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The stratigraphy and palaeoenvironment of the Bathonian "Great Oolite Group" of Woodeaton Quarry, Oxfordshire.

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Woodeaton Quarry, Oxfordshire, represents the most continuously exposed section of the Upper Bathonian "Great Oolite Group" in the United Kingdom. Like most of the British Bathonian, it is lacking in reliable ammonite zonation from which to define a chronostratigraphy. The sedimentology of the succession can be broken up into two broad facies types:

1. A clay rich, brackish lagoonal environment with intermixed freshwater-influenced flora and fauna;
2. A marginal marine calcareous succession of an oolitic nature with periodic mud-drape intervals.

The marginal marine depositional setting, the completeness of the Upper Bathonian stratigraphy and lack of biostratigraphically important macrofauna has motivated this study into the micropalaeontology of Woodeaton. The primary aims of this study are to use foraminifera and ostracods to reconstruct the palaeoenvironments and to refine the biostratigraphy of the Upper Bathonian.

The studied succession commences at the top of the Taynton Limestone Formation, which fines upwards into the clay-rich Rutland Formation. Several species of marine ostracods known from the Mid-Upper Bathonian are recovered from the base of the Rutland Formation, such as *Praeschuleridea confossa* and *Angliaecytherldea calvata*, as well as fragments of fish scales and elasmobranch teeth. Freshwater influence is evident further up the Rutland Formation where freshwater charophytes, nested bivalves and ostracods of the genus *Bisulcocypris* have been found. The progression from the Rutland Formation's marine base into the freshwater influenced clays is clear from the varied micropalaeontological fauna.

A return to marine conditions in the overlying White Limestone Formation can be observed through the increasing number of benthic foraminiferal taxa - with *Spirillina* and *Lenticulina* the most abundant – compared to the Rutland Formation. Within the Shipton and Ardley Members there are also indicative marine ostracod taxa present (including *Acanthocythere spiniscutulata* and *Terquemula robusta)*. The upper part of the section exposes the Bladon Member that displays a relative shallowing within the *fimbriatus–waltoni* beds preserving a number of *in situ* rootlets and exogenous carbonised logs. This unit contains a mixed assemblage of marine species of ostracods (e.g. *Fossaterquemula blakeana)* and foraminifera (e.g. *Lenticulina tricarinella)* in association with freshwater ostracod taxa such as *Timiriasevia* sp.

The succession at Woodeaton Quarry of Upper Bathonian carbonates exhibits microfaunal assemblages that can be viewed as direct proxies to the palaeoenvironment. The assemblages of ostracods and foraminifera indicate marine conditions prevailed in the basal Rutland Formation before the evolution of a freshwater environment. A return to a marine dominated environment with freshwater fluctuations occurs throughout the White Limestone Formation. It is through the high-resolution micropalaeontological study that palaeoenvironmental analysis can be refined in the marginal marine settings of the Upper Bathonian in Oxfordshire.