Parallel dispersal and its effect on the kin composition of groups in a gregarious primate (Cebus capucinus)

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Despite a growing number of studies reporting parallel dispersal, it is not clear how this dispersal pattern affects the distribution of kin or the occurrence of kin cooperation in the dispersed sex. To further our understanding of the temporal and spatial distribution of kin in a population with male parallel dispersal, we collected demographic and genetic data from white-faced capuchins (Cebus capucinus) at Santa Rosa National Park, Costa Rica, between 2007 and 2013. Based on the demographic database, we classified animals as natal, single immigrant, or parallel immigrant (i.e. transferred between groups with familiar kin or non-kin). We genotyped all adult and subadult animals in 5 study groups at 15 short tandem repeat loci, and we calculated their estimated relatedness values. As predicted in a population with female philopatry and male dispersal, females but not males were more closely related within than between groups. However, females were not always more closely related than males residing in the same group due to influxes of parallel immigrant male kin. Within bisexual social groups, parallel immigrant males resided with a similar number of same-sexed kin as natal females did. Thus, males have opportunities to develop cooperative kin relationships in species such as the white-faced capuchins in which parallel dispersal is common. Because parallel dispersal can have important consequences for the evolution of kin cooperation, this dispersal pattern should be taken into account in future models of the evolution of social structure.

Spatial ecology of perceived predation risk in white-faced capuchins, Cebus capucinus

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Although predation has likely played a central role in the evolution of primate socioecology, we currently lack a thorough understanding of how fine-scale variation in perceived predation risk affects primates’ short-term space use patterns and predator avoidance strategies. We examined the spatial and ecological characteristics of predator encounters, as well as behavioral responses to perceived predation risk, by five groups of wild white-faced capuchins (Cebus capucinus) in Costa Rica over a 1.5 year period. Alarm-calling bouts directed at birds were more likely to originate in high forest strata, while alarm-calling bouts at snakes and terrestrial quadrupeds were more likely to originate near the ground. Relative risk maps based on the locations of predator encounters revealed that high-risk areas for birds and snakes consisted of mature, high-canopy forest, while low-risk areas for these predators consisted of relatively younger forest. We observed a general increase in vigilance behavior in more open forest, but this relationship was modulated by spatial variation in perceived risk. The animals were most vigilant near the ground and at heights exceeding 20 m, which may reflect greater perceived exposure to snakes and terrestrial predators near the ground and to aerial predators near the top of the forest canopy. Our results suggest that capuchin monkeys in this study system experience reduced predation risk in the middle forest layers, and they adjust their vigilance behavior to small-scale spatial variation in perceived risk.