

The modulating role of group stability on fitness effects of group size is different in females and males of a communally rearing rodent

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Abstract

1. Group size may influence fitness benefits and costs that emerge from cooperative and competitive interactions in social species. However, evidence from plural breeding mammals indicates that group size is insufficient to explain variation in direct fitness, implying other attributes of social groups were overlooked. 2. We studied the natural population of a social rodent during 5 years to test the hypothesis that social stability – in terms of group composition – modulates the effects of increasing number of breeding females (a proxy of communal rearing) and males on the number of offspring weaned (sired) and on the number of offspring weaned (sired) surviving to breeding age (two proxies of direct fitness). We quantified the effects of social stability (measured as changes in female or male group members between mating and the onset of lactation) on these fitness measures. 3. We used live trapping, telemetry and DNA markers to determine social and fitness measures. 4. Social stability in degus was variable in terms of the number of changes in group composition across groups. Low stability was mostly due to mortality and emigration of group members. 5. Results supported a modulating role of social stability on the relationship between group size and the number of offspring weaned (sired). Stability in female and male group composition were both modulators of fitness to females and males. 6. The modulatory role of stability was sex specific, where high social stability was often fitness beneficial to the females. Instead, low social stability was fitness enhancing to the males..

Keywords

Communal rearing, Degus, Fitness, Reproductive success, Social instability, Sociality.