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# AUTOMATED HYPHENATED THERMOCHEMOLYSIS-GC-MS FOR THE PROFILING OF ALGAE AND BACTERIA

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The merits of gas chromatography (GC) for the analysis of biological samples are often under-estimated. Clearly GC can not be used to study such samples directly, but after suitable sample pretreatment GC and GC-MS can provide highly detailed information. A possible way to reduce sample preparation is the use of thermally-assisted hydrolysis and methylation (THM). In previous work we developed an improved and fully automated THM procedure. This new THM-method was based on direct liquid injections of dissolved or dispersed bio-materials into the GC. Drying of the sample, addition of the reagent, incubation, and when necessary pyrolysis, are performed inside the liner of a programmable temperature vaporizer (PTV) - injector.

The aim of the present study was to investigate the potential of automated THM-GC-MS in combination with advanced data-analysis methods as a tool for the profiling micro-organisms. In this contribution, two applications will be discussed. The first application focused on the rapid determination of the fatty acid methyl ester profiles of algae's. Such information is relevant for biologist and for researcher investigating alternatives sustainable sources of automotive fuels. A second application studied was detection of diseases. In particular the work focused on the detection of the bacteria causing tuberculosis, *M. tuberculosis*, in sputum samples and bacteria cultures. Here, the experimental settings were optimized for the direct injection of sputum samples and bacterial cultures. First, the identification of *M. tuberculosis* was based on the known specific biomarker 10-methyl octadecanoic acid (tuberculostearic acid). In later experiments also other known or proposed biomarkers were investigated. Profiles of bacteria were obtained and used to further improve the specificity of the method for identification of *M. tuberculosis*.