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Feeding ecology of brown bears of the Southern Kurils revealed by multi-stable isotope analysis

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Various methods have been conducted for food habit analysis in wildlife. Direct observation, contents analysis in scats or in stomach, and bio-element stable analysis are the conventional methods. However, Direct observation is time and labor consuming, and scats and stomach contents analyses only provide information just before the sampling; these methods also cannot evaluate assimilated food variation because of different digestabilities among food items. Furthermore, stomach contents analysis can only apply to dead animals. In contrast, stable isotope analysis has been used more frequently for revealing food habits in recent years, because stable isotopic compositions of animal tissues reflect those of their foods. Any tissues could be used for the analysis, and depending on the tissue turn over time, we can obtain short- and long- term diet information of a specific animal.

Brown bears (*Ursus arctos*) are found on the Kunashiri and Etorofu islands located among the Southern Kuril Islands and their ecology is not well clarified. In September 2010, we conducted an ecological survey of brown bears on the Kunashiri Island and collected the hair samples of brown bears. In this study, we determined stable carbon, nitrogen and sulfur isotopic compositions of these hair samples to estimate the feeding habit of brown bears on the Kunashiri island.

A strong positive correlation between carbon, nitrogen and sulfur isotopic compositions was observed, indicating a small variation in food sources. Moreover, every bear showed a similar isotopic pattern from hair root to tip, which suggests that bears have a similar feeding history; consume plants in spring and salmons from summer to autumn. Compared to brown bears on the nearby Shiretoko Peninsula, which consumed not only plants and salmons but also sika deers (*Cervus nippon*) and anthropogenic crops, Kunashiri bears highly depended on abundant salmon resources under an environment without influences of human activities. We are planning to analyze the hair samples of brown bears on the Etorofu Islands for further information.

Keywords: brown bears, Kunashiri, Etorofu, stable isotope analysis