

## **Abstract**

Postcopulatory sexual selection, which encompasses sperm competition and cryptic female choice, has long been an understudied or neglected component of sexual selection. However, in sexually promiscuous organisms, it can play a crucial role in mate choice. Sperm competition exerts strong selective pressure on sperm phenotypes, yet detailed intraspecific studies investigating the relationship between sperm phenotype and male fertilization success remain relatively scarce. Furthermore, selection may operate differently in organisms with external fertilization (where the female's role in influencing sperm competition outcomes is limited) versus internal fertilization (where sperm competition occurs within the female reproductive tract, and cryptic female choice can also come into play), potentially favoring different sperm characteristics.

This thesis, based on research synthesis, summarizes the knowledge about sperm traits that influence male fertilization success in promiscuous organisms, with a focus on differences in sperm trait selection in organisms with internal and external fertilization. To elucidate this issue, the thesis first provides a brief overview of the morphological diversity of vertebrate sperm. It explores sperm morphology and its relationship with male fertilization success, as well as more general characteristics of ejaculates that may affect males' competitive abilities, such as sperm quantity and the proportion of morphologically abnormal sperm. In the second part, the thesis investigates these phenomena within specific groups of vertebrates and examines particular species within these groups, aiming to identify overarching trends and correlations.

## **Keywords**

Sperm length, ejaculate sizes, mitochondria, ATP, sperm longevity, sperm velocity, sperm numbers, sperm morphology, sperm storage