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Title:	No apparent cost of evolved immune response in <i>Drosophila melanogaster</i>
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Keywords:	<i>Drosophila melanogaster</i> Life history Trade-offs
Issue Date:	2016
Publisher:	Society for the Study of Evolution
Citation:	Evolution, 70(4), pp. 934-943
Abstract:	Maintenance and deployment of the immune system are costly and are hence predicted to trade-off with other resource-demanding traits, such as reproduction. We subjected this longstanding idea to test using laboratory experimental evolution approach. In the present study, replicate populations of <i>Drosophila melanogaster</i> were subjected to three selection regimes—I (Infection with <i>Pseudomonas entomophila</i> ), S (Sham-infection with $MgSO_4$ ), and U (Unhandled Control). After 30 generations of selection flies from the I regime had evolved better survivorship upon infection with <i>P. entomophila</i> compared to flies from U and S regimes. However, contrary to expectations and previous reports, we did not find any evidence of trade-offs between immunity and other life history related traits, such as longevity, fecundity, egg hatchability, or development time. After 45 generations of selection, the selection was relaxed for a set of populations. Even after 15 generations, the postinfection survivorship of populations under relaxed selection regime did not decline. We speculate that either there is a negligible cost to the evolved immune response or that trade-offs occur on traits such as reproductive behavior or other immune mechanisms that we have not investigated in this study. Our research suggests that at least under certain conditions, life-history trade-offs might play little role in maintaining variation in immunity.
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