

# **Stony Head Bush Blitz**

## ***Coleoptera, Hemiptera, Hymenoptera***

***(and a small number of species from 9 other Orders: Blattodea, Dermaptera, Diptera, Neuroptera, Odonata, Orthoptera, Phasmida, Thysanoptera and Zygentoma).***

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A first record of this unusual genus in Tasmania, *Carvalhoma malcolmae* is merely 2.4mm (female): An extraordinary bug (Hemiptera: Miridae) with hardened, shiny, hemelytra that could easily be mistaken for a beetle. [Photo: L. Forster]

Nomenclature and taxonomy used in this report is consistent with:

The Australian Faunal Directory (AFD)

<http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home>

## Contents

Contents.....	2
List of contributors.....	2
Abstract.....	3
1. Introduction.....	3
2. Methods.....	4
2.1 Site selection.....	4
2.2 Survey techniques.....	4
2.2.1 Methods used at standard survey sites.....	4
2.3 Identifying the collections.....	4
3. Results and Discussion.....	5
3.1 Un-named or not formalised taxa.....	6
3.2 Putative new species (new to science).....	8
3.3 Exotic and pest species.....	9
3.4 Threatened species.....	10
3.5 Range extensions.....	10
3.6 Genetic information.....	12
4. Information on species lists.....	12
5. Information for land managers.....	12
6. Other significant findings.....	12
7. Conclusions.....	12
Acknowledgements.....	13
References.....	14
Appendices.....	16
Appendix 1. List of Coleoptera, Hemiptera, Hymenoptera (and a small number of species from 9 other Orders: Blattodea, Dermaptera, Diptera, Neuroptera, Odonata, Orthoptera, Phasmida, Thysanoptera, Zygentoma) recorded during the Stony Head Bush Blitz.....	16

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List of contributors to this report.			
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## Abstract

A total of 225 species from 12 Orders were among the 573 specimens collected over seven days during the Stony Head Bush Blitz. Their species richness reflected the diverse juxtaposition of habitats in the area which included wet sclerophyll forest, dry eucalypt forest and *Xanthorrhoea* heathland. The area had not been previously surveyed for invertebrates and all species collected represent range extensions and infill distributions for Tasmanian species. The number of species includes 42 informal species that have not previously been encountered in Tasmania and await further work. Of these, two species of Delphacini (Delphacidae) are considered to be new to science, pending further investigation. One of Tasmania's endemic stag beetles, *Lissotes launcestoni*, was locally abundant while collection of the ground beetle, *Oodes modestus*, is the third recorded location for Tasmania.

Two remarkable specimens that are new records for Tasmania were Hemiptera found on *Xanthorrhoea australis*. One was the unusual Mirid bug with hardened hemelytra, *Carvalho malcolmae* and the other an extremely flattened, brachypterous Thaumastocorid bug, *Baclozygum brachypterum*. These species, previously only known from the Australian Mainland, represent major range extensions and are likely to have a biogeographic history of dispersal to Tasmania via the Bassian land bridge.

The number of un-named and poorly known named species highlight the taxonomic and ecological work that still needs to be done to discover and describe our heritage of invertebrates. The benefit of Bush Blitz surveys to accelerate species discovery is a major contribution to this work.

## 1. Introduction

Stony Head provided an opportunity to survey some of Tasmania's relatively intact coastal heath and woodland, little of which has been surveyed for insects. Its location adjacent to Bass Strait was of biogeographic interest because there was a possibility that it may represent a confluence of species of Gondwanan origins along with those that dispersed from the north during periods when there was a land bridge linking Tasmania, Flinders Island and Mainland Australia.

It was anticipated that the diversity of habitats within short distances of each other would provide a wide range of species with different adaptations. Since the area had not been surveyed before, the plan was to survey all representative habitats, from beaches to dry eucalypt forest, wet eucalypt forest and dams. Sampling was late in the season after most plants had flowered, so, the number of active pollinators was expected to be low. *Xanthorrhoea* heathland was of particular interest because its protection as a threatened plant community means that it cannot always be sampled. This was an ideal opportunity to do so, although it was a little late in the season.

## **2. Methods**

### **2.1 Site selection**

Sites were selected to represent the wide diversity of coastal habitats present in the reserve, ranging from sandy beaches and dunes to shrubby coastal heath, grassland, ephemeral wetlands, ponds, dry eucalypt woodland and wet sclerophyll forest. Vegetation communities that are threatened in Tasmania were also targeted for sampling, including *Eucalyptus ovata* plant communities, *Xanthorrhoea* heath, *Poa* grassland and *Melaleuca* swampland.

### **2.2 Survey techniques**

Specimens were mostly hand collected opportunistically by examining a diversity of microhabitats at each site, including terrestrial substrates (such as coastal sand, forest litter), under logs or rocks, under bark on trees, on vegetation or beaten from vegetation, knockdown spray of bark and pond dipping. Insects attracted to a sheet illuminated by an LED night light were hand collected. Roadside car vibration sampling was also productive.

#### **2.2.1 Methods used at standard survey sites**

Invertebrates from the two standard survey sites were sampled over eight days with malaise tents, a transect of pitfall traps, and an array of yellow pans. None of these specimens are part of this report. I did, however, sweep vegetation, look under bark of eucalyptus trees, examine leaf litter, and use knockdown spray at the standard survey sites. The sampling time in March was late in the season when few plants were in flower and only one patch of Tea tree (*Leptospermum*) was encountered that was in flower.

### **2.3 Identifying the collections**

Coleoptera were identified by the author according to their classification in Lawrence and Slipinski (2013) and Slipinski and Lawrence (2020) and reference to taxonomic papers therein.

Other orders were identified using numerous published papers, of which only those mentioned in the text are referenced as there were too many to list.

The insect collection at the Tasmanian Museum and Art Gallery (TMAG) was also consulted. Interim code names have been assigned to morphologically distinct, but undetermined or undescribed species found at Stony Head. All specimens are to be lodged with the Tasmanian Museum Insect Collection.

### 3. Results and Discussion

A total of 573 specimens collected from diverse habitats at Stony Head comprised 227 species from 81 Families in 12 insect Orders.

As anticipated, forest at the top of Ryans Hill and wet gullies along the Perimeter Trail and Barrows Trail supported slightly different assemblages of species compared with dry woodland and grassland. Wet forests provided damp mossy habitat and large rotting logs for several species that are known to occupy this habitat elsewhere in the State, including stag beetles (*Syndesus cornutus* and *Lissotes launcestoni*), predatory ground beetles such as *Promecoderus brunnicornis* and the flightless longhorn beetle, *Dorcadida bilocularis*. Given the relatively small areas of wet forest and the long time that it takes to regenerate, protection of these areas from fire might be warranted. In contrast, the drier forests and woodlands supported many species of ants, grasshoppers, crickets, and true bugs.

A number of deep roadside dams scattered across the dry woodland seemed to play an important role in maintaining moist habitat that is likely to provide refugia that sustain populations of invertebrates during dry periods while, in turn, they become food for vertebrates such as frogs. The dams were inhabited by numerous water bugs, including the elongate needle bug (*Rantra dispar*) and creeping water bugs (*Naucoris congrex*), while minute *Nesidovelia peramoena* skated across the water surface. Diving beetles (*Sternopriscus* sp.) were also present, along with several large water beetles (*Onychohydus scutellaris*) emerging from their pupal cells in the mud next to a dam and making their way to the water. Toad bugs (*Nerthra suberosa*) were more common in areas of ephemeral wetlands such as Fothers Hill, the dam area in Black Rock hinterland and seasonally inundated *Eucalyptus ovata* habitat on the Perimeter Trial section 1.

On sandy beaches, beetles and flies dominated the Orders of insects. Species adapted to this dry and unstable environment tend to take refuge in, and feed upon, stranded kelp or dead sea creatures. The beetles collected included minute scavenging weevils (*Aphela algarum*) and darkling beetles (*Hyocis bakewelli*, *Spharigeris physodes*), and an extraordinary endemic, hooded predator (*Mecynotarsus leai*). Rove beetles constituted the larger beach predators, represented by *Cafius sabulosus* and *Remus sericeus*. The beach was relatively devoid of stranded kelp during the survey which may explain why several other species of beach rove beetles were not encountered.

**Coleoptera:** A total of 113 morphologically distinct species of Coleoptera from 33 Families were identified from 228 beetles collected during the Stony Head Bush Blitz. Tasmanian collections of coleoptera held in the State have received a lot of attention to identify species and recognised morphospecies and yet 34% of Coleoptera collected were assigned to informal species, suggesting that a large number remain to be discovered despite this work.

**Hemiptera:** A total of 54 morphologically distinct species of Hemiptera from 23 Families were identified from 99 true bugs collected during the Stony Head Bush Blitz. Approximately 38% of Hemiptera could not be readily assigned to described species, suggesting that many more species remain to be discovered.

Hymenoptera-Formicidae: A total of 28 morphologically distinct species from the ant family, Formicidae, were identified from 65 specimens collected during the Stony Head Bush Blitz. Tasmanian Formicidae are relatively better known, with only 14% assigned to undescribed species.

For the remaining nine Orders, 30 species from 23 families were collected from Blattodea (cockroaches), Diptera (flies), Neuroptera (lacewings), Odonata (a damsel fly), Orthoptera (grasshoppers and crickets), Phasmida (stick insects), Thysanoptera (thrips) and Zygentoma (silverfish). These were all species that are commonly encountered in Tasmania and add to the diversity of new records for the survey area. Only two species were not formally named, both from Blattodea.

Significant range extensions included two genera of Hemiptera not previously recorded from Tasmania. The closest known locations for *Neolethaeus australiensis* (Rhyparochromidae) and *Carvalhoma malcolmae* (Miridae) are in Victoria and their dispersal to Tasmania may have occurred via the Eastern Bassian land bridge

Appendix 1 lists all 12 Orders recorded during the Bush Blitz. Collections made during this Bush Blitz will result in 436 records for 573 specimens being added to public collections and 436 records added to publicly accessible databases.

### 3.1 Un-named or not formalised taxa

The 69 informal species recorded were all new records for Stony Head, of which 42 are considered to be new for Tasmania. Twenty-seven have been recorded elsewhere in Tasmania and are recognised as species waiting for formal description. Further work will be carried out to determine the status of the newly recognised informal species. Most of these are Coleoptera in the families of leaf beetles (Chrysomelidae), weevils (Curculionidae) and rove beetles (Staphylinidae). New taxa of Hemiptera were largely from the speciose families of leafhoppers (Cicadellidae), seed bugs (Lygaeidae) and Psyllid and Mirid bugs.

Table 1. Putatively un-named or not formalised taxa	
Taxon	Family
BLATTODEA	
<i>Calolampra</i> sp TMAG_F12724	Blaberidae
<i>Balta</i> sp TMAG_F114557	Ectobiidae
COLEOPTERA	
<i>Amblystomus</i> sp TMAG_F114593	Carabidae
<i>Clivina</i> sp BBSH_01	Carabidae
Alticini sp BBSH_01	Chrysomelidae
<i>Chaetocnema</i> sp BBSH_01	Chrysomelidae
<i>Chaetocnema</i> sp nr <i>propinqua</i>	Chrysomelidae
<i>Chaetocnema</i> sp TMAG_F95720	Chrysomelidae
Chrysomelidae sp BBSH_01	Chrysomelidae

<i>Ditropidella</i> sp BBSH_01	Chrysomelidae
<i>Monolepta</i> sp TMAG_F112426	Chrysomelidae
<i>Paropsisterna</i> sp BBSH_01	Chrysomelidae
Coccidulini sp BBSH_01	Coccinellidae
<i>Scymnus</i> sp BBSH_01	Coccinellidae
<i>Sericoderus</i> sp BBSH_01	Corylophidae
Curculionidae sp BBSH_01	Curculionidae
Cyclominae sp BBSH_01	Curculionidae
<i>Gonipterus</i> sp BBSH_01	Curculionidae
<i>Leptopius</i> sp TMAG_F97806	Curculionidae
<i>Mandalotus</i> sp BBSH_01	Curculionidae
<i>Merimnetes</i> sp BBSH_01	Curculionidae
<i>Polyphrades</i> sp BBSH_01	Curculionidae
Tychyiini sp BBSH_01	Curculionidae
<i>Sternopriscus</i> sp BBSH_01	Dytiscidae
<i>Sternopriscus</i> sp TMAG_F100452	Dytiscidae
Elateridae sp BBSH_01	Elateridae
<i>Cercyon</i> sp TMAG_F96383	Hydrophilidae
<i>Notobrachypterus</i> sp TFIC_01	Kateridae
<i>Corticaria</i> sp TFIC_02	Latridiidae
<i>Corticaria</i> sp TFIC_02	Latridiidae
<i>Orchesia</i> sp BBSH_01	Melandryidae
<i>Tomoxia</i> sp BBSH_01	Melandryidae
<i>Heteronyx</i> sp BBSH_01	Scarabaeidae
<i>Cryptomorpha</i> sp TFIC_03	Silvanidae
Aleocharinae sp BBSH_01	Staphylinidae
Aleocharinae sp BBSH_02	Staphylinidae
<i>Anotylus</i> sp BBSH_01	Staphylinidae
Pselaphinae sp BBSH_01	Staphylinidae
<i>Quedius</i> sp TFIC_04	Staphylinidae
<i>Quedius</i> sp BBSH_01	Staphylinidae
Scydmaenidae sp BBSH_01	Staphylinidae
Staphylinidae sp BBSH_01	Staphylinidae
DIPTERA	
<i>Empis</i> sp BBSH_01	Empididae

HEMIPTERA	
<i>Anyzygina</i> sp BBSH_01	Cicadellidae
<i>Euacanthella</i> sp BBSH_01	Cicadellidae
Macrostelini sp BBSH_01	Cicadellidae
<i>Stirellus</i> sp BBSH_01	Cicadellidae
<i>Aka</i> sp BBSH_01	Cixiidae
Lethaeini sp BBSH_01	Lygaeidae
<i>Nysius</i> sp BBSH_01	Lygaeidae
<i>Nysius</i> sp BBSH_02	Lygaeidae
<i>Nysius</i> sp BBSH_03	Lygaeidae
<i>Ausejanus</i> sp BBSH_01	Miridae
<i>Closterotomus</i> sp BBSH_01	Miridae
Phylinae sp BBSH_01	Miridae
Phylinae sp BBSH_02	Miridae
<i>Anisops</i> sp BBSH_01	Notonectidae
<i>Ochterus</i> sp BBSH_01	Ochteridae
<i>Acizzia</i> sp BBSH_01	Psyllidae
<i>Cardiaspina</i> sp BBSH_01	Psyllidae
<i>Ctenarytaina</i> nr <i>bipartita</i>	Psyllidae
<i>Ctenarytaina</i> nr <i>spatulata</i>	Psyllidae
<i>Baclozygum brachypterum</i>	Thaumastocoridae
HYMENOPTERA	
<i>Antrocephalus</i> sp BBSH_01	Chalcididae
<i>Brachymeria</i> sp BBSH_01	Chalcididae
<i>Anonychomyrma</i> sp BBSH_01	Formicidae
<i>Camponotus</i> sp BBSH_01	Formicidae
<i>Pheidole</i> sp BBSH_01	Formicidae
<i>Prolasius</i> sp BBSH_01	Formicidae
NEUROPTERA	
Myrmeliontidae sp BBSH_01	Myrmeliontidae

### 3.2 Putative new species (new to science)

In this report, 'putative new species' means an unnamed species that, as far as can be ascertained, was identified as a new species as a direct result of this Bush Blitz.



Two new species from the planthopper family, Delphacidae: Delphacini, were collected during sweeping of grasslands. The new species are strikingly different to each other with respect to their frons and clypeus. In their revision of Australian Delphacini, Bellis et al. (2014) listed 68 species for Australia, but only one of these (*Nilaparvata myersi*) is known from Tasmania and is otherwise a New Zealand species that was not collected during the Bush Blitz. Several other species appear to be new to science and will be investigated further after. Our invertebrates are poorly known so it can be a time-consuming process to determine whether or not a species is new.

Species	Comment
Delphacini sp. n. BBSH_01 Delphacidae	
Delphacini sp. n. BBSH_02 Delphacidae	

### 3.3 Exotic and pest species

No listed exotic or serious pest species were detected. Two species which can become a pest of low concern in agricultural settings is the cosmopolitan greenhouse thrips (*Heliethrips haemorrhoidalis*) and native strawberry bug (*Euander lacertosus*) which are likely to be controlled by a range of natural predators in native habitat. Five introduced cosmopolitan species of low concern include species associated with decaying animals or moulds on decaying organic matter; and the sea rocket beetle that is associated with its introduced host plant on beaches.

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
<i>Heliethrips haemorrhoidalis</i> Thripidae (greenhouse thrips)	Perimeter trail: sweeping fishbone ferns	4	Pest: Cosmopolitan, only known to be a pest in greenhouses.
<i>Euander lacertosus</i> Hemiptera (strawberry bug)	Maitland Bay: sweeping vegetation above high tide mark	1	A native species that feeds on seeds of Poa grasses etc and can become a pest of strawberries by feeding on achenes.
<i>Psylliodes marcida</i> Chrysomelidae (sea rocket beetle)	Maitland Bay: sweeping sea rocket on the beach	6	Exotic: commonly on exotic sea rocket ( <i>Cakile maritima</i> ) on beaches. The impact of sea rocket plants on Tasmanian coastal habitat does not seem to have been assessed.
<i>Corticaria japonica</i> Latridiidae (minute mould beetle)	Fire Trail: gully South of quarry	1	Exotic: Cosmopolitan among moulds in decaying organic matter.

<i>Dermestes maculatus</i> Dermestidae (hide beetle)	Gunners Drive; on dry late-stage dead wallaby	1	Cosmopolitan on carrion.
<i>Necrobia ruficollis</i> Cleridae (red shouldered ham beetle)	Gully near Seaview Rd on mid-stage dead cow.	dozens	Cosmopolitan on carrion.
<i>Necrobia rufipes</i> Cleridae (red legged ham beetle)	Seaview Rd on early-stage dead wallaby; and gully near Seaview Rd on mid-stage dead cow	dozens	Cosmopolitan on carrion.

### 3.4 Threatened species

No threatened species were encountered during the survey.

**Table 4. Threatened species**

Species	Listing status and level (EBPC, State/Territory)	Location sighted/observed	Indication of abundance

### 3.5 Range extensions

The area had not been previously surveyed for invertebrates, so all species represent infill distributions for many of Tasmania's widespread species, or range extensions for less commonly encountered species. Many species are likely to be more common than their records indicate because of their minute size and cryptic habitat, such as the *Baclozygum* bug on *Xanthorrhoea*. Finding such species on the Bush Blitz can be a catalyst for further discoveries of a species in other parts of the State through targeted searching.

The survey fills in the distribution of an endemic species of stag beetle *Lissotes launcestoni* (Lucanidae), known to have a restricted range. The range of an uncommonly encountered ground beetle, *Oodes modestus*, was extended by the Bush Blitz, confirming its presence in the Northeast of Tasmania. It was previously only recorded from Clarke Island in Bass Strait and one site in NE Tasmania.

Three genera of Hemiptera are new records for Tasmania and represent significant range extensions to Tasmania having previously only been found on the Australian Mainland. The specimen of seed bug, *Neolethaeus* (Rhyparochromidae) has some body parts missing but looks close to *australiensis* (Woodward 1963) and was collected in decomposing leaf litter in a patch of coastal wet sclerophyll forest. There are four species in this genus which has a

predominantly Asian distribution, and this specimen extends the global distribution of the genus further south.

Another new record for Tasmania, *Baclozygum brachypterum* is a species of Thaumastocoridae, commonly called palm bugs, which was collected by sweeping fronds of grass trees, *Xanthorrhoea australis*. The new record confirms that this species has an association with *Xanthorrhoea*, which was previously unknown by Slater (1973). Of the three records from collections in Australian Museums (ALA), one specimen in Victoria was collected from *Xanthorrhoea australis*. Although *Baclozygum brachypterum* has been rarely recorded, it appears to be locally abundant and may be overlooked because of its small size. *Baclozygum depressum*, the only other species in this endemic Australian genus that has been recorded in Tasmania, also occurs on the Australian mainland and its biology on *Eucalyptus* trees has been detailed by Hill (1988).

The third new Tasmanian record, *Carvalhoma malcolmae* (or a subspecies) represents an endemic Australian genus from the fascinatingly diverse family of Mirid bugs. Its body is highly sclerotised and polished giving it a strong resemblance to a beetle (see photo on cover) and may be an adaptation to reduce water loss in dry habitat (Slater and Gross 1977). The genus is only found coastally in the Southern half of Australia and is represented by five species (Namyatova and Cassis 2016). The new specimen from the Bush Blitz extends the range of *Carvalhoma malcolmae* from coastal NSW and Victoria into Tasmania.

The extension of the ranges of *Oodes modestus* and species of *Neolethaeus* and *Carvalhoma* indicate that their dispersal to Tasmania may have occurred via the Eastern Bassian land bridge and that there are likely to be many more species to be found that share this biogeographic history.

**Table 5. Range extensions or significant infill in distribution records for species**

Species	Location sighted/observed	Distance from nearest known record (km)	Comments
<i>Oodes modestus</i> Coleoptera: Carabidae	Perimeter Trail in <i>Eucalyptus ovata</i> woodland.	92	For Tasmania, the species is only otherwise recorded from Clarke Island in Bass Strait and a site in NE Tasmania.
<i>Carvalhoma malcolmae</i> Hemiptera: Miridae	SSS1 in ground litter under <i>Xanthorrhoea australis</i>	550	New record for Tasmania. Range extension from Victoria
<i>Neolethaeus</i> cf. <i>australiensis</i> Rhyparochromidae	Ryans Hill in wet sclerophyll forest.	390	New record for Tasmania. Range extension from Victoria
<i>Baclozygum brachypterum</i> Hemiptera: Thaumastocoridae	SSS2, sweeping <i>Xanthorrhoea australis</i> among <i>Eucalyptus amygdalina</i>	800	New species and new record for Tasmania. Range extension for the genus. Previously only recorded from Mainland Australia.

### **3.6 Genetic information**

No genetic work has been conducted so far.

## **4. Information on species lists**

Less than 20% of Tasmanian invertebrates have been described, so it is not surprising that many specimens were not identified to species level. Further taxonomic work will be undertaken to clarify the characters of described species and classify new species.

## **5. Information for land managers**

Dry eucalypt woodlands and forests are poorly reserved in Tasmania which makes Stony Head an important area for conservation. Current use of the land seems compatible with protection of native habitat. While fire is a natural disturbance that maintains much of the dry eucalypt woodlands and *Xanthorrhoea* heathland, if fire frequency increases, as expected under climate change (Fox-Hughes et al. 2014), there may not be sufficient regeneration time for species to become established and this alteration of habitat would have cascading effects on invertebrates and vertebrates.

Wet sclerophyll areas such as Ryans Hill and wet gullies are important refugia that may require protection from fire. Wet forest is an important habitat for one of Tasmania's endemic stag beetles, *Lissotes launcestoni*. In these forests old, decaying logs are essential for stag beetle larvae.

Roadside dams seem to have become an important part of the ecosystem by increasing the diversity of invertebrate and frog species in the area and are likely to provide important refugial habitat during prolonged periods of drought, increased extremes in temperature and precipitation and rising shifts in mean temperature.

## **6. Other significant findings**

## **7. Conclusions**

The collection of 573 specimens from 12 insect Orders at Stony Head adds distributions for 185 formally and informally recognised species of Tasmanian insects, and adds 42 species not previously encountered in Tasmania, some of which may already be described and warrant further investigation. All species from the 81 Families collected represent infill distributions and range extensions as the area had not previously been surveyed for invertebrates. Based on the rate of discovery of species among the specimens collected, many more species would almost certainly be added with further survey work.

Highlights of the survey was the first Tasmanian record of an unusual Mirid bug, *Carvalho malcolmae*, in a genus not previously thought to be present here. Two other genera of Hemiptera recorded from Tasmania for the first time are represented by *Neolethaeus cf australis* and *Baclozygum brachypterum*. One of Tasmania's endemic stag beetles, *Lissotes launcestoni*, was locally abundant. Collection of the ground beetle, *Oodes modestus*, is the third recorded location for Tasmania. Two new species of Delphacini planthoppers that were identified from the material collected will add to our poor knowledge of this tribe in Tasmania.

The number of un-named and poorly known named species found at Stony Head highlight the benefit of Bush Blitz surveys in accelerating species discovery to fill gaps in our knowledge of Tasmanian invertebrates.

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Margined-winged stick insect, *Ctenomorpha marginipennis* (Phasmida)

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## Appendices

**Appendix 1. List of Coleoptera, Hemiptera, Hymenoptera (and a small number of species from 9 other Orders: Blattodea, Dermaptera, Diptera, Neuroptera, Odonata, Orthoptera, Phasmida, Thysanoptera and Zygentoma) recorded during the Stony Head Bush Blitz**



A first record of this unusual species in Tasmania, *Baclozygum brachypterum* (Hemiptera: Thaumastocoridae, 2.2 mm) with projecting eyes and short hemelytra. It was collected from *Xanthorrhoea australis*. [Photo: L. Forster]



Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/ Territory Act)	Exotic/pest
<b>Coleoptera</b>						
Anthicidae	<i>Lagrioida australis</i>		No	No	No	No
Anthicidae	<i>Mecynotarsus leai</i>		No	No	No	No
Buprestidae	<i>Temognatha mitcheli</i>		No	No	No	No
Cantharidae	<i>Chauliognathus tricolor</i>		No	No	No	No
Carabidae	<i>Amblystomus nigrinus</i>		No	No	No	No
Carabidae	<i>Amblystomus sp TMAG_F114593</i>		No	No	No	No
Carabidae	<i>Anomotarus crudelis</i>		No	No	No	No
Carabidae	<i>Clivina sp BBSH_01</i>		No	No	No	No
Carabidae	<i>Homethes elegans</i>		No	No	No	No
Carabidae	<i>Mecyclothorax punctipennis</i>		No	No	No	No
Carabidae	<i>Oodes modestus</i>		No	No	No	No
Carabidae	<i>Promecoderus brunnicornis</i>		No	No	No	No
Carabidae	<i>Prosopogmus chalybeipennis</i>		No	No	No	No
Carabidae	<i>Sarothrocrepis corticolis</i>		No	No	No	No
Carabidae	<i>Simodontus cf clermonti</i>		No	No	No	No
Cerambycidae	<i>Ancita marginicollis</i>		No	No	No	No
Cerambycidae	<i>Dorcadida bilocularis</i>		No	No	No	No
Chrysomelidae	<i>Alticini sp BBSH_01</i>		No	No	No	No
Chrysomelidae	<i>Arsipoda variegata</i>		No	No	No	No
Chrysomelidae	<i>Chaetocnema sp nr propinqua</i>		No	No	No	No
Chrysomelidae	<i>Chaetocnema sp TMAG_F95720</i>		No	No	No	No
Chrysomelidae	<i>Chrysomelidae sp BBSH_01</i>		No	No	No	No
Chrysomelidae	<i>Ditropidella sp BBSH_01</i>		No	No	No	No
Chrysomelidae	<i>Monolepta sp TMAG_F112426</i>		No	No	No	No
Chrysomelidae	<i>Paropsisterna agricola</i>		No	No	No	No
Chrysomelidae	<i>Paropsisterna morio</i>		No	No	No	No
Chrysomelidae	<i>Paropsisterna sp BBSH_01</i>		No	No	No	No
Chrysomelidae	<i>Psylliodes marcida</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/ Territory Act)	Exotic/pest
Chrysomelidae	<i>Trachymela ferrugata</i>		No	No	No	No
Cleridae	<i>Necrobia ruficollis</i>		No	No	No	Yes
Coccinellidae	<i>Coccidulini sp BBSH_01</i>		No	No	No	No
Coccinellidae	<i>Scymnus sp BBSH_01</i>		No	No	No	No
Corylophidae	<i>Sericoderus sp_BBSH_01</i>		No	No	No	No
Curculioniade	<i>Ethemaia sellata</i>		No	No	No	No
Curculionidae	<i>Aphela algarum</i>		No	No	No	No
Curculionidae	Curculionidae sp BBSH_01		No	No	No	No
Curculionidae	<i>Cyclominae sp BBSH_01</i>		No	No	No	No
Curculionidae	<i>Gonipterus sp BBSH_01</i>		No	No	No	No
Curculionidae	<i>Leptopius sp TMAG_F97806</i>		No	No	No	No
Curculionidae	<i>Mandalotus sp BBSH_01</i>		No	No	No	No
Curculionidae	<i>Merimnetes oblongus</i>		No	No	No	No
Curculionidae	<i>Merimnetes sp BBSH_01</i>		No	No	No	No
Curculionidae	<i>Orthorhinus cylindrirostris</i>		No	No	No	No
Curculionidae	<i>Polyphrades sp BBSH_01</i>		No	No	No	No
Curculionidae	<i>Rhinaria granulosa</i>		No	No	No	No
Curculionidae	<i>Sclerorinus bubalus</i>		No	No	No	No
Curculionidae	<i>Tychiini sp BBSH_01</i>		No	No	No	No
Dermestidae	<i>Dermestes maculatus</i>		No	No	No	No
Dytiscidae	<i>Onychohydrus scutellaris</i>		No	No	No	No
Dytiscidae	<i>Sternopriscus sp BBSH_01</i>		No	No	No	No
Dytiscidae	<i>Sternopriscus sp TMAG_F100452</i>		No	No	No	No
Elateridae	<i>Crepidomenus decoratus</i>		No	No	No	No
Elateridae	<i>Elateridae sp BBSH_01</i>		No	No	No	No
Histeridae	<i>Saprinus laetus</i>		No	No	No	No
Hydrophilidae	<i>Cercyon sp TMAG_F96383</i>		No	No	No	No
Hydrophilidae	<i>Helochares tristis</i>		No	No	No	No
Hydrophilidae	<i>Sternolophus marginicollis</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/Territory Act)	Exotic/pest
Kateridae	<i>Notobrachypterus</i> TFIC sp. 01		No	No	No	No
Latridiidae	<i>Corticaria japonica</i>		No	No	No	No
Latridiidae	<i>Corticaria</i> sp TFIC_02		No	No	No	No
Latridiidae	<i>Corticaria</i> sp TFIC_02		No	No	No	No
Lucanidae	<i>Lissotes launcestoni</i>		No	No	No	No
Lucanidae	<i>Syndesus cornutus</i>		No	No	No	No
Melandryidae	<i>Orchesia</i> sp BBSH_01		No	No	No	No
Melyridae	<i>Dicranolaius cinctus</i>		No	No	No	No
Mordellidae	<i>Tomoxia</i> sp BBSH_01		No	No	No	No
Oedemeridae	<i>Copidita maritima</i>		No	No	No	No
Phalacridae	<i>Austroporus melas</i>		No	No	No	No
Rhipiceridae	<i>Rhipicera femorata</i>		No	No	No	No
Scarabaeidae	<i>Diphucephala collaspidoides</i>		No	No	No	No
Scarabaeidae	<i>Euoniticellus fulvus</i>		No	No	No	No
Scarabaeidae	<i>Heteronyx</i> sp BBSH_01		No	No	No	No
Scarabaeidae	<i>Liparetrus</i> sp nr atratus		No	No	No	No
Scarabaeidae	<i>Onthophagus australis</i>		No	No	No	No
Scarabaeidae	<i>Onthophagus posticus</i>		No	No	No	No
Scarabaeidae	<i>Onthophagus pronus</i>		No	No	No	No
Scarabaeidae	<i>Phyllotocus nigripennis</i>		No	No	No	No
Silphidae	<i>Ptomaphila lacrymosa</i>		No	No	No	No
Silvanidae	<i>Cryptamorpha</i> sp TFIC_03		No	No	No	No
Staphylinidae	<i>Aleocharinae</i> sp BBSH_01		No	No	No	No
Staphylinidae	<i>Aleocharinae</i> sp BBSH_02		No	No	No	No
Staphylinidae	<i>Anotylus</i> sp BBSH_01		No	No	No	No
Staphylinidae	<i>Cafius sabulosus</i>		No	No	No	No
Staphylinidae	<i>Creophilus erythrocephalus</i>		No	No	No	No
Staphylinidae	<i>Paederus cruenticollis</i>		No	No	No	No
Staphylinidae	<i>Paederus simsoni</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/Territory Act)	Exotic/pest
Staphylinidae	<i>Pselaphinae sp BBSH_01</i>		No	No	No	No
Staphylinidae	<i>Quedius sp BBSH_01</i>		No	No	No	No
Staphylinidae	<i>Quedius sp TFIC_04</i>		No	No	No	No
Staphylinidae	<i>Quedius stenocephalus</i>		No	No	No	No
Staphylinidae	<i>Quedius sulcicollis</i>		No	No	No	No
Staphylinidae	<i>Remus sericeus</i>		No	No	No	No
Staphylinidae	<i>Scydmaeninae sp BBSH_01</i>		No	No	No	No
Staphylinidae	<i>Staphylinidae sp BBSH_01</i>		No	No	No	No
Tenebrionidae	<i>Adelium abbreviatum</i>		No	No	No	No
Tenebrionidae	<i>Adelium brevicorne</i>		No	No	No	No
Tenebrionidae	<i>Adelium licinoides</i>		No	No	No	No
Tenebrionidae	<i>Adelium similatum</i>		No	No	No	No
Tenebrionidae	<i>Adelium tenebroides</i>		No	No	No	No
Tenebrionidae	<i>Brycopia globicollis</i>		No	No	No	No
Tenebrionidae	<i>Coripera deplanata</i>		No	No	No	No
Tenebrionidae	<i>Diemenoma commoda</i>		No	No	No	No
Tenebrionidae	<i>Diemenoma tuberculifera</i>		No	No	No	No
Tenebrionidae	<i>Ecnolagria rufescens</i>		No	No	No	No
Tenebrionidae	<i>Hyocis bakewelli</i>		No	No	No	No
Tenebrionidae	<i>Isopteron obscurum</i>		No	No	No	No
Tenebrionidae	<i>Meneristes australis</i>		No	No	No	No
Tenebrionidae	<i>Pachycoelia sulcicollis</i>		No	No	No	No
Tenebrionidae	<i>Pterohelaeus peltatus</i>		No	No	No	No
Tenebrionidae	<i>Saragus costatus</i>		No	No	No	No
Tenebrionidae	<i>Sphargeris physodes</i>		No	No	No	No
Throscidae	<i>Aulonothroscus elongatus</i>		No	No	No	No
Trogidae	<i>Omorgus australasiae</i>		No	No	No	No
<b>Hemiptera</b>						

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/ Territory Act)	Exotic/pest
Acanthosomatidae	<i>Duadicus pallidus</i>		No	No	No	No
Acanthosomatidae	<i>Panaetius lobulatus</i>		No	No	No	No
Aradidae	<i>Brachyrhynchus wilsoni</i>		No	No	No	No
Cercopidae	<i>Anyllis leiala</i>		No	No	No	No
Cercopidae	<i>Bathyllus albicinctus</i>		No	No	No	No
Cicadellidae	<i>Anzygina</i> sp BBSH_01		No	No	No	No
Cicadellidae	<i>Euacanthella palustris</i>		No	No	No	No
Cicadellidae	<i>Euacanthella</i> sp BBSH_01		No	No	No	No
Cicadellidae	<i>Limotettix incertus</i>		No	No	No	No
Cicadellidae	Macrostelini sp BBSH_01		No	No	No	No
Cicadellidae	<i>Stirellus</i> sp BBSH_01		No	No	No	No
Cicadellidae	<i>Zygina evansi</i>		No	No	No	No
Cicadellidae	<i>Anzygina</i> sp BBSH_01		No	No	No	No
Cixiidae	<i>Aka</i> sp BBSH_01		No	No	No	No
Cydnidae	<i>Adrisa atra</i>		No	No	No	No
Delphacidae	Delphacini sp. n. BBSH_01		Yes	No	No	No
Delphacidae	Delphacini sp. n. BBSH_02		Yes	No	No	No
Dictyopharidae	<i>Thanatodictya</i> cf hebe		No	No	No	No
Flatidae	<i>Siphanta hebes</i>		No	No	No	No
Gelastocoridae	<i>Nerthra suberosa</i>	toad bug	No	No	No	No
Lygaeidae	<i>Nysius</i> sp BBSH_01		No	No	No	No
Lygaeidae	<i>Nysius</i> sp BBSH_02		No	No	No	No
Lygaeidae	<i>Nysius</i> sp BBSH_03		No	No	No	No
Miridae	<i>Ausejanus</i> sp BBSH_01		No	No	No	No
Miridae	<i>Carvalhoma malcolmae</i>		No	No	No	No
Miridae	<i>Closterotomus</i> sp BBSH_01		No	No	No	No
Miridae	<i>Phylinae</i> sp BBSH_01		No	No	No	No
Miridae	<i>Phylinae</i> sp BBSH_02		No	No	No	No
Nabidae	<i>Nabis kinbergi</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/ Territory Act)	Exotic/pest
Naucoridae	<i>Naucoris congrex</i>	creeping water bug	No	No	No	No
Nepidae	<i>Ranatra dispar</i>	needle bug	No	No	No	No
Notonectidae	<i>Anisops</i> sp BBSH_01	backswimmer	No	No	No	No
Notonectidae	<i>Enithares woodwardi</i>	backswimmer	No	No	No	No
Ochteridae	<i>Ochterus</i> sp BBSH_01		No	No	No	No
Pentatomidae	<i>Diaphyta cf tasmani</i>		No	No	No	No
Pentatomidae	<i>Omyta centrolineata</i>	gum tree shield bug	No	No	No	No
Psyllidae	<i>Acizzia</i> sp BBSH_01		No	No	No	No
Psyllidae	<i>Cardiaspina</i> sp BBSH_01		No	No	No	No
Psyllidae	<i>Ctenarytaina</i> sp nr <i>bipartita</i>		No	No	No	No
Psyllidae	<i>Ctenarytaina</i> sp nr <i>spatulata</i>		No	No	No	No
Reduviidae	<i>Peirates fuliginosus</i>		No	No	No	No
Reduviidae	<i>Pseudobargylia iuncea</i>		No	No	No	No
Reduviidae	<i>Ptilocnemus sidnicus</i>		No	No	No	No
Rhyparochromidae	<i>Brachydrymus lateabundans</i>		No	No	No	No
Rhyparochromidae	<i>Brentiscerus</i> sp. BBSH_01		No	No	No	No
Rhyparochromidae	<i>Dieuches notatus</i>		No	No	No	No
Rhyparochromidae	<i>Euander lacertosus</i>	strawberry bug	No	No	No	No
Rhyparochromidae	Lethaeini sp BBSH_01		No	No	No	No
Rhyparochromidae	<i>Myocara acuminatum</i>		No	No	No	No
Rhyparochromidae	<i>Neolethaeus cf australiensis</i>		No	No	No	No
Rhyparochromidae	<i>Porander scudderi</i>		No	No	No	No
Thaumastocoridae	<i>Baclozygum brachypterum</i>		No	No	No	No
Veliidae	<i>Nesidovelia peramoena</i>		No	No	No	No
<b>Hymenoptera</b>						
Chalcididae	<i>Antrocephalus</i> sp BBSH_01		No	No	No	No
Chalcididae	<i>Brachymeria</i> sp BBSH_01		No	No	No	No
Formicidae	<i>Amblyopone australis</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/Territory Act)	Exotic/pest
Formicidae	<i>Anonychomyrma biconvexa</i>		No	No	No	No
Formicidae	<i>Anonychomyrma itinerans</i>		No	No	No	No
Formicidae	<i>Anonychomyrma nitidiceps</i>		No	No	No	No
Formicidae	<i>Anonychomyrma</i> sp BBSH_01		No	No	No	No
Formicidae	<i>Camponotus hartogi</i>		No	No	No	No
Formicidae	<i>Camponotus</i> sp BBSH_01		No	No	No	No
Formicidae	<i>Camponotus terebrans</i>		No	No	No	No
Formicidae	<i>Colobopsis gasseri</i>		No	No	No	No
Formicidae	<i>Hypoponera scitula</i>		No	No	No	No
Formicidae	<i>Iridomyrmex bicknelli</i>		No	No	No	No
Formicidae	<i>Iridomyrmex calvus</i>		No	No	No	No
Formicidae	<i>Iridomyrmex mattirolai</i>		No	No	No	No
Formicidae	<i>Myrmecia forficata</i>		No	No	No	No
Formicidae	<i>Myrmecia pilosula</i>		No	No	No	No
Formicidae	<i>Myrmecorhynchus emeryi</i>		No	No	No	No
Formicidae	<i>Notoncus hickmani</i>		No	No	No	No
Formicidae	<i>Pheidole cf liteae</i>		No	No	No	No
Formicidae	<i>Pheidole liteae</i>		No	No	No	No
Formicidae	<i>Pheidole</i> sp BBSH_01		No	No	No	No
Formicidae	<i>Pheidole tasmaniensis</i>		No	No	No	No
Formicidae	<i>Polyrhachis femorata</i>		No	No	No	No
Formicidae	<i>Polyrhachis patiens</i>		No	No	No	No
Formicidae	<i>Prolasius</i> sp BBSH_01		No	No	No	No
Formicidae	<i>Rhytidoponera tasmaniensis</i>		No	No	No	No
Formicidae	<i>Tapinoma cf minutum</i>		No	No	No	No
<b>Blattodea</b>						
Blaberidae	<i>Calolampra</i> sp TMAG_F12724		No	No	No	No
Blattidae	<i>Platyzosteria melaneria</i>		No	No	No	No

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/ Territory Act)	Exotic/pest
Ectobiidae	<i>Balta</i> sp TMAG_F114557		No	No	No	No
<b>Dermoptera</b>						
Anisolabididae	<i>Euborellia brunneri</i>		No	No	No	No
Labiduridae	<i>Labidura riparia</i>		No	No	No	No
<b>Diptera</b>						
Bombyliidae	<i>Villa fuscicostata</i>		No	No	No	No
Chloropidae	<i>Apotropina ornatipennis</i>		No	No	No	No
Empididae	<i>Empis</i> sp BBSH_01		No	No	No	No
Empididae	<i>Thinempis turimetta</i>		No	No	No	No
Muscidae	<i>Australophyra rostrata</i>		No	No	No	No
Piophilidae	<i>Piophila casei</i>	cheese skipper fly	No	No	No	No
Tachinidae	<i>Trigonospila</i> sp.nr. <i>spilota</i>		No	No	No	No
<b>Neuroptera</b>						
Hemerobiidae	<i>Micromus tasmaniae</i>	brown lacewing	No	No	No	No
Myrmeleontidae	Myrmeleontidae sp BBSH_01	antlion lacewing	No	No	No	No
<b>Odonata</b>						
Lestidae	<i>Austrolestes analis</i>	slender ringtail damselfly	No	No	No	No
<b>Orthoptera</b>						
Acrididae	<i>Cirphula pyrrhocnemis</i>		No	No	No	No
Acrididae	<i>Gastrimargus musicus</i>	yellow-winged locust	No	No	No	No
Acrididae	<i>Macrotoma australis</i>	common Macrotoma	No	No	No	No
Acrididae	<i>Phaulacridium vittatum</i>	wingless grasshopper	No	No	No	No
Gryllacrididae	<i>Kinemia ambulans</i>	raspy cricket	No	No	No	No
Gryllidae	<i>Teleogryllus commodus</i>	field cricket	No	No	No	No



Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/Territory Act)	Exotic/pest
Morabidae	<i>Pseudnura pedestris</i>	pyrgomorph grasshopper	No	No	No	No
Morabidae	<i>Vandiemena viatica</i>	matchstick grasshopper	No	No	No	No
Tetrigidae	<i>Paratettix agrillaceus</i>		No	No	No	No
Tetrigidae	<i>Paratettix cf. agrillaceus</i>		No	No	No	No
Trigoniidae	<i>Bobilla bakali</i>	hairy pygmy cricket	No	No	No	No
Trigoniidae	<i>Trigonidium albobittata</i>	pygmy white-lined cricket	No	No	No	No
<b>Phasmida</b>						
Phasmida	<i>Ctenomorpha marginipennis</i>	Margined-winged stick insect	No	No	No	No
<b>Thysanoptera</b>						
Thripidae	<i>Heliethrips haemorrhoidalis</i>	greenhouse thrips	No	No	No	Yes
<b>Zygentoma</b>						
Lepismatidae	<i>Heterolepisma buntonorum</i>	silverfish	No	No	No	No