

## Abstract

Sexual promiscuity, whereby females copulate with more than one male, is a quite common phenomenon in socially monogamous birds, and especially in songbirds. This behavior is assumed to influence the evolution of various anatomical traits associated with male ability to outcompete other males in the process of sperm competition. High promiscuity is, in a multi-species comparison, associated with higher relative testis mass, but may also affect sperm phenotypes and other male phenotypes. Sperm morphology is clearly differentiated across avian species and some studies suggest that stabilizing post-copulatory selection on sperm length is responsible for a clear association of between male variation in sperm length and levels of promiscuity. However, the association between other phenotypic traits and promiscuity remains less clear. In this study, I focus on sperm characteristics in relation to the estimated levels of promiscuity in songbirds of tropical and temperate zone climates, and across an altitudinal gradient in the tropics. I found that the coefficient of variation in sperm length, both between males ( $CV_{bm}$ ) and within males ( $CV_{wm}$ ), was indeed a good index of promiscuity. I also reveal the size of cloacal protuberance as an anatomical trait intimately associated with the level of sperm competition across species. I found no association between latitude or altitude and estimated levels of promiscuity. In contrast, total sperm length was changed across both ecological gradients, with tropical lowland species having shortest sperm cells. Population density, altitudinal range, migration distance, clutch size and body mass had no effect on estimated promiscuity levels, indicating weak or absent association between sexual promiscuity and basic ecology or life history traits in songbirds.

*Key words: cloacal protuberance, extra-pair paternity, passerines, variation in sperm length, sperm size*