

An Example of Plecoptera Stamina

For many years, the amazingly complex genital structures of male Pteronarcyidae made me wonder about their functions. In 1998, I had an opportunity to preserve a mating pair of *P. reticulata* in the field to study the relative position of the various male and female structures during mating. At the occasion of the Plecoptera symposium held to Provo, in May 2000, I hoped to do something similar with some American taxa but was early. Although last instar larvae of *Pteronarcys californica* and *Pteronarcella badia* were common in the Provo River above the city, I found no adults. Therefore, I decided to take some last instar larvae home to Germany, rear them, and try my luck when back home in Europe.

A number of larvae were put into two 1 mm mesh nylon net bags which I suspended in the river on 23 May; no food was added but some of the fine detritus trapped on the outside of the bags was probably also washed into them. The bags were retrieved on 27 May and each was placed in a decapitated small plastic Coke bottle. The larvae spent the night on the windowsill in the student dormitory and travelled with me to Keystone, Colorado, the next day, for the NABS conference. Late the next day, the bags were suspended in the Snake River at Keystone. The river was turbid and discharge fluctuated because of snowmelt during the sunny days and frost at night. I noticed no detritus that could serve as food for the larvae.

On 1st June, the bags were retrieved from the Snake River. After two weeks in captivity, all larvae survived and were active. The bags were again placed into those bottles and stayed in my room until my departure, the following day. In the afternoon, the bags were briefly wetted at a chlorine-smelling drinking water fountain in the airport. Subsequently, they were kept dry in my cabin luggage for approximately another 15 hours. On 3 June, all of the 15 *Pteronarcys* were alive while half of the *Pteronarcella* larvae had died, only about 15 of them remained. The survivors were transferred to an aerated 25 litre drum with clean stream water and kept at ambient temperatures, close to 20°C in the day. Within a week, 4 male *Pteronarcys* emerged but unfortunately all females got stuck in their larval skins. The *Pteronarcella* fared better. Although they had suffered initial losses, 4 pairs emerged and mated shortly afterwards. They were sprayed with ethyl Chloride (C₂H₅Cl) during mating to freeze them in this position; however, all couples separated immediately.

This is an example of the exceptional stamina of Plecoptera. The experience provided also some additional insights: One dying female *P. badia* extruded 17 eggs which were incubated in vials with stream water. 13 eggs developed to eye-spot stage and 9 larvae eventually hatched, but only after exposure to 4°C, for several weeks. I was pleased to see where hatching larvae open their eggs and to study the first and second instar of *Pteronarcella*, none of which, I believe, are described.

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Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Perla](#)

Jahr/Year: 2001

Band/Volume: [19](#)

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Artikel/Article: [An Example of Plecoptera Stamina 11](#)