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Title: INSIGHTS INTO PAST AND PRESENT ENVIRONMENTAL CHANGE IN INDONESIAN ESTUARINE ENVIRONMENTS

Abstract:

To a number of organisms, estuaries represent unstable habitats, as environmental parameters such as temperature, salinity, and currents show strong short-term variability. At present, human activities can result in noticeable anthropogenic influence and create considerable environmental stress to the estuarine organisms. Therefore, we have studied the distribution of benthic foraminifera, which are sensitive to environmental parameters, in two type localities of estuarine environments in Java. Southern Gombong, in Central Java used to be an estuarine environment during the Late Quaternary, but has been transformed into land. 13 subsamples of a 20m-long sediment core have been analyzed. Nine species of benthic foraminifera were found, dominated by *Ammonia beccari*, which accounted for more than 300 specimens in each sample, *Quinqueloculina poeyana*, and *Miliolinella lakemacquariensis*. The fluctuations of these species abundances and the change in the overall diversity reflect three distinct stages of paleoenvironmental change, related to the increase and decrease of the influence both from the ocean and fluvial, and accompanied by changes in water circulation, salinity, temperature and oxygen supply to the estuary. While benthic foraminifera in the Gombong area can be used to monitor changes in environmental conditions over longer time periods, the results from Segara Anakan lagoon surface sediments reflect recent environmental change. Currently, the lagoon is clearly affected by anthropogenic pollution, as shown by high heavy metals contents in the sediments. Only five of twenty sediment samples contain benthic foraminifera, represented by one species, *Ammonia beccari*, with very low abundance, reaching on average to only six specimens. As this species is known to be able to tolerate high levels of environmental stress, the lagoon appears to offer very unsuitable living conditions for organisms. In contrast, the former estuarine Gombong offered better living condition, since it had not been influenced by any anthropogenic activities.

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