riment. The result showed that 46, 35 and 17 compounds were identified from ripe, half-ripe and raw bayberry volatiles, respectively. β-Caryophyllene was the dominant compound in bayberry fruits at the different ripening stages, and most esters were released from the bayberry fruits at the ripe stage. Five volatile compounds, namely methyl 3-hexenoate, methyl 2-hexenoate, ethyl 2-hexenoate, α-ylangene, α-caryophyllene, and an unknown chemical in the bayberry headspace samples, elicited GC-EAD responses from the female flies. Four synthetic compounds, namely 3-hexenoate, methyl 2-hexenoate, ethyl 2-hexenoate and α-caryophyllene and their mixtures could attract the females. The mixture was attractive to both males and females in a sandal wood orchard (*Osyris wightiana*, Santalaceae). It suggested that the mixture of methyl 3-hexenoate, methyl 2-hexenoate, ethyl hexenoate and α-caryophyllene is a good candidate for attracting *D. suzukii*.

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New approaches to apply plant compounds in control strategies: Screening for natural compounds against *Drosophila suzukii*

Astrid Eben[1], Frank Sporer[2], Michael Wink[2], Heidrun Vogt[1]
[1] Julius Kühn – Institut, Federal Research Centre for Cultivated Plants, Institute for Plant Protection in Fruit Crops and Viticulture, Dossenheim, Germany
[2] Institute of Pharmacy and Molecular Biotechnology IPMB, Heidelberg University, Heidelberg, Germany; corresponding author: E-Mail: astrid.eben@julius-kuehn.de

Drosophila suzukii (Diptera: Drosophilidae) invaded Germany in 2011 and has become a major economic pest in soft and stone fruits. It is highly polyphagous and oviposits in ripe, undamaged fruits. Larvae feed on the fruit pulp, infested fruits collapse quickly, and leave no tolerance threshold for fruit infestation. Since the currently practiced calendar-scheduled treatment with insecticides is not a sustainable means of pest control, alternative monitoring and management options are urgently needed. Behaviour based strategies are often species-specific and require attractive or repellent substances. In order to identify potentially applicable compounds, we tested eight synthetic plant substances from different chemical classes and eight essential oils for toxic, feeding stimulant or – repellent effects on adult *D. suzukii*. Male and female flies with an age of 7–9 d were used in the assays. Compounds were sprayed on bottom and sides of test cups in 2%, 4%, 6%, 8%, and 10% emulsion in lecithin/water. Ten insects were released into the cups after complete evaporation of the spray cover. The lecithin/water solution served as control. Mortality through contact with treated surfaces was evaluated after 1 h, 4 h, and 24 h. Six replications were conducted for each concentration and compound. Capillary feeding assays were used to determine feeding stimulation or inhibition compared to a control without the test compound. Test insects were previously starved and kept with only water for 20 h. Five females (7–9 d old) were used in each test vial. Blue dye was added to the liquid diet to detect consumption of the food mix by each of the test insects. Substances were offered in 0.01%, 0.1%, and 1.0% solutions in the capillaries. After 4 h the amount consumed was measured for each group of flies. Ten replications were evaluated for each concentration and compound. During the assays, cups and vials with capillaries were maintained in a climate chamber. Purity of all substances was verified and composition of essential oils was analyzed by GC/MS (Hewlett Packard 890 II/Finnigan Mat SSQ 7000). Several potentially toxic and behaviour modifying compounds were identified. Farnesol and lemongrass oil had lowest contact toxicity and were strongest feeding stimulants, whereas cinnamon oil and eugenol showed highest contact toxicity and strongest feeding repellency. These substances will be further tested in behavioural assays. Their use as bait components in attract &kill or as volatiles in push-pull strategies will be investigated.

Behavioral rhythms of *Drosophila suzukii* and *Drosophila melanogaster*

Li Zheng[1], Qingcai Lin[1], Yifan Zhai[1], Frank G. Zalom[2], Chenggang Zhou[3], Yi Yu[1]
[1] Institute of Plant Protection, Shandong Academy of Agricultural sciences, Jinan, China
[2] Department of Entomology and Nematology, University of California, Davis, USA
[3] College of Plant Protection, Shandong Agricultural University, Taian, China

Drosophila suzukii and *Drosophila melanogaster* feed on various fruits, causing great economic losses. In order to find the optimum time for controlling *D. suzukii* and *D. melanogaster*, the daily rhythms of oviposition, egg hatch, pupation, adult eclosion, copulation, and feeding of these two pests were studied. We found the circadian rhythm of *D. suzukii* oviposition to have a single pattern with a peak from 20:00–24:00, while the peak oviposition of *D.melanogaster* was from 16:00–4:00 (the next day). Neither *D. suzukii* nor *D. melanogaster* showed a daily pattern of egg hatch. The single peak of egg hatch for *D. suzukii* occurred 24–32 h after oviposition, while that for *D. melanogaster* followed a bimodal pattern with the first peak of egg hatch from 0–4 h after oviposition and the second from 32–36 h after oviposition. Pupation in *D. suzukii* showed a single peak from 8:00–16:00, while in *D. melanogaster* pupation followed a bimodal pattern, with peaks from 4:00–8:00 and 12:00–20:00. Eclosion of *D. suzukii* adults followed a unimodal pattern and generally took place from 0:00–8:00, while that of *D. melanogaster* also showed a single peak, generally from 0:00–12:00. Meanwhile copulation of *D. suzukii*, which showed a bimodal pattern, was concentrated from 0:00–12:00 and 20:00–24:00 (the next day), while copulation of *D. melanogaster* showed a single peak, generally from 0:00–12:00. Both *D. suzukii* and *D. melanogaster* had a preference for feeding in light, and in a 24 h photoperiod the percentages of feeding insects were 80.8 and 81.1, respectively.

Effect of selected fungi from diet on the growth and development of *Drosophila suzukii* (Diptera: Drosophilidae)

Huanhuan Gao[1,2], Hao Chen[1], Qian Liu[1], Qianyun Pu[1], Dongyun Qin[1], Yifan Zhai[1], Yi Yu[1]
[1] Institute of Plant Protection, Shandong Academy of Agricultural Sciences, Jinan, China
[2] Shandong Academy of Grape, Jinan, China

Drosophila suzukii (Diptera: Drosophilidae) is one of the very few *Drosophila* species which are able to lay eggs and feed on healthy ripening fruit. Adults and larvae are all able to obtain the nutrition in the decaying food, which will generate many microorganisms. However, the relationship between *D. suzukii*