

Characterization of a secondary contact zone of the Great Tit *Parus major* and the Japanese Tit *P. minor* (Aves: Passeriformes) in Far Eastern Siberia with DNA markers.

LAURA KVIST* & SEPPO RYTKÖNEN

Department of Biology, POB 3000, 90014-University of Oulu, Finland

**Corresponding author*

Abstract

The Great Tit *Parus major* and the Japanese Tit *P. minor* meet and hybridize in a secondary contact zone in Far Eastern Amur River Valley. The genetic characteristics of this hybrid zone were studied by nuclear microsatellites and mitochondrial DNA sequences. Patterns of introgression of nuclear markers, mitochondrial markers and phenotypic characters were found to be different. The possible reasons, such as stronger selection against heterogametic females according to Haldane's rule, lowered hybrid fitness, assortative mating and factors enforcing introgression, like density-dependent pair-formation, are discussed.

Key words: Paridae, hybrid zone, Amur, microsatellite, mitochondrial DNA, introgression, Haldane's rule

Introduction

There are two kinds of hybrid zones, the primary and the secondary hybrid zones. The primary zones are formed in parapatry when natural selection forms the distribution of allele frequencies over a more or less continuous population, and secondary zones when two previously isolated allopatric populations come into a contact. A secondary contact zone is usually characterized by an abrupt but continuous change in phenotypic characters and allele frequencies (Barton & Hewitt 1985, 1989). Geographical width of such a transition zone depends on the strength of introgression and on the selection against hybrid offspring. In birds hybridization is relatively common, and secondary hybrid zones have been described for many species (Newton 2003).

The Great Tit complex is divided into four groups the Great Tit, *Parus major* (Linnaeus), the Japanese Tit, *P. minor* (Temminck & Schlegel), the Turkestan Tit, *P.*