

## コスカシバの性誘引物質

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of the two experiments, performed at different times, by different appliances, deviated little from each other. Most of the model ecosystem study was carried out using the two tanks simultaneously, and also showed little deviation between the two results.

The results obtained here verified that N-CH<sub>3</sub>-(<sup>14</sup>C)-labeled XMC was degraded in the model ecosystem to produce <sup>14</sup>CO<sub>2</sub> as the major compound among <sup>14</sup>C-metabolites, and this was the reason why the recovery of <sup>14</sup>C was low when <sup>14</sup>C-XMC was applied to the ordinary model ecosystem.

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#### REFERENCES

- KAZANO, H. and C. TOMIZAWA (1975) 1975 Meeting of the Agr. Chem. Soc. Jap.
- KAZANO, H., M. ASAKAWA and C. TOMIZAWA (1975) *Appl. Ent. Zool.* **10**: 108-115.
- METCALF, R. L., G. K. SANGHA and I. P. KAPOOR (1971) *Environ. Sci. Tech.* **5**: 709-713.
- OHKAWA, H., R. YOSHIHARA, T. KOHARA and J. MIYAMOTO (1974) *Agric. Biol. Chem., Tokyo* **38**: 1035-1044.
- TOMIZAWA, C. and H. KAZANO (1975) *Rev. Plant Prot. Res.* **8**: 41-54.
- TSUGE, S., H. KAZANO, K. SUZUKI, T. KASHIWA and C. TOMIZAWA (1975) 1975 Meet. Agr. Chem. Soc. Jap.
- TSUGE, S., H. KAZANO and C. TOMIZAWA (1976) *Jour. Pesticide Sci.* submitted for review.
- YU, C. C., G. M. BOOTH, D. J. HANSEN and J. R. LARSEN (1974a) *J. agr. Fd. Chem.* **22**: 431-434.
- YU, C. C., G. M. BOOTH, D. J. HANSEN and J. R. LARSEN (1974b) *Environ. Entomol.* **3**: 975-977.

### Sex Attractant for the Cherry Tree Borer, *Synanthedon Hector* BUTLER (Lepidoptera : Sesiidae)<sup>1</sup>

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The cherry tree borer, *Synanthedon Hector* BUTLER, is one of the most important pests of peach and various deciduous fruit trees in Japan (KUMAKURA et al., 1968). Virgin females of this species release a potent sex pheromone which attracts a number

of conspecific males (YAGINUMA, 1973). The seasonal trend in the number of male moths captured by a virgin female trap coincided relatively well with the data on pupal cases obtained by routine field survey. That suggested the potential usefulness of the sex pheromone or a sex attractant for monitoring population of this species (YAGINUMA, 1973; YAGINUMA et al., 1975). In 1974, sex pheromones of the lesser peach tree borer, *Synanthedon pictipes* (GROTE and ROBINSON), and the peach tree borer, *Sanninoidea exitiosa* (SAY), were isolated and identified as (*E,Z*)-3,13-octadecadien-1-ol acetate and (*Z,Z*)-3,13-octadecadien-1-ol acetate, respectively (TUMLINSON et al., 1974). Subsequently, various sesiids were found to be attracted by these compounds, which suggested relatively low species specificity of the pheromonal component of Sesiidae (NIELSEN et al., 1975).

This information prompted us to test the four geometrical isomers of 3,13-octadecadien-1-ol acetate (ODDA) for the cherry tree borer moth. We found that a mixture of (*Z,Z*)- and (*E,Z*)-3,13-ODDAs is a potent sex attractant for the male moth of this species.

The four geometrical isomers of 3,13-ODDA (99%+ pure), individually or as binary mixtures,

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were impregnated on rubber septa (code a<sub>0</sub>, Takeda Chemical Ind.)<sup>1</sup>. Ratios of components in the binary mixtures were 8 : 2, 1 : 1, 2 : 8. Thus, 22 different samples were prepared and evaluated for attractiveness to the cherry tree borer moth in Takeda sticky traps (25 × 30 cm sticky board with a transparent plastic roof and two port entrances (SARO et al., 1976)), during the autumn of 1975 in peach orchards in Hobaracho, Date-gun, Fukushima Prefecture. The amount of compound(s) used per septum was 1 mg. The results apparently indicated that the 1 : 1 mixture of (Z,Z)- and (E,Z)-isomers is a potent sex attractant for the male moths of the cherry tree borer. These traps baited with the most active mixture caught 463 males during 76 days from August 1 to October 25. Mixtures of (Z,Z)- and (E,Z)-ODDAs in the ratios of 8 : 2 and 2 : 8 also attracted 77 and 55 males, respectively. In other compounds or mixtures, (Z,Z)-isomer alone, the 1 : 1 mixture of (Z,E)- and (E,Z)-isomers, and the 8 : 2 mixture of (Z,Z)- and (E,E)-isomers attracted 2, 1, and 1 male moths, respectively, during the same period.

As the next step in the experiment, we determined the optimum ratio of (Z,Z)- and (E,Z)-

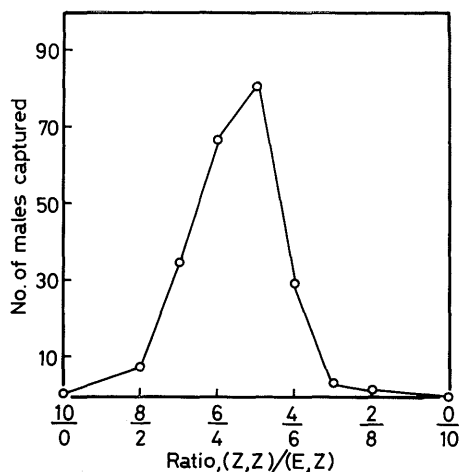


Fig. 1. Capture of male moths of the cherry tree borer by field traps baited with mixtures of (Z,Z)- and (E,Z)-3,13-ODDAs. Ratios of the two components ranged from 10 : 0 to 0 : 10. Two mg amount per rubber septum. Total of five traps for 5 days.

isomers in the attractant mixture. The amount of the compounds was 2 mg total per rubber septum (Takeda, code b), and 5 traps were used for each treatment. Trapping data for five days in the Hobara peach orchards showed that the 1 : 1 ratio is the most suitable as the attractant (Fig. 1). Optimum loading of the attractant ((Z,Z) : (E,Z) = 1 : 1) was also evaluated by using a range of from 0.1 mg to 10 mg per septum. The result indicated that the larger the amount, the more males captured (Table 1). Two to three mg per septum, however, seemed to be enough for practical use in population monitoring.

Potency of the sex attractant ((Z,Z) : (E,Z) = 1 : 1, 2 mg per septum) was compared with the potency of 2 to 3 virgin females which were confined in a screen cage and placed in the center of an electric grid trap (National, YE-12460). The 2-mg attractant per septum was competitive with the 2 to 3 virgin females (Table 2). It is not known at present that these (Z,Z)- and (E,Z)-3,13-ODDAs are the components of the sex attractant pheromone of the cherry tree borer moth. The potency

Table 1. CAPTURE OF MALE MOTHS OF THE CHERRY TREE BORER BY TRAPS BAITED WITH DIFFERENT AMOUNT OF THE EQUIMOLAR MIXTURE OF (Z,Z)- AND (E,Z)-3,13-ODDAs

Amount per septum	No. males captured by 3 traps for 5 days
0.1 mg	14
0.3	32
1.0	64
3.0	107
10.0	128

Table 2. COMPARISON OF THE ATTRACTIVENESS OF THE EQUIMOLAR MIXTURE OF (Z,Z)- AND (E,Z)-3,13-ODDAs AND VIRGIN FEMALES

Date and attractant source	No. males attracted
Sept. 27	
2 virgin females	29
2-mg synthetic attractant	38
Sept. 28	
3 virgin females	24
2-mg synthetic attractant	41

<sup>1</sup> Mention of a commercial or proprietary product in this paper does not constitute an endorsement of that product by the USDA.

of 2-mg attractant per septum for this species is comparable with *Spodoptera litura* F. In the case of *S. litura*, 1 mg of 9 : 1 mixture of (Z,E)-9,11- and (Z,E)-9,12-tetradecadien-1-ol acetates, the sex pheromone of this species (TAMAKI et al., 1973), impregnated on a rubber septum is competitive with 10 virgin females (YUSHIMA et al., 1974). Therefore, it seems likely that (Z,Z)- and (E,Z)-3,13-octadecadien-1-ol acetates are the pheromone of the cherry tree borer moth.

## REFERENCES

- KUMAKURA, M., K. YAGINUMA and M. SUZUKI (1968) *Bull. Fukushima Horticul. Exp. Stn* **1**: 49-62.
- NIELSEN, D. G., F.F. PURRINGTON, J. H. TUMLINSON, R. E. DOOLITTLE, and C. E. YONCE (1975) *Environ. Entomol.* **4**: 451-454.
- SATO, Y., M. NAGANO, M. SAKAI and Y. FUJIWARA (1976) *Botyu-Kagaku* (in press).
- TAMAKI, Y., H. NOGUCHI and T. YUSHIMA (1973) *Appl. Ent. Zool.* **8**: 200-203.
- TUMLINSON, J. H., C. E. YONCE, R. E. DOOLITTLE, R. R. HEATH, C. R. GENTRY and E. R. MITCHELL (1974) *Science* **185**: 614-616.
- YAGINUMA, K. (1973) *Shokubutsu-Boeki* (Tokyo) **27**: 446-450.
- YAGINUMA K., M. KUMAKURA and K. SUZUKI (1975) *Bull. Fukushima Horticul. Exp. Stn* **5**: 43-59.
- YUSHIMA, T., Y. TAMAKI, S. KAMANO and M. OYAMA (1974) *Appl. Ent. Zool.* **9**: 147-152.