共生蟎透過比例辨識法選擇埋葬蟲宿主

Proportional processing of burying beetle host selection in the phoretic mite

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背景/研究問題/材料方法Background/Question/Methods\*

Phoretic animals, by attaching to other species with greater mobility, can access resources otherwise unobtainable. The choice of host is vital for their lives. In our fieldwork, the number of attached mites (*Poecilochirus carabi*) correlates positively with the body size of the host burying beetle (*Nicrophorus nepalensis*). Although proportional processing is a recognized cognitive strategy in host selection, most research on this topic focuses on vertebrates. The way such sensory methods work in invertebrates remains understudied. In this study, we investigate whether phoretic mites show a preference for larger beetle hosts and whether such behaviour aligns with proportional processing. We introduced mites onto adult beetle and confined them with a mite-free beetle, allowing interaction for ten minutes. Each beetle pair was exposed to mites of five different densities: 1, 5, 10, 20, or 40 mites. After the experiment, we counted the number of mites on each beetle, and analysed the relationship between mites’ preference for beetle size and 1) absolute body size difference, 2) proportional size difference, and 3) mean size of each pair of the beetles.

結果/結論/應用啟示Result/Conclusions/Applications

Our results indicate that mites show a stronger preference for larger beetles, especially when both options are of smaller size. This preference declines when both hosts are larger beetles. These findings reveal that proportional processing might be more prevalent in the animal kingdom than previously thought.

關鍵字（Keywords）

宿主選擇（host selection）、比例辨識法（proportional processing）、行為生態（behavioural ecology）、埋葬蟲（burying beetles）、附生蟎（phoretic mites）