

Australian Alps Bush Blitz
Heteroptera (True bugs)
30 January – 8 February 2023
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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>

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List of contributors

List of contributors to this report.			
Name	Institution/affiliation	Qualifications/area of expertise	Level/form of contribution
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Abstract

The Australian Alps Bush Blitz of Heteroptera were collected in February 2023, resulting in the discovery of 72 different species belonging to 17 different families. The three best represented families are the mirid bugs (Miridae) with 24 species, the shield bugs (Pentatomidae) with 16 species and the seed bugs (Rhyparochromidae) with eight species. Seven putative new species are recognised as new to species, with five belonging to the Miridae, and one to the Acanthosomatidae and Enicocephalidae. Forty-three species are identified to species or a morphospecies code where the genus is unknown. Twenty-two species are identified to species. A discussion is given on the species found during the Bush Blitz, highlighting species of significance or potentially of public interest.

1. Introduction

The Heteroptera is a suborder of the order Hemiptera, and one of the core target taxa for the Bush Blitz program (e.g. Cassis and Symonds 2016). There are about 40,000 described species in the world (Cassis 2019), with 2500+ heteropteran species described from Australia (Cassis and Gross 1995, 2002, Australian Faunal Directory). The Australian heteropteran biota is not well known, with a huge number of species discovered over the past 25 years through the Plant Inventory (Cassis and Schuh 2012) and the Bush Blitz program (Cassis and Symonds 2016). Since 1995, over 400 new species have been described, with the majority from the Cassis laboratory at the University of New South Wales (e.g., Cassis and Symonds 2016, Symonds and Cassis 2018, Cassis et al. 2019).

Knowledge of the Heteroptera of the Southern Alps is cursory, based on opportunistic general collecting rather than taxon targeted sampling. There has never been a heteropteran taxonomic treatment of the southern montane regions of Australia, particularly for the hyperdiverse families such as the Miridae and the Tingidae. The Australian Alps Bush Blitz survey provided an excellent opportunity to supplement historical collections from this region. The time of the expedition was in late summer when conditions were dry and few plants were flowering. Because of these impediments there was no prior expectation of diversity.

The doctoral student Zoe Bloesch of UNSW participated in the fieldwork. Prof. Cassis identified the material. Both UNSW team members produced the report.

2. Methods

2.1 Site selection

The majority of terrestrial Heteroptera are herbivorous and many are host plant specific, mostly on flowering plants. Sites were selected based on records of host plants, (e.g. *Drosera* for *Setocoris* spp.) and habitat complexity. Sampling focused on plants in flower.

2.2 Survey techniques

The chief collection method was beating vegetation. Net sweeping, light trap, shaking out grass clumps, bark peeling and hand collecting was also used. Specimens were euthanised with ethyl acetate and mounted. When multiple individuals of a species had been collected, a subsample for each was stored in 100% ethanol for future DNA sequencing.

2.2.1 Methods used at standard survey sites

The above survey techniques in 2.2 were used at the standard survey sites.

2.3 Identifying the collections

In the field, specimens were sorted visually into families, then morphospecies. In the lab Gerry Cassis and Zoe Bloesch processed and identified specimens with reference to the entomological collection housed at UNSW and consultation with the literature on heteropterans. Nomenclature aligns with the Heteroptera sections of the Australian Faunal Directory.

3. Results and Discussion

Appendix 1 lists all Heteroptera collected during the Bush Blitz survey.

3.1 Un-named or not formalised taxa

The un-named species are given in Table 1 with notes on the status of each in terms of taxonomic activity and/or ongoing work.

Taxon	Comment
<i>Amorbus</i> SP001 (Coreidae: Coreinae: Amorbini)	<i>Amorbus</i> is currently being revised by Cassis and Steinbauer.
<i>Amphaces</i> SP001 (Acanthosomatidae)	Further investigation is required to determine species.
Ausejanus SP001 (Miridae: Phylinae: Leucophoropterini)	This species is most like <i>A. albisignatus</i> . Genitalia investigations are required to determine if it is conspecific to <i>A. albisignatus</i>
<i>Australacanthus</i> SP001 (Berytidae: Gampsocorinae)	Further investigation is required to determine species. Henry and Cassis are reviewing this group.
<i>Austrocapsus</i> SP001 (Miridae: Mirinae: Mirini)	The Australian Mirini are under review by Cassis and Michael Schwartz (Canadian National Insect Collection)
<i>Cligenes</i> SP001 (Rhyparochromidae: Rhyparochrominae: Antillocorini)	Further investigation is required to determine species.
<i>Cuspicona</i> SP001 (Pentatomidae: Pentatominae: Rhynchocorini)	Further investigation is required to determine species.
<i>Cymus</i> SP001 (Cymidae)	The Australian Cymidae require revision.
<i>Dictyotus</i> SP001 (Pentatomidae: Pentatominae: Myrocheini)	Further investigation is required to determine species.
<i>Diemenia</i> SP001 (Pentatomidae: Pentatominae: Diemeniini)	Further investigation is required to determine species.
<i>Eribotes</i> SP001 (Pentatomidae: Pentatominae: Aeptini)	Further investigation is required to determine species.

<i>Euander</i> SP001 (Rhyparochromidae: Rhyparochrominae: Udeocorini)	Further investigation is required to determine species.
<i>Eupolemus</i> SP002 (Acanthosomatidae)	Further investigation is required to determine species.
<i>Geocoris</i> SP001 (Geocorinae: Geocorinae)	Further investigation is required to determine species.
GN_MYOD_001 SP001 (Rhyparochromidae: Rhyparochrominae: Myodochini)	Further investigation is required to determine species.
GN_PIEZ_001 SP001 (Pentatomidae: Pentatominae: Piezodorini)	Further investigation is required to determine species.
GN_REDU_001 SP001 (Reduviidae)	Further investigation is required to determine species.
GN_COLP_001 SP001 (Coreidae: Coreinae: Colpurini)	Further investigation is required to determine species.
GN_CREMN_001 SP001 (Miridae: Phylinae: Cremnorrhinini: Cremnorrhinina)	Further investigation is required to determine species.
GN_HARP_001 SP001 (Reduviidae: Harpactocorinae)	Further investigation is required to determine species.
GN_ORTH_001 SP001 (Miridae: Orthotylinae)	Further investigation is required to determine species.
GN_ORTH_002 SP001 (Miridae: Orthotylinae)	Further investigation is required to determine species.
GN_PHYL_001 SP001 (Miridae: Phylinae)	Further investigation is required to determine species.
GN_PHYL_002 SP001 (Miridae: Phylinae)	Further investigation is required to determine species.
GN_RHYN_001 SP001 (Pentatomidae: Rhynchocorini)	Further investigation is required to determine species.
GN_RHYP_001 SP001 (Rhyparochromidae: Rhyparochrominae)	Further investigation is required to determine species.
GN_RHYP_002 SP001 (Rhyparochromidae: Rhyparochrominae)	Further investigation is required to determine species.
GN_RHYP_003 SP001 (Rhyparochromidae: Rhyparochrominae)	Further investigation is required to determine species.
GN_RHYP_004 SP001 (Rhyparochromidae: Rhyparochrominae)	Further investigation is required to determine species.
GN_STEN_001 SP001 (Miridae: Mirinae: Stenodemini)	Further investigation is required to determine species.

<i>Myrtlemiris</i> SP001 (Miridae: Orthotylinae: Orthotylini)	Further investigation is required to determine species.
<i>Notius</i> SP001 (Pentatomidae: Pentatominae: Carpocorini)	Further investigation is required to determine species.
nr <i>Gminatus</i> SP001 (Reduviidae: Harpactocorinae)	Further investigation is required to determine species.
<i>Nethersia</i> SP001 (Tingidae: Tinginae: Tingini)	Further investigation is required to determine species. This genus is being investigated by Sherlock and Cassis.
<i>Oncocoris</i> SP001 (Pentatomidae: Pentatominae: Diemeniini)	Further investigation is required to determine species.
<i>Peirates</i> SP001 (Reduviidae: Peiratinae)	Further investigation is required to determine species.
<i>Piezodorus</i> SP001 (Pentatomidae: Pentatominae: Piezodorini)	Further investigation is required to determine species.
<i>Proteatingis</i> SP001 (Tingidae: Tinginae: Tingini)	This genus and species are about to be published
<i>Remaudiereana</i> SP001 (Rhyparochromidae: Rhyparochrominae: Myodochini)	Further investigation is required to determine species.
<i>Setocoris</i> SP_BINA (Miridae: Bryocorinae: Dicyphini)	This species has yet to be formally described.
<i>Wallabicoris</i> SP001 (Miridae: Phylinae)	Further investigation is required to determine species.
<i>Wallabicoris</i> SP002 (Miridae: Phylinae)	Further investigation is required to determine species.
<i>Wallabicoris</i> SP003 (Miridae: Phylinae)	Further investigation is required to determine species.

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. The new species are based on knowledge of genus- and species-groups. Seven new species were recognised as putatively new to science. Notes are given for each in Table 2.

Species	Comment
<i>Deraeocoris</i> SP001 n.sp. (Miridae: Deraeocorinae: Deraeocorini)	The Australian genus <i>Deraeocoris</i> have not been studied.

<i>Deraeocoris</i> SP002 n.sp. (Miridae: Deraeocorinae: Deraeocorini)	The Australian genus <i>Deraeocoris</i> have not been studied.
<i>Eupolemus</i> SP001 n.sp. (Acanthosomatidae)	Cassis has examined types of <i>Eupolemus</i> and is confident in the recognition of this species as new to science.
GN_IRYM SP001 n.sp. (Miridae: Orthotylinae: Orthotylini)	This is an Austromirini new genus and new species.
<i>Systelloderes</i> SP001 n.sp. (Enicocephalidae)	The genus <i>Systelloderes</i> is known from Australia but not formally documented. This is undoubtedly a new species of the genus.
<i>Zanessa</i> SP001 n.sp. (Miridae: Orthotylinae: Austromirini)	This is an Austromirini new species.
<i>Zanessa</i> SP002 n.sp. (Miridae: Orthotylinae: Austromirini)	This is an Austromirini new species.

3.3 Exotic and pest species

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
N/A			

3.4 Threatened species

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

3.5 Range extensions

Species	Location sighted/observed	Distance from nearest known record (km)	Comments
Setocoris SP_BINA	Alpine National Park (Suggan Buggan)	70km	There is one prior record from southern NSW of this species.

	Kosciusko National Park (Cascade Hut, Tin Mine Trail, nr. Lake Jindabyne)		These are the first in the Mt Kosciusko region.
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3.6 Genetic information

No genetic sampling was performed. When multiple specimens of one species were collected, half were stored in 100% ethanol for future DNA extraction.

4. Information on species lists

The species lists are parsed into described species, putative new species, named to genus-group with a morphospecies code or a genus-morphospecies code requiring more work. The total list combined the aforementioned categories are given in Appendix 1 and the species spreadsheet.

5. Information for land managers

Based on current knowledge, there are no species that can be categorised as rare or endemic. There are no species that listed as threatened under the EPBC Act.

6. Other significant findings

The following species are considered to have significance that highlight the impact of the Bush Blitz survey on heteropteran knowledge, inclusive of new species discovery.

- (1) ***Eupolemus* SP001 n.sp.** The Acanthosomatidae are a cosmopolitan family with less than 100 described species (Cassis and Gross 2002). Australia is a centre of diversity for the family (Cassis and Gross 2002). The most interesting and diverse genus is *Eupolemus*, which has many new species awaiting description, with *Eupolemus* SP001 a new species from the southern Alps. Species of this genus are known from flowering perennial shrubs and may have southern cool temperate connections to South America.
- (2) ***Myrmecoroides grossi*.** This species is a remarkable ant-mimic, belonging to a genus with five species, that have a hatchet-like frontal plate on the head and is associated with grasses. This genus was revised by Cassis and Wall (2002), and it is also noteworthy because of its rarity and association with grasses.
- (3) ***Zanessa* SP001 and SP002.** These two new species are in a genus of bugs which has not been studied for over 75 years (Cassis and Gross 1995). They appear to be associated with eucalypts and have putative aposematic colouration.
- (4) **Bark-dwelling stink bugs.** It is known that a number of stink bugs are associated with bark in the montane regions of southeast Australia. In this Bush Blitz survey notable stink bugs found under bark included two species of *Notius* (Carpocorini), *Diemenia* SP001 (Diemeniini) and *Platycoris musgravei* (Halyini). These species are a subsample of a richer stink bug assemblage that are adapted to a cryptozoic lifestyle under bark.

7. Conclusions

The trip resulted in the discovery of 72 species of Heteroptera, all of which belong to the land bugs (Terhetroptera) (Table 6). As was to be expected, the Miridae being the most diverse heteropteran family, predominated with the discovery of 24 new species, including two new species each of the poorly known herbivorous genus *Zanessa* and the predaceous mirid genus *Deraeocoris* respectively.

Table 6. Heteroptera collected during the Australian Alps Bush Blitz survey.

FAMILY	SPECIES NUMBER
Acanthosomatidae	4
Alydidae	1
Berytidae	1
Coreidae	2
Cryptorhamphidae	1
Cymidae	2
Enicocephalidae	1
Geocoridae	1
Lygaeidae	1
Miridae	24
Nabidae	2
Pentatomidae	16
Pyrrhocoridae	1
Reduviidae	4
Rhyparochromidae	8
Scutelleridae	1
Tingidae	2
Grand Total	72

The Australian Alps resulted in the discovery of seven new species. Of the 72 species discovered, 43 require additional research to identify them to either a described species or putative new species. As with most heteropterans this typically requires detailed investigation of the male genitalia, which is beyond scope at this time.

Acknowledgements

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Appendices

Appendix 1. List of Heteroptera recorded during the Australian Alps Bush Blitz

Family	Species
Acanthosomatidae	<i>Amphaces</i> SP001
Acanthosomatidae	<i>Eupolemus</i> SP001 n.sp.
Acanthosomatidae	<i>Eupolemus</i> SP002
Acanthosomatidae	<i>Galgacus labidus</i>
Alydidae	<i>Mutusca brevicornis</i>
Berytidae	<i>Australacanthus</i> SP001
Coreidae	<i>Amorbus</i> SP001
Coreidae	GN_COLP_001 SP001
Cryptorhamphidae	<i>Cryptorhamphus orbus</i>
Cymidae	<i>Cymus</i> SP001
Cymidae	<i>Ontiscus barberi</i>
Enicocephalidae	<i>Systelloderes</i> SP001 n.sp.
Geocoridae	<i>Geocoris</i> SP001
Lygaeidae	<i>Nysius vinitor</i>
Miridae	<i>Ausejanus</i> SP001
Miridae	<i>Austrocapsus</i> SP001
Miridae	<i>Coridromius monotocopsis</i>
Miridae	<i>Deraeocoris</i> SP001 n.sp.
Miridae	<i>Deraeocoris</i> SP002 n.sp.
Miridae	<i>Dolichomiris linearis</i>
Miridae	GN_CREMN_001 SP001
Miridae	GN_IRYM SP001 n.sp.
Miridae	GN_ORTH_001 SP001
Miridae	GN_ORTH_002 SP001
Miridae	GN_PHYL_001 SP001
Miridae	GN_PHYL_002 SP001
Miridae	GN_STEN_001 SP001
Miridae	<i>Myrmecoroides grossi</i>
Miridae	<i>Myrtlemiris</i> SP001
Miridae	<i>Pseudopantilius australis</i>
Miridae	<i>Rayeria acaciae</i>
Miridae	<i>Setocoris</i> SP_BINA
Miridae	<i>Wallabicoris</i> SP001
Miridae	<i>Wallabicoris</i> SP002
Miridae	<i>Wallabicoris</i> SP003
Miridae	<i>Zanessa pictulifer</i>
Miridae	<i>Zanessa</i> SP001 n.sp.
Miridae	<i>Zanessa</i> SP002 n.sp.
Nabidae	<i>Nabis biformis</i>
Nabidae	<i>Nabis kinbergii</i>
Pentatomidae	<i>Cermatulus nasalis</i>

Pentatomidae	<i>Commius elegans</i>
Pentatomidae	<i>Cuspicona</i> SP001
Pentatomidae	<i>Dictyotus</i> SP001
Pentatomidae	<i>Diemenia</i> SP001
Pentatomidae	<i>Eribotes</i> SP001
Pentatomidae	<i>Eysarcoris distinctus</i>
Pentatomidae	GN_PIEZ_001 SP001
Pentatomidae	GN_RHYN_001 SP001
Pentatomidae	<i>Notius depressum</i>
Pentatomidae	<i>Notius</i> SP001
Pentatomidae	<i>Oechalia schellenbergeii</i>
Pentatomidae	<i>Oncocoris</i> SP001
Pentatomidae	<i>Piezodorus</i> SP001
Pentatomidae	<i>Platycoris musgravei</i>
Pentatomidae	<i>Tholosanus proximus</i>
Pyrrhocoridae	<i>Dindymus versicolor</i>
Reduviidae	GN_HARP_001 SP001
Reduviidae	GN_REDU_001 SP001
Reduviidae	nr <i>Gminatus</i> SP001
Reduviidae	<i>Peirates</i> SP001
Rhyparochromidae	<i>Cligenes</i> SP001
Rhyparochromidae	<i>Euander</i> SP001
Rhyparochromidae	GN_MYOD_001 SP001
Rhyparochromidae	GN_RHYP_001 SP001
Rhyparochromidae	GN_RHYP_002 SP001
Rhyparochromidae	GN_RHYP_003 SP001
Rhyparochromidae	GN_RHYP_004 SP001
Rhyparochromidae	<i>Remaudierieana</i> SP001
Scutelleridae	<i>Choerocoris paganus</i>
Tingidae	<i>Nethersia</i> SP001
Tingidae	<i>Proteatingis</i> SP001