

## Ecological and morphological analysis of radiolarians based on laboratory culture and X-ray micro-CT technology

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Living radiolarian researches have provided us with fundamental data on radiolarian ecology including feeding behavior, symbiosis, and parasitism. These researches together with detailed morphological analysis are expected to expand our understandings of past pelagic environments. Detailed observations of feeding behavior of laboratory cultured radiolarian specimens make it possible to understand the relationship between skeletal morphology and feeding behavior. Four types of feeding strategy well correspond to skeletal morphology in extant radiolarian taxa. High diversity of radiolarian skeletal morphology is partly related to having a variation in feeding strategies. The wide variation in feeding behavior means that radiolarians occupy several kinds of ecological niches in marine environments. We can infer feeding behavior of extinct radiolarian group based on their skeletal morphology. Once we recognize the role of radiolarians in food web in the modern ocean environments, we can apply it to reconstruct marine ecosystem in the past. Fluctuation in morphological diversity of radiolarian skeletons is well documented in fossil records. This fluctuation can be interpreted as change in the number of ecological niches in the marine eco-system through time. Recently developed X-ray micro-CT and layered manufacturing technology is essential for detailed morphological analysis of radiolarian skeletons.

Keywords: radiolaria, laboratory culture, X ray micro-CT technology, detailed morphological analysis, pelagic realm