

Coding species and individual information in the song of African wood doves (*Turtur* sp.)

PhD thesis-abstract

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The song and other vocalisations of birds play an important role in many aspects of their daily lives but are particularly important in the context of mate attraction and territory defence. To fulfil these functions, song should enable birds to convey information about species identity and, at the same time, contain features that allow individual discrimination within a species. In my thesis, I have studied African doves of the *Turtur* genus, exploring their vocal repertoire, mainly in terms of species and individual recognition. To this purpose, I participated in field research in Nigeria, Mozambique, Ghana and Uganda between 2019 and 2023, collecting data on the vocalisations and other biological features of the *Turtur* doves. As this group of birds was not well studied, the first trips were mainly dedicated to collecting biometric data, blood and feather samples, as well as, observing the behaviour and recording the vocalisations of individuals from each species. These data allowed us to describe the phylogenetic relationships between the species, their morphological characteristics and habitat preferences, and – most of all - a complete description of within and- between species song variation. The analysis of the genetic material confirmed the assumed phylogenetic relationships between doves, in which two larger species preferring a forest habitat are more closely related to each other than to the remaining three species from more open areas, as also shown by the morphological data. Song analysis of all species showed shared two-part song structure, where in all species, the initial part is more diverse, quieter and has a high potential for encoding individual-specific information. Conversely, the final part is more homogeneous in structure and louder across the genus, and carries over further distances, having more significant potential to encode information about the species. During the study's second phase, we conducted playback experiments to test some theoretical assumptions about species and individual recognition in the *Turtur* genus. In the first, we tested two forest species (*T. brehmeri* and *T. tympanistrria*) living in sympatry and one of them (*T. tympanistrria*) in an allopatric population. Both groups were introduced to playbacks with the song of a conspecific, a congeneric and a control. In the

sympatric population, both tested species responded strongly only to the songs of their own species, whereas in the allopatric population, *T. tympanistreria* males responded to the playback of both dove species. We conducted a similar experiment in two savannah species (*T. afer* and *T. chalcospilos*) living in sympatry with an additional playback containing the first part of the song from one species with the final part from the other, and vice versa. The tested males (*T. chalcospilos*) reacted strongly only to their own species, like forest doves. In contrast, the additional mixed playback did not elicit strong responses, indicating that one part of the song is insufficient for the bird to categorise the song as coming from its species. The last experiment addressed the problem of individual recognition and was conducted on the largest forest species (*T. brehmeri*). The males were presented with playbacks of songs from their neighbour and stranger birds of their species from the same population. Doves reacted stronger to the playback of strangers than neighbours, indicating – for the first time for doves - that also in this family, birds are able to discriminate between neighbours and strangers and behave according to the dear enemy hypothesis predictions. Summarising the results from the study presented in this thesis, wood doves of the genus *Turtur* share a song of a similar, two-part structure but with both species- and individually specific phrases, and they are capable of processing this identity information during territorial interactions, which helps them to make optimal decisions regarding territory defence and mate attraction.

Keywords: vocalisations, song syntax, species recognition, individual recognition, playback experiments, *Turtur* sp.