Title:	Evolution of Condition-dependent Sexual dimorpism in crowding-adapted populations of Drosophila melanogaster
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Abstract:	Sexual dimorphism is a product of some form of differential selection between males and females. Such traits should also have a history of directional selection for exag- geration in any one of the sexes. Because of this persistent directional selection, these traits are also expected to evolve a form of heightened condition-dependence. More- over, theory also predicts a coevolution between sexual dimorphism and condition- dependence itself such that the two eventually evolve a positive covariation. Pheno- typic evidence of this comes from a wide-ranging set of taxa which includes species with highly exaggerated display traits and even species which show more typical levels of sexual dimorphism. Empirical studies of condition-dependent sexual dimorphism have predominantly resorted to single generation manipulations and fail to address evolutionary consequences of resource limitation. Sexual dimorphism also results for optimal resource allocation in the two sexes and therefore including evolution in a resource limiting environment could provide us with key insights. In this study, I manipulated larval rearing density (thereby, manipulating condition) in baseline populations of Drosophila melanogaster and also in populations subjected to more than 250 generations of adaptation in crowded developmental environment. While dimorphism in body size did increase as the rearing density decreased (i.e., increasing condition) in both control and selected populations, control populations nearly lost all their dimorphism in high density whereas selected populations were better able to maintain their sexual dimorphism even in high density. Among traits, both control and selected populations showed positive covariation between condition-dependence and sexual dimorphism. My results suggest a shared developmental and genetic basis for condition-dependence and sexual dimorphism in both control and selected popula- tions. Moreover, selected populations maintaining sexual dimorphism in high density suggest evolution of some optimal resource allocation mechanisms that help in main- taining this costly dimorphism.
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