

A Tale of Two Strains: a Comparison of Two Populations of *Eccritotarsus catarinensis*, a Biological Control Agent of Water Hyacinth in South Africa

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Abstract

The mirid, *Eccritotarsus catarinensis* (Carvalho), a biological control agent of water hyacinth, *Eichhornia crassipes* (Mart.) Solms, was originally collected from Rio de Janeiro, Brazil, in 1989 and later recollected and imported to South Africa in 1992 from Florianopolis, Brazil. Despite experiencing a significant bottleneck in quarantine which reduced the population to progeny from a single female, it was released in South Africa in 1996 following host specificity testing which found it to be specific to the Pontederiaceae and damaging to water hyacinth. It established around South Africa, largely in the warmer subtropical regions, but struggled to establish permanent populations in high altitude areas characterized by eutrophic waters and cold winters where water hyacinth is most problematic, requiring frequent reintroductions. A second strain of *E. catarinensis* was collected in 1999 from Iquitos, Peru, a higher altitude site thought to be more climatically similar to South Africa than tropical Brazil, in the hope that this strain would be more tolerant of the cooler South African conditions. Studies comparing aspects of the two strains' thermal physiology and host specificity showed the Peruvian strain to have higher thermal requirements than the Brazilian strain, but a narrower host range as it performed significantly worse than the Brazilian strain on pickerelweed, *Pontederia cordata* L., a close relative of water hyacinth. Subsequent sequencing of the CO1 region of the mitochondrial DNA revealed two distinct haplotypes, one Brazilian and one Peruvian, with a 5.2% sequence divergence. This divergence is greater than that often observed in interspecific comparisons in insects, suggesting that these might be two separate species. Inter-Simple Sequence Repeat (ISSR) data supported the mtDNA results. This highlights the need to investigate the effects of inter-breeding or competition between these highly divergent strains before any additional variation is introduced into the current South African population of *E. catarinensis*.