Title:	Investment in adult reproductive tissues is affected by larval growth conditions but not by evolution under poor larval growth conditions in Drosophila melanogaster Author links open overlay panel
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Abstract:	In many insects, the larval environment is confined to the egg-laying site, which often leads to crowded larval conditions, exposing the developing larvae to poor resource availability and toxic metabolic wastes. Larval crowding imposes two opposing selection pressures. On one hand, due to poor nutritional resources during developmental stages, adults from the crowded larval environment have reduced investment in reproductive tissues. On the other hand, a crowded larval environment acts as a cue for future reproductive competition inducing increased investment in reproductive tissues. Both these selection pressures are likely affected by the level of crowding. The evolutionary consequence of adaptation to larval crowding environment on adult reproductive investment is bound to be a result of the interaction of these two opposing forces. In this study, we used experimentally evolved populations of Drosophila melanogaster adapted to larval crowding to investigate the effect of adaptation to larval crowding on investment in reproductive organs (testes and accessory glands) of males. Our results show that there is a strong effect of larval developmental environment on absolute sizes of testes and accessory glands. However, there was no effect of the developmental environment when testis size was scaled by body size. We also found that flies from crowded cultures had smaller accessory gland sizes relative to body size. Moreover, the sizes of the reproductive organs were not affected by the selection histories of the populations. This study highlights that adaptation to two extremely different developmental environments does not affect the patterns of reproductive investment. We discuss the possibility that differential investment in reproductive tissues could be influenced by the mating dynamics and/or investment in larval survival traits, rather than just the developmental environment of the populations.
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