Anexa 3

DECLARAŢIE
privind depunerea candidaturii pentru funcţia de membru
al Consiliului pentru studii universitare de doctorat (CSUD)
din instituţia organizatoare de studii universitare de doctorat
Universitatea Babeş-Bolyai din Cluj-Napoca

Subsemnata/Subsemnatul, Pap Péter László

prin prezenta anunţ depunerea candidaturii pentru funcţia de membru al Consiliului pentru studii universitare de doctorat (CSUD) din instituţia organizatoare de studii universitare de doctorat (IOSUD) Universitatea Babeş-Bolyai din Cluj-Napoca. Anexez următoarele documente, în conformitate cu *Metodologia privind alegerea membrilor și desemnarea directorului consiliului pentru studiile universitare de doctorat (CSUD) din IOSUD Universitatea Babeş-Bolyai din Cluj-Napoca*:

- Copia cărţii de identitate, a paşaportului sau a unui alt document de identitate întocmit într-un scop echivalent cărţii de identitate;
- [Copii ale documentelor care atestă schimbarea numelui, dacă este necesar;]
- Curriculum vitae;
- Declaraţie pe propria răspundere privind îndeplinirea standardelor minimale necesare și obligatorii pentru acordarea atestatului de abilitare, în conformitate cu legislația în vigoare.

Data: 28.06.2024 Semnătura,

Declarație pe propria răspundere,

Subsemnatul, Pap Péter László, prof. dr. habil. la Facultatea de Biologie si Geologie, Departamentul de Biologie și Ecologie al Liniei Maghiare, Director al Scolii Doctorale de Biologie Integrativă, declar prin prezenta că îndeplinesc standardele minimale necesare și obligatorii pentru acordarea atestatului de abilitare, în conformitate cu legislația în vigoare.

Prof. dr. habil. Pap Péter László

Cluj Napoca

28.06.2024

PROF. DR HAB. PÉTER LÁSZLÓ PAP

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EDUCATION AND SCIENTIFIC TITLES/DEGREES

2020 full professor

2015 defense of habilitation thesis at the Babeş-Bolyai University, Faculty of Biology and Geology, Cluj Napoca, Romania

2005 PhD in biology (animal ecology), University of Debrecen, Hungary, 3 years

2008 BSc in biology, Babeş-Bolyai University, Cluj Napoca, Romania, 4 years

EMPLOYMENT

2020 – present: professor, Babeş-Bolyai University, Cluj Napoca, Romania

2018 – 6 months: post-doctoral researcher, University of Colorado, USA

2012 – 2020: associate professor, Babeş-Bolyai University, Cluj Napoca, Romania

2013 – 2014: post-doctoral researcher, University of Debrecen, Debrecen, Hungary

2006 – 2008: post-doctoral researcher, University of Debrecen, Debrecen, Hungary

2005 – 2012: senior lecturer, Babeş-Bolyai University, Cluj Napoca, Romania

2002 – 2005: assistant lecturer, Babeş-Bolyai University, Cluj Napoca, Romania

1998 – 2002: teacher assistant, Babeş-Bolyai University, Cluj Napoca, Romania

MAJOR ACHIEVEMENTS

Achievement 1

Avian species largely differ in their physiological attributes. Understanding the causes and consequences of variation in physiology among bird species, and particularly that of the immune system and oxidative physiology is a hot topic in physiological ecology and evolutionary biology. This topic also represents my principal research interest. While many interesting advancements have been made in this field, a serious limitation of these is that they focus on a limited number of species, making generalisations difficult and the exploration of evolutionary trajectories impossible. In 2009 I initiated a comparative fieldwork project with the aim to build a unique and extensive database on avian immune function and oxidative physiology. Over the course of 13 years, my research group and I sampled over 2,000 individual birds of 124 species across Romania, measuring physiological traits of breeding birds. This extensive data collection allowed to perform phylogenetic analyses to test specific hypotheses regarding the evolution of avian immune function, oxidative physiology, and life histories. My research led to several important discoveries. I found that avian immune function is linked to embryonic rate of development and metabolic rate [1], supporting the hypothesis that immune function is constrained by the energetic turnover of the organism. I also found strong evidence that immune indices are higher in females across birds (when bias is present), but oxidative physiology shows no general sex-bias [2]. However, seasonal changes in immune function may affect sex-bias in defence, as revealed by one of my earlier within-species studies [3]. My research also demonstrated that oxidative stress influences the evolution of phenotype, life history and MHC dependent immune function in birds. For example, large brained birds suffer less oxidative damage [4], longevity and pace of life coevolve with oxidative stress [5], and high blood glucose levels in birds apparently bear no marked oxidative cost, at least across Passerines [6]. In a more recent comparative study, in collaboration with Piotr Minias we found that species selected for more robust MHC-based immunosurveillance show stronger antioxidant defences, while selection for MHC diversity still show a positive evolutionary association with oxidative damage to lipids [7]. The comparative physiology project is ongoing, and I continue to use this database to explore further intriguing questions. These include the oxidative physiological cost of flight and migration in birds [8], the effect of sex roles in parental care in the evolution of sex-specific immune function and oxidative physiology in birds [9], and the pattern and evolutionary consequences of senescence of avian phenotypic traits (see [10] as a starting research output of a comparative study in avian reproductive senescence].

[1] Pap, P.L., Vágási, C.I., Vincze, O., Osváth, G., Veres-Szászka, J. and Czirják, G.Á., 2015. Physiological pace of life: the link between constitutive immunity, developmental period, and metabolic rate in European birds. Oecologia, 177, pp.147-158.
[2] Vincze, O., Vágási, C.I., Pénzes, J., Szabó, K., Magonyi, N.M., Czirják, G.Á. and Pap, P.L., 2022. Sexual dimorphism in immune function and oxidative physiology across birds: The role of sexual selection. Ecology Letters, 25(4), pp.958-970.
[3] Pap, P.L., Czirják, G.Á., Vágási, C.I., Barta, Z. and Hasselquist, D., 2010. Sexual dimorphism in immune function changes during the annual cycle in house sparrows. Naturwissenschaften, 97, pp.891-901.
[4] Vágási, C.I., Vincze, O., Pătraş, L., Osváth, G., Marton, A., Bărbos, L., Sol, D. and Pap, P.L., 2016. Large-brained birds suffer less oxidative damage. Journal of Evolutionary Biology, 29(10), pp.1968-1976.
[5] Vágási, C.I., Vincze, O., Pătraș, L., Osváth, G., Pénzes, J., Haussmann, M.F., Barta, Z. and Pap, P.L., 2019. Longevity and life history coevolve with oxidative stress in birds. Functional Ecology, 33(1), pp.152-161.
[6] Vágási, C.I., Vincze, O., Adámková, M., Kauzálová, T., Lendvai, Á.Z., Pătraş, L.I., Pénzes, J., Pap, P.L., Albrecht, T. and Tomášek, O., 2024. Songbirds avoid the oxidative stress costs of high blood glucose levels: a comparative study. Journal of Experimental Biology, 227(1), p.jeb246848.
[7] Minias, P., Pap, P.L., Vincze, O. and Vágási, C.I. *in press*. Correlated evolution of oxidative physiology and MHC-based immunosurveillance in birds. Proceedings of the Royal Society B.
[8] Pap, P.L., Vincze, O. and Vágási, C., 2024. Oxidative state is associated with migration distance, but not traits linked to flight energetics. Authorea Preprints.
[9] Pap, P.L., Vágási, C.I., Bókony, V., Pénzes, J., Szabó, K., Magonyi, N.M., Czirják, G.Á. and Vincze, O., Phylogenetic relationships of immune function and oxidative physiology with sexual selection and parental effort in male and female birds. MS
[10] Vágási, C.I., Vincze, O., Lemaître, J.F., Pap, P.L., Ronget, V. and Gaillard, J.M., 2021. Is degree of sociality associated with reproductive senescence? A comparative analysis across birds and mammals. Philosophical Transactions of the Royal Society B, 376(1823), p.20190744.

Achievement 2

Understanding why birds differ in plumage traits and how they adapt to flight, thermal and aquatic conditions is an intriguing question because birds can live under extreme hot or cold conditions, and they may fly thousands of kilometres. The performance of birds relies on their morphology, physiology and feather adaptations. Despite these adaptations and athletic performances, our knowledge of bird plumage and the functional morphological adaptations of feathers is surprisingly limited. My research, based on comparative analyses of a large number of species characterized with different lifestyle, habitat or flight characteristics, resulted in some novel and interesting discoveries in the area of ecomorphology of bird plumage and feathers. I demonstrated that the morphology of flight feathers (wing shaft, vane density and porosity) is non-homogenous along the wing axis and vary consistently between species due to aerodynamic forces generated according to the flight style. Additionally, flight feathers differ between terrestrial and aquatic species due to the need to repel water [11,12]. This cross-species study, combined with within-species studies [13], will allow to draw the first 2D map of wing feathers along the bird wing, enabling future projections about the optimal wing morphology and even the evolution of flight. I extended these analyses to over 170 species, providing strong evidence about morphological adaptations of the plumage (feather density) and body feathers in birds to their two principal functions: insulation and water repellence. My comparative analyses demonstrated how plumage density changes according to cold and aquatic environment [14], and I revealed how different feather elements of contour and down feathers change along the temperature gradient and habitat [15,16]. One of my studies on the adaptation of avian flight feathers to flight and habitat published in Functional Ecology was spotlighted by the journal and disseminated to the wider public by the popular media platform *Deep Look*, reaching almost half a million views in two years. I extended my studies on wing architecture and its adaptation to flight in collaboration with my former PhD students. We brought important insights into the evolution of avian wing architecture using the sample of data from 213 European bird species. We found that birds with slender wings accumulate less fuel than species with low wing aspect ratio when covering a similar migration distance [17]. We also found that the mass-adjusted aspect ratio increased, while mass-adjusted heart weight and wing loading decreased with increasing migration distance [18]. These results highlight complex eco-evolutionary adaptations to migratory behaviour, pointing toward the importance of energy minimisation. Our findings indicate that selection due to migration acts on wing traits that reduce the energetic cost of transportation to increase the flight range.

[11] Pap, P.L., Osváth, G., Sándor, K., Vincze, O., Bărbos, L., Marton, A., Nudds, R.L. and Vagasi, C.I., 2015. Interspecific variation in the structural properties of flight feathers in birds indicates adaptation to flight requirements and habitat. Functional Ecology, 29(6), pp.746-757.
[12] Pap, P.L., Vincze, O., Vágási, C.I., Salamon, Z., Pándi, A., Bálint, B., Nord, A., Nudds, R.L. and Osváth, G., 2019. Vane macrostructure of primary feathers and its adaptations to flight in birds. Biological Journal of the Linnean Society, 126(2), pp.256-267.
[13] Osváth, G., Vincze, O., David, D.C., Nagy, L.J., Lendvai, Á.Z., Nudds, R.L. and Pap, P.L., 2020. Morphological characterization of flight feather shafts in four bird species with different flight styles. Biological Journal of the Linnean Society, 131(1), pp.192-202.
[14] Osváth, G., Daubner, T., Dyke, G., Fuisz, T.I., Nord, A., Pénzes, J., Vargancsik, D., Vágási, C.I., Vincze, O. and Pap, P.L., 2018. How feathered are birds? Environment predicts both the mass and density of body feathers. Functional Ecology, 32(3), pp.701-712.
[15] Pap, P.L., Vincze, O., Wekerle, B., Daubner, T., Vágási, C.I., Nudds, R.L., Dyke, G.J. and Osváth, G., 2017. A phylogenetic comparative analysis reveals correlations between body feather structure and habitat. Functional ecology, 31(6), pp.1241-1251.
[16] Pap, P.L., Osváth, G., Daubner, T., Nord, A. and Vincze, O., 2020. Down feather morphology reflects adaptation to habitat and thermal conditions across the avian phylogeny. Evolution, 74(10), pp.2365-2376.
[17] Vincze, O., Vágási, C.I., Pap, P.L., Palmer, C. and Møller, A.P., 2019. Wing morphology, flight type and migration distance predict accumulated fuel load in birds. Journal of Experimental Biology, 222(1), p.jeb183517.
[18] Vágási, C.I., Pap, P.L., Vincze, O., Osváth, G., Erritzøe, J. and Møller, A.P., 2016. Morphological adaptations to migration in birds. Evolutionary Biology, 43, pp.48-59.