

The exceptional success achieved with biological control of *Cylindropuntia fulgida* (Engelm.) F.M.Knuth var. *mamillata* (Schott ex Engelm.) Backeberg using the cochineal, *Dactylopius tomentosa* Costa (Cholla biotype), in South Africa

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Summary *Cylindropuntia fulgida* (Engelm.) F.M.Knuth var. *mamillata* (Schott ex Engelm.) Backeberg, also known as the boxing glove cactus, is a garden escapee which has invaded large areas in the Northern Cape, Western Cape and Limpopo provinces of South Africa and also in parts of Australia. It is a monstrose form of the chain-fruit cholla (*C. fulgida* (Engelm.) F.M. Knuth var. *fulgida*) and is native to south-western USA and north-western Mexico.

A biotype of the cochineal, *Dactylopius tomentosus* Costa was collected from a closely related cholla, known as *C. cholla* A.Weber in Baja California Sur which was subsequently introduced into quarantine in South Africa for host-specificity studies. This cochineal biotype, also known as the Cholla biotype,

is highly host-specific and shows a high preference for both *C. fulgida* varieties. The first releases were made on *C. fulgida* var. *fulgida* in 2008 followed by further releases on the boxing glove cactus in 2012. The results are spectacular and invasions are usually brought under biological control within three years. Best results are achieved in hot and dry areas. Several boxing glove infestations are now being monitored to demonstrate population declines. Two institutions and private landowners are involved in the manual dispersal of the insect to all infestations. The dramatic outcome of this project could be the result of a new association effect which is based on the avoidance of evolved interspecific homeostasis typical of old associations.