

Relationship between beach-face gradient and distribution width of modern *Macaronichnus segregatis*-trace

Koji Seike[1]

[1] DEPS, Univ. Tokyo

Trace fossils provide not only information on the autoecology of ancient animals but also some information on the paleoenvironment in which the trace-producing animals lived. In order to utilize trace fossils, it is essential to investigate modern counterparts of particular trace fossils.

The horizontal and vertical extents of the extant opheliid polychaete *Euzonus* sp. and its feeding trace distributions were examined on a modern wave-dominated Pacific sandy beach of central Japan by periodical fieldwork and sampling from June to December, 2006, to reveal paleoecological and paleoenvironmental significances of its fossil counterpart, namely the trace fossil *Macaronichnus segregatis*. The horizontal distribution widths of *Euzonus* sp. and its feeding trace ranged from 5-40 m. Their vertical distribution widths also differed from 32-123 cm (*Euzonus*) and from 34-126 cm (trace), respectively. These extents were correlated with the beach-face gradient: it increased with decreasing slope inclination. On the other hand, the median levels of their distributions invariably occurred at around the high tide level, indicating that the vertical widths of *Euzonus* sp. and its feeding trace distributions changed equally upward and downward from the high tide level. Foreshore width (both horizontal and vertical) was also correlated with the beach gradient: it increased with decreasing slope inclination. These facts suggest that the changes in the extent of *Euzonus* and its trace distributions which correspond to optimal environment for interstitial fauna, vary in association with the beach morphodynamics. In addition, the invariant occurrence of the median level of a trace-bearing bed suggests that the trace fossil bearing bed can be useful as an index of high tide level (mid-foreshore environment) in the geological record. Also, the result of this study suggests that the vertical width of the trace-bearing bed can be applied to interpret a paleo-beach morphodynamic state.