

Effects of mountain ranges on the genetic structures of the burrowing mayflies, *Ephoron* (Polymitarcyidae)

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Adults of polymitarcyid mayflies emerge simultaneously, and often swarm in large numbers. The adult stage is extremely short (1 to 2 h). In Japan, a polymitarcyid species, *Ephoron shigae* is observed. The adults emerge simultaneously and often swarm in large numbers in September. Because adults show positive phototaxis, swarming around lights on bridges has been observed. In addition, the legs of female adults are so degenerate that the females can not easily take flight and may die when they fall to the ground. Therefore, dead *E. shigae* individuals often accumulate on the streets like snow. The mayflies are not only distributed in Japan, but also Far East Russia and Korea.

In this study, I studied the genetic structures of *E. shigae* populations to examine, whether the populations are fragmented by mountains. In addition, I also examined the genetic structures of *E. nigradorsum* which is distributed in the Mongolian Selenge River basin.

As results, although *E. nigradorsum* had high genetic diversity, there was little geographic cluster of haplotypes within the river basin. In addition, the genetic structure showed stable type for long time. Although Korean *E. shigae* did not show clear fragmentation by geographic barrier such as the Sobaek Mountains, Japanese *E. shigae* was divided to two groups, the Eastern and Western Japanese groups. The migration and gene flow of Japanese *E. shigae* would have been affected by the geological events around the Fossa Magna and the Japanese Alps.

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