

## Abstract

Sperm phenotype is an essential indicator of the male ejaculate quality and may have a significant impact on male reproductive success. Sperm phenotypes are considerably variable across species but variation is also found among males within species. This thesis examines (1) variation in sperm phenotypes among males in barn swallows (*Hirundo rustica*), (2) changes in male ejaculate quality with age, (3) relationships between sperm morphology and motility, (4) effects of sperm phenotypes (morphology and motility) on male fertilization success, using a large dataset of 174 observations for 130 males, and (5) the influence of female reproductive environment on sperm motility. From the tested variables, only midpiece length correlated with male age. Older males had shorter midpiece but no relationship between male age and reproductive success was found. Sperm length negatively affected sperm motility and, simultaneously, relative midpiece length positively correlated with sperm motility. No correlation was found between the male reproductive success and sperm motility, presence of abnormalities, length of outermost tail feathers or age. Males with shorter relative midpiece were more successful in within-pair paternity, and males with shorter sperms but longer relative midpiece were more successful in extrapair copulations. This result is consistent with a negative relationship between sperm length and motility. Stabilizing selection on sperm length of barn swallow has not been proven, as males with medium sized sperm did seem to outcompete short or long sperm males. A comparison of sperm traits in cuckolding males and males they cuckolded did not reveal any differences in sperm morphology or motility. The experimental part of thesis focused on cryptic female choice. Sperm cells were swimming better in a setup mimicking the female reproductive environment than in a neutral medium. Sperm motility, however, did not differ between female environment of heterospecific and conspecific females. The results indicate that postcopulatory selection may affect several sperm phenotypes in barn swallows and demonstrate some role of cryptic female choice on sperm performance in this species.

**Key words:** Postcopulatory sexual selection, sperm morphology, sperm motility, sperm senescence, barn swallow