Stilbopteryx lacewing (Neuroptera)

The Insect fauna of Kalamurina Wildlife Sanctuary

A Brief Report to the Australian Wildlife Conservancy

Dr David Yeates, Alan Landford and You Ning Su,
Australian National insect Collection
CSIRO National Research Collections Australia
PO Box 1700
Canberra ACT 2601

David.yeates@csiro.au
Alan.landford@csiro.au
Youning.su@csiro.au

Introduction

The Australian Wildlife Conservancy (AWC) invited the Australian National Insect Collection (ANIC, CSIRO) to undertake a project of initial insect sampling at the Kalamurina Wildlife Sanctuary (KWS), on the southern edge of the Simpson Desert to the north east of Lake Eyre, South Australia. KWS lies in Australian arid zone, within the Simpson-Strzelecki Dunefields region of the 1995 *Interim Biogeographic Regionalisation for Australia* (Thackway *et al.* 1995, Version 4, Australian Nature Conservation Agency, Canberra). KWS surrounds Warburton Creek as it enters Kati-Thanda Lake Eyre, with the Simpson Desert to the north and Tirari Desert to the south.

'Kalamurina' is a former marginal cattle station now being managed and regenerated by AWC. In mid-March 2016 (17-22/3) ANIC Director Dr David Yeates and Research Technicians You Ning Su and Alan Landford travelled to Kalamurina for an intensive week of collection and study. Due to the high volume of water flowing along Warburton Creek during our visit we could not access the Simpson Desert areas of KWS. Most insects were obtained within 20 km of the Kalamurina homestead, adjacent to the southern shore of Warburton Creek.

Kalamurina and surrounding areas had received sustained and unseasonal heavy rain in preceding months, and the abundance of plant growth and recent flowering resulted in extensive dispersal of native mammals and high breeding activity of birds, and abundant insect life. Perfect weather conditions meant that setting up malaise traps, extensive collecting by sweeping with hand held nets and night collecting at light sheets in various localities were very productive. Collecting was predominantly on the sand dunes, open plains, and drying watercourses.

Results

A range of insects and other arthropods were encountered including beetles, moths, lacewings and antlions, large scorpions, wasps, grasshoppers, stick insects, grasshoppers, crickets and flies. Specimens were prepared for drying and pinning, as well as samples of a number of collected specimens stored in 100% ethanol and RNAlater for molecular/DNA analysis. All specimens have been accessed into ANIC.

A table listing representative specimens collected at various localities within the area is included on pages 8-17 of this report. Where possible we have included named species in the list. Most (75%) of Australian insects species still lack scientific names, and it is impossible for us to provide a complete listing of species collected in any reasonable timeframe. Many specimens are the subject of current or future taxonomic work, and many species are listed by their generic names alone because their species identification is not known.

A number of interesting and potentially new Bombyliidae (bee flies), Asilidae (robber flies), a buprestid beetle apparently not previously seen in the area, a profusion of Sphingidae (hawk moth), Geometridae (including an undescribed moth of the *Hypobapta* genus), interesting oecophorid moths and a primitive braconid wasp of the genus *Megalohelcon* are just some that await further study. In addition, we sampled a number of new species of Raspy Cricket (Gryllacrididae) that are the subject of ongoing taxonomic research. We have included here a set of images on the web of various species in Kalamurina on pages 5-7.

Significance of the KWS insect fauna

Australia is home to perhaps as many as 500,000 species, and approximately 50% of these (250,000) are insects. An estimated 25% of Australian insects have scientific names. Australia's woodlands and semi-arid rangelands contain a very high diversity of species, and the AWC sanctuaries will be home to tens of thousands of insects without names. The Australian arid zone contains a significant but smaller fauna of highly specialized species. Many of these are quite mobile and move large distances in response to the appearance of resources, often after rainfall events. In addition to these mobile species are the more cryptic and sedentary species that often have more limited distributions and survive on resources available in situ. From this temporally limited survey it is impossible to estimate the total size of the insect fauna in Kalamurina, but it is likely to total hundreds of species.

Kalamurina Wildlife Sanctuary contains a significant and specialized insect fauna representing species that inhabit the dunefields and riverine habitats of the Australian arid zone. Many of the species inhabiting the park rely on friable sands in the dunes, so the compaction and disturbance caused by grazing will negatively impact those populations outside the park. This is especially so for the rich fauna of Neuroptera - larvae are "ant lion" invertebrate predators on the dunes. We only identified one ant lion to genus, the large and impressive *Stilbopteryx*, endemic to arid Australia.

Many of the species in the park are nocturnal, living in burrows (e.g. Tenebrionidae, Coleoptera) or hiding in vegetation during the day. The rich fauna of nocturnal insects in the park will provide food for the insectivorous marsupials such as the dusky hopping mouse and reptiles such as the Lake Eyre Dragon.

The Sanctuary is free of the introduced honey bee (*Apis mellifera*) so will likely preserve the native bee (Apoidea, Hymenoptera) fauna and pollination ecology intact. The introduced dung beetle *Onthophagus gazella* was common in the park at light traps. This species is winged and has good dispersal abilities, and survives in the park on the dung of feral cattle, or has flown in from adjacent grazing properties.

A notable inclusion in the insect fauna is the Australian Plague Locust, *Chortoicetes terminifera,* a highly mobile winged herbivore that was common at a number of localities. During our visit there were a very large number of the hawk moth *Hippotion celerio* (Sphingidae) in the park. These large moths (wing span up to 6 cm) were in outbreak proportions after rain had provided excellent growing conditions for their larval foodplants.

Should the AWC require further information on the information contained in this report, contact david.yeates@csiro.au in the first instance.

Thanks

ANIC would like to thank the Australian Wildlife Conservancy for the invitation to carry out this initial insect sampling project. We would like to thank Keith Bellchambers and David Roshier of AWC for logistic support in planning our visit. We extend special thanks to the resident Sanctuary managers Tess and Mark McLaren for their hospitality during our visit, ensuring safe access to an excellent range of varied collecting localities on the property, and for sharing their knowledge and passion for Kalamurina.

Images of some Kalamurina Insects

Grasshoppers
Stropis maculosa http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:b5a3ba8b-88aa-43c3-a4d2-5ebe85dc9b7b

Chortoicetes terminifera (Plague Locust) http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:5d1f294c-d87a-4644-84ca-fe1f160902db

Cricket
Lepidogryllus comparatus http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:b8ba141f-2708-4b71-b82f-8a70fd939fa5

Eucalyptus Shield Bug
Poecilometis patruelis *http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:018eae6d-32c0-44d6-86f9-1c9c7f75e1dd*

Dung Beetle
Digitonthophagus gazella *http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:ab4b1823-a112-48d3-9f74-304106702177*

Pie Dish Beetle
Tenebrionidae, Helea sp. *http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:fec69be8-c619-4453-8fcf-a5b58f282fe1*

Robber Fly
Asilidae, Andrenosoma sp http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:9d7c7930-2034-4fe0-8775-c9e7b7ab6868

Bee Fly
Bombyliidae, Thraxan sp. http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:698a60cc-8e20-4234-afc2-fbc2238119b5

Butterfly
Danaus petilia http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:231413e2-8ba8-417d-94b1-a5dbac0d2a91

Lacewing
Neuroptera, Stilbopteryx sp .
http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:e3ebf8e4-6c49-48b0-b724-d459026e3cfa

Moths

Anthelidae
Anthela callispila https://www1.ala.org.au/main.php?g2_itemId=9192

Cossidae
Archaeoses pentasema https://www1.ala.org.au/main.php?g2_itemId=11287
Endoxyla neuroxantha https://www1.ala.org.au/main.php?g2_itemId=36360

Geometridae
Arhodia lasiocamparia https://www1.ala.org.au/main.php?g2_itemId=16903

Notodontidae
Epicoma
barytima *https://www1.ala.org.au/main.php?g2_itemId=26731*

Limacodidae
Anaxidia
lactea https://www1.ala.org.au/main.php?g2_itemId=21392

Crambidae
Achyra
affinitalis https://www1.ala.org.au/main.php?g2_itemId=11672

Lasiocampidae
Genduara
fola https://www1.ala.org.au/main.php?g2_itemId=20307

Sphingidae
Agrius
convolvuli *https://www1.ala.org.au/main.php?g2_itemId=31915*
Hippotion
scrofa *https://www1.ala.org.au/main.php?g2_itemId=32278*

Noctuidae
Helicoverpa
punctigera https://www1.ala.org.au/main.php?g2_itemId=22517

Table of Insects Collected at Various localities in Kalamurina 17-22 March 2016

Locality key

1. Kalamurina Homestead (1km vicinity)
2. Mia Mia
3. Sand Bluff 30's Lagoon
4. Oolabarrinna Crossing
5. Turkey Nest
6. Frog Pond Turkey Nest
7. Stony Crossing
8. Wardlarkaninna Yard
9. Pink Dunes
10. Murreebirrie Hill

Scientific name	**Common name**	1	2	3	4	5	6	7	8	9	10
Diptera	**Flies**										
Asilidae, *Andrenosoma* sp	Robber Fly										X
Asilidae, *Bathypogon* sp	Grey Short-winged Robber Fly	X		X							X
Asilidae, Brachyrhopalinae	Wasp-mimic Robber Fly			X							X
Bombyliidae	(Bee Flies)										

Anthracinae, various spp	Black Bee Flies		X				X
Lomatiinae, *Comptosia* spp	Bee Flies		X			X	X
Toxoporinae, *Geron* sp	Bee Fly	X					
Dolichopodidae	Long-legged Fly			X			
Therevidae	Stiletto Fly			X			
Tachinidae	Tachinid Fly			X			
Hymenoptera	**Wasps, Bees**						
Tiphiidae 1	Flower Wasps			X	X		X
Tiphiidae 2	Flower Wasps				X		X
Braconidae, *Megalohelcon* sp.	Parasitoid Wasp	X					X
Pompilidae, *Cryptocheilus* sp	Spider Wasp				X		
Vespidae	Potter Wasp				X		X
Sphecidae	Thread-waisted Wasp					X	X
Crabronidae	Sand Wasp						X
Mutillidae	Velvet Ants	X				X	X
Ichneumonidae	Ichneumon Wasps	X					
Halictidae, *Lipotriches* sp	Halictid Bee				X		X
Apidae, *Amegilla* sp	Blue Banded Bee	X					
Coleoptera	**Beetles**						
Buprestidae, *Chalcophorotaenia* sp	Jewel Beetle	X	X		X		
Curculionidae, *Leptopius* sp	Large Desert Weevil	X					X
Curculionidae, *Leptopius* sp	Small Desert Weevil			X			
Curculionidae, *Lixus* sp	Weed Weevil	X					
Curculionidae, *Onesorus* group	Weevil	X					
Belidae, *Rhinotia* sp	Long nosed Weevil	X					X

Cerambycidae, *Athemistus* sp	Longhorn Beetle	X				X
Cerambycidae, *Apositis* sp	Longhorn Beetle	X				
Cerambycidae, *Phorocantha* sp	Eucalyptus Long-horned Borer		X			
Cerambycidae, tbc		X	X			
Cerambycidae, tbc		X				
Rhipiphoridae, tbc						
Trogidae, *Omorgus* spp	Carcass beetle				X	X
Dytiscidae, Cybister sp	Diving Beetle		X			
Hydrophilidae, *Hydrophilus* sp	Large Black Water Beetle	X				
Bostrichidae, *Bostrychopsis* sp	Auger Beetle	X				
Chrysomelidae, *Paropsis* sp	Tortoise Beetle		X			
Carabidae, Calosoma sp	Green Carab beetle	X				
Carabidae, Scaratinae (various spp)	Predacous Ground Beetle	X	X			
Carabidae, Harpalinae	Ground Beetle		X			
Cicindelidae,	Tiger Beetle				X	
Tenebrionidae, *Helea* sp	Pie-dish Beetle	X				
Tenebrionidae, various spp	Darkling Beetle	X	X			X
Scarabaeidae, *Onthophagus gazella*	Dung Beetle	X			X	
Scarabidae, Dynastinae (various spp)	Dynastid Beetles		X			
Scarabidae, Melolonthinae (various)	Chafer Beetles	X	X			

Orthoptera

Acrididae	**Grasshoppers**						
Pycnostictus seriatus		X					
Ecphantus quadrilobus		X					
Beplessia dispar		X					
Retuspia sp. (validicornis)		X					
Goniaea australasiae		X					
Coryphistes ruricola (purple Race)		X	X				
Coryphistes interioris		X	X				
Stropis maculosa		X					X
Austracris guttulosa		X					
Schizobothrus flavovittatus		X					
Aportropis sp. (vittata)		X					
Macrotona modesta		X				X	
Micreola sp. (sp4)	(Un-named)	X					
Collitera variegata (Pink femur)		X				X	X
Chortoicetes terminifera	Plague Locust	X					X
Pardillana limbata			X				
Genus Novum 95 ochracea	(Un-named)						X
Gryllidae	**Crickets**						
Gryllinae, *Velarifictorus scutellatus*				X			
Gryllinae, *Velarifictorus* sp A1	(New species to be described)			X			

Gryllinae, *Cyrtoprosopus stramineus*		X			
Gryllinae, *Lepidogryllus comparatus*		X	X	X	
Oecanthinae, *Oecanthus angustus*		X		X	
Grylloidea					
Phalangopsinae, *Endacusta pindana*		X			
Trigonidiidae					
Nemobiinae, *Pteronemobius nundra*		X			
Gryllacrididae	**Raspy Crickets**				
Gryllacridinae, *Ametrus* sp	(New species to be described)				
Gryllacridinae, *Hadrogryllacris* sp. 1	(New species to be described)				
Gryllacridinae, *Hadrogryllacris* sp. 2	(New species to be described)				
Neuroptera	**Lacewings, Ant Lions**				
Myrmeleontidae, *Stilbopteryx* sp	Lacewing	X			X
Hemiptera	**Bugs**				
Pentatomidae, *Poecilometis patruelis*	Brown Eucalyptus Shield Bug	X			

Lepidoptera **Butterflies, Moths**

(butterflies)

Nymphalidae, *Danaus petilla*
Lycaenidae, *Theclinesthes miskini*
Lycaenidae, *Nacaduba biocellata*
Lycaenidae, *Zizina otis*

Found mainly by light sheet collecting at night, at multiple localities across Kalamurina.

(medium to larger moths)

Cossidae
- *Archaeoses pentasema*
- *Endoxyla neuroxantha*
- *Endoxyla* sp.
- *Endoxyla amphiplecta*

Limacodidae
- *Anaxidia lactea*
- *Parasa* sp.

Pyralidae
- *Etiella behri*

Crambidae
- *Achyra affinitalis*
- *Achyra massalis*

Geometridae
Arhodia lasiocamparia
Chlorocoma sp.
Anomocentris trissodesma

Lasiocampidae
Genduara fola

Anthelidae
Anthela callispila

Sphingidae
Agrius convolvuli
Agrius godarti
Hyles livornicoides
Hippotion scrofa
Hippotion celerio

Notodontidae
Epicoma barytima

Oenosandridae
Discophlebia sp.

Erebidae

Utetheisa pulchelloides
Prorocopis sp.
Pandesma submurina
Diatenes gerula
Praxis marmarinopa
Eudesmeola lawsoni
Mocis alterna
Achaea argilla
Grammodes sp
Grammodes ocellata
Ophiusa parcemacula
Niguza spiramioides
Donuca spectabilis

Noctuidae

Armactica columbina
Armactica conchidia
Xanthodes congenita
Earias huegeliana
Earias paralella
Earias chlorodes
Chrysodeixis argentifera
Calophasidia sp.
Helicoverpa punctigera
Heliothis punctifera
Heliocheilus sp.
Agrotis munda

.Microlepidoptera - predominantly (small/ micro moths) collecting at light, across Kalamurina.

Families only listed as most species, although known, are undescribed.
Tineidae
Galacticidae
Glyphipterigidae
Oecophoridae
Hypertrophidae
Cosmopterigidae
Gelechiidae
Scythrididae
Tortricidae
Pterophoridae