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We humans excel in recognizing between many other individuals. We use many clues, like face, voice, gestures, and even smell, depending on situation, to guess whether we know the other person and precisely who he or she is. For us, recognition of tens and hundreds of individuals is an easy task. We humans evolved as very social species. Keeping the track about who is who in the group and how they behaved to us is a crucial skill for humans. For example, our brains possess special skills for recognition of other individuals. Also, for example, our faces evolved to stress differences between individuals to make the recognition easier for our brains.

We do these cognitive tasks so automatically that we do not realize that such skills are not common to many other animals. For example, some species may only distinguish individuals in two categories – familiar or unfamiliar. Many animal parents do not distinguish different individuals between their offspring despite the fact that there are clear differences between them. Such failure of recognition shows that mechanisms allowing recognition may be costly for animals. And, if individuals "do want" to be recognized, they must stop relying on a fact that there is always some individual variation and they need to get traits which will make them more different and recognizable from the other individuals – the true identity signal. Our faces are an example of such identity signal.

One does not need to be a scientist to see that individuals of many other species are individually distinct and it is possible to distinguish between them. However, to decide whether the species poses a true identity signal is a tricky thing. Even more tricky, is to find out how the identity signalling gradually evolved. With any behaviour, there is a problem that, unlike bones, behaviour does not fossilize. Many times, the only way how to learn about the evolution of behaviour, such as identity signalling in case of this project, is to use phylogenetic comparative method. We need to look at the extant species and assess how much identity information is there in their signals. Subsequently, it is possible to infer what evolutionary processes lead to current state, which were the transitional steps during the process and which factors (like, for example, number of individuals the animal regularly encounters) affect whether a species has high or low identity information in its signals.

Right now, there is enough studies that assessed individual identity signalling in single species (>100 in vertebrates), and therefore, it is a right time to conduct such comparative analysis. This will be the ultimate aim of my project. However, before that I will need to develop statistical methods that will allow comparison of results from those many different studies. Also, I will look for new ways of measuring identity information in signals, because current methods have many shortcomings (e.g. reported amount of identity information is dependent on number of individuals in each study and number of calls per individual). I will also conduct second comparative analysis on tropical duetting bird species. In this second analysis, all species will be investigated with the same methods which will allow more direct comparison between species and additional insights in the evolution of identity signalling. Besides these technical reasons, there are also other very good reasons to study identity signalling in duetting bird species. Duetting species often sing songs in which both partners within a pair contribute a part of the song in such a concert that the song seems to be sung by a single individual. Such coordination demands excellent individual recognition of the partner which is very likely associated with high identity information content in their songs. Duetting species thus represent excellent model to study identity signalling.

The results of this project are important in many ways. Because recognition of individuals underlies almost any social behaviour, detail understanding of identity signalling will help us better understand the social behaviours as well. This project represents the most ambitious attempt to understand evolution of identity signalling to date. Further, I will improve methods for studying identity signalling which will be advantageous for further research in this field. Last but not least, the knowledge about how animals signal their identity will help us develop new practical applications. For example, in future, scientist, nature conservation institutions, and amateur naturalists would not have to catch and mark animals for future identification, they would just record their songs or calls for a while and the computer (or even smartphone) would simply tell them which individual is singing.