FAUNA

ANTS IN YOUR REMNANT

by
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and
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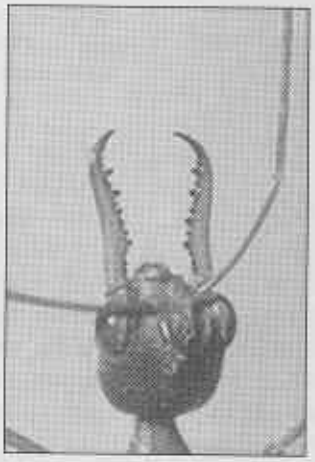
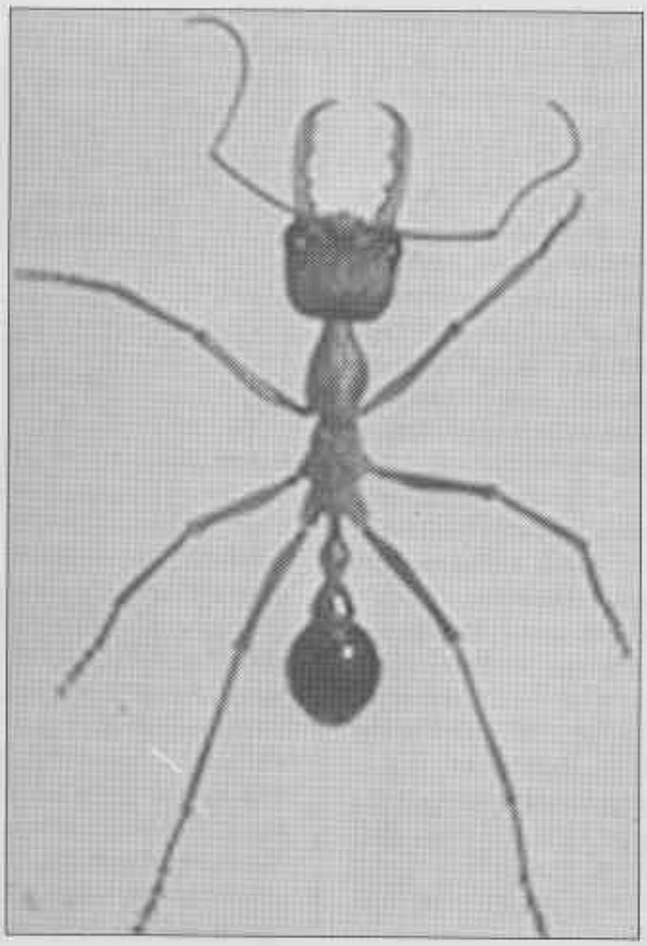
THE wide variety of invertebrates which occur in any bush remnant were discussed in the first issue of Western Wildlife (WW1/1, pp 4-5). If you took ALL of the animals, from the smallest mite to the largest kangaroo, from any area of bush and weighed them, you would be surprised to find the invertebrate animals collectively weighed more than all of the birds, mammals, reptiles and amphibians in that area. Their diversity is just as impressive - invertebrate animals make up over 99 per cent of all the terrestrial animal species.

One group of invertebrates, however, consistently attracts our attention and leads to the greatest number of enquiries - the ants (family Formicidae). Along with bees and wasps, ants are members of the insect order Hymenoptera ('narrow waisted insects'). The name of this order is particularly applicable to ants, since members of this family always have one or two reduced waist segments, unlike bees and nearly all wasps.



▲ *Close up of a bulldog ant head, showing the powerful, toothed mandibles characteristic of this genus.*

▼ *A large bulldog ant (Myrmecia sp.).*



Ants are true social insects. Most females in an ant colony have forfeited their birthright in order to rear the offspring of their mother. The females which do this are the workers of the colony, and the young that they help rear are actually their siblings. Mathematical biologists have demonstrated that this colonial co-operation is a more efficient strategy for ensuring the spread and survival of the ants' genes than living and attempting to reproduce alone or as breeding pairs. Thus, a typical colony consists of one or more queens, non-reproductive female workers (the recent film "Antz" is incorrect in portraying workers as males!), males and brood. Winged queens are produced when environmental conditions are suitable, and these will mate with males from the same or other colonies. Inseminated females may establish new nests or return to the old colony.

Ants are enormously diverse, ant researchers consider there may be as many as 4000 Australian species. At Curtin University we have pinned specimens of approximately 550 species from Western Australia alone! A previous student at Curtin University, Anne Brandenburg, surveyed the ant fauna of fenced and unfenced remnants in the Kellerberrin district. Anne found 105 species, with 76 species occurring in fenced remnants and 69 occurring in non-fenced sites. Intrusion by livestock had resulted in alteration to the composition of the ant fauna in the unfenced remnants, possibly due to changes in soil and vegetation structure.

As is the case with all other plants and animals, ant species can be classified into different genera. The ants in the remnant study belonged to 17 genera, all of which are typical of what is found in the WA wheatbelt. Readers may wonder how such a high diversity of ants can co-exist in the relatively small remnants which occur on the typical farm. Many mechanisms allow this situation to occur: these include differing diets or feeding strategies, different nesting sites and differing foraging times. The following notes discuss and illustrate interesting ant genera that are commonly found in wheatbelt remnants.

Myrmecia (bulldog or sergeant ants).

Bulldog ants have a very distinctive appearance, being in general large with big eyes and long, menacing mandibles. Bulldog ants are a primitive group, formerly confined to Australia and New

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Caledonia. One species, however, has been introduced to New Zealand by human activities. Many species of bulldog ants have a powerful sting and potent, histamine-laden venom that can seriously affect people who are sensitive to wasp and bee stings. Cases are known where healthy adults have become dangerously ill after being stung, and one Tasmanian woman who had been envenomated died within 15 minutes from a massive allergic reaction. Clearly these are insects worthy of respect.

The greenhead ant (Rhytidoponera metallica).

Rhytidoponera (the greenhead ant and allied species).

Ants belonging to the genus *Rhytidoponera* are common in south western Australia. The iridescent greenhead ant is found throughout much of Australia, and is an important dispersal agent for seeds of native plants. The greenhead and other ants feed greedily on a nutritious appendage (the elaiosome) found on certain plant species. The plants producing the seeds also benefit, since the greenhead ants drag seeds into their nest. In ant nests the seeds are protected from seed predators and adverse weather conditions, while the ants' faeces and dead insect remains provide a fertile seedbed for the emerging seedlings.

A cocktail ant (Crematogaster sp.). There are several common wheatbelt species.

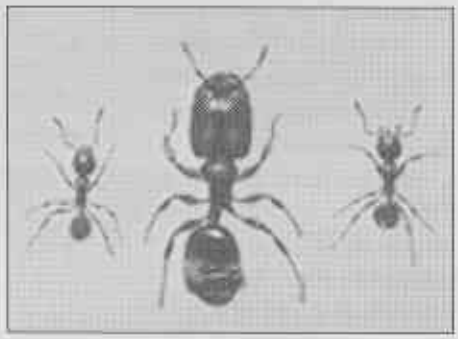
Crematogaster (cocktail ants).

Cocktail ants are commonly seen crawling on trees and dead timber. Other species are soil nesters. All *Crematogaster* ants have a distinctively heart-shaped gaster (the gaster being that part of the abdomen in bees, wasps and ants that looks like the full abdomen of insects in other orders). Species of *Crematogaster* have two reduced waist segments, but are distinct from related ants in that the second segment is attached to the dorsal part of the gaster, rather than to its midline. This feature makes members of this genus readily identifiable under a microscope. When alarmed, cocktail ants raise their gasters above their trunks. They possess a sting but also rely for defence on tacky and noxious exudates from glands in the rear of the gaster.

A small species of Meranoplus. Note the flattened shield on the foreparts.

Meranoplus (no common name).

The very many Australian species of *Meranoplus* possess a characteristic shield that covers the front section of their trunk. Once seen they can be readily recognised on subsequent occasions. Local species often have translucent patches, like windows, near the spiny edges of their shields. When disturbed these ants will retract their legs and antennae into grooves on the body and head capsule respectively. They also curl up and sham death, so that they resemble nothing more than small orange or brown seeds. These adaptations, together with thick hairs, protect them from potential predators (such as other ants). A more northern group of *Meranoplus*, common in the Kimberley and Pilbara regions, are significant seed-harvesters and help to disperse plants like spinifex.

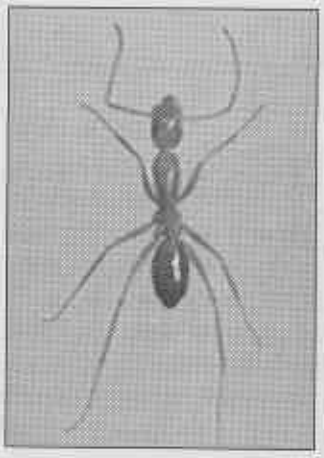


A native species of Pheidole. The middle worker is a major

Pheidole. (no common name)

Species of *Pheidole* are among the most ubiquitous and abundant of Australian ants. All Australian *Pheidole* have two worker casts, a small minor worker and a much larger major worker with a hugely developed head. The inner margin of the mandible also differs: minor workers have alternating large and small teeth or denticles, but the major has a sharp toothless edge like the blade of a pair of scissors. Most ants seen are minor workers, as majors rarely leave the nest. In well-watered wheatbelt townsites, you may see an introduced species of *Pheidole*, the coastal brown ant (*Pheidole megacephala*). This species looks much like the native *Pheidole*, but is a real pest in houses and gardens and it also displaces harmless native ants. Unfortunately, the coastal brown ant is abundant in settled parts of several Australian states, and is widely distributed overseas.

Camponotus claripes marcens; *major worker. This species is commonly found on trees in the Darling Range.*



Camponotus claripes marcens; *minor worker.*

Camponotus (sugar ants and their allies).

The genus *Camponotus* is one of the biggest in Australia with well over 100 Australian species. Most species of *Camponotus* are polymorphic with big-headed majors, smaller minor workers and other workers with features of both majors and minors. *Camponotus* love honeydew, the watery, nectar-like faeces of certain plant-sucking bugs. Moreover, one group of *Camponotus*, the true sugar ants, includes one or two species that will enter houses looking for sweet foodstuffs. They can be a minor nuisance, but more so in the eastern states of Australia where the main species (*Camponotus consobrinus*) occurs. Very large major workers in this genus can be intimidating in appearance, some specimens reaching 2 cm in length. However, they do not possess a sting, and will inflict no more than a sharp nip!

A wheatbelt Melophorus; *minor, major and media workers.*

Melophorus (including some 'honey-pot' ants).

In the heat of a scorching summer's day, when all sensible creatures are taking a siesta, you may see a nest being excavated by shiny brown or reddish ants of different sizes. These will be *Melophorus*. Workers are physiologically adapted to be most active in summer, and in the middle of the day when the heat is at its peak. In this way the members of this genus avoid competition with other ant species. The genus *Melophorus* is confined to Australia, with many of its numerous constituent species still undescribed. Workers of some arid area species of *Melophorus* store honeydew in their gasters, and this part can be greatly distended (the same behaviour is found in other ants in the subfamily to which *Melophorus* belongs). These 'honey-pot' ants have long been a valuable food source for Aboriginal tribes.

A worker of one of the many small Iridomyrmex *species.*

Iridomyrmex (including the meat ants and allied species).

The genus *Iridomyrmex* is arguably the most successful in Australia, with a cluster of species in nearly all temperate habitats. Only in tropical rainforest or in highly disturbed sites are *Iridomyrmex* species likely to be absent or present only in small numbers. The most visible members of the genus are the meat ants, with twelve Australian species. The common meat ant of the WA wheatbelt is *Iridomyrmex greensladei*. Most country dwellers would be familiar with the pebble mounds in which this species lives. Meat ants are highly aggressive, and are important scavengers in the natural environment. Even the meat of kangaroo carcasses can be removed by these voracious insects, though their normal diet is dead insects and honeydew.

This review of a selection of the ant genera found in the wheatbelt indicates that even the smallest remnant can contain fascinating species. Seen under a microscope some ants are as spectacular as any colourful bird or reptile. For example, a small, nondescript-looking black ant (*Dolichoderus ypsilon*) will be found to have a beautiful, glassy, dimpled exoskeleton and red-tipped spines, or a barely visible orange species (*Colobostruma* sp.) sports delicate lacy flanges on its waist segments, like the wings of an embryo aircraft. Equally fascinating are the complex and vital interactions between ants, plants and other animals. By looking after your remnants, you will maintain these components of the ecosystem, and contribute to the conservation of wheatbelt diversity. Although we have written about the ants of these remnants, areas which are diverse in ants tend to support an equally wide array of other invertebrates. So for every interesting story to tell about ants, there are hundreds more to say about the other invertebrates in your remnant.

Acknowledgement: All photos were taken by the late Dr George Lowe

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