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HOLOCENE SUMMER MONSOON VARIABILITY- EVIDENCE FROM MARINE SEDIMENT OF WESTERN CONTINENTAL SHELF OF SRI LANKA

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Understanding long term variability of Indian monsoon system is essential for better climate forecasting which is a prerequisite for agricultural development and disaster management. Yet, it has been a least attended scientific question in Sri Lanka. Therefore, this study was carried out to understand the monsoonal variability during the Holocene using multiple proxies on a sediment core, representing unmixed summer monsoonal record.

A 390 cm long piston core was obtained from the continental shelf off Negombo by National Aquatic Resources Research and Development Agency (NARA), was used for this study. This site mainly receives sediment from rivers fed by summer monsoon. Colour reflectance and chemical composition of the sediments, and $\delta^{18}O$ and $\delta^{13}C$ of *Globigerinoides ruber* foraminifera, extracted from the sediments were measured at 0.1-2.0 cm resolutions. Principal component analysis (PCA) of chemical compositional data (XRF-PCA) and colour reflectance data (DSR-PCA) was performed to extract important components that represent climate variability. Benthic and planktonic foraminifera species that indicate upwelling were counted at 2 cm resolution. Radiocarbon dating was carried out using intact micro-shells.

Results indicate that upwelling proxies ($\delta^{13}C$, foraminiferal proxies, and colour reflectance-Chlorophyll) and $\delta^{18}O$, which indicates evaporation-precipitation (E-P), increased during 8000-10000 cal yrs BP, 2000-4000 cal yrs BP and again after 1000 cal yrs BP. This increase in upwelling and E-P indicates strengthening of summer monsoon during these periods. However, terrestrial proxies, (XRF-PC1-Terrestrial, Ti, and DSR-PC3-iron oxides)indicate decrease in terrestrial influx which represents rainfall, from 6000-1000 cal yrs BP followed by an increase after 1000 cal yrs BP. Gradual decrease in precipitation has been observed locally as well as regionally after around 6000 cal yrs BP followed by an increase after 1000 cal yrs BP. The contrast behavior of strengthening monsoonal winds and decreasing precipitation during 2000-4000 cal yrs BP has also been observed in Arabian Sea close to the west coast of India. Although monsoonal wind strength is increased, change in its direction, which decreases orographic effect, could be a possible reason for this phenomenon.