

## Symposium 40 Periodic environmental changes: understanding the physiological basis of life history adaptations

### Introduction

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Most organisms adjust their phenotype to different environmental conditions, for example by thermal acclimation, organ remodeling or changes in body mass. Such seasonal changes have obvious selective advantages, yet it is often unclear how birds change from one phenotypic condition to another. For it to be effective, individuals must perceive and integrate environmental cues, transfer the cues into endocrine signals and undergo the morphological changes that are the basis of specific life history adaptations. Analyzing this cascade of events is one of the challenging tasks of avian ecology.

This symposium highlights common phenotypic alterations for breeding, migration, molt and wintering, and analyzes in some detail the physiological mechanisms underlying them. Its aim: to contribute to a better understanding of mechanisms underlying life history adaptations. Thomas Hahn related neuro-endocrinological mechanisms to a

specific reproductive adaptation: opportunistic breeding. Simone Meddle and John Wingfield presented an in-depth analysis of brain function in relation to seasonal reproduction, highlighting the use of seasonal environmental information at neural level. George Noskov and colleagues addressed the photoperiodic control of molt, and Martin Wikelski summarized current understanding of how different physiological systems interact to shape diverse phenotypes. All of these papers were presented as orals only, the abstracts of which are published in the Abstract volume for the Congress.

In the only paper submitted for the Proceedings, Barbara Helm and Eberhard Gwinner link constraints in the molt process to environmental seasonality, breeding and migration, using as their exemplars three subspecies of the stonechat (*Saxicola torquata*).