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Development of a new method for evaluation of the coastal environment  
(tidelands and river mouth area)  
with the humic substance of surface sediment

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Summary

Humic substances are heterogeneous mixtures of naturally occurring large molecules in soils, waters and sediments. Among these, humic acid (HA) is extractable from alkaline aqueous solution and precipitate in acidic pH. The HA in coastal sediments is thought to share most of its major characteristics with terrigenous HA and share some characteristics with the HA in the seawater. Thus, the structural characteristics of humic acid provide general information about the environment of the river basin and the coastal region; these characteristics can, therefore, be used as a general environmental indicator. We have intended to specify the relationship of environmental elements of tideland and coastal region and structural features of HA in these areas. We had reported the structural features of HA in the surface sediment of the river mouse Chikugo-gawa River, the large river poured into Ariake-Sea, a lot of unique living systems dominated in this area. Expanding the methods of the evaluation of tideland HA related to the environmental condition of the area, this report presents the correlation of environmental condition and the HA more precisely.

At first, the seasonal differences of the structural features of HA in the surface sediment of the river mouse Chikugo-gawa River was observed from 2002 to 2005. From the summer at 2002 to winter at 2003, severe water shortage was occurred at the area. Accordingly, drastic change of the content of HA at the area which was caused probably from the reduction of terrigenous (aromatic) compound and accumulation of carbohydrate from algal cell wall was observed at the winter to spring of 2003. The change was remarkable from the seasonal changes of contents of HA by the continuous observation of the seasonal changes at 2004 to 2005 with 1-month interval.

Expanding the methods of the evaluation of tideland HA, humic acid was extracted from the estuary of a river mouse at Sone Tideland at the Kitakyushu City (This area was well-known as an egg-laying site of horseshoe crab). From the structural feature of humic acid extracted from surface of the three different site, the supply of terrigenous humic substances and river water influence the content of HA environmental condition, and it keep the constancy of the constituent of sedimental organics beyond the seasonal changes. These effects of terrigenous humics at the local riverine and coastal environment can be observed from the change of  $^1\text{H}$  NMR, UV spectra of the humic acid extracted from the area.