

Geoenvironmental evaluation of the Kuma and the Kawabe Rivers from compositions of sediments, Kyushu, Japan

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The Kuma and Kawabe Rivers are known to be one of the important rivers of Japan where natural environments have been preserved with species diversity in both fluvial and forestry systems. These rivers are also the places of breeding a sweetfish (an ayu). A gigantic ayu (over 30 cm length) has produced especially in the Kawabe Riverine. Present environment of the Kuma and Kawabe Rivers are evaluated from compositions of sediments including the bottom sediments of the Ichifusa Dam and other dams and dykes. This study is a cooperative research with Drs. Murakami, T. (Nagoya Women's University) and Hodoki, M. (NACS-J). Members of the Kumagawa and Yatsushiro Fisherman's Union and related persons helped field research. The sediments at the bottom of the Ichifusa Dam lake are characterized by alternating beds of fine sediments (muds) rich in organic matter and coarser sediments occasionally intercalated with fragments of wood. The organic muds deposited under the stagnant conditions during higher water level. At Arase Dam, finer sediments deposited over 1 m thick at both sides of the riverbanks. They show light color at the surface of the sections, but show dark gray or yellowish brown 20 cm below the surface. The ORP (oxidation reduction potential) values range from -50 to -100 mV suggesting deposition under reducing conditions.

The mixture of these sediments may be transported to the down stream of the Kuma River leaching to the mouth into the Yatsushiro Sea. The sediments of the intertidal flat at the Kuma River mouth are also compared to these fluvial sediments to disclose an influence and a mode of mixing with finer sediments and to evaluate sedimentary environments of the coastal regions. Cored sediments at the river mouth and Yatsushiro sea show usually negative ORP values (-50 to -100 mV) and have abnormally lower values (below -200 mV).

Present paper reports, 1) Changes in geochemical compositions of sediments from upper to down stream of the Kuma River, 2) evaluation of sedimentary environments, 3) transportation and mixing of finer sediments from the lake deposits to the coastal area, and 4) examination of the environments of the intertidal flat.