

Investigating Insect Adhesion Secretions by Gas Chromatography-Mass Spectrometry

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Insects are able to carry the multiple of their weight and to climb at vertical supports such as glass. This is due to the fact that they contain liquid secretions at the end of their tarsi (lower part of the legs). Such biological adhesive systems could be used for technical and medical applications [1]. The chemical composition of these secretions is still unknown. Because of the extreme low content of material available it is a real analytical challenge to obtain information upon the structure of the compounds forming the secretions.

For the investigation of small amounts of compounds there exist different enrichment and extraction techniques such as “solid phase microextraction (SPME)” [2-4]. These techniques can not be favourably used for sample sampling at living insects. Therefore a new efficient technique had to be developed prior to GC-MS analysis.

Contact solid-phase microextraction (SPME) with a self-made uncoated glass fiber in comparison to the use of polydimethylsiloxane-coated fibers or classical solvent sampling showed to yield a very efficient technique for *in vivo*-sampling [5,6]. Employing this technique in conjunction with GC-MS analysis 45 different hydrocarbons can be determined in the secretions of the investigated insect *Schistocera gregaria*. Long chain n-alkanes (C₂₉) as well as branched alkanes (3-Me-C₂₉) are the main components of the detected hydrocarbons. This is shown in the chromatogram of the tarsal secretion of *Schistocera gregaria* (Figure 1).

Overall, the combination of contact solid-phase microextraction with uncoated glass together with GC-MS analysis proved to be a very efficient technique for the structure elucidation of extreme low amounts in living organisms.

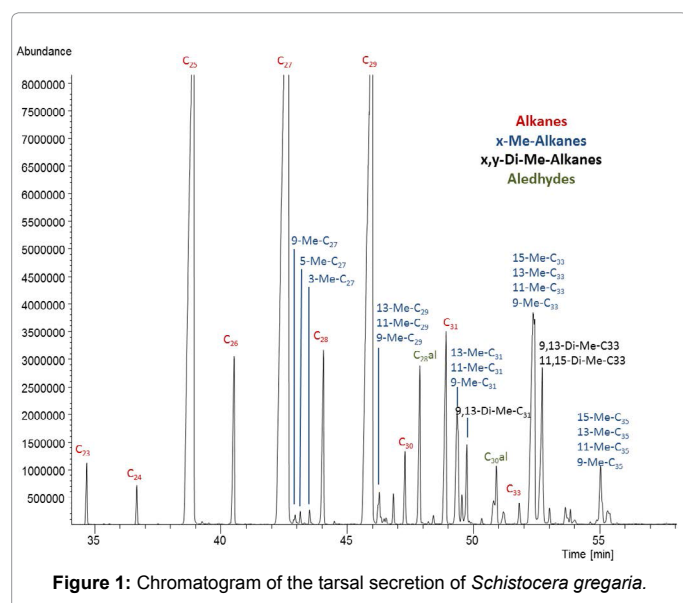


Figure 1: Chromatogram of the tarsal secretion of *Schistocera gregaria*.

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