One of the fundamental features of organisms and manifestation of their life is the transfer of information of many different kinds. Even if we consider reproduction as the essence of life, in its deepest meaning it is a vertical transfer of information encoded in DNA from parents to offspring. All organisms, which for sure is easier to observe in more complex animals, function because cooperation at level of tissues, cells and molecules is coordinated by signals linking different activities. Information transfer is also crucial when we look at relations between organisms of the same or different species. For example, nestlings demonstrate hunger by begging calls to their parents; alarm calls produced by birds after detection of a predator are perceived properly by some monkeys and allow efficient escape. It is just hard to imagine any kind of animal behavior which is not underpinned by communication ability, understood as decoding signals of other organisms.

Our project concerns one of the least known aspects of communication between individuals. It occurs mainly in tropics, but good knowledge about it is necessary for better understanding of animal communication in a model group for studying acoustic signaling – birds.

Birds have fascinating people, including biologists, for long time. In addition to the ability to fly, birds also sing and this is one of the most easy to observe sign of live nature around us. The problem is that majority of studies on birds and their songs have been conducted in the temperate regions of Europe and North America. This resulted in the fact that our knowledge of the evolution of song and its function was biased for long time. In temperate climate singing are usually males and the two fundamental functions of this behavior are territorial defense and mate attraction. In tropical regions of the world often sing also females, and what is really spectacular they sometimes sing in duets with males. Duets are defined as simultaneous and coordinated producing of individual phrases of a song in a way that is alternating or overlapping by two individuals, mostly male and female within a pair. The level of duet coordination's reach miliseconds and it is hard to distinguish which sounds are produced by particular bird. Despite the growing interest in song duets, researchers are still unable to answer many questions about their functions and factors affecting their evolution. Researchers suggest a few crucial functions of duets: mate guarding, mutual recognition, pair bond maintenance, and territorial defense. These functions are not mutually exclusive, and researchers have found evidence both in favor of and against all four of these hypotheses. Research on duet functions in natural conditions is often extremely difficult. First, after recording birds in the tropics, the sounds of two individuals must be separated during analysis. Second, the clear biological context of duet production should be known in order to unravel its function. It seems that one of the most important issue for understanding duets is considering acoustic individual recognition. Individual recognition appears in many forms among animals but seems to be something widespread. Songbirds are one of the best-documented animal groups with such ability and for many species we have experimental proofs that birds are able to learn to specific character of the song of other individuals. The usefulness of individual recognition has been demonstrated in such contexts as recognizing a partner, offspring, and siblings, or distinguishing between neighbors and rivals. In the case of duetting species, two functions of individual recognition seem to be crucial for their biology—neighbor-stranger discrimination for joint territory defense, and mate recognition for maintaining contact between members of a breeding pair and for guarding a mate. Frequent lack of sexual dimorphism in size and colors probably makes acoustic sex recognition an additionally important function.

In the case of singing in duet, communication networks seem to be a particularly interesting issue. A communication network is a natural system where, in addition to what is usually many individuals simultaneously sending and receiving signals, we consider also third-party individuals eavesdropping on interactions between others. Such eavesdropping on social interactions provides the eavesdroppers with reliable information about other individuals' relationships and it provides measurable evolutionary benefits. So far, communication networks have been little studied among duetting species, although it would be more accurate to say that with the exception of one article, we have practically no data on this topic.

We plan to conduct experiments, which should allow to demonstrate if social eavesdropping occur in duetting bird species. A preliminary analysis of our own recordings has shown that the potential for individual recognition in males is very high, possibly even at a distance of hundreds of meters. In the case of females' voices, we did not find any individual features in preliminary study. However, these sounds are much more complicated, with a dominant noise component, and should be studied in more detail. Preliminary results indicate the possible existence of an intra-pair conflict based on differentiated potential for individual recognition of males and females, which could be important for reproductive strategies of both sexes.

Our project fits well with the recent trend in examining the evolution of animal communication, which is no longer understood as a process of information exchange "for the good" of both parties (sender and receiver). Much more efficient framework for explaining signaling behavior is assumption that an essence of communication is an attempt at manipulation of the (mind-reader) receiver by the selfish sender (assessement/management approach).

This project is aimed at experimental testing hypotheses, which should clarify our understanding of song duets' functions. We chose as a model species from genus Laniarius, because in this taxon we had an evolutionary divergence of duetting complexity and some data for other species are already available. We hope that the results of our study bring not only new data about one species, but will be helpful for reconstruction of song duet evolution in this group. The primary aim of this project is to test experimentally whether yellow-breasted boubous can identify conspecifics based on acoustic characteristics, both within pair and during neighbor-stranger interaction, and whether vocal communication in this species has the characteristics of a communication network. We plan to conduct majority of our work with experimental approach, and using state-of-the-art equipment and biocacoustics techniques, such as interactive playback, microphone array recording and sophisticated analysis of signal distribution in time and 3D space. Preparation for this project took altogether 8 years of reconnaissance field work in Cameroon.