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### **Alive and dead foraminiferal assemblages at sandy beaches of Karachi coast- diversity, ecological distribution and responses to seasonal fluctuations**

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#### **Abstract**

Many species of living foraminifera are considered as [bioindicators](#) in littoral habitats which help to analyze environmental health of the beach. Benthic foraminifera in relation to habitat conditions and seasonal influences was studied for the first time from Pakistan coast, based on 48 core samples collected monthly with the help of hand corer (diameter =3 cm) from four stations at two sandy beaches during 2014-2015. The aim of this research is to explore distribution of alive and dead benthic foraminifera from the studied beaches of Karachi coast with respect to physicochemical environment, sediment characteristics and seasonal fluctuations.

For this study the top 0-2 cm sediment slice was analyzed for both living and dead foraminiferal assemblages. A total of 6615 cm<sup>-2</sup> specimens consisting of 3451 cm<sup>-2</sup> dead tests and 3164 cm<sup>-2</sup> living specimens were recorded which belong to 66 species out of which 47% species are miliolina, 42% rotaliina, 9% textulariina and 2% are spirillina. At Sandspit 3197 cm<sup>-2</sup> specimens were recorded while a sum of 3418 cm<sup>-2</sup> specimen were recorded from Hawksbay. The highest abundance was exhibited by rotaliina, miliolina and textulariina respectively. The most dominant rotaliina species were *Ammonia beccari*, *Pararotalia stellata*, *P. vensuta*, *Elphidium crispum* and *E. advenum* respectively. SIMPER showed that average dissimilarity between foraminifera abundance at Sandspit and Hawksbay is 18.51%. *A. beccari* and *P. stellata* are the most similar species within stations at both sites. The highest foraminifera abundance was recorded in Northeast monsoon season (3232 cm<sup>-2</sup>) and the lowest during pre monsoon season (398 cm<sup>-2</sup>). pH, salinity, organic content, nutrients and sediment grain size appeared to effect the foraminiferal assemblages. The most influencing factor for foraminiferal diversity and abundance is monsoon season at both studied sites.

#### **Keywords**

foraminifera, sandy beaches, Karachi coast, Monsoon season