

# Using chemical tools to discriminate *Tapinoma* species.

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Communication among social insects is fundamental between individuals, castes and societies. This is achieved through chemical recognition and ensures that altruistic acts are directed towards relatives. The nestmate and species discrimination in ants is based on antennal detection of non-volatile chemicals found on the cuticle. These cuticular compounds are species specific and can be used as biosystematic tools. Actually, discriminating some of the *Tapinoma* species is a difficult undertaking with only variations in the clypeal cleft shape of queen or workers. Currently male genitalia analysis provides the only secure method for differentiation. In order to simplify the differentiation of five species of *Tapinoma* (*T. erraticum*, *T. Israelis*, *T. madeirense*, *T. nigerrimum*, and *T. simrothi*) we used gas chromatography coupled with GC-mass spectrometry to identify, compare and quantify cuticular hydrocarbons (CHCs). We found that each species possess unique pattern of CHCs. Across the five species, 154 CHCs were identified. We found n-alkanes, monomethylalkanes, dimethylalkanes and trimethylalkanes occurring between C23 and C33. Unlike the n-alkanes and monomethylalkanes, there was a large diversity of specific dimethylalkanes that makes them likely candidates for nestmate and species discrimination signals.

**Keywords:** *Tapinoma*, Nestmate recognition, cuticular hydrocarbons, gas chromatography, GC-mass spectrometry, biosystematic.