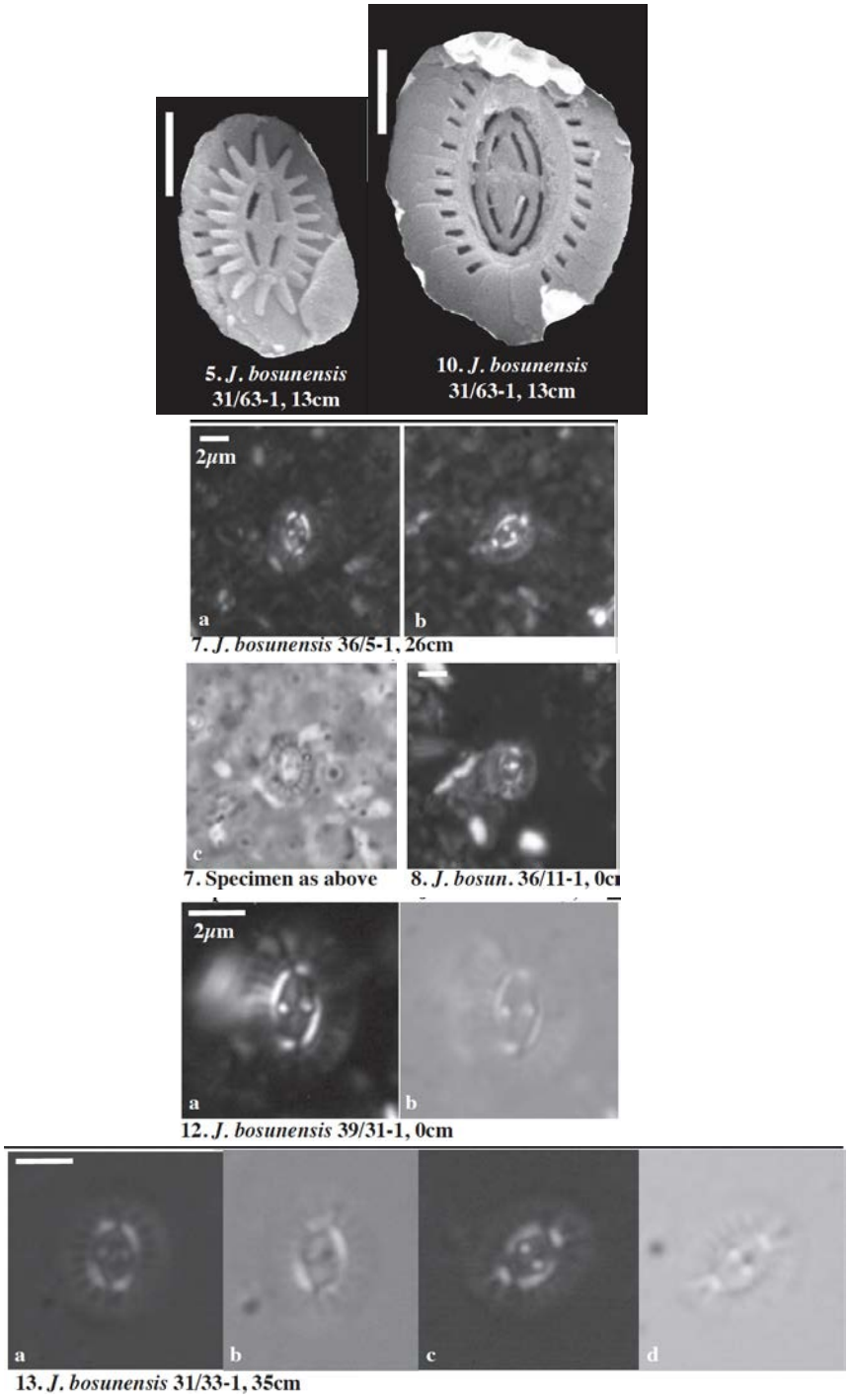
53. Jimenezberrocosoia bosunensis (Jeremiah, 2001) emend. Lees & Bown (2016)



Pl. 1, figs 5, 7, 8, 10, 12, 13

Basionym: *Crucibiscutum bosunensis* Jeremiah, 2001, p. 73, pl. 1, figs 7 (holotype), 8. Jeremiah, J. 2001. A Lower Cretaceous nannofossil zonation for the North Sea Basin. *Journal of Micropalaeontology*, **20**: 45–80.

2007 *Crucibiscutum salebrosum*? (Black, 1971) Jakubowski, 1986; Lees, p. 44, pl. 5, figs 24–31.

Remarks: Lees (2007) questionably identified LM images of this form as *Crucibiscutum salebrosum*, which, based on Black's holotype (SEM of proximal view), has a central cross that almost fills the central-area and comprises four almost equidimensional bars. Unfortunately, Black (1971) did not provide any LM images and so later reports of *C. salebrosum* have depended on LM interpretations of that holotype; however, these seem to show that the central cross is entirely birefringent (*e.g.* Bown *et al*., 1998, pl. 10, fig. 25). Whilst Jeremiah (2001) admitted that he was essentially using stratigraphic non-contiguity to distinguish between his new *C. bosunensis* and *C. salebrosum*, his LM holotype actually shows a distinctly longer, dark axial bar, with the shorter short-axis bars being highly birefringent when rotated. So, the Lees (2007) images actually conform to *bosunensis*, in terms of overall XPL view, size and central-area proportions.

On closer inspection, our LM images show that our forms have *Jimenezberrocosoia*-style rim-slits, especially visible when viewed in PC (Pl. 1, fig. 7) or PPL (Pl. 1, figs 12, 13). We contend that our LM images of *bosunensis* conform to the SEM images in Pl. 1, figs 5 and 10, and that these are simply well-preserved forms of *bosunensis*. Thus, we have placed *bosunensis* into *Jimenezberrocosoia*.

Emended description: LM/SEM - broadly elliptical, small to medium-sized (~4–6μm long) *Jimenezberrocosoia* coccoliths; rim dark in XPL, with bright inner cycle; relatively short slits between elements of distal shield particularly visible in PPL (may not be visible in less well-preserved specimens); moderately wide, open, elongate-elliptical central-area (approximately equal to width of rim) spanned by axial cross-bars, long-axis bar being subrhomboidal in centre, but thinning into straight ends that attach to inner tube-cycle, surrounded by a single set of concentric bars (Pl. 1, fig. 10; note that concentric bars visible in SEM images are not particularly visible in any of our LM images); short, straight short-axis bars appear bright at 45° rotation, whilst long-axis bar goes into extinction. Proximal view shows again rim composed of elongated, widely-spaced elements and central cross structure attached to inner tube-cycle, proximally (Pl. 1, fig. 5).

Differentiation: This species is distinct from *J. birchiae* because the rim slits in *bosunensis* appear to be relatively shorter, the central-area is relatively wider, the central cross is constructed of different-shaped bars, and *birchiae* bears a small spine; *bosunensis* is also larger, being ~4–6μm, as opposed to 3μm or less (*birchiae*).

Occurrence: TDP Sites 15, 22, 26, 30, 31, 33, 34, 36, 39; Middle Cenomanian-Coniacian; UC3a/b–UC11.

Discussion: Although the basic rim structure of *Jimenezberrocosoia* is biscutacean, it differs from all other Mesozoic rims in possessing slits between the distal shield elements and in

having a proximal shield of narrow, widely-spaced elements. It is possible that the distal-shield slits could overgrow in less well-preserved specimens, and the central structure in *Jimenezberrocosoia is* reminiscent of that in the biscutacean *Sollasites lowei* (Bukry, 1969) Rood *et al*., 1971 - an axial cross surrounded by a set of concentric bars, that structure also being anchored to the rim at the axial points. However, although the holotype of *S. lowei* shows calcite overgrowth (Bukry, 1969, pl. 22, fig. 6), other SEM images of better-preserved *S. lowei* specimens (*e.g*. Bown & Cooper, 1998, pl. 4.5, fig. 8) clearly show no evidence of overgrown rim slits. Furthermore, the central-areas in both *J. birchiae* and *J. bosunensis* are proportionally, respectively, much smaller and smaller than in the holotype of *S. lowei*, in which the central-area is twice as wide as the rim. The bars are straight and all of equal thickness in *S. lowei*, whereas the axial bar in *J. bosunensis* is subrhomboidal. There are other iterations of this central structure in the Mesozoic: Jurassic species with similar central structures include forms with rims that do not appear to be biscutacean, the Oxfordian holotype of *S. concentricus* Rood *et al*., 1971 (proximal view) appears to have a loxolith rim, for example.

Crucibiscutum is another biscutacean form with an axial cross (*e.g. C. salebrosum* (Black, 1971) Jakubowski, 1986 as illustrated in Bown *et al*., 1998, pl. 5.3, fig. 13), but this genus does not have slits in the rim, nor concentric bars.

Lees, J.A. & Bown, P.R., 2016. New and intriguing calcareous nannofossils from the Turonian (Upper Cretaceous) of Tanzania. *Journal of Nannoplankton Research,* **36**(1): 83–95.