

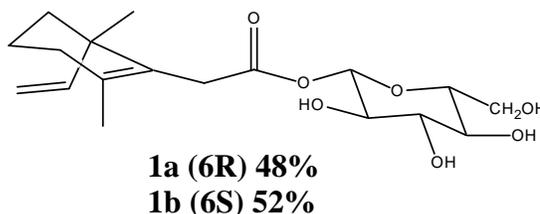
## Suspensoside, a Pheromone Glucoconjugate from the Oral Secretions of Male *Anastrepha suspensa*

S.S. Walse, F. Lu, and P. E. A. Teal (CMAVE-USDA-ARS)

---

### Introduction

The NHMFL 1-mm HTS probe in AMRIS (*I*) has been a great asset for our studies on identification of pheromones and pheromone conjugates in the Caribbean Fruit Fly (2-3). Using this probe, we have determined structures of pheromone the glycosylated precursors components 1a (6R) and 1b (6S) *B*-D-glucopyranosyl 2, 6-dimethyl-6-vinyl-cyclohex-1-ene-1-acetoate which serve as water soluble carriers for the pheromones anastrephin and epianastrephin. This work illustrates the first example of natural use of glucose to dissolve lipidic pheromones in aqueous media by insects and demonstrates the utility of the 1mm HTS probe for such studies. We also used the probe to document conversion of the lipid pheromone suspensolide into epianastrephin, anastrephin and the corresponding  $\gamma$  hydroxyl acid analogs and to track the abiotic mechanisms associated with regulation of pheromone release.



### Experimental, Results and Discussion

For this project, *A. suspensa* were reared in captivity in Gainesville FL. In addition to the 1mm NMR probe, standard analytical tools have been utilized such as mass spectrometry and gas chromatography. The samples analyzed were all just a few microliters representing several collections of oral secretions of insects, thus demonstrating the power of the 1 mm HTS probe. Both NMR and GC-MS results, compared with synthetic standards.

### Conclusions

These studies provide an example of a physicochemical-based inter-organism communication strategy that has been mechanistically linked to the abiotic environmental processing of volatile chemical signals. Also, the NHMFL 1-mm HTS probe is very useful for analysis of sample-limited natural products.

### Acknowledgements

This work was supported by the United States Department of Agriculture. Partial support was from the DOE-funded (DE-FG09-93ER-20097) Center for Plant and Microbial Complex Carbohydrates, which provided complimentary data on glucose characterization, and the NSF through the External User Program of the National High Magnetic Field Laboratory. NMR studies, facilitated by an invaluable collaboration with Arthur S. Edison, were done at the Advanced Magnetic Resonance Imaging and Spectroscopy (AMRIS) facility in the McKnight Brain Institute of the University of Florida. HRESIMS was performed in the mass spectrometry laboratory at the University of Florida. We would like to extend our gratitude to Jodie Johnson and James R. Rocca for guidance on spectrometric and spectroscopic measurements, respectively.

### References:

1. S.S. Walse, F. Lu and P. E. A. Teal. Suspensoside, a pheromone glucoside conjugate from the oral secretions of male *Anastrepha suspensa*. *Journal of Natural Products*, in press.
2. S. S. Walse, H. T. Alborn and P. E. A. Teal. Environmentally Regulated Abiotic Release of Volatile Pheromones from the Sugar-based Oral Secretions of Caribflies, *Green Chemistry*. In press.