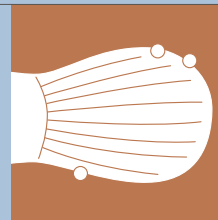


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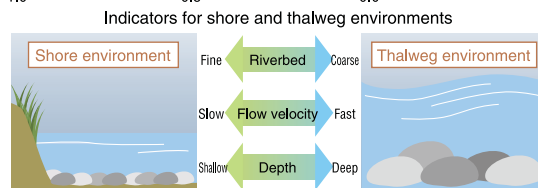
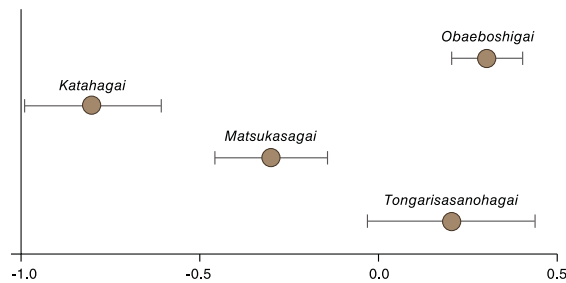
Glochidium

Glochidium larvae of unionoid mussels attach themselves to the fins and gills of fish to migrate



Study 1 Importance of diverse flows and natural bed materials in drainage channels

We examined the microhabitat of the lotic unionids in drainage channels in Seki, Gifu Prefecture. Four species of unionids found in drainage channels with a relatively natural environment each showed different habitat preferences. *Obaeboshigai* (*Inversidens brandti*) was dominant in the center of the flow (thalweg), while *katahagai* (*Obovalis omiensis*) was dominant in the shore areas, indicating that diverse flow patterns across the stream is important for maintaining unionid species diversity. In a study focused on *matsukasagai* (*Pronodularia japonensis*), we compared two adjacent drainage channels: one with a concrete bottom (Section 1) and the other with sand and gravel (Section 2). We found that the *matsukasagai* density in Section 2 was four times higher than that in Section 1. This was probably because Section 1 had minimal natural bed materials for use as unionid habitat and inappropriate habitat for fish species that the unionids use as hosts. Accordingly, the modification of drainage channels using concrete is likely to deteriorate the habitat quality for unionids due to alteration of flow patterns and bed materials.



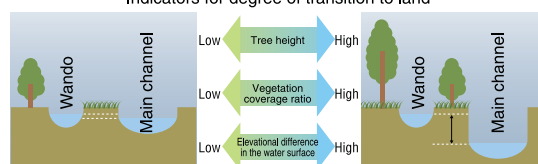
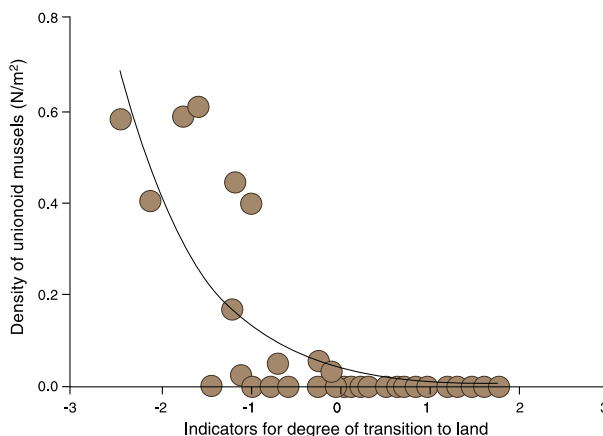
Microhabitat environment in a drainage channel



Isolated wando in the Kiso River

Study 2 Importance of turnover of water and sediment in wando in inundation

We surveyed 44 isolated wando (pools isolated from the main river channel during base flow) remaining in the middle reaches of the Kiso River basin. The presence of unionid mussels [consisting of *ishigai* (*Unio douglasiae nipponensis*), *tongarisanohagai* (*Lanceolaria grayana*), and *dobugai-zoku* (Anodonta families)] were confirmed only in 11 wando with extremely low densities. Wando where mussels were present were characterized with relatively short height of riparian trees, little mud in the sediment, and small differences in elevation from the water surface of the main river channel. These patterns probably derives from processes in which mud sediment is rarely washed away in areas that are infrequently inundated (because of the large difference in elevation) and the surrounding environment has more terrestrial conditions, promoting tree growth. Organic matter provided by excessive growth of riparian vegetation further accelerates the accumulation of mud. Moreover, there was a clear negative correlation between unionid density and indicator variable for the degree of transition to land, which is obtained through multivariate analyses. Therefore, alterations in flow patterns and channel morphology that promote transition of floodplains to land and tree growth may cause the deterioration of unionid habitat.



Presence in each wando