

3-3-19. Dichotomous Morphological and Molecular Characters Between *Ephemera orientalis* and *E. sachalinensis*

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A possibility has been raised to use *Ephemera orientalis* as an index species to assess a specific aquatic environment. Another species in this genus, *E. sachalinensis*, shares similar habitat and external morphology (for example, four longitudinal stripes on the abdominal tergum) with those of *E. orientalis* so that it is not easy to discriminate these two species. This study is focused on developing any dichotomous morphological and molecular characters between *E. orientalis* and *E. sachalinensis*.

Light trap was effective to collect both adult species in an upstream of Nakdong river. Much more *E. orientalis* adults were collected during entire investigation period from late August to late September in 2002, while a few *E. sachalinensis* were collected only in mid September.

In external morphological characters of adults, *E. orientalis* (13-15 mm) is relatively smaller than *E. sachalinensis* (17-23 mm). Male *E. orientalis* has a pair of curved claspers and prominent penes, while *E. sachalinensis* has a pair of straight claspers and concealed penes under the tergum.

Polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) was used to develop molecular characters to discriminate these two ephemerid species. Cytochrome oxidases (CO-I and CO-II) and cytochrome C (Cyt-C) regions were analyzed using universal mitochondrial DNA primers known in insects. *E. orientalis* showed a species variation in Alu I, Msp I, and Rsa I restriction sites within CO-I region. A specific forward PCR primer (5ACTGTAAATATATGATGTGCTCA3) had different binding affinity to CO-I region between *E. orientlis* and *E. sachalinensis*. Further restriction site polymorphism has been under investigation.