

**Non-indigenous Animal  
Taxa on St Helena:  
likely effects on endemic  
and indigenous invertebrates  
and their habitats and  
possible control measures**

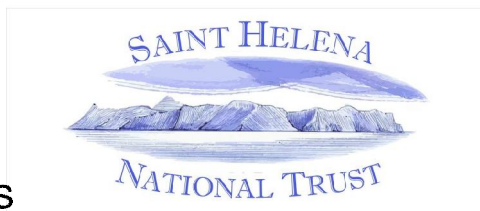
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front cover picture Springbok Mantis *Miomantis caffra*

rear cover picture Red-headed centipede *Scolopendra morsitans* - both South African

pictures © Roger Key

# Contents

## Layout of data sheets

### Predatory Species

(including parasitoids)

#### Invertebrates

- Scorpion
- False Scorpions
- Spiders
- Mites
- Centipedes
- Praying Mantis
- Earwigs
- Crickets
- Cockroaches
- Predatory Bugs
- Green lacewings
- Predatory Ground, Rove, 'Scavenger' (& Soldier) Beetles
- Ladybirds
- Predatory Flies
- Ants
- Social/European Common Wasp
- Solitary Wasps
- Parasitoid Wasps

#### Vertebrates

- Guppy
- Grass Frog
- Java Gecko
- Birds
- Mammals

## Competing Species and Ones Likely Adversely to Affect the Habitat of Indigenous Species

### Detritivores, Carrion & Dung Feeders

- Earthworms
- Landhoppers
- Woodlice
- Mites
- Millipedes
- Springtails
- Detritivorous/mycophagous Beetles
- Synanthropic Beetles
- Detritivorous/carrion feeding Flies
- Herbivore Dung Fauna

### Saproxylics

- Termites
- Saproxylic weevils

### Plant Feeders

- Slugs and Snails
- Aphids & scale insects
- Plant Bugs & Hoppers
- Thrips
- Plant-feeding Beetles
- Moths & Butterflies
- Phytophagous Flies
- Rabbits (and Goats)

### Others

- Ants
- Barkflies/Barklice
- Webspinner

### Summary

# Layout of data sheets

## Group Referred to

English name – may be taxon - “Spiders” or combined with ecological role - “Plant feeding bugs and hoppers”

## Threat posed

### Desirability for control

### Likelihood of success

Self explanatory – based on my best opinion from personal knowledge of the group and/or what I have been able to research on threats/effects/control measures elsewhere. Colour coded on agency and possibility.

## Taxonomy

higher than that listed below eg Insecta: Hymenoptera:

## Alien species

Number of species, list of species, with family if not given above in ‘Taxonomy’ and sometimes brief note on ecology/pest status etc in larger lists.

## Related Endemic/Indigenous species

number of reasonably closely related species which might need to be taken into account when any consideration is being given to biological control, most often with a list of the species.

## Ecology

Notes on what I can find on the ecology of the species or group of species, mainly from web-searching.

## Possible effects on St Helena’s indigenous/endemic invertebrates

Reasons why the species/group may be of concern in the conservation of the indigenous invertebrate fauna of St Helena.

### i **Predatory Effects** (including parasitoids)

Whether or not the species or group may pose a threat to populations of the indigenous invertebrate fauna of St Helena through direct predation. This can be difficult to assess and the assessment has to be to some degree subjective.

### ii **Competitive effects**

Even more difficult to assess. I have tried to indicate those endemic/indigenous species/groups which are most likely naturally to inhabit the microhabitat into which the alien species invades. *Proving* a competitive effect is most difficult.

### iii **Parasitic effects**

Invertebrate parasites/parasitoid on other invertebrates, where appropriate.

### iv **Effects on invertebrate habitats**

Many species are likely to impact on indigenous invertebrates not directly, but by altering the habitat in some way, making it less or unsuitable for the indigenous species, either by destroying foodplants, altering the quality of them in some way (eg by changing vigour, inducing the production of stress chemicals, producing honeydew and encouraging sooty mould etc), or changing the hydrology or physical characteristics of detritus or dead wood by burrowing etc.

### v **Pest effects for people**

Species that also make a nuisance of themselves to the people of St Helena. These are the ones where there are likely to be control measures already known about.

## Possibility of Control

### i **Likelihood of safe physical/chemical control in wild populations & habitats**

Whether or not direct destruction of individual alien invertebrates or the modification of their habitat or the use of chemical biocides may safely achieve control (or elimination) of the species or group of species. Based mainly on studies elsewhere or from what is known of the ecology of the species/group.

## **ii Likelihood of safe biocontrol measures & precedence**

Mainly from biological control work undertaken elsewhere, including sometimes research I have found that does not seem so far to have led to use in the field. In some instances, I have indicated predatory or parasitoid species that are known to impinge on the taxa in question but which seem not to have been used as biocontrol agents for the species either on St Helena or at all, and are included as thought provokers...

## **iii Possible dangers of biocontrol measures**

My own feeling as to the dangers inherent in possible biocontrol programmes for alien invertebrates in the context of St Helena, concentrating mainly on the risk to endemic & indigenous species.

## **Other comments**

## **Additional References**

A good source of further information on biocontrol relevant to the UK Overseas Territories is :-

Maczey, Norbert ;Tanner, Rob & Shaw, Richard. 2012. Understanding and addressing the impact of invasive non-native species in the UK Overseas Territories in the South Atlantic: A review of the potential for biocontrol. DEFRA ref: CR 0492 . CABI ref: TR10086. CABI Bioscience, Egham.

<http://www.cabi.org/uploads/projectsdb/documents/9748/Project%20reference%20list.docx>

Presumably there are other publications resulting from this project, although I am not familiar with them.

# PREDATORY SPECIES

(including parasitoids)

Species or groups that may pose a threat to populations of the indigenous invertebrate fauna of St Helena through direct predation. This can be difficult to assess and the assessment has to be to some degree subjective.

## INVERTEBRATES

### **Scorpion**

False Scorpions

### **Spiders**

Mites

### **Centipedes**

### **Praying Mantis**

Earwigs

Crickets

Cockroaches

Predatory Bugs

Green lacewings

Predatory **Ground, Rove**, 'Scavenger' (& Soldier) Beetles

Ladybirds

Predatory Flies

### **Ants**

### **Social/European Common Wasp**

Solitary Wasps

### **Parasitoid Wasps**

## VERTEBRATES

### **Guppy**

### **Grass Frog**

### **Java Gecko**

### **Birds**

### **Mammals**

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Scorpion

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
unknown/possible

### Taxonomy

Scorpiones: Buthidae:

### Alien species - 1

*Isometrus maculatus*

### Related Endemic/Indigenous species - 0

### Ecology

Mainly dry habitats with loose stones for cover. Predatory on ground-dwelling and lapidicolous invertebrates.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Effects could be significant on dry ground invertebrates

#### v Pest effects for people

Painful sting, though not dangerous.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Scorpions may be killed by parasitic nematodes and mites and there are chloropid fly parasitoids of the eggs of (fairly) closely related whip scorpions. However there appears little or no literature on biological control of scorpions and this may require primary research, ideally in South Africa where the species originates.

#### iii Possible dangers of biocontrol measures

Probably low if any biocontrol agent is known that is specific to scorpions.

### Additional References

<http://www.bioone.org/doi/full/10.1603/0022-0493-98.5.1486?prevSearch=scorpion%2Bcontrol&searchHistoryKey=&queryHash=2145991d9345db699d6a3a0333fe71e7>

Gary A. Polis (ed) 1990 The Biology of Scorpions. Stanford University Press – see chapter on parasites:-  
<http://books.google.co.uk/books?id=6OqeAAAAIAAJ&pg=PA318&lpg=PA318&dq=insect+parasitoids+of+scorpion+eggs&source=bl&ots=ZSz-YnfvnV&sig=hp3K4Bg7aQjEz-zAaErgDcm6Lsk&hl=en&sa=X&ei=36LvUo6OEJCg7AaDroDgAw&ved=0CGwQ6AEwCw#v=onepage&q=insect%20parasitoids%20of%20scorpion%20eggs&f=false>

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## False Scorpions

Threat posed  
Desirability for control  
Likelihood of success

?Low  
Unclear  
Low

### Taxonomy

Arachnida: Pseudoscorpionida:

### Alien species - 3

<i>Chthonius ischnocheles</i>	Chthoniidae
<i>Roncus lubricus</i>	Neobisiidae
<i>Withius piger</i>	Withiidae

### Related Endemic/Indigenous species – 5

<i>Tyrannochthonius helenae</i>	Chthoniidae
<i>Hemisolinus helenae</i>	Garypinidae
<i>Scotowithius helenae</i>	Withiidae
<i>Sphallowithius excelsus</i>	Withiidae
<i>Sphallowithius dishonestus</i>	Withiidae

### Ecology

Alien species on St Helena favour moist microhabitats, particularly soil, litter, dead wood, mosses etc. Predatory on very small invertebrates, especially mites and springtails.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Unknown, but may effect mite and springtail populations.

#### ii Competitive effects

Possibly with endemic species.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Unknown – no precedent.

#### iii Possible dangers of biocontrol measures

Risk to endemic species



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Spiders

Threat posed  
Desirability for control  
Likelihood of success

Variable, some HIGH  
Variable, some HIGH  
unknown ?Low

### Taxonomy

Arachnida: Araneae:

### Alien species - 51 (most species not assessed for priority)

<i>Malthonica pagana</i>	Agelenidae	<i>Hasarius adansoni</i>	Salticidae
<i>Tegenaria domestica</i>	Agelenidae	<i>Menemerus bivittatus</i>	Salticidae
<i>Gasteracantha sanguinolenta</i>	Araneidae	<i>Scytodes fusca</i>	Scytodidae
<i>Neoscona hirta</i>	Araneidae	<i>Scytodes velutina</i>	Scytodidae
<i>Neoscona rufipalpis</i>	Araneidae	<b><i>Segestria florentina</i></b>	Segestriidae
<b><i>Xeropigo tridentiger</i></b>	Corinnidae	<b><i>Anyphops stauntoni</i></b>	Selenopidae
<b><i>Dysdera crocata</i></b>	Dysderidae	<i>Dyschiriognatha argyrostilba</i>	Tetragnathidae
<i>Pritha condita</i>	Filistatidae	<i>Achaearana acorensis</i>	Theridiidae
<i>Trachyzelotes lyonneti</i>	Gnaphosidae	<i>Argyrodes argyroides</i>	Theridiidae
<i>Urozelotes rusticus</i>	Gnaphosidae	<i>Enoplognatha mandibularis</i>	Theridiidae
<i>Diplostyla concolor</i>	Linyphiidae	<i>Kochiura aulica</i>	Theridiidae
<i>Erigone prominens</i>	Linyphiidae	<b><i>Latrodectus geometricus</i></b>	Theridiidae
<i>Lepthyphantes leprosus</i>	Linyphiidae	<i>Latrodectus tredecimguttatus</i>	Theridiidae
<i>Meioneta prosectes</i>	Linyphiidae	<i>Nukuhiva adamsoni</i>	Theridiidae
<i>Microlinyphia pusilla</i>	Linyphiidae	<i>Parasteatoda tepidariorum</i>	Theridiidae
<i>Ostearius melanopygius</i>	Linyphiidae	<i>Rhomphaea nasica</i>	Theridiidae
<i>Ero aphana</i>	Mimetidae	<i>Steatoda capensis</i>	Theridiidae
<i>Mimetus</i> cfr. <i>fernandi</i>	Mimetidae	<i>Steatoda grossa</i>	Theridiidae
<i>Oecobius cellariorum</i>	Oecobiidae	<i>Steatoda triangulosa</i>	Theridiidae
<i>Oecobius navus</i>	Oecobiidae	<i>Theridion melanurum</i>	Theridiidae
<i>Heteroonops spinimanus</i>	Oonopidae	<i>Theridion purcelli</i>	Theridiidae
<i>Opopaea concolor</i>	Oonopidae	<i>Theridion sisyphium</i>	Theridiidae
<i>Coryphasia fasciventris</i>	Oxyopidae	<i>Runcinia grammica</i>	Thomisidae
<i>Pholcus phalangoides</i>	Pholcidae	<i>Uloborus walckenaerius</i>	Uloboridae
<i>Dendryphantas purcelli</i>	Salticidae	<i>Zosis geniculata</i>	Uloboridae

### Related Endemic/Indigenous species – 51 (plus 10 possibly indigenous species of doubt)

<i>Argiope trifasciata</i>	Araneidae	<i>Trochosa</i> cfr. <i>urbana</i>	Lycosidae
<i>Freyanomorpha ambigua</i>	Avenzoariidae	<i>Trochosa</i> sp. 1	Lycosidae
<i>Clubiona dubia</i>	Clubionidae	<i>Trochosippa?</i> sp.	Lycosidae
<i>Archaeodictyna conducta</i>	Dictynidae	<i>Cheiracanthium wilma</i>	Miturgidae
<i>Benoitodes caheni</i>	Gnaphosidae	<i>Tecution helenicola</i>	Miturgidae
<i>Benoitodes sanctaehelenae</i>	Gnaphosidae	<i>Tecution mellissi</i>	Miturgidae
<i>Drassodes distinctus</i>	Gnaphosidae	<i>Tecution planum</i>	Miturgidae
<i>Pterochroa funerea</i>	Gnaphosidae	<i>Tecution</i> sp.	Miturgidae
<i>Bathyphantes gracilipes</i>	Linyphiidae	<i>Mysmena isolata</i>	Mysmenidae
<i>Bathyphantes helenae</i>	Linyphiidae	<i>Nesticella helenensis</i>	Nesticidae
<i>Helsdingenia extensa</i>	Linyphiidae	<i>Gamasomorpha insularis</i>	Oonopidae
<i>Lepthyphantes albimaculatus</i>	Linyphiidae	<i>Ischnothyreus peltifer</i>	Oonopidae
<i>Napometa sanctaehelenae</i>	Linyphiidae	<i>Oonops erinaceus</i>	Oonopidae
<i>Napometa trifididens</i>	Linyphiidae	<i>Opopaea atlantica</i>	Oonopidae
<i>Dolocosa dolosa</i>	Lycosidae	<i>Alloptes stercorarii</i>	Proctophyllodidae
<i>Hogna cinica</i>	Lycosidae	<i>Zimirina relegata</i>	Prodidomidae
<i>Hogna inexorabilis</i>	Lycosidae	<i>Thecarthra stercorarii</i>	Pterolichidae
<i>Hogna ligata</i>	Lycosidae	<i>Tetrablemma helenense</i>	Tetrablemmidae
<i>Hogna nefasta</i>	Lycosidae	<i>Leucauge digna</i>	Tetragnathidae
<i>Hogna</i> sp. 1	Lycosidae	<i>Tetragnatha nitens</i>	Tetragnathidae
<i>Hogna</i> sp. 2	Lycosidae	<i>Argyrodes mellissi</i>	Theridiidae
<i>Lycorma?</i> sp.	Lycosidae	<i>Nesticodes rufipes</i>	Theridiidae
<i>Lycosa elysae</i>	Lycosidae	<i>Theridion sciaphilum</i>	Theridiidae
<i>Lycosa ringens</i>	Lycosidae	<i>Theridion solium</i>	Theridiidae
<i>Lycosidae</i> sp. 1	Lycosidae	<i>Theridula huberti</i>	Theridiidae
<i>Lycosidae</i> sp. 2	Lycosidae	<i>Zercidium helenense</i>	Theridiidae
<i>Lycosidae</i> sp. 3	Lycosidae		

## **Ecology**

All habitats. Predators of other invertebrates of almost all taxonomic groups. Active hunters and lurking ambushers on ground, under stones & bark and on vertical hard surfaces such as bark, rock and walls, amongst vegetation and in litter. Web-spinners in a wide variety of locations.

## **Possible effects on St Helena's indigenous/endemic invertebrates**

### **i Predatory Effects**

mainly generalist predators on a particular size range of invertebrates within their (micro-)habitat, although with at least one highly specific to a particular higher taxon, in this case (*Dysdera crocata*) specialising on woodlice, of which there are several endemic species in St Helena as well as a large number of very abundant alien species.

### **ii Competitive effects**

Such a large number of alien species in the same families and with the same lifestyles as endemic species means that competition is probably inevitable, in particular for web building space. *Dysdera crocata* may be in competition with 2 endemic species of *Tecution* (Miturgidae) which specialise on preying woodlice, (see [http://www.issg.org/database/species/impact\\_info.asp?si=1465&fr=1&sts=&lang=EN](http://www.issg.org/database/species/impact_info.asp?si=1465&fr=1&sts=&lang=EN) however).

### **v Pest effects for people**

The brown widow *Latrodectus geometricus* and, in particular *Dysdera crocata* and *Segestria florentina* have painful bites. *Latrodectus geometricus* toxin is very potent but is very rarely produced in sufficient quantities for the bite to be dangerous. Many of the larger alien species are of a size and appearance to cause problems to arachnophobes.

## **Possibility of Control**

Given the highly effective dispersive mechanism of many/most spiders (ballooning), re-invasion after any partially successful control is highly likely.

### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely.

### **ii Likelihood of safe biocontrol measures & precedence**

There appear to be no web references to biological control of spiders. There are polysphinctine ichneumonid parasitoids of adult spiders and geline ichneumonid parasitoids of spider egg masses. However, they are unlikely to be species-specific.

### **iii Possible dangers of biocontrol measures**

The very large number endemic spiders mean that any form of biological control would be highly hazardous to that fauna.

## **Other comments**

*Dysdera crocata* is included in the IUCN list of world invasive species  
<http://www.issg.org/database/species/ecology.asp?si=1465&fr=1&sts=&lang=EN>

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## MITES

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
unknown

### Taxonomy

Arachnida: Acari:

### Alien species - 43

Parachipteria punctata	Orbatida: Archipteriidae	Ornithonyssus bursa	Parasitiformes: Dermanyssidae
Platynocheilus peltifer	Orbatida: Camisiidae	Boophilus decoloratus	Parasitiformes: Ixodidae
Ceratozetes gracillis	Orbatida: Ceratozetidae	Rhipicephalus evertsi	Parasitiformes: Ixodidae
Scapheremaeus palustris	Orbatida: Cymbaeremaeidae	Laelaps echidnus	Parasitiformes: Laelapidae
Damaeus ornatus	Orbatida: Damaeidae	Macrocheles penicilliger	Parasitiformes: Macrochelidae
Epilohmannia inexpectata	Orbatida: Epilohmannidae	Macrocheles peniculatus	Parasitiformes: Macrochelidae
Galumna elimata	Orbatida: Galumnidae	Macrocheles submotus	Parasitiformes: Macrochelidae
Acrogalumna longipluma	Orbatida: Galumnidae	Geholaspis mandibularis	Parasitiformes: Macrochelidae
Protoribates lophotrichus	Orbatida: Haplozetidae	Pergamasus longicornis	Parasitiformes: Parasitidae
Liacarus coracinus	Orbatida: Liacaridae	Phityogamasus primitivus	Parasitiformes: Parasitidae
Trimalaconothrus novus	Orbatida: Malaconothridae	Parholaspus kewensis	Parasitiformes: Parholaspidae
Nanhermannia elegantula	Orbatida: Nanhermannidae	Holaspulus tenuipes	Parasitiformes: Parholaspidae
Nothrus palustris	Orbatida: Nothridae	Bdellodes longirostris	Prostigmata: Bdellidae
Oppia varians	Orbatida: Oppiidae	Pediculaster manicatus	Prostigmata: Siteroptidae
Zygoribatula exilis	Orbatida: Oribatulidae	Anystis baccarus	Trombidiformes: Anystidae
Phthiracarus nitens	Orbatida: Phthiracaridae	Anystis kochi	Trombidiformes: Anystidae
Steganacarus magnus	Orbatida: Phthiracaridae	Anystis berlesii	Trombidiformes: Anystidae
Scheloribates laevigatus	Orbatida: Scheloribatidae	Tetranychus evansi	Trombidiformes: Tetranychidae
Trhypochthoniellus excavatus	Orbatida: Trhypochthoniellidae		

### Related Endemic/Indigenous species – 42 (plus an additional 6 possibly indigenous species)

Freyanomorpha ambigua	Astigmata: Avenzoariidae	Hypoaspis decellei	Parasitiformes: Dermanyssidae
Alloptes stercorarii	Astigmata: Proctophyllodidae	Glyptolaspis thorri	Parasitiformes: Macrochelidae
Thecarthra stercorarii	Astigmata: Pterolichidae	Macrocheles helenensis	Parasitiformes: Macrochelidae
Mongaiardia magna	Orbatida: Amerobelbidae	Pachylaelaps major	Parasitiformes: Pachylaelaptidae
Carabodes carinatus	Orbatida: Carabodidae	Gamasiphis krieli	Parasitiformes: Rhodacaridae
Carabodes fenestatus	Orbatida: Carabodidae	Chiropturopoda brevopilus	Parasitiformes: Uropodidae
Carabodes horridus	Orbatida: Carabodidae	Fuscuropoda leleupi	Parasitiformes: Uropodidae
Carabodes hyalinus	Orbatida: Carabodidae	Bdellodes parvisetosa	Prostigmata: Bdellidae
Carabodes incrustatus	Orbatida: Carabodidae	Bdellodes quadrisetosa	Prostigmata: Bdellidae
Carabodes pentatrachus clavatus	Orbatida: Carabodidae	Chaussieria benoiti	Trombidiformes: Anystidae
Crotonia perforata	Orbatida: Crotoniidae	Chaussieria brevis	Trombidiformes: Anystidae
Galumna ambigua	Orbatida: Galumnidae	Chaussieria dissimilis	Trombidiformes: Anystidae
Galumna rugosa	Orbatida: Galumnidae	Chaussieria sanctaehelenae	Trombidiformes: Anystidae
Pergalumna irregularis	Orbatida: Galumnidae	Balaustium southcotti	Trombidiformes: Erythraeidae
Liodes lanceosetosus	Orbatida: Liodidae	Cavannea cooremani	Trombidiformes: Erythraeidae
Trimalaconothrus pallidus	Orbatida: Malaconothridae	Cavannea sanctaehelenae	Trombidiformes: Erythraeidae
Oppia petiolata	Orbatida: Oppiidae		
Oppia rubida	Orbatida: Oppiidae		
Indotritia clavata	Orbatida: Oribotritiidae		
Hoplophthiracarus cavernosus	Orbatida: Phthiracaridae		
Phthiracarus flagellatus	Orbatida: Phthiracaridae		
Scheloribates abbreviatus	Orbatida: Scheloribatidae		
Scheloribates brachypterus	Orbatida: Scheloribatidae		
Scheloribates calcaratus	Orbatida: Scheloribatidae		
Scheloribates curvirhynchus	Orbatida: Scheloribatidae		
Scheloribates deficiens	Orbatida: Scheloribatidae		
Scheloribates evanescens	Orbatida: Scheloribatidae		
Scheloribates helenensis	Orbatida: Scheloribatidae		
Scheloribates lanceolatus	Orbatida: Scheloribatidae		
Scheloribates maculatus	Orbatida: Scheloribatidae		
Scheloribates microsetosus	Orbatida: Scheloribatidae		
Platyseius leleupi	Parasitiformes: Ascidae		

## **Ecology**

All terrestrial habitats, dry and moist. Detritivorous, fungivorous, phytophagous, predatory, parasitic on invertebrates and vertebrates & bloodsucking on vertebrates.

## **Possible effects on St Helena's indigenous/endemic invertebrates**

### **i Predatory Effects**

Many species are predatory on other mites and other very small invertebrates. Their effects on populations are likely to be very difficult to assess.

### **ii Competitive effects**

Possible or likely, but their effects on other invertebrate populations are likely to be very difficult to assess.

### **iii Parasitic effects**

Haemolymph sucking parasitic mites can have very serious effects on other species of invertebrates, from considerably reducing vigour to killing infested individuals. Whether this is of significance for St Helenan species appears unknown. There may be possible effects from severe phoretic load on some invertebrates.

### **iv Effects on invertebrate habitats**

Likely to have an effect on detritus and fungal habitats but probably impossible to quantify at the moment.

### **v Pest effects for people**

Some species are blood-sucking on humans and cause itching. Others are parasitic on domestic livestock or pests on crop and garden plants.

## **Possibility of Control**

### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

### **ii Likelihood of safe biocontrol measures & precedence**

Unlikely

### **iii Possible dangers of biocontrol measures**

Given the number of possibly endemic species, it is unlikely that this is likely to be an option.

## **Additional References**

<http://learningstore.uwex.edu/Biological-Control-of-Insects-and-Mites-An-Introduction-to-Beneficial-Natural-Enemies-and-Their-Use-in-Pest-Management-P1392.aspx>

This may have some relevance but I've not been able to see a copy.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Centipedes

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
unknown

### Taxonomy

Chilopoda:

#### Alien species - 8

<i>Geophilus flavus</i>	Geophilidae
<i>Henia vesuviana</i>	Geophilidae
<b><i>Lithobius forficatus</i></b>	Lithobiidae
<i>Lithobius melanops</i>	Lithobiidae
<i>Lithobius aeruginosus</i>	Lithobiidae
<b><i>Cryptops hortensis</i></b>	Cryptopidae
<b><i>Scolopendra morsitans</i></b>	Scolopendridae
<i>Scutigera coleoptrata</i>	Scutigerae

#### Related Endemic/Indigenous species - 3

<i>Tuoba benoiti</i>	Geophilidae
<i>Lamyctes leleupi</i>	Henicopidae
<i>Cryptops basilewskyi</i>	Cryptopidae

### Ecology

Opportunistic predators on other invertebrates of most taxonomic groups, mainly nocturnal or subterranean. All habitats. Mainly ground & litter dwelling, lapidicolous, corticolous or subterranean. Some species also forage high amongst vegetation at night. *Geophilus flavus* tends to be a beach species under drift litter.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Probably almost all species of indigenous invertebrate are vulnerable to predation from one or other of the alien centipede species on St Helena. This group may probably pose amongst the greatest threats to indigenous invertebrates on St Helena. *Scolopendria morsitans* may have been significant in the extinction of the endemic giant earwig and ground beetle.

#### ii Competitive effects

May compete with endemic species.

#### v Pest effects for people

*Scolopendria morsitans* has an excruciatingly painful bite and may produce severe allergic reactions.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely. Web advice on control of centipedes is restricted to use of biocides and removal of sheltering habitat.

#### ii Likelihood of safe biocontrol measures & precedence

There are tachinid fly and parasitoid wasp parasites of centipedes as well as gregarine gut parasitic protozoans. No reference to biocontrol measures for centipedes could be found on the web.

#### iii Possible dangers of biocontrol measures

It is unlikely that biocontrol agents will differentiate between indigenous and alien species.

### Additional References

J. G. E. Lewis. 2007. The Biology of Centipedes, Cambridge University Press. see:-

<http://books.google.co.uk/books?id=AEp22u6tJgsC&pg=PA359&lpg=PA359&dq=parasites+of+centipedes&source=bl&ots=2VesY4LiO4&sig=vvMLHQsqIb7aEo-CqsAL7J-VjQq&hl=en&sa=X&ei=o53vUtSJAumR7AbMo4GYDw&ved=0CE8Q6AEwBA#v=onepage&q=parasites%20of%20centipedes&f=false>

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Praying Mantis

Threat posed  
Desirability for control  
Likelihood of success

**HIGH**  
**HIGH**  
**possible**

### Taxonomy

Insecta: Mantodea: Mantidae

### Alien species - 1

*Miomantis caffra*

### Related Endemic/Indigenous species - 0

### Ecology

Most habitats with structured vegetation. Predatory, living on highly structured vegetation. Oviposits on rock or bark. relatively recently colonised St Helena and still spreading.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Large, voracious predator producing large numbers of young. Predates any foliage dwelling invertebrates, plus any flying species attracted to lights. Likely to have significant effect on indigenous species.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Low

#### ii Likelihood of safe biocontrol measures & precedence

Chalcidoid (Torymid) parasitoids of mantis oothecae (egg pods) are known from S Africa, where there are two chalcidoid specialists currently working on biocontrol agents and who may be able to help, Steve Compton and .....

#### iii Possible dangers of biocontrol measures

Possibly none - however confirmation on true specificity of biocontrol agent to mantids is needed

### Other Comments

Species is seen possibly to be useful in controlling household pests and may be a 'popular character' species. Education and awareness raising would need to be included in any control programme.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Earwigs

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
unknown

### Taxonomy

Insecta: Dermaptera:

### Alien species - 3

<i>Anisolabis maritima</i> ,	Anisolabididae
<i>Euborellia annulipes</i>	Anisolabididae
<i>Labidura riparia</i>	Labiduridae

### Related Endemic/Indigenous species – 1 (probably extinct)

<i>Labidura herculeana</i>	Labiduridae
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### Ecology

Predatory. *Euborellia annulipes* and *Labidura riparia* occur in most habitats with sufficient cover, under stones, plant litter and under bark. *Anisolabis maritima* only on the seashore, often under strandline litter.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Possible effects on ground dwelling invertebrates.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

The Falklands are considering biological control of European earwig using tachinid fly parasitoids  
<http://www.falklands.gov.fk/assets/209-12P.pdf> .

#### iii Possible dangers of biocontrol measures

Any biocontrol agent targeted at earwigs might possibly pose a threat to giant earwig should it survive.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Crickets

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
Unknown

### Taxonomy

Insecta: Orthoptera: Gryllidae

### Alien species - 3 or 4

*Acheta domesticus*,  
*Gryllodes sigillatus*  
*Myrmecophilus acervorum*  
*?Gryllus bimaculatus*

### Related Endemic/Indigenous species - 1

*Gryllus abnormis*

### Ecology

Largely omnivorous. *Acheta domesticus* indoors (though not reported to have been seen recently), *Gryllodes sigillatus* in dry scrub and *Myrmecophilus acervorum* in ants' nests. *Gryllus bimaculatus* in dry areas with sparse grass.

### Habitat types

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

In captivity, *Gryllus bimaculatus* is known to be both facultatively predatory and cannibalistic and may thus impact on other invertebrate species.

#### ii Competitive & Genetic effects

*Gryllus bimaculatus* is considered indigenous by the Ashmoles, based solely on its mobility. My own speculation is that it just *might* be the re-introduced parent species of the endemic *Gryllus abnormis* and hence may represent a threat by hybridization with that species. It is, however, unknown if this actually occurs.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Unlikely

#### iii Possible dangers of biocontrol measures

Effects on Given the occurrence of other, endemic, Orthoptera, probably not an option.



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Cockroaches

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
unknown

### Taxonomy

Insecta: Blattodea:

### Alien species - 8

<i>Calolampra irrorata</i>	Blaberidae
<i>Pycnoscelus surinamensis</i>	Blaberidae
<i>Nauphoeta cinerea</i>	Blaberidae
<i>Rhyparobia maderae</i>	Blaberidae
<i>Periplaneta australasiae</i>	Blattidae
<i>Euthyrrhapha pacifica</i>	Corydiidae
( <i>Blattella germanica</i> )	Ectobiidae)
<i>Balta longicercata</i>	Ectobiidae

### Related Endemic/Indigenous species - 0

### Ecology

Most habitats with sufficient cover - lapidicolous, under wood etc. Some species climb high in structured vegetation. Polyphagous, especially detritivorous.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Some species are facultatively predatory but it is unclear whether they may exert any significant effects on indigenous invertebrates.

#### v Pest effects for people

*Periplaneta australasiae* is a pest species indoors.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Parasitic nematodes and chalcidoid wasp egg parasites have been used elsewhere. Two species of wasp *Ampulex compressa* & *Evania appendigaster* are specific predators/parasitoids on non-native cockroaches and can be thought of as beneficial.

#### iii Possible dangers of biocontrol measures

Species that are proved specific to cockroaches, especially parasitoids of oothecae are unlikely to deleterious to indigenous invertebrates.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Predatory Bugs

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
unknown

### Taxonomy

Insecta: Hemiptera: Heteroptera:

#### Alien species - 5

<i>Orius thripoborus</i>	Anthocoridae
<i>Orius niger</i>	Anthocoridae
<i>Tropiconabis capsiformis</i>	Nabidae
<i>Amphibolus venator</i>	Reduviidae
<i>Empicoris rubromaculatus</i>	Reduviidae

#### Related Endemic/Indigenous species - 7

<i>Cardiastethus bicolor</i>	Anthocoridae
<i>Cardiastethus exiguus</i>	Anthocoridae
<i>Lasiochilus contortus</i>	Anthocoridae
<i>Lyctocoris campestris</i>	Anthocoridae
<i>Kerzhneria hirsuta</i>	Nabidae
<i>Vernonia wollastoniana</i>	Nabidae
<i>Napoleon vinctus</i>	Reduviidae

### Ecology

Predatory, usually occurring on foliage. Almost any vegetated habitat except, perhaps, very sparsely vegetated dry zones.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

the three common species could be of some significance on foliage dwelling invertebrates

#### ii Competitive effects

possibly with indigenous predators

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Low

#### ii Likelihood of safe biocontrol measures & precedence

Low. ?no precedents.

#### iii Possible dangers of biocontrol measures

Related indigenous species.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Green Lacewings

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
unknown

### Taxonomy

Insecta: Neuroptera: Chrysopidae

### Alien species - 3

*Chrysopa squamosa*  
*Chrysoperla pudica*,  
*Chrysoperla zastrowi*

### Related Endemic/Indigenous species - 2

*Chrysoperla exul*  
(*Micromus atlanticus* brown lacewing- Hemerobiidae)

### Ecology

On structured vegetation, mostly in  
Adults and larvae predatory, probably on aphids and perhaps other small invertebrates on foliage.

### Habitat types

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

May add to the predator load encountered by indigenous/endemic invertebrates.

#### ii Competitive effects

Possible competition with endemic lacewings – unknown if significant

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

unknown

#### ii Likelihood of safe biocontrol measures & precedence

unknown

#### iii Possible dangers of biocontrol measures

effects on endemic species

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Predatory Ground, Rove, ‘Scavenger’ (& Soldier) Beetles

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
Low

### Taxonomy

Insecta: Coleoptera:

### Alien species - 16

<i>Laemostenus complanatus</i>	Carabidae
<i>Lithocharis ochracea</i>	Staphylinidae
<i>Chloecharis debilicornis</i>	Staphylinidae
<i>Philonthus peliomerus</i>	Staphylinidae
<i>Philonthus discoideus</i>	Staphylinidae
<i>Philonthus turbidus</i>	Staphylinidae
<i>Spatulonthus longicornis</i>	Staphylinidae
<i>Gabrius nigrifulus</i>	Staphylinidae
<b><i>Creophilus maxillosus</i></b>	Staphylinidae
<i>Neohypnus attenuatus</i>	Staphylinidae
<i>Notolinus hottentotus</i>	Staphylinidae
<i>Aleochara puberula</i>	Staphylinidae
(other alien staphylinids are probably detritivores or mycophagous)	
<i>Gnathoncus nanus</i>	Histeridae
<i>Euspilotus gnathoncoides</i>	Histeridae
<i>Saprinus bicolor</i>	Histeridae
<i>Saprinus cupreus</i>	Histeridae
<i>Dactylosternum abdominale</i>	Hydrophilidae
<i>Cryptomorpha desjardinsi</i>	Silvanidae
( <i>Caccodes oceaniae</i> *)	Cantharidae)

\*only one individual and therefore probably not established: it is a foliage dwelling predator

### Relevant Related Endemic/Indigenous species - 19

<i>Aplothorax burchellii</i> (extinct)	Carabidae
<i>Campalita chlorostictum helenae</i>	Carabidae
<i>Eotachys caheni</i>	Carabidae
<i>Lymnastis sanctaehelenae</i>	Carabidae
<i>Notaphus mixtus mellissii</i>	Carabidae
* <i>Harpalus prosperus</i>	Carabidae
* <i>Harpalus sanctaehelenae</i>	Carabidae
<i>Philonthus dictator</i>	Staphylinidae

Ten other endemic species of carabid have a specialist relationship with wood decay or tree fern litter.

\*The two species of *Harpalus* are predatory as larvae and phytophagous (probably seed eating) as adults.

### Ecology

+/- all terrestrial habitats on the island. Mainly ground or litter-dwelling predators on other invertebrates. Rove-beetles are adapted to access very narrow crevices. Histerid & terrestrial hydrophilid beetles (the majority are aquatic) tend to be predators, mainly of fly larvae, in decaying organic matter, including dung, carrion and wet decaying plant material.

### Possible effects on St Helena’s indigenous/endemic invertebrates

#### i Predatory Effects

Likely to impact on indigenous fauna simply by adding to the predator load. The wide variety of sizes of carabids and staphylinids puts all indigenous ground-dwelling species at risk

#### ii Competitive effects

Could well be competing with endemic related species, as well as other ground dwelling indigenous predators such as spiders and predatory bugs

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

**ii Likelihood of safe biocontrol measures & precedence**

Unlikely

**iii Possible dangers of biocontrol measures**

Presence of related endemic species.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Ladybirds

Threat posed  
Desirability for control  
Likelihood of success

Low  
Low  
Low

### Taxonomy

Insecta: Coleoptera: Coccinellidae

### Alien species - 7

(\*?)*Cheilomenes propinqua*

(\*)*Exochomus flavipes*,

\**Rodolia cardinalis*,

\**Hyperaspis pantherina*,

(\*)*Nephus binaevatus*,

\**Cryptolaemus montrouzieri*

\*species used for biocontrol of alien pests (if bracketed – uncertain whether deliberately introduced))

(*Psyllobora variegata* is also a ladybird but is a fungus feeder)

### Related Endemic/Indigenous species - ?2

*Cheilomenes lunata* & *Scymnus nubilus* are possibly considered to be indigenous speices

### Ecology

Most vegetated habitats. Predatory on various Auchenorhycha - aphids, scale insects & whitefly

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Hopefully specific to their biocontrol target species.

#### v Pest effects for people

None

### Possibility of Control

Not desirable

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Predatory Flies

Threat posed  
Desirability for control  
Likelihood of success

Possibly  
Possibly  
Low

Insecta: Diptera:

### Alien species - 31

<i>Sylvicola cinctus</i>	Anisopodidae	decaying leaf litter, compost	Common Window Gnat
<i>Pelastoneurus emasculatus</i>	Dolichopodidae	predatory	
<i>Hydrophorus balticus</i>	Dolichopodidae	predatory	
<i>Hydrophorus praecox</i>	Dolichopodidae	predatory	
<i>Medetera ambigua</i>	Dolichopodidae	predatory	
<i>Medetera bicolor</i>	Dolichopodidae	predatory	
<i>Thrypticus bellus</i>	Dolichopodidae	predatory	
<i>Syntormon flexibilis</i>	Dolichopodidae	predatory	
<i>Syntormon pallipes</i>	Dolichopodidae	predatory	
<i>Rhaphium macrocerum</i>	Dolichopodidae	predatory	
<i>Epithalassius corsicanus</i>	Dolichopodidae	predatory	
<i>Campsicnemus mirabilis</i>	Dolichopodidae	predatory	
<i>Campsicnemus armatus</i>	Dolichopodidae	predatory	
<i>Campsicnemus magius</i>	Dolichopodidae	predatory	
<i>Acrosilus niger</i>	Dolichopodidae	predatory	
<i>Sympycnus rusticus</i>	Dolichopodidae	predatory	
<i>Sciapus unicolor</i>	Dolichopodidae	predatory	
<i>Sciapus lamellatus</i>	Dolichopodidae	predatory	
<i>Sciapus subfascipennis</i>	Dolichopodidae	predatory	
<i>Sciapus setifrons</i>	Dolichopodidae	predatory	
<i>Sciapus inflexus</i>	Dolichopodidae	predatory	
<i>Chrysosoma longifilum</i>	Dolichopodidae	predatory	
<i>Desmometopa m-nigrum</i>	Milichiidae	cleptoparasite of other predatory invertebrates	
<i>Coenosia humilis</i>	Muscidae	adults predatory on leafhoppers larve subterranean predators	Tiger Fly
<i>Megaselia breviterga</i>	Phoridae	?	some <i>Megaselia</i> are predators
<i>Megaselia curtineura</i>	Phoridae	?	
<i>Megaselia pleuralis</i>	Phoridae	?	
<i>Scathophaga stercoraria soror</i>	Scathophagidae	predatory adults on mammal dung	Yellow Dung Fly
<i>Scenopinus glabrifrons</i>	Scenopinidae	larvae predatory, possibly in dry litter	
<i>Scenopinus fenestralis</i>	Scenopinidae	larvae predatory - tineid, flea larvae etc	House Windowfly

I'd be very cautious in ascribing all the Dolichopodidae to non-indigenous status – The Ashmoles' consider that some of the cosmopoliotan species could well have colonised naturally

### Related Endemic/Indigenous species – 4

<i>Eristalis tenax</i>	Syrphidae
<i>Eumerus lugens</i>	Syrphidae
<i>Loveridgeana beattei</i>	Syrphidae
<i>Atlantomyia nitida</i>	Tachinidae

Plus others that might eventually be considered indigenous.

## Ecology

It is inappropriate to attempt summary of the ecology of a whole order.

## Possible effects on St Helena's indigenous/endemic invertebrates

### i Predatory Effects

*Scathophaga stercoraria* and *Coenosia humilis* are a predators on other invertebrates, the latter particularly on planthoppers of which there are endemic species on St Helena. The family Dolichopodidae are predators, both as larvae probably on other insect larvae in organic mud, and on other small invertebrates as adults. The larvae of scenopinids are also predatory.

## **Possibility of Control**

**i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

**ii Likelihood of safe biocontrol measures & precedence**

No precedence

**iii Possible dangers of biocontrol measures**

Unclear



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Ants

Threat posed  
Desirability for control  
Likelihood of success

**HIGH**  
**HIGH**  
**POSSIBLE**

Insecta: Hymenoptera: Formicidae:

### Alien species - 13

*Hypoponera punctatissima*

*Pheidole megacephala*

*Cardiocondyla emeryi*

*Solenopsis globularia*

*Solenopsis sp.*

*Tetramorium caldarium*

*Tapinoma melanocephalum*

*Plagiolepis alluaudi*

*Paratrechina bourbonica*

*Paratrechina longicornis*

*Linepithema humile*

*Monomorium latinode*

*Monomorium sechellense*

### Related Endemic/Indigenous species - (?1)

There was one species purported to be endemic (*Camponotus fabricator*). This is now thought to be either a museum labelling error or, at most, a brief establishment from an unknown area (see

[http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&ved=0CDIQFjABOAO&url=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F253771832\\_Ants\\_\(Hymenoptera\\_Formicidae\)\\_of\\_the\\_South\\_Atlantic\\_islands\\_of\\_Ascension\\_Island\\_St\\_Helena\\_and\\_Tristan\\_da\\_Cunha%2Ffile%2F60b7d5258d2b41efe9.pdf&ei=T-jvUuv-GuWK7AbbzYCgBq&usq=AFQjCNGORTX4pH3TqAr7-CYTdBbhF2FuDw&cad=rja](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&ved=0CDIQFjABOAO&url=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F253771832_Ants_(Hymenoptera_Formicidae)_of_the_South_Atlantic_islands_of_Ascension_Island_St_Helena_and_Tristan_da_Cunha%2Ffile%2F60b7d5258d2b41efe9.pdf&ei=T-jvUuv-GuWK7AbbzYCgBq&usq=AFQjCNGORTX4pH3TqAr7-CYTdBbhF2FuDw&cad=rja) )

## Ecology

Relatively indiscriminate predators on most groups of invertebrates, social nesting in various biotopes dependent on species. Several species have symbiotic relationship with alien stenorrhynchine Hemiptera (aphids and scale insects) and actively remove/destroy predators and competitors of their 'livestock' from the vegetation on which they are reared. They have colonised all terrestrial biotopes on St Helena, damp, dry, densely & sparsely vegetated. Some species lapicolous, others in decaying dead wood, grassland soils, plant litter and moss.

## Possible effects on St Helena's indigenous/endemic invertebrates

### i Predatory Effects

Collectively, now possibly the most significant invertebrate predators on most groups of terrestrial invertebrates on the island. Especially likely to be significant in decaying dead wood (eg in gumwood forest, where a very high proportion of larger dead wood harbours ant nests rather than endemic saproxylics) and under stones in dry zones. Additional species are still arriving.

### iv Effects on invertebrate habitats

Considerable change to saproxylic habitats through their burrowing activity. Degrading/deterioration of foliage quality of foodplant of phytophagous species through their symbiotic 'cultivation' of alien stenorrhynchines - aphids and scale insects and subsequent stressing of plants, coating with waxes or honeydews and sooty moulds and their potential for spreading plant diseases.

### v Pest effects for people

Some species bite or sting, others cultivate aphids and scales on agricultural or forest crops or garden plants.

## Possibility of Control

### i Likelihood of safe physical/chemical control in wild populations & habitats

**Possible** – there is considerable precedence around the world using poisoned baits, including on fairly comparable islands such as Hawaii <http://www.ens-newswire.com/ens/oct2010/2010-10-25-092.html> and the Seychelles <http://www.ncbi.nlm.nih.gov/pubmed/21340553>

**ii Likelihood of safe biocontrol measures & precedence**

Possible - phorid flies of the genus *Pseudacteon* have been used against fire ants in the US.

**iii Possible dangers of biocontrol measures**

Probably none if species exclusively predatory/parasitic on ants are used

**Additional Comments**

Mike Samways at Stellenbosch University has experience and contacts in ant control on islands

**Additional References**

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/antsnz/invasive-ants>

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/antsnz/invasive-ants/information-sheets>

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Social/European Common Wasp

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
POSSIBLE

### Taxonomy

Insecta: Hymenoptera: Vespidae

### Alien species - 1

*Vespula vulgaris*

### Related Endemic/Indigenous species - 0

### Ecology

Relatively indiscriminate **predators** on most groups of invertebrates, social nesting usually underground. Most habitats, though on St Helena ?mainly at higher altitude.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i **Predatory Effects**

Mainly on foliage dwelling invertebrates, though any exposed species in any habitat may be at risk. The species is thought to be increasing and its effects are likely to increase.

#### v **Pest effects for people**

Painful sting with possibility of severe allergic reaction which can lead to anaphylaxis and even death. In a warm country like St Helena, nests are likely to be perennial and may increase considerably in size and numbers posing a serious threat to health and life.

### Possibility of Control

#### i **Likelihood of safe physical/chemical control in wild populations & habitats**

**Possible** – chemically poisoned bait has been used with some success in New Zealand. The smaller area of St Helena means greater likelihood of success.

#### ii **Likelihood of safe biocontrol measures & precedence**

**Possible** - use of parasitoid (Ichneumonid, *Sphexophaga vesparum*) and non-specific fungal pathogens have been used in New Zealand.

#### iii **Possible dangers of biocontrol measures**

For the parasitoid, probably none, but non-specific fungal pathogens are not recommended.

### Additional References

[http://newzealandecology.org/nzje/free\\_issues/NZJEcol22\\_1\\_55.pdf](http://newzealandecology.org/nzje/free_issues/NZJEcol22_1_55.pdf)

[http://www.issg.org/database/species/reference\\_files/vesvul/vesvul\\_man.pdf](http://www.issg.org/database/species/reference_files/vesvul/vesvul_man.pdf)

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/wasps/control/biological>

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/wasps/control/biological/classical-biological-control>

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/wasps>

Moller, H., Plunkett, G.M., Tilley, J.A.V., Toft, R.J. & Beggs, J.R. (1991) Establishment of the wasp parasitoid, *Sphexophaga vesparum* (Hymenoptera: Ichneumonidae), in New Zealand. - New Zealand Journal of Zoology, 18: 199–208.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Solitary wasps

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
unknown

### Taxonomy

Insecta: Hymenoptera:

### Alien species - 6

<i>Ampulex compressa</i>	Ampulicidae	specialist predator on cockroaches
<i>Solierella scrobiculata</i>	Crabronidae	possibly specialist predator on lygaeid bugs
<i>Sceliphron spirifex</i>	Sphecidae	specialist predator on spiders
<i>Podalonia canescens</i>	Sphecidae	probably specialist predator on moth caterpillars

### Related Endemic/Indigenous species - 1

*Pison wollastoni*

### Ecology

Various habitats. Predatory, usually on a specific narrow taxonomic range of invertebrate targets (eg large moth caterpillars, plant hoppers, aphids, etc. Hole dwelling – in the ground or in plant stems.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

*Ampulex compressa* (plus the evaniid parasitoid wasp evaniid *Evania appendigaster*) are specific predators/parasitoids on non-native cockroaches and can be thought of as beneficial.

Based on what has been found on the ecology of congeneric species:-

*Podalonia* is likely to be a predator of large moth caterpillars and may take endemic species, It ?mainly occurs in dry places.

*Sceliphron* is likely to be a predator of various taxa of spiders and may take endemic species.

*Solierella* is likely to be a predator on heteropterous bugs, most possibly lygaeids and may take endemic species. A related species specialises on *Nysius* spp of which there is an endemic species.

#### v Pest effects for people

Larger solitary wasps may sting, though this is usually much less likely and less painful than social wasps.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Unknown - ? no precedents

#### iii Possible dangers of biocontrol measures

Unknown

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Parasitoid Wasps

Threat posed  
Desirability for control  
Likelihood of success

**LIKELY**  
**Unclear**  
**Low**

### Taxonomy

Insecta: Hymenoptera: Parasitica

### Alien species - at least 13\*

<i>Encarsia formosa</i>	Aphelinidae	biocontrol agent against whiteflies
<i>Encarsia diaspidicola</i>	Aphelinidae	biocontrol agent against scale insects
<i>Aphaereta minuta</i>	Braconidae	specialist parasitoid on flesh-fly larvae in carrion
<i>Aphidius colemani</i>	Braconidae	biocontrol agent against aphids
<i>Aphidius camerunensis</i>	Braconidae	biocontrol agent against aphids
<i>Cotesia vestalis</i>	Braconidae	biocontrol agent against diamondback moth
<i>Trichopria natalensis</i>	Diapriidae	host unknown – possibly small fly larvae
<i>Evania appendigaster</i>	Evaniidae	specialist parasitoid on cockroaches
<i>Leptopilina heterotoma</i>	Figitidae	specialist parasitoid on fruit flies
<i>Hexacola nr. hexatoma</i>	Figitidae	<i>H. hexatoma</i> specialist parasitoid on ephydrid flies
<i>Diplazon laetatorius</i>	Ichneumonidae	specialist parasitoid on hoverflies
<i>Diadegma mollipla</i>	Ichneumonidae	biocontrol agent against diamondback moth
<i>Anaphes nitens</i>	Mymaridae	biocontrol agent against Eucalyptus beetle

\*in addition there are 59 species (some undescribed) in the families Aphelinidae, Braconidae, Chalcididae, Cynipidae, Diapriidae, Encyrtidae, Eulophidae, Eurytomidae, Mymaridae, Platygasteridae, Pteromalidae, Scelionidae, Signiphoridae, Trichogrammatidae about which either their specific identity or indigenous versus alien origin is currently undecided.

\*I understood that in the 1970s/80s/90s that quite a large number of parasitic wasps that were relatively unspecific parasitoids of lepidopterous larvae were introduced by the fledgling pest control department, although I can't remember where I saw reference to it or whether someone told me (?Jill Key?). These seem not to be recorded in the current island's developing database species list

### Related Endemic/Indigenous species - 11

<i>Kleidotoma microscutellaris</i>	Figitidae
<i>Mymarilla wollastoni</i>	Mymaridae
* <i>Sclerodermus wollastoni</i>	Bethylidae
* <i>Sclerodermus insularis</i>	Bethylidae
* <i>Sclerodermus sanctaehelenae</i>	Bethylidae
* <i>Holepyris atlanticus</i>	Bethylidae
<i>Cirrospilus nireus</i>	Eulophidae
<i>Dendrocerus wollastoni</i>	Megaspilidae
<i>Pteromalus ipsea</i>	Pteromalidae
<i>Netelia insulicola</i>	Ichneumonidae
<i>Echthromorpha agrestoria atrata</i>	Ichneumonidae

\*although Bethylids are taxonomically not part of the Hymenoptera Parasitica, their lifestyle is as parasitoids and hence they are included here rather than with the Solitary Wasps

### Ecology

All habitat types. Internal (and perhaps one or two external) parasitoids feeding on the bodies of other invertebrates at various stages in their life cycles, including eggs, larvae, pupae and adults. Usually specific to either a taxon (at various taxonomic levels from species up to order) or a variety of taxa that share the same body form or ecological niche (eg, exposed insect eggs, soft-bodied larvae living in dead wood etc). Some species have been widely used in biological control, often in contained environments such as greenhouses but also outdoors.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory/Parasitoid Effects

It depends on the number of species that have actually been introduced to the island and the degree of their taxonomic or habitat niche specificity (see above highlighted comment). Some of these could already have had a considerable deleterious effect on non-target species, which would be very difficult to ascribe to the parasitoids without extensive research. *Diplazon laetatorius* is a specialist parasitoid on hoverfly larvae, although the endemic species seems to be successfully holding its own .

**ii Competitive effects**

There may have been competitive exclusion with endemic parasitoids if any of these have highly specific niches, though this would be very difficult to assess.

**Possibility of Control**

**i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

**ii Likelihood of safe biocontrol measures & precedence**

No precedence.

**iii Possible dangers of biocontrol measures**

Possibly adding to an existing problem.

**Other comments**

All future biocontrol measure proposals, including those suggested in this document, must be assessed against strict internationally accepted criteria on specificity of action.

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## GUPPY

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
POSSIBLE

### Taxonomy

Vertebrate: Fish: Poeciliidae

### Alien species - 1

presumably *Poecilia reticulata*

### Related Endemic/Indigenous species - 0

none

### Ecology

Introduced to freshwater on St Helena, notably at Sandy Bay and at the plunge pool below Heart Shaped Waterfall. Carnivorous on small aquatic invertebrates

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Likely to be highly deleterious to micro- and meiocrustaceans and small flatworms in water bodies to which they have been introduced and also to indigenous aquatic insects.

Endemic/indigenous species possibly at risk:-

<i>Microvelia gracillima</i>	Hemiptera	Veliidae
<i>Simulium atlanticum*</i>	Diptera	Simuliidae
<i>Simulium loveridgei</i>	Diptera	Simuliidae
<i>Anatanaïs sp.</i>	Tanaidacea	Tanaidae
<i>Tanaïs stanfordi</i>	Tanaidacea	Tanaidae
<i>Herpetocypris helenae</i>	Ostracoda	Cyprididae
<i>Xestoleberis potamophila</i>	Ostracoda	Cytheridae
<i>Dinizia sanctaehelenae</i>	Turbellaria	Procerodidae
<i>Macrostomum parmum</i>	Turbellaria	Macrostomidae

\*Sandy Bay only known breeding site.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Guppies are recognised as problem invasives in other small islands (eg Hawaii, Guam), as well as in continental North & South America, India and Australia. Chemical treatments (usually rotenone) are available to remove fish from water bodies but they are known to have deleterious effects on invertebrate populations. Electrofishing and even the use of detonating cord as a substitute for dynamiting fish have been used on other islands.

#### ii Likelihood of safe biocontrol measures & precedence

No precedence

#### iii Possible dangers of biocontrol measures

### Other comments

Presumably these fish originate from aquaria somewhere on the island and it is almost certain that the fish were deliberately introduced to the two water bodies mentioned. They are popular with local children 'tiddling' at Sandy Bay, and may well be introduced again if eliminated. Heart-shaped Waterfall is immediately downstream of two schools which may have/had guppies and which have been released in to the stream. Control attempts would need to be backed up with an educational project painting the species as an 'undesirable alien'.

### **Additional References**

<http://geneticengsoc.ncsu.edu/research/invasive-fish-and-impacts-on-endemic-fish-and-insects>

[http://science.nature.nps.gov/im/units/pacn/assets/docs/features/feature.c2013032\\_guppies\\_guam.pdf](http://science.nature.nps.gov/im/units/pacn/assets/docs/features/feature.c2013032_guppies_guam.pdf)

review of control measures:-

[http://www.issg.org/pdf/publications/island\\_invasives/pdfhqprint/1nico.pdf](http://www.issg.org/pdf/publications/island_invasives/pdfhqprint/1nico.pdf)



# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Grass Frog

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
POSSIBLE

### Taxonomy

Amphibia: Ranidae

### Alien species - 1

*Rana grayi*

### Related Endemic/Indigenous species - 0

none

### Ecology

Within freshwater all across the island – adults and mature larvae are predatory on invertebrate in and beside water.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Along with the spread of alien shading vegetation which provides cover for frogs, this species is likely to have had a very considerable effect on species of freshwater and riparian invertebrates right across St Helena.

Indigenous/endemic taxa at risk:

Wetland spiders, carabid and staphylinid beetles.

Riparian bugs, notably *Helenasaldula aberrans* and *Microvelia gracillima*

Wetland flies, notably Dolichopodidae, Ephydriidae & possibly Limoniidae (Tipulidae)

Possibly aquatic crustaceans

#### Possibility of Control

There seems to be remarkably little information on the web about frogs as invasive species.

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely. Control of problem frogs on Hawaii have been restricted to impractical chemical poisons (hydrated lime, citric acid) or physical removal.

#### ii Likelihood of safe biocontrol measures & precedence

The highly infectious Chytridiomycosis disease of frogs has been killing off frog populations around the world, but appears not to have been used as a biocontrol agent. Might it be investigated for use on St Helena where there are no indigenous amphibians?.

#### iii Possible dangers of biocontrol measures

Probably none.

#### Other Comments

The species may be a 'popular character' species. Education and awareness raising would need to be included in any control programme.

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Java Gecko

Threat posed  
Desirability for control  
Likelihood of success

Possibly significant  
Unknown  
Unlikely

### Taxonomy

Reptilia: Gekkonidae

### Alien species - 1

*Hemidactylus frenatus*

### Related Endemic/Indigenous species - 0

none

### Ecology

Under stones, on cliffs, buildings and bark. Regularly around lights feeding on the attracted insects. Predatory on any small invertebrates

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Facultative predator on almost any invertebrates with which it comes into contact.

### Possibility of Control

Recognised as an invasive species around the world, there seems little information on the web concerning attempts at control (see <http://www.tsusinvasives.org/database/common-house-gecko.html>).

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely. Control of geckos elsewhere has been restricted to making local areas in houses uninviting to them.

#### ii Likelihood of safe biocontrol measures & precedence

Unlikely.

### Other Comments

Species is seen possibly to be useful in controlling household pests and is likely to be a 'popular character' species. Education and awareness raising would need to be included in any control programme.

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Birds

Threat posed  
Desirability for control  
Likelihood of success

High  
High  
Unlikely

### Taxonomy

Aves:

#### Alien species - 1

(Chukar) Partridge	<i>Alectoris chukar</i>	Phasianidae
Ring-necked Pheasant	<i>Phasianus colchicus</i>	Phasianidae
Indian Myna	<i>Acridotheres tristis</i>	Sturnidae
Madagascar Fody	<i>Foudia madagascariensis</i>	Ploceidae
(Java Sparrow)	<i>Padda oryzivora</i>	Ploceidae)*
Common Waxbills	<i>Estrilda astrild</i>	Ploceidae
Canary	<i>Serinus flaviventris</i>	Fringillidae

\*it seems unclear, at least from the web, whether or not Java Sparrows take insects, even when feeding young

#### Related Endemic/Indigenous species - 0

none

### Ecology

Pheasant and partridge are predators on ground-dwelling insects when rearing young, most of the songbirds either take foliage living insect facultatively or only when the young are being reared.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Given the abundance some of these birds, the insect take must be considerable and it is likely that there may be an impact on the populations of scarcer species.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely.

#### ii Likelihood of safe biocontrol measures & precedence

Unlikely.

### Other Comments

Attempts to control most bird species would be likely to be controversial, both on island and possibly internationally, and likely to include animal rights issues. Education and awareness raising would need to be included in any control programme.

# Non-indigenous Invertebrate Taxa on St Helena – Effects and Possible Control Measures

## Rats & Mice

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
££ Possible ££

Mammalia: Muridae

### Alien species - 3

Black Rat *Rattus rattus*

Brown Rat *Rattus norvegicus*

House Mouse *Mus musculus*

### Related Endemic/Indigenous species - 0

### Ecology

Facultative predators which are likely to have had a similarly devastating effect on population of at least the larger invertebrates.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### i Predatory Effects

Rats and mice have been implicated in the extinction of the giant earwig and giant ground beetle but will no doubt had considerable effects on any of the larger invertebrates into which they come into contact.

#### iv Effects on invertebrate habitats

Goats in particular have destroyed whole habitats for invertebrates on St Helena, and rabbits are almost certainly still preventing revegetation of many denuded areas and heavily influencing what vegetation is able to re-establish, favouring unpalatable alien species.

#### v Pest effects for people

Rats and mice as domestic and agricultural pest and rats as disease vectors.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

New Zealand companies have had considerable success on some isolated islands in eradicating rats but this would probably involve £millions.

### Other Comments

Attempts to control mammal species are likely to be controversial (even for rats!), possibly internationally, on animal rights issues.

# **INVERTEBRATE DISEASES**

# Non-indigenous Taxa on St Helena – Effects and Possible Control Measures

## Diseases and carriers

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
Low

### Taxonomy

Fungi: Ascomycotina: Entomophthorales: Cordycipitaceae

### Alien species - unknown

A white fungal arthropod pathogen is widespread on St Helena and has been observed occurring at least on a number beetle and woodlouse species including both indigenous and alien species of beetle but ?only *Armadillidium vugare* in the woodlice.

Possibly it is *Beauveria bassiana*, a species that is fairly ubiquitous around the planet and may actually be indigenous to St Helena. Alternatively it may have been accidentally (?or deliberately) introduced with one of the alien species, or may be a different species entirely. It is widely used as a completely non-specific biocontrol agent against a wide variety of insect and other arthropods and particularly virulent strains have been selected as insecticides.

Other diseases, fungal, bacterial or viral, may have been brought in with alien invertebrates.

### Related Endemic/Indigenous species ?

Entomopathogenic fungi and other diseases appear not to have been studied at all on St Helena.

### Ecology

*Beauveria bassiana* - Spores are picked up, usually from soil and develop through arthropods' tissues, altering the behaviour so that the individual climbs to a height which improves the dispersal success of the fungus. White mycelium emerges from the interarthrodial membranes, killing the host, and eventually producing a fruiting body and produces spores to repeat the cycle.

### Possible effects on St Helena's indigenous/endemic invertebrates

Ultimately lethal to the individual arthropods. Unknown how much this affects the populations of individual species in the wild and it would be difficult to assess.

### Possibility of Control

i Likelihood of safe physical/chemical control in wild populations & habitats

None

### Additional References

<http://organicsoiltechnology.com/fungus-beauveria-bassiana-entomopathogenic-fungi.html>  
<http://www.catalogueoflife.org/col/details/species/id/14037373>

# COMPETING SPECIES AND ONES LIKELY ADVERSELY TO AFFECT THE HABITAT OF INDIGENOUS SPECIES

Many species are likely to impact on indigenous invertebrates not directly, but by competing with indigenous species or by altering the habitat in some way, making it less or unsuitable for the indigenous species, either by destroying foodplants, altering the quality of them in some way (eg by changing vigour, inducing the production of stress chemical, producing honeydew and encouraging sooty mould), changing the humidity profile or physical characteristics of detritus or dead wood by burrowing etc.

## **DETRITIVORES, CARRION & DUNG FEEDERS**

Earthworms  
**Landhoppers**  
**Woodlice**  
Mites  
**Millipedes**  
Springtails  
Detritivorous/mycophagous Beetles  
Synanthropic Beetles  
Detritivorous/carrion feeding Flies  
Herbivore Dung Fauna

## **SAPROXYLICS**

**Termites**  
Saproxylic weevils

## **PLANT FEEDERS**

**Slugs and Snails**  
**Aphids & scale insects**  
**Plant Bugs & Hoppers**  
Thrips  
Plant-feeding Beetles  
**Moths & Butterflies**  
Phytophagous Flies  
**Rabbits** (and Goats)

## **OTHERS**

Ants  
Barkflies/Barklice  
Webspinner

# **DETRITIVORES, CARRION & DUNG FEEDERS**



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Earthworms

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
Low

### Taxonomy

Annelida: Oligochaeta:

### Alien species - 21

Microscolex dubius	Acanthodrilidae	Eiseniella tetraedra	Lumbricidae
Eudrilus eugeniae	Eudrilidae	Lumbricus castaneus	Lumbricidae
Pontoscolex corenthurus	Glossoscolecidae	Pheretima californica	Megascolecidae
Allolobophora chlorotica	Lumbricidae	Pheretima diffringens	Megascolecidae
Aporrectodea rosea	Lumbricidae	Pheretima elongata	Megascolecidae
Aporrectodea trapezoides	Lumbricidae	Pheretima hawayana	Megascolecidae
Aporrectodea turgida	Lumbricidae	Pheretima loveridgei	Megascolecidae
Bimastos beddardi	Lumbricidae	Pheretima morrisi	Megascolecidae
Allolobophoridella eiseni	Lumbricidae	Pheretima rodericensis	Megascolecidae
Dendrodrilus rubidus	Lumbricidae	Phoenicodrilus taste	Ocnerodrilidae
Eisenia foetida	Lumbricidae		

### Related Endemic/Indigenous species - 0

### Ecology

Areas with microclimates and soils that are at least seasonally moist. Plant/leaf/grass litter, well decayed dead wood, soil, moss, under bark – not always subterranean. Saprobic, detritivorous, geophagous.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

May possibly compete with indigenous detritivore communities in forest litter, moss and dead wood, beside freshwater and in wetland litter.

#### iv Effects on invertebrate habitats

May change plant litter and decaying dead wood structurally which may have a deleterious effect on the indigenous detritivore and saproxylic communities.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

There are muscid fly parasitoids and flatworm predators of earthworms.

#### iii Possible dangers of biocontrol measures

Given that there are no indigenous earthworms on St Helena, earthworm specific biocontrol agents are likely to pose little risk.

### Other comments

They are usually regarded as beneficial and any possible control measures likely to be seriously opposed by farmers, foresters and gardeners. Not recommended.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Landhoppers

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
unknown

### Taxonomy

Crustacea: Amphipoda: Talitridae:

### Alien species - 1

*Talitroides alluaudi*

### Related Endemic/Indigenous species - 1

Single halophile aquatic species *Platorchestia ashmoleorum*. There is also a possibly indigenous species *Talitriator insularis* in similar habitats to *Talitroides alluaudi* which has been described as endemic to St Helena and Ascension Island, though may be an introduction from somewhere in Africa where it may currently be unrecorded.

### Ecology

Detritivorous. Plant litter in damp places, especially cloud forest as well as grass and flax litter at higher altitude.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Given the densities and biomass that this species can attain and together with alien woodlice and millipedes in the same environments, they may possibly competitively exclude whole elements of the detritivore community, at least locally, especially in habitats such as forest leaf litter.

#### iv Effects on invertebrate habitats

Such large numbers of individuals and biomass may change plant litter structurally which may have a deleterious effect on the indigenous detritivore communities.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

A web search surprisingly revealed no precedents for biocontrol of landhoppers, despite their being regarded as problematic in Australia, New Zealand and Hawaii. There are nematode parasites of Talitridae, though these do not seem to have been investigated for biocontrol.

#### iii Possible dangers of biocontrol measures

Any biocontrol agent would need to be specific to terrestrial amphipods and specifically not affect terrestrial isopods.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Woodlice

Threat posed  
Desirability for control  
Likelihood of success

Likely  
High  
Low

### Taxonomy

Crustacea: Isopoda:

### Alien species -1

<i>Armadillidium vulgare</i>	Armadillidiidae	<i>Niambia capensis</i>	Platyarthridae
<i>Pseudodiploexochus tabularis</i>	Armadillidiidae	<i>Leptotrichus panzeri</i>	Porcellionidae
<i>Cyclistus convexus</i>	Cyclisticidae	<b>Porcellionides pruinosus</b>	Porcellionidae
<b>Oniscus asellus</b>	Oniscidae	<b>Porcellio scaber</b>	Porcellionidae
<i>Atlantoscia floridana</i>	Philosciidae	<b>Porcellio laevis</b>	Porcellionidae
<i>Littorophiloscia tropicalis</i>	Philosciidae	<i>Porcellio lamellatus</i>	Porcellionidae
<i>Trichorhina tomentosa</i>	Platyarthridae	<i>Haplophthalmus danicus</i>	Trichoniscidae

### Related Endemic/Indigenous species – 8

<i>Pseudodiploexochus insularis</i>	Armadillidiidae	<i>Styloniscus sp.</i>	Styloniscidae
<i>Pseudodiploexochus leleupi</i>	Armadillidiidae	<i>Leptotrichus panzeri</i>	Porcellionidae
<i>Pseudodiploexochus mellissi</i>	Armadillidiidae	<i>Porcellionides pruinosus</i>	Porcellionidae
<i>Pseudolaureola atlantica</i>	Armadillidiidae	<i>Porcellio scaber</i>	Porcellionidae
<i>Iais aquilei</i>	Janiridae	<i>Porcellio laevis</i>	Porcellionidae
<i>Halophiloscia couchii</i>	Philosciidae	<i>Porcellio lamellatus</i>	Porcellionidae
<i>Littorophiloscia alticola</i>	Philosciidae	<i>Haplophthalmus danicus</i>	Trichoniscidae

### Ecology

All habitats, most species are in more humid areas although there are nocturnal xerophilic species in arid zones. Detritivorous, fungivorous or sometimes plant-eating.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Various hygrophilic species can, together with alien species of millipede and landhopper, reach very high density and biomass in indigenous forest plant litter and may result in competitive exclusion of endemic members of the detritivore community and possibly also in the saproxylic communities within the later stages of decaying wood. High levels of xerophilic alien species occur under stones might have a similar effects in drier zones.

#### iv Effects on invertebrate habitats

Such large numbers of individuals and biomass may change plant litter structurally which may have a deleterious effect on the indigenous detritivore communities.

#### v Pest effects for people

Regarded as pests simply for coming into houses.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

There are tachinid fly parasites of woodlice but they seem not to have been used in this way.

#### iii Possible dangers of biocontrol measures

There is a diversity of rare endemic species in the same families as some of the alien invasive species and these would be at risk from any biocontrol agents unless proven to be species specific, which is unlikely

**Other comments**

High densities of non-native isopods may increase the abundance of the non-native woodlouse spider *Dysdera croccata* in certain habitats and amplify any possible negative effect on indigenous woodlice

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Mites

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
unknown

### Taxonomy

Arachnida: Acari:

### Alien species - 43

Parachipteria punctata	Orbatida: Archipteriidae	Ornithonyssus bursa	Parasitiformes: Dermanyssidae
Platynocheilus peltifer	Orbatida: Camisiidae	Boophilus decoloratus	Parasitiformes: Ixodidae
Ceratozetes gracillis	Orbatida: Ceratozetidae	Rhipicephalus evertsi	Parasitiformes: Ixodidae
Scapheremaeus palustris	Orbatida: Cymbaeremaeidae	Laelaps echidnus	Parasitiformes: Laelapidae
Damaeus ornatus	Orbatida: Damaeidae	Macrocheles penicilliger	Parasitiformes: Macrochelidae
Epilohmannia inexpectata	Orbatida: Epilohmannidae	Macrocheles peniculatus	Parasitiformes: Macrochelidae
Galumna elimata	Orbatida: Galumnidae	Macrocheles submotus	Parasitiformes: Macrochelidae
Acrogalumna longipluma	Orbatida: Galumnidae	Geholaspis mandibularis	Parasitiformes: Macrochelidae
Protoribates lophotrichus	Orbatida: Haplozetidae	Pergamasus longicornis	Parasitiformes: Parasitidae
Liacarus coracinus	Orbatida: Liacaridae	Phityogamasus primitivus	Parasitiformes: Parasitidae
Trimalaconothrus novus	Orbatida: Malaconothridae	Parholaspus kewensis	Parasitiformes: Parholaspidae
Nanhermannia elegantula	Orbatida: Nanhermannidae	Holaspulus tenuipes	Parasitiformes: Parholaspidae
Nothrus palustris	Orbatida: Nothridae	Bdellodes longirostris	Prostigmata: Bdellidae
Oppia varians	Orbatida: Oppiidae	Pediculaster manicatus	Prostigmata: Siteroptidae
Zygoribatula exilis	Orbatida: Oribatulidae	Anystis baccarum	Trombidiformes: Anystidae
Phthiracarus nitens	Orbatida: Phthiracaridae	Anystis kochi	Trombidiformes: Anystidae
Steganacarus magnus	Orbatida: Phthiracaridae	Anystis berlesii	Trombidiformes: Anystidae
Scheloribates laevigatus	Orbatida: Scheloribatidae	Tetranychus evansi	Trombidiformes: Tetranychidae
Trhypochthoniellus excavatus	Orbatida: Trhypochthoniellidae		

### Related Endemic/Indigenous species – 42 (plus an additional 6 possibly indigenous species)

Freyanomorpha ambigua	Astigmata: Avenzoariidae	Hypoaspis decellei	Parasitiformes: Dermanyssidae
Alloptes stercorarii	Astigmata: Proctophyllodidae	Glyptolaspis thorri	Parasitiformes: Macrochelidae
Thecarthra stercorarii	Astigmata: Pterolichidae	Macrocheles helenensis	Parasitiformes: Macrochelidae
Mongaiardia magna	Orbatida: Amerobelbidae	Pachylaelaps major	Parasitiformes: Pachylaelaptidae
Carabodes carinatus	Orbatida: Carabodidae	Gamasiphis krieli	Parasitiformes: Rhodacaridae
Carabodes fenestatus	Orbatida: Carabodidae	Chiropturopoda brevopilus	Parasitiformes: Uropodidae
Carabodes horridus	Orbatida: Carabodidae	Fuscuropoda leleupi	Parasitiformes: Uropodidae
Carabodes hyalinus	Orbatida: Carabodidae	Bdellodes parvisetosa	Prostigmata: Bdellidae
Carabodes incrustatus	Orbatida: Carabodidae	Bdellodes quadrisetosa	Prostigmata: Bdellidae
Carabodes pentatrachus clavatus	Orbatida: Carabodidae	Chaussieria benoiti	Trombidiformes: Anystidae
Crotonia perforata	Orbatida: Crotoniidae	Chaussieria brevis	Trombidiformes: Anystidae
Galumna ambigua	Orbatida: Galumnidae	Chaussieria dissimilis	Trombidiformes: Anystidae
Galumna rugosa	Orbatida: Galumnidae	Chaussieria sanctaehelenae	Trombidiformes: Anystidae
Pergalumna irregularis	Orbatida: Galumnidae	Balaustium southcotti	Trombidiformes: Erythraeidae
Liodes lanceosetosus	Orbatida: Liodidae	Cavannea cooremani	Trombidiformes: Erythraeidae
Trimalaconothrus pallidus	Orbatida: Malaconothridae	Cavannea sanctaehelenae	Trombidiformes: Erythraeidae
Oppia petiolata	Orbatida: Oppiidae		
Oppia rubida	Orbatida: Oppiidae		
Indotritia clavata	Orbatida: Oribotritiidae		
Hoplophthiracarus cavernosus	Orbatida: Phthiracaridae		
Phthiracarus flagellatus	Orbatida: Phthiracaridae		
Scheloribates abbreviatus	Orbatida: Scheloribatidae		
Scheloribates brachypterus	Orbatida: Scheloribatidae		
Scheloribates calcaratus	Orbatida: Scheloribatidae		
Scheloribates curvirhynchus	Orbatida: Scheloribatidae		
Scheloribates deficiens	Orbatida: Scheloribatidae		
Scheloribates evanescens	Orbatida: Scheloribatidae		
Scheloribates helenensis	Orbatida: Scheloribatidae		
Scheloribates lanceolatus	Orbatida: Scheloribatidae		
Scheloribates maculatus	Orbatida: Scheloribatidae		
Scheloribates microsetosus	Orbatida: Scheloribatidae		
Platyseius leleupi	Parasitiformes: Ascidae		

## **Ecology**

All terrestrial habitats, dry and moist. Detritivorous, fungivorous, phytophagous, predatory, parasitic on invertebrates and vertebrates & bloodsucking on vertebrates.

## **Possible effects on St Helena's indigenous/endemic invertebrates**

### **i Predatory Effects**

Many species are predatory on other mites and other very small invertebrates. Their effects on populations are likely to be very difficult to assess.

### **ii Competitive effects**

Possible or likely, but their effects on other invertebrate populations are likely to be very difficult to assess.

### **iii Parasitic effects**

Haemolymph sucking parasitic mites can have very serious effects on other species of invertebrates, from considerably reducing vigour to killing infested individuals. Whether this is of significance for St Helenan species appears unknown. There may be possible effects from severe phoretic load on some invertebrates.

### **iv Effects on invertebrate habitats**

Likely to have an effect on detritus and fungal habitats but probably impossible to quantify at the moment.

### **v Pest effects for people**

Some species are blood-sucking on humans and cause itching. Others are parasitic on domestic livestock or pests on crop and garden plants.

## **Possibility of Control**

### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

### **ii Likelihood of safe biocontrol measures & precedence**

Unlikely

### **iii Possible dangers of biocontrol measures**

Given the number of possibly endemic species, it is unlikely that this is likely to be an option.

## **Additional References**

<http://learningstore.uwex.edu/Biological-Control-of-Insects-and-Mites-An-Introduction-to-Beneficial-Natural-Enemies-and-Their-Use-in-Pest-Management-P1392.aspx>

This may have some relevance but I've not been able to see a copy.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Millipedes

Threat posed  
Desirability for control  
Likelihood of success

Likely  
possibly **HIGH**  
possible

### Taxonomy

Diplopoda:

### Alien species - 14

<i>Rhinotus africanus</i>	Siphonotidae	<i>Glyphiulus granulatus</i>	Cambalopsidae
<i>Proteroiulus fuscus</i>	Blaniulidae	<i>Aporodesminus wallacei</i>	Chytodesmidae
<b><i>Blaniulus guttulatus</i></b>	Blaniulidae	<i>Cryptocorypha ornata</i>	Chytodesmidae
<b><i>Ommatoiulus moreleti</i></b>	Julidae	<i>Oxidus gracilis</i>	Paradoxosomatidae
<i>Brachyiulus pusillus</i>	Julidae	<i>Alloproctoides remyi</i>	Lophoproctidae
<i>Cylindroiulus latestriatus</i>	Julidae	<i>Alloproctoides dawydoffi</i>	Lophoproctidae
<i>Cylindroiulus parisiorum</i>	Julidae	<i>Silvestrus cf. seminudus</i>	Polyxenidae

### Related Endemic/Indigenous species - 0

### Ecology

All habitats where there is sufficient cover – most species prefer damper habitats but there are xerophilic species in dry zones. Detritivorous, fungivorous or sometimes plant eating.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Given the densities and biomass that certain species may attain and together with alien woodlice and landhoppers in the same environments, they may possibly competitively exclude whole elements of the detritivore community, at least locally, especially in habitats such as leaf litter and possibly tree fern litter. The densities of buttonworms in some dry areas may lead to competition for detritus.

#### iv Effects on invertebrate habitats

Such large numbers of individuals and high biomass may change decaying wood and plant litter structurally which may have a deleterious effect on the indigenous saproxylic and detritivore communities.

#### v Pest effects for people

Some species are pests of root crops, burrowing holes in roots and tubers.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

There are nematode parasites specific to millipedes which are used for biocontrol in Australia [http://www.bugcentral.com.au/products/millipede\\_control.php](http://www.bugcentral.com.au/products/millipede_control.php) <http://mrc.wa.gov.au/Documents/Millipedes/Millipede---General-information---Dept-of-Agricult.aspx>. The 'buttonworm' *Ommatoiulus moreleti* has been targeted for biocontrol using sciomyzid flies in Australia <http://journals.cambridge.org/action/displayAbstract?jsessionid=592104620EF004B8E5225183FE08FDE7.journals?fromPage=online&aid=2427236>.

Successful biocontrol of millipedes in detritivore communities might, however, simply result in greater dominance of the fauna by alien isopod and amphipod populations.

#### iii Possible dangers of biocontrol measures

Providing specificity to Diplopoda is assured, none. Note, however, that some parasitoid nematodes may be able to parasitise both millipedes and woodlice

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Springtails

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
Unknown

### Taxonomy

Collembola:

### Alien species - 15

<i>Entomobrya atrocincta</i>	Entomobryidae	<i>Isotoma nobilis</i>	Isotomidae
<i>Entomobrya multifasciata</i>	Entomobryidae	<i>Ceratophysella denticauda</i>	Poduridae
<i>Orchesella cincta</i>	Entomobryidae	<i>Xenyella grisea</i>	Poduridae
<i>Pseudosinella alba</i>	Entomobryidae	<i>Xenyella yucatanana</i>	Poduridae
<i>Pseudosinella imparipunctata</i>	Entomobryidae	<i>Brachystomella parvula</i>	Poduridae
<i>Tomocerus minor</i>	Entomobryidae	<i>Neanura muscorum</i>	Poduridae
<i>Folsomia candida</i>	Isotomidae	<i>Deuteraphorura ghidinii</i>	Poduridae
<i>Proisotoma minuta</i>	Isotomidae		

### Related Endemic/Indigenous species - 0

there are hints by the Ashmoles of undescribed endemic species awaiting naming

### Ecology

All habitats from desert to cloud forest. Under stones & bark, in dead wood, amongst litter & moss etc. Detritivorous.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

May be likely to compete with the indigenous detritivore community, possibly especially mites, especially in leaf-litter & treefern litter, but it would be difficult to assess.

#### iv Effects on invertebrate habitats

May affect the physical structure or breakdown rate of litter/detritus, but would be difficult to assess.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

No precedent

#### iii Possible dangers of biocontrol measures

None likely if springtail-specific biocontrol agent were to be used.



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Detritivorous/mycophagous Beetles

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
Low

### Taxonomy

Insecta: Coleoptera:

#### Alien species - 13

<i>Anommatus duodecemstriatus</i>	Bothriderydae
<i>Sericoderus lateralis</i>	Corylophidae
<i>Orthoperus atomaruis</i>	Corylophidae
<i>Aglenus brunneus</i>	Salpingidae
<i>Lispinus hintzi</i>	Staphylinidae
<i>Carpelimus corticinus</i>	Staphylinidae
<i>Epomotylus pseudosculptus</i>	Staphylinidae
<i>Oxytelus alutaceifrons</i>	Staphylinidae
<i>Anotylus nitidifrons</i>	Staphylinidae
<i>Oligota flavicornis</i>	Staphylinidae
<i>Acrotoma aterrima</i>	Staphylinidae
<i>Atheta laticollis gp</i>	Staphylinidae
<i>Hemasodes batesi</i>	Tenebrionidae

#### Related Endemic/Indigenous species – 14

<i>Atheta helenensis</i>	Staphylinidae
<i>Atheta caheniana</i>	Staphylinidae
<i>Atheta basilewskyana</i>	Staphylinidae
<i>Gonocephalum simplex hadroides</i>	Tenebrionidae
<i>Hadrodus helenensis</i>	Tenebrionidae
<i>Helenomelas basilewskyi</i>	Tenebrionidae
<i>Pseudoleichenum benoiti</i>	Tenebrionidae
<i>Stenosis sanctaehelenae</i>	Tenebrionidae
<i>Tarphiophasis tuberculatus</i>	Tenebrionidae
<i>Tarphiophasis decellei</i>	Tenebrionidae
<i>Tarphiophasis wollastoni</i>	Tenebrionidae
<i>Tarphiobasis leleupi</i>	Tenebrionidae
<i>Tarphiophasis insulanus</i>	Tenebrionidae
<i>Zophobas atratus concolor</i>	Tenebrionidae

some of the litter dwelling weevils may also be detritivorous, although may be tied to a specific type

### Ecology

In many types of grass or leaf litter. *Hemasodes batesi* specialises in dry habitats. *Carpelimus corticinus*, *Oxytelus alutaceifrons*, *Anotylus nitidifrons* live on organic mud beside freshwater. Various detritivorous, mycophagous on fungal hyphae rather than fruiting bodies and 3 species of staphylinid beetle algivorous.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Possibly in competition with various endemic detritivores, though this would be difficult to substantiate.

#### iv Effects on invertebrate habitats

Possibly may change quality of the detritus micro-habitat, though would be very difficult to determine.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Unlikely, no precedence.

#### iii Possible dangers of biocontrol measures

Related endemic species.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Synanthropic Beetles

Threat posed  
Desirability for control  
Likelihood of success

Unlikely  
pest control grounds  
variable

### Taxonomy

Insecta: Coleoptera:

### Alien species - 40

Anobium punctatum	Anobiidae	Common Furniture Beetle
Gibbium psylloides	Anobiidae	Shiny Spider Beetle
Mezium americanum	Anobiidae	American Spider Beetle
Nicobium villosum	Anobiidae	
Sphaericus gibboides	Anobiidae	Humped Spider Beetle
Stegobium paniceum	Anobiidae	Drugstore Beetle
Araecerus fasciculatus	Anthribidae	Coffee Bean Weevil
Dinoderus bifoveolatus	Bostrichidae	Auger Beetle
Rhizopertha dominica	Bostrichidae	Lesser Grain Borer
Anommatus duodecemstriatus	Bothriderydae	
Acanthoscelides obtectus	Bruchidae	Bean Weevil
Bruchidius spadiceus	Bruchidae	<b>Acacia Seed Beetle</b>
Callosobruchus chinensis	Bruchidae	Pulse Beetle
Necrobia rufipes	Cleridae	Red-legged Ham Beetle
Euxestus phalacroides	Colydiidae	
Cryptophagus affinis	Cryptophagidae	
Cryptophagus badius	Cryptophagidae	
Cryptolestes ferrugineus	Cucuidae	Rusty Grain Beetle
Cryptolestes pusillus	Cucuidae	Flat Grain Beetle
Sitophilus oryzae	Curculionidae	Rice Weevil,
Anthrenus fuscus	Dermestidae	
Attagenus fasciatus	Dermestidae	Wardrobe Beetle
Dermestes ater	Dermestidae	Black Larder Beetle
Dermestes maculatus	Dermestidae	Common Hide Beetle
Mycetaea hirta	Endomychidae	Hairy Cellar Beetle
Adistemia watsoni	Latridiidae	
Cartodere nodifer	Latridiidae	
Coninomus constrictus	Latridiidae	
Corticaria elongata	Latridiidae	
Typhaea stercorea	Mycetophagidae	Hairy Fungus Beetle
Brachypeplus depressus	Nitidulidae	
Carpophilus dimidiatus	Nitidulidae	Corn Sap Beetle
Carpophilus hemipterus	Nitidulidae	Dried-fruit Beetle
Monotoma picipes	Rhizophagidae	
Monotoma spinicollis	Rhizophagidae	
Aglenus brunneus	Salpingidae	
Oryzaephilus surinamensis	Silvanidae	Saw-toothed Grain Beetle
Alphitobius diaperinus	Tenebrionidae	Lesser Mealworm Beetle
Alphitobius laevigatus	Tenebrionidae	Black Fungus Beetle
Gnathocerus cornutus	Tenebrionidae	Horned Flour Beetle
Tenebrio obscurus	Tenebrionidae	Dark Mealworm Beetle
Tribolium castaneum	Tenebrionidae	Red Flour Beetle
Trox rhyaroides	Trogidae	Scarce Hide Beetle
Tenebroides mauritanicus	Trogossitidae	Cadelle Beetle

### Related Endemic/Indigenous species – n/a

Species here are selected on lifestyle rather than taxonomy. There are indigenous/endemic species in the families Anobiidae, Anthribidae, Curculionidae & Tenebrionidae

### Ecology

Synanthropic:- largely in stored foodstuffs, usually indoors. At least some of these species occur out of doors in the UK, usually as part of the detritivore community in straw & hay litter or compost heaps and sometimes more 'in the wild' in grass & leaf litter in moss, and the dermestids in dry carrion. Many of these do so similarly on St Helena.

### **Possible effects on St Helena's indigenous/endemic invertebrates**

some species may have entered into the detritivore community and thus may compete with the indigenous species with a similar lifestyle. Otherwise, probably little or none, other to get beetles a bad name...

### **v Pest effects for people**

Considerable – spoiling of foods

### **Possibility of Control**

largely a pest control issue rather than conservation one

### **ii Likelihood of safe biocontrol measures & precedence**

### **iii Possible dangers of biocontrol measures**

There are related endemic and indigenous species which must be taken into account when considering any biological control for these species.

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Detritivorous Flies

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
On pest control grounds  
Low

Insecta: Diptera:

### Alien species - possibly 50

<i>Sylvicola cinctus</i>	Anisopodidae	decaying leaf litter, compost	Common Window Gnat
<i>Lucilia sericata</i>	Calliphoridae	carrion	Common Green Bottle Fly
<i>Calliphora croceipalpis</i>	Calliphoridae	carrion	African Blowfly
<i>Sarcophaga argyrostoma</i>	Calliphoridae	carrion	
<i>Sarcophaga exuberans</i>	Calliphoridae	carrion	
<i>Sarcophaga haemorrhoidalis</i>	Calliphoridae	carrion	Red-tailed Flesh Fly
<i>Sarcophaga inaequalis</i>	Calliphoridae	carrion	
<i>Sarcophaga redux</i>	Calliphoridae	carrion	
<i>Drosophila simulans</i>	Drosophilidae	decaying fruit - especially pickly pear	
<i>Drosophila repleta</i>	Drosophilidae	purid material, including dung, especially from pig	Dark-eyed Fruit Fly
<i>Drosophila immigrans</i>	Drosophilidae	decaying fruit	
<i>Drosophila punctatonervosa</i>	Drosophilidae	?	
<i>Zaprionus vittiger</i>	Drosophilidae	decaying organic mattter & possibly dead wood	
<i>Zaprionus tuberculatus</i>	Drosophilidae	decaying organic mattter & possibly dead wood	
<i>Fannia canicularis</i>	Fanniidae	decaying organic waste - eg dustbins	Lesser Housefly
<i>Fannia perpulchra</i>	Fanniidae	?	
<i>Lamprolonchaea smaragdi</i>	Lonchaeidae	?to do with fruit	
<i>Lonchaea avida</i>	Lonchaeidae	?	
<i>Milichiella lacteipennis</i>	Milichiidae	feed on aphid honeydew	
<i>Euryomma peregrinum</i>	Muscidae	decaying vegetable matter and carrion	
<i>Musca domestica</i>	Muscidae	decaying organic waste - eg dung, dustbins	Housefly
<i>Musca autumnalis</i>	Muscidae	nuisance pest of livestock - breed in dung	Face Fly
<i>Dasyphora cyanella</i>	Muscidae	breeds in cattle dung	Green Cluster Fly
<i>Hydrotaea capensis</i>	Muscidae	larvae in carrion	
<i>Muscina stabulans</i>	Muscidae	carrion, stable litter, primitive toilets	False Stable Fly
<i>Muscina prolapsa</i>	Muscidae		
<i>Stomoxys calcitrans</i>	Muscidae	larvae in dung, adults livestock nuisance pests	Stable Fly
<i>Atherigona orientalis</i>	Muscidae	agricultural pest of tomatos	Pepper Fruit Fly, Tomato Fruit Fly
<i>Leia arsona</i>	Mycetophilidae	rotting plant material, roots, compost	
<i>Dohrniphora cornuta</i>	Phoridae	decaying animal and plant material	
<i>Psychoda pencillata</i>	Psychodidae	?	
<i>Psychoda surcoufi</i>	Psychodidae	wide range of moist materials, from cow dung to decaying leaves or potatos	
<i>Coboldia fuscipes</i>	Scatopsidae	?	Minute Black Scavenger Fly
<i>Lycoriella sp.</i>	Sciaridae	larvae in damp compost etc - pests of seedlings	biocontrol by mites has been researched
<i>Leptocera nigra</i>	Sphaeroceridae	decaying carrion	
<i>Phthitia longisetosa</i>	Sphaeroceridae	?	
<i>Leptocera fontinalis</i>	Sphaeroceridae	?	
<i>Leptocera fuscipennis</i>	Sphaeroceridae	?	
<i>Leptocera subtinctipennis</i>	Sphaeroceridae	?	
<i>Thoracochaeta brachystoma</i>	Sphaeroceridae	larval sites include dead bodies	

<i>Trachypella leucoptera</i>	Sphaeroceridae	?
<i>Elachisoma aterrimum</i>	Sphaeroceridae	?
<i>Coproica vagans</i>	Sphaeroceridae	? cattle dung ?
<i>Coproica hirtula</i>	Sphaeroceridae	?
<i>Gonioneura spinipennis</i>	Sphaeroceridae	?
<i>Pullimosina heteroneura</i>	Sphaeroceridae	?
<i>Pullimosina moesta</i>	Sphaeroceridae	?
<i>Opacifrons coxata</i>	Sphaeroceridae	?

### **Related Endemic/Indigenous species – possibly 8**

<i>Anarista vittata</i>	Asteiidae
<i>Hecamede brasiliensis</i>	Ephydriidae
<i>Scatella sp. 1</i>	Ephydriidae
<i>Scatella sp. 2</i>	Ephydriidae
<i>Dicranomyia basilewskyana</i>	Limoniidae
<i>Dicranomyia loveridgeana</i>	Limoniidae
<i>Dicranomyia sanctaehelenae</i>	Limoniidae
<i>Aubertinia sanctaehelenae</i>	Sphaeroceridae

### **Ecology**

The larvae of many live in detritus or other rotting organic material, but their actual role, whether saprobic or predatory is often not known.

### **Possible effects on St Helena's indigenous/endemic invertebrates**

#### **ii Competitive effects**

A significant proportion of non-indigenous flies are members of the saprobic/detritivore communities, usually in moist to wet decay conditions and. as such, may compete with indigenous species although this would be difficult to quantify.

#### **iv Effects on invertebrate habitats**

Large numbers of fly maggots in wet litter decaying wood perhaps may adversely change its characteristics and hence suitability for indigenous species, though this would be difficult to assess.

#### **v Pest effects for people**

Some as adults are veterinary or medical biting or nuisance pests.

### **Possibility of Control**

#### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

#### **ii Likelihood of safe biocontrol measures & precedence**

Biocontrol measures have had some success against species like stable flies in other countries.

#### **iii Possible dangers of biocontrol measures**

The presence of related endemic species

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Herbivore Dung Fauna

Threat posed  
Desirability for control  
Likelihood of success

None  
None  
N/A

### Taxonomy

Insecta: Coleoptera: & Diptera

### Alien species - 3

<i>Labarrus (Aphodius) pseudolividus</i>	Scarabaeidae/Aphodiidae
<i>Calamosternus (Aphodius) granarius</i>	Scarabaeidae/Aphodiidae
<i>Ataenius heinekeni</i>	Scarabaeidae/Aphodiidae
<i>Scathophaga stercoraria soror</i>	Scathophagidae

### Related Endemic/Indigenous species - 0

### Ecology

Mainly pasture. Feeding in herbivore dung, sheep, goat, cow & donkey. *Aphodius granarius* also feeds on wet decaying plant litter, including strandline seaweed on the beach. *Scathophaga stercoraria* is actually predatory as adults on other flies.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

*Aphodius granarius* may be a minor competitor within the detritivore community. There are no indigenous dung beetles on St Helena.

#### v Pest effects for people

None. Beneficial in causing the degradation of dung.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Not desirable

#### ii Likelihood of safe biocontrol measures & precedence

Not desirable

# **SAPROXYLICS**

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Termites

Threat posed  
Desirability for control  
Likelihood of success

High  
High  
unknown

### Taxonomy

Insecta: Blattodea or Isoptera:

### Alien species - 2

*Cryptotermes brevis*                      Kalotermitidae  
*Heterotermes perfidus*                Rhinotermitidae

### Related Endemic/Indigenous species - 0

none

### Ecology

In buildings, and areas with shrubs and trees. In timber, including seasoned building wood & furniture and wood of dead and decaying wood in plantation and natural forest.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### iv      Effects on invertebrate habitats

Destruction of the decaying wood habitat of saproxylic invertebrates, reported to be mainly of non-indigenous trees (Ashmole & Ashmole, 2000, St. Helena and Ascension Island: A Natural History. Anthony Nelson.) *Heterotermes perfidus* may have the potential to reduce the opportunity of the endemic saproxylic fauna to colonise decaying wood of non-indigenous trees. The Forestry department is likely to know more about the severity of threat and potential for control.

#### v      Pest effects for people

Destruction of wood, including buildings and furniture. Effects on forest trees.

### Possibility of Control

#### i      Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii     Likelihood of safe biocontrol measures & precedence

Research has been carried out looking at the use of entomopathogenic fungi of the control of forest termites.

<http://www.icup.org.uk/reports%5Cicup008.pdf>

#### iii    Possible dangers of biocontrol measures

Dependent on specificity of any proposed biocontrol agent.



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Saproxylic weevils

Threat posed  
Desirability for control  
Likelihood of success

Uncertain  
**TOO HAZARDOUS**  
N/A

### Taxonomy

Insecta: Coleoptera: Curculionidae

### Alien species - 3

*Pseudophloeophagus aeneopiceus*

*Calyciforus excavatus*

*Stenoscelis hylastoides*

### Related Endemic/Indigenous species

These saproxylic weevils are in the same subfamily (Cossoninae) as the majority of the 77 endemic weevils present on St Helena.

### Ecology

In many types of habitat with woody plants, including indigenous and commercial forest, scrub and hedgerow trees. Feeding in decaying wood from thin gorse twigs to large decay-cavities in *Erythrina* trees.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Unclear

#### iv Effects on invertebrate habitats

*Pseudophloeophagus aeneopiceus* is a large species and its burrows may change the nature of the decaying timber it inhabits, possibly to the detriment to other species.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Not desirable

#### ii Likelihood of safe biocontrol measures & precedence

Not desirable

#### iii Possible dangers of biocontrol measures

Too closely related to a large number of endemic species with similar lifestyles.

# **PLANT FEEDERS**

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Slugs and Snails

Threat posed  
Desirability for control  
Likelihood of success

possibly High  
possibly High  
Unknown

### Taxonomy

Mollusca:

### Alien species - 21

<i>Arion ater-rufus</i>	Arionidae		anywhere with moist vegetation, horticultural pest
<i>Arion hortensis</i>	Arionidae	Garden Slug	horticultural pest - herbage, litter, in soil, crevices etc
<i>Cochlicopa lubrica</i>	Cochlicopidae	Glossy Pillar	moist, well vegetated places
<i>Carychium tridentatum</i>	Ellobiidae		moist, well vegetated places
<i>Cecilioides acicula</i>	Ferussaciidae	Blind Awnsnail	subterranean - amongst rocks, including in dry places
<i>Fruiticicola sp.</i>	Helicidae		
<i>Helicidae indet.</i>	Helicidae		
<i>Helicigona sp.</i>	Helicidae		(or or <i>Chilostoma sp.</i> )
<i>Helix aspersa</i>	Helicidae	Garden Snail	anywhere with vegetation - including surprisingly dry places - horticultural pest
<i>Deroceras reticulatum</i>	Limacidae	Grey Garden Slug	major pest species - moist litter, grass, under stones & bark
<i>Physella acuta</i>	Physidae	Tadpole Snail	still or slow flowing water, including that low in oxygen
<i>Planorbarius sp.</i>	Planorbidae		still or slow flowing water, including that low in oxygen - the UK species ( <i>P. corneus</i> ) is often spread via aquaria
<i>Paralaoma servilis = Punctum pusillum</i>	Punctidae		New Zealand species - recognised world invasive. Leaf litter
<i>Lauria cylindracea</i>	Pupillidae	Common Chrysalis Snail	rocks, screes, woodland & grassland
<i>Opeas pumilum</i>	Subulinidae	Dwarf Awnsnail	regarded as a pest in nurseries in Egypt, biocontrol by nematodes has been researched - see <a href="http://www.cabdirect.org/abstracts/20123093886.html;jsessionid=074DD34B18EB1779AE1FB10DEF265EE">http://www.cabdirect.org/abstracts/20123093886.html;jsessionid=074DD34B18EB1779AE1FB10DEF265EE</a>
<i>Vallonia excentrica</i>	Valloniidae	Eccentric Vallonia	dry, grassy, often rocky places
<i>Columella microspora</i>	Vertiginidae		IUCN Red Listed (least concern) species from the Azores, Canaries and Madeira - see <a href="http://www.iucnredlist.org/details/156991/0">http://www.iucnredlist.org/details/156991/0</a>
<i>Vertigo pygmaea</i>	Vertiginidae	Crested Vertigo	dry grassy places
<i>Euconulus fulvus</i>	Zonitidae		moist, well vegetated places
<i>Oxychilus alliarius</i>	Zonitidae	Garlic Snail	amongst litter, under stones etc - also gardens
<i>Oxychilus cellarius</i>	Zonitidae		moist litter, under stones & wood. Caves

### Related Endemic/Indigenous species – 2 (+18 extinct endemic species)

<i>Helenoconcha relict</i>	Charopidae
<i>Nesopupa turtoni</i>	Vertiginidae
<i>Succinea sanctaehelenae</i>	Succineidae

### Ecology

All alien species on St Helena are either phytophagous, either on the foliage of higher plants or encrusting algae, or are detritivorous,.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Some of the smaller species may possibly compete with the two smaller endemic species *Helenoconcha relict* and *Nesopupa turtoni* but that would be difficult to assess.

#### **iv Effects on invertebrate habitats**

Some species almost certainly have a very considerable effect on plant species composition, especially in the revegetation of denuded areas. Densities (at least of dead shells) of *Helix aspersa* at places such as The Millennium Forest are extraordinarily high and very large quantities of snail faeces indicate that a large volume of plant material is being eaten, even in very sparsely vegetated areas. Together with rabbits, the influence that they have on St Helena's vegetation may be considerable. (An experimental mollusc & rabbit enclosure treated with slug-pellets in the Millennium Forest might prove an interesting experiment!).

The two aquatic species in still and slow-flowing water bodies and in particular seepages may conceivably change the character of organic build-up to the detriment of indigenous/endemic freshwater crustaceans, crane flies and simuliid flies.

#### **v Pest effects for people**

Many are horticultural pests.

### **Possibility of Control**

#### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

#### **ii Likelihood of safe biocontrol measures & precedence**

Nematode worm parasites are used as biocontrol agents elsewhere against slugs and snails that are important pest species. While this could be possible in more moist areas, the worms require damp soil and would likely be less effective in the drier areas of St Helena where the effects on vegetation may be more severe. Sciomyzid flies, parasitoids of snails, have been used for the control aquatic/semi-aquatic species for disease control purposes.

#### **iii Possible dangers of biocontrol measures**

The remaining endemic species of mollusc might well be at risk to biocontrol agents and rigorous research on vulnerability to any possible control agents would be needed.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Aphids & scale insects

Threat posed  
Desirability for control  
Likelihood of success

**HIGH**  
**HIGH**  
**HIGH – for some**

### Taxonomy

Insecta: Hemiptera: Stenorrhyncha:

### Alien species - 59

<i>Aleurocanthus sp.</i>	Aleyrodidae		<i>Saissetia somereni</i>	Coccidae	Black Scale
<i>Aleurothrix floccosus</i>	Aleyrodidae	Woolly Whitefly	<i>Dactylopius coccus</i>	Dactylopiidae	Cochineal Insect
<i>Aleurotrachelus atratus</i>	Aleyrodidae	Coconut Whitefly	<i>Abgrallaspis cyanophylli</i>	Diaspididae	Cyanophyllum Scale
<i>Trialeurodes vaporariorum</i>	Aleyrodidae		<i>Aonidiella aurantii</i>	Diaspididae	California Red Scale
<i>Aphis craccivora</i>	Aphididae	Cowpea Aphid	<i>Aonidiella citrina</i>	Diaspididae	Yellow Scale
<i>Aphis fabae</i>	Aphididae	Black Bean Aphid	<i>Aonidiella orientalis</i>	Diaspididae	Oriental Scale
<i>Aphis gossypii</i>	Aphididae	Melon or Cotton	<i>Aulacaspis crawii</i>	Diaspididae	
<i>Aphid</i>			<i>Aulacaspis rosarum</i>	Diaspididae	
<i>Aulacorthum solani</i>	Aphididae	Foxglove Aphid	<i>Chrysomphalus pinnulifer</i>	Diaspididae	
<i>Brachycaudus helichrysi</i>	Aphididae	Leaf Curl Plum	<i>Diaspis brumeliae</i>	Diaspididae	Pineapple Scale
		Aphid	<i>Diaspis echinocacti</i>	Diaspididae	Cactus Scale
<i>Brevicoryne brassicae</i>	Aphididae	Cabbage Aphid	<i>Hemiberlesia lataniae</i>	Diaspididae	Latania Scale
<i>Macrosiphum euphorbiae</i>	Aphididae	Potato Aphid	<i>Lepidosaphes beckii</i>	Diaspididae	Citrus Mussel Scale
<i>Macrosiphum rosae</i>	Aphididae	Rose Aphid	<i>Morganella longispina</i>	Diaspididae	Champaca Scale
<i>Myzocallis castanicola</i>	Aphididae	Sweet Chestnut	<i>Pseudaulacaspis pentagona</i>	Diaspididae	White Peach (or Plum) Scale
		Aphid			
<i>Myzus ornatus</i>	Aphididae	Ornate Aphid	<i>Icerya purchasi</i>	Margarodidae	Cottony Cushion Scale
<i>Myzus persicae</i>	Aphididae	Peach Potato	<i>Insignorthesia insignis</i>	Ortheziidae	Jacaranda Bug, Ensign Scale
		Aphid			
<i>Neotoxoptera oliveri</i>	Aphididae	Marigold Aphid	<i>Dysmicoccus brevipes</i>	Pseudococcidae	Pineapple Mealybug
<i>Pentalonia nigronervosa</i>	Aphididae	Banana Aphid	<i>Paracoccus burnerae</i>	Pseudococcidae	Oleander Scale
<i>Rhopalosiphoninus latysiphon</i>	Aphididae	Bulb-and-Potato	<i>Paracoccus sporoboli</i>	Pseudococcidae	
		Aphid	<i>Planococcus citri</i>	Pseudococcidae	
<i>Rhopalosiphoninus sp.</i>	Aphididae		<i>Planococcus minor</i>	Pseudococcidae	Passionvine Mealybug
<i>Rhopalosiphum maidis</i>	Aphididae	Corn Leaf Aphid	<i>Pseudococcus comstocki</i>	Pseudococcidae	Comstock Mealybug
<i>Rhopalosiphum padi</i>	Aphididae	Bird Cherry-Oat	<i>Pseudococcus longispinus</i>	Pseudococcidae	Long-tailed Mealybug
		Aphid	<i>Pseudococcus maritimus</i>	Pseudococcidae	Grape Mealybug
<i>Sitobion sp.</i>	Aphididae		<i>Pseudococcus viburni</i>	Pseudococcidae	Obscure Mealybug
<i>Toxoptera aurantii</i>	Aphididae	Black Citrus Aphid	<i>Rhizoecus dianthi</i>	Pseudococcidae	Blind Mealybug
<i>Toxoptera citricidus</i>	Aphididae	Brown Citrus	<i>Rhizoecus falcifer</i>	Pseudococcidae	Ground Mealybug
		Aphid	<i>Rhizoecus graminis</i>	Pseudococcidae	Graminis Ground Mealybug
<i>Coccus hesperidum</i>	Coccidae	Soft Scale			
<i>Coccus longulus</i>	Coccidae	Long Brown Scale	<i>Trioza erytreae</i>	Psyllidae	African Citrus Psyllid
<i>Parasaissetia nigra</i>	Coccidae	Nigra Scale			
<i>Pulvinaria psidii</i>	Coccidae	Guava Mealy Scale			
<i>Saissetia coffeae</i>	Coccidae	Hemispherical			
Scale					

### Related Endemic/Indigenous species - 1

*Ripersiella mediatlantica* (scale insect)

### Ecology

All vegetated habitats. Phytophagous, most alien species are polyphagous. Many species live in dense aggregations.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

These are likely to compete with many indigenous phytophagous species, probably most intensively with indigenous thrips, and plant-hoppers, but effects of the nutritional value and physical condition of the foliage and stems of infested foodplants are likely adversely to affect many/all species of phytophagous invertebrates. Honeydew and various fungal growths upon it may affect likelihood of oviposition by indigenous phytophagous insects as well likelihood of success of completion of development.

#### iv Effects on invertebrate habitats

Some species produce very severe effects on plant health, even death, of foodplants which will affect indigenous species – see above.

#### v Pest effects for people

Many/most are pests of cultivated agricultural, forestry and garden plants

## **Possibility of Control**

### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Low

### **ii Likelihood of safe biocontrol measures & precedence**

Variable - some species already under some degree of control - many parasitoid wasp, spider and ladybird control measures have been used on St Helena and for other species around the world

### **iii Possible dangers of biocontrol measures**

There is a single endemic species of mealy-bug. Various non-specific predators and parasitoids have been introduced to St Helena in the past and this should not be repeated.

### **Additional References**

There is a huge literature on this subject and it would be inappropriate to chose but a few – best left to the pest control departments.

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Plant Bugs & Hoppers

Threat posed  
Desirability for control  
Likelihood of success

Possible  
Unclear  
unknown

### Taxonomy

Insecta: Hymenoptera:

#### Alien species - 11

<i>Cletus capensis</i>	Coreidae	fruit feeding - also known as plant disease vector
<i>Cenaeus carnifex</i>	Pyrrhocoridae	seeds of herbaceous plants
<i>Sophonia orientalis</i>	Cicadellidae	polyphagous – on Hawaii particularly on tree ferns
<i>Balclutha saltuella</i>	Cicadellidae	on grasses
<i>Cicadellidae sp. 2</i>	Cicadellidae	?
<i>Empoasca sp.</i>	Cicadellidae	?polyphagous, possibly particularly on Solanaceae
<i>Aethus pallidipennis</i>	Cydnidae	root feeder, possibly on Apiaceae
<i>Issus coloepratus</i>	Issidae	Polyphagous – twigs of broadleaved trees
<i>Sweetocoris minutus</i>	Lygaeidae	?
<i>Trigonotylus dohertyi</i>	Miridae	?possibly grasses
<i>Nezara viridula</i>	Pentatomidae	polyphagous – usually shrubby plants & trees
<i>Teleonemia scrupulosa</i>	Tingidae	biocontrol agent for <i>Lantana</i>

#### Related Endemic/Indigenous species – 43

<i>Cardiastethus bicolor</i>	Anthocoridae	<i>Ilburnia ignobilis</i>	Delphacidae
<i>Cardiastethus exiguus</i>	Anthocoridae	<i>Sogatella kolophon</i>	Delphacidae
<i>Lasiochilus contortus</i>	Anthocoridae	<i>Toya propinqua</i>	Delphacidae
<i>Lyctocoris campestris</i>	Anthocoridae	<i>Toya thomasseti</i>	Delphacidae
<i>Metacanthus concolor</i>	Berytidae	<i>Toya tuberculosa</i>	Delphacidae
<i>Plyapomus longus</i>	Berytidae	<i>Nysius ericae</i>	Lygaeidae
<i>Argaterma alticola</i>	Cicadellidae	<i>Nysius sanctaehelenae</i>	Lygaeidae
<i>Argaterma multisignata</i>	Cicadellidae	<i>Agrametra aethiops</i>	Miridae
<i>Atlantisia leleupi</i>	Cicadellidae	<i>Creontiades pallidus</i>	Miridae
<i>Chlorita edithae</i>	Cicadellidae	<i>Helenocoris horridus</i>	Miridae
<i>Cicadellidae sp. 1</i>	Cicadellidae	<i>Hirtopsallus suedae</i>	Miridae
<i>Nehela vulturina</i>	Cicadellidae	<i>Insulopus asteri</i>	Miridae
<i>Nyhimbricus wollastoni</i>	Cicadellidae	<i>Lopsallus flavosparsus</i>	Miridae
<i>Sagmatiini sp.</i>	Cicadellidae	<i>Naresthus hebes</i>	Miridae
<i>Sanctahelenia decellei</i>	Cicadellidae	<i>Neisopsallus lutosus</i>	Miridae
<i>Sanctahelenia insularis</i>	Cicadellidae	<i>Neisopsallus vinaceus</i>	Miridae
<i>Sanctahelenia sanctaehelenae</i>	Cicadellidae	<i>Oligobiella fuliginea</i>	Miridae
<i>Stonaslans consors</i>	Cicadellidae	<i>Orthops mutabilis</i>	Miridae
<i>Stonaslans undulata</i>	Cicadellidae	<i>Taylorilygus apicalis</i>	Miridae
<i>Helenolius dividens</i>	Cixiidae	<i>Tytthus parviceps</i>	Miridae
<i>Helenolius insulicola</i>	Cixiidae	<i>Macrorhaphis wollastoni</i>	Pentatomidae
<i>Ilburnia diana</i>	Delphacidae		

### Ecology

Almost any vegetated habitat. Phytophagous on foliage/stems– most (?all) are polyphagous with the exception of *Teleonemia scrupulosa* – biocontrol agent for *Lantana*. *Issus* is mainly on shrubs & trees.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

May potentially compete with indigenous species.

#### iv Effects on invertebrate habitats

There may be adverse effects on indigenous host food-plants.

#### v Pest effects for people

At least one species *Nezara viridula* can be pest on crops and *Sophonia orientalis* is both a serious crop pest and deleterious to indigenous flora elsewhere in the world.

## **Possibility of Control**

### **i Likelihood of safe physical/chemical control in wild populations & habitats**

low

### **ii Likelihood of safe biocontrol measures & precedence**

Parasitoid wasps have been used to control other species of leafhopper elsewhere in the world. Inadvertently introduced Mymarid wasp egg parasites have achieved control of *Sophonia orientalis* on Hawaii <http://www.cabi.org/isc/?compid=5&dsid=50605&loadmodule=datasheet&page=481&site=144> . However, scelionid parasitoids *Trissolcus basalis* introduced to Hawaii to control *Nezara viridula* on Hawaii turned out to be non-specific and are now regarded as invasives in their own right [https://web.duke.edu/nicholas/bio217/mg53/trissolcus\\_basalis.html](https://web.duke.edu/nicholas/bio217/mg53/trissolcus_basalis.html) . Tachinid fly parasitoids (*Trichopoda* sp) of *Nezara viridula* have achieved success on Hawaii. <http://www.extento.hawaii.edu/kbase/crop/type/nezara.htm>

### **iii Possible dangers of biocontrol measures**

Given the number of indigenous related species, specificity of any biocontrol agent should be assured before any biocontrol agent is considered.



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Thrips

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
unknown

### Taxonomy

Insecta: Thysanoptera:

### Alien species - 8

<i>Aeolothrips fasciatus</i>	Aeolothripidae
<i>Haplothrips gowdeyi</i>	Phlaeothripidae
<i>Liothrips vaneeckeii</i>	Phlaeothripidae
<i>Nesothrips propinquus</i>	Phlaeothripidae
<i>Heliethrips haemorrhoidalis</i>	Thripidae
<i>Hercinothrips bicinctus</i>	Thripidae
<i>Taeniothrips simplex</i>	Thripidae
<i>Thrips tabaci</i>	Thripidae

### Related Endemic/Indigenous species - 2

<i>Helenothrips tinctus</i>	Thripidae
<i>Diceratothrips meridionalis</i>	Phlaeothripidae

### Ecology

All areas with vegetation. Phytophagous, usually on leaves, soft stems, flowers and fruits. Some species are highly plant species specific, but most (?all) alien species are polyphagous.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Alien species may possibly compete with indigenous thrips, bark-flies and plant-hoppers.

#### iv Effects on invertebrate habitats

Effects on health and quality of foodplants from high infestations and plant stress may affect indigenous species of plant feeding invertebrates.

#### v Pest effects for people

None

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Anthocorid bugs, parasitoid wasps, predatory mites, parasitic nematodes and pathogenic fungi have all been researched for control of thrips

#### iii Possible dangers of biocontrol measures

Presence of indigenous species.

### Additional References

[http://biocontrol.ucr.edu/wft.html#Efficacy Trials With Predators and Parasites](http://biocontrol.ucr.edu/wft.html#Efficacy_Trials_With_Predators_and_Parasites)

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Plant-feeding Beetles

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
mainly pest control grounds  
variable

### Taxonomy

Insecta: Coleoptera:

### Alien species - 22 (21)

<i>Ernobius mollis</i>	Anobiidae	timber pest on conifers
<i>(Anobium punctatum,</i>	Anobiidae	pest of building and furniture timber indoors)
<i>Curtomerus flavus</i>	Cerambycidae	timber pest
<i>Coptops aedificator</i>	Cerambycidae	fruit tree pest
<i>(Uroplata girardi</i>	Chrysomelidae	<i>Lantata</i> biocontrol agent)
<i>Phratora vulgatissima</i>	Chrysomelidae	leaf feeder on Salicaceae (potential for biocontrol?)
<i>Diachus auratus</i>	Chrysomelidae	leaf feeder on wide variety of trees and ferns, including crop species
<i>Naupactus godmanni*</i>	Curculionidae	leaf feeder, polyphagous, but pest of fruit
<i>Sitona lineatus</i>	Curculionidae	leaf/root feeder on Fabaceae – pea and bean pest
<i>Otiorrhynchus sulcatus</i>	Curculionidae	vine weevil – polyphagous - root feeder
<i>Phlyctinus callosus</i>	Curculionidae	pest of fruit
<i>Goniopteris scutellatus</i>	Curculionidae	pest of Eucalyptus
<i>Hypohypurus aequatorialis</i>	Curculionidae	no information
<i>Baris scolopacea*</i>	Curculionidae	on Chenopodiaceae, including <i>Sueda</i>
<i>Cosmopolites sordidus</i>	Curculionidae	pest on banana roots
<i>Sciobius tottus*</i>	Curculionidae	S. African species – leaf feeder
<i>Brachypeplus depressus</i>	Nitidulidae	on Eucalyptus
<i>Lasioidites maculatus</i>	Nitidulidae	pest of fruit
<i>Adoretus versutus</i>	Scarabaeidae	pest of fruit
<i>Heteronychus arator*</i>	Scarabaeidae	root pest especially of grass and in gardens
<i>Hylurgus ligniperda*</i>	Scolytidae	bark feeder
<i>Xyleborus aemulus*</i>	Scolytidae	bark feeder

\* several of the more polyphagous species are widespread in indigenous vegetation.

### Related Endemic/Indigenous species

Species here are selected on lifestyle rather than taxonomy. There are indigenous/endemic species in the families Chrysomelidae, Curculionidae, & Scarabaeidae,

### Ecology

Variously agricultural land, pasture, forestry and gardens, though several of the more polyphagous species are widespread in indigenous vegetation (asterisked above). Leaf, stem or root feeding beetles, either as adults, larvae or both. Included are xylophagous (as opposed to saprozylic) species that feed on either bark, cambium or living wood, mainly through probably not exclusively on forest or fruit trees. Also included here the woodworm *Anobium punctatum* an indoor pest of furniture, building timber etc

### Possible effects on St Helena's indigenous/endemic invertebrates

#### iv Effects on invertebrate habitats

Some species that also feed on indigenous plants may have a deleterious effect on foodplant availability or quality, but this is unknown.

#### v Pest effects for people

High – see table

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Because of their pest status, a number of these species may be subject to biocontrol projects elsewhere in the world.

#### iii Possible dangers of biocontrol measures

There are related endemic and indigenous species which must be taken into account when considering any biological control for these species.

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Moths & Butterflies

Threat posed  
Desirability for control  
Likelihood of success

Variable  
On pest control grounds  
Variable

### Taxonomy

Insecta: Lepidoptera:

#### Alien species - 38

Diaphania indica	Crambidae	Cucumber Moth	polyphagous	crop pest
Uresiphita gilvata	Crambidae		polyphagous	
Spoladea recurvalis	Crambidae	White-striped Moth	polyphagous	crop/indigenous species pest
Cnaphalocrocis poeyalis	Crambidae	Lesser Rice-Leafroller	grasses	crop pest (rice)
Hydriris ornatalis	Crambidae		Convolvulaceae	
Herpetogramma licarsisalis	Crambidae	Grass Webworm	grasses	pest of turf & pasture
Bedellia somnulentella	Lyonetiidae	Sweet Potato Leaf Miner	Convolvulaceae	pest of sweet potatoes
Endrosia sarcitrella	Oecophoridae	White-shouldered House Moth	plant detritus and keratin	indoor pest
Hofmannophila pseudospretella	Oecophoridae	Brown House Moth	keratin etc	indoor pest
Plutella xylostella	Plutellidae	Diamondback Moth	Brassicaceae	crop pest
Pyralis farinalis	Pyralidae	Meal Moth	flour & bran	stored product pest
Cactoblastis cactorum	Pyralidae	Cactus Moth	Opuntia sp	biocontrol of tungi
Etiella zinckenella	Pyralidae		Fabaceae	pea and bean pest
Aphomia sociella	Pyralidae	Bee Moth	Bee wax	pest of honey-bees
Erechthias minuscula	Tineidae	Erechthias Clothes Moth	dead plant material	
Monopis crocicapitella	Tineidae		animal and plant detritus	
Opogona omoscropa	Tineidae		decaying vegetation	
Opogona sacchari	Tineidae	Banana Moth	polyphagous	crop pest
Tinea pellionella	Tineidae		keratin etc	carpets and woollen clothes pest
Lozotaenia capensana	Tortricidae		polyphagous	
Crociosema plebejana	Tortricidae		Malvaceae	pest of cotton
Cryptophlebia leucotreta	Tortricidae	False Coddling Moth	polyphagous	crop pest
Argyresthia curvella	Yponomeutidae	Apple Blossom Tineid	Rosaceae	pest of fruit trees
Agrius convolvuli	Sphingidae	Convolvulus Hawkmoth	Convolvulaceae	
Achaea catella	Noctuidae		Polyphagous	May defoliate trees
Agrotis segetum	Noctuidae	Turnip Moth, Cutworm	Polyphagous on roots	crop pest
Anomis flava	Noctuidae		Malvaceae	
Hypena laceratalis	Noctuidae	Lantana Defoliator	Lantana	biocontrol agent
Hypocala rostrata	Noctuidae		Ebenaceae Sapotaceae	
Ophiusa tirhaca	Noctuidae		Pistachia, Schinus	
Simplicia extinctalis	Noctuidae		polyphagous	pest of coffee
Pandesma robusta	Noctuidae		polyphagous	
Ctenoplusia limbirena	Noctuidae	Scar Bank Gem	polyphagous	
Condica pauperata	Noctuidae		unknown	possibly polyphagous
Schrankia costaestrigalis	Noctuidae		polyphagous	
Inachis io	Nymphalidae	European Peacock	nettles	not established
Papilio demodocus	Papilionidae	Citrus Swallowtail, Orange Dog	Citrus	pest of oranges etc – not established
Pieris brassicae	Pieridae	Large White	Brassicaceae	pest of cabbages – not established

#### Related Endemic/Indigenous species - 80

### Ecology

It is perhaps inappropriate to attempt summary of the ecology of a whole order. Caterpillars of alien invasive species on St Helena feeds on a very wide variety of introduced and indigenous/endemic plants of most taxa, many of them being very broadly polyphagous. A few are specific to one or a small number of plants and many are serious pests of crop plants and two have been used as biocontrol agents of invasive plants. A small number are detritivorous.

#### Possible effects on St Helena's indigenous/endemic invertebrates

## **ii Competitive effects**

Certain species, for example *Spoladea recurvalis* may completely defoliate indigenous species and thus deny endemic Lepidoptera access to foodplants, at least locally. By hugely increasing the abundance and biomass of lepidopterous larvae, this may lead to a much greater abundance of unspecific hymenopterous parasitoids which may have a deleterious effect on indigenous species

## **iv Effects on invertebrate habitats**

Stress effects on indigenous plants supporting high infestations of alien species may affect the availability and quality of foliage for indigenous moth species.

## **v Pest effects for people**

Many are crop pests and a few damage clothes, carpets etc indoors.

## **Possibility of Control**

### **i Likelihood of safe physical/chemical control in wild populations & habitats**

Unlikely

### **ii Likelihood of safe biocontrol measures & precedence**

Parasitoids have been used widely against problem Lepidoptera and there is a wide literature.

### **iii Possible dangers of biocontrol measures**

Few, however, are truly monophagous and indigenous/endemic Lepidoptera are very likely to be at risk. All future biocontrol measure proposals must be assessed against strict internationally accepted criteria on specificity of action.

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Phytophagopus Flies

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
On pest control grounds  
remainder - **Low**

Insecta: Diptera:

### Alien species - possibly 15

<i>Phytomyza atricornis</i>	Agromyzidae		Pea Leaf Miner
<i>Liriomyza brassicae</i>	Agromyzidae	pest of cabbage family crops	Serpentine Leaf Miner
<i>Liriomyza huidobrensis</i>	Agromyzidae	polyphagous leaf miner crop pest	Pea Leafminer
<i>Delia platura</i>	Anthomyiidae	polyphagous pest of crop seedlings	Seedcorn maggot, Bean seed fly
<i>Elachiptera sacculicornis</i>	Chloropidae	phytophagous - leguminous trees	
<i>Drosophila simulans</i>	Drosophilidae	decaying fruit - especially pickly pear	
<i>Drosophila immigrans</i>	Drosophilidae	decaying fruit	
<i>Drosophila punctatonervosa</i>	Drosophilidae	?	
<i>Scaptomyza pallida</i>	Drosophilidae	leaf miner - often in Allium sp	
<i>Lamprolonchaea smaragdi</i>	Lonchaeidae	?to do with fruit	
<i>Lonchaea avida</i>	Lonchaeidae	?	
<i>(Milichiella lacteipennis</i>	Milichiidae	feed on aphid honeydew)	
<i>Ceratitis capitata</i>	Tephritidae	serious fruit crop pest	Mediterranean Fruit Fly
<i>Dioxya sororcula</i>	Tephritidae	feeds in Asteraceae seed head - pest in other places	
<i>Dacus ciliatus</i>	Tephritidae	pest of Cucurbitaceae fruit & vegetables	Lesser Pumpkin Fly

### Related Endemic/Indigenous species –unclear – possibly none

#### Ecology

Mainly either leaf or seed miners which may be highly specific or generalist, or feeding on very ripe or over-ripe fruit.

#### Possible effects on St Helena's indigenous/endemic invertebrates

possibly none, although indigenous species may be vulnerable to biocontrol methods used to target pest species if insufficiently host-specific

#### v Pest effects for people

Most are crop pests.

#### Possibility of Control

##### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

##### ii Likelihood of safe biocontrol measures & precedence

Biocontrol measures have had some success against dipterous crop pests in other countries.

##### iii Possible dangers of biocontrol measures

Possible effects on distantly related endemic species.

# Non-indigenous Invertebrate Taxa on St Helena – Effects and Possible Control Measures

## Rabbits (and Goats)

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
?

### Taxonomy

Mammalia:

### Alien species - 2

Goat	<i>Capra hircus</i>	Capridae
Rabbit	<i>Oryctolagus cuniculus</i>	Leporidae

### Related Endemic/Indigenous species - 0

### Ecology

Two grazers which have had devastating effect on invertebrate habitat.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### iv Effects on invertebrate habitats

Goats in particular have destroyed whole habitats for invertebrates on St Helena, and rabbits are almost certainly still preventing revegetation of many denuded areas and heavily influencing what vegetation is able to re-establish, favouring unpalatable alien species.

#### v Pest effects for people

Presumably rabbits are regarded as an agricultural pest?

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Has so far been successful with goats. New Zealand companies have had considerable success on some isolated islands in eradicating rabbits.

#### ii Likelihood of safe biocontrol measures & precedence

Two viral diseases have been used with variable success against rabbits, but their use in the UK is illegal.

#### iii Possible dangers of biocontrol measures

none

### Other Comments

Rabbits are hunted for sport or food on the island. Attempts to control mammal species are likely to be controversial, possibly internationally, on animal rights issues. Education and awareness raising would need to be included in any control programme.

**OTHERS**



# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Ants

Threat posed  
Desirability for control  
Likelihood of success

HIGH  
HIGH  
POSSIBLE

Insecta: Hymenoptera: Formicidae:

### Alien species - 13

*Hypoponera punctatissima*

*Pheidole megacephala*

*Cardiocondyla emeryi*

*Solenopsis globularia*

*Solenopsis* sp.

*Tetramorium caldarium*

*Tapinoma melanocephalum*

*Plagiolepis alluaudi*

*Paratrechina bourbonica*

*Paratrechina longicornis*

*Linepithema humile*

*Monomorium latinode*

*Monomorium sechellense*

### Related Endemic/Indigenous species - (?1)

There is one purported endemic (*Camponotus fabricator*) but this is now thought to be an establishment from an unknown area (see

[http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&ved=0CDIQFjABOAO&url=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F253771832\\_Ants\\_\(Hymenoptera\\_Formicidae\)\\_of\\_the\\_South\\_Atlantic\\_islands\\_of\\_Ascension\\_Island\\_St\\_Helena\\_and\\_Tristan\\_da\\_Cunha%2Ffile%2F60b7d5258d2b41efe9.pdf&ei=T-jvUuv-GuWK7AbbzYCgBq&usq=AFQjCNGORTX4pH3TqAr7-CYTdBbhF2FuDw&cad=rja](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&ved=0CDIQFjABOAO&url=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F253771832_Ants_(Hymenoptera_Formicidae)_of_the_South_Atlantic_islands_of_Ascension_Island_St_Helena_and_Tristan_da_Cunha%2Ffile%2F60b7d5258d2b41efe9.pdf&ei=T-jvUuv-GuWK7AbbzYCgBq&usq=AFQjCNGORTX4pH3TqAr7-CYTdBbhF2FuDw&cad=rja) )

## Ecology

Relatively indiscriminate predators on most groups of invertebrates, social nesting in various biotopes dependent on species. Several species have symbiotic relationship with alien stenorhynchine Hemiptera (aphids and scale insects) and actively remove/destroy natural predators and competitors of their 'livestock' from the vegetation on which they are reared. They have colonised all terrestrial biotopes on St Helena, damp, dry, densely & sparsely vegetated. Some species lapicolous, others in decaying dead wood, grassland soils, plant litter and moss.

## Possible effects on St Helena's indigenous/endemic invertebrates

### i Predatory Effects

Collectively, possibly the most significant invertebrate predators on most groups of terrestrial invertebrates on the island. Especially likely to be significant in decaying dead wood (eg in gumwood forest, where a very high proportion of larger dead wood harbours ant nests rather than endemic saproxylics) and under stones in dry zones

### iv Effects on invertebrate habitats

Considerable change to saproxylic habitats through their burrowing activity.

Degrading/deterioration of foliage quality of foodplant of phytophagous species through their symbiotic 'cultivation' of alien stenorhynchines - aphids and scale insects and subsequent stressing of plants, coating with waxes or honeydews and sooty moulds

### v Pest effects for people

Some species bite or sting, others cultivate aphids and scales on agricultural or forest crops or garden plants.

## Possibility of Control

### i Likelihood of safe physical/chemical control in wild populations & habitats

**Possible** – there is considerable precedence around the world using poisoned baits, including on fairly comparable islands such as Hawaii <http://www.ens-newswire.com/ens/oct2010/2010-10-25-092.html> and the Seychelles <http://www.ncbi.nlm.nih.gov/pubmed/21340553>

### ii Likelihood of safe biocontrol measures & precedence

Possible - phorid flies of the genus *Pseudacteon* have been used against fire ants in the US.

### iii Possible dangers of biocontrol measures

Probably none if species exclusively predatory/parasitic on ants are used

### **Additional References**

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/antsnz/invasive-ants>  
<http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/invertebrates/invasive-invertebrates/antsnz/invasive-ants/inforamtion-sheets>

# Non-indigenous Animal Taxa on St Helena – Likely Effects on Indigenous Invertebrates & Their Habitats and Possible Control Measures

## Barkflies/Barklice

Threat posed  
Desirability for control  
Likelihood of success

Unclear  
Unclear  
unknown

### Taxonomy

Insecta: Psocoptera:

### Alien species - 10

Ectopsocus briggsi	Ectopsocidae	Trichopsocus clarus	Trichopsocidae
Ectopsocus strauschi	Ectopsocidae	Helenatropos abrupta	Trogiidae
Liposcelis bostrychophila	Liposcelidae	Cerobasis annulata	Trogiidae
Liposcelis entomophila	Liposcelidae	Cerobasis guestfalica	Trogiidae
Myopsocus eatoni	Myopsocidae	Lepinotus inquilinus	Trogiidae

### Related Endemic/Indigenous species - 11

Stenocaecilius benoiti	Caeciliusidae	Blaste helenae	Psocidae
Stenocaecilius caboverdensis	Caeciliusidae	Psyllipsocus ramburii*	Psyllipsocidae
Peripsocus decellei	Peripsocidae	Sphaeropsocopsis insularum*	Sphaeropsocidae
Peripsocus leleupi*	Peripsocidae	Sphaeropsocopsis myrtleae	Sphaeropsocidae
Peripsocus pauliani*	Peripsocidae	Cerobasis atlantica	Trogiidae
Blaste basiliewskyi	Psocidae		

\* species of more doubtful indigenous status

### Ecology

Almost any vegetated areas - foliage, bark, other hard surfaces with algae/lichens. Detritivorous (?algivorous & lichenophagous?)

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

Possible, but would be very difficult to assess.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

Most (all?) control measures have been aimed at synanthropic species associated with stored products, glues etc. – there has been research on the use of pseudoscorpions as biocontrol agents, but these could have a deleterious effect on endemic species of pseudoscorpion.

#### iii Possible dangers of biocontrol measures

Endemic species at risk

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Saunders' Webspinner

Threat posed  
Desirability for control  
Likelihood of success

Unlikely  
Low  
N/A

### Taxonomy

Embioptera:

### Alien species - 1

*Oligotoma saundersii*

### Related Endemic/Indigenous species – 0

### Ecology

Subsocial species. Larvae and females live in colonies of webs on rocks and (mainly) tree and shrub bark, feeding on lichens and bark flakes.

### Possible effects on St Helena's indigenous/endemic invertebrates

#### ii Competitive effects

The only two groups with endemic species with which they could perhaps compete would be barkflies/lice and lichenophagous larvae of tineid moths.

### Possibility of Control

#### i Likelihood of safe physical/chemical control in wild populations & habitats

Unlikely

#### ii Likelihood of safe biocontrol measures & precedence

No precedence.

#### iii Possible dangers of biocontrol measures

Unlikely

<http://animals.irank.org/pages/2399/Webspinners-Embioptera-SAUNDERS-EMBIID-Oligotoma-saundersii-SPECIES-ACCOUNT.html>

[http://www.insectasylum.net/Life\\_History\\_And\\_Behavior\\_of\\_the\\_Embiopteran\\_Oligotoma\\_saundersii.pdf](http://www.insectasylum.net/Life_History_And_Behavior_of_the_Embiopteran_Oligotoma_saundersii.pdf)

# **SUMMARY**

# Non-indigenous Animal Taxa on St Helena – Effects and Possible Control Measures

## Summary

Below are tabulated all non-indigenous species/groups where I have assessed the threat posed to the endemic invertebrates of St Helena and desirability of desirability of control to be other than 'Low' or 'unknown/unclear'.

Group	Effect	Threat posed to St Helena's endemic invertebrate fauna	Desirability of control on basis of invertebrate conservation concern	Estimate of likelihood of success	Synergy with other concerns
Scorpion	Predator	High	High	Possible	pests - sting
Alien spiders	Predator	High (some species)	High (some species)	Low	pests – bite (some spp)
Alien centipedes	Predator	High	High	Possible	pest - bite
Praying Mantis	Predator	High	High	Possible	
Alien predatory beetles	Predator	High (some species)	High (some species)	Low	
Ants	Predator	High	High	Possible	pests – stings, rear aphids etc
European social wasp	Predator	High	High	Possible	pests - sting
Alien parasitoid wasps	Predator	Likely	Unclear	Low	
Guppy	Predator	High	High	Possible	
African Grass frog	Predator	High	High	Possible	
some bird species	Predator	High	High	Low	nuisance value – fruit damage
Rats/mice	Predator	High	High	Possible, <u>very</u> expensive	pests – stored products etc
Amphipod landhopper	Competitor/Habitat deterioration	High	High	Unknown	
Alien slugs/snails	Habitat deterioration	High	High	Unknown	crop pests
Alien woodlice	Competitor/Habitat deterioration	High	High	Low/too risky	
Millipedes	Competitor/Habitat deterioration	High	High	Unknown	some crop pests
Termites	Habitat deterioration	High	High	Unknown	damage to forestry & domestic timber
various Auchenorhycha – aphids, scale insects, etc	Habitat deterioration	High	High	Ongoing	crop pests, threat to endemic plants
Rabbits	Habitat deterioration	High	High	Unknown	crop damage, damage to regeneration of indigenous vegetation



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front cover picture Springbok Mantis *Miomantis caffra*

rear cover picture Red-headed centipede *Scolopendra morsitans* - both South African

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