

Tytuł projektu
Efektywna utrata ciepła jako czynnik ograniczający sukces migracji ptaków.
Project title
Effective heat dissipation as a limiting factor for the successful bird migration.
Dyscyplina /Area of science
Nauki biologiczne
PROJECT DESCRIPTION
<p>In the proposed project we aim to answer the question, whether successful migration of small birds is constrained by the ability to effectively dissipate heat and the need to conserve water? To answer it we will experimentally verify the hypothesis that birds are constrained by a trade-off between effective heat dissipation, and water and energy conservation. This hypothesis combines two previously, but separately formulated hypotheses which posit that i) that performance of endothermic animals is limited by the capacity of effective heat dissipation (Speakman and Król 2010) and ii) that energy and water availability are key for the success of migratory flight (Carmi et al. 1992; Klaassen 1995). We predict that small passerine birds reduce their resting evaporative water loss and resting metabolic rate when acclimatized to hot or desiccating conditions, or both, while maintaining the effective heat dissipation during flight.</p> <p>In this project we will measure two fundamental physiological processes which underlie the performance of small migrating passerines: the effective regulation of body temperature and evaporative water loss. Using migrating and non-migrating small passerines we will measure metabolic rate, total, cutaneous and respiratory evaporative water loss, and body temperature in resting and in exercising animals. Studies will be done on birds acclimated to control conditions and to heat, under limited and unlimited access to drinking water. With the results of these experiments, we will be able to answer whether, and if so then how, small passerines flexibly adjust their heat loss capacity and effective regulation of body temperature in response to exposure to heat and water scarcity. Results of laboratory experiments will be verified in birds captured under natural conditions along their migration route.</p> <p>Literature</p> <p>Speakman, J. R. and Król, E. (2010). Maximal heat dissipation capacity and hyperthermia risk: neglected key factors in the ecology of endotherms. <i>J Anim Ecol</i> 79, 726-46.</p> <p>Carmi, N., Pinshow, B., Porter, W. P. and Jaeger, J. (1992). Water and Energy Limitations on Flight Duration in Small Migrating Birds. <i>Auk</i> 109, 268-276.</p>

Klaassen, M. (1995). Water and Energy Limitations on Flight Range. *Auk* **112**, 260-262.

Required initial knowledge and skills of the PhD candidate

The ideal candidate will have Master's degree in biology or ecology or relevant field, strong motivation for research work, strong English communication skills, ability to work as a team member, ability of independent and critical thinking.

Desired skills: Qualifications to work with living vertebrates, experience in work with birds, experience in animal respirometry, a proven track record of academic excellence, proficiency in statistical analysis

Zgłaszający projekt/ Author of the project

dr hab. Michał S. Wojciechowski

stopień/tytuł, imię, nazwisko

e-mail : mwojc@umk.pl

Wydział Biologii i Ochrony Środowiska UMK

jednostka organizacyjna

Proponowani promotorzy i mentorzy/prospective supervisors

1) promotor główny/ main supervisor

dr hab. Michał S. Wojciechowski

e-mail : mwojc@umk.pl

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jednostka organizacyjna

2) promotor pomocniczy / co-supervisor