Potential of the Seed-Feeding Weevil *Cissoanthonomus tuberculipennis* for Biological Control of Balloon Vine *Cardiospermum grandiflorum* in South Africa

D. O. Simelane¹, K. V. Mawela¹ and F. Mc Kay²

¹Agricultural Research Council-Plant Protection Research Institute, Private Bag X134, Queenswood, 0121 South Africa  Simelaned@arc.agric.za
²USDA-ARS-South American Biological Control Laboratory, Hurlingham, Argentina

Abstract

Balloon vine *Cardiospermum grandiflorum* Swartz (Sapindaceae), originally from South and Central America and now invasive in South Africa, was one of the five emerging weeds targeted for biological control in 2003. In search of potential biocontrol agents, exploratory surveys were conducted in northern Argentina from 2005 to 2009. These surveys, which included other plant species in the genus *Cardiospermum* and other native Sapindaceae, were aimed at determining the distribution and ecological host ranges of the natural enemies associated with balloon vine. The seed-feeding weevil *Cissoanthonomus tuberculipennis* Hustache (Coleoptera: Curculionidae) was one of the two insect species found to be restricted to balloon vine, and was widespread throughout the north eastern part of Argentina, particularly in Misiones province. Open-field tests, conducted under natural conditions in the native range, also showed that *C. tuberculipennis* was restricted and highly damaging to its natural host *C. grandiflorum*, with up to 54% of balloon vine fruits damaged by the beetle between September 2008 and April 2010. Host-specificity tests, including no-choice, paired-choice and multi-choice tests, showed that *C. tuberculipennis* fed and reproduced only on *C. grandiflorum*. Failure of *C. tuberculipennis* to feed and reproduce even on the three congeners of *C. grandiflorum* during host range studies proves beyond reasonable doubt that the weevil is highly host-specific to the target weed, and therefore poses no threat to non-target plant species. As *C. tuberculipennis* is monophagous and has a very short life cycle with a highly damaging larval stage, it is the best candidate for biological control of this weedy creeper in South Africa and elsewhere. It is strongly recommended that permission be granted for the release of *C. tuberculipennis* from quarantine for the biological control of *C. grandiflorum* in South Africa.