

Triaromatic 23,24-Dimethylcholestane: a New Age-Related Biomarker

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Some studies have shown the application of steranes as indicators of geologic age, which is particularly useful to constrain the age for petroleum that has not been rigorously correlated to a source rock. Age correlation of such steranes derives from their taxon-specific occurrence, which can be verified by natural product chemistry of their precursors and by correlation with fossil records of the taxa.

Triaromatic 23,24-dimethylcholestanes (TA-DMD) and triaromatic 4,23,24-dimethylcholestanes (TA-dinosteroids) have been studied because of the occurrence of structurally related sterol precursors in modern dinoflagellates. Both compound types were found to distinguish Paleozoic from Mesozoic (and younger) oils and rocks. However, TA-DMD appear to be even more selective than TA-dinosteroids for this distinction.

A large set of oil and rock samples with a wide range of source age from Precambrian to Miocene was studied in order to define relationships between (1) these compounds and their precursor dinoflagellates, (2) TA-DMD and TA-dinosteroids, and (3) occurrence of both compound types and geologic age and environment.