Title:	What doesn't kill you makes you stronger: Correlated evolution of adult traits in the populations of Drosophila melanogaster adapted to stressful larval crowding environment
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Abstract:	The fitness of an organism is determined by its ability to survive and reproduce in an environment. Resources available to an organism during its juvenile stages have a huge impact on its adult fitness. This is especially true for holometabolous insects, where most of the resource acquisition for the adult stages happens during the larval stages. Because of the poor locomotor abilities during the larval stage, the egg-laying site becomes the feeding site for larvae, which at times leads to a larval crowding environment. Quite often, this exposes larvae to high competition for resources and an environment full of highly toxic excretory waste during juvenile stages. Populations facing such larval crowding every generation should be selected by natural selection to optimize the distribution of limited resources in traits of high fitness importance. A major theme of my Ph.D. thesis was to investigate reproductive and stress-related traits in adults of a population that are experimentally evolved to adapt to larval crowding conditions. I have used eight large outbred laboratory populations of Drosophila melanogaster in my experiments, four of which have been experimentally selected for adaptation to larval crowding for more than 250 generations now, whereas the other four populations are non-larval crowded control populations. I aimed to investigate the evolutionary consequences of adaptation to a poor juvenile environment on adult fitness. Hence, I have looked into reproductive traits and stress-tolerance-related traits in adults of these populations. For reproductive traits, I looked into the evolution of investment in reproductive tissues (testis and accessory gland size), sperm competition, sexual-conflict levels, re-mating frequencies. To investigate the evolution of the stress-tolerance ability of these populations, I have looked at the immune response and heat-stress tolerance ability of adults. The findings of these studies have given an insight into the completely unexplored territory of the evolution of these traits in populations adapted to the stressful developmental environment.
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