

## Water quality of Hiikawa and Kandogawa rivers in the eastern Shimane and its difference

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Here we evaluated water quality of the Hiikawa and Kandogawa Rivers running in the eastern part of Shimane Prefecture, SW Japan. River water was sampled between 2009 and 2011 and its major and trace element concentrations, Sr isotope ratio were measured together with basic information such as EC and pH. Our new findings are as follows:

(1) Concentration in  $\text{Na}^+$  and  $\text{Cl}^-$  are higher along the coastal region of Shimane Peninsula, decreasing to the Chugoku-mountain. This change is suggestive of the contribution from sea-salt grains transported by wind. The relatively high values on the Shimane Peninsula imply this peninsula has been acting as a topographic barrier. Their concentration is much smaller in the samples obtained from the Kandogawa River. This was probably due to the deep valley developed near the border of the plain and mountains, suppressing the transport of sea-salt grains into the upstream region of the river. On the contrary, the middle reach valley of the Hiikawa River is wider, which may allow the transport of sea-salt grains to the upper reach of the river.

(2) The higher concentrations of the  $\text{Sr}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{HCO}_3^-$  were obtained from the upstream region of the Hiikawa River. Very gentler topography even in the uppermost reach area of the Hiikawa River than that of the Kandogawa River may explain higher ion concentrations near the upstream end of the river.

(3) No major urban areas along the middle and upper reaches of the Kandogawa River may be the reason of smaller concentration in  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$  except for Mt. Sambe region where field for livestock farming is widely spread.

As the results, the dissolved ion concentrations are higher along the Hiikawa River and its major control factor may be due to topography, such as gentler topography along the Hiikawa River which allow penetration of sea-salt grains into the upstream region as well as promote reaction between rocks and water. The steeper topography, particularly seen in the middle reach of the Kandogawa River is due to andesitic volcanoclastics. The slight difference in geology between areas is reflected as differences in topography, leading to water quality difference between these two rivers.

Keywords: Water quality, Sr isotope ratio, Hexa diagram, Hiikawa River, Kandogawa River