有孔虫の殻における水平および垂直なテクスチャー
Lateral and Vertical Textures in Shells of Calcitic and Aragonitic Foraminifers

*中島 希実子[1]、鈴木 萌菜美[1]、長井 裕季子[2]、緒明 佑哉[1]、豊福 高志[2]、今井 宏明[1]
*Kimiko Nakajima[1], Monami Suzuki[1], Yukiko Nagai[2], Yuya Oaki[1], Takashi Toyofuku[2], Hiroaki Imai[1]

1.慶應義塾大学理工学部応用化学科、2.独立行政法人海洋研究開発機構
1.Department of Applied Chemistry, Keio University, Yokohama, Japan, 2.Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan

Although shells of various foraminifers were reported to be composed of unique layered structures, details of the crystallographic structure have not been clarified sufficiently. Here, we investigated the shells of foraminifers, calcitic *Ammonia beccarii* and aragonitic *Hoeglundina elegans*, using scanning electron microscopy (SEM), transmission electron microscopy (TEM), and selected area electron diffraction (SAED). Despite the difference in their crystal polymorph and shapes, they exhibited similar textures in micro- and nano-scales. The shells were revealed to consist of single-crystalline micrometric domains with their c axes perpendicular to the shell surface from SAED patterns of platy samples 100 nm thick prepared using a focused ion beam (FIB) technique. Cross-sectional SEM and TEM observations showed the presence of lateral organic layers ~10–20 nm thick with ~200–400 nm intervals in the single-crystalline domains. Whereas a micrometric layered structure has previously been reported as a periodic growth pattern, we discovered finer lateral textures. On the other hand, a columnar structure ~100–400 nm wide derived from vertical textures was observed on the cross-sections after mild etching of the shells in a diluted acetic acid solution. We also found the vertical textures which originated from strains of the crystal lattice as a difference of contrast in the TEM images of the FIB-cut samples. The columns were produced through selective dissolution of the strained area. Therefore, the foraminifer shells of the two species were deduced to consist of micrometric single-crystalline domains having lateral and vertical textures with organic thin layers and strains, respectively, regardless of the difference of polymorph.

