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'Prof. Nicola Saino

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Obituary – Necrologio

Nicola Saino (6th December 1961 – 17th April 2019)



On April 17th, 2019, at the age of 57, Nicola Saino unexpectedly passed away in Milano, his hometown. Nicola started his research career in the early eighties by collaborating with the ornithology research group of the University of Pavia to study colonial waterbirds, mainly gulls and terns, breeding ecology in the Comacchio Lagoon, in north-eastern Italy. He graduated in Natural Sciences in 1986 with a thesis on the feeding ecology of gulls and terns at the University of Milano, co-supervised by one of us (MF). In 1992, he obtained his PhD at the University of Milano, by defending a

thesis focused on the mechanisms that maintain phenotypic differentiation in the Italian carrion-hooded crow (*Corvus c. corone* - *C. c. cornix*), hybrid zone. In fact, he was prof. Møller postdoc in Uppsala (planning his postdoc in Denmark) and Denmark (field work) in 1992. He began his academic career as a research technician (1992-1998), first at the University of Rome 'La Sapienza' and then at the University of Milano. He was first appointed Associate Professor of Ecology at the University of Milano-Bicocca in 1998. Soon after he moved to the University of Milano, where he eventually became Full Professor of Ecology in 2005 he began establishing his own research group. He has served as a coordinator of the PhD school in Environmental Sciences of the University of Milano, which he contributed to establish in 2013. In 2017, Nicola was among the main promoters and founders of the Department of Environmental Science and Policy at the University of Milano, a multidisciplinary, thematic department broadly focusing on environmental issues. He subsequently became its deputy Director.

Nicola was an outstanding scientist and naturalist. He was extremely dynamic and curious, always keen on asking questions about natural phenomena, and enthusiastic about developing new hypotheses and testing new ideas through a rigorous scientific approach. He was a highly prolific and influential scholar, eclectic in his research interests. These ranged from fundamental organismal ecology, to ecophysiology, ecotoxicology, population genomics, and climate change effects. He authored or co-authored over 300 papers in peer-reviewed journals, including top journals in ecology and evolutionary biology, such as *PNAS*, *Nature Genetics*, *Ecology*

Letters, *Evolution*, *Ecology*, *Biological Reviews*, *The American Naturalist*, *Proceedings of the Royal Society B*, *Journal of Animal Ecology*, and many others. Collectively, his publications received over 14,000 citations (according to his Google Scholar profile, accessed October 2019). As a result of his research, many tens of students defended theses based on research conducted in Nicola's lab. The legacy of Nicola's work continues in the lives of the many who learned about the scientific understanding of animal behaviour from him.

Despite his broad range of research interests, the main focus of his scientific interest was doubtless behavioural ecology. Indeed, in a recent version of his curriculum vitae, he defined himself as a 'behavioural ecologist and evolutionary biologist'. He aimed at unravelling both the proximate and ultimate causes of behavioural variation and natural selection in the wild, using mainly bird species as his study subjects. Through elegant and carefully designed experiments in natural settings, he was able to demonstrate the causal links between several aspects of the phenotype – including morphology, sexual ornaments, stress response, immunity, oxidative status – and fitness. He is perhaps best known worldwide for his career-long research activity on the barn swallow (*Hirundo rustica*). He began studying this species in the early nineties by collaborating with one of us (APM), until he established his own long-term study in northern Italy in 1994, collecting longitudinal data on morphology, physiology and reproduction. The study aimed at exploring variation in life-history traits, trade-offs, and patterns of natural and sexual selection. Two of us (DR and RA) are proud to carry on that same study into the future.

Among the many research topics he has explored during his career, we highlight three areas of behavioural ecology where he made pioneering empirical contributions. These are: 1) ecological immunology, demonstrating that immunocompetence is a major driver of differences in fitness among both adult individual birds and their offspring; 2) parent-offspring communication, showing that carotenoid-based signaling of condition by bird nestlings affects parental allocation decisions; and 3) maternal effects, providing experimental evidence that maternal transfer of nutrients, antioxidants and hormones to the eggs shapes the phenotype of the offspring in adaptive ways. Throughout his career he established a worldwide network of collaborations and mentored several ecologists, including three of us (AB-A, DR, RA), who are now at different stages of academic career in Italy and abroad. The work of the scientists that Nicola trained and mentored will propagate his scientific legacy. His insight, acumen and dedication will be severely missed.

His sudden passing has left an abyss of pain in the lives of his wife Francesca and his daughter Lucia, as well as in those of his friends, collaborators, and colleagues. We wish to express our deepest sympathy to his family.

Diego Rubolini, Roberto Ambrosini, Andrea Bonisoli-Alquati, Anders P. Møller,
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