

Polyandry provides reproductive and genetic benefits in colonising populations

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Abstract

Polyandry, when females mate with more than one male, is theorised to play an important role in successful colonisation of new habitats. In addition to possible benefits from sexual selection, even mild polyandry could facilitate colonisation by protecting against inbreeding and reducing the costs of mating with incompatible or infertile males. Here, we measure the importance of mild polyandry for population viability and reproductive fitness following experimental founder events into a higher temperature regime. Using colonisation experiments with the model beetle *Tribolium castaneum*, in which females can produce offspring for up to 140 days following a single mating, we founded more than 100 replicate populations using single females that had been given the opportunity to mate with either one or two males, and then tracked their subsequent population dynamics. Following population viability and fitness across ten generations, we found that extinction rates were significantly lower in populations founded by females given polyandrous opportunities to mate with two males (9%) compared to populations founded by monogamous females (34%). In addition, populations founded by females that had been provided with opportunities to store sperm from two different males showed double the median productivity following colonisation compared to monogamous-founded populations. Notably, we identified short-term and longer-term benefits to post-colonisation populations from double-mating, with results suggesting that polyandry acts to both protect against mating with incompatible males through the founder event, and reduce inbreeding depression as the colonisation proceeds for ten generations. Our results therefore show that even mild polyandry provides both reproductive and genetic benefits for colonising populations.

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