The palaeopsychrosphere in the Devonian

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The interpretation of Palaeozoic marine benthonic ostracods of the Thuringian "Ecotype" or "Megaassemblage" as indicative of a palaeopsychrosphere has been controversial. We review the evidence and conclude that the characteristics and distribution of these ostracods are consistent with the existence of deep, cold, well-oxygenated water masses, formed by high-latitude sinking of surface waters, in the Devonian oceans, comparable with those of the modern ocean that constitute the psychrosphere (waters below the thermocline with temperature < 10 °C). We present a new palaeoceanographic model for the Frasnian-Famennian (Late Devonian) Kellwasser events that resulted in the extinction of 75% of marine ostracod taxa, mostly neritic or pelagic forms, while the deep-water Thuringian Mega-assemblage was relatively unaffected. We offer an explanation for the unlikely preservation of examples of such a deepwater (bathyal to abyssal) ostracod fauna that involves upwelling of deep cold waters on continental margins.

Speaker