

## Attraction of *Ereunetis simulans* (Lepidoptera: Tineidae) to the Sex Attractant of Peachtree Borer, *Sanninoidea exitiosa* (Lepidoptera: Sesiidae)<sup>1</sup>

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*Ereunetis simulans* (Butler) occurs in the Marquesas Islands, Fiji, Ceylon, and the Hawaiian Islands (Swezey, 1909) including Midway (Suehiro, 1960). Swezey states that the "hau" tree is commonly attacked by this insect, although apparently only on the bark and wood of dead trees. In Hawaii *E. simulans* has also been taken on coffee (Illingworth, 1929), aala (*Sapindus oahuensis*) (Swezey, 1935), garden pea (Holdaway and Look, 1942), and on live monkeypod (Mitchell, 1965). Perhaps because this insect is of little economic importance, very little is known about its biology in general and its behavior in particular.

In 1907 Girault noted that males of the lesser peachtree borer, *Synanthedon pictipes* (Grote and Robinson), were attracted to "calling" females (i.e., with their abdomens elevated and ovipositor extended). Cleveland and Murdock (1964) demonstrated that an attractive substance was associated with the tip of the female abdomen. The isolation, identification, and synthesis of the sex attractant by Tumlinson et al. (1974) was an important step in providing material for use in monitoring or survey programs. The sex attractant was identified as (E,Z)-3, 13-octadecadien-1-ol acetate. At the same time the (Z,Z)-isomer was found to be highly attractive to the peachtree borer, *Sanninoidea exitiosa* (Say). These two species were found to be reproductively isolated by male responses to the (E,Z) and (Z,Z)-isomers of 3,13-octadecadien-1-ol acetate (ODDA). The lesser peachtree borer responded to pure (Z,Z)-isomer.

Nielsen and Balderston (1973) found that live virgin female ash tree borers, *Podosesia syringae* (Harris), attracted male peachtree borers, suggesting that a common sex attractant acting at the intergeneric level may be present. Using synthetic isomers of ODDA, Nielsen et al. (1975) found that under field conditions the (Z,Z)-isomer attracted significant numbers of four sesiid species in two genera, indicating that this isomer may be an important component of several different sesiid sex pheromones.

The objective of the present study was to determine if insect fauna found in different agricultural areas on Oahu could be attracted to either of these two isomers.

### MATERIALS AND METHODS

A plastic coated wick impregnated with pure (E,Z)-ODDA or pure (Z,Z)-ODDA was suspended in a Pherocon 1C sticky trap. Traps were coated with Tanglefoot<sup>®</sup>, and hung ca. 1.75 to 2 m above ground level. After 5 days of field exposure all traps were taken back to the lab and examined.

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The first survey was conducted at the University of Hawaii Pearl City Instruction Facility (PCIF) located near central Oahu. The two traps were placed *ca.* 60 m apart. The trap containing the (Z,Z)-isomer was hung from Christmas berry (*Schinus terebinthifolius*) and surrounded by koa haole (*Leucaena glauca*). The trap containing the (E,Z)-isomer was hung under a gold tree (*Tebebuia donnell-smithii*) located at roadside. The positions of the two traps were reversed the following week, i.e., the (Z,Z)-isomer was hung in the gold tree and the (E,Z)-isomer was placed in the Christmas berry. Weather conditions during both trapping periods were quite variable and included sunshine, drizzles, and some heavy nighttime rain.

The second survey was conducted at the Hawaii Agricultural Experiment Station in Waimanalo, Oahu. Wicks used in the first experiment were utilized in this survey. Traps were located *ca.* 8 m apart and attached to a wire fence protected by jacaranda trees (*Jacaranda acutifolia*). Eggplant, onions, and papaya were being grown directly across the road from both trapping sites. Guava trees (*Psidium* sp.) were also abundant in the vicinity. Weather conditions were drier than at PCIF. As in the first survey, placement of the traps was reversed the second week.

#### RESULTS AND DISCUSSION

Several species of insects were apparently attracted to the traps. Their numbers varied from a single occurrence to extreme abundance. However, only *E. simulans* was differentially attracted to one of the isomers, (Z,Z)-ODDA, regardless of where the trap was located. In addition, a random sample of 25 *E. simulans* revealed that all were males. The results of the survey are summarized in Table I.

These results indicate that *E. simulans* utilizes (Z,Z)-3,13-octadecadien-1-ol acetate as its sex attractant or as an important component of its sex attractant. This suggestion is based on the fact that only males were attracted and a high degree of specificity to the two isomers was evident.

The role of sex attractants in the Tineidae has only been investigated in the common webbing clothes moth, *Tineola biselliella* (Hum.). Roth and Willis (1952) reported that female *T. biselliella* elaborate a scent which both activates and attracts the male.

Attraction of several different species to the same chemical has been shown to occur in the Lepidoptera even at the superfamily level (Roelofs and Comeau, 1970; Ganyard and Brady, 1972; Klun et al. 1975). Roelofs and Feng (1968) found that none of the males of 10 different species of Tortricidae were responsive to female extracts of the lesser peachtree borer or to other extracts prepared from females of other families. Insofar as the author is aware, this is the first report of non-species specificity occurring between the sesiids and Tineoidea.

In cases where pheromones are apparently non-specific, other factors, such as variations in mating rhythms, seasonal cycles, host plant selection, and geographical distribution can serve to isolate the species (Roelofs and Comeau, 1969). Neither the peachtree borer nor the lesser peachtree borer occur west of the Rocky Mountains, and therefore these species are geographically isolated from *E. simulans*. However, the fact that all three

species utilize similar sex pheromones, or components thereof, may indicate that an important precursor of ODDA is found in their host plants. Compounds identified as sex attractants in a number of phytophagous insects have been found in a variety of host plants (see review by Hendry, et al. 1975). The oriental fly, *Dacus dorsalis*, is attracted to methyl eugenol, which has been shown to occur in a variety of plants grown in Hawaii (Kawano, et al. 1968; Metcalf, et al. 1975).

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TABLE 1. Number and location of *Ereunetis similans* attracted to PheroconR 1C sticky traps baited with (E,Z)- or (Z,Z)-isomer of 3,13-octadecadien-1-ol acetate.

Trap Location	Trapping period	No. <i>E. similans</i> at each isomer	
	Date	(Z,Z)	(E,Z)
PCIF <sup>1</sup>	6-10-IV-76	28	0
	12-16-IV-76	50	0
Waimanalo <sup>2</sup>	24-29-IV-76	56	2
	7-11- V-76	164	2
	TOTAL	298	4

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