

Female palm-seed borer beetles adjust their sex ratio according to relatedness of female neighbours

Daphna Gottlieb^{1,2}, Amos Bouskila^{1,2}, Gal Sitkov-Sharon¹, Yael Lubin² and Ally R. Harari^{1,3} (with an appendix by Peter Taylor⁴)

¹Department of Life Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel,

²Mitrani Department of Desert Ecology, Blaustein Institute for Desert Research, Midreshet Sede-Boqer, Israel, ³Department of Entomology, Agricultural Research Organization, The Volcani Center, Bet Dagan, Israel and ⁴Department of Mathematics and Statistics, Queen's University, Kingston, Ontario, Canada

ABSTRACT

Question: Can the sex ratio of the palm-seed borer beetle, *Coccotrypes dactyliperda* (Fabricius), be described by local mate competition? Does relatedness among neighbouring foundresses affect their offspring sex ratio in the context of local mate competition?

Hypothesis: According to Hamilton's local mate competition hypothesis, the optimal sex ratio (proportion of males out of the total clutch) should increase as the number of foundresses increases. We predict that when multiple foundresses can assess their relatedness, relatedness among foundresses will decrease the sex ratio.

Methods: We measured the effect of number of foundresses and relatedness among foundresses on offspring sex ratio in seven populations of *C. dactyliperda* in Israel.

Results: In line with local mate competition theory, offspring of related foundresses had a lower sex ratio than offspring of unrelated foundresses and the sex ratio among offspring of a single foundress was lower than that of several unrelated foundresses. However, when the multiple foundresses were related, the offspring sex ratio of one and of several foundresses did not differ. This result may be explained by a high expectation of the related females that their sons will encounter only related males.

Keywords: haplodiploid, local mate competition, sex allocation, sex ratio.

INTRODUCTION

Maternal sex allocation is a major component of the reproductive strategies of all sexual plants and animals (Godfray and Werren, 1996). Since Fisher (1958) predicted the predominance of an even sex allocation in panmictic populations with random matings, sex ratio studies have become one of the most productive research areas in evolutionary biology (Charnov, 1982; Leigh

Correspondence: D. Gottlieb, Department of Life Sciences, Ben-Gurion University of The Negev, PO Box 653, 84104 Beer-Sheva, Israel. e-mail: gdaphna@bgu.ac.il

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