

Animals, like humans, have individually distinct voices. Individual signatures have been found in vocalizations in more than a hundred of species of mammals and birds so far. Like humans, animals need to recognize others to successfully navigate through their social environments, to keep track about who is friend and who is foe, and to select the best response in each interaction with another individual. But, in some species, or for some types of vocalizations, it is easier to distinguish individuals than in others. Could it be that animals “need to” sound different and that evolutionary processes in some cases push the limits of individual distinctiveness?

For example, researchers have shown, in an iconic example, that a king penguin chick’s survival and its parent’s reproduction success depends on their ability to recognize each other’s voices in roaring colonies and among thousands of other individuals. Previously, researchers, searched for an extra high individuality in vocalizations in large and complex groups and in contexts like recognition between parents and their offspring. In yet unpublished study, we found, surprisingly, that individuality of territorial and mate attraction calls of solitary or pair living animals bear extra-high individuality. We hypothesized that signalling of who am I to the rivals is crucial to avoid repeating fights. And, the bigger is the pool of the rivals encountered, the greater should be the need to sound different from others. Therefore, in this project, we will look for relationship between vocal individuality and breeding density of animals.

Surprisingly, this relationship was very little studied before. We prepared comprehensive project addressing this problem on different levels. We will test if species generally breeding in higher densities have also higher individuality in their vocalizations. Within selected species, we will test if we can find higher individuality in vocalizations within populations living in favourable conditions and high breeding densities. Last, we will test if neighbouring individuals differentiate their vocalizations from each other and ‘try to sound different’ from their neighbours to be easily recognized from other intruders. We will also study genetic and social factors that might influence development and amount of individuality in vocalizations.

Our project will help us understand seemingly simple but important question: why animals differ from each other? Beside importance of individual variation in animal communication and behaviour, studying origins of variation between individuals also helps us to understand the process of evolution and natural selection which directly depend on mechanisms generating biological variation.

During this project we will also collect large dataset of recordings from many individuals and across several different animal species with simple and more complex vocalizations. These data represent valuable resources in ongoing efforts to develop manual and automatic acoustic individual identification tools which could allow us to census and track individual animals non-invasively based on their sounds only.