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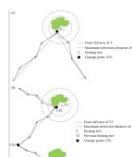


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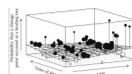
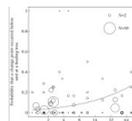


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Taï chimpanzees change their travel direction for rare feeding trees providing fatty fruits

Simone D. Ban^{a, b, c}, Christophe Boesch^a, Antoine N'Guessan^{b, d}, Eliezer Kouakou N'Goran^{b, c}, Antoine Tako^c, Karline R.L. Janmaat^a

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Highlights

- We explore a new way to study food preferences by analysing animal ranging patterns.
- We followed five adult female chimpanzees for a total of 275 full days.
- Females changed travel direction for rarer trees with fruits with high fat content.
- They also tended to change direction for fruits with more sugars and fibres.
- Travel direction analyses may reveal value of food's nutrition for an animal's diet.

The production of edible rainforest fruits is characterized by fluctuating and seasonal patterns that require frugivores to flexibly adjust their ranging behaviour. We investigated whether significant changes in a forager's travel direction can inform us about the importance of the nutritional and energetic aspects of different food sources for a wild animal's diet. We recorded the ranging patterns of five adult female chimpanzees, *Pan troglodytes verus*, for a total of 275 full days in the Taï National Park in Côte d'Ivoire and 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. We 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. Our results indicate that the nutrient content of fruit and its abundance exerted a significant impact on the shape of chimpanzee female travel paths, which opens up a new avenue for investigation of food preferences in wild animals through analyses of their ranging patterns.

Keywords

change point; food preference; fruit nutrient contents; *Pan troglodytes*; ranging patterns

Correspondence: S. D. Ban, Max Planck Institute for Evolutionary Anthropology, Deutscher Platz 6,
04103, Leipzig, Germany.

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