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Symposium 18 Sexual signaling and speciation

Introduction

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Connections between sexual selection and speciation were first discussed by Darwin (1872) and Gulick (1890). More recent contributions come from the theory of Lande (1981) and the review by West-Eberhard (1983) who noted two features of sexual selection that are the subject of this symposium. First, sexually selected traits may diverge rapidly, and secondly, recognition of such traits may diverge at the same time. Thus different populations may diverge so far that members of each fail to recognize suitable mates in the other; the populations are then essentially good species. Whether complete speciation occurs in this way is a major issue in evolutionary biology. It is being addressed through a diversity of approaches, as summarized in the four contributions to this symposium. The fifth paper, an oral from Ben Sheldon concerning the role of sexual selection in hybridizing of *Ficedula* flycatchers, is published in abstract form in the Abstract Volume for the Congress.

The great infusion of molecular data has enabled us to assess just how rapidly sexually selected traits may evolve; and the answer is sometimes quickly, at least on evolutionary timescales. This is exemplified by the work of Omland and Kondo on species of orioles. Two species are extremely similar in their DNA sequences but differ strikingly in plumage patterns. One problem with the scenario of rapid evolution is that if traits are closely linked genetically, then evolution of one trait may lead to deleterious changes in others. Badyaev and Snell-Rood suggest ways by which rapidly evolving traits may sometimes become less integrated (i.e., share lower correlations with other traits).

A second question concerns how and whether pre-mating isolation evolves along with the trait. In birds, sexual imprinting provides the crucial means by which individuals recognize conspecifics as mates. This learning process seems to create a conflict between directional (sexual) selection and selection against novelty. We are beginning to understand how this conflict is resolved; ten Cate discusses the ideas. Because it appears that pre-mating isolation is often incomplete, other sources of reproductive isolation are likely to contribute to species barriers. Selection against hybrids may lead to increased levels of pre-mating isolation (reinforcement). Price addresses the relatively unexplored question of the extent to which sexual selection against hybrids imposes both post- and pre-mating isolation. It appears likely that post-mating isolation is important in bird speciation, and that sexual selection plays a major role.

References

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