The C_{32} Alkane-1,15-Diol as a Tracer for Riverine Input in Coastal Seas

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Long chain alkyl diols are lipids which occur ubiquitously in marine sediments [1,2,3] and are applied for sea surface temperature reconstructions via the Long chain Diol Index (LDI) [3]. The distribution of 1,13- and 1,15-diols are well studied in open marine and lake sediments but rarely in coastal seas receiving a significant freshwater, and thus terrestrial, input. Here we study the distribution of diols in four shelf seas near major river outflows: the Gulf of Lion, the Yenisei basin, the Amazon basin and the Berau delta, covering a wide range of climate conditions. The relative abundance of the C_{32} 1,15-diol is consistently higher close to the river mouth and particularly in the rivers, suggesting a terrestrial source. This is supported by statistical analysis which points out a significant positive link between the C_{32} 1,15-diol and the Branched and Isoprenoid Tetraether index, a proxy reflecting soil and river input. However, the C_{32} 1,15-diol was not detected in several soils analysed and is unlikely to be derived from vegetation, suggesting that the C_{32} 1,15-diol is mainly produced in rivers. This agrees with the observation that it is a dominant diol in most freshwater Eustigmatophyte algae. Our results suggests that the relative abundance of the C_{32} 1,15-diol can potentially be used as a proxy for riverine organic matter input in shelf seas.

References

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