
Evolutionary pathways to cooperative breeding in Mammals: The role of ecology

Valentine Federico*^{†1}, Aurélie Cohas², Jean-Michel Gaillard³, Jean-François Lemaître⁴, and Dominique Allainé

¹Laboratoire de Biologie et Biométrie Evolutive (LBBE) – Laboratoire de Biométrie et Biologie Evolutive – France

²Laboratoire de Biométrie et Biologie Evolutive (LBBE) – CNRS : UMR5558, Université Claude Bernard - Lyon I (UCBL) – 43 Bld du 11 Novembre 1918 69622 VILLEURBANNE CEDEX, France

³Laboratoire de Biométrie et Biologie Evolutive (LBBE) – CNRS : UMR5558, Université Claude Bernard - Lyon I – 43 Bld du 11 Novembre 1918 69622 VILLEURBANNE CEDEX, France

⁴Institut de Recherche sur les lois Fondamentales de l'Univers (Irfu) – CEA-DSM – France

Abstract

In cooperatively breeding species, non-breeding helpers assist in raising young produced exclusively by dominant breeders. Such species also display delayed dispersal, as helpers are usually previous offspring produced by breeders. Ecological constraints are widely thought to have a major role in the emergence of cooperative breeding, by increasing the costs of dispersion and the benefits of cooperation. Several studies linked the severity of ecological constraints to the prevalence of cooperative breeding in birds. In mammals, previous research focusing on abiotic variables has linked cooperative breeding to low annual rainfall. However, little attention has been paid to the role of habitat variation, and the resulting variation in predation pressure and resource availability. Yet the impact of such variables on the costs and benefits of group living, delayed reproduction and delayed dispersal may make them key factors in the evolution of cooperative breeding. Here, we investigate the role of variation of habitat specialization, predation pressure, food availability and climate in explaining why cooperative breeding has evolved in some lineages of mammals but not in others. We aim at identifying which ecological characteristics are overrepresented in cooperatively breeding species, and are therefore susceptible to have played a role in the evolutionary pathway to cooperative breeding. Ultimately, our work aims at investigating the directionality of the evolutionary relationships between cooperative breeding and ecology: Has cooperative breeding enabled species to specialize in habitats, or has it evolved in response to specific ecological characteristics?

*Speaker

[†]Corresponding author: valentine.federico@univ-lyon1.fr