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# PREDICTING THE FERTILITY OF LONG-TERM HONEY BEE DRONE SPERM STORAGE THROUGH CORRELATION OF *IN VITRO* AND *IN VIVO* DATA

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**Abstract** – The article describes a study on the long-term storage of honey bee drone sperm and the evaluation of its quality. The current method of evaluating sperm quality, which involves inseminating queens and waiting for progeny. It is time-consuming and limited by the seasonal nature of beekeeping. The study aims to find correlations between queen fertility rates and sperm quality indicators in the queen spermatheca versus sperm quality indicators after storage in a thawed sperm sample. The study also examines the correlation between number of sperm cells, sperm motility, sperm viability, proportion of worker bee broods, sperm quality indicators in the spermatheca of queen bees, and duration of queen laying. The goal of this study is to validate *in vitro-in vivo* data and to facilitate future research on sperm storage issues.

**Keywords** – *Drone sperm fertility; honey bee drone sperm storage; in vitro-in vivo data correlation; queen fertility; spermatheca; sperm motility; sperm quality evaluation; sperm viability; worker bee brood*