THE POTENTIAL FOR BIOLOGICAL CONTROL OF THE SOUTH AFRICAN WEED *POLYGALA MYRTIFOLIA*

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Summary *Polygala myrtifolia* is a South African shrub that invades natural ecosystems in southern Australia. Biological control is likely to be required to suppress infestations in the longer term. In South Africa, several organisms with potential as biological control agents are identified: *Aceria myrtifoliae*, *Duffyoemida barkeri*, ?*Uredo polygalae*, a stem-galling agromyzid, a stem-boring cerambycid, a stem and crown boring cossid, a bud and flower feeding psyllid and three cecidomyiid species. Priority should be given to evaluating *A. myrtifoliae*.

INTRODUCTION

The woody shrub *Polygala myrtifolia* L. is native to South Africa where it is widely distributed in coastal and mountainous near-coastal areas of the western Cape, eastern Cape and KwaZulu-Natal. The species is morphologically highly variable, with some forms recognised as distinct taxonomic entities (Levyns 1955). The earliest collection of *P. myrtifolia* in Australia is from Melbourne in 1886, but the plant was available from nursery catalogues in Adelaide from at least 1845 (Carter *et al*. 1990). As *P. myrtifolia* has attractive purple and white flowers which are present throughout the year, it is highly likely the species was introduced as a garden ornamental. It has subsequently become naturalized in native vegetation in coastal areas of Victoria, New South Wales, Tasmania, South Australia and Western Australia (Carter *et al.* 1990). In Victoria and South Australia, large infestations occur on calcareous soils with a history of land disturbance. Minor infestations occur in the other states. Dense infestations of *P. myrtifolia* form a closed understorey canopy consisting of mature plants and large numbers of juveniles. This appears to reduce species richness and abundance and the regeneration potential of native vegetation. As coastal areas are exposed to high levels of natural and human-induced disturbance, the distribution and status of *P. myrtifolia* as an environmental weed in southern Australia is likely to increase unless control measures are implemented. The use of herbicides and fire for the suppression of *P. myrtifolia* have not been adequately evaluated, but are likely to be useful for small and accessible infestations. Biological control is considered the only long-term control option for large, widespread or inaccessible infestations. In Australia, few phytophagous organisms occur on *P. myrtifolia*, and then only rarely. This contrasts greatly with plants in South Africa, which are frequently hosts to a range of damaging organisms.

MATERIALS AND METHODS

During January and February 1996, *P. myrtifolia* at 32 sites ranging from Cape Town (33° 56'S, 18°28'E) to Boesmansriviermond (33°41'S, 26°40'E) in the eastern Cape, South Africa were haphazardly examined for pathogens and phytophagous arthropods. Flowers, fruits, foliage, stems, crowns and roots were examined. Adults were collected or immatures were reared for identification.

RESULTS AND DISCUSSION

Around 25 species were found on *P. myrtifolia* of which 13 would be suitable for evaluation as potential biological control agents. Those with the greatest potential include the eriophyid mite *Aceria myrtifoliae* Meyer & Ueckermann (Meyer and Ueckermann 1996), an unidentified psyllid that feeds on flower buds, the stem-boring cerambycid *Duffyoemida barkeri* Martins and an unidentified, gregarious stem and crown boring cossid moth that frequently causes damage to the plant. A rust fungus, probably *Uredo polygalae* Kalchbrenner and a stem-galling agromyzid also offer prospects as potential biological control agents. Similarly, three unidentified cecidomyiids, one that causes shoot-tip galls, another that burrows under bark deforming twigs and another free-living gregarious species that damages buds and flowers are worth consideration. In South Africa, *P. myrtifolia* was widely grown as an ornamental, but now often requires treatment for infestations of *A. myrtifolia* which largely suppresses flowering in various regions. Wild populations of *P. myrtifolia* may also be severely attacked, particularly in the eastern Cape. Eriophyids are typically host specific (Jeppson *et al.* 1975) and some cause significant damage to their host. We suggest that *A. myrtifoliae* should be the first organism to be considered for further evaluation as a biological control agent. *P. myrtifolia* has not been nominated as a target for biological control, but given that its status as an environmental weed is likely to increase and adequate control measures are not available, research towards biological control seems warranted. The commonly cultivated

P. myrtifolia var. *grandiflora* may be susceptible to attack by *A. myrtifoliae*, although occurrences of the mite have not been reported on this taxon in South Africa. Similarly, Australian native Polygalaceae particularly perennial species, require priority evaluation for susceptibility to *A. myrtifoliae*.

ACKNOWLEDGMENTS

The assistance of John Scott with field collection is greatly appreciated. Mike Morris, Beth Grobbelaar, Rolf Oberprieler and Marianne Horak kindly provided identifications for voucher specimens. Penny Edwards found time at short notice to review this manuscript.

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