

An occurrence of *Ammobaculites* (Foraminiferida, Lituolacea) in the Purbeck Formation (late Jurassic-early Cretaceous) of Dorset, south-west England

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ABSTRACT

An influx of *Ammobaculites* cf. *obliquus* Loeblich & Tappan is documented from the late Jurassic-early Cretaceous Purbeck Formation of Dorset, south-west England. The foraminifera are interpreted as inhabitants of a dysaerobic, muddy, brackish lagoonal environment. *J. Micropalaeontol.*, 12 (1): 119-120 August 1993.

INTRODUCTION

Foraminifera have only occasionally been noted from the predominantly non-marine Purbeck Formation of Dorset, southern England (late Portlandian to Berriasian, see Allen & Wimbledon, 1991) and have never been documented in any detail. The few records indicate sporadic occurrences of both agglutinated and calcareous taxa (e.g. Clements, 1973; Robertson Research, 1974; West, 1975). By contrast, ostracods and molluscs are abundant and relatively well-researched (e.g. Anderson, 1985; Clements, 1969, 1973).

This note documents a monospecific population of *Ammobaculites* cf. *obliquus* Loeblich & Tappan in the Corbula Beds of Durlston Bay, Swanage, Dorset, for the first time. These strata occur in the upper part of the Middle Purbeck Beds (Clements, 1969) and are probably late Berriasian in age (Allen & Wimbledon, 1991).

OCCURRENCE AND PRESERVATION

Clements (1973) first recorded agglutinated foraminifera in bed DB168 (Corbula Beds) of his account at Durlston Bay, near Swanage (SZ 0377, SZ 0378) but did not attempt to name them. DB168 is the equivalent of Bed 150 of a new section being prepared by Wimbledon *et al.* (Fig. 1). The author has recently re-sampled the bed (pyritic and selenitic dark shale with intercalated calcarenite, approximately 0.6m thick), in the northern part of Durlston Bay (SZ 0384 7851). These samples have yielded abundant finely siliceous, but crushed, *Ammobaculites*, with rarer molluscan and ostracod debris.

IDENTIFICATION

Ammobaculites from DB 168/Bed 150 (Fig. 2a,b) agree well with *Ammobaculites obliquus* Loeblich & Tappan, described and figured from the Upper Valanginian and Hauterivian of the Lusitanian Basin, west Portugal (Wightman, 1990), from the Lower Aptian of the southeast Paris Basin (Damotte & Magniez-Jannin, 1973) and the Lower Aptian of the Isle of Wight, southern England (Crittenden, 1983). The Purbeck tests are smaller than those originally described from the Albian Kiowa Shale of Kansas by Loeblich & Tappan (1949, 1950), but are otherwise comparable in morphology. They are consequently identified as *A. cf. obliquus*. Similar, larger, *A. obliquus* also occur in the Vectis Formation (Wealden Group, Barremian or possibly up to Lower Aptian) of the Isle of Wight, southern England (Radley, in prep.).

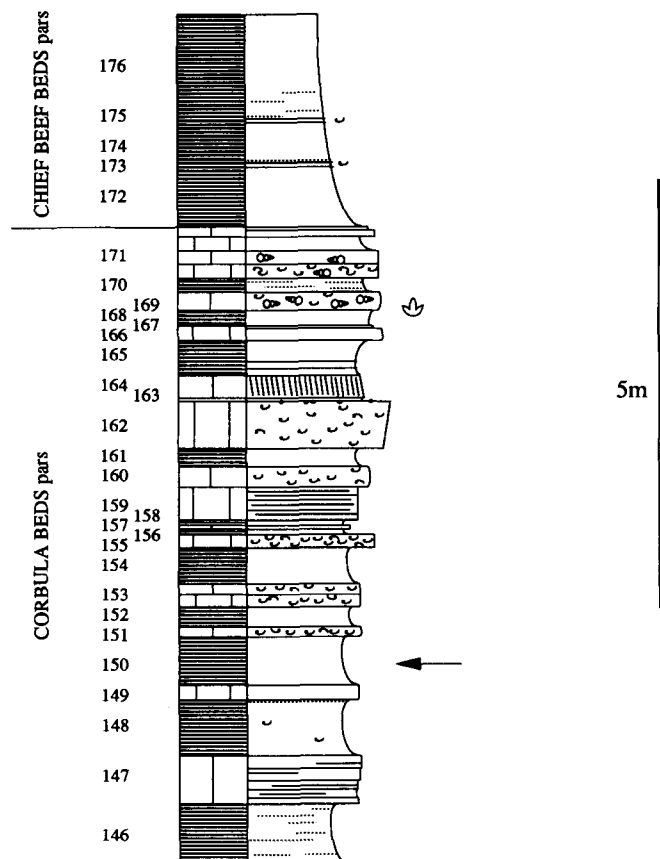


Fig. 1 Stratigraphic relations of foraminiferal horizon in the Durlston Bay section (from Wimbledon *et al.* in prep).

PALAEOECOLOGY

The shelly carbonates and mudstones which constitute much of the Purbeck Formation were deposited in and around an extensive shallow lagoon of fluctuating salinity. Semi-arid climates prevailed during early Purbeck times but later gave way to more humid, warm-temperate conditions (El-Shahat & West, 1983). The ostracod and molluscan faunas indicate fluctuating salinities, ranging from hypersaline through brackish to freshwater (e.g. Clements, 1969; Anderson, 1985).

The Corbula Beds have been interpreted as moderate brackish ("mesohaline") lagoonal deposits (Clements, 1969;

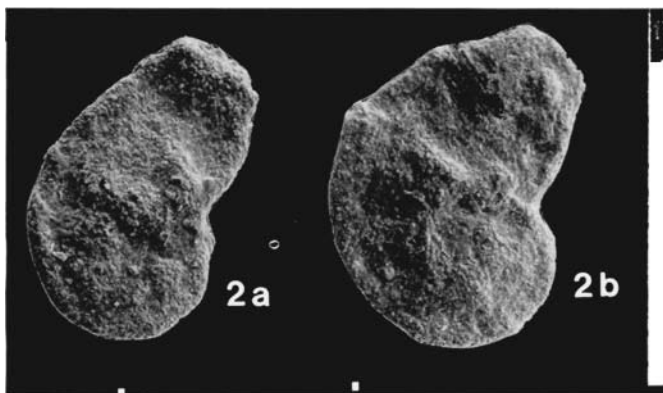


Fig. 2 a,b *Ammobaculites* cf. *obliquus* from the Corbula Beds, Purbeck Formation, Durlston Bay, Swanage, Dorset. 2a x 104, 2b x 125.

El-Shahat & West, 1983). The limestones formed largely as molluscan shell accumulations on marginal flats (El-Shahat & West, 1983); intercalated fossiliferous shales are accordingly of shallow subaqueous or mud flat origin.

The foraminiferal tests generally lack signs of abrasion, indicating little or no post mortem transport. The presence of scattered calcareous molluscan and ostracod debris in the samples indicates that the shale has not been decalcified. The foraminifera thus represent a true monospecific agglutinated assemblage.

Dense monospecific *Ammobaculites* populations occur in Recent brackish lagoons and estuaries of moderate temperature, where they characterise argillaceous substrates. These brackish-water species appear to be highly opportunistic and sometimes inhabit poorly-oxygenated muds. Many prefer salinities in the range of 12.5-15 parts per thousand, although they tolerate salinity fluctuations (Ellison, 1972). Extant *Ammobaculites* appear to feed on bacteria and other organic detritus and live both infaunally and epifaunally (Jones & Charnock, 1985; Nagy, 1992).

Purbeck *A. cf. obliquus* are similarly interpreted here as environmentally-tolerant opportunists, which inhabited muddy, brackish, lagoonal substrates or marginal mud-flats. Ostracods and molluscs are rare in the sampled shale (see above), but occur commonly in the overlying and subjacent strata, which lack foraminifera (Clements, 1969, 1973). It therefore seems likely that the foraminiferal shale was deposited under ephemeral dysaerobic conditions, excluding most benthos, but allowing *A. cf. obliquus* to temporarily thrive.

Recently, monospecific *Ammobaculites* accumulations have been documented from Berriasian to Hauterivian strata of the Lusitanian Basin, western Portugal by Wightman (1990). Here, similar finely-agglutinated *A. obliquus* was interpreted as a grain-selective, upper estuarine mud-flat inhabitant.

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