Abstract

Passerines' migration is a unique and complex phenomenon that can be studied by various methods, including stable isotope analysis. Stable isotopes can reflect bird migrations between continents and determine their wintering sites. These methods can be used to characterise the carry-over effects of the wintering site environment on the physiological status and reproductive success of individuals at the breeding site. Stable isotopes are an ideal tool to distinguish migration connectivity at the migration divide.

This thesis aims to study the isotope profiles of feathers of the Barn swallow (*Hirundo rustica*), a trans-Saharan migratory passerine at the centre of a migratory divide in an area where populations differ in their migratory connectivity. This work focuses on the validation of the use of carbon isotopes ($\delta^{13}C$) to determine the character of wintering sites in a palearcto-afrotropical system, based on geolocator data combined with a $\delta^{13}C$ isotopic map of Africa (contrasting forest and savannah environments), and to describe the carry-over effects of migration that can influence the condition and reproductive success of individuals. The results show that feather isotope profiles correlate with isotope profiles of the wintering environment based on geolocator locations, and the different migration strategies can be detected based on the isotope profiles in feathers in the population. In the studied population, mainly young males showed different timing of arrival according to the level of carbon isotopes in their feathers, which carried over to the following phases of breeding performance. The studied physiological traits did not differ depending on the isotope profiles of the individual´s feathers. This thesis provides a basic description of the migration connectivity and carry-over effects in the studied Barn swallow population.

Key words: Trans-Saharan migration, moulting, ornamentation, timing of breeding, Congo Basin, Southern Africa, carry-over effects, $\delta^{13}C$