Parectadial: A Novel Monoterpene from *Parectatosoma mocquerysi*

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Introduction

The NHMFL 1-mm HTS probe in AMRIS has been a great asset for natural product studies (*1*). Using this probe, the defensive secretion of *Parectatosoma mocquerysi* Finot 1897, a walkingstick insect from Madagascar, was determined to contain glucose, water, and a new monoterpene, parectadial, (4*S*)- (3-oxoprop-1-en-2-yl)cyclohex-1-enecarbaldehyde. This work demonstrates the utility of the 1-mm HTS probe and the value of walkingstick insects as sources of new bioactive compounds and provides an analytical framework for identifying such substances (*2*).

Experimental, Results and Discussion

P. mocquerysi was kept in culture by O. Conle (Figure 1), and the spray from 5 insects was collected and sent to the AMRIS facility for analysis. We used a variety of mass spectrometry, chromatography, and NMR techniques to show that the spray consists of glucose and a novel monoterpene that we named parectadial (Figure 2). We showed by chemical synthesis and enantioselective gas chromatography and circular dichroism that insect produces only the "S" isomer that is shown in Figure 2. *Anisomorpha buprestoides*, a walkingstick found in Florida, produces a variable mixture of monoterpenes that have a 5 membered ring (*2*, *3*)rather than the 6 membered ring of parectadial (*4*).

Figure 1. Adult male *Parectatosoma mocquerysi*.

Based on similarities to other chemicals that have been shown to kill cancer cells, we have tested parectadial for anti-cancer activity. At a single concentration it inhibits the growth of several different cancer cell lines at the National Cancer Institute's 60 cell line screen and is currently in the second round of testing to evaluate a dose response.

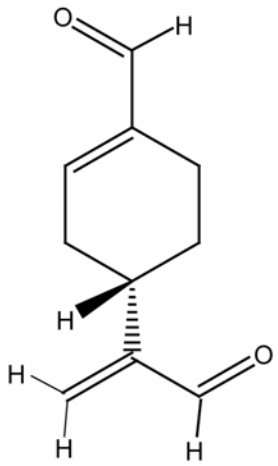

Figure 2. Parectadial: (4*S*)- (3-oxoprop-1-en-2-yl)cyclohex-1-enecarbaldehyde.

Conclusions

The NHMFL 1-mm HTS probe is an extremely efficient instrument for natural product discovery, because much less material is needed than for conventional probes.

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References

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