

Hybridization with a common relative - the threat or chance for the protected bird species?

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Species are assumed to be reproductively isolated from other taxa, what is principal rule in biological species concept. However, observations of individuals with intermediate characters suggested that mating of various taxa is possible and could lead to development of a new type organism called 'hybrids'. People were aware of existence of such interspecific organisms at least since times of Linnaeus. Darwin admitted that hybridization is important force of evolution, whereas Mayr denied the role of this phenomenon. Currently, thanks to increasing number of observations and studies, it is known that hybrids are common in the animal kingdom, and that hybridization is crucial for biology, evolution, ecology and conservation of species. In birds, misallies occur quite often - they have been documented in the case of approx. one fifth of studied species. Classic examples (from Europe) include the crows, nightingales, "large" gulls species complexes, or ducks and geese.

Woodpeckers are no exception, but hybrids are known mainly of the American genera. In Eurasia, the most commonly observed hybrids are in the so-called pied woodpeckers (genus *Dendrocopos*), and in Europe two species are known to hybridize - the Syrian Woodpecker (*D. syriacus*) and the Great Spotted Woodpecker (*D. major*). The Syrian woodpecker spread from its native range in the Middle East to the Balkans and Central-Eastern Europe since end of XIX century, becoming there fully synantropic. In Europe Syrian woodpeckers met great-spotted woodpeckers which are widespread in any wooded areas. This open opportunity for interspecific mating. This pair of species is especially interesting for studying hybridization in birds, as the taxa met very recently (in evolutionary timescale) in artificial conditions (synantropic), and their crosses are viable and fertile. Interspecific mating between these two species probably have some evolutionary consequences as recent studies indicate that some urban populations include approx. 20% of hybrids, including backcrosses in further generations. Even successful mating was observed between two hybrids. Moreover, hybridization could be a threat for Syrian woodpecker populations, at least in the verge of this species range. Important is to highlight that Syrian woodpecker is rare and specially protected in UE (it is a species protected by the Birds Directive of the EU and Natura 2000 areas have been created for its protection).

The major goal of the project is to use information about the structure of sympatric populations of Syrian and great-spotted woodpeckers to assess the impact of interspecific mating and hybridization on the conservation of Syrian woodpecker as a species of special concern in the EU. For this purpose, it is intended to solve specific hypotheses which are focused on the prediction that the extent of interspecific pairing and hybridization is a result of current parental species distribution and environmental constraints like the availability of suitable habitats and species selection to various landscape types. It is planned to examine span of interspecific mating and hybrid occurrence in various scales: European (across Syrian woodpecker sympatric range with great-spotted woodpecker in Europe), regional (examination along urban-rural gradient in Central Europe) and local (details about ecology, hybrid share in populations and reproduction success for selected populations like the best known area of hybridization in Kraków agglomeration in S Poland). These issues will be examined based on field surveys made by PhD student and PI with contribution of data collected by cooperating ornithologists according to "citizen science". Moreover, share of hybrids and backcrosses will be examined for selected populations with use molecular methods. The research is designed in order to prepare PhD thesis by a student recruited to this project. Moreover, Principal Investigator plan cooperation with specialists in woodpeckers ecology, phylogenetic and hybridization in bird from foreign institutions (e.g. Institut de Systématique, Évolution, Biodiversité, Muséum of Natural History, Paris; Charles University in Prague; Hungarian Woodpecker Working Group - Birdlife Hungary). Finally, it is planned to use data from bird monitoring programs in Poland, Hungary and other countries for assessment of the impact of interspecific mating and hybridization on the population status of Syrian woodpeckers in its core and peripheral range in EU.

Apart from leading to scientific findings (evolutionary perspective), this project should develop new strategies for the proper protection of SW and its hybrids (conservation perspective). In this way, the presented proposal fits the fundamentals of life science, as well as the basis for applied nature protection.