DIFFERENTIAL ANTENNAL SENSITIVITY TO HOST ODOR COMPOUNDS IN RHAGOLETIS SIBLING SPECIES (DIPT.: TEPHRITIDAE)

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Host odor is among the primary cues in host finding and acceptance in Rhagoletis species (Prokopy et al., 1973). Electroantennogram (EAG) responses to esters known to contribute to the odor of apples have been shown to correspond to behavioral host finding responses in R. pomonella (Fein et al., 1982). This indicates that host odor perception through the antenna is a primary cue in host finding in this species. We recently established differences between the closely related sibling species R. pomonella and R. mendax in EAG response to odors of their respective host fruits, apple and blueberry (Frey, J.E. and G.L. Bush, manuscript). These data indicate that R. mendax is relatively more sensitive to the odor of blueberries, its original host, than R. pomonella whose main hosts are hawthorn and apple. To study the underlying sensitivity differences we analyzed the sensitivity spectrum of both species to apple and blueberry odors using a gas chromatograph with an output split between a flame ionization detector and an antennal preparation as electroantennogram detector.

We used mature females of both species collected as pupae from their respective host plants (apples from Hart, Michigan; blueberries from Sawyer, Michigan). Headspace odours of blueberries and apples were prepared as pentane washes of whole fruits. For the analysis of interspecific differences, we used the average rank of the nine EAG responses with the largest average amplitude for both species in response to each host fruit extract.

Mean rank difference between the species is 73.5 for apple and 162.0 for blueberry fruit extract indicating that interspecific peripheral sensitivity differences are significant for both host fruit extracts but stronger for blueberry (F=3.235, p<0.001) than for apple (F=3.173, p=0.001) extract.

These data indicate that interspecific differences in antennal sensitivity between R. pomonella and R. mendax are at least partly due to differences in response to a number of single, mainly low molecular weight odour compounds of host fruit extracts. Identification of some of these odour compounds is under way and bioassays
will reveal the behavioural significance of the peripheral sensitivity differences between *R. pomonella* and *R. mendax*.

**REFERENCES**

