

## **ANTS COLLECTED DURING SURVEY BS612, MARQUALPIE REGION, CAMP ‘KE’, SEPTEMBER 2008.**

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### **INTRODUCTION:**

Ants were collected from 176 of the 192 micro-pits put out, (one micro-pit was lost and 15 empty), at the 16 sites over two four-night periods. The sites were chosen for their diversity of vegetation. The 96 micro-pits put out during the first week contained significantly lower numbers of ants, than the 95 micro-pits collected during the second week of the survey. A total of 13 genera were recorded from micro-pits and macro-pits. The weather during the two weeks varied greatly.

### **LOCATION:**

Keleary South and Keleary North sites, Camp ‘KE’, Marqualpie Region, is in the NE corner of the Innamincka Regional Reserve which is situated in the NE corner of South Australia.

### **HABITAT:**

Innamincka Regional Reserve covers 103 million hectares of land ranging from gibber rises to the thriving wetlands of the Cooper Creek system. The area was proclaimed a reserve in 1988 to protect the integrity of the internationally significant wetlands. The regional reserve classification permits grazing, petroleum exploration and extraction, and managed recreation use to continue side by side. It includes the Innamincka Station, making it the first reserve of its type.

The Reserve consists of large red sand dunes with potentially rich interdunal areas, vegetated with bloodwoods, mallee and Spinifex. Scientifically this area is almost entirely unknown.

### **MARQUALPIE LAND SYSTEM:**

The dune fields of the Marqualpie land system are linked with the Montecleary (or Nilpie Nilpie) creek and its associated streams, which originate on the stony tablelands of Cordillo Downs Station immediately north of Innamincka Station.

The dominant land units within this land system are sand dunes, interdune swales, sandy plains and drainage lines. The dune fields consist of numerous low, irregular sand ridges which tend north-north-west to south-south-east, but rather than being longitudinal like those found further west and south, most of the dunes tend to be circular or semi-circular in shape and are generally up to seven metres high. The soils of this land unit are red siliceous sand, supporting a vegetation cover of tall open shrubland and lobed Spinifex.

### **VEGETATION:**

The interdunal swale land unit is highly variable. In general the soils of this unit are grey cracking clay, but distinct vegetation types appear to be related to the frequency of inundation. The areas enclosed by circular dunes receive localized runoff and drainage, with the amount and frequency of inundations controlled by various factors including the height of dune, permeability of sands and non-

permeability of swales soils. Swales receiving sufficient water support low open woodland with an overstorey of Coolabah, while swales with lower water regimes support shrub land.

The sandy plain land unit is characterized by open, gently undulating sandy plains located along the edge of the stony plains and between sand dunes. The soils are gradational loams that may or may not be calcareous throughout. These plains are characterized by low open woodlands with an overstorey species of Long-fruited Bloodwood (*E. terminalis*) and Mulga (*Acacia aneura*). The drainage line comprises the channels and waterholes of the Montecleary Creek and its tributaries. Soils are usually sandy in texture and not calcareous. Vegetation varies from open woodland in the more frequently inundated areas to low open woodlands in drier areas (DELM 1993, Love 2008).

### **CLIMATE:**

It is hot in summer: the mean summer temperature is 36.9° C. Winters are mild with a mean temperature of 20.4° C. The mean annual rainfall is 206 mm, with the mean summer rain being 28.7 mm and the mean winter rainfall being 12.2 mm. The mean annual relative humidity at 9 a.m. is 44% and at 3 p.m. is 27% (BOM Moomba, 1972 to 2005).

### **SITE LOCALITY:**

Base camp 'KE', Lat. 27° 10' 05" S, Long. 140° 39' 57" E in the Marqualpie area of the Innamincka Regional Reserve (map sheet Innamincka SG 54-14) about 9 km south of the Keleary oil field and 63.6 km north of Innamincka. The survey was conducted north and south of the base camp, along the track from Patchawara Bore to Keleary Well, a distance of 35 km.

### **METHOD:**

#### **Macro-pitfalls, Micro-pitfalls and Elliott traps:**

At each site two standard pitlines were constructed within the same habitat type. Two rows of six macro-pits were placed at 10 m intervals in the ground, flush with the surface. Each line of macro-pits was connected by a 30 cm high, fly-wire fence. The macro-pits were then baited with a golf ball-size mixture of rolled oats and peanut paste. Four Elliott traps were placed in the vicinity of the same habitat type. Six micro-pits were placed alongside each row of the six macro-pits. These micro-pits, 10 cm deep and 2 cm diameter vials containing 75% ethanol were placed flush with the ground surface, about 1.5 m to one side of the macro-pit line. When only Elliott traps were used, the micro-pits were placed about 1.5 m to one side of the Elliott traps. Pink flagging tape was used to mark the position of the micro-pits. These micro-pits were left open for the whole trapping period of four nights (Alonso 2000).

Micro-pits were placed at sites KES 001–008 on 15 September and collected on 19 September 2008. The following week, micro-pits were put out at sites KEN 001 and KEN 003 on 19 September and brought in on 23 September, while the other sites, KEN 002, 004, 005, 006, 007, and 008 were put out on 20 September and brought in on 24 September.

Micro-pits were inspected each day for evaporation and if needed, the 75% ethanol was topped up (Alonso 2000).

The ants were identified and counted into genera at the South Australian Museum by the author and checked by John Weyland, using Shattuck 1999 as a reference.

## RESULTS:

### Ant numbers and genera:

The number of ants collected in micro-pits during each of the four-night periods at Sites KES 001–008 and KEN 001–008, and sorted into their genera, are shown in **Tables 1 and 2**. The ants collected in macro-pits are shown in **Tables 3 and 4**.

**Weather:** (The weather was very different between the two periods of collecting.)

**Week 1**, 15–19 September 2008 had hot, sunny, dry weather. The daily maximum temperatures ranged from 20.6° C–36.1° C; the average maximum was 28.8° C. The minimum ranged from 6.2° C–19.6° C; the average minimum was 11.5° C. The relative humidity ranged from 7%–32%. The maximum wind gust was 61 km/h.

**Week 2**, 20–24 September 2008 started off hot and sunny. The maximum daily temperatures ranged from 18.8° C–35.3° C with the average being 28.5° C. The relative humidity ranged from 14%–56%. It was the 100 km/h dust storm on 22 September that rolled in collapsing many of the little personal tents, blew the roof off the science tent, and the roof of the kitchen tent collapsed (BOM 2008).

### Vegetation:

KES 001: *Sclerolaena* sp. and *Atriplex spongiosa* hermland on sandy floodplain.

KES 002: *Hakea leucoptera* (Silver Needlewood), tall, very open shrubland on low dune.

KES 003: *Triodia basedowii* (Spinifex), open hummock grassland on dune.

KES 004: *Muehlenbeckia florulenta* (Lignum), low, very open shrubland over *Eragrostis* sp. on gravelly clay pans in swale.

KES 005: *Eucalyptus coolabah*, open woodland in wet swale.

KES 006: *Atalaya hemiglaucha* (Whitewood) and *Hakea leucoptera*, low open woodland on undulating sandplain/low dune.

KES 007: *Acacia aneura* (Mulga), low open woodland with *Atalaya hemiglaucha* and *Hakea leucoptera* on undulating sandplain.

KES 008: *Atalaya hemiglaucha*, low open woodland over *Triodia basedowii* on dune.

KEN 001: *Eucalyptus coolabah*, open woodland over *Muehlenbeckia florulenta* and *Chenopodium auricomum* in sandy clay swale.

KEN 002: *Sclerolaena bicornis*, (Goat-head Bindy), low open shrubland on flood-out plain.

KEN 003: *Triodia basedowii* (Spinifex) very open hummock grassland over *Aristida holathera* (Tall Kerosene Grass) on dune and dune flanks.

KEN 004: *Muehlenbeckia florulenta*, *Chenopodium auricomum* and *Eragrostis australasica* (Cane Grass), open shrubland in clay swale,

KEN 005: *Eucalyptus coolabah* open woodland over *Acacia ligulata* (Umbrella Bush), *Acacia stenophylla* (River Cooba) along sandy creekline.

KEN 006: *Eucalyptus coolabah* open woodland over *Muehlenbeckia florulenta* and *Chenopodium auricomum* in swamp.

KEN 007: *Zygochloa paradoxa* (Sandhill Canegrass) open hummock grassland on tall red dune.

KEN 008: *Aristida holathera* tussock grassland with emergent *Atalaya hemiglaucha* (Whitewood) on lower dune.



Marqualpie Survey Site KES 001



Marqualpie Survey Site KES 002



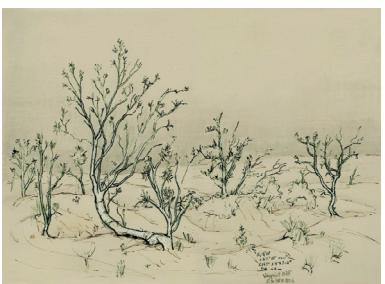
Marqualpie Survey Site KES 003



Marqualpie Survey Site KES 004



Marqualpie Survey Site KES 005



Marqualpie Survey Site KES 006



Marqualpie Survey Site KES 007



Marqualpie Survey Site KES 008



Marqualpie Survey Site KEN 001



Marqualpie Survey Site KEN 002



Marqualpie Survey Site KEN 003



Marqualpie Survey Site KEN 004



Marqualpie Survey Site KEN 005



Marqualpie Survey Site KEN 006



Marqualpie Survey Site KEN 007



Marqualpie Survey Site KEN 008

**Table 1:** Number of ants in different genera collected in **micro-pits** at sites KES 001–008.

<b>Genera</b>	<b>Site</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Total*</b>	<b>Sites/ Genus</b>
<i>Camponotus</i>		1	1		15	11	5			33	5
<i>Cerapachys***</i>											
<i>Doleromyrma</i>		5	12							17	2
<i>Iridomyrmex</i>	25	204	73	86	654	95	530	63		1730	8
<i>Melophorus</i>	13	20	42	14	2	95	66	17		269	8
<i>Meranoplus</i>											
<i>Monomorium</i>		8	122		1	50	24	106		311	6
<i>Odontomachus***</i>											
<i>Pheidole</i>	21		40	56		2	19	12		150	6
<i>Rhytidoponera</i>			2							2	1
<i>Stigmacros***</i>											
<i>Tapinoma</i>											
<i>Tetramorium</i>			13			15	6	8		42	4
<b>No. ants/site</b>	<b>59</b>	<b>238</b>	<b>305</b>	<b>156</b>	<b>672</b>	<b>268</b>	<b>650</b>	<b>206</b>		<b>2554</b>	
<b>No. Genera/site</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>5</b>		<b>8</b>	

\* = Total no. of ants of each genus collected in micro-pits at Sites KES 001–008 during Week 1.

\*\* = Only collected during Week 1. \*\*\* = Collected only in macro-pits.**Table 2:** Number of ants in different genera collected in **micro-pits** at sites KEN 001–008.

<b>Genera</b>	<b>Site</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Total*</b>	<b>Sites/ Genus</b>
<i>Camponotus</i>					172				6	178	2
<i>Cerapachys***</i>											
<i>Doleromyrma</i>							3	4	7	2	
<i>Iridomyrmex</i>	313	438	558	88	778	943	99	55		3272	8
<i>Melophorus</i>	36	37	104	4	61		44	39		325	7
<i>Meranoplus**</i>				1		1				2	2
<i>Monomorium</i>	112	36	14	1	41		4	5		213	7
<i>Odontomachus***</i>											
<i>Pheidole</i>	9	15	9	2	20	13				68	6
<i>Rhytidoponera</i>											
<i>Stigmacros***</i>											
<i>Tapinoma**</i>					2		7	9		2	
<i>Tetramorium</i>		14	2	1			1			18	4
<b>No. ants / site</b>	<b>470</b>	<b>526</b>	<b>699</b>	<b>98</b>	<b>1073</b>	<b>959</b>	<b>150</b>	<b>117</b>		<b>4092</b>	
<b>No. Genera/site</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>7</b>		<b>9</b>	

\* = Total no. of ants of each genus collected in micro-pits at Sites KEN 001–008 during Week 2.

\*\* = Only collected during Week 2. \*\*\* = Collected only in macro-pits.**Total number of ants collected in micro-pits during Week 1 and Week 2 = 6,646.**

**Table 3:** Number of ants in different genera collected in macro-pits at sites KES 001-008.

Genera	Site	1	2	3	4	5	6	7	8	Total*	Sites/ genus
<i>Camponotus</i>		4	6	14		9	11	7	3	54	7
<i>Cerapachys</i> **									1	1	1
<i>Doleromyrma</i> ***											
<i>Iridomyrmex</i>		4	63	33		51	117	17	3	288	7
<i>Melophorus</i>		2	2	4			8		2	18	5
<i>Meranoplus</i> ***											
<i>Monomorium</i> ***											
<i>Odontomachus</i> **					2					2	1
<i>Pheidole</i>							1			1	1
<i>Rhytidoponera</i>				11				5	8	24	3
<i>Stigmacros</i>											
<i>Tapinoma</i> ***											
<i>Tetramorium</i>				1			1			2	3
<b>No. ants/Site</b>		10	71	63	2	60	138	29	17	390	
<b>No. Genera/Site</b>		3	3	5	1	3	5	3	5	8	

\* = Total no. of ants of each genus collected in macro-pits at Sites KES 001-008 during Week 1.

\*\* = Only collected during Week 1 in a macro-pit at one site. \*\*\* = Collected only in micro-pits.

**Table 4:** Number of ants in different genera collected in macro-pits at sites KEN 001-008.

Genera	Site	1	2	3	4	5	6	7	8	Total*	Sites/ genus
<i>Camponotus</i>		29	4		1	72	1		6	113	6
<i>Cerapachys</i>											
<i>Doleromyrma</i> ***											
<i>Iridomyrmex</i>		12	6	9	15	40	9	8	21	120	8
<i>Melophorus</i>		2	1					1		4	3
<i>Meranoplus</i>											
<i>Monomorium</i> ***											
<i>Odontomachus</i>											
<i>Pheidole</i>		1	9					1		11	3
<i>Rhytidoponera</i>		8							1	9	2
<i>Stigmacros</i> **					5					5	1
<i>Tapinoma</i> ***											
<i>Tetramorium</i>		3						2	2	7	3
<b>No. Ants / Site</b>		55	20	9	16	117	10	12	30	269	
<b>No. Genera/Site</b>		6	4	1	2	3	2	4	4	7	

\* = Total no. of ants of each genus collected in macro-pits at Sites KEN 001-008 during Week 2.

\*\* = Only collected during Week 2 in a macro-pit at one site. \*\*\* = Collected only in micro-pits.

**Total number of ants collected in macro-pits during Week 1 and Week 2 = 659.**

## DISCUSSION:

### Ant Abundance:

The total number of ants collected during Week 1 from all the micro-pits was 2,554, ranging from 59 to 672 per site. Week 2 had significantly more with 4,092, ranging from 98 to 1,073 per site. A total of 6,646 ants were collected in the micro-pits during the two weeks. (See **Tables 1 and 2**.)

The total number of ants at each site, during Week 1 in macro-pits was 390, while during Week 2 there were 269, with a total of 659 ants collected in the macro-pits during the two weeks. (See **Tables 3 and 4**.)

### Genera Richness:

The total number of genera recorded during the survey was 13. Eight genera were recorded during Week 1 and nine during Week 2 in the micro-pits.

Week 1, two genera, *Cerapachys* and *Odontomachus* were found only in the macro-pits. Similarly in Week 2, *Rhytidoponera* and *Stigmacros* were only found in the macro-pits. *Doleromyrma* and *Monomorium* were only found in the micro-pits during Weeks 1 and 2, while *Tapinoma* and *Meranoplus* were only found in the micro-pits for Week 2.

The number of genera found in micro-pits at sites KES 001–008, ranged from 3–8. At sites KEN 001–008 during Week 2 the number of genera ranged from 4–7.

KES 003 open hummock grassland of *Triodia basedowii* had the highest richness of the survey with 8 genera.

KEN 008 tussock grassland, *Aristida holathera* with emergent *Atalaya hemiglaucha* had the highest richness of this Week 2 with 7 genera.

KES 006, KES 007, KEN 004 and KEN 005 had 6 genera.

KES 002, KES 008, and KEN 003 had 5 genera.

KES 005, KEN 001, KEN 002, KEN 006, and KEN 007 all had 4 genera.

KES 001 and KES 004 on grey cracking clays had the lowest richness of 3 genera. (**Tables 1 and 2**)

Three genera were collected only from the macro-pits. *Cerapachys* and *Odontomachus* during Week 1 and *Stigmacros* from Week 2, at sites KES 008, KES 004 and KEN 005 respectively.

*Iridomyrmex* dominated at 15 of the sites, *Monomorium* dominated at one site, KES 003. (**Tables 1 and 2**)

*Melophorus* occurred at 15 sites and *Monomorium* at 13 sites. But numerically, *Monomorium* outnumbered *Melophorus* 311 to 269 in Week 1, but *Melophorus* outnumbered *Monomorium*, 325 to 213 in Week 2.

*Iridomyrmex* is a highly abundant aggressive genus and has a strong competitive influence on the other genera. It is found in open habitats where it can move fast to any available food.

*Iridomyrmex*, Week 1, a total of 1,730, ranging from 25–654 over 8 sites. KES 005, had 654 *Iridomyrmex* with 282 from one micro-pit, ranging from 9–282 per micro-pit. This site was open woodland of *Eucalyptus coolabah*. KES 007 had a total 530 *Iridomyrmex* ranging from 14–124 per micro-pit. Week 2 had a total of 3,272, ranging from 55–943 over 8 sites. KEN 006 had 943 *Iridomyrmex*, with 782 from one micro-pitfall. KEN 005 had 778 *Iridomyrmex*, ranging from 5 to 165 over the 12 micro-pits.

*Monomorium*, Week 1, a total of 311, ranging from 1–122 over 6 sites and Week 2, a total of 325 ranging from 1–112.

*Pheidole*, Week 1, a total of 150, ranging from 2–56 over 6 sites and Week 2, a total of 68 ranging from 2–20 over 6 sites

*Tetramorium*, Week 1, a total of 42, ranging from 6–15 over 4 sites and Week 2, a total of 18 ranging from 1–14 over 4 sites.

*Camponotus*, Week 1, total of 33, ranging from 1–15 over 5 sites and Week 2, a total of 178 ranging 6–172 over 2 sites.

*Doleromyrma*, Week 1, a total of 17, ranging from 5–12 over 2 sites and Week 2, a total of 7 ranging from 3–4 over 2 sites.

*Tapinoma*, Week 1, none were collected; Week 2, a total of 9 ranging 2–7 over 2 sites.

*Meranoplus*, Week 1, none were collected; Week 2, a total of 2 from 2 sites were collected.

*Rhytidoponera* are large solitary foragers and do not interact very strongly with other ants. During Week 1, two *Rhytidoponera* were found at one site (KES 003), and not found in any micro-pit of Week 2. Nine were found in the macro-pits at three sites KES 003, KES 007 and KES 008 during Week 1 and at two sites KEN 001 and KEN 008 during Week 2.

*Camponotus* and *Rhytidoponera* (an opportunistic genus), during Week 1 in the macro-pits, greatly exceeded the numbers caught in the micro-pits, 54 and 24 respectively. *Camponotus* was only captured at 7 sites in the micro-pits but when the macro-pits were counted, it occurred at 13 of the 16 sites. This could be a size factor. *Melophorus* (a warm weather specialist), during Week 1, totalled 269, ranging from 2–92 over 8 sites and during Week 2, a warmer time, a total of 325 were collected, ranging from 4–104 over 7 sites.

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