Invasion, Coexistence, and Extinction Driven by Preemptive Competition and Sex Ratio[1] FERENC MOLNAR, Dept. of Physics, Applied Physics, and Astronomy, Rensselaer Polytechnic Institute, THOMAS CARACO, Dept. of Biological Sciences, University at Albany, GYORGY KORNISS, Dept. of Physics, Applied Physics, and Astronomy, Rensselaer Polytechnic Institute — We investigate competitive invasion in a simple population dynamics model, where females can differ genetically in the sex ratio of their offspring, and males can differ in mortality. Analyzing of the mean-field dynamics, we obtain conditions for ecological stability of a given sex-ratio allele for any mortality rate parameters. We also found that stable coexistence of the two alleles is possible, but only males can differ; one female phenotype is present. Our results show that the success of invasion is determined by the female birth sex ratio. A lower female ratio never excludes a larger female sex ratio; in case of coexistence, the surviving female phenotype always has the greater female sex ratio. Finally, we identified an interesting invasion-to-extinction scenario: successful invasion followed by extinction occurs when the invader initially propagates with the resident allele, but after excluding the resident, cannot survive on its own.

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