26
JAN.
2012

de 15h à 16h

SÉMINAIRE

Adaptive Responses to an Unpredictable Environment: Behavior, Physiology and Evolution.

Carsten Schradin
Department of Animal Behavior, University of Zurich

Behavioral flexibility to optimize individual fitness occurs in many species and is regulated by endocrine mechanisms. If flexibility in social behavior exists in both sexes, this can lead to changes in the social organization of an entire population. I define this phenomenon as "social flexibility". Social flexibility can be advantageous in a changing environment. For example the African striped mouse (Rhabdomys pumilio) can either live solitarily or form extended family groups. Group-living striped mice can benefit from improved thermoregulation (huddling in nests) and possibly increased vigilance against nest predators. I explored the ultimate reasons of social flexibility by testing two main hypotheses, 1. ecological constraints (measured as population density) leading to philopatry and group-living, and 2. reproductive competition within groups leading to dispersal and solitary-living. Striped mice always lived in groups during the non-breeding season when reproductive competition was absent, indicating that the benefits of group-living prevailed during this period. During the breeding season when reproductive competition occurred, striped mice left the communal group and started solitary breeding if vacant territories were available. However, they remained group-living under high population density, consistent with the ecological constraints hypothesis. Fitness consequences of social flexibility have been studied in detail in male striped mice following alternative reproductive tactics. Depending on ecological conditions, solitary living males (roamers) can be making the best of a bad job with low reproductive success, or they can be equal in success to the group-living tactic, or they can even be superior with high reproductive success. Endocrine mechanisms (prolactin, testosterone and corticosterone) underlie social flexibility in the striped mouse. Thus, changes in social behavior (behavioral adaptation) seem to be regulated by changes in hormone levels (physiological adaptation), maximizing individual reproductive success (evolutionary adaptation) under changing environmental conditions.