Fluorescence XAFS analysis of local structures in perostracum of *Setashijimi* (*Corbicula sandai*)

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Lake Biwa is the largest monomictic freshwater lake in Japan and the most important water reservoir. It is home to endemic species of flora and fauna. *Setashijimi* (*Corbicula sandai*) is one of the endemic species to Lake Biwa. Only 50 years ago, the *setashijimi* was one of the most important game species in Lake Biwa, and people enjoyed shijimi clam gathering. However, now in the Red Data Book of Japan, the s*etashijimi* is classified as Vulnerable, while listed as only Endangered in the Red Data Book of Shiga Prefecture [1].

It is well known that the shell is an important organ on which an environmental signal was recorded. Generally, the shell consists of a periostracum and the main body. The main body is composed of $CaCO_3$ and conjugated protein. The periostracum is composed of organic materials as proteins. It limits shell abrasion or dissolution of shell $CaCO_3$ by acid waters and bottom sediments. In fresh water, the periostracum remains without dissolving fully. In this work, fluorescence XAFS spectra were used to determine chemical states of S species in the periostracum of the *C. sandai* sp.

Living specimens of *C. sandai* were collected from the lakebed in Lake Biwa. The shells have yellowish colored periostracum. After removing the inside and drying, the shells were set on the sample plates and sulfur K-edge XAFS spectra were taken with a soft X-ray XAFS beamline BL-10 and BL-13. The XAFS spectra exhibit two peaks at 2472 and 2473 eV. Spectra of the reference S compounds show several unique features [2]. The peak at ~2472 eV assigned to cystine, and the peak at ~2473 eV assigned to methionine. The abundance ratio of cystine depend on the measuring position. The umbo (large hump to the anterior end on the dorsal side) contained cystine at an abundance ratio smaller than that in the ventral margin. Because the umbo is the oldest part of the shell, this result suggests that the difference reflects the living environment.

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