

Structure of Natural Populations of Animals and Plants Focus on Understanding Patterns of Dispersal

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Abstract

Organismal biology, the study of structure, function, ecology and evolution at the level of the organism, provides a rich arena for investigation on its own, but also plays a central role in answering conceptual questions about both ecology and evolution. Organisms connect ecology, physiology, and behavior to the fields of comparative genomics, evolutionary development, and phylogenetics. Organismal-level study is crucial throughout comparative biology, which becomes increasingly potent as the genomes of more and more organisms are sequenced and annotated. Faculty in EEB share a conviction that studies of ecological and evolutionary processes are more efficient, and their results more reliable, when they are solidly grounded in a naturalist's detailed familiarity with the organisms being studied.

Introduction

We study the underlying molecular and environmental bases of individual variation and the consequences of phenotypic variation for fitness and organismal interactions. We study organismal structure with methods ranging from traditional dissections to micro-CT scans, and we study function with methods ranging from whole-body physiological performance to detailed functional genomics. Using these methods, we explore, both within and between clades, the causes and consequences of variation in a wide suite of traits: mating and migration systems; immunological defenses; swim bladders and feathers.

The Department includes the Cornell University Museum of Vertebrates (CUMV) and these collections serve as the foundation for a rich community of organismal biologists with whom we interact at the Laboratory of Ornithology and The Paleontological Research Institution. The CUMV collections have nationally important holdings of fish, birds, mammals, reptiles, and amphibians that reflect faculty research interests in vertebrate biology since the University's founding.

Studies of the genetic structure of natural populations of animals and plants focus on understanding patterns of dispersal, and the nature of barriers to gene exchange; together with studies of ecology and behavior, such studies allow detailed analysis of how genotype, phenotype, and environment combine to determine evolutionary trajectories.

Within the Biological Sciences, studies of ecology, evolution, and organismal

biology are essential in understanding the complex relationships of life on Planet Earth. Ecology focuses on the interactions among organisms as well as the interactions between organisms and their physical environments. Evolutionary theory addresses the origins and interrelationships of species. Organismal biology studies both the diversity of biological organisms and the structure and function of individual organisms.

The EEOB Department offers several undergraduate majors with other departments. Students interested in the areas of ecology, evolution, and organismal biology should major in Biology, Environmental Science, or Genetics. The Biology Major is administered and offered jointly by the EEOB and GDCB departments. The faculty of EEOB, together with those in GDCB and BBMB, administer and offer the Genetics Major. Faculty in EEOB, in cooperation with faculty from other departments on campus, administer and offer the Environmental Science Major. Each of these majors is available through the College of Liberal Arts and Sciences or through the College of Agriculture and Life Sciences. Faculty in the EEOB Department also teach undergraduate courses at Iowa Lakeside Laboratory.

The Biology Major, the Environmental Science Major, and the Genetics Major prepare students for a wide range of careers in biological sciences. Some of these careers include conservation of natural resources and biodiversity, human and veterinary medicine, and life science education. These majors are also excellent preparation for graduate study in systematics, ecology, biological diversity, physiology, and related fields. Faculty members in EEOB contribute to the undergraduate courses listed below. The titles and descriptions of these courses are in the Biology section of the catalog.

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