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Plenary 3

Abstract

The economics of bird migration

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Through their migrations birds spin a worldwide web of migratory routes. Even at the level of individuals and populations, the migrations can cover a large part of the globe. Many factors are involved in the evolution and maintenance of all these migration systems: the contingencies of earth history, the sensory and metabolic evolutionary potential of flying organisms, the distribution of predators and parasites, and energetic considerations. In this presentation I aim to briefly outline the use of energetics in studies on the maintenance of today's flyways. My overview will focus on the shorebird species seasonally migrating between wintering grounds in coastal African and the breeding grounds in the Canadian, Greenlandic, European and Siberian Arctic.

Every individual animal has to balance its energy budget but depending on size, it can balance the discrepancies between energy expenditure and energy intake through the use or storage of nutrients at various time scales. Energy thus provides a common currency to relate ecological phenomena that are separated in space and time. I will describe methods to estimate energy expenditure, energy intake and the use of energy stores, and how these estimates can be translated as an annual energy budget of a coastal shorebird species. This will then be used to evaluate the repercussions of wintering at tropical latitudes and at temperate latitudes, and how such knowledge might help us to understand the evolution of a migration system. Population-specific energy budgets provide only one of the possible uses of energetics approach. Studies at the individual level, at which it is rarely possible to quantify such budgets completely, nevertheless benefit from energetic considerations when the functional significance of variations in migratory timing and seasonal body mass and plumage changes are the focus of attention.