ELECTROPHYSIOLOGICAL AND BEHAVIOURAL RESPONSES OF *DROSOPHILA SUZUKII* TO HOST PLANT VOLATILES

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Drosophila suzukii is a highly polyphagous invasive pest endemic to South East Asia, which has recently invaded western countries. Its serrated ovipositor allows this fly to lay eggs on and damage unwounded ripening fruits, and for this reason it is considered a main threat to fruit production. The development of environmentally-safe control methods is urgent for a safeguard of the concerned fruit industry. The aim of this study was therefore to characterize and identify the volatiles of the *D. suzukii* host plants, which are likely to influence its olfactory behaviour, in order to set-up management strategies based on semiochemicals. The olfactory responses of the adult flies for the odour released by intact host fruits (raspberry, blackberry, cherry, blueberry and strawberry) in behavioural assays (Y-shaped glass olfactometer) have been evaluated. *D. suzukii* females were expected to choose between the test material (25 g of fresh fruits) and the control (holding the same amount of fruits wrapped in a trasparent plastic bag). *D. suzukii* females were significantly attracted to the volatiles emitted by the 5 tested fruit species. Volatiles released from the attractive host fruits have been extracted and identified (GC-MS), and their biological activity on *D. suzukii* females screened by means of electrophysiological analysis (GC-EAD). Electroantennographic (EAG) and behavioural assays (Y-shaped glass olfactometer) have been also carried out to test responses of *D. suzukii* mated females to isoamyl acetate, one of the most EAD-active volatiles. Indeed, this is the only compound released from all the fruit species analyzed and able to elicit always significant antennal responses in *D. suzukii* mated females. Analysis of the EAG responses to increasing doses of isoamyl acetate in hexane solutions (from 0.1 pg/µl to 100 µg/µl) showed a dose-response relationship. Moreover, in olfactometer experiments isoamyl acetate loaded in red rubber dispensers at the dosage of 10 µg elicited significant attraction in *D. suzukii* females. The release rate of those rubber dispensers was estimated as 2.4±0.6 ng/hr. Environmentally friendly management against *D. suzukii* would achieve great enhancement by using specific kairomones such as isoamyl acetate. The identification of the most behaviourally-active volatiles emitted by *D. suzukii* host fruits indeed may allow the development of more selective and powerful synthetic lures held in dry traps adaptable to control strategies such as mass trapping and attract and kill.