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Using fluorescence microscopy to discern *in situ* from reworked palynomorphs in dynamic depositional environments – an example from sediments of the late Miocene to early Pleistocene Caspian Sea

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Abstract

Knowledge of the ecological affinities of fossil palynomorphs found in sediments allows palynologists to reconstruct environmental change through time. However, the journey from source to sink is not straightforward and it is often difficult to discern whether palynomorphs are *in situ*, especially when working on sediments deposited in dynamic environments such as deltas. Palynomorphs may be buried for long periods of time before being re-suspended and transported to secondary depositional sites, sometimes without visible changes in their appearance. In such cases, the palynological assemblages are not representative of the contemporary environment, as they contain a mixture of *in situ* and reworked palynomorphs. Here we use fluorescence microscopy as a tool to assess levels of reworking in a spatiotemporally highly dynamic setting, the Pliocene hydrocarbon reservoir rocks of the South Caspian Basin. The results highlight trends in the fluorescence

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