

CHALLENGING ADVANTAGE OF TRICHROMACY IN FRUIT FORAGING BEHAVIOR OF WILD SPIDER MONKEYS

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Trichromacy in primates has long been regarded as an adaptive trait to facilitate detecting reddish objects such as ripe fruits against background leaves. Spider monkeys are excellent subjects to test this hypothesis because of their highly frugivorous diet and polymorphic colour vision. In this study, we examined fruit foraging behaviour of a free-ranging group of spider monkeys (*Ateles geoffroyi*), consisting of dichromats (N = 11) and trichromats (N = 9) in Santa Rosa National Park, Costa Rica. First, we compared the frequency, accuracy and unit-time intake efficiency of detecting fruits at close viewing distance between dichromats and trichromats. Unexpectedly, trichromats did not show any foraging advantage. This result is explained by the importance of achromatic contrast between fruits and leaves to both dichromats and trichromats. In natural conditions, olfaction could also be an informative modality in fruit foraging. We then examined whether and how sniffing behaviour was associated with any visual trait of fruits and foraging efficiency. Both dichromats and trichromats sniffed the fruits with low visual contrast more often than the fruits with high visual contrast, suggesting that monkeys utilize olfactory cues for discrimination between edible and inedible fruits when vision alone is insufficient to evaluate the quality of fruits. Overall, we found no evidence of trichromat advantage in fruit foraging of spider monkeys. Other factors than fruit foraging should be considered for evolution of trichromacy in primates.

Keywords: colour vision polymorphism, fruit foraging, olfaction, spider monkeys