SEXUAL DE *Spodoptera latifascia* WALKER (LEPIDOPTERA: NOCTUIDAE).

Os feromônios sexuais de diversas espécies do gênero *Spodoptera* têm sido investigados, visando ao uso destes no controle de pragas. Análises dos extratos de

glândulas de feromônio sexual de *S. latifascia*, feitas por cromatografia de fase gasosa acoplada à espectrometria de massa, permitiram a identificação de mais um componente do feromônio sexual, o acetato de (Z)-11-hexadecenila. Por intermédio de bioensaios em túnel de vento e em gaiolas, verificou-se a atratividade desse novo componente a machos de *S. latifascia*.

6. ACKNOWLEDGMENT

We wish to thank two Brazilian govt. agencies, FINEP and CNPq, for a grant to perform this study.

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