

# Laboratory experiments on cold acclimation in overwintering Colorado potato beetles, *Leptinotarsa decemlineata* (Say)

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Colorado potato beetle *Leptinotarsa decemlineata* (Say) is a freeze intolerant species hibernating under soil as adult, and being able to supercool to certain degrees. In postdiapause state the mean supercooling point of beetles overwintering in laboratory conditions under soil at 7 °C was  $-10.5 \pm 1.4$  °C. In February the beetles were exposed for 8 days to each of the stepwise lowered temperatures, -2, -4 and -6 °C. Following cold acclimation for 24 days at these temperatures the mean supercooling point was lowered to  $-17.5 \pm 2.4$  °C. All the beetles survived the prolonged exposures to gradually lowered subzero temperatures. However, without a preliminary acclimation to higher subzero temperatures, all the beetles died if exposed directly to -6 °C for 8 days. All the beetles survived the measuring of their supercooling points if they were removed from the cold within 2-3 minutes after the rebound caused by the crystallization. Subsequently the beetles exhibited an abnormal behaviour at 24 °C and long day conditions, burrowing in the soil for 3-4 weeks. The control beetles began to feed immediately after emerging from soil. The authors suggest the inhibition of juvenile hormone by the chilling and/or freezing of pupae resulting in digging behaviour typical of individuals entering diapause.

Key words: Cold acclimation, *Leptinotarsa decemlineata*

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