
P182. Supercooling capacity and acute cold stress of *Ceratitis capitata* (Diptera: Tephritidae) populations across the Northern Hemisphere

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Ceratitis capitata (Diptera: Tephritidae), holds an impressive record of successful invasion events promoted by globalization in fruit trade and human mobility. Additionally, *C. capitata* is gradually expanding its geographic distribution to cooler temperate areas of the Northern Hemisphere. Cold tolerance of *C. capitata* is a crucial feature promoting population establishment and hence invasion success. To elucidate the interplay between invasion process in northern hemisphere and cold tolerance of geographically isolated populations of *C. capitata*, we determined (a) the supercooling capacity (SCP) of immature stages and adults, and (b) the response to acute cold stress as far as survival of adults was regarded. To assess the phenotypic plasticity, the effect of acclimation to low temperatures on acute cold stress survival was also examined. The results revealed that there is no correlation between SCP and climate variables. SCP was much lower than the lowest temperature individuals may have ever experienced in the respective habitats. For acute cold stress of adults, the results revealed that low temperature acclimation was positively related with survival after acute cold stress, except for females originating from Thessaloniki (Greece). Adults from South Arava (Israel) were less tolerant after acute cold stress compared with those from Heraklion (Crete, Greece) and Thessaloniki (Greece). Plastic responses to cold acclimation were population specific, with the Israel population expressing lower levels compared to the two Greek populations. These results set the stage for asking questions regarding the evolutionary adaptive processes that facilitate range expansions of *C. capitata* into cooler temperate areas of Europe.

Keywords: *Ceratitis capitata*, supercooling capacity, cold response, cold treatment, dispersal potential
