



Palaeobiogeographical patterns reveal the origins of a pelagic lifestyle in ostracods

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Coupled with evidence from depositional setting, faunal associates and functional morphology, the palaeogeographical distribution patterns of ancient marine organisms can be used as a test of lifestyle. Thus, fossil organisms that are interpreted to have been planktonic throughout their lifecycle (e.g. graptolites), and those with a long-lived planktonic larval stage (e.g. the planula larvae of corals) typically have wide intercontinental distribution, whilst those that have a demersal and short-lived larval stage (e.g. brachiopods), and those that are exclusively benthic (e.g. podocope ostracods) generally have a more restricted biogeographical distribution.

Here we develop an independent test of fossil ostracod autoecology using modern distribution patterns to visualize 'geographical domains' for pelagic and benthic lifestyles. These data are statistically filtered in order to match the ranges of geography and bathymetry between Silurian and modern forms. Our analysis decisively identifies Silurian myodocopes with ranges overlapping with modern pelagic ostracods. Though predicated on ostracods, our approach is potentially applicable to analyzing the patterns of any putative arthropod zooplankton in the fossil record where the ecology of modern representatives can be readily determined. Furthermore it may also form a guide to identify fossil zooplanktonic arthropods (like some Ordovician trilobites) that have no modern representatives.