ABSTRACT

Bird song is a sexually selected trait that is crucial for mate choice and for maintenance of pre-mating reproductive barriers. Secondary contact of closely related and partially reproductively isolated song bird species may result in changes in their songs; these can either diverge and strengthen the reproductive barrier between the two species, or converge and contribute to mixing of their gene pools. The Thrush Nightingale (*Luscinia luscinia*) and its congener Common Nightingale (*L. megarhynchos*) may serve as model species suitable for studying these phenomena. In their secondary contact zone, an interspecific hybridization has been documented, as well as convergence of songs of Thrush Nightingales caused by copying of heterospecific songs. Such copying may be a result of erroneous learning of species-specific songs or by genetic introgression. We tested these hypotheses by simultaneous analyses of DNA and song recordings of both species from allopatry (Czech Republic and northeastern Poland) and sympatry (central Poland). Comparisons between our recordings and a catalogue of songs recorded in a Common Nightingale population from allopatry (Germany) confirmed that most of Thrush Nightingale males from the sympatric region were 'mixed singers' that use Common Nightingale phrases in their repertoires; the proportion of heterospecific songs varied among individuals. In contrast, songs of allopatric Thrush Nightingales do not include these heterospecific phrases. Additionally, we included in the analyses five individuals with a phenotype indicating potential hybridization or introgression; DNA analyses confirmed that these five individuals were interspecific hybrids. Their repertoires also combined song types of both species, as in Thrush Nightingale 'mixed singers', and the proportion of Common Nightingale songs sung by hybrids was significantly higher than in Thrush Nightingales. Heterospecific copying of songs by Thrush Nightingales may be caused either by copying from territorial neighbours in adulthood or by erroneous learning of juveniles. Given the fact that only ca 5% of sympatric males are hybrids, the direct contribution of hybridization to this phenomenon is probably unimportant, although the hybrid origin might increase the tendency for learning of songs from both parental species.

Key words: *Luscinia luscinia, Luscinia megarhynchos*, song structure, hybrid zone, introgression, bioacoustics