

## Evidences for Climate Cycles in High Resolution Paleomonsoonal Records Reconstructed Through Foraminifera in Marine Sediments off Indian Coasts

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Reconstructing the records of past short and long term monsoon changes helps understand the factors that affect monsoon. Therefore, past monsoon records are generated from different parts of the world, by using various types of techniques. Out of the available set of techniques, those based on characteristics of marine microorganisms, especially foraminifera, from the oceanic regions are very helpful to reconstruct past monsoon changes.

In order to obtain knowledge about past changes in the rainfalls, foraminifera in marine sediments particularly from microenvironments off river mouths can be used. Studies on core samples off Karwar, west coast of India showed the clear signals of marked high rainfall around 4000 and 3500 years BP and reversal of rainfall condition since 3500 B.P. with a marked low at 2000 years BP. These findings gathered support from palynological investigations of the same core and foraminiferal studies off Oman, western Arabian Sea. In addition to this, a cyclicity of approximately 77 years in concentration of drought years was deciphered which is possibly regulated by Gleissberg cycle in the radius of the sun. Similar studies were conducted in areas off the central east coast of India and Myanmar coasts. Besides Gleissberg cycle, two more cycles of  $200 \pm 50$  years and  $22 \pm 3$  years were deciphered. These cycles show influence of Seuss Solar Cycle and Double Sunspot Cycle on monsoonal rainfalls. The cycles of  $200 \pm 50$  years has also been reported from marine sediments off west coast of India.

Although foraminifera have acquired the position of a very important and a very essential tool for many studies aimed to tackle environmental issues of the past and the present. But there still exists a need and scope for further development of foraminiferal techniques. This has further necessitated the establishment of laboratory culture experiments on living foraminifera to addresses successfully the new type of problems. .