

A Dietary Shift in Sichuan Snub-nosed Monkeys

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川金丝猴的一次食物转变

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摘要: 先前的研究表明川金丝猴的食物具有季节性变化, 特别是在秋季主要取食植物的果实。然而, 在 2001 年秋季, 我们发现秦岭玉皇庙西梁群的金丝猴主要取食树衣类植物 (Lichens)。依据焦点动物取样法, 我们在 1997 年和 2001 年秋季分别获得 769 次和 828 次取食记录, 结果表明, 1997 年秋季的食物组成中 38 % 为果实和种子, 占主要成分, 其次是树衣占 21 %; 而 2001 年秋季主要取食树衣占 41 %, 果实和种子仅占 3 %。造成这个物种食物转变的原因是由于在春季末期, 一场大雪严重地摧毁了植物的花, 导致秋季果实非常稀少, 以致于猴子不得不转向取食植物的其它部位, 这证明了气候变化能引起这个物种取食行为的改变。在通常的食物类型缺乏时, 金丝猴不是通过转变其家域而是利用取食行为变化来满足生存需要。

关键词: 川金丝猴; 食物选择; 食物

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Species inhabiting seasonal environments may be required to consume food items that normally do not constitute a substantial portion of their diet. Presumably these alternate food choices provide enough nutritive value to meet their energy demands^[1]. Typically, Asian colobinae have diets that consist mainly of young leaves, fruits and seeds^[2,3]. A member of Colobinae, the Sichuan snub-nosed monkey (*Rhinopithecus roxellana*) consumes a combination of leaves, fruits, buds and bark. Flowers,

seeds and catkins also feature strongly in their diet. Arboreal lichen, although an uncommon food item for primates, is known to be consumed for this species almost every month of the year^[4-7]. The distribution of nutrients and defense compounds in colobinae may vary throughout a plant part^[8].

Previous studies have shown that the Sichuan snub-nosed monkey exhibited a seasonal change in the type of food consumed. In particular, a substantial proportion of

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the monkeys' diet in the autumn was fruits^[4,5,7]. Here, we document changes in the monkeys' diet from fruits to lichens as a result of heavy snowfall in the Qinling Mountains at the end of Spring in 2001. To date there haven't been any reports on the dietary change described in the species reference to climate impacts on food availability.

1 METHODS

The investigation was carried out in the Yuhuangmiao region, located in Zhouzhi Nature Reserve on the northern slope of the Qinling Mountains during September 2 - 10, November 14 - 30, 1997 and October 4 - November 5, 2001. Two troops are found in the area. The West Ridge Troop, occupying the west ridge, was used as the study troop^[6].

Instantaneous focal animal sampling at one minute intervals was used to record the plant species and those parts consumed by the different age/sex class of the monkeys^[9]. If the focal animal was out of sight, we then opportunistically chose another individual and began another focal bout. The sum of sequential food and their part records constituted one "focal bout". The focal method we used was similar to that described by Altmann^[10] and Long *et al.*^[11], with the modifications that (1) observations began opportunistically, rather than at previously-determined times, (2) the maximum span of the focal bout is 20 minutes, rather than by how long we could follow the focal animal. Observations were made using a Nikon Field-scope ED (20 - 45 X) from a distance varying from 50 - 500 m. In the course of tracking the monkey troops, feeding remains such as gnawed twigs, leaves, peels and stems were identified.

We collected 769 feeding records over 16 days in the Autumn of 1997 and 828 feeding records in 13 days in the Autumn of 2001.

2 RESULTS

Figure 1 shows that the diet of the Sichuan snub-nosed monkey in the Autumn of 1997 consisted of 38 % fruits (including seeds), 21 % arboreal lichens, 17 % buds, 13 % barks, 7 % young leaves and 4 % twigs. But in the Autumn of 2001, we found that the monkeys fed on mostly lichens, buds, and barks which were 41 %, 22 %, and 23 %, respectively. During this time, young

leaves, twigs and fruits only represented 7 %, 4 %, and 3 %, respectively. The monkeys shifted their diet from mainly feeding on fruits to lichens. During the observation of feeding behavior from the Autumn of 1998 to 2000, it was still found that the monkeys consumed more fruits in proportion than lichens.

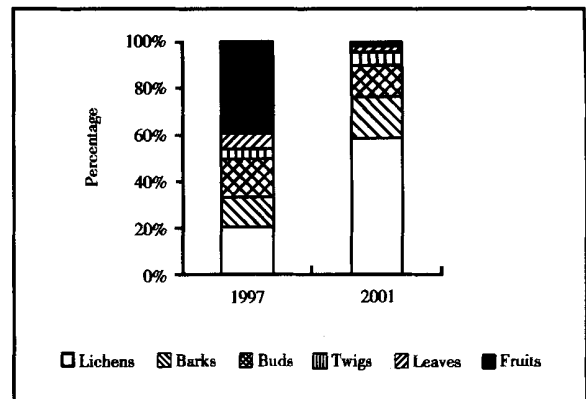


Fig. 1 The percentage comparison of parts eaten in the Autumns of 1997 and 2001

3 DISCUSSION

Shi *et al.*^[4] and Li^[7] described over 17 different fruit species that formed the autumn food of the monkey in Baihe of Sichuan Province and Shennongjia of Hubei Province. Li and Liu^[5] reported that the animals mainly consumed the fruits of 11 tree species during the autumn in the northern slope of Qinling Mountains. These results suggest that the Sichuan snub-nosed monkey generally consumes fruit as the main diet in the autumn.

However, we found changes in the monkeys' diet in the Yuhuangmiao region in 2001. This was due to a heavy snowfall between April 20 and 22, which seriously destroyed the flowers of plants, so that fruits became scarce in the following Autumn. The lack of regular food items apparently caused the monkeys to shift to other plant parts. Thus, a climatological event in the Spring can have lasting consequences in the feeding behavior of this species during the subsequent Autumn. Similar results were found in other colobinae that shifted to seed eating when the more nourishing leaves are scarce^[2,12]. Compared with other mammals when some foods are scarce in special period, primates can shift more easily dietary rather than range. This is because a) primates are believed to form

cognitive maps, so that they know where food is located within their range, thus making it easier to locate some type of food source, and b) there are risks involved in moving to a new area, both from predators and from intraspecific aggression^[12-14].

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