



A Coral Based Study Reveals Extreme Paleo-oceanographic Events of the Recent Past

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Abstract

Northern sea of Sri Lanka is very representative of Northern Indian ocean with co-variability in the South China Sea and El-Nino region of the East Pacific, thus making Sri Lanka a desirous location for Paleo-oceanographic studies. North of Sri Lanka is highly influenced by the oceanographic changes of Bay of Bengal and harbour imprints of extreme oceanographic events of the past. Long lived corals carry images of its environment where it had been living, in terms of geochemical imprints. Hence skeleton of corals are diagnostic in determining past environmental conditions. This particular study used coral growth rate, Sr/Ca ratio and Mg/Ca ratio in determining extreme events of the recent past of Northern Indian Ocean. A coral core of 50cm was drilled through the main growth axis of a massive *Porites lobata* head at Point Pedro (PP). It was sliced into a 6mm slab along the growth axis and its X-radiograph revealed a continuous chronological history of 36 years from 1981 to 2016. Micro samples of 2mg weight were collected from each annual growth band and analysed in an ICP-OES for stable isotopes. Sea Surface Temperature (SST) derived from Sr/Ca and Mg/Ca paleo thermometric proxies were observed against time. A sudden increase of SST was observed during 1997/1998 followed by the death/bleaching of the coral which started regenerating/recolonizing in 2001. It was clearly identified as the strongest El-Nino of the century which affected Indian Ocean during 1997/1998 period which was responsible for mass bleaching and death of many coral reefs around Sri Lanka. During the 1980's average growth rate of *Porites lobata* was 15.63 mm/yr and it has been decreased up to modern average growth rate of 13.3 mm/yr. Increase in SST over the past must be the reason for reduced growth.

Key words: Corals, El-Nino, Growth rate, Sea Surface Temperature, Sr/Ca

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