No geographic variation in chill coma recovery time of Ceratitis capitata adults after repeated frost events, in spite of population-specific survival costs

Authors: Moraiti Kleopatra[1], Papadopoulos Nikos T.[1], [1]University of Thessaly, Greece
Abstract: The Mediterranean fruit fly, Ceratitis capitata (Diptera: Tephritidae), is a chill-susceptible invasive, insect pest. Adults are capable of fully recovering after a short cold exposure at temperatures that induce a chill coma. However, the effects of repeated cold exposures on chill coma recovery time and post-recovery survival of flies remained unexplored. Here, we addressed the impact of three frost events in chill coma recovery time and post-recovery survival after a period of four days. We used adults from three temperate populations from different climatic zones from Greece (Thessaloniki and Chios Greece) and Israel (Yotvata). Flies (from F4-F5 generations were reared at 25oC up to adult day 10 and then exposed to three cycles of 4h exposures to 0oC (using slurry ice), each separated by 20h at 25oC with full access to adult diet and water. The recovery time was marked as the time needed for each individual to reach the upright position or fly. Our results reveal that multiple frost events evoke population-specific fitness costs in terms of survival of adults during the chill coma and repairing periods. Nonetheless, there is no geographic variation in both chill coma recovery time and short-term post-recovery survival after the three frost events.