

Camp Evolution 2016 – February 21-25
Summaries of Lectures & Readings
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3) *Mating system evolution and the outcrossing - selfing paradigm*

Comparisons of the causes and consequences of cross- and self-fertilization have dominated research on plant mating since Darwin's seminal work on plant reproduction. Here, I provide examples of these accomplishments, but also illustrate new approaches that emphasize the role of floral design and display in pollen dispersal and fitness gain through male function. Wide variation in outcrossing rate characterizes animal-pollinated plants. In species with large floral displays, part of the selfing component of mixed mating can arise from geitonogamy and be maladaptive because of strong inbreeding depression and pollen discounting. Floral strategies that separate the benefits of floral display from the mating costs associated with geitonogamy can resolve these conflicts by reducing lost mating opportunities through male function. The results from experiments with marker genes and floral manipulations provide evidence for the function of herkogamy and dichogamy in reducing self-pollination and promoting pollen dispersal. Evidence is also presented indicating that increased selfing resulting from changes to floral design, or geitonogamy in large clones, can act as a stimulus for the evolution of dioecy. The scope of future research on mating strategies needs to be broadened to include investigations of functional links among flowers, inflorescences and plant architecture within the framework of life-history evolution.

Barrett, S.C.H. (2003). Mating strategies in flowering plants: the outcrossing-selfing paradigm and beyond. *Philosophical Transactions of the Royal Society of London Ser. B.* 358: 991-1004.

Harder, L.D. & Barrett, S.C.H. (1995). Mating cost of large floral displays in hermaphrodite plants. *Nature* 373: 512-515.

Harder, L.D. and S.C.H. Barrett. (1996). Pollen dispersal and mating patterns in animal-pollinated plants. In: *Floral Biology: Studies on Floral Evolution in Animal-Pollinated Plants*. (eds. D.G. Lloyd and S.C.H. Barrett). Chapman & Hall, New York, pp. 140-190.