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**Title:** Effect on Sperm Storage After Cold Shock and Rapid Cold Hardening in Female *Drosophila melanogaster*

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**Abstract:** For ectotherms like *Drosophila melanogaster* the ability to resist variation in temperature is an important component of fitness. Cold shock (CS) can affect both male and female reproductive fitness leading to a decrease in progeny production, egg viability, adult mortality and effects female reproductive fitness by killing both eggs and stored sperm; however females of *D. melanogaster* remove these dead sperm, so as to let in fertile sperm by re-mating. Rapid cold hardening (RCH) which is short exposure of cold stress prior to chilling injury or CS, is sufficient to increase cold tolerance in *Drosophila melanogaster*. In this study I have explored the effect of CS and RCH, for which two different laboratory populations of *Drosophila melanogaster* were taken. The base line population which were subjected to different treatments namely RCH, RCH followed by CS and CS. It was found the females of baseline population which were subjected to RCH followed by CS, remarkably remove dead sperm from storage organs than control females as well as females of other treatment. This clearly shows that RCH indeed has an effect on sperm storage when given prior to chilling injury.


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