

Performance of *Hydrellia pakistanae* (Diptera: Ephydriidae) and *Hydrellia* sp. on the South African Biotype of *Hydrilla verticillata* (Hydrocharitaceae)

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Abstract

Hydrilla, *Hydrilla verticillata* L.f. is a submerged aquatic plant of Asian and Australian origin that is invasive in the U.S.A. and South Africa. Two leaf-mining flies, *Hydrellia pakistanae* Deonier. and *Hydrellia* sp., are currently under evaluation as candidate biological control agents for *H. verticillata* in S.A. Because of high genetic diversity within the species, biotype matching for the biological control program was an important consideration. *H. pakistanae* originates on a dioecious biotype of hydrilla from India and *Hydrellia* sp. originates on monoecious hydrilla from Singapore, close to the region of origin of S.A. *H. verticillata*. Based on this, it was assumed that *Hydrellia* sp. is the more suitable candidate however any differences in performance between the two cultures needed quantification before rejecting *H. pakistanae*. Various fitness parameters were measured in a quarantine glasshouse with a min/max of 22/28 °C and a growth chamber with a constant temperature of 27°C and a 16:8 day: night period. *Hydrellia* sp. had a shorter development time and significantly higher egg to adult survival, fecundity and adult longevity compared to *H. pakistanae* under both experimental conditions. *H. pakistanae* fitness parameters were also compared to those measured for this species in the U.S.A. By this comparison, *H. pakistanae* doesn't perform as well on S.A. monoecious *H. verticillata* as it does on the U.S. dioecious form. The results from this study in conjunction with results from host specificity testing suggest that *Hydrellia* sp. is the better candidate for release against *H. verticillata* in S.A. However, the damage potential of each candidate agent will be measured through impact trials before making a final decision on whether *H. pakistanae* should be rejected as a biological control agent for *H. verticillata* in S.A.