

## Molecular phylogenetic position of *Reticulofenestra sessilis*

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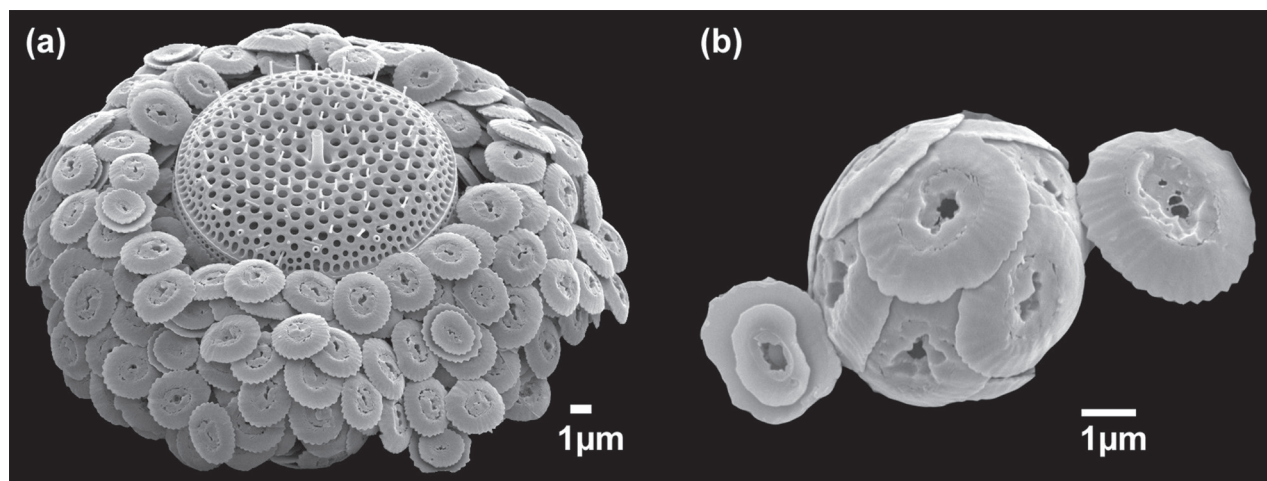
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Here we report on a newly isolated culture strain of *Reticulofenestra sessilis* (Prymnesiophyceae), a coccolithophore that is known to form symbiotic colonies around a diatom (Figure 1a). The clonal culture strain Usa-1 (Figure 1b), which was collected from subsurface seawater from offshore Usa (Kochi, Japan), was isolated from a colony that surrounded a diatom of the genus *Thalassiosira*. The diatom cell, which co-occurred with the colony of *R. sessilis*, died in the early stage of culture experiments, and the cells of *R. sessilis* grew in the f/2 medium without diatoms. Phylogenetic reconstructions, based on classical ribosomal markers (18S and 28S rRNA), suggest that *R. sessilis* has a closer affinity to *Gephyrocapsa oceanica*, *G. muelleriae*, and *Emiliania huxleyi* than to *G. ericsonii* and *G. parvula* (the latter species until recently was classified in the genus *Reticulofenestra*). Phylogenies

constructed with cytoplasmic markers (mitochondrial *cox1*, *cox3*, and plastidial *tufa*) confirmed the clustering of *R. sessilis* with *G. oceanica*, *G. muelleriae*, and *E. huxleyi*, but sequences were highly divergent, and the exact phylogenetic position within this clade was not stable between the markers. Our results provide new evidence on reticulate evolution within the *Gephyrocapsa* complex, giving further support for the hypothesis of past hybridization between some members of the family Noëlaerhabdaceae. The fact that the two extant species, which were classified until recently within the genus *Reticulofenestra* on the basis of morphological similarity of their coccoliths (noëlaerhabdacean coccoliths without slits between shield elements and without a disjunct bridge) but do not form a distinct clade with any of the genetic markers tested, highlights the evolutionary plasticity of coccolith morphology in this lineage.



**Figure 1:** SEM images of *Reticulofenestra sessilis*. (a) A colony of *R. sessilis* surrounding a diatom from lower photic zone of the Gulf of Mexico, and (b) *R. sessilis* strain Usa-1 established in this study