

## ARTICULATED ECHINOIDS FROM THE BASAL BLUE LIAS FORMATION (LOWER JURASSIC) NEAR WATCHET, SOMERSET, ENGLAND



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Common, small, crushed *Diademopsis* tests with associated spines occur in the Lower Jurassic, lowermost Blue Lias Formation near Watchet, Somerset. Almost all come from a 5–10 cm shale interval in the top of Whittaker and Green's bed 14 in the lower part of the Planorbis Chronozone (Hettangian) with a few specimens also recorded from Bed 18. The associated assemblage includes *Psiloceras* ex grp *planorbis* (Sowerby), the bivalves *Modiolus miminus* (J. Sowerby) and *Anningella*?, a pluricolumnal of *Isoerinus angulatus* (Fraas), a decapod crustacean and rare plant fragments. Echinoid remains include teeth and hemipyramids from the jaw apparatus, as well as ambulacral and interambulacral plates with associated spines. All plates derive from the pedinoid echinoid, *Diademopsis*. Several examples appear to have been fragmented before burial, suggesting they were subjected to predation, but burial was soon after death due to the presence of attached spines associated with the tests of most individuals. *Diademopsis* tests with associated spines are also known from the basal Blue Lias in south-east Devon (Pinhay Bay and Tolcis Quarry). The horizons in Pinhay Bay (Lang's beds H1, H3 and H6) are, however, slightly lower in the Blue Lias succession as they occur below the first occurrence of ammonites in bed H25, at levels corresponding to the Tilmanni Chronozone and probably also the terminal Triassic.

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### INTRODUCTION

Articulated echinoids have long been known from the lower part of the Lower Lias Group of Devon and Dorset (Hettangian-Lower Sinemurian, Lower Jurassic), but seem to have been less frequently recorded from the West Somerset coast. For example, De La Beche (1826, p. 28, pl. 4, fig. 5) briefly described and illustrated a partial test with a few associated spines of an unidentified echinoid from the "lias marl" of Dorset. From De La Beche's illustration, the specimen appears to be a cidaroid. Broderip (1837) described '*Cidaris bechei*' Broderip from Lyme Regis, Dorset and suggested it might be the same species as that figured by De La Beche (1826). Wright (1855) described '*Hemipedina bechei*' and '*H. bowerbanki*' Wright, from the Blue Lias Formation of Devon and later (1861) added '*H. tomesii*' Wright. Wright (1857–1878) also monographed all the then known Jurassic echinoids and described several species from the Blue Lias Formation of Devon. Fraser and Lewis (2010) figured specimens from the Natural History Museum London, reported to be from the Blue Lias Formation of the Lyme Regis area, including *Procidaris edwardsi* (Wright), '*Cidaris*' sp., *Diademopsis bowerbanki* (Wright) and *D. heberti* (Agassiz and Desor), but all lack precise stratigraphical information.

Most recently Smith (2015) has thoroughly described and illustrated the British Jurassic regular echinoids recorded from the Lower Lias Group. He recognized four species, three cidaroids and one pedinoid, all of which are known from the Blue Lias Formation in Devon and Dorset (Hettangian to Lower

Sinemurian, as reviewed by Page, 2002), but only a single example of *Couvelardicidaris* sp. from the Upper Hettangian of Cockhill Quarry, Emborough, Somerset (Smith, 2015, p. 11).

These records suggest that, remarkably, few articulated echinoids have been recorded from the considerably more extensive exposures of the Blue Lias Formation on the West Somerset coast, although 'echinoid fragments' were noted by Whittaker and Green (1983) in their comprehensive memoir on the area (for instance in their Bed 22 of the Blue Lias Formation in Doniford Bay, near Watchet). One of us (KNP) has also noted concentrations of echinoid spines at several levels in the Liassic Chronozone (as noted in Weedon *et al.* 2017, p. 21) with occasional isolated spines at other levels. Nevertheless, although Warrington *et al.* (1994) reported the sea urchin *Diademopsis* from the Late Triassic, Lilstock Formation in St Audrie's Bay, we are unaware of any report in the literature of specifically identified sea urchins from the overlying Blue Lias Formation of the coastal area.

It is, therefore, appropriate to document a recently identified occurrence of partially complete and partially articulated examples of *Diademopsis* from low in the Blue Lias Formation at Helwell Bay, Somerset (Figs 1, 2), as noted briefly by Weedon *et al.* (2017, p. 20). Most of the new specimens come from a 5–10 cm shale interval in the upper part of Whittaker and Green's bed 14, with a few specimens being recorded from Bed