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# Intra-specific morphological variation of the spermatheca in the simultaneously hermaphroditic land snail *Helix aperta*

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## Abstract

In the majority of internally fertilizing animals, females are equipped with sperm storage organs where they store the sperm received during copulation. In many simultaneously hermaphroditic pulmonates, these organs consist of complex spermathecae that show inter- and intraspecific variation in their structure. This variability is theoretically predicted by postcopulatory sexual selection in the context of sperm competition and cryptic female choice. In this study, the variation in the structure of the spermatheca was investigated in the land snail *Helix aperta* from four natural populations near Bejaia in northern Algeria. The populations were different in local snail density, probably also reflecting the intensity of sperm competition. We tested whether the spermatheca showed differences that are predicted by sperm competition theory. In addition, we tested whether the spermathecal structure depends on the shell size and/or is correlated with other reproductive organs that are thought to be affected by sexual selection. We found that the fertilization pouch of *H. aperta* consists of a simple fertilization chamber and 3–9 spermathecal tubules. The four populations did not differ significantly in the mean number of these tubules. However, significant differences were found in the length of the main tubule, the length of the fertilization chamber, and the average length of lateral tubules. In addition, strong associations were detected between the lengths of these structures and the local snail density, while no effect of shell size or reproductive organs was found. Our results indicate that the intensity of sperm competition may not affect the total number of spermathecal tubules, but may increase their lengths. This increase in spermathecal length may reflect an improved sperm storage capacity that is probably beneficial in situations of high sperm competitions intensity.

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