

EGU21-1662

<https://doi.org/10.5194/egusphere-egu21-1662>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Microfossil evidence for the EECO and MECO events in the Eocene sediments of the Isle of Wight, UK.

Malcolm Hart, Pritpal Mangat, and Meriel Fitzpatrick

Plymouth University, School of Geography, Earth & Environmental Sciences, Plymouth, United Kingdom of Great Britain – England, Scotland, Wales (mhart@plymouth.ac.uk)

The Paleogene section of Whitecliff Bay (Isle of Wight) is one of the most complete onshore successions in North West Europe (see Curry, 1965, 1966). The microfossil assemblages have been investigated by many micropaleontologists and the succession of foraminifera, ostracods, calcareous nannofossils, pteropods, diatoms, charophytes and dinocysts have been described in varying levels of detail. The planktic foraminiferal datum (Wright, 1972; Murray et al., 1989) in the Lower Eocene and the occurrence of larger foraminifera in the mid-Eocene provide evidence of incursions of warm water taxa that may be recording the presence of the Early Eocene Climatic Optimum (EECO) and the Middle Eocene Climatic Optimum (MECO) although these occurrences could equally be caused by changes in palaeogeography, glacio-eustasy and the general depositional environment.

Over a period of over 40 years samples have been collected from both the cliff succession and, at times of lowered sediment levels, on the foreshore which can often provide 100% exposure of the succession. Preservation of microfossil assemblages in samples is always better when collected from the foreshore while the cliff succession often records no calcareous (e.g., foraminifera) or siliceous microfossils (e.g., diatoms).

Both EECO and MECO are recorded as being brief, transient events while the palaeontological variations look to be of an altogether longer duration. Stable isotope data are limited (Dawber et al., 2011) and, at the present time, do not provide precise confirmation of isotope excursions precisely synchronous with the palaeontological distributions. Nevertheless, the evidence of northward migration by warm-water taxa is quite distinctive and worthy of still further investigation. In the case of MECO, the presence of *Nummulites* spp., *Alveolina fusiformis* and corals is certainly suggestive of warm-water migration into the northern confines of the Anglo-Paris-Belgian Basin.

Curry, D., 1965. The Palaeogene Beds of South-East England. *Proceedings of the Geologists' Association*, 76(2), 151–173.

Curry, D., 1966. Problems of correlation in the Anglo-Paris-Basin. *Proceedings of the Geologists' Association*, 77(4), 437–467.

Dawber, C.F., Tripathi, A.K., Gale, A.S., MacNiocaill, C., Hesselbo, S.P., 2011. Glacioeustasy during the middle Eocene? Insights from the stratigraphy of the Hampshire Basin, UK. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 300, 84–100.

Wright, C.A., 1972. The recognition of a planktonic foraminiferid datum in the London Clay of the Hampshire Basin. *Proceedings of the Geologists' Association*, 83, 413–419.

Murray, J.W., Curry, D., Haynes, J.R., King, C., 1989. Palaeogene. In: Jenkins, D.G., Murray, J.W. (eds), *Stratigraphical Atlas of Fossil Foraminifera* [2nd Edition] (eds), British Micropalaeontological Series, Ellis Horwood Ltd, Chichester, 490–536.