

In the social amoeba *Dictyostelium discoideum*, shortened stalks may limit obligate cheater success even when exploitable partners are available

James Medina*, Tyler Larsen*, David C. Queller and Joan E. Strassmann

Department of Biology, Washington University in St. Louis, St. Louis, Missouri, United States

* These authors contributed equally to this work.

ABSTRACT

Cooperation is widespread across life, but its existence can be threatened by exploitation. The rise of obligate social cheaters that are incapable of contributing to a necessary cooperative function can lead to the loss of that function. In the social amoeba *Dictyostelium discoideum*, obligate social cheaters cannot form dead stalk cells and in chimeras instead form living spore cells. This gives them a competitive advantage within chimeras. However, obligate cheaters of this kind have thus far not been found in nature, probably because they are often enough in clonal populations that they need to retain the ability to produce stalks. In this study we discovered an additional cost to obligate cheaters. Even when there are wild-type cells to parasitize, the chimeric fruiting bodies that result have shorter stalks and these are disadvantaged in spore dispersal. The inability of obligate cheaters to form fruiting bodies when they are on their own combined with the lower functionality of fruiting bodies when they are not represent limits on obligate social cheating as a strategy.

Subjects Cell Biology, Evolutionary Studies

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