Prospects for Biological Control of Moth Plant,

Araujia sericifera (Asclepiadaceae)

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1. Summary

1.1 Project and Client

The feasibility of biological control of moth plant, *Araujia sericifera* Brot. (Asclepiadaceae), was investigated by Landcare Research, Mt Albert, for the Auckland Regional Council, Northland Regional Council, and horizons.mw, in March-May 2000.

1.2 Objectives

- Review the taxonomic status of moth plant.
- Describe the biology of moth plant.
- Record the distribution and weed status of moth plant, both in New Zealand and worldwide.
- Describe the impacts of moth plant, both in New Zealand and worldwide.
- Briefly assess the current control options for moth plant in New Zealand.
- Review the literature and current information available from biological control of weeds researchers worldwide to detect potential agents for biological control of moth plant.
- Assess the prospects of achieving successful biological control of moth plant in New Zealand.

1.3 Results and Discussion

- Moth plant is a member of the family Asclepiadaceae, and originates from Southern Brazil and Argentina. There are no native species of Asclepiadaceae in New Zealand.
- Moth plant has naturalised, and is regarded as a weed, in Australia, South Africa, USA, Israel, Italy, and Spain.
- Moth plant occurs within all regional authority areas of the North Island and in the Nelson/Marlborough area. Intolerance of cold restricts the southern expansion of moth plant in New Zealand, and the shallow root system is a limitation in dry soils. Two independent assessments, in Auckland and Northland, both give moth plant the highest ranking in terms of weed potential, for those two regions.
- Mechanical and chemical control of moth plant is costly. Individual plants and local infestations can be cleared, but infestations are often inaccessible or inconspicuous, and reinfestation from wind-borne seeds means the problem recurs.
- Few insect herbivores have been recorded feeding on moth plant in New Zealand and there is no evidence that any of these cause any substantial damage to the plant.
- There have been no biological control programmes against moth plant elsewhere in the world, but a number of potential biological control agents have been identified from the native range of the plant in South America. A list of insects that attack *Araujia* species in Argentina has been provided by the South American Biological Control Laboratory in Buenos Aires, Argentina. A virus disease of *Araujia* species, the araujia mosaic virus, which is transmitted by aphids, is common throughout northern Argentina. The highly restricted host range and the ability to stunt the vines are features that indicate that the virus could be a safe and desirable biological control agent. *Araujia* species in South America are susceptible to rust fungi but the taxonomy and life cycles of these rusts need to be understood before they could be considered as classical biological control agents.
- The development of a mycoherbicide for moth plant may be worth pursuing in New Zealand, but the economic justification of this is doubtful.

1.4 Conclusions

- Moth plant has the potential to be a serious invasive weed in all moist, mostly frost-free, areas of New Zealand, and to cause substantial environmental damage.
- Although there have been no biological control programmes against *Araujia sericifera* elsewhere in the world, a number of potential biological control agents have been identified. Based on the reported impact that natural enemies have on *Araujia* species in their native range in South America, the long-term prospects for successful biological control of moth plant in New Zealand are promising. Because of the taxonomic status of moth plant, there are likely to be few conflicts of interest with regard to host specificity of potential biological control agents.

1.5 Recommendations

- Survey the invertebrate fauna and pathogens of moth plant in New Zealand.
  Estimated costs — $35,000.
- Contact weed research organisations in all countries where moth plant is regarded as a weed to investigate the possibility of collaboration on biological control of moth plant.
  Estimated costs — Landcare Research will do at no cost to regional councils.

2. Introduction

The feasibility of biological control of moth plant, *Araujia sericifera* Brot. (Asclepiadaceae), was investigated by Landcare Research, Mt Albert, for the Auckland Regional Council (ARC), Northland Regional Council, and horizons.mw, in March-May 2000.

3. Background

Moth plant has the potential to be a serious invasive weed in all moist, mostly frost-free, areas of New Zealand, and to cause substantial environmental damage. Biological control has been identified as an appropriate control strategy because in many of the areas being invaded by moth plant, herbicide use would be likely to damage non-target species, and the scale of the problem is such that mechanical control is often not feasible. Landcare Research is undertaking feasibility studies on the potential biological control of weeds selected by local authorities and other stakeholders. These studies are necessary before decisions can be made whether to invest more substantial funding and other resources into biological control programmes.

4. Objectives

- Review the taxonomic status of moth plant.
- Describe the biology of moth plant.
- Record the distribution and weed status of moth plant, both in New Zealand and worldwide.
- Describe the impacts of moth plant, both in New Zealand and worldwide.
- Briefly assess the current control options for moth plant in New Zealand.
- Review the literature and current information available from biological control of weeds researchers worldwide to detect potential agents for biological control of moth plant.
- Assess the prospects of achieving successful biological control of moth plant in New Zealand.

5. Methods

Information for this report was obtained by searching computer databases (Current Contents and CAB Abstracts); from the "Aliens-L" list server; by cross-referencing known references; and from the following people:

Dr Raghaven Charudattan, Associate Professor, Plant Pathology Department, University of Florida;
Dr Hugo Cordo, Director of the South American Biological Control laboratory, Buenos Aires;
Jack Craw, formerly Northland Regional Council, New Zealand (now Keith Turnbull Research Institute, Australia);
Dr Alan Esler, Botanist (ex DSIR, New Zealand);
Dr John Hoffmann, University of Cape Town, South Africa;
Dr Willy Kuschel, Entomologist - research associate, Landcare Research;
Tony McCluggage, Department of Conservation, Northland;
Rosa Henderson, Entomologist, Landcare Research, New Zealand;
Dr Dane Panetta, Department of Natural Resources, Queensland, Australia.

6. Results and Discussion

6.1 Taxonomy

Moth plant, *Araujia sericifera* Brot, is a member of the family Asclepiadaceae, which is best known for ornamentals of the genera *Asclepias* (milkweeds and butterfly flowers) and *Hoya* (wax plant). There are three species of the genus *Araujia: A. angustifolia* (Hook. et Arn.) Duches*; A. hortorum* Fourn*;* and *A. sericifera*; all originating from eastern South America. *Araujia sericifera* is the only *Araujia* species to have naturalised in New Zealand. It has previously been known in New Zealand as *A. hortorum* and *Physianthus albens,* and it is also occasionally referred to as *A. sericofera.* Common names for *A. sericifera* include: moth plant, milk weed, moth catcher plant, cruel plant, kapok vine, and white bladder flower. The common names moth plant, moth catcher plant, and cruel plant refer to the fact that insects such as moths, butterflies, and bees can be trapped when their proboscis becomes caught within the flowers.

The Asclepiadaceae is a fairly large family comprising about 2500 species. The family is principally tropical and subtropical, with many representatives in South America. It is closely related to the family Apocynaceae (Heywood 1978). There are no native species of Asclepiadaceae in New Zealand. The only species in the Asclepiadaceae recorded as being naturalised in New Zealand, apart from *A. sericifera,* is swan plant, *Gomphocarpus fruticosus* (=*Asclepias fruticosa*), which is commonly cultivated in warmer parts of New Zealand to act as a host for monarch butterfly caterpillars. The plant *Oxypetalum caeruleum* (=*Tweedia caerulea*) is commonly cultivated in gardens around New Zealand and seedlings sometimes appear in open places around the parent plants. Other commonly cultivated species of Asclepiadaceae in New Zealand belong to the succulent genera *Hoya, Ceropegia,* and *Stephanotis* (Appendix 11.1). These species are subtropical or tropical and include some of our most common indoor or glasshouse climbers and trailers (Webb et al. 1988).

6.2 Biology

Description

Moth plant is a fast-growing evergreen vine with a woody stem up to 40 mm in diameter. The leaves are arrowhead-shaped, opposite, and dark green on their upper sides and greyish green on the undersides. Spread of the plant is by wind-borne seeds, which can travel at least several hundred metres on parachutes of fine silky tufts. It is suspected that seeds have blown from the mainland to offshore islands in the Hauraki Gulf (Esler 1988). Although it flowers in profusion, with clusters of small creamy-coloured tubular flowers (sometimes marked with pinkish mauve) being formed between December and May, fruit set is low. Possibly only 1% of flowers bear fruit and this may be because of a lack of suitable pollinators in New Zealand. The establishment of an efficient pollinator in New Zealand could further increase the weediness of moth plant (A. E. Esler, pers. comm.). The choko-like fruits, as big as a fist, contain about 400 seeds, and mature fruits normally remain on the vines, giving the advantage of elevation for wind dispersal of the seeds as the fruit dries and splits. Seeds can germinate freely more than 5 years from the time of being shed.

Habitat

Moth plant prefers loose, fertile soils in warmer climates in areas of moderate to high rainfall. It establishes most freely in semi-shade but will tolerate exposure to full light once it reaches the canopy of shrubs, hedges, or trees. Intolerance to cold restricts the southern expansion of moth plant in New Zealand, and the shallow root system is a limitation in dry soils. The requirements of a moist, mild climate probably confines moth plant as a serious weed to lowland areas in the North Island and northern South Island.

6.3 Distribution and Weed Status

World – native range

The native range of *Araujia sericifera* is Southern Brazil and Argentina.

World – introduced range

Moth plant has been introduced into many countries as an ornamental, and it has naturalised or reached weed status in a number of these. It is weedy in a number of states in Australia (Queensland 25°S to 28°S, New South Wales 29°S to 35°S, Victoria, and Western Australia near Perth and Bunbury) (Esler 1988). It is a concern in South East Queensland and it appears to be increasing in numbers and impact (D. Panetta, pers. comm.). Although listed as a weedy species in South Africa (Henderson 1995), it is still localised and not very abundant (J. Hoffmann, pers. comm.). Moth plant is also weedy in California, Israel, Italy, and Spain. It is cultivated in England but is not regarded as a weed there. It is set out in beds in summer and taken indoors for winter.

New Zealand

Moth plant was brought to New Zealand as an ornamental during the 1880s and it is recorded as being naturalised since 1888 (Webb et al.1988). It is now common throughout parts of the Auckland Region, and also occurs in all other regional authority areas of the North Island, and in the Nelson/Marlborough area. In accordance with the Biosecurity Act 1993, moth plant is subject to Plant Pest Management Strategies in various parts of New Zealand. It is listed as a national surveillance plant pest and is thus banned from sale, propagation, and distribution throughout New Zealand. It was available in nurseries in New Zealand up until the 1970s and seeds were still being advertised at $16.40 a packet by Dowseeds,

Gisborne in 1989. It was once promoted as food for monarch butterfly caterpillars, which will develop successfully on it if they are transferred from swan plant.

In the Auckland Region, moth plant is widely distributed and common in urban areas, as well as in rural areas of South Auckland and on Waiheke Island. However, it has yet to become well established in a number of areas in the Auckland Region, particularly the Waitakere Ranges and Great Barrier Island. For this reason moth plant has been declared a "total control" plant pest in certain areas of the Waitakere Ranges and on Great Barrier Island, and landowners in those areas are required by law to control or eradicate the plant (ARC 1996). Throughout the remainder of the Auckland Region, moth plant is a "regional surveillance" plant pest, meaning that there is no legal requirement for landowners to control established infestations. The objective is to arrest the further spread of the plant by: enforcing a ban on its sale, propagation, and distribution; undertaking inspections, monitoring, and surveillance; providing information and advice on control methods; and by increasing public awareness of the problem.

6.4 Impacts

Overseas

In its native range of Argentina and Brazil, moth plant is considered to be an ornamental, industrial, and medicinal plant (Esler et al. 1993). The stem yields tough smooth fibre for textiles, and the silky down on the seeds has many uses. When cut, the stems, pods, and leaves of moth plant exude a milky sap, which can cause irritation to the skin. This latex is used as a treatment for warts in South America and South Africa. The plant is also reported to be a purgative and an agent that induces vomiting (Watt & Breyer-Brandwijk 1962). On several occasions, the plant has been suspected of poisoning cattle and poultry in Australia, but it is not often eaten and cases of poisoning are not common. In feeding tests with poultry, dark brown, ripe seeds were fatal at rates of 5 – 15 g per head (0.3 – 0.6% of body weight). Violent symptoms appeared within 4 hours of eating the seeds and death occurred within 24 hours (Everist 1974).

New Zealand

Moth plant has the potential to cause substantial environmental damage in New Zealand. This vigorous South American vine can scramble over trees and shrubs to a height of about 6 m, smothering and replacing native species in disturbed or low-canopy forest, and in open lands such as coastal areas or offshore islands. It is also a problem in urban reserves and gardens where it can become the dominant species. It is expected that it will spread to become a serious weed in open forest and on forest margins (Esler 1988).

Weeds interfere by being obstructive, suppressing useful plants, damaging native vegetation, lowering the quality of plant and animal products, affecting the well-being of humans and domestic animals, and creating fire hazards. Using the impacts of these features, and an estimate of the ability of each species to increase, Auckland's terrestrial weeds have been ranked for degree of weediness – the Esler index of weediness (Esler 1988). Moth plant is just one of over 600 naturalised species recorded in Auckland, but by this assessment it is the highest ranking weed in Auckland, along with kikuyu grass (*Pennisetum clandestinum*). A similar exercise was undertaken by the Northland Regional Council in order to set new research priorities for invasive weeds (Craw 1999), and moth plant was ranked as their number one priority weed. To quote Jack Craw, Biosecurity Officer for the Northland Regional Council: "This species is spreading faster than any other in Northland, and with wind dispersal it is capable of being distributed into all forests and offshore islands. In 20 years of assessing weed impacts I have seen no species with higher environmental weed potential." These concerns are shared by the Department of Conservation in Northland (T. McCluggage, pers. comm.).

6.5 Current control options for moth plant in New Zealand

Individual plants and local infestations can be cleared, but infestations are often in inaccessible or inconspicuous places, and reinfestation from seeds means the problem recurs and control is therefore costly. Seedlings can be pulled if not too numerous. For larger plants the stems can be cut close to the ground and the roots grubbed out. Care is needed to avoid getting the sticky white sap on the skin as this can be very irritating. Seedlings or larger plants can be sprayed with one of the following herbicide mixtures, being careful not to accidentally apply the chemical to desirable plants that may be under or adjacent to the moth plant vine (ARC Pestfacts 1999):

Knapsack application

Banvine.....120 ml per 10 litres of water
Yates Woody Weedkiller .....120 ml per 10 litres of water
Grazon.....60 ml per 10 litres of water
Escort.....5 g plus 10 ml pulse per 10 litres of water
Tordon Brush Killer.....60 ml plus 10 ml pulse per 10 litres of water

Handgun application

Grazon.....300 ml per 100 litres of water
Escort.....35 g plus 100 ml pulse per 100 litres of water
Tordon Brush Killer.....250 ml plus 100 ml pulse per 100 litres of water

Note: Best spraying results are achieved from spring to autumn.

An alternative method, to avoid damage to neighbouring plants, is to cut back the vines to less than 200 mm above ground level, and treat the cut ends with a liberal dose of one of the following herbicide mixtures:

Banvine.....1 part per 4 parts water
Yates Woody Weedkiller.....1 part per 5 parts water.

6.6 Potential agents for biological control of moth plant

Spiller & Wise (1982) record only the monarch butterfly (*Danaus plexippus*) from moth plant in New Zealand. Although monarch butterfly caterpillars will develop successfully on moth plant, eggs are generally not laid on the plant. Other insects known to occur on moth plant in New Zealand are passionvine hoppers (*Scolypopa australis* Walk.), and the aphids *Toxoptera aurantii* (Boyer de Fonscolombe) (D.Teulon, pers. comm.), and *Aphis nerii* (Fonsc.) (R. Henderson, pers. comm.). A systematic survey would probably reveal more herbivorous insect species feeding on moth plant in New Zealand, but there is no evidence to date that any of these cause any substantial damage to the plant. Pennycook (1989) records no plant diseases from moth plant.

There have been no biological control programmes against moth plant elsewhere in the world, but a number of potential biological control agents have been identified from the native range of the plant in South America.

Potential insect introductions for biological control of moth plant

A list of insects that attack *Araujia* species in Argentina has been provided by Dr Hugo Cordo, Director of the South American Biological Control Laboratory in Buenos Aires (Appendix 11.2). However, this list is incomplete as no one has ever looked in detail at the entomofauna of *Araujia* species (H. Cordo, pers. comm.).

The aphid *Aphis nerii*, which is also one of the few herbivourous insects known to feed on moth plant in New Zealand, may be significant as a vector for the araujia mosaic virus in South America - see below. Dr Willy Kuschel (Entomologist - research associate, Landcare Research), from his knowledge of the plant in Argentina, suggested that at least one of the insect species on the list may be a good candidate as a biological control agent. The fruit weevil (*Rhyssomatus diversicollis*) is likely to have a narrow host range and is quite damaging to the plant (W. Kuschel, pers. comm.).

Potential microbial agents for biological control of moth plant

(a) Rust Fungi (Aecidium asclepiadinum *and* Puccinia araujae): *Aecidium asclepiadinum*, a systemic rust fungus, causes severe distortion and stunting of infected branches. *Puccinia araujae* forms pustules on lower leaf surfaces, petioles, and stems. Tissues surrounding older telia usually turn necrotic (Freeman 1976). However, the taxonomy and life cycles need to be better known before they could be considered as classical biological control agents (R. Charudattan, pers. comm.).

(b) Araujia mosaic virus (AjMV): A virus disease of *Araujia* species is common throughout northern Argentina. The virus has characteristics suggesting that it is a member of the potato virus Y (potyvirus) group. The virus is systemic and induces mild to severe mosaic symptoms, accompanied occasionally by leaf necrosis. There is a general reduction in biomass of infected plants, which become stunted and may eventually die. Araujia mosaic virus (AjMV) has been tested on 121 plant species in 25 families through manual inoculation (Charudattan 1982). Thirty-seven plant species were also tested through aphid inoculations. Only 10 species, all vines belonging to the Asclepiadaceae family, were susceptible. Herbaceous milkweeds and plants outside the Asclepiadaceae family were not susceptible. The virus is transmitted by aphid vectors, and as at least two aphid species (including *Aphis nerii* – the aphid species recorded from *Araujia sericifera* in Argentina) feed on moth plant in New Zealand, the virus could possibly spread rapidly if released. The highly restricted host range and the ability to stunt the vines are features that indicate that araujia mosaic virus could be a safe and desirable biological control agent. However, viruses have rarely been candidates as potential biological control agents for weeds, and there is a lack of relevant knowledge and expertise in that field.

(c) Mycoherbicide: Mycoherbicides are plant-pathogenic fungi applied to control weeds in a similar manner to chemical herbicides. The first product in the world to be registered commercially for biological control of a weed was DeVine® in 1981. It is based on the fungus *Phytophthora palmivora* and is used in Florida, USA, as a mycoherbicide against *Morrenia odorata* (strangle vine), which is a member of the Asclepiadaceae family. Typically more than 90% control is obtained using DeVine® and this lasts for at least 2 years after initial application (Evans et al. in press). This suggests that the mycoherbicide approach may be worth pursuing for moth plant in New Zealand, but the costs of development and application may be prohibitive.

6.7 Prospects for achieving successful biological control of moth plant in New Zealand

A number of potential biological control agents for moth plant have been identified and the chances of finding suitably host-specific and effective agents to release as classical biological control agents appear to be good. A thorough, systematic survey in moth plant's native range, southern Brazil and Argentina, would undoubtedly reveal many more potential biological control agents. There is also the possibility of developing a mycoherbide for moth plant, although the economic justification of this is doubtful. Overall, the costs of developing a biological control programme for moth plant are likely to be relatively high because there has been little work done to date. As moth plant is also a weed in a number of other countries, collaboration with those countries would reduce the costs. The possibility of collaboration should be further investigated.

Host-range testing is a key component of biological control, because it is important to minimise the risk of introduced agents damaging non-target plants. Only those agents that can be shown to be sufficiently host-specific that they do not pose a threat to valued non-target plants are likely to gain approval for release. A biological control project will be more likely to succeed in identifying host-specific control agents if the target weed has few close relatives among native species and plants of economic significance. New Zealand has no native members of the Asclepiadaceae. However, a number of ornamental members of the family are cultivated here. A selection of plants from other families would also need to be tested in order to gain approval for the introduction of any biological control agent for moth plant. The closely related family Apocynaceae includes two native species of the genus *Parsonsia*. There are also three naturalised genera of Apocynaceae in New Zealand, *Nerium*, *Catharanthus,* and *Vinca*, and a number of other genera cultivated for ornamental purposes.

Overall, the prospects for achieving successful biological control of moth plant in New Zealand are promising.

7. Conclusions

Moth plant has the potential to be a serious invasive weed in all moist, mostly frost-free, areas of New Zealand, and to cause substantial environmental damage. Two independent assessments, in Auckland and Northland, both give moth plant the highest ranking in terms of weed potential, for those two regions. However, moth plant at present is probably prevented from reaching its full seeding potential by the absence of efficient pollinators. The establishment of an efficient pollinator in New Zealand would probably further increase the weediness of moth plant.

There have been no biological control programmes against moth plant elsewhere in the world, but a number of potential biological control agents have been identified from the native range of the plant in South America. Based on the reported impact that some of these natural enemies have on *Araujia* species in their native range in South America, the long-term prospects for successful biological control of moth plant in New Zealand are promising. Because of the taxonomic status of moth plant, conflicts of interest, with regard to host specificity of potential biological control agents, may be negligible.

8. Recommendations

- Survey the invertebrate fauna and pathogens of moth plant in New Zealand.
  Estimated costs — $35,000.
- Contact weed research organisations in all countries where moth plant is regarded as a weed to investigate the possibility of collaboration on biological control of moth plant.
  Estimated costs — Landcare Research will do at no cost to regional councils.

9. Acknowledgements

Thanks to Raghaven Charudattan, Hugo Cordo, Jack Craw, Alan Esler, John Hoffmann, Willy Kuschel, Tony McCluggage, Rosa Henderson, Dane Panetta, and David Teulon for information and assistance. Pauline Syrett, Jane Fröhlich, Peter Williams and Lynley Hayes provided helpful comments on the draft report. Thanks also to Christine Bezar for editorial assistance, and Wendy Weller for final word processing.

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11. Appendices

11.1 Species from the family Asclepiadaceae commonly grown in New Zealand as ornamentals

Genus	Species	Synonym	Common Name
Asclepias	*curassavica*		blood flower
Asclepias	*incarnata*		
Asclepias	*tuberosa*		
Ceropegia	*linearis*		
Gomphocarpus	*fruticosus*	*Asclepias fruticosa*	swan plant
Gomphocarpus	*physocarpus*	*Asclepias physocarpa*	swan plant
Hoya	*bella*		
Hoya	*carnosa*		Indian rope
Hoya	*linearis*		
Hoya	*multiflora*		
Hoya	*nicholsonae*		
Hoya	*pauciflora*		
Hoya	*polyneura*		fish tail hoya
Oxypetalum	*caeruleum*	*Tweedia caerulea*	tweedia
Stephanotis	*floribunda*		Madagascar jasmine

11.2 Records of herbivorous insects found on *Araujia* species in Argentina

Cordo, H.A.; Logarzo, G.; Brown, K.; DiIorio, O.(in preparation): Catálogo de Insectos Fitófagos de la Argentina.

Table 1 Herbivorous insects found on *Araujia angustifolia* (Hook. et Arn.) Duches, in Argentina

Species	Family
Araptus araujiae Brethes	Curculionidae (weevils)

Table 2 Herbivorous insects found on *Araujia hortorum* Fourn, in Argentina

Species	Family
Acanthode resjaspidea (Germ.)	Cerambycidae (long-horned beetles)
Aphis nerii Boyer de Fonscolombe	Aphididae (aphids)
Eupogonius petulans Melzer	Cerambycidae (long-horned beetles)
Hyperplatys cana (Bates)	Cerambycidae (long-horned beetles)
Urgleptes mancus (Melzer)	Cerambycidae (long-horned beetles)

Table 3 Herbivorous insects found on *Araujia sericifera* Brot., in Argentina

Species	Family
Aphis nerii Boyer de Fonscolombe	Aphididae (aphids)
Araptus araujiae (Brethes)	Curculionidae (weevils)

Table 4 Herbivorous insects found on *Araujia* spp., in Argentina

Species	Family
Araptus araujiae (Brethes)	Curculionidae (weevils)
Colaspis argentinensis (Bechyné)	Chrysomelidae (flea beetles)
Eubule sculpta (Perty)	Coreidae (squash bugs)
Eupogonius petulans Melzer	Cerambycidae (long-horned beetles)
Oncopeltus stali Berg	Lygaeidae (ground bugs)
Rhyssomatus diversicollis Heller	Curculionidae (weevils)
Urgleptes mancus (Melzer)	Cerambycidae (long-horned beetles)

11.3 Herbivorous insects recorded on moth plant in New Zealand

Species	Common name
Aphis nerii Boyer de Fonscolombe	Oleander aphid
Danaus plexippus (L.)	monarch butterfly
Scolypopa australis Walk.	passionvine hopper
Toxoptera aurantii Boyer de Fonscolombe	black citrus aphid