Who are you? No kin discrimination during egg care in the European earwig

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Abstract

Kin discrimination is the ability of an individual to distinguish between close genetic kin and non-kin and to adapt its behaviours accordingly. Kin discrimination is often considered as a keystone in the evolution of parental care, as it allows parents to address cooperative behaviours towards their own offspring, while limiting the risk of social parasitism and the resulting costs of providing care to unrelated individuals. In this study, we investigated whether females discriminate between related and unrelated eggs in the European earwig *Forficula auricularia*. In this insect species, females provide extensive forms of care towards their eggs over winter, without any food intake. We set up four types of experimental clutches, in which females tended either their own clutch of eggs, an unrelated clutch with a similar number of eggs or no egg at all, or in which eggs were maternally deprived. Our results first confirm that maternal deprivation leads to a total failure in term of eggs development and hatching success. However, we found that the level of maternal investment into egg grooming, egg defence and egg abandonment was independent of eggs origin. Similarly, egg hatching success and juveniles quality were not associated with their genetic relatedness to the tending mother. Overall, these results reveal that earwig mothers do not discriminate against foreign eggs. More generally, they show that the evolution of parental care does not necessarily rely on and/or lead to the emergence of kin discrimination in insects.

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