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Wei Feng* (fengw@uncw.edu) and **Xin Lu** (lux@uncw.edu). *On Reaction-Diffusion Models of Resource Competition and Mating Interference.*

We study reaction-diffusion models for closed related biological species (u and v) under resource competition and mating interference from v -species to u -species. In the case of bounded habitat, conditions for coexistence or competitive exclusion are obtained. In the case of unbounded habitat, the effect of one-sided sexual competition makes the trivial state and u -dominance state both unstable, the v -dominance state asymptotically stable with attraction regions and convergent rates depending on the biological parameters. We further prove that for a family of wave speeds, there exist traveling wave solutions connecting the u -dominance state and the v -dominance state at infinities. This confirms an earlier conjecture that unbalanced mating interference will lead to competitive exclusion. These results can also be obtained on an extended model with instantaneous effects of resource competition and temporal delay on mating interference. Through a transformation into three-equation system, we prove that the temporal delay does not affect the stability of the steady states and the existence of the traveling waves, but causes changes on the attraction regions and convergence rates. Finally, numerical simulations are also presented to illustrate the theoretical results. (Received September 21, 2014)