

Camp Evolution 2016 – February 21-25
Summaries of Lectures & Readings
Spencer C.H. Barrett, University of Toronto

1) Darwin's legacy and the origins of plant reproductive biology

Charles Darwin studied floral biology for over 40 years and wrote three major books on plant reproduction. These works have provided the conceptual foundation for understanding floral adaptations that promote cross-fertilization, the fitness consequences of selfing and outcrossing, and the mechanisms responsible for evolutionary transitions in reproductive systems. Many of Darwin's novel insights, gained from careful observations and experiments on diverse angiosperm species, remain remarkably durable today and have stimulated much current research on floral function and the evolution of pollination and mating systems. Here, I review Darwin's seminal contributions to reproductive biology and provide an overview of the current status of research on several of the main topics to which he devoted considerable effort, including the causes of inbreeding depression, the evolution and function of stylar polymorphisms, the origins of dioecy and related gender polymorphisms, reproductive assurance and its role in the evolution of selfing, and the transition from animal pollination to wind pollination. Post-Darwinian perspectives on floral function now recognize the importance of pollen dispersal and male outcrossed siring success in shaping floral adaptation. This has helped to link work on pollination biology and mating systems, two subfields of reproductive biology that remained largely isolated during much of the twentieth century despite Darwin's efforts towards integration. Perhaps the next frontier will be the integration of research on two distinct aspects of plant-animal interactions that have taken separate courses and largely remain isolated – plant pollination biology and plant-herbivore interactions, involving mutualists versus antagonists, respectively. Plant reproductive biology continues to attract many researchers and has a bright future.

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Barrett, S.C.H. (2010). Darwin's legacy: the forms, function and sexual diversity of flowers. *Philosophical Transactions of the Royal Society of London Ser. B.* 365: 351-368.

Barrett, S.C.H. (2010). Understanding plant reproductive diversity. *Philosophical Transactions of the Royal Society of London Ser. B.* 365: 99-109.