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FLUORESCENCE FINGERPRINTS OF LAKE AND RIVER AQUATIC SYSTEMS USING PARAFAC ANALYSIS

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Abstract

Fluorescence spectroscopy and parallel factor (PARAFAC) form a powerful tool in separating different fluorophores and may be useful in detecting the fluorescent signature of dissolved organic matter (DOM). Despite the large number of studies on fluorescence and PARAFAC it is still uncertain if this combination is capable to separate DOM from different water types by analyzing the presence of specific components and their spectral shape. This paper presents a preliminary study on the fluorescence and PARAFAC potential to identify the fluorescence fingerprint of DOM components from spectra of samples collected from rural and urban lakes and rivers. PARAFAC analysis revealed three main components, one component being associated principally with microbial matter and two components with terrestrial organic matter. Specifically, PARAFAC effectively distinguished the fluorescence features of the urban lake, which was characterized by a high bacterial load.

Key words: dissolved organic matter, fluorescence fingerprints, PARAFAC analysis

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