

Higher reproductive success for chimeras than solitary individuals in the kelp *Lessonia spicata* but no benefit for individual genotypes

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Abstract

Chimerism is a peculiar, yet widespread, type of group living in which genetically heterogeneous entities are created through fusion between conspecifics. Here we tested whether chimerism provides direct benefits to the kelp *Lessonia spicata*, by analyzing its consequences on reproductive investment and success, at both the genotype and thallus levels. In addition, we quantified the frequency of chimerism in two natural populations, tested if group members were close kin, and evaluated the effects of relatedness and the number of genotypes per thallus on reproduction. Chimeric thalli were frequent (>60 %) in natural populations of *L. spicata*. In most cases, average intragroup relatedness was not significantly different from the background population. Reproductive investment was not significantly affected by the type of thallus (chimeric versus non-chimeric), by the number of genotypes per thallus or the average relatedness within thallus. Chimerism did not result in net benefits or costs in terms of genotypic reproductive success or probability of reproducing at the genotypic level. Yet, at the thallus level, chimerism increased reproductive success and the probability of reproducing, since more than one genotype reproduced in chimeric thallus. At the population level, chimerism affects *L. spicata* reproductive success by allowing the coexistence of a higher density of potential reproducers and mates compared to a scenario with only non-chimeric thallus. Chimerism may then have an important effect on the effective population size and possibly in reducing selfing rates..

Keywords

Chimerism, Group living, Reproductive success, Reproductive investment, Brown seaweed.