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Tracing dissolved organic matter in aquatic environments using a new approach to fluorescence spectroscopy

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Abstract

Dissolved organic matter (DOM) is a complex and poorly understood mixture of organic polymers that plays an influential role in aquatic ecosystems. In this study we have successfully characterised the fluorescent fraction of DOM in the catchment of a Danish estuary using fluorescence excitation“emission spectroscopy and parallel factor analysis (PARAFAC). PARAFAC aids the characterisation of fluorescent DOM by decomposing the fluorescence matrices into different independent fluorescent components. The results reveal that at least five different fluorescent DOM fractions present (in significant amounts) in the catchment and that the relative composition is dependent on the source (e.g. agricultural runoff, forest soil, aquatic production). Four different allochthonous fluorescent groups and one autochthonous fluorescent group were identified. The ability to trace the different fractions of the DOM pool using this

relatively cheap and fast technique represents a significant advance within the fields of aquatic ecology and chemistry, and will prove to be useful for catchment management.



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Keywords

Coloured dissolved organic matter; Fluorescence; Modelling; River; Mixing

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Tracing dissolved organic matter in aquatic environments using a new approach to fluorescence spectroscopy, the channel is not so obvious.

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