

THE OCCURRENCE OF EXTENDED TRICYCLIC TERPANES IN THE PROTEROZOIC AND PALEOZOIC

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Introduction

C₁₉-C₂₆ tricyclic terpanes are ubiquitous in oils and bitumens spanning the geological record. Ratios of particular homologs are used to distinguish source rocks, assess the extent of post-depositional microbial degradation, and reconstruct ancient environmental conditions [1]–[4]. Although the C₁₉-C₂₆ tricyclic terpanes are frequently described in the literature, there is little known about the occurrence of extended tricyclic terpanes (C₂₇-C₅₄) throughout the geological record. Studies that have discussed the extended tricyclic terpanes are biased to the Phanerozoic Eon, and there are ongoing debates about their paleoenvironmental and biological interpretation [5]–[7].

Here we present the first compilation of clearly indigenous tricyclic terpanes ranging from the Paleoproterozoic to the early Palaeozoic Era. We analysed bitumens and oils from a range of depositional environments to identify trends linked with lithology, maturation, biochemistry and paleoecology. Extended tricyclic terpanes (>C₂₇) were detected in almost every Proterozoic and Cambrian sample analysed, highlighting the potential significance of measuring the extended tricyclic terpanes and including them in paleoenvironmental parameters. Preliminary data further indicates that environmental conditions influence the relative distribution of extended tricyclic terpanes and additional research will be conducted to verify the observed correlations.

References

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