



A temporary pond in the Early Cretaceous of southern England: palaeoclimatic implications of nonmarine "Purbeck-Wealden" ostracod faunas

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Excavation of the partial skeleton of an Iguanodon from the Upper Weald Clay (Barremian, Early Cretaceous) at Smokejacks Brickworks near Ockley, Surrey, UK included detailed sampling for micropalaeontological and palynological studies (Nye et al., 2008). Rich and well-preserved non-marine assemblages of pollen and spores include early angiosperms as well as freshwater green algae. Taphonomic analyses show the ostracod assemblages to be autochthonous thanatocoenoses, indicative of local environment at the time of deposition. Using a palaeobiological approach, the ostracods and palynomorphs demonstrate temporary / ephemeral freshwater conditions at the time when the Iguanodon died and the carcass was buried. Ostracod "faunicycles" in "Purbeck-Wealden" deposits may represent salinity variations in non-marine water-bodies, influenced by the balance between precipitation and evaporation, and/or the relative abundance of permanent and temporary waterbodies in the landscape; many assemblages resulted from post-mortem mixing, perhaps during flood events (Horne, 2002). Faunal alternations may therefore reflect shifts of the boundary between warm temperate and paratropical climate in the Early Cretaceous of NW Europe. The previously rejected suggestion that such assemblage variations record Milankovitch cyclicity deserves to be reconsidered, as does the possibility that they reflect changes on sub-Milankovitch timescales. Climate variability may have influenced the differential evolutionary success of sexual, mixed and parthenogenetic reproductive strategies in nonmarine ostracods. Latitudinally restricted distribution patterns and wind dispersal of resting eggs offer potential for inferring global climate patterns from ostracod palaeobiogeography, although dispersal by large animals (e.g., crocodiles, pterosaurs) is likely to have confused any aeolian transport patterns.

References

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- Nye, E., Feist-Burkhardt, S., Horne, D. J., Ross, A. J. & Whittaker, J. E. (2008) The palaeoenvironment associated with a partial Iguanodon skeleton from the Upper Weald Clay (Barremian, Early Cretaceous) at Smokejacks Brickworks (Ockley, Surrey, UK), based on palynomorphs and ostracods. *Cretaceous Research*, 29, 417–444.