

Student-project on divergent evolution in crossbills 1

Crossbills are songbirds that show unusually high levels of specialisation to their food resources (seeds of conifer trees).

Within the project 'Adaptation Unlimited? The struggle between natural selection and genetic constraints in shaping the adaptive radiation of crossbills' there are two new student projects available.

1: Bill size and shape of crossbills are thought to be main determinants of fitness. Since different kinds of resources (cones of a number of conifer species) call for different kinds of bills in order to obtain the seeds, we expect that selection acting on populations using these different resources should be divergent, resulting in morphological differentiation. We have taken digital images and measures of several hundreds of individuals, both from all crossbill subspecies in the world and from a number of field sites in Spain. You would compare measurements as well as shape variables (using Geometric Morphometrics) across age cohorts, in order to test whether divergent selection has driven the adaptive radiation and speciation of this group. We also want to test at which spatial scales and geographical settings adaptive divergence of ecological traits has occurred, since current theory predicts that gene flow should population differentiation, but this seems not to hold for crossbills.

The interpretation of your obtained results will benefit from comparison with ongoing population genetic analyses of the same populations. Both projects are expected to result in peer-reviewed publications. Depending on your personal interests and capabilities, there may be possibilities for some fieldwork in the Mediterranean region in order to collect additional data. Starting date and length of the project can be adjusted to your needs.

For more information, please contact Dr. Pim Edelaar (pim.edelaar@ebc.uu.se) or Prof. Mats Björklund (mats.bjorklund@ebc.uu.se) at the Department of Animal Ecology (see our website on the [Evolutionary Biology Centre homepage](#)).

Företag/institution: Department of Animal Ecology

Plats: Uppsala University

Projektstart: Negotiable