

SEASONAL OCCURRENCE OF MALE SESIIDAE IN
NORTH CENTRAL FLORIDA DETERMINED WITH
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ABSTRACT

The seasonal occurrence of 20 species of male Sesiidae was determined in Alachua and Marion counties in north central Florida during 1975-77. Sticky traps were baited with the sex pheromones of the lesser peachtree borer, *Synanthedon pictipes* (Grote and Robinson), and the peachtree borer, *Synanthedon* (= *Sanninoidea*) *exitiosa* (Say), (*E,Z*)- and (*Z,Z*)-3, 13-octadecadien-1-ol acetate, respectively. These materials or the corresponding alcohols or binary mixtures of the acetates plus alcohols attracted 15 species of 25 currently recognized Sesiidae from Florida plus the following 5 species not reported before: *Synanthedon decipiens* (Hy. Edwards), *Synanthedon fatifera* Hodges, *Carmenta bassiformis* (Walker), *Carmenta suffusata* Englehardt, and *Alcathoe carolinensis* Engelhardt.

The sex pheromones of the lesser peachtree borer, *Synanthedon pictipes* (Grote and Robinson), and the peachtree borer, *Synanthedon* (= *Sanninoidea*) *exitiosa* (Say), were identified, respectively, as the (*E,Z*) and (*Z,Z*) isomers of 3,13-octadecadien-1-ol acetate (*EZ*- and *ZZ*-ODDA) (Tumlinson et al. 1974). Subsequently, Barry et al. (1978) showed that a 96:4 (*ZZ*:*EZ*) mixture is much superior to pure *ZZ* isomer as a trap bait for the peachtree borer, although both pheromones are attractive to males of other sesiid species (Nielsen et al. 1975; Yaginuma et al. 1976). Here we report on the seasonal occurrence of male sesiids recovered in pheromone-baited sticky traps in Alachua and Marion counties in north central Florida during 1975-1977.

MATERIALS AND METHODS

The study areas were native woods and commercially managed peach and nectarine orchards near Gainesville and Hawthorne (Alachua County) and Lowell, Belleview, and Pedro (Marion County).

Pherocon® 1C sticky traps (Zoecon Corp., Palo Alto, California) were baited with *ZZ*-ODDA, *EZ*-ODDA, the corresponding alcohols or with binary mixtures of the acetates plus alcohols. The materials were purified at this laboratory; for the tests, the materials were evaporated into the environment from Conrel® capillary tubes (Brooks et al. 1976) or rubber stoppers (No. 8753-022, A. H. Thomas Co.). The rubber stoppers were impregnated with 50-500 µg of attractant. The baited traps were hung in trees, and when they were serviced twice each week the sticky inserts were cleaned

1. Lepidoptera: Sesiidae. Mention of a commercial or proprietary product in this paper does not constitute an endorsement of that product by the USDA.

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study ended in December 1977. The nomenclature used here for the Sesiidae is taken from Duckworth and Eichlin (1977). The seasonal occurrence of 2 economically important species, *Synanthedon pictipes* and *Synanthedon exitiosa*, is discussed in detail by Sharp et al. (1978).

RESULTS AND DISCUSSION

Kimball (1965) listed 25 species of Aegeriidae (=Sesiidae) from Florida; 24 are currently recognized as valid (Duckworth and Eichlin 1977). Subsequently, *Synanthedon arkansasensis* Duckworth and Eichlin was reported from the panhandle area of Florida as a new record (Duckworth and Eichlin 1973). Also, Purrington and Nielsen (1977) reported new in Florida, *Podosesia syringae* (Harris) and *P. aureocincta* Purrington and Nielsen. Five species new to Florida and 13 of Kimball's 25 were recovered in baited traps during this study (Fig. 1). The most effective attractants are given for individual species, since some sesiids were attracted to several mixtures (Table 1).

Differences from year to year in the seasonal occurrence of a particular species and in the number captured in baited traps may have been due to the location of study sites, number of traps, pheromone formulations, weather changes, and emergence patterns. For example, males of *Synanthedon pictipes* occurred in the field 1 month later in 1977 than in 1976 probably because temperatures were colder in 1976 during the winter months. Also, certain sesiids (i.e. *Synanthedon arkansasensis*, *Sannina uroceriformis* Walker, and species of *Paranthrene* (Hübner) were more abundant in 1 year or another. This occurrence indicates that these species have a 2-year or longer life cycle (Engelhardt 1946). During 1975 near Gainesville, 148 males of *Synanthedon arkansasensis* were attracted to EZ-ODDA from May to November and were most abundant in September. No *Synanthedon arkansasensis* males were captured in 1976 in traps baited with EZ-ODDA, but 8 were captured during August and October 1976 in several traps baited with different ratios of binary blends of the EZ and ZZ alcohols. In 1977 during July-October, 10 *S. arkansasensis* males were captured again in traps baited with EZ-ODDA only. *Paranthrene simulans* (Grote) has a life cycle requiring 2 years for development, and in the eastern United States the adults are reported to be abundant during even-numbered years only (Engelhardt 1946). In Florida during 1975, no *P. simulans* males were captured; however, in 1976 a total of 76 males were captured in traps during March (12%), April (48%), May (5%), June (30%), July (4%), and August (1%). In 1977, a total of 132 *P. simulans* males were captured during April (70%), June (26%), and July (4%). Several hundred males of both *Podosesia* species were captured in 1977: *Podosesia syringae* from March through June with a peak in March, and *Podosesia aureocincta* from July through December with a peak in September; the differences in attractant response reported for these species by Purrington and Nielson (1977) did not occur in Florida.

Males of *Synanthedon sapygaeformis* (Walker) were second in abundance to *Synanthedon pictipes* and in 1976 were captured during January-December with peak numbers of ca. 70/trap each day during April 1-7. In 1977 males were taken during March-December 9 with peak populations of

TABLE 1.—A LIST OF THE SPECIES OF MALE SESIIDAE RECOVERED IN BAITED TRAPS, INCLUDING THE CHEMICALS THAT ATTRACTED THEM IN GREATEST NUMBERS.*†

Moth identification	Attractant
<i>Paranthrene asilipennis</i>	1975 Farchan ZZ-ODDA
<i>Paranthrene dollii</i>	EZ-ODDA, blends of EZ-ODDA + EZ-ODDOH, EZ-ODDA + ZZ-ODDA, EZ-ODDOH + ZZ-ODDA, EZ-ODDOH + ZZ-ODDOH
<i>Paranthrene simulans palmii</i>	1975 Farchan ZZ-ODDA
<i>Vitacea scepiformis</i>	1974 Farchan ZZ-ODDA, 25% ZZ-ODDA + 75% EZ-ODDA, 10% ZZ-ODDA + 90% EZ-ODDA
<i>Synanthedon alleri</i>	EZ-ODDA, blends of EZ-ODDA + EZ-ODDOH
<i>Synanthedon arkansasensis</i>	EZ-ODDA, blends of EZ-ODDA + EZ-ODDOH
* <i>Synanthedon decipiens</i>	EZ-ODDA, 1974 Farchan ZZ-ODDA
<i>Synanthedon exitiosa</i>	1975 Farchan ZZ-ODDA
* <i>Synanthedon fatifera</i>	1975 Farchan ZZ-ODDA
<i>Synanthedon geliformis</i>	ZZ-ODDA (H-combination), blends of ZZ-ODDA + EZ-ODDA, ZZ-ODDA + ZZ-ODDOH
<i>Synanthedon pictipes</i>	EZ-ODDA, 1974 Farchan ZZ-ODDA
<i>Synanthedon rubrofascia</i>	1975 Farchan ZZ-ODDA, blends of ZZ-ODDA + EZ-ODDA
<i>Synanthedon sapygaeformis</i>	1975 Farchan ZZ-ODDA
<i>Podosesia aureocincta</i>	1975 Farchan ZZ-ODDA, blends of ZZ-ODDA + ZZ-ODDOH, and ZZ-ODDA + EZ-ODDOH
<i>Podosesia syringae</i>	1975 Farchan ZZ-ODDA
<i>Sannina uroceriformis</i>	EZ-ODDOH, EZ-ODDA
* <i>Carmenta bassiformis</i>	Blends of ZZ-ODDA + ZZ-ODDOH
* <i>Carmenta suffusata</i>	EZ-ODDOH
<i>Carmenta texana</i>	1975 Farchan ZZ-ODDA (light color form) ZZ-ODDA (H-combination) (dark color form)
* <i>Alcathoe carolinensis</i>	25% ZZ-ODDA + 75% EZ-ODDA

*State record

†EZ-ODDA = 99.9% pure; ZZ-ODDA (H-combination) = 96% ZZ with impurities of other isomers of ZE (1.9%), EZ (1.3%), and EE (0.6%). 1974 Farchan ZZ-ODDA = 88% ZZ with impurities of ZE (5.6%), EZ (4.2%), and EE (1.3%). 1975 Farchan ZZ-ODDA = 95.0% ZZ with impurities of ZE (2.2%), EZ (1.6%), and EE (0.6%). Also used were 99% pure EZ or ZZ alcohols or 99% pure EZ or ZZ isomers.

ca. 163 males/trap during April. The other sesiids were captured in much smaller numbers.

The 5 species new to Florida were the following: *Synanthedon decipiens* (Hy. Edwards), *Synanthedon fatifera* Hodges, *Carmenta bassiformis* (Walker), *Carmenta suffusata* Engelhardt, and *Alcathoe carolinensis* Engelhardt. Males of *Synanthedon decipiens* were captured during 1975-1977, and fewer than 10 were taken during July and August near Hawthorne. A male of *Synanthedon fatifera* was captured near Hawthorne on 13 May, 1977, in a trap baited with 1975 Farchan ZZ-ODDA. Males of *Carmenta bassiformis* (Walker) were first captured in 1977 during June near Gainesville and from June through August near Lowell in traps baited with a mixture of ZZ-ODDA plus ZZ-ODDOH. A male of the rare species *Carmenta suffusata* Engelhardt was captured in a trap baited with EZ-ODDOH on 7 June 1976, near Lowell. The type series of only 3 individuals were previously recorded from Kansas and Oklahoma. Finally, a single male of *Alcathoe carolinensis* Engelhardt was captured near Lowell on 6 December 1977 in a trap baited with a mixture of 25% ZZ-ODDA plus 75% EZ-ODDA. The capture is highly significant, a state record and the first capture in Florida of a species described by Engelhardt from a single specimen taken from Black Mountains, North Carolina. That specimen was believed to be labeled with an erroneous locality since it is thought to be a species from Mexico.

We also recovered a few unidentifiable species of *Synanthedon* Hübner attracted to EZ-ODDA. Description of the unknown species must be deferred until specimens of better quality can be obtained. *Melittia satyriniformis* (= *cucurbitae*) Hübner and *Vitacea polistiformis* (Harris) are 2 agriculturally important sesiids in Florida; however, males were not captured in baited traps in this study. In Georgia, *Vitacea polistiformis* males were captured in traps baited with 1974 Farchan ZZ-ODDA (also used in our study). Other species of sesiids in Florida undoubtedly will be captured after pheromones identified from different sesiid species are synthesized and used in survey programs since cross attraction of different species to individual isomers or combinations has been demonstrated (Nielsen et al. 1975).

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EMPYREUMA PUGIONE L. (LEPIDOPTERA: CTENUCHIDAE)—A NEW U.S. INTRODUCTION—(Note). During our studies of ctenuchid moths and their interactions with plants which produce pyrrolizidine alkaloids, we have discovered a diurnally active, wasp-like moth with red wings which was collected in Boca Raton, Palm Beach County, Florida. Since the first collection on 2 Feb. 1978, 4 additional specimens have been collected in the same general locality between April and July 1978. In addition other specimens have been observed but not collected in northern Broward County, Florida. We identified the specimens as *Empyreuma pugione* L., a wasp-mimic common in the Bahama Islands and the Greater Antilles. Two voucher specimens were deposited in the U.S. National Museum, Washington, D.C.

Of the 5 specimens collected, 3 were female, 1 was male and 1 was so damaged that sex could not be determined. Dissection of a female specimen collected live on 29 July 1978, revealed the presence of 2 spermatophores within the bursa. We are not certain how extensively this new introduction is distributed in southern Florida. The population could be increasing since copulation is occurring, and a larval food plant, *Nerium oleander* L., a common cultivar, is abundant. Furthermore, adult moths have been observed feeding on the flowers of *Scaevola frutescens* (Miller) Krause, another common cultivar as well as on the flowers of *Bidens pilosa* L., a native composite. Acknowledgements: We are grateful to Dr. Robert B. Grimm, Department of Biological Sciences, Florida Atlantic University, Boca Raton, Florida for the initial discovery and collection of *E. pugione*.—Ralph M. Adams, Department of Biological Sciences, Florida Atlantic University, Boca Raton, Florida 33431 and Gary J. Goss; Department of Biology; Palm Beach Atlantic College; West Palm Beach, Fla. 33401.