



Behavior of Brown Bears During Feeding in the Sikhote-Alin

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ABSTRACT

Feeding methods and habits of brown bear in Sikhote-Alin are varied and specific for each type of feeding behavior depending on the composition and condition of food, its availability and abundance, season, animal's sex, age, physical condition, personal preferences and experience, the presence of competitors and disturbance from other predators and humans. A feature of the feeding behavior of bears in Sikhote-Alin is consumption of the remains of meals of tigers.

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Introduction

Brown bears (*Ursus arctos*) in Sikhote-Alin (Russian Far East) prefer pine–broad-leaf and broad-leaved forests. The diet of bears in the region is widely varied (Bromlei, 1965; Seryodkin, 2012), which leads to behavioral diversity of the species associated with procuring and consumption of food. The study of traces of life activities of animals allows the researchers to determine the diet of the bear and the characteristics of its food-procuring behavior, which is important for the assessment of the predator population and development of scientific measures for its control.

This paper is based on the author's research conducted in Sikhote-Alin in 1998–2015, as well as on literature review.

Feeding on Herbaceous Vegetation

Herbaceous vegetation is essential in the diet of Sikhote-Alin brown bears from May till August, and stays in the diet in September as well. The animals spend much time in floodplains of rivers and creeks where the most juicy and dense vegetation grows. Here they graze in mass feeding on aerial parts of grass, as well as underground parts of some species of plants.

The most common among the traces of grass eaten by bears is the remains of Tatewaki butterbur (*Petasites tatewakianus*) – 80% of all traces. Bears often eat the leaves completely off the young plants of this species up to 15 cm high. For more mature plants only leafstalks are consumed, while leaf blades are not used for food. When grazing a bear grabs a juicy leafstalk at the bottom with its teeth and pulls it. The leaf with most of the stalk breaks off, and at the remaining part of the stalk revolute fragments of the tissue are formed (Fig. 1). In plants of Umbelliferae family (hogweed – *Heracleum* spp., angelica – *Angelica* spp.) bears prefer to eat the stems and leafstalks (Bromlei, 1965). The animals usually feed on butterbur, angelica and hogweed up to the point of almost complete consumption of these plants in the places of their local habitat. Bears consume the entire vegetative part of many species of grass – leaves with the stem (*Corydalis ochotensis*, *Urtica angustifolia*, *Impatiens noli-tangere*, *Filipendula palmate*, etc.).

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Fig. 1. Remains of a plant *Petasites tatewakianus* eaten by brown bear.

At leisure grazing in floodplains bears trample down the grass leaving clearly discernible tracks. For a more rational use of the feeding territory bears walk in shuttle-manner, the center line of which is the course of the creek or animal tracks. Usually the animal moves parallel to the direction of the watercourse. In areas with high concentrations of preferred plants, such as butterbur, bears can remain until they crop all the plants. When grazing on herbaceous vegetation bears can be distracted from their main activity eating insects found in the grass and mollusks.

Brown bears eat up underground parts of grassland plants such as tubers of *Arisaema amurense* and *Lilium distichum*. The animals pry the bulbs with their claws pulling them to the surface, then bite them off the stem and eat. At the site of such dig an almost invisible hole remains next to the aerial part of the plant. When procuring the roots of *Hedysarum branthii* animals make more notable excavations.

Feeding on Soft Fruit

Brown bears feed on berries by two basic ways: devour them from the plants or pick up fallen berries from the forest cover. The first way is more common. When feeding on berries of short-growing plants animals graze with their heads down to the ground picking berries in one or several pieces at once with their lips, depending on the density of berries on a plant. In this manner, the bears can for a long time eat red berry (*Rhodococcum vitis-idaea*) and blueberry (*Vaccinium uliginosum*) – the berries that are important for their diet. Tearing berries off medium sized shrubs (blue-berried honeysuckle – *Lonicera* spp., currant – *Ribes* spp., raspberry – *Rubus* spp., spiny eleutherococcus – *Eleutherococcus senticosus*) bears raise their heads to the branches, or if necessary, stand up on their hind legs. In this manner, feeding on honeysuckle (*Lonicera edulis*), the bear moves from one bush to another, tearing them one by one. At this the animal bows, crushes, and sometimes breaks the branches, going through them with its paws.

When feeding on the fruits of the vines (kolomikta actinidia – *Actinidia kolomikta*, tara vine – *Actinidia arguta*, Amur grape – *Vitis amurensis*, Chinese magnolia vine – *Schisandra chinensis*) bears grab the vine and shake it trying to drag it down from the support tree. Some fruit falls down to the forest cover and the bears pick them up. Soft fruits growing on trees (apple – *Malus* spp., Dahurian buckthorn – *Rhamnus davurica*, pear – *Pyrus ussuriensis*, bird cherry – *Padus* spp., hawthorn – *Crataegus* spp.) are almost inaccessible for brown bears due to the fact that the majority of adult animals are unable to climb trees. The animals bend the branches and eat up the fruit that they can reach or settle with fallen berries. Brown bears feed on berries of common bird cherry (*Padus avium*) more often than on fruit from other trees because bird cherry trunks often grow at a sharp angle to the surface which allows the animals to reach fruiting branches while standing.

The bears eat up berries and other soft fruit that fall from the trees, shrubs and vines by circling around fruiting trees. In this manner they pick up the fruits of Amur grape, actinidia, wild roses (*Rosa* spp.), honeysuckle, and spiny eleutherococcus.

Brown bears are more likely to visit berry beds with the most plentiful fruitage compared to neighboring berry beds (Mikhailovsky and Skryabina, 1972). If animals are not disturbed they repeatedly visit areas with the abundance of berries eating up a significant portion of the fruitage. Within two months (July, August) brown bears ate 43% of biological fruitage at a relatively large area in sedge blueberry bed. In a single feeding a bear ate up around 8 kg of blueberry, and in total the bears consumed approximately 7% of biological fruitage of the entire area of studied blueberry beds (Mikhailovsky and Skryabina, 1972).

In some seasons berries can be a background component of the diet of bears. Thus, cranberries constituted 97% of the diet of brown bears in the vicinity of the Sikhote-Alin Nature Reserve in the second half of August–September 1999. Animals come to berry beds long before the ripening of cranberries. As soon as the berry turns red the bears begin to eat it.

The nutritional value of berries is inferior to other fattening feed. In addition, thick-skinned berries, such as cranberries, are poorly crushed in the jaws of animals, and most of them remain intact passing through the digestive tract. Ripe berries are always

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