

IDENTIFICATION AND SCREENING OF POTENTIAL BIOLOGICAL CONTROL
AGENTS IN *Ligustrum robustum* (Roxb.) Bl. Subsp. *walkeri* (Decne.) P.S.Green, FOR
POSSIBLE RELEASE IN THE ISLAND OF LA RÉUNION

By

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ABSTRACT

Ceylon Privét, *Ligustrum robustum* (Roxb.) Bl. subsp. *walkeri* (Decne.) P.S. Green. (Oleaceae), an ornamental tree of Asian origin, has become an invasive weed in the islands of Mascarene archipelago in the Indian Ocean. Since 1969 *L. robustum* has been spreading in the forests of La Réunion Island, where only 30% of the original vegetation of the island and 98% of the primary native vegetation of the Mascarene Islands still exists. In Mauritius, where *L. robustum* was introduced in around 1895, the invasive alien weed has formed dense, impenetrable thickets, and its presence has been correlated with the inability of native vegetation to re-establish. It is currently listed among the 32-world's worst invasive land alien plant species in the IUCN-global invasive species database.

L. robustum arrived in La Réunion from Mauritius and since then had a serious impact on the remnant native vegetation of the island. Molecular techniques together with traditional techniques and historical research to elucidate its taxonomy and determine its exact area of origin revealed that the levels of variation in both Sri Lankan and La Réunion populations were similar and suggested that more than one introductions have been made to Mauritius from Sri Lanka. These results are supported by comparisons between the natural enemies collected from each region. Literature searches suggest

that the likely source of the introduction was an exchange of plant material between botanic gardens of Sri Lanka and Mauritius during the early 20th century.

In 1997, studies were initiated to search for natural enemies of the weed in Sri Lanka. The survey covered four districts including eastern slopes of Hantana Mountains in Kandy, Hakgala Botanic Gardens to Walapane range in Nuwara-Eliya, Boralanda to Attampitiya- Koslanda upper mountains in Badulla and A4 main-road side areas between Balangoda to Haldummulla in Ratnapura districts, all located in the eastern slopes of central-hill country in Sri Lanka, between 725msl. - Koslanda (lowest), 1725msl. Hakgala forests (highest) in elevation category, and Northern latitude 6° 38' 034" - Kadurugama to 7° 40' 437" - Ethulgama and Eastern Longitude 80° 39' 688" - Ethulgama to 81° 01' 736" Koslanda. Most of the insects were collected from leaves, but stem-borers, flower- and seed-feeders were also found. During the past three years about 16 insect species from 3 orders and 11 families were collected and identified, but some common polyphagous insects were not included in the experiment.

Species selected for host-specificity screening and release were ranked according to their impact on plant performance, feeding niche, and distribution. The biology and host specificity of all candidate biocontrol agents were studied to evaluate their potential to control *L. robustum* in its introduced region. Information on characterisation and identification for assessment of human health, safety assessment of environmental risks and efficacy assessment were done to prioritise these insect biocontrol agents. Based on information from the literature and results from laboratory

tests and field surveys on their host range, severity of damage and field populations, four species were regarded as potential biocontrol agents against *L. robustum*, namely Epiplemidae moth, *Epiplema albida* (M.J. Cock), three endemic Chrysomelids, *Dermorhytis ornatissima* Baly. , *D. lewisi* Jacoby. and *Hyphasis* sp. 1. The latter is a new species found in Sri Lanka. *Epiplema albida* (M.J. Cock), a Leaf eating caterpillar, was given the highest priority because of the field and laboratory studies indicated that this Lepidopteran species has inclusive fundamental niches on *L. robustum* subsp. *walkeri* in Sri Lanka.