A chemical signal of offspring quality affects maternal care in a social insect

ID 89182
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Year 2009
Title A chemical signal of offspring quality affects maternal care in a social insect
Journal Proceedings of the Royal Society. Series B, Biological sciences
Volume 276
Number 1668
Pages / **Article-Number** 2847-2853
Keywords begging signal, chemical communication, parent-offspring conflict, signal of quality, cuticular hydrocarbons, Forficula auricularia

Begging signals of offspring are condition-dependent cues that are usually predicted to display information about the short-termneed (i.e. hunger) to which parents respond by allocating more food. However, recent models and experiments have revealed that parents, depending on the species and context, may respond to signals of quality (i.e. offspring reproductive value) rather than need. Despite the critical importance of this distinction for life history and conflict resolution theory, there is still limited knowledge of alternative functions of offspring signals. In this study, we investigated the communication between offspring and caring females of the common earwig, Forficula auricularia, hypothesizing that offspring chemical cues display information about nutritional condition to which females respond in terms of maternal food provisioning. Consistent with the prediction for a signal of quality we found that mothers exposed to chemical cues from well-fed nymphs foraged significantly more and allocated food to more nymphs compared with females exposed to solvent (control) or chemical cues from poorly fed nymphs. Chemical analysis revealed significant differences in the relative quantities of specific cuticular hydrocarbon compounds between treatments. To our knowledge, this study demonstrates for the first time that an offspring chemical signal reflects nutritional quality and influences maternal care.

Publisher The Royal Society
ISSN/ISBN 0962-8452
edoc-URL http://edoc.unibas.ch/dok/A5251442
Full Text on edoc Restricted;
Digital Object Identifier DOI 10.1098/rspb.2009.0498
ISI-Number WOS:000267373700020
Document type (ISI) Article