

# **Bush Blitz of the Heteroptera of Cape Range, Western Australia**

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*Gerry Cassis, Nikolai Tatarnic and Arlee McMaha*

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

<b>List of contributors to this report.</b>			
<b>Name</b>	<b>Institution/affiliation</b>	<b>Qualifications/area of expertise</b>	<b>Level/form of contribution</b>
Gerry Cassis	University of New South Wales	Prof. of Biology	Specimen identification, report author
Nikolai Tatarnic	Western Australian Museum	B.Sc., M.Sc., Ph.D.	Specimen collection, curation, identification, principal report author
Arlee McMahan	University of New South Wales	Ph.D. candidate	Specimen collection, curation, identification, principal report author

## Abstract

The Bush Blitz survey of Cape Range, Western Australia resulted in the collection of 97 species of Heteroptera, of which 24 are putatively new to science, and a further 4 are known from collections yet remain to be described. 22 families of Heteroptera were collected, with the greatest species richness occurring in the family Miridae with a total of 41 species.

Specimens were collected by beating vegetation, hand collecting and from light sheet collection. Specimens were collected from 31 localities and 39 hosts.

## 1. Introduction

Australian Heteroptera comprise approximately 2500 described species (Australian Faunal Directory). Bush Blitz Phase 1 surveys revealed 1391 Heteropteran species, 391 of which are new to science. In their report to the ABRS on Bush Blitz Phase 1, Prof. Cassis and Prof. Laffin indicated the species taxonomic accumulation curve of Australian Heteroptera is not levelling and predicated there are approximately 6500 species.

The Cape Range Bush Blitz survey consisted of a collaboration between Prof. Cassis and Arlee McMahan of the University of New South Wales (UNSW), and Dr Nikolai Tatarinic of the Western Australian Museum (WAM). In 2014, the WA Museum conducted limited sampling in Cape Range, while the Cassis Laboratory had not previously sampled Heteroptera in this region.

## 2. Methods

### 2.1 Site selection

A total of 31 sites were surveyed over the 11-day period. Full descriptions of the sites are included in the attached Point Data spreadsheet.

Site selection was based primarily on vegetation present including known plant hosts and noticeable flowering of vegetation. Other factors included presence of creeks or water bodies.

### 2.2 Survey techniques

Specimens were collected in four main ways:

1. Beating of vegetation: Vegetation was beaten with a stick to dislodge specimens, which fell into a handheld beating sheet. Specimens were then collected using a pooter.
2. Collection at light sheet: Three light traps were used. Each trap used a single light suspended in front of a white mosquito netting sheet stretched flat between two poles. Two types of light sources were employed: one self-ballasted, mixed 1000W light was run off of a portable generator (used only near base camp), and two Lepi-LED lights (<http://www.gunnarbrehm.de/en/contact.html>) powered by USB batteries. Specimens were collected off sheet using a pooter.
3. Hand collecting: Insects were captured by hand or with a collecting jar/falcon tube from the ground, rocks, foliage and tree trunks.
4. SLAM trapping: Similar to a Malaise trap, SLAM traps are free-standing flight intercept traps used to sample flying insects directly into ethanol over multiple days. Four SLAM traps were used over the course of this survey. Note that this trapping method is not generally used for collection Heteroptera. Instead, these traps were deployed primarily to provide material for other researchers, especially those studying Diptera and Hymenoptera.

## 2.2.1 Methods used at standard survey sites

Techniques used at the standard survey sites included beating of vegetation, hand collecting and SLAM trap use.

Vegetation was beaten for 1 hour by each scientist, and specimens collected using a beating sheet and pooter. The number of specimens collected was influenced by the lack of vegetation in flower and season of collection.

## 2.3 Identifying the collections

Prof. Gerry Cassis of UNSW, Dr Nikolai Tatarnic of the Western Australian Museum and Arlee McMahan of UNSW identified specimens with reference to the WA Museum and Cassis Lab collections, as well as in consultation with the heteropteran literature. Nomenclature is in alignment with the Heteroptera section of the Australian Faunal Directory. Unpublished manuscript names are presented in quotes.

## 3. Results and Discussion

Appendix 1 spreadsheet lists all Heteroptera recorded during the Bush Blitz.

### 3.1 Un-named or not formalised taxa

This table includes taxa that are presumed known but have not been fully keyed to species, as well as species that are known to exist but have yet to be described.

Family	Taxon	Comment
Alydidae	<i>Daclera</i> sp_BBCRWA_msp.053	
Alydidae	<i>Melanacanthus</i> sp_BBCRWA_msp.054	
Anthocoridae	<i>Orius</i> sp_BBCRWA_msp.015	High abundance
Cydnidae	Gn_Cydniae_CR001 sp_BBCRWA_msp.085	
Geocoridae	<i>Germalus</i> sp_BBCRWA_msp.024	
Heterogastridae	<i>Parathyginus</i> sp_BBCRWA_msp.076	
Lygaeidae	<i>Spilostethus</i> sp_BBCRWA_msp.042	
Lygaeidae	<i>Nysius</i> sp_BBCRWA_msp.040	Low abundance
Lygaeidae	Gn_Lathiini_CR002 sp_BBCRWA_msp.084	
Lygaeidae	<i>Spilostethus</i> sp_BBCRWA_msp.042	
Lygaeidae	Gn_Lathiini_CR001 sp_BBCRWA_msp.079	
Miridae	Gn_Orthotylinae_CR001 sp_BBCRWA_msp.039	
Miridae	<i>Exaeretini</i> sp_BBCRWA_msp.034	
Miridae	Gn_ZANCGEN_CR001 sp_BBCRWA_msp.035	
Miridae	Gn_"Kallosmiris"_CR001 sp_"solis"_msp.009	High abundance
Miridae	<i>Exocarpocoris</i> sp_BBCRWA_msp.005	
Miridae	Gn_ZANCGEN_CR002 sp_BBCRWA_msp.036	

Miridae	Gn_ORTHOGEN_CR004 sp_BBCRWA_msp.057	
Miridae	Gn_"Carenotus"_CR001 sp_BBCRWA_msp.038	Known, undescribed
Miridae	Gn_Austromirini_CR003 sp_BBCRWA_msp.093	
Miridae	Gn_nr_Hipsolecus_CR001 sp_BBCRWA_msp.026	
Miridae	<i>Zanchius</i> sp_BBCRWA_msp.081	
Miridae	Gn_ORTHO_CR006 sp_BBCRWA_msp.082	
Heterogastridae	<i>Dinomachus</i> sp_BBCRWA_msp.071	
Miridae	<i>Proteophylus</i> sp_BBCRWA_msp.066	
Miridae	Gn_nr_Hipsolecus_CR001 sp_BBCRWA_msp.026	
Miridae	Gn_"Neosinghalesia"_CR001 sp_BBCRWA_msp.068	Known, undescribed
Miridae	<i>Decomia</i> sp_BBCRWA_msp.101	
Miridae	Gn_Austromirini_CR002 sp_BBCRWA_msp.078	
Miridae	Gn_ORTHO_CR003 sp_BBCRWA_msp.080	
Pentatomidae	Gn_Podopinae_CR001 sp_BBCRWA_msp.092	
Pentatomidae	<i>Pseudaelia</i> sp_BBCRWA_msp.072	Known, undescribed
Pentatomidae	<i>Aeosopini</i> sp_BBCRWA_msp.090	
Reduviidae	Harpactorini sp_BBCRWA_msp.059	
Reduviidae	Gn_Harpactorini_CR001 sp_BBCRWA_msp.061	
Reduviidae	Gn_Harpactorini_CR001 sp_BBCRWA_msp.083	
Reduviidae	<i>Heniartes</i> sp_BBCRWA_msp.100	
Reduviidae	Gn_Reduviidae_CR001 sp_BBCRWA_msp.074	
Reduviidae	<i>Remauderiana</i> sp_BBCRWA_msp.073	
Reduviidae	<i>Poecilosphodrus</i> sp_BBCRWA_msp.091	Known, undescribed
Rhyparachromidae	<i>Dieuches</i> sp_BBCRWA_msp.019	
Thaumastocoridae	Gn_Thaumastocoridae_CR001 sp_BBCRWA_msp.102	
Tingidae	<i>Malandiola</i> sp_BBCRWA_msp.046	
Tingidae	<i>Nethersia</i> sp_BBCRWA_msp.031	
Tingidae	<i>Oncophysa</i> sp_BBCRWA_msp.033	

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

In this report 'putative new species' means an unnamed species that to our knowledge recorded for the first time on this Bush Blitz.

Family	Species	Comment
Berytidae	Gn_Berytidae_CR001 sp_BBCRWA_msp.048	
Coreidae	<i>Agriopocodemus</i> sp_BBCRWA_msp.064	
Coreidae	<i>Mirabelamorbus</i> sp_BBCRWA_msp.155	One male, one female

Hyocephalidae	<i>Maevius</i> sp_BBCRWA_msp.060	
Miridae	Gn_“Bilbonotus”_CR001 sp_BBCRWA_msp.013	one male collected
Miridae	Gn_Austromirini_CR001 sp_BBCRWA_msp.044	
Miridae	Gn_Phylinae_CR001 sp_BBCRWA_msp.022	
Miridae	Gn_LEUCOGEN_CR001 sp_BBCRWA_msp.011	New genus
Miridae	Gn_CREMNGEN_CR001 sp_BBCRWA_msp.140	
Miridae	Oecophyloides sp_BBCRWA_msp.056	Single specimen
Miridae	Gn_Orthotylini_CR001 sp_BBCRWA_msp.023	
Miridae	Gn_ZANCGEN_CR004 sp_BBCRWA_msp.037	
Miridae	<i>Rayieria</i> sp_BBCRWA_msp.014	Low abundance
Miridae	Gn_ORTHOGEN_CR001 sp.BBCRWA_msp.095	
Miridae	Gn_Phylinae_CR002 sp_BBCRWA_msp.096	
Miridae	<i>Singhalesia</i> sp_BBCRWA_msp.070	
Miridae	<i>Myrmecoridae</i> sp_BBCRWA_msp.077	Two specimens
Miridae	Gn_ZANCGEN_CR001 sp_BBCRWA_msp.035	
Miridae	Gn_Nr. Austromiris_CR001 sp_BBCRWA_msp.055	High abundance
Miridae	Gn_“Kallosmiris”_CR001 sp_BBCRWA_msp.010	
Pentatomidae	<i>Aplerotus</i> sp_BBCRWA_msp.045	Single specimen
Tingidae	<i>Lasiacantha</i> sp_BBCRWA_msp.016	Two specimens
Tingidae	<i>Lasiacantha</i> sp_BBCRWA_msp.017	
Tingidae	<i>Paracopium</i> sp_BBCRWA_msp.018	

### 3.3 Exotic and pest species

There were 2 heteropteran pest species collected during the Cape Range Bush Blitz.

*Nysius vinitor*, commonly known as the Rutherglen bug, of the family Lygaeidae, is a widespread pest species throughout Australia. It is present on many hosts, and causes damage to grain, sunflower and sorghum. Pest control management has limited impact on its spread.

*Creontiades dilutus*, commonly known as the Green mirid, of the family Miridae, is a major pest of cotton throughout Australia. It has many hosts and causes damage to other crops including soybeans and grapes.

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
<i>Nysius vinitor</i>	L02, L05, L10	Low abundance = 5 total	Common name: The Rutherglen bug
<i>Creontiades dilutus</i>	L04- SS2, L05, L24, L33	Moderate abundance = 22 total	Common name: the Green mirid. Collected on several hosts and at light during Cape Range Bush Blitz.

### **3.4 Threatened species**

No threatened species were encountered.

### **3.5 Range extensions**

There were no previous records for Heteroptera of the Cape Range region by ABRS, or from the Cassis Lab collections. While the WA Museum has many specimens from recent Cape Range collecting, these have yet to be fully identified, databased and uploaded to ALA. Currently, range extensions cannot be assessed due to a lack of baseline data.

### **3.6 Genetic information**

Virtually all heteropteran species collected were subsampled into 100% ethanol for future molecular analyses. Samples are stored in both the Western Australian Museum and the Cassis Lab.

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

The Heteroptera section of the Australian Faunal Directory was used to compile the species list that accompanies this report.

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

All sites that comprised new species are of conservation interest. We are unable to recommend specific management practices to land managers as more collecting is necessary to determine species ranges, the degree of host specificity, and whether taxa are endemic and/or rare.

## **6. Other significant findings**

All notable and unexpected collections have been explained above.

## **7. Conclusions**

The Bush Blitz survey of Cape Range resulted in the discovery of 97 species of Heteroptera, from 22 families and 31 localities. Of these species 24 are recognised as putatively new to science.

## **Acknowledgements**

The ABRS is greatly thanked for their funding and logistical support in running this survey. We also thank the Australian Defence Force for providing lodging and facilitating access to Defence Force lands, the Parks and Wildlife Service, and the Ningaloo Centre. We acknowledge that this survey was conducted on the ancestral lands of the Jinigurida, Baijunju, and Thalanyji people.

## References

References are given in the Heteroptera section of the Australian Faunal Directory.

## **Appendices**

### **Appendix 1. List of Heteroptera recorded during the Cape Range Bush Blitz**

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State/Territory Act)	Exotic/pest
Alydidae	Daclera sp_BBCRWA_msp.053		No	No	No	No
Alydidae	Melanacanthus sp_BBCRWA_msp.054		No	No	No	No
Anthocoridae	Orius sp_BBCRWA_msp.015		No	No	No	No
Berytidae	Gn Berytidae_CR001 sp_BBCRWA_msp.048		Yes	No	No	No
Coreidae	Agriopocodemus sp_BBCRWA_msp.064		Yes	No	No	No
Coreidae	Mirabelamorbus sp_BBCRWA_msp.086		Yes	No	No	No
Cydnidae	Gn Cydniae_CR001 sp_BBCRWA_msp.085		No	No	No	No
Geocoridae	Germalus sp_BBCRWA_msp.024		No	No	No	No
Heterogastridae	Dinomachus sp_BBCRWA_msp.071		No	No	No	No
Heterogastridae	Parathyginus sp_BBCRWA_msp.076		No	No	No	No
Hyocephalidae	Maevius sp_BBCRWA_msp.060		Yes	No	No	No
Lygaeidae	Gn Lathiini_CR001 sp_BBCRWA_msp.079		No	No	No	No
Lygaeidae	Gn Lathiini_CR002 sp_BBCRWA_msp.084		No	No	No	No
Lygaeidae	Nysius sp_BBCRWA_msp.040		No	No	No	No
Lygaeidae	Nysius vinitor	The Rutherglen Bug	No	No	No	Yes
Lygaeidae	Spilostethus sp_BBCRWA_msp.042		No	No	No	No
Mesoveliidae	Mesovelia hungerfordi		No	No	No	No
Miridae	Acaciacapsus sp_BBCRWA_msp.002		No	No	No	No
Miridae	Creontiades dilutus	The Green Mirid	No	No	No	Yes
Miridae	Decomia sp_BBCRWA_msp.101		No	No	No	No
Miridae	Exaeretini sp_BBCRWA_msp.034		No	No	No	No
Miridae	Exocarpocoris sp_BBCRWA_msp.005		No	No	No	No
Miridae	Gn "Bilbonotus" CR001 sp_BBCRWA_msp.013		Yes	No	No	No
Miridae	Gn "Carenotus" CR001 sp_BBCRWA_msp.038		No	No	No	No
Miridae	Gn "Kallosmiris" CR001 sp "solis" msp.009		No	No	No	No
Miridae	Gn "Kallosmiris" CR001 sp_BBCRWA_msp.010		Yes	No	No	No
Miridae	Gn "Neosinghalesia" CR001 sp_BBCRWA_msp.068		No	No	No	No
Miridae	Gn Austromirini CR001 sp_BBCRWA_msp.044		Yes	No	No	No
Miridae	Gn Austromirini CR002 sp_BBCRWA_msp.078		No	No	No	No
Miridae	Gn Austromirini CR003 sp_BBCRWA_msp.093		No	No	No	No
Miridae	Gn CREMNGEN_CR001 sp_BBCRWA_msp.140		Yes	No	No	No
Miridae	Gn LEUCOGEN_CR001 sp_BBCRWA_msp.011		Yes	No	No	No
Miridae	Gn_Nr.Auchenocrepis_CR001 sp_BBCRWA_msp.172		No	No	No	No
Miridae	Gn_Nr.Austromiris_CR001 sp_BBCRWA_msp.055		Yes	No	No	No
Miridae	Gn_nr_Hipsolecus_CR001 sp_BBCRWA_msp.026		No	No	No	No
Miridae	Gn_ORTHO_CR003 sp_BBCRWA_msp.080		No	No	No	No

Miridae	Gn_ORTHO_CR006_sp_BBCRWA_msp.082		No	No	No	No
Miridae	Gn_ORTHOGEN_CR001_sp.BBCRWA_msp.095		No	No	No	No
Miridae	Gn_ORTHOGEN_CR001_sp.BBCRWA_msp.095		Yes	No	No	No
Miridae	Gn_ORTHOGEN_CR002_sp_BBCRWA_msp.103		No	No	No	No
Miridae	Gn_ORTHOGEN_CR004_sp_BBCRWA_msp.057		No	No	No	No
Miridae	Gn_Orthotyliinae_CR001_sp_BBCRWA_msp.039		No	No	No	No
Miridae	Gn_Orthotylini_CR001_sp_BBCRWA_msp.023		Yes	No	No	No
Miridae	Gn_Phylinae_CR001_sp_BBCRWA_msp.022		Yes	No	No	No
Miridae	Gn_Phylinae_CR002_sp_BBCRWA_msp.096		Yes	No	No	No
Miridae	Gn_ZANCGEN_CR001_sp_BBCRWA_msp.035		No	No	No	No
Miridae	Gn_ZANCGEN_CR001_sp_BBCRWA_msp.035		Yes	No	No	No
Miridae	Gn_ZANCGEN_CR002_sp_BBCRWA_msp.036		No	No	No	No
Miridae	Gn_ZANCGEN_CR002_sp_BBCRWA_msp.036		No	No	No	No
Miridae	Gn_ZANCGEN_CR004_sp_BBCRWA_msp.037		Yes	No	No	No
Miridae	Myrmecoridae sp_BBCRWA_msp.077		Yes	No	No	No
Miridae	Oecophyloides sp_BBCRWA_msp.056		Yes	No	No	No
Miridae	Onymocoris stysi		No	No	No	No
Miridae	Proteophylus sp_BBCRWA_msp.066		No	No	No	No
Miridae	Rayieria sp_BBCRWA_msp.014		Yes	No	No	No
Miridae	Singhalesia sp_BBCRWA_msp.070		Yes	No	No	No
Miridae	Singhalesia sp_BBCRWA_msp.097		No	No	No	No
Miridae	Zanchius sp_BBCRWA_msp.081		No	No	No	No
Nabidae	Nabis kinbergii		No	No	No	No
Pachygronthidae	Stenophyella macreta		No	No	No	No
Pentatomidae	Aeosopini sp_BBCRWA_msp.090		No	No	No	No
Pentatomidae	Aplerotus grossi		No	No	No	No
Pentatomidae	Aplerotus sp_BBCRWA_msp.045		Yes	No	No	No
Pentatomidae	Birna griggae		No	No	No	No
Pentatomidae	Cephaloplatus sp_CRWA_msp.160		No	No	No	No
Pentatomidae	Gn_Podopinae_CR001_sp_BBCRWA_msp.092		No	No	No	No
Pentatomidae	Menidia sp_BBCRWA_msp.088		No	No	No	No
Pentatomidae	Oechalia schellenbergii		No	No	No	No
Pentatomidae	Oncocoris sp_BBCRWA_msp.047		No	No	No	No
Pentatomidae	Poecilometis nigriventris nigriventris		No	No	No	No
Pentatomidae	Pseudaelia sp_BBCRWA_msp.072		No	No	No	No
Pyrrhocoridae	Australodindymus nigroruber		No	No	No	No
Reduviidae	Emesini sp_BBCRWA_msp.043		No	No	No	No
Reduviidae	Gn_Harpactocorini_CR001_sp_BBCRWA_msp.061		No	No	No	No
Reduviidae	Gn_Harpactocorini_CR001_sp_BBCRWA_msp.083		No	No	No	No

Reduviidae	Gn Reduviidae CR001 sp BBCRWA msp.074		No	No	No	No
Reduviidae	Harpactorini sp BBCRWA msp.059		No	No	No	No
Reduviidae	Heniartes sp BBCRWA msp.100		No	No	No	No
Reduviidae	Poecilosphodrus sp BBCRWA msp.091		No	No	No	No
Reduviidae	Remauderiana sp BBCRWA msp.073		No	No	No	No
Rhopalidae	Liorrhysus hyalinus		No	No	No	No
Rhyparachromidae	Dieuches sp BBCRWA msp.019		No	No	No	No
Saldidae	Pentacora leucographa		No	No	No	No
Scutelleridae	Choerocoris paganus		No	No	No	No
Spilostethus	Spilostethus sp BBCRWA msp.042		No	No	No	No
Thaumastocoridae	Gn Thaumastocoridae CR001 sp BBCRWA msp.067		No	No	No	No
Thaumastocoridae	Gn Thaumastocoridae CR001 sp BBCRWA msp.102		No	No	No	No
Tingidae	Diplocysta trilobata		No	No	No	No
Tingidae	Lasiacantha sp BBCRWA msp.016		Yes	No	No	No
Tingidae	Lasiacantha sp BBCRWA msp.017		Yes	No	No	No
Tingidae	Malandiola sp BBCRWA msp.046		No	No	No	No
Tingidae	Nethersia acaciaphila		No	No	No	No
Tingidae	Nethersia mareeba		No	No	No	No
Tingidae	Nethersia silveirae		No	No	No	No
Tingidae	Nethersia sp BBCRWA msp.031		No	No	No	No
Tingidae	Nethersia sp BBCRWA msp.058		No	No	No	No
Tingidae	Paracopium sp BBCRWA msp.018		Yes	No	No	No