

## A study on life cycle of freshwater copepod in Chino-ike(Bloody lake), an ephemeral lake on the top of Mt.Akagi, central Japan

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Chino-ike, located on the top of Mt. Akagi at an elevation of ca. 1450 m, is known as an ephemeral lake in which water only appears from early summer to late autumn. Because of being an ephemeral lake, no fish exists there and its ecosystem is mainly composed of plankton. The species of plankton representative of Chino-ike is *Acanthodiaptomus pacificus*. This study aims to clarify the ecosystem in Chino-ike with special emphasis on the life cycle of *A. pacificus*.

The survey was conducted in June, October and December in 2018 and July, September, November and December in 2019. In 2018, lake water appeared on October 1 and lasted until on October 19. In 2019, lake water appeared on June 22 and lasted until September 29, and reappeared on October 12 and lasted until mid-December. In 2018, the maximum water depth of 98 cm was recorded on October 3. In 2019, the maximum water depths of about 180 cm and 200 cm and more were recorded on August 29 and on mid-October, respectively. The survey was conducted in October 2018 and in July, September, November and December 2019. Plankton samples were collected from 13 points (17 samples in total with different depths) in 2018 and 3 or 4 points (4-21 samples in total with different depths) in 2019. The number of plankton in a given volume of lake water was counted on the samples in the laboratory. For the surveys in June and December 2018 when the lake dried up, surface soil samples were collected at the same locations for counting the number of dormant eggs and plankton. Sedimentation traps were installed at two locations on the lake bottom to collect dormant eggs from September 26 to December 8, 2019.

As a result of the study, for adult and copepodite larvae, a higher population density was found at deeper water depths. Nauplius larva showed a higher population density at the surface water to the contrary. The optimal water temperature for *A. pacificus* growth proved to be 17°C, hatching and growing into adults in about two weeks. Additional findings including the life cycle of *A. pacificus* are to be discussed at the conference.

A reconnaissance analysis of nitrogen and carbon isotopes indicates one of the reasons why the lake water in Chino-ike turned red in late autumn is the mixing of *A. pacificus* and lake water. We are also elucidating food habits of *A. pacificus* in more detail on the basis of nitrogen and carbon isotopes from now on.

Keywords: Mt. Akagi, freshwater copepod, carbon and nitrogen isotopes, ephemeral lake, *Acanthodiaptomus pacificus*, aquatic ecology