

Life History of Foraminifera: Stable Isotopic and Elemental Proxies

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Abstract

Foraminifera are single-celled microscopic life that occupy various niches of modern oceans and often form the bulk of the sediments in deep sea and tropical coral reef settings. They were equally widespread in the geologic past since Cambrian and episodically formed thick sequences of limestone particularly in Permian, Cretaceous and Eocene times. Although the biology of this group of micro-organism is somewhat better understood today due to several observations in natural environments and laboratory cultures, most aspects of foraminiferan biology are still not known. It is particularly true for the palaeobiology of a large number of fossil taxa which have no living representatives. Therefore, proxy data needs to be studied to interpret life history of foraminifera. Several aspects of life history can be understood by oxygen and carbon isotopic composition of their tests. The temperature of their habitat, temperature tolerance, reproduction, depth distribution, life span and symbiosis are some of the major life processes that can be inferred by isotopic analysis of the foraminiferal carbonates. Some trace elements in the tests also indicate temperature of the ambient water and, in symbiont-bearing species their composition is observed to be influenced by photosynthesis – respiration cycle. The potential of geochemical proxies in inferring the life history of foraminifera is being increasingly recognized in recent studies.

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Educational Qualification:

M.Sc.	Geology	Banaras Hindu University
Ph.D.	Micropalaeontology	IIT-Bombay

Appointments held:

1988	IIT Bombay
1986-1988	Lecturer, Kumaun University
1983-1986	Geologist, ONGC.

Research Specialization:

Areas of research

- (i) Biostratigraphy and palaeoenvironment of Cenozoic sedimentary basins
- (ii) Palaeobiology of foraminifera.
- (iii) Stable isotopes and trace element proxies of palaeoenvironment and palaeobiology in biogenic carbonates.

Current research work

- (i) Stable isotopes and trace elements in foraminifera from the coral reefs of Ryukyu Islands (Japan) and Lakshadweep archipelago (India).
- (ii) Linkage between climate and faunal changes in the Palaeogene rock records of India.

Other information:

- Visiting Scientist, Smithsonian Institution (1996)
- STA, Japan, Fellow (1999)
- JSPS Fellow – INSA/JSPS Exchange Programme (2000)
- Member, Program Advisory Committee, DST (1998-2004)
- Member, National Committee for IUGS (2000-2003)
- Member, Res. Adv. Comm. of Wadia Institute of Himalayan Geology (2001- 2007)
- Fellow, Geological Society of India
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Editorial Board: Journal of Petroleum Geology (Blackwell, UK)
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