

## Crystallographic direction of coccolith elements of the marine alga *Florisphaera profunda* and its fossil group, *Discoaster*

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Selected area electron diffraction (SEAD), high-resolution transmission electron microscopic and scanning electron microscopic analyses of coccoliths, the exoskeleton of certain unicellular algae (the coccolithophores), were performed to determine crystallographic nature of two types of nannolith elements, *Florisphaera profunda* and *Discoasters*. The [0001] direction (c axis) of a pentagonal plate like element of *F. profunda* is oriented parallel to its face and in the direction of elongation to the plate-like element. Its crystallographic nature mostly resembles to the proximal shield element of *Emiliana huxleyi* based on Mann and Sparks (1988).

On the other hand, a nannolith of *Discoasters* is composed of a form like the frame of spread umbrella in which bent leg (called 'ray') radially combined. There are mainly the five-rayed and six-rayed types and the latter type has two kinds of tip shapes, the linear tip type (*Discoaster brouweri*) and the Y character tip type (*Discoaster variabilis*). Based on the overgrown method of Okazaki and Inoue (1976), each ray seems to be respectively the single crystal. Moreover, the [0001] direction of a ray is identical on the five ray type and six ray type and its direction is perpendicular to the tangent plane of the central area of *Discoasters*. Therefore, each base part of rays is almost perpendicularly elongated for the [0001].

Each ray is being joined together in the plane which is parallel for [0001], but it is still uncertain whether it is joining the five ray and six ray type together in the identical plane.