

Birrigai & Namadgi National Park **ACT Bush Blitz**

Hemiptera: Psylloidea, Odonata, Embioptera, Psocoptera

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Gary S. Taylor

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>

The Australian Plant Name Index (APNI)

<http://www.anbg.gov.au/databases/apni-about/index.html>

The Australian Plant Census (APC)

<http://www.anbg.gov.au/chah/apc/about-APC.html>

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List of contributors

| List of contributors to this report. | | | |
|--------------------------------------|-------------------------------|--|----------------------------|
| Name | Institution/affiliation | Qualifications/area of expertise | Level/form of contribution |
| <i>Gary S. Taylor</i> | <i>University of Adelaide</i> | <i>Insects (Hemiptera: Psylloidea)</i> | <i>Participant</i> |

Abstract

The ACT Bush Blitz surveyed the Birrigai and Namadgi National Park for Hemiptera: Psylloidea (lerp insects and 'psyllids') employing targeted sweep-netting of a wide variety of potential host plant species. Also targetted were Odonata and miscellaneous, infrequently collected Orders such as Embioptera (foot-spinners) and Psocoptera (booklice).

The survey yielded a remarkable diversity of psyllids with a total of 44 species collected. These comprised 28 species in 10 genera in the family Aphalaridae, 12 species in one genus, *Acizzia*, in the family Psyllidae and 4 species in two genera in the family Triozidae. Most of the Aphalaridae have been described due to an early focus on this group by previous taxonomists in the eastern states, and all four species of Triozidae have been described. The *Acizzia* represent the least know of the psyllid fauna, with at least 6 new species represented in the survey material.

Of special note was the rediscovery of *Trioza banksiae*, from *Banksia marginata*, that has not been collected since its description by Froggatt in 1903, some 115 years ago.

New species of *Acizzia* were collected from various species of *Acacia*, *Grevillea* (with no species described from this host genus to date), and a putative new species from *Banksia* (representing a potential new host plant genus record for the Psyllidae).

For the Psylloidea, plant species were selectively targeted during sampling to determine their host associations.

Also collected were three species of Odonata (core taxon group), one species of Embioptera (notably very infrequently collected) and miscellaneous Psocoptera (often ignored by collectors).

1. Introduction

The Australian psyllid fauna is better known in the temperate, south-eastern portion of the continent than the arid, semi-arid, sub-tropical and tropical regions due to the concentration of historical collecting and work locations of early taxonomists. It was not surprising that a 'higher than normal' number of psyllids from the ACT Bush Blitz survey represented described species, especially in Aphalaridae and Triozidae. The Psyllidae: *Acizzia* are less well known, and consequently the ACT Bush Blitz yielded about half the material collected in this group to represent new species. Notably two species of Psylloidea collected were from host genera previously unrecorded for the group: these were a species of *Acizzia* from *Banksia* and a species of *Ctenarytaina* from *Leptospermum*. Both these species will be described to establish these new putative host records. The likelihood to record new species of psyllids for this area was about as expected. The Odonata from the ACT region is especially well-known, with all three species collected as known species.

2. Methods

2.1 Site selection

Site selection was based on different habitats concentrating on areas of diverse vegetation types. Due to high host specificity recorded for the Psylloidea, individual plants species at each site were selected and sampled by sweep-netting foliage. A sampling unit was determined as an individual plant, or group of plants of the same species in close proximity (within 20 metres), at the same locality. A malaise trap was set of at Birrigai for the duration of

the survey. Light traps were run on several evenings. Odonata were collected near waterways.

2.2 Survey techniques

Due to host specificity of many psyllids and to record host data, one particular plant species at each site is swept, generally restricting sampling to one plant specimen (if sufficiently large) but may sample up to 20 plant specimens in an area of up to 20 metre x 20 metre. Additional plant species may be sampled at that particular site. Sites were selected to survey a broad range of habitats. A malaise trap was set up in a flight corridor between a large *Acacia* containing honeydew-producing psyllids and a flowering *Callistemon*, with the intention of capturing nectar-feeding insects. Light traps were set up overlooking valleys in mature, old-growth forests to attract nocturnal insects over a wide visual area. Odonata were collected by visual sampling along waterways.



Ryan Shofner and Gary Taylor sweep-netting in Namadgi National Park



A light trap set up in Namadgi National Park



Sorting specimens in the laboratory, Birrigai

2.2.1 Methods used at standard survey sites

Malaise traps were set up at Standard Survey sites. These were monitored by other collectors targeting invertebrates, and have therefore not been included in this report. Malaise traps are an exceptionally poor method for collection psyllids.

2.3 Identifying the collections

Insect groups were identified by Gary Taylor.

Identification for Psylloidea was based on original descriptions and redescrptions of species: Froggatt (1901, 1903), Yen (1977), KL Taylor (1984, 1985, 1990), GS Taylor (1990), and generic keys: Hollis (2004).

3. Results and Discussion

Appendix 1 lists all Hemiptera: Psylloidea, Odonata and Embioptera, and some miscellaneous Insecta recorded during the Bush Blitz survey.

3.1 Un-named or not formalised taxa

| Table 1. Putatively un-named or not formalised taxa | |
|---|---------|
| Taxon | Comment |
| <i>Blastopsylla</i> sp. 1 | |
| <i>Blastopsylla</i> sp. 2 | |
| <i>Blastopsylla</i> sp. 3 | |
| <i>Ctenarytaina</i> sp. 1 | |
| <i>Ctenarytaina</i> sp. 2 | |
| <i>Glycaspis</i> sp. 1 | |
| <i>Glycaspis</i> sp. 2 | |
| <i>Glycaspis</i> sp. 3 | |
| <i>Glycaspis</i> sp. 4 | |
| <i>Glycaspis</i> sp. 5 | |
| <i>Hyalinaspis</i> sp. 1 | |
| <i>Phellopsylla</i> sp. 1 | |
| <i>Acizzia</i> sp. 1 | |
| <i>Acizzia</i> sp. 4 | |
| <i>Acizzia</i> sp. 5 | |
| <i>Acizzia</i> sp. 6 | |
| <i>Acizzia</i> sp. 8 | |
| <i>Acizzia</i> sp. 12 | |

3.2 Putative new species (new to science)

In Bush Blitz III reporting, '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.

| Table 2. Putative new species (new to science) | |
|--|---------|
| Species | Comment |
| <i>Creiis</i> sp. 1 | |

| | |
|---------------------------|---|
| <i>Creiis</i> sp. 2 | |
| <i>Creiis</i> sp. 3 | |
| <i>Creiis</i> sp. 4 | |
| <i>Creiis</i> sp. 5 | |
| <i>Ctenarytaina</i> sp. 3 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |
| <i>Acizzia</i> sp. 2 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |
| <i>Acizzia</i> sp. 3 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |
| <i>Acizzia</i> sp. 7 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |
| <i>Acizzia</i> sp. 9 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |
| <i>Acizzia</i> sp. 10 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |
| <i>Acizzia</i> sp. 11 | Will be described as part of an ABRS Research Grant and/or an ABRS Bush Blitz Taxonomy Grant. |

3.3 Exotic and pest species

| Table 3. Exotic and pest species recorded | | | |
|--|----------------------------------|--------------------------------|-----------------|
| Exotic/pest species | Location sighted/observed | Indication of abundance | Comments |
| | | | |

3.4 Threatened species

| Table 4. Threatened species | | | |
|------------------------------------|---|----------------------------------|--------------------------------|
| Species | Listing status and level (EBPC, State/Territory) | Location sighted/observed | Indication of abundance |
| | | | |

3.5 Range extensions

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

| Species | Location sighted/observed | Distance from nearest known record (km) | Comments |
|------------------------|---------------------------|---|---|
| <i>Trioza banksiae</i> | Namadgi National Park | Described from Sydney. Range extension of 250 km. | Rediscovered, not collected since its description in 1903 |

3.6 Genetic information

Specimens of Hemiptera: Psylloidea were preserved in 100% ethanol for potential future sequencing/barcoding projects.

4. Conclusions

The ACT Bush Blitz surveyed the Birrigai and Namadgi National Park for Hemiptera: Psylloidea (lerp insects and 'psyllids') employing targeted sweep-netting of a wide variety of potential host plant species. Also targetted were Odonata and miscellaneous, infrequently collected Orders such as Embioptera (foot-spinners) and Psocoptera (booklice).

The survey yielded 44 species of Psylloidea comprising 28 species in 10 genera in the family Aphalaridae, 12 species in one genus, *Acizzia*, in the family Psyllidae and 4 species in two genera in the family Triozidae. Most of the Aphalaridae have been described due to an early focus on this group by previous taxonomists in the eastern states, and all four species of Triozidae have been described. Note that two isolates of *Anoeconeossa* are listed as unplaced species (A and B) as they comprised female specimens which could not be readily associated with any of the named species (represented by males) due to their morphological conservatism. The *Acizzia* represent the least know of the psyllid fauna, with at least 6 new species represented in the survey material. Most of the named species of Psylloidea were described by taxonomist based in Sydney or Canberra, and mostly from locally collected material. Consequently, most of the new material (of the described species) did not provide significant range extensions.

The Psylloidea are highly host specific and host association data were recorded for most species, including various species of *Acacia*, *Eucalyptus*, *Grevillea*, *Hakea* and *Banksia*. A remarkable new species of *Ctenarytaina* from *Leptospermum* and up to six new species of *Acizzia* from *Grevillea*, *Hakea* and *Banksia* will be described as part of a current ABRS-funded project awarded to Gary Taylor describing new species of *Acizzia* under "Systematics, biodiversity and host associations of Australian psyllids: Implications for conservation and biosecurity".

Of special note was the rediscovery of *Trioza banksiae*, from *Banksia marginata*, that has not been collected since its description by Froggatt in 1903, some 115 years ago.

New species of *Acizzia* were collected from various species of *Acacia*, *Grevillea* (with no species described from this host genus to date), and a putative new species from *Banksia* (representing a potential new host plant genus record for the Psyllidae).

Three species of Odonata (core taxon group). These comprised species that are recorded for the ACT. Also collected was one species of Embioptera (notably very infrequently collected) and miscellaneous Psocoptera (an Order that is often ignored by collectors).

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Appendix 1. List of Hemiptera: Psylloidea, Odonata, Embioptera and other miscellaneous insects known to occur in/near Birrigai and Namadgi National Park.

| Family | Species | Putative new species | Threatened | Exotic/pest | Birrigai | Namadgi National Park |
|-------------|--|----------------------|------------|-------------|----------|-----------------------|
| Aphalaridae | <i>Anoeconeossa assimilis</i> | | | | | Yes |
| Aphalaridae | <i>Anoeconeossa</i> c.f. <i>secreta</i> | | | | | Yes |
| Aphalaridae | <i>Anoeconeossa copodiformis</i> | | | | | Yes |
| Aphalaridae | <i>Anoeconeossa nigripennis</i> | | | | | Yes |
| Aphalaridae | <i>Anoeconeossa</i> unplaced sp. A | | | | | Yes |
| Aphalaridae | <i>Anoeconeossa</i> unplaced sp. B | | | | | Yes |
| Aphalaridae | <i>Blastopsylla</i> c.f. <i>adnatariae</i> | | | | Yes | |
| Aphalaridae | <i>Blastopsylla</i> sp. 1 | | | | | Yes |
| Aphalaridae | <i>Blastopsylla</i> sp. 2 | | | | | Yes |
| Aphalaridae | <i>Blastopsylla</i> sp. 3 | | | | | Yes |
| Aphalaridae | <i>Blepharocosta marmorata</i> | | | | | Yes |
| Aphalaridae | <i>Creiis</i> sp. 1 | Yes | | | Yes | Yes |
| Aphalaridae | <i>Creiis</i> sp. 2 | Yes | | | | Yes |
| Aphalaridae | <i>Creiis</i> sp. 3 | Yes | | | | Yes |
| Aphalaridae | <i>Creiis</i> sp. 4 | Yes | | | | Yes |
| Aphalaridae | <i>Creiis</i> sp. 5 | Yes | | | | Yes |
| Aphalaridae | <i>Cryptoneossa vulgaris</i> | | | | | Yes |
| Aphalaridae | <i>Ctenarytaina</i> sp. 1 | | | | Yes | Yes |
| Aphalaridae | <i>Ctenarytaina</i> sp. 2 | | | | Yes | Yes |
| Aphalaridae | <i>Ctenarytaina</i> sp. 3 | Yes | | | | Yes |
| Aphalaridae | <i>Glycaspis</i> sp. 1 | | | | | Yes |
| Aphalaridae | <i>Glycaspis</i> sp. 2 | | | | Yes | |
| Aphalaridae | <i>Glycaspis</i> sp. 3 | | | | | Yes |
| Aphalaridae | <i>Glycaspis</i> sp. 4 | | | | | Yes |
| Aphalaridae | <i>Glycaspis</i> sp. 5 | | | | | Yes |
| Aphalaridae | <i>Hyalinaspis</i> sp. 1 | | | | | Yes |
| Aphalaridae | <i>Phellopsylla</i> sp. 1 | | | | | Yes |

| Family | Species | Putative new species | Threatened | Exotic/pest | Birrigai | Namadgi National Park |
|----------------|----------------------------------|----------------------|------------|-------------|----------|-----------------------|
| Aphalaridae | <i>Platyobria lewisi</i> | | | | | Yes |
| Coenagrionidae | <i>Ischnura aurora</i> | | | | | Yes |
| Coreidae | <i>Agriopocoris</i> sp. | | | | | Yes |
| Fergusoninidae | <i>Fergusonina</i> sp. | | | | | Yes |
| Gasteruptiidae | <i>Gasteruption</i> sp. | | | | | Yes |
| Lestidae | <i>Austrolestes cingulatus</i> | | | | | Yes |
| Libellulidae | <i>Diplacodes bipunctata</i> | | | | | Yes |
| Oligotomidae | | | | | Yes | |
| Psyllidae | <i>Acizzia</i> sp. 1 | | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 2 | Yes | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 3 | Yes | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 4 | | | | Yes | |
| Psyllidae | <i>Acizzia</i> sp. 5 | | | | Yes | |
| Psyllidae | <i>Acizzia</i> sp. 6 | | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 7 | Yes | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 8 | | | | Yes | |
| Psyllidae | <i>Acizzia</i> sp. 9 | Yes | | | Yes | Yes |
| Psyllidae | <i>Acizzia</i> sp. 10 | Yes | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 11 | Yes | | | | Yes |
| Psyllidae | <i>Acizzia</i> sp. 12 | | | | Yes | |
| Triozidae | <i>Schedotrioza eucalypti</i> | | | | | Yes |
| Triozidae | <i>Schedotrioza marginata</i> | | | | | Yes |
| Triozidae | <i>Schedotrioza multitudinea</i> | | | | | Yes |
| Triozidae | <i>Trioza banksiae</i> | | | | | Yes |