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Jurassicorbula n. g., a new bivalve genus from the Upper Jurassic of Portugal

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With 2 figures in the text

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Abstract: *Jurassicorbula* n. g. with the type species, *Jurassicorbula edwardi* (SHARPE, 1850) is described in detail from Upper Jurassic marginal marine environments of the Lusitanian Basin (Portugal). *Jurassicorbula* appears to have been euryhaline and lived preferentially in soft substrates.

Key words: Venerida (*Jurassicorbula* n. g.), taxonomy, palaeoecology, Upper Jurassic; Central Portugal (Lusitanian Basin).

Zusammenfassung: Aus dem Oberjura des Lusitanischen Beckens (Mittelportugal) werden *Jurassicorbula* n. g. und die Typus-Art *J. edwardi* beschrieben. Bei *Jurassicorbula* scheint es sich um eine euryhaline Gattung zu handeln, die an ein Leben in Weichgründen angepaßt ist. Sie tritt auch in vergleichbaren Milieus im Oberjura Nordwesteuropas auf.

Introduction

In the course of a biofacies analysis of Upper Jurassic sediments in the Lusitanian Basin (Central Portugal), a particular species of the bivalve family Corbulidae, "*Corbula*" *edwardi* SHARPE, was found to be widespread at certain levels in the so-called Pteroceriano, particularly in the coastal sections south of Santa Cruz (west of Torres Vedras) and south of Praia da Areia Branca. The species was described in 1850 by SHARPE from "subcretaceous limestones between Sobral and Torres Vedras" (p. 181, pl. 21, figs. 2a–b), but its dentition remained unknown. It was possible to prepare the hinge in well preserved material from the uppermost Pteroceriano south of Praia da Areia Branca and this revealed that "*C.*" *edwardi* must be separated in a new genus to which the name *Jurassicorbula* is here given.

Taxonomy

Class Bivalvia Linné, 1758
Subclass Heterodonta Neumayr, 1884
Order Myoida Stoliczka, 1870
Superfamily Myacea Lamarck, 1809
Family Corbulidae Lamarck, 1818
Subfamily Corbulinae Gray, 1823
Genus *Jurassicorbula* n. g.

Type species: *Corbula edwardi* Sharpe, 1850.

Derivatio nominis: *jurassicus* (lat.) = Jurassic.

Diagnosis: A corbulid with strongly inflated right and weakly inflated left valve. Hinge of right valve with broad, deep resilium, one cardinal tooth, and one anterior and two posterior lateral teeth. Left valve with triangular cardinal socket and narrow, elongate, posteriorly sloping chondrophore with a median groove. With very small pallial sinus.

Discussion: *Jurassicorbula* is very close to the Upper Cretaceous corbulid genus *Ursirivus* (Vokes, 1945), but differs from it in the following respects: It is more inequivalve, there is no heavy internal ridge immediately posterior to the resilial pit of the right valve and, above all, the chondrophore is of a different shape.

Several corbulid species described from the Upper Jurassic of northwestern Europe closely resemble *J. edwardi* in overall shape and ribbing. Apart from *Sphaenia pellati* de Loriol (1875, p. 160, pl. 11, figs. 13–16) which is a junior synonym of *J. edwardi* their internal features are unknown and thus their status is uncertain. As most have been described from strata in which compactional distortion is widespread (e. g. clays and marls) it cannot be decided from illustrations how much of their morphological variation is due to diagenetic distortion, how much to intraspecific variation and how much to specific differences. They include

Corbula ferruginea de Loriol, 1875 (p. 163, pl. 11, figs. 2–5)
Corbula saemanni de Loriol, 1866 (p. 42, pl. 4, fig. 6)
Corbula morini de Loriol, 1866 (p. 43, pl. 4, fig. 7)
Neoera mosensis Buvignier, 1852 (p. 10, pl. 8, figs. 26–28).

Although it is not yet clear whether the above are conspecific with *J. edwardi*, it is almost certain that they belong in *Jurassicorbula*.

In the following, the type species of *Jurassicorbula* is described in detail in order to provide more information on the genus.

The figured specimens have been deposited in the collections of the Serviços Geológicos de Portugal, Lisbon.

Jurassicorbula edwardi (Sharpe, 1850)

Figs. 1–2

* 1850 *Corbula edwardi* sp. nov. – Sharpe, p. 181–182, pl. 21, figs. 2a–b.
1875 *Sphaenia pellati* sp. nov. – de Loriol, p. 160, pl. 11, figs. 13–16.

Fig. 1. Left (a) and right (b) valves of *Jurassicorbula edwardi* (SHARPE). Pteroceriano, cliff south of Praia da Areia Branca; × 1.

Description: Medium-sized, very inequivalve, slightly rostrate shell; longer than high. Right valve strongly inflated, left valve only slightly so. Left valve smaller than right, posterodorsal and ventral margins of right valve protruding slightly beyond those of left valve. Anterodorsal margin straight, anterior margin very convex and tending to a point, ventral margin regularly curved, posterior margin trunco-rostrate, posterodorsal margin straight. Posterior part of shell depressed in both valves. Region of greatest tumidity of shell somewhat anterior of centre. Umbones slightly anterior of centre. Beak of right valve orthogyrate to slightly prosogyrate, beak of left valve distinctly opisthogyrate. With very large lunule, delineated by rounded ridges. Escutcheon very long, narrow, broader in left valve than in right. Surface ornament of right valve consisting of comarginal ribs between which faint growth lines are visible. Ornament of left valve similar to that of right, but more irregular and only strongly developed near the ventral and posterior margins; remaining part of shell provided with faint comarginal growth lines.

Hinge of right valve with one, large, narrow, upward curved cardinal tooth anterior to beak; below beak is a deep, broad resilial pit, triangular in shape, extending considerably dorsad of the cardinal tooth. With two posterior and one anterior lateral tooth. Dorsal of the anterior lateral and between the posterior laterals are distinct grooves, into which the dorsal margins of the left valve fit.

Hinge plate of left valve facing obliquely outwards. With triangular cardinal socket and distinct anterior and faint posterior lateral socket. Cardinal socket strongly undercut anterodorsally. Chondrophore elongate, relatively narrow, projecting slightly beyond hinge plate and sloping posteriorly; with faint median groove.

Pallial line with very shallow sinus.

Remarks on the palaeoecology of *Jurassicorbula*

The ecology of corbulids has recently been summarised by LEWY & SAMTLEBEN (1979). In the Recent, the group seems to be fairly eurytopic, being able to flourish under a range of oxygen, temperature and salinity conditions. However, due to their slow burrowing motion, they require low-energy environments. Judging from the limited evidence available, fossil corbulids seem to have been ecologically similar.

Jurassicorbula is widespread in marginal marine environments in the Upper Jurassic of Portugal and elsewhere (Boulonnais, Paris Basin). It exhibits a clear prefe-

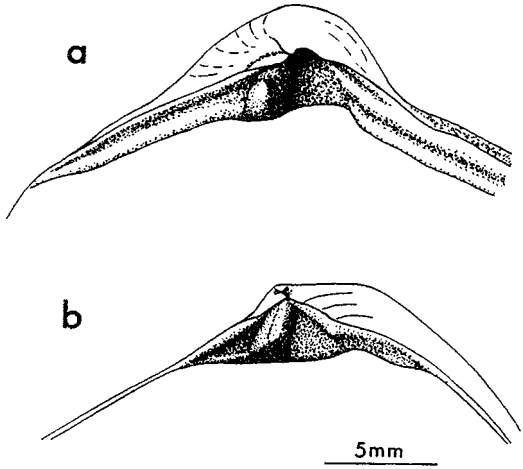

Fig. 2. Hinge of right (a) and left (b) valves of *Jurassicorbula edwardi* (SHARPE). Pteroceriano, cliff south of Praia da Areia Branca.

rence for fine-grained sediments, occurring mainly in clays, silts, marls and micritic limestones. Like the Recent *Corbula (Varicorbula) gibba*, *Jurassicorbula* was probably a shallow burrowing suspension-feeder and most likely was adapted for dealing with large amounts of inorganic matter taken-in during the feeding process (YONGE 1946). It was thus well adapted to life in soft sediment where no distinct sediment/water interface existed.

Jurassicorbula edwardi typically occurs in near-shore sediments which show evidence of having been deposited under periodically reduced salinity. Very low diversity shell beds of *J. edwardi* indicate that the species may have been able to tolerate mesohaline conditions (FÜRSICH, 1981). As in the Recent *Corbula gibba* (LEWY & SAMTLEBEN 1979; fig. 3) the ventral margin of the smaller left valve of *J. edwardi* meets the right valve almost perpendicularly. The additional development, in *Corbula gibba*, of a thick inner conchiolin layer permits very tight closure of the valves – a clear advantage for a life in conditions which were from time to time unfavourable. Although no conchiolin layers are preserved in *Jurassicorbula*, their former presence and a similar adaptation to fluctuating conditions seems likely.

In summary, *Jurassicorbula* was thus probably able, like several other fossil and Recent members of the family, to tolerate considerable environmental variability, particularly with regard to salinity.

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