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An improved extraction method of 3-oh fatty acids for environmental reconstruction

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3-hydroxy or beta-hydroxy fatty acids produced by Gram-negative bacteria are a novel proxy for assessment of the environmental changes. These compounds composed of lipopolysaccharide (LPS) of Lipid A, a core polysaccharide region, and an O-antigen polysaccharide chain. The improved method for the 3-hydroxy fatty acids extraction was proposed in this study. The 12 soil samples collected from the eastern US border along the coastline from Maine to Florida were generally processed by acid hydrolysis, methylation, total lipid extraction, and solid-phase chromatography, respectively. Fatty acids eventually can be separated from the main part of LPS and combined with a methyl group. However, in the stage of acid hydrolysis, the temperature was decreased to 55 °C, and heating time was extended in order to prevent the broken of volatile compounds and diminish the relative abundance of 3-OH fatty acids. The higher abundance of interested 3-OH fatty acids for the environmental reconstruction can potentially be extracted by this improvement than the classical protocol. This research will be further compared in terms of cost, experimental time and completeness of data between these two methods.