

昆虫学报 » 2013, Vol. 56 » Issue (11): 1267-1274 DOI:

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果蝇 *Drosophila biarmipes* 翅斑二型性的生态学意义 (英文)

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Ecological significance of wing spot dimorphism in *Drosophila biarmipes* (Diptera: Drosophilidae) (In English)

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摘要 雌性对雄性表饰的偏好性有利于性别选择。目前尚不清楚这一偏好性是否只限于雄性表饰或这一偏好性实际上是源于影响后代适合度的基因。对于雄性可直接有利于雌性或其后代适合度的交配系统而言, 答案是肯定的——雌性偏好于与对气候胁迫具有更强生理抗性的雄性交配。对果蝇 *Drosophila biarmipes* 的室内研究已经证明了求偶过程中翅斑的作用, 但是其生态学意义仍然不清楚。我们检验了有翅斑与无翅斑雄性果蝇 *D. biarmipes* 及雌性偏好的雄性所产生的后代对环境胁迫的抗性是否不同。结果表明: 在干燥或冷胁迫条件下, 有翅斑的雄性果蝇比无翅斑的雄性果蝇的交配成功率明显要高。相反, 在高湿条件下, 无翅斑雄性果蝇的交配频率更高。我们也发现在较为干旱的条件下, 与有翅斑雄性交配的雌性果蝇的生殖力以及所得后代从卵至成虫的存活率更高。我们的结果与优良基因性选择假说一致, 说明交配选择能给雌性带来间接好处。这是对热带物种 *D. biarmipes* 翅色二型性生态学意义的首次报道。

关键词: 果蝇 翅斑 二型性 性选择 优良基因 交配 偏好性

Abstract: Female preference for male ornament is favored by sexual selection. It is not clear whether the preference is limited to male ornament only or actually for genes that affect fitness of the progeny. In *Drosophila biarmipes*, females prefer to mate with males that are able to provide greater physiological tolerance to climatic stresses, *i. e.*, males provide direct benefit of fitness to the females or their offsprings. Laboratory studies in *D. biarmipes* have evidenced the role of wing spot during courtship but its ecological significance remains unclear. We tested the hypothesis whether spotted and spotless males and progeny from sexually preferred males of *D. biarmipes* vary in their levels of environmental stress tolerances. Our results showed that the male flies with spotted wings performed significantly better in their mating success under desiccation or cold stress than the males with spotless wings. In contrast, spotless males mated more frequently under highly humid conditions. We also found significantly higher fecundity of females mated with the males with spotted wings under drier condition and higher egg-to-adult viability of the resulting progeny. Our results are consistent with good gene sexual selection hypothesis, suggesting that mate choice could provide indirect benefits to females. This is the first report on the ecological significance of wing color dimorphism in a tropical species-*D. biarmipes*.

Key words: *Drosophila biarmipes* wing spot dimorphism sexual selection good genes mating preference

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