



## **PRESS RELEASE**

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### **Wild chimpanzees aim their travel towards fatty nuts**

An international team of researchers from the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and the Félix Houphouët Boigny University in Abidjan, Ivory Coast were the first to explore an alternative way to gain insight into what nutritional aspects of natural food sources are important and preferred by wild foragers by combining analyses on the ranging patterns of wild chimpanzees. For this, the researchers followed five adult female chimpanzees from Taï National Park, Côte d'Ivoire, for more than 275 days and tested the relationship between the changes in travel direction that occurred on the chimpanzees daily travel paths and the nutritional aspects of the fruit species that they feed on and the trees' characteristics. They found that chimpanzees were more likely to aim their travel towards fruit-bearing trees belonging to rare tree species and trees that provided fruits with high amounts of fat, sugar and fiber, such as nuts.

In captivity, many studies on food preference in primates have focused on cultivated fruits that contain much sucrose and less fiber than wild fruit. In the natural habitat, food preference is traditionally estimated by the recordings of feeding duration, sometimes in combination with an estimation of food availability. The researchers discuss the limits of both approaches and the need to develop new ways to gain insight in the importance of nutritional variables of natural food sources in our closest relatives.



By recording the ranging behaviour of the wild chimpanzees and their changes in travel direction, the researchers found the chimpanzees were more likely to approach certain trees in a goal-directed way than others. They measured the nutritional value of the fruits in the tree and tested which factors influenced the probability of occurrence of a goal-directed approach. For this they designed two models that predicted their directional changes at, and

on the way to, fruit-bearing feeding trees. In both models, directional change was significantly influenced by the density of the feeding tree species and the crude fat content of that species' fruit. Female chimpanzees were more likely to change their travel direction for rarer trees, at which they fed on fruits that contained higher amounts of fat. In addition, directional changes tended to be positively influenced by the content of nonstructural ('easy energy') and structural carbohydrates (NDF) in that species' fruit. They did not detect any effect of sensory cues or social factors on the directional changes, in either model. The amount of fruit available and the time since the start of the fruiting season positively influenced directional change in the second model, which suggests that chimpanzees were updating their knowledge of the fruit availability in individual trees over time.

Researcher Simone Ban of the Félix Houphouët Boigny University suggests that the chimpanzees aim to obtain a particular diet, with a strong preference for fatty fruits, like nuts. She argues that this seems to be healthy according to studies on human diet. During evolution primates, including humans have lost their ability to produce certain vitamins and highly depend on plant foods to obtain them. The consumption of fat is essential for a primate's body to absorb vitamins. It is for example often recommended to add oil to a salad for better absorption of vitamins by the body. In addition, as wild animals are more active, it is not surprising that they go out of their way to obtain fatty fruits, such as nuts, since fat contains twice the amount of energy compared to sugar, but releases it at a slower rate to supply energy all day long. Fat storage can in addition be useful for brain development and maintenance in a primate with relatively large brains.

To her surprise, chimpanzees also seem to have a preference for fibrous fruits, which are difficult to digest. She suggests that fibrous fruit can perhaps help with fat oxidation, but may also help the chimpanzees to feel satiated. Taï chimpanzees especially aim for fibrous food early in the morning, which may help them to feel satiated after a long overnight period of not feeding. Perhaps the chimpanzee diet can be compared to the habit of westernized humans who eat oats and fiber-rich products for breakfast, but this should be further investigated. The higher probability to aim at rare trees can be explained by the fact that rare trees in the research area have larger trunks and often produce larger amounts of fruit.

Simone Ban says: "Our study is the first to indicate that the nutrient content of fruits consumed by female chimpanzees as well as tree abundance have an impact on these animals' travel paths. These findings open important new avenues for future investigations on food preference and the importance of nutritional variables in a wild animal's diet through the analyses of their ranging patterns".

Karline Janmaat of the Max Planck Institute for Evolutionary Anthropology says: "It is notoriously difficult to gain insight in what wild animals like to eat. We were therefore very excited to see that the chimpanzee females changed their travel direction to reach trees with fatty fruits. Fat not only produces twice the amount of energy as sugars, it also helps to absorb vitamins and is crucial for the brain development of their young".

[SB, KJ & SJ]

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**Tai chimpanzees change their travel direction for rare feeding trees providing fatty fruits**

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