

A NEWLY DESCRIBED JURASSIC 'SQUID-LIKE CEPHALOPOD' FROM THE LIAS GROUP OF DORSET

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A newly described 'clarkeiteuthid' (squid-like cephalopod) from the Lias Group (Jurassic) of the Dorset Coast provides a significant insight into the development of arm hooks (onychites) in the early Jurassic. This specimen shows the trace of four arms that are picked out by only the lines of hooks. The hooks are paired, with two distinctive elements that are described for the first time. With no soft-bodied preservation of the animal, or signs of a phragmocone, the specimen can only be tentatively identified as *Clarkeiteuthis* sp. cf. *C. montefiorei*.

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INTRODUCTION

In the palaeontological collections of the Bristol Museum & Art Gallery is specimen number BRSMG Ce12385 that was collected by Stuart Bagnoli, and gifted to the museum on the 26th September 1989. It is recorded as coming from "the (?) Jamesoni Subzone (Pliensbachian), 15 ft (4.5 m) below the *Lytoceras* Stone Band at a location 300 yards (275 m) east of Golden Cap at Stanton St Gabriel". The *Lytoceras* Stone Band is better known as the Belemnite Stone (Cope, 2012, p. 56) and is Lang's Bed 121 which is located at the top of the Belemnite Marls (Beds 106–120): see Lang and Spath (1926) and Lang *et al.* (1928) for the bed notation within the Lias Group. This would place the specimen at the top of the Jamesoni Subzone (*vide*, Donovan, 2017). This is within the Charmouth Mudstone Formation (Cox *et al.*, 1999). The specimen is interesting in that it occurs in highly bioturbated (Figure 1A), calcareous mudstone and it is quite striking that the lines of arm hooks remain virtually undisturbed in such a sedimentary environment.

ONYCHITES

Modern squid have few easily preserved components. These include the crystalline lens of the eye (Clarke, 1993), the gladius or chitinous backbone (La Roe, 1971), mandibles or chitinous jaws (Clarke, 1965), onychites (squid arm and tentacle hooks) and statoliths (Clarke, 1966, 2003).

Modern coleoid (squid-like) cephalopods have arms that carry arrays of both suckers and hardened, organic hooks. Fossil arm hooks have been known since their 'accidental' description by Kašpar Maria Sternberg in 1822, although he identified them as plant remains: see Naef (1922) and Cleal *et al.* (2005). During the twentieth century there were a number of brief descriptions of hooks but it was Kulicki and Szaniawski

(1972) who described 22 morphotypes from the Jurassic of Poland. These authors gave these 'forms' names using a binomial classification though, with many lacking defined (and figured) holotypes and, in some cases, only one recorded specimen, some of their designations should probably be regarded as invalid. Some of their morphotypes from Poland have, however, been reported from Germany (Engeser, 1987; Fuchs *et al.*, 2013), Spitzbergen (Hammer *et al.*, 2012) and the United Kingdom (Pollard, 1968, 1990; Hart *et al.*, 2016). An account of earlier records of hooks was provided by Engeser and Clarke (1988, and references therein), who also attempted to use some of the Kulicki and Szaniawski (1972) terminology. It is important to record that Engeser (1987, pp. 8, 9) described the processing methods appropriate for the recovery of separate hooks from sediment samples, though few authors appear to have adopted this approach to their study.

The material described by Kulicki and Szaniawski (1972) came from the Middle and Upper Jurassic of Poland and, therefore, did not record the typical Lower Jurassic hooks described by Engeser and Clarke (1988, fig. 2d, fig. 3) that had a bi-lobed, inflated base. Engeser and Clarke (1988) attributed these forms to "*Phragmoteuthis montefiorei*" (Buckman, 1880), illustrating a specimen from the Lower Jurassic of Southern England. Fuchs *et al.* (2013) have recently revised the generic position of *Clarkeiteuthis montefiorei* (Buckman, 1880) and illustrated (Fuchs *et al.*, 2013, fig. 5b, c) a specimen from the Charmouth Mudstone Formation (Upper Sinemurian) of Dorset that clearly shows the bi-lobed bases to the lines of arm hooks. These are quite different from the more prominently 'hooked' forms associated with *Phragmoteuthis bisinuata* (Bronn, 1859) and illustrated by Doguzhaeva *et al.* (2007, fig. 2C) and Fuchs *et al.* (2013, fig. 4E). One issue with the illustration of Doguzhaeva *et al.* (2007, fig. 2C) is that it shows, without comment, two types of hook: