

## 延腹小蜂属榕小蜂对榕果果内空腔大小差异的行为和形态适应

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Behavioral and morphological adaptation of *Philotrypesis* (Hymenoptera: Chalcidoidea: Agaonidae) to cavity size of fig fruits

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### 摘要

大多数榕小蜂的雄蜂终生都在密闭的榕果中生活, 榕果间果内空腔的大小存在很大的差异, 这种差异可能限制对小蜂的活动。已有研究表明榕果的大小会影响果内榕小蜂雄蜂的打斗行为, 那么这种差异是否会影响雄蜂的果内爬行行为? 雄蜂是否会产生适应性的形态特征? 针对这些问题, 在2008年6月到2009年10月期间, 我们在野外采集榕果, 并带回实验室中, 对榕果内生活的延腹小蜂属*Philotrypesis* 5种雄蜂的果内爬行行为和足的形态特征进行了研究。结果表明, 根据*Philotrypesis* spp.雄蜂后足的跗节形态特征的不同, 其后足可分成2种形态型——I型: 后足跗节基部两节的突出部分排列紧密, 后足中跗节不发达; II型: 后足跗节基部两节的突出部分排列疏松, 二者之间有较宽的分隔, 后足中跗节发达。GLM分析结果表明各种榕树上生活的*Philotrypesis*雄蜂前足腿节长宽比存在极显著差异 ( $F_{8, 81}=94.86, P<0.001$ )。在大果中生活的*Philotrypesis*雄蜂都具有较细长的前足腿节, 在小果中生活的*Philotrypesis*雄蜂除了M7#c-ben外, 都具有较粗壮的前足腿节。当雄蜂在榕果内寻偶时, 主要依靠粗壮的前足或灵活的后足在果内爬行。结果提示, 榕果空腔大小可能限制了*Philotrypesis*雄蜂果内爬行行为, 进而影响了雄蜂足形态的适应性进化。

### 关键词:

### Abstract:

Most males of fig wasps are restricted to the cavity of fig fruits for the whole life. There are remarkable differences in fig fruit cavities. These differences can constrain the movement of males. It has been shown that the size of cavities of different fig fruits could influence male fighting behavior. We ask whether the size of cavities of fig fruits can constrain the leg morphology and scramble behavior of the male wasps. Thus we collected fig fruits from five fig species in the field during June, 2008 to October, 2009. We investigated leg morphology and scrambling behavior of *Philotrypesis* spp. inhabited in those fig fruits. Two morphological types were identified according to hindleg tarsi among the males collected from different fig species: type I: the basal two hindleg tarsi are close to each other and hindleg middle tarsi are not robustious; type II: the basal two hindleg tarsi are separated widely and hindleg middle tarsi are robustious. The results of GLM indicated the differences were remarkable in the ratio of length and width of foreleg femur of the males collected from different fig species ( $F_{8, 81}=94.86, P<0.001$ ). Males in big fig fruits had slighter foreleg femur and males in small fig fruits, except that M7#c-ben had robustious one. Males scrambled for mating in the fig fruit through robustious forelegs or flexible hindlegs. The results suggest that the size of fig fruit cavity can constrain the movement of *Philotrypesis* males and influence morphological adaptation of their legs.

### Key words:

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