Freshwater molluscan fossil assemblages in the floodplain deposits of the middle Pleistocene Kiyokawa Formation, Shimosa Group.

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Molluscan fossil assemblages are good indexes for analysis of depositional environments of the sedimentary rocks. The Shimosa Group yields large quantities of molluscan assemblages, which indicate a variety of marine depositional environments. On the contrary, freshwater molluscan fossils are extremely rare; accordingly, little is known about the inland water depositional environments of the Shimosa Group.

The excavation of the bone-bearing beds (Units B & C in Okazaki's abstract) of the Kiyokawa Formation revealed that these units yield freshwater molluscan fossils including Unio douglasiae, Anodonta woodiana, Corbicula leana, and Parafossarulus and Gyraulus gastropods. The shells of bivalves are commonly articulated and attain their adult size. Especially in the silts of Unit C, the unionid bivalves are often found in life position indicating that there was a stagnant shallow lake environment, which had continued long period enough for the prosperity of freshwater molluscan fauna.

Besides the depositional environments, these freshwater molluscan fossils are the key to knowing the pH conditions of their habitats. In general, extant unionid bivalves suffer shell corrosion at their umbonal regions, i.e. the older part of the shell, during life because the pH conditions of freshwater are principally low [5.6 (rainwater saturated to CO2) to 6-8 (world average of inland water)]. Even of in neutral pH conditions, shell corrosion occurs by physical abrasion against the substratum and biological boring of algae and bacteria. In the case of unionid fossils from the bone-bearing beds of Kiyokawa Formation, they have suffered no corrosion at their umbonal regions. This fact indicates that the paleo-pH conditions of the shallow lake sediments appear to have been higher than neutral. Such chemical condition may be an important factor to preserve the calcareous skeleton from pre-fossilization dissolution.