Targeting Ecotypes of *Hydrellia lagarosiphon* in Pre-Release Studies Using Adult Longevity, Reproductive Performance and Temperature Tolerance

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Abstract

A leaf-mining fly, *Hydrellia lagarosiphon* Deeming (Ephydridae) was identified as a potential biological control candidate for the submerged aquatic weed *Lagarosiphon major* Ridl. Moss ex Wager (Hydrocharitaceae). Larvae feed on the leaves and cause significant damage to shoot tips reducing the photosynthetic potential of the plant. Three populations of *H. lagarosiphon* were collected from different sites across the native geographic range in South Africa varying in altitude. As part of the pre-release testing the variation in adult longevity, reproductive performance and extreme temperature tolerance of the three fly populations were assessed under laboratory conditions maintained at 22:16° C in a day:night photoperiod of 15:9h. The mismatch between performance in native and introduced ranges in classical biological control is considered an important factor reducing the efficacy of biocontrol agents. To assess temperature tolerance for different fly populations critical minima trials were run using a range of pre-treatments and plunge protocol into discriminating temperatures before scoring survival. The implications for targeting specific populations in the native range as a better ecological match to conditions in Ireland and parts of Europe are discussed.