A Sex Attractant for *Sperchia intractana* Walker (Lepidoptera: Tortricidae) in New Zealand

M. H. Benn

Chemistry Department, The University, Calgary, Alberta T2N 1N4 Canada; on leave at Entomology Division, D.S.I.R.

R. A. Galbreath and V. A. Holt

Entomology Division, D.S.I.R., Private Bag, Auckland, New Zealand

and H. Young

Division of Horticulture & Processing, D.S.I.R., Private Bag, Auckland, New Zealand

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Traps baited with approx. 2:1 mixtures of (*E*)-, and (*Z*)-11-tetradecenyl acetates caught male *Sperchia intractana* Walker in the field. Analyses of extracts obtained from virgin female moths revealed the presence of these two compounds, which are presumably the major components of the sex pheromone.

During field tests in which binary mixtures of various tetradecenyl acetates were screened as attractants for pests in orchards, we noticed that sticky-traps (Pherocon 1C, Zeocon Corporation, USA) baited with mixtures of (*E*)-, and (*Z*)-11-tetradecenyl acetates (*E*11-14:Ac, and *Z*11-14:Ac) caught males of *Sperchia intractana* Walker, an Australian Tortricid long established in New Zealand [1]. Such blends have been observed before in the sex pheromones of Northern Hemisphere Tortricids [2, 3] and it has recently been reported [4] that in European apple orchards all species of the Tortricinae sub-family examined, contained *Z*11-14:Ac in their pheromone glands, together with various ratios of *E*11-14:Ac, or (*Z*)-11-tetradecenyl alcohol (*Z*11-14:OH).

Sperchia intractana also belongs to the sub-family Tortricinae and, although it is not an important pest, we were curious to see whether this Southern Hemisphere species had a sex pheromone like that of its Northern relatives. Accordingly, we reared moths on an artificial diet [5] supplemented by 10% of freeze-dried and powdered leaf of *Acmena smithii* (Poiret), and carried out an investigation, based on the protocol developed by Roelofs [6]. Thus, the abdominal tips of some 60 virgin female moths were clipped into dichloromethane (approx. 1 ml), and the extract so obtained was filtered through a glass-wool plug, concentrated at room temperature under a nitrogen stream, and fractionated by gas liquid chromatography (glc) on a non-polar column (2 m×2 mm i. d. stainless steel packed with 3% OV-1 on Chromosorb W-AW-DMCS 100–120 mesh). The effluent gas was split between a flame ionisation detector (FID), and an exit port at which collections could be made in Pasteur pipettes cooled with solid carbon dioxide. Consecutive one minute collections were made and screened by the electroantennogram response (EAG) obtained when 1 ml of air was puffed through each pipette over an antenna excised from a male moth. Maximal EAG response corresponded to the time of elution of tetradecenyl acetates. The FID trace showed a small signal at this time, as well as more intense signals at later retention times which were EAG inactive.

When tetradecenyl acetate standards were submitted to an EAG examination a clear maximum was observed for the (*E*)-11 and (*Z*)-11 isomers (Fig. 1).

The tubes containing the maximally EAG-active material from the OV-1 column were rinsed out with redistilled pentane. The washings were concentrated as before, and re-examined by glc on a polar SCOT column (Carbowax 20M, 50 m) coupled to a mass spectrometer. Selective ion monitoring (SIM) was performed for ions of 196, 194 and 192 a. m. u. (these being significant fragment-ions of tetradecyl, tetradecenyl, and tetradecadienyl acetates respectively). The only signals observed were on the 194

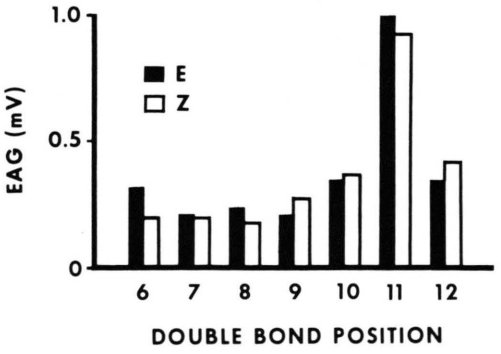

Fig. 1. EAG response of male *Sperchia intractana* to tetradecenyl acetate standards (1 µg on filter paper, 1 ml air puff).

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a. m. u. channel. With tetradecyl acetate (14AC) added as an internal standard, these signals had retention times relative to 14AC (R_T^{REL}) of 1.153 and 1.199 with an approximate relative abundance of 2:1.

Under the same glc conditions only *E*11-14:Ac (R_T^{REL} 1.156) and *Z*11-14:Ac (R_T^{REL} 1.197) of the tetradecenyl acetate standards corresponded to the signals seen in the tip extract (the error in the R_T^{REL} values being $\pm$ 0.002 in all cases).

To test for the presence of tetradecenyl alcohols [*cf.* 2, 3, 4], *S. intractana* tip-extract was also analysed on a less polar SCOT column (OV-17, 50 m), with SIM for ions of 196, 194 and 192 a. m. u. However, as before, the only signals observed were on the 194 channel, and corresponded in retention time to the tetradecenyl acetates.

For a preliminary field test of the attractiveness of *E*11-14:Ac and *Z*11-14:Ac, Pherocon 1 C traps were baited with 6 mixtures (ratios from 1:1 to 5:1) on 5 mm sleeve-type rubber caps (total loading 50 µg/cap). For comparison, virgin female moths, reared as above, were also tested (caged 4/trap). There were insufficient moths available to replenish these and the traps were left for two weeks, while those baited with synthetic mixtures were left for four weeks. One trap with each mixture and three with female moths were hung 1.5 m above ground, 20 m or more apart in a hedge of *A. smithii*. Trap positions were rotated each time the traps were checked, three times weekly. Although the variation in trap catch with female moths precluded statistical comparison of relative attractiveness, the catches with synthetic mixtures (Fig. 2) showed a clear maximum with blends of *E*11-14:Ac and *Z*11-14:Ac near 2:1.

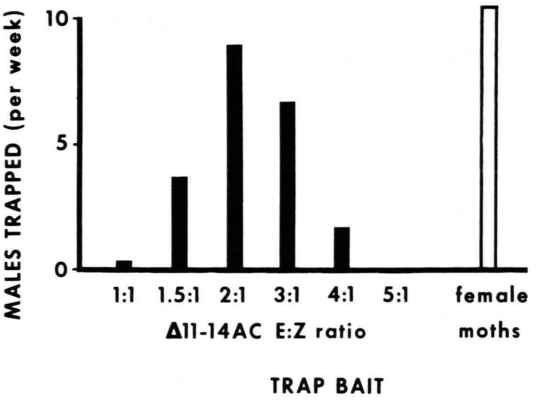

Fig. 2. *Sperchia intractana* males captured in traps baited with *E*11-14:Ac + *Z*11-14:Ac (1 replicate; May 23–June 20, 1980), and virgin female moths (mean of 3 replicates; May 23 – June 6, 1980) at Auckland.

We conclude that, like some European Tortricinae, the antipodean *S. intractana* uses a sex pheromone in which *E*11-14:Ac and *Z*11-14:Ac are the major components, and that these components are present in approx. 2:1 ratio.

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