

## Is vocal communication in birds affected by cellular oxidative stress?

Messina Simone, University of Antwerp (presenting author)

Eens Marcel, University of Antwerp

Casasole Giulia, University of Antwerp

AbdElgawad Hamada, University of Antwerp

Asard Han, University of Antwerp

Pinxten Rianne, University of Antwerp

Costantini David, University of Antwerp

Avian song is a renowned acoustic trait that may convey honestly several attributes of individual quality. Although some constraints are known to limit vocal communication, it is still unclear which cellular mechanisms underlie the expression of acoustic traits. Recently, there has been growing interest in the role of oxidative stress as a mediator of avian song. We experimentally inhibited the synthesis of glutathione, a key cellular antioxidant, in male European starlings *Sturnus vulgaris*, by DL-buthionine-(S,R)-sulfoximine treatment, in order to experimentally test for the first time whether an altered oxidative balance results in decreased song rate. We measured the effect of our treatment on total song rate and on its two components, i.e. undirected and nest-box oriented song. Treated males that did not own a nest-box (subordinates) suffered increased oxidative stress, while treated males that owned a nest-box (dominant males) did not. Treated non-owners also reduced their undirected song rate toward the end of the experiment. On the other hand, nest-box owners did not suffer any reduction in song rate. Our results revealed that a change in individual oxidative balance results in decreased vocal communication in a social vertebrate, depending on its social ranking. Our results provide support to the hypothesis that acoustic signals may honestly convey information about the individual oxidative status and capacity to regulate the oxidative balance.

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Contact: [simone.messina@uantwerpen.be](mailto:simone.messina@uantwerpen.be)