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Research Project

The cichlid and reef fish visual system as a model for speciation processes

Third-party funded project

Project title The cichlid and reef fish visual system as a model for speciation processes

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Organisation / Research unit

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Department

Project Website <http://evolution.unibas.ch/salzburger/team/sstieb/>

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Freshwater cichlid and marine reef fish species represent spectacular products of adaptive radiations. Their amazing color diversities and well adapted visual systems make them ideal candidates for a comparative study of molecular mechanisms involved in speciation based on the visual system. By integrating the physiological and genetic basis of visual communication such a comparison will help to identify external factors and environmental conditions that shape color morphs and visual sensitivities. This study raises the question whether cichlid and reef fish coloration and visual sensitivities show convergent patterns and whether comparable freshwater and marine light environments mediate these patterns. For this, a representative set of labrids, damselfish and cichlids will be studied regarding their light environment, coloration and visual sensitivities. The major aims are to compare (1) the coloration, (2) the molecular basis of the diversity of visual pigments, (3) visual pigment expression patterns, (4) transmission properties of the ocular media and (5) photic properties of habitats. To determine the molecular basis of visual pigments, cone opsin genes will be sequenced using DNA and next generating sequencing. Real time quantitative PCR will be used to quantify the relative amount of opsin gene expression. Spectrophotometry will be used to characterize the reflectance spectra of body coloration, to assess the spectral properties of the ocular media and to define different light environments.

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Financed by

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