

**Title:** Research on the Conservation, Growth Conditions and Ecology of Unionoida

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Freshwater mussels of the order Unionoida is a spawning ground for bitterlings and are therefore an important species in freshwater ecosystems. However, they face global extinction threat due to habitat destruction and pollution. In this study, we investigated a species of Unionoida, *Unia douglasiae nipponesis* (*U. d. nipponesis*), in a riverine environment to determine its growth, lifestyle, and conservation strategies. Previous research has shown that *U. d. nipponesis* typically resides in sandy gravel riverbeds without sulfide deposits and eddies formed around their shells enhance their foraging efficiency in flowing water. Additionally, reproduction of *U. d. nipponesis* requires a host fish species. This study examined the possible variation in the shell orientation of *U. d. nipponesis* in response to localization direction of current velocity. An aquarium with the same flow conditions as those in the field was set-up to examine the behavior of *U. d. nipponesis*. Results showed that *U. d. nipponesis* tended to align their shells with the flow velocity, similar to their behavior in the wild. Therefore, water flow was visualized using a mixture of colored water and laundry glue, and it was found that the shape of the surrounding vortex changed depending on the orientation of the shell. In fast currents *U. d. nipponesis* positioned themselves to reduce resistance, whereas in slow currents, they created a higher resistance to optimize vortex formation. These findings suggest that *U. d. nipponesis* adjust its shell orientation in response to current strength. Therefore, *U. d. nipponesis* can be protected by maintaining a moderate-current environment and a sandy gravel bottom with a variety of coexisting fish species.