Replicator-dynamics models of sexual conflict

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Abstract:
In many species, females prefer mates with extreme characteristics that are apparently useless or deleterious for survival, such as bright colors, elaborate ornaments and conspicuous songs. Although empirical evidence has shown that many male traits have evolved via sexual selection by female mate choice, our understanding of the adaptive value of female mating preferences is still very incomplete. It has recently been suggested that female mate choice may result from females evolving resistance rather than attraction to males. When the sexes are in conflict over mating rates, natural selection favors both males that induce higher mating rates and females that are more successful at resisting mating attempts. Such sexual conflict may result in an escalating coevolutionary arms race between males and females. Here, we develop simple replicator-dynamics models of sexual conflict in order to investigate its evolutionary dynamics. For these models, we obtain the conditions for a coevolutionary process to establish costly male and female traits and examine under what circumstances polymorphism is maintained at equilibrium. Then we discuss how assumptions in previous models of sexual conflict are translated to fit to our model framework and compare our results with those of the previous studies.