

SEEWIESEN

# LECTURE SERIES

FALL/WINTER 2018/19

Max Planck Institute  
for Ornithology



MAX-PLANCK-GESELLSCHAFT

THURSDAY | January 10th, 2019 | 13.00 | HOUSE 4 LECTURE ROOM

## CAROLINE ISAKSSON

Lund University | Host: Brumm Research Group

### Evolutionary adaptation and/or acclimation to urban environments by birds

To estimate the past and future impact of urbanisation on birds, it is important to understand the mechanistic underpinnings of a physiological response to anthropogenic stress. It is well known that urban pollution increases oxidative stress - a state when the antioxidant system is overwhelmed by oxidants, which may cause tissue damage linked to disease and senescence. Urban great tits (*Parus major*) have, repeatedly, shown to have a higher antioxidant activity than rural conspecifics, sometimes sufficient enough to prevent tissue damage and sometimes not. Regardless, an increased antioxidant defence is probably not cost free for urban birds, which is why we need to understand the underlying mechanisms. Is it a result of: i) the evolutionary history (i.e. a strong selection pressure for greater antioxidant capacities in urban habitats); ii) the present environment (i.e. direct physiological up-regulation in response to current urban stressors); or iii) the individual history combined with the present environment (i.e. developmental programming of gene regulation and the potential for match/mis-match between environment and optimal physiological response). By using the European great tit as our model system, my group address these three mechanistic pathways for generating variation in antioxidant capacities between populations and individuals.

#### WHO IS CAROLINE ISAKSSON?

2007	PhD in Gothenburg/Sweden
2007	Rubicon Fellowship, Groningen University, NL
2008	Post doc fellowship from the Swedish Research Council, Oxford University, UK
2010	Wenner-Gren post doc, Oxford University, UK
2012	Associate Senior Lecturer, Lund University, Sweden
2016	Senior Lecturer, Lund University, Sweden

#### SELECTED PUBLICATIONS

- Isaksson, C. 2018 Impact of Urbanization on Birds. In: *Bird Species: How They Arise, Modify and Vanish* (Ed. By Tietze D.T.)
- Andersson, M.N., Nilsson, J., Nilsson, J-Å and Isaksson, C. 2018 Diet and ambient temperature interact to shape plasma fatty acid composition, basal metabolic rate, and oxidative stress in great tits. *Journal of Experimental Biology*, in press
- Salmón, P., Nilsson, J.F., Watson, H., Bensch, S. and Isaksson, C. 2017 Selective disappearance of great tits with short telomeres in urban areas. *Proc. R. Soc. Lond. B.* 284: 20171349.
- Watson, H., Videvall, E., Andersson, M.N. and Isaksson, C. 2017 Transcriptome analysis of a wild bird reveals physiological responses to the urban environment. *Scientific Reports* 7: 44180.

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