



Invertebrate Fauna in a Peat Core from the Tasmanian Land Conservancy Skullbone Plains Reserve

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Sample Details

Location: Skullbone Plains; GPS Reference: 55G 441994, 5345329

Date collected: 16/11/2012

Sample: portion of a peat core at a depth of 2.98m. Approximate peat age at this depth: 3900-7900 years before present (extrapolated from Hope, Whinam & Hopf, 2013). For the peat core profile – stratigraphy, dating, pollen analysis - please refer to Hope, Whinam & Hopf (2013).

Assessment Methods

The intact peat sample was photographed then gently separated in water and passed through a series of sieves of mesh 1mm, 750 μ m, 500 μ m, 250 μ m, after the method of Porch and Elias (2000) for small peat samples. The residues were examined microscopically and invertebrate subfossil fragments were removed and placed in vials containing 70% ethanol to await further assessment and identification.

The cuticular specimens were sorted, where possible, to invertebrate class and order. The entire, or otherwise recognisable, specimens were photographed and identified to family, genus and species/morphospecies (Appendices 1 & 2).

Findings

A total of 44 cuticular specimens could be identified to invertebrate order (Tables 1 & 2). A further 84 cuticular fragments were too small and shattered to be readily identified with a light microscope (Appendix 1).

The majority (37) of the identifiable specimens were Mesostigmatid and Oribatid mites (Acarina: Mesostigmata, and Oribatida, respectively, Table 1). Nearly a quarter of these specimens (11) were part carapaces which could be identified no further. Of the remainder, the Mesostigmatids (Appendix 2, plate 2) were the more numerous, with 16 individuals of a morphospecies in the cohort Uropodina, and a single individual of the superfamily Monogynaspida (cohort Dermanyssina). The seven Oribatid mites (Appendix 2, plate 3) were more diverse: six morphospecies representing five families and three superfamilies in the cohort Brachypilina.

The nine identifiable non-mite specimens (Table 2; Appendix 2, plate 4) comprised 6 individuals of a soil aphid species (either *Rhopalosiphum rufiabominale*, subfamily Aphidinae; or *Aploneura lentisci*, subfamily Pemphiginae); the elytra covering thorax and abdomen of a Minute Brown Scavenger Beetle (Latridiidae); a moth larva (Lepidoptera) which was too small, shrivelled and distorted to identify further; and an Elongate-bodied Springtail (Collembola, Poduromorpha).

Comments

Mites account for a large component of litter-soil fauna (Walter & Proctor, 1999): the Oribatida are fungivore/detritivores, feeding on fungal spores, algae or dead plant and animal material; while the Mesostigmata are primarily predators, feeding on Collembola, other mites and small arthropods. The Latridiidae beetles and Collembola are fungivore/detritivores; soil aphids are sap-suckers on plant roots; and several Lepidoptera families (e.g. Micropterigidae, Hepialidae) contain species with soil dwelling larvae.

The sample was small, and more accurate identification of specimens would require higher resolution magnification, including scanning electron microscopy, which was beyond the scope of this study. However, the peat core portion gives a snapshot of some of the invertebrate fauna within, and on the surface of, the soil at Skullbone Plains more than 3,900 years ago. This provides a record which can be compared with present day litter-soil samples, or with further peat cores from the site.

Code	Suborder	Cohort	Superfamily	Family	Genus	Species	Count
SkP_AcMe01	Mesostigmata	Dermanyssina	Monogynaspida			sp. 1	1
SkP_AcMe02	Mesostigmata	Uropodina				sp. 1	16
SkP_AcOr01	Oribatida	Brachypilina	Oripodoidea	Oribatulidae	nr <i>Paraphauloppia</i>	nr <i>novazealandica</i> Hammer 1967	2
SkP_AcOr02	Oribatida	Brachypilina	Gustaviodea	Peloppiidae	nr <i>Pseudoceratoppia marianne</i> J&P Balogh 1983	sp. 1	1
SkP_AcOr03	Oribatida	Brachypilina	Gustaviodea	Astegistidae/Maorizetidae		sp. 1	1
SkP_AcOr04	Oribatida	Brachypilina	Oripodoidea	Oribatulidae	nr <i>Paraphauloppia</i>	sp. 2	1
SkP_AcOr05	Oribatida	Brachypilina	Ceratozetoidea	Mycobatidae	nr <i>Anellozetes</i>	sp. 1	1
SkP_AcOr06	Oribatida	Brachypilina	Oripodoidea	Mochlozetidae		sp. 1	1
Morphospecies Total							24
Misc. mites							11
Overall Mite Total							35

Table 1. Mite specimens (Class Arthropoda, Order Acarina) found in the Skullbone Plains Peat Core (depth 2.98m): identification and count.

Description	Code	Class	Order	Suborder	Superfamily	Family	Genus, Species (subfamily)	Count
Aphid	SkP_HeAp01	Insecta	Hemiptera	Sternorrhyncha	Aphidoidea	Aphididae	most probably <i>Rhopalosiphum rufiabominale</i> (Aphidinae); or <i>Aploneura lentisci</i> (Pemphiginae)	6
Latridiid beetle	SkP_CpLa01	Insecta	Coleoptera		Cucujoidea	Latridiidae		1
Moth larva	SkP_LeLx01	Insecta	Lepidoptera					1
Collembolan	SkP_CmPo01	Collembola	Collembola	Poduromorpha				1
Total								9

Table 2. Non-mite specimens, Insects and Collembola, found in the Skullbone Plains Peat Core (depth 2.98m): identification and count.

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Appendix 1. Description of invertebrate specimens, entire and fragments, found in the peat core (depth 2.98m) from Tasmanian Land Conservancy Skullbone Plains Reserve.

Specimen	Description	Code	Count	Sieve mesh (μm)
Aphid	entire	SkP_HeAp01	6	500
Beetle, Latridiidae	orange-brown; elytra deeply pitted; part of thorax with mid and hind legs, abdomen	SkP_CpLa01	1	250
Moth larva	more or less entire	SkP_LeLx01	1	1000
Collembolan	entire	SkP_CmPo01	1	500
Mite, Mesostig	red-brown, complete with legs	SkP_AcMe01	1	500
Mite, Mesostig	dark, discoid, carapace only, 'beaked' anteriorly	SkP_AcMe02	16	250
Mite, Oribatid	dark, elongate with 'snout' (one lost)	SkP_AcOr01	2	250
Mite, Oribatid	dark and globular larger than Or4/5	SkP_AcOr02	1	≤ 250
Mite, Oribatid		SkP_AcOr03	1	
Mite, Oribatid	like a smaller SkP_AcOr01	SkP_AcOr04	1	250
Mite, Oribatid	dark and tiny/small	SkP_AcOr05	1	≤ 250
Mite, Oribatid	dark and small ?same as Or4	SkP_AcOr06	1	1000
Misc. mites	part carapace		10	250
Misc. mites	part carapace		1	≤ 250
Total specimens identifiable to invertebrate order			44	
Misc. fragment	dark brown, shiny, curved/cylindrical		40	250
Misc. fragment	light brown, transparent		7	250
Misc. fragment	light brown, small punctures, short setae attached		5	250
Misc. fragment	pale brown		1	500
Misc. fragment	dark, metallic		2	500
Misc. fragment	light brown, transparent		3	500
Misc. fragment	light brown, small punctures, short setae attached		5	500
Misc. fragment	dark brown, shiny, curved/cylindrical		8	500
Misc. fragment	NOS		5	500
Misc. fragment	dark brown, shiny, curved/cylindrical		2	710
Misc. fragment	? leg		1	710
Misc. fragment	dark brown, shiny		2	≤ 250
Misc. fragment	light brown, transparent, segmented		3	500
Miscellaneous fragments total			84	
Overall Total			128	

Appendix 2. Photo-record of peat core and coded specimens.

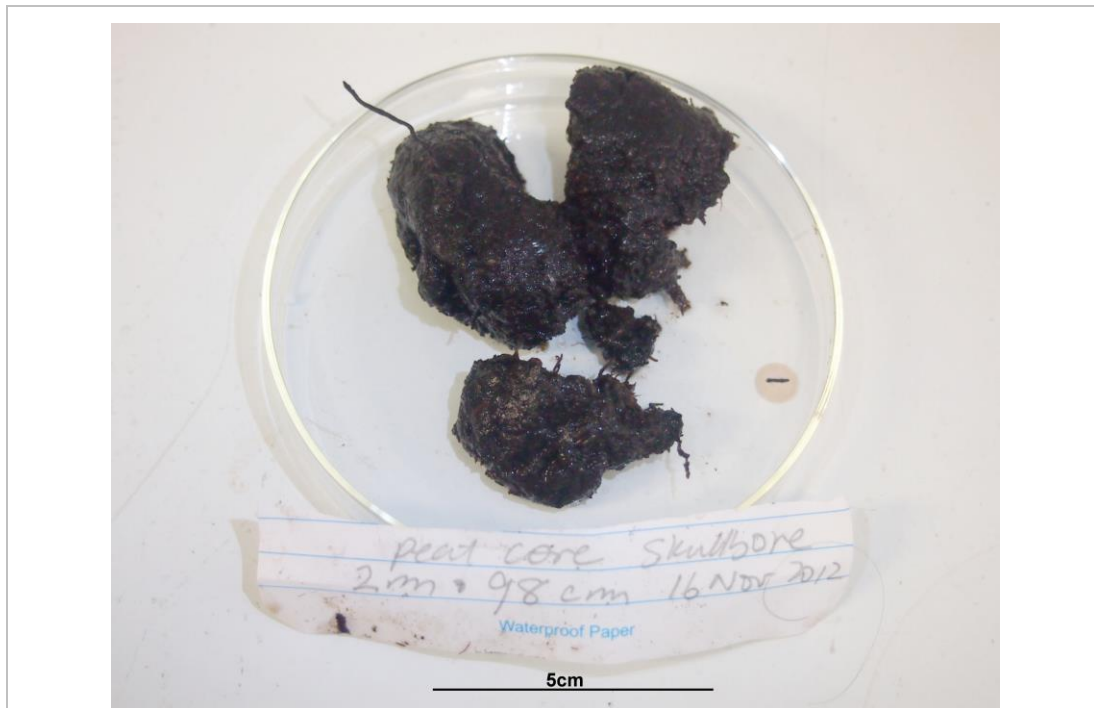
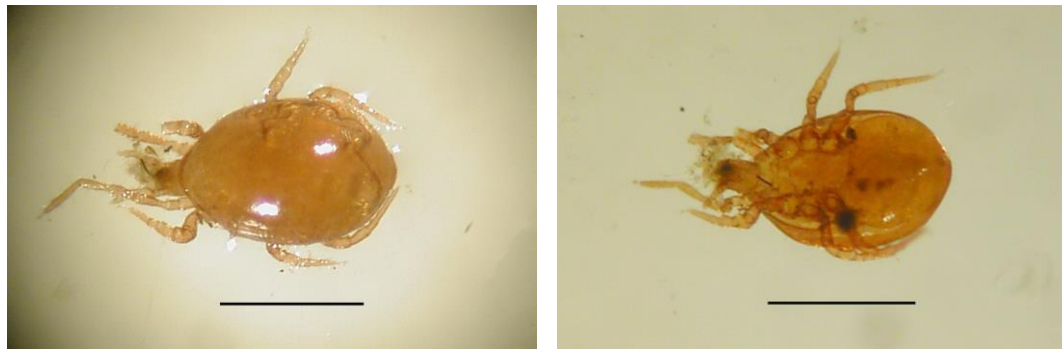


Plate 1. Peat core sample from a depth of 2.98m at the Tasmanian Land Conservancy Skullbone Plains Reserve. Scale Bar = 5cm.



a. SkP_AcMe01, Mesostigmata, Dermanyssina, Monogynaspida, sp. 1



b. SkP_AcMe02, Mesostigmata, Uropodina, sp. 1

Plate 2. Mite morphospecies: Acarina, Mesostigmata. Dorsal and ventral views. Scale Bar = 0.5mm



a. SkP_AcOr01, Oribatida, Brachypilina , Oripodoidea, Oribatulidae, nr *Paraphauloppia novazealandica* Hammer 1967



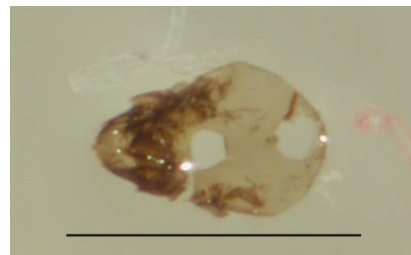
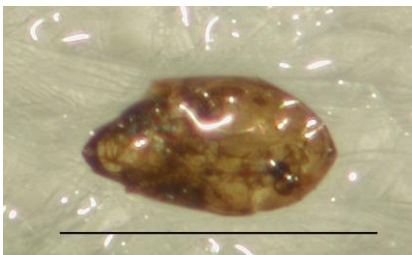
b. SkP_AcOr02, Oribatida, Brachypilina , Gustaviodea, Peloppiidae, nr *Pseudoceratoppia marianne* J&P Balogh 1983



c. SkP_AcOr04, Oribatida, Brachypilina , Oripodoidea, Oribatulidae, nr *Paraphauloppia* sp. 2

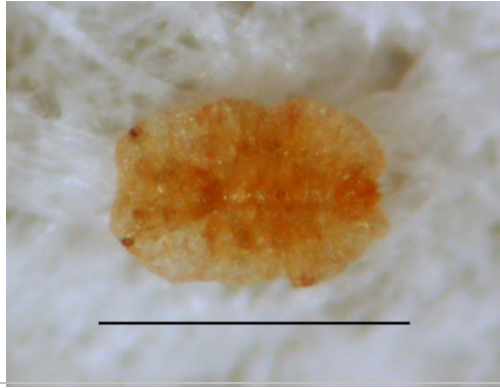


d. SkP_AcOr05, Oribatida, Brachypilina , Ceratozetoidea, Mycobatidae, nr *Anellozetes* sp. 1



e. SkP_AcOr06, Oribatida, Brachypilina , Oripodoidea, Mochlozetidae sp. 1

Plate 3. Mite morphospecies, continued: Acarina: Oribatida. Dorsal and ventral views, except (d) dorsal only. Scale Bar = 0.5mm



a. SkP_HeAp01, Hemiptera, Sternorrhyncha, Aphidoidea, Aphididae, most probably *Rhopalosiphum rufiabominale* (Aphidinae); or *Aploneura lentisci* (Pemphiginae)



b. SkP_CpLa01, Coleoptera, , Cucujoidea, Latridiidae, sp.1



c. SkP_LeLx01, Lepidoptera sp. 1, larva



d. SkP_CmPo01, Collembola, Poduromorpha sp. 1

Plate 4. Other taxa. Views: (a) dorsi-lateral & ventral; (b) dorsal and ventral; (c) distorted; (d) lateral. Scale Bar = 0.5mm