Walking behavior of the Antarctic tardigrade, Acutuncus antarcticus

Kurumi Yoshimura[1], Megumu Tsujimoto[2]
1,2 *Faculty of Environment and Information Studies. Keio University*

According to Vogel (1988), swimming is a better mean of transportation than walking in terms of energy consumption for aquatic animal. Despite having many similarities in their ecology including habitats and tolerance abilities against extreme environments as the Antarctic terrestrial meiofauna, rotifers and nematodes swim, on the other hand, tardigrades walk for the transportation. We wondered whether there are any advantages for Tardigrada to choose walking instead of swimming as a mean of transportation.

In the present research, we observed the walking behavior of the Antarctic tardigrade, Acutuncus antarcticus. Acutuncus antarcticus is the tardigrade species endemic to Antarctica and widely distributed around the continent (Velasco-Castrillón et al. 2014). Individual tardigrades of the A. antarcticus LSW strain (Tsujimoto et al. 2015, 2020) were placed on flat agar plates and their walking behaviors were recorded using Stereomicroscope (Olympus Research Stereomicroscope System SZX10) and attached USB camera (Raymer's USB digital camera for microscopes WrayCAM-NOA2000). We then collected the data of the following four characteristics, 1) walking speed, 2) type of the walk (classification of how they walk), 3) movement during the directional change, and 4) grounding ratio (percentage of the legs which are attached on the plate) and analyzed. Some of the data we collected here on the Antarctic tardigrade will be compared from the data obtained from the previous study on two other temperate species of tardigrades, Ramazzottius varieornatus and Milnesium sp., and we will try to find the differences in their walking behavior.

References

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