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**THE ANTS OF LORD HOWE ISLAND AND  
NORFOLK ISLAND.**

**BY WILLIAM MORTON WHEELER.**

## THE ANTS OF LORD HOWE ISLAND AND<sup>1</sup> NORFOLK ISLAND.<sup>1</sup>

By WILLIAM MORTON WHEELER.

SEVERAL years ago Mr. A. M. Lea, entomologist of the Museum of South Australia, sent me a series of ants which he collected during the autumn of 1915 on Norfolk Island and during the winter of 1915 to 1916 on Lord Howe Island. Although I have published descriptions of some of the new forms which he discovered, pressure of other work has prevented me from reporting on the whole collection. I owe an apology to Mr. Lea and the authorities of the Museum of South Australia for this long delay. Owing to their position in relation to Australia, New Zealand, New Caledonia and the Loyalty Islands, the islands visited by Mr. Lea are of unusual interest to the student of geographical distribution. They are both isolated and of small size, Lord Howe Island being only about six square miles in area and some 400 miles east of Sydney, while Norfolk Island comprises about 13 square miles and lies some 800 miles east of New South Wales. Both have a fine subtropical climate and an abundant vegetation. While Norfolk Island, owing to its proximity to New Zealand, shows greater affinities, at least in its flora and avifauna, to that region, Lord Howe Island has closer faunistic connections with Australia, but both have elements in common with New Caledonia and the Loyalty Islands. Tillyard<sup>2</sup> and other students of the distribution of Australian organisms, conclude that during Upper Cretaceous and early Tertiary times New Zealand must have been connected by a land-mass with Papua and thus acquired the tropical elements of its fauna at the same time that Australia was receiving many organisms from the same source. The present very distinctive facies, however, of the Australian and New Zealand faunas is a result of the development of different climatic conditions in the two regions. According to Tillyard, "in the early Tertiary Australia was taking form as we know it at present, and a dry continental climate had to a great extent developed. New Zealand, on the other hand, though probably more extensive than at the present day, was never large enough to have developed more than comparatively limited areas of land with a continental climate, as in

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<sup>1</sup> Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University. No. 279.

<sup>2</sup> Origin of the Australian and New Zealand Insect Faunas. Rep. Austral. Ass. Adv. Sci. 16, 1923, p. 407-413.

Central Otago. Thus, for the most part, the New Zealand bush still shows clearly enough its tropical origin, and the insects which came in with it have altered but little. In Australia, on the other hand, a very large and typical xerophytic flora and fauna was developed, to which the great majority of Australian insects of the present day belong. It is this fauna, more than any other, which marks off the Australian insects as distinct from all other known faunas, and gives to them their most striking peculiarities."

The so-called "Antarctic" component of the New Zealand and Australian faunas is more obscure. Certain elements of it, even among the ants, reappear in Chile and Patagonia, (e.g. the subgenus *Notomyrmex* and the genera *Acanthoponera* and *Lasiophanes*, the latter closely allied to the New Zealand *Prolasius*), but it is still an open question, I believe, whether this South Polar fauna is not after all of very ancient northern origin. Even the leading Australian authorities hold divergent opinions on this subject.<sup>1</sup> Of course, the problem would be solved if we could accept Wegener's very ingenious hypothesis of the migration of continental areas.<sup>2</sup> There seems to be no reason why we should not continue to use the designation "Antarctic" for the present faunal and floral elements, which are common to Australia, New Zealand, the adjacent islands and southern South America, without necessarily implying that they arose on an Antarctic land-mass and radiated northward into the regions mentioned.

Tillyard recognizes also early (Upper Permian) and late (Upper Triassic) Austro-Gondwanan faunal elements (formerly associated with the *Glossopteris*-flora) as present in Australia but absent from New Zealand. He also distinguishes three components contributed by as many migrations from Antarctica, namely an early (Jurassic), penultimate (Early Tertiary) and last Antarctic, and three Austro-Malayan components: early (Jurassic), middle (Upper Cretaceous to Early Tertiary) and late (Late Tertiary). Of these New Zealand contains elements belonging to the early and penultimate Antarctic and to the early and middle Austro-Malayan, but was isolated before the last Antarctic and late Austro-Malayan invasions. These conditions are shown in the following table borrowed from Tillyard's paper:

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<sup>1</sup> See e. g. H. A. Longman's able essay: "The Zoogeography of Marsupials, with Notes on the Origin of the Australian Fauna. Mem. Queensland Mus. 8, 1923, p. 1-15.

<sup>2</sup> The Origin of Continents and Oceans. Transl. by J. G. A. Skerl, New York, E. P. Dutton & Co., 1922.

Faunal Element	Geologic Period	Australia	New Zealand
1. Early Austro-Gondwanan	Upper Permian	Present	Absent
2. Late Austro-Gondwanan	Upper Triassic	Present	Absent
3. Early Austro-Malayan	Jurassic	Present	Present
4. Early Antarctic	Jurassic	Present	Present
5. West Australian	Cretaceous	Present	Absent
6. Middle Austro-Malayan	Upper Cretaceous to Early Tertiary	Present	Present
7. Penultimate Antarctic	Early Tertiary	Absent	Present
8. Last Antarctic	Middle Tertiary (? Miocene)	Present	Absent
9. Autochthonous (xerophytic)	Tertiary	Present (dominant)	Present (slight)
10. Late Austro-Malayan	Late Tertiary	Present	Absent

He concludes that the "insect fauna of New Zealand may rightly be considered as belonging to that of the Australian region, seeing that it has originated from sources which also supplied other parts of that region. New Zealand, however, had little or no access to the Gondwanan faunas which first peopled Australia, nor had she a sufficiently late connection with the north to receive the mass of representatives of the highest groups of insects which poured across into Australia. Nor again, had she sufficient development of large continental areas to allow of the formation of a striking autochthonous fauna of a xerophytic type such as we find in Australia itself. Thus, while we notice in the New Zealand fauna resemblances with that of Tasmania on the one hand, through the unions with Antarctica, and with that of Queensland on the other, through the northward union with Australia and Papua, we must remember that the earliest and latest of the Australian immigrant groups are absent. Though no fossil insects have yet been found in New Zealand, such should certainly occur somewhere in Jurassic or later strata."

With these inferences in mind we may turn to the Formicidæ, whose history as a family of Aculeata goes back certainly to the Cretaceous and probably even to the Jurassic. As data for consideration I append lists of the forms known to occur in New Zealand and in New Caledonia, the Loyalty Islands, Lord Howe Island and Norfolk Island, which presumably represent small surviving fragments of the former land-mass connecting New Zealand with Papua and indirectly with Australia. We fortunately possess an important study of the

ants of New Caledonia and the Loyalty Islands by Emery,<sup>1</sup> from which the following lists are compiled, with such changes as are necessitated by advances in nomenclature. The names of endemic forms are preceded by an asterisk.

#### ANTS OF NEW CALEDONIA.

- \* *Myrmecia apicalis* Emery
- \* *Amblyopone australis nana* Emery
- \* *Chalcoponera fulgens* Emery
- \* *Chalcoponera numeënsis* Ern. André
- \* *Chalcoponera pulchella* Emery
- \* *Chalcoponera acupuncta* Emery
- \* *Euponera* (*Trachymesopus*) *rotundiceps* Emery
- \* *Ponera andrei* Emery
- Ponera truncata elliptica* Forel
- Ponera trigona convexiuscula* Forel
- \* *Leptogenys* (*Lobopelta*) *punctata* Emery
- \* *Leptogenys* (*Lobopelta*) *acutangula* Emery
- \* *Leptogenys* (*Lobopelta*) *acutangula* var. *brevinoda* Emery.
- \* *Prionogenys rouxi* Emery.
- Anochetus punctiventris oceanicus* Emery
- Odontomachus hæmatoda* L.
- Pheidole oceanica* Mayr.
- \* *Pheidole oceanica cavannæ* Emery
- \* *Pheidole variabilis aliena* Emery
- \* *Pheidole mediofusca* Forel var. *croceithorax* Emery
- \* *Pheidole luteipes* Emery
- \* *Pheidole luteipes obvia* Emery
- Pheidole umbonata* Mayr.
- Pheidole xanthocnemis* Emery
- \* *Vollenhovia denticulata* Emery
- Vollenhovia oblonga pedestris* F. Smith
- Monomorium* (*Monomorium*) *floricola* Jerdon
- \* *Monomorium* (*Notomyrmex*) *tricolor* Emery
- \* *Monomorium* (*Notomyrmex*) *croceiventre* Emery
- \* *Monomorium* (*Notomyrmex*) *nelleum* Emery
- \* *Monomorium* (*Notomyrmex*) *aper* Emery
- \* *Monomorium* (*Notomyrmex*) *aper* var. *dubium* Emery

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<sup>1</sup> Les Fourmis de la Nouvelle Calédonie et des Iles Loyalty, in F. Sarasin and J. Roux, Nova Caledonia. Zool. 1, 1914, p. 393-435, 1 pl.

- \* *Monomorium (Chelancer) forcipatum* Emery.
- \* *Monomorium (Chelancer) longipes* Emery  
*Solenopsis geminata rufa* Jerdon
- \* *Oligomyrmex corniger sodalis* Emery
- \* *Lordomyrma caledonica* Ern. André
- \* *Promecranoplus rouxi* Emery
- \* *Meranoplus levillei* Emery
- \* *Prodicroaspis sarasini* Emery.  
*Tetramorium pacificum subscabrum* Emery  
*Tetramorium simillimum* F. Smith  
*Tetramorium guineense* Fabr.
- \* *Tetramorium guineense macrum* Emery.
- \* *Xiphomyrmex tenuicrinis* Emery
- \* *Orectognathus antennatus* F. Smith var. *sarasini* Emery  
*Strumigenys godeffroyi* Mayr.
- \* *Dolichoderus (Hypoclinea) tricolor* Emery  
*Leptomyrmex pallens* Emery
- \* *Leptomyrmex pallens* var. *geniculatus* Emery
- \* *Leptomyrmex pallens* var. *nigriceps* Emery
- \* *Iridomyrmex calvus* Emery
- \* *Iridomyrmex obsidianus* Emery
- \* *Iridomyrmex anceps papuanus* Emery var. *neocaledonicus* Emery
- \* *Iridomyrmex glaber sommeri* Forel  
*Iridomyrmex glaber sommeri* var. *ianthinus* Emery  
*Tapinoma melanocephalum* Fabr.  
*Technomyrmex albipes* F. Smith  
*Anoplolepis longipes* Jerdon  
*Plagiolepis foreli* Santschi var. *ornata* Santschi  
*Paratrechina (Paratrechina) longicornis* Latr.  
*Paratrechina (Nylanderia) caledonica* Forel.
- \* *Paratrechina (Nylanderia) foreli* Emery
- \* *Paratrechina (Nylanderia) foreli* var. *nigriventris* Emery  
*Paratrechina (Nylanderia) obscura* Mayr. var.  
*Paratrechina (Nylanderia) vaga* Forel  
*Camponotus (Tanæmyrmex) irritans chloroticus* Emery
- \* *Camponotus (Tanæmyrmex) irritans croceomaculatus* Emery  
*Camponotus (Tanæmyrmex) variegatus novæhollandiæ* Mayr. var.
- \* *Camponotus (Tanæmyrmex) gambeyi* Emery
- \* *Camponotus (Tanæmyrmex) gambeyi marthæ* Emery
- \* *Camponotus (Tanæmyrmex) hoplites* Emery
- \* *Camponotus (Colobopsis) rufifrons* F. Smith var. *leucopus* Emery

- Camponotus (Colobopsis) sommeri* Forel
- \* *Camponotus (Colobopsis) camelus* Emery
- \* *Camponotus (Myrmamblys) pulchellus* Forel
- Polyrhachis (Chariomyrma) guerini* Roger

## ANTS OF THE LOYALTY ISLANDS.

- Odontomachus hæmatoda* L.
- Phcidole oceanica* Mayr.
- Phcidole xanthocnemis* Emery
- Monomorium floricola* Jerdon
- \* *Rogeria stigmatica sublevinodis* Emery
- Tetramorium pacificum subscabrum* Emery
- Tetramorium simillimum* F. Smith
- Tetramorium guineëse* Fabr.
- Leptomyrmex pallens* Emery
- Tapinoma melanocephalum* Fabr.
- Technomyrmex albipes* F. Smith
- Plagiolepis foreli* Santschi var. *ornata* Santschi
- Paratrechina (Paratrechina) longicornis* Latr.
- Paratrechina (Nylanderia) caledonica* Forel
- Paratrechina (Nylanderia) vaga* Forel
- Camponotus (Tanæmyrmex) irritans chloroticus* Emery
- Camponotus (Colobopsis) sommeri* Forel
- Polyrhachis (Chariomyrma) guerini* Roger

## ANTS OF LORD HOWE ISLAND.

- \* *Amblyopone australis cephalotes* F. Smith var. *howensis* Wheeler
- \* *Amblyopone læa* Wheeler
- Ponera pallidula* Emery
- \* *Monomorium (Notomyrmex) howense* Wheeler
- Monomorium (Lampromyrmex) lææ fraterculus* Santschi
- \* *Lordomyrma læa* Wheeler
- Tetramorium guineëse* Fabr.
- \* *Orectognathus antennatus* F. Smith var. *howensis* Wheeler
- Strumigenys læa* Forel
- Iridomyrmex glaber sommeri* Forel var. *ianthinus* Emery
- Technomyrmex albipes* F. Smith
- Paratrechina (Nylanderia) obscura* Mayr.
- Paratrechina (Nylanderia) minutula* Forel
- \* *Camponotus (Colobopsis) howensis* Wheeler

## ANTS OF NORFOLK ISLAND.

- \* *Amblyopone australis cephalotes* var. *norfolkensis* Wheeler
- \* *Ponera læ oculata* Wheeler
- \* *Ponera mina* Wheeler
- \* *Phcidole ampla norfolkensis* Wheeler
- \* *Monomorium* (*Notomyrmex*) *sanguinolentum* Wheeler
- Monomorium* (*Lampromyrmex*) *læve fraterculus* Santschi
- \* *Cardiocondyla nuda nercis* Wheeler.
- Tetramorium guincense* Fabr.
- \* *Tetramorium antipodum* Wheeler
- Strumigenys læ* Forel
- \* *Iridomyrmex albitarsus* Wheeler
- Paratrechina* (*Nylanderia*) *vaga* Forel

## ANTS OF NEW ZEALAND.

- \* *Amblyopone australis cephalotes* F. Smith
- \* *Stigmatomma* (*Fulakora*) *saundersi* Forel
- \* *Discothyrea antarctica* Emery
- \* *Acanthoponera brouni* Forel
- \* *Acanthoponera brouni kirki* Wheeler
- \* *Euponera* (*Mesoponera*) *castanea* Mayr
- \* *Ponera antipodum* Forel
- \* *Huberia brouni* Forel
- \* *Huberia striata* F. Smith
- \* *Huberia striata* var. *rufescens* Forel
- \* *Monomorium* (*Notomyrmex*) *antarcticum* White
- \* *Monomorium* (*Notomyrmex*) *antipodum* Forel
- \* *Monomorium* (*Notomyrmex*) *integrum* Forel
- \* *Monomorium* (*Notomyrmex*) *nitidum* F. Smith
- \* *Monomorium* (*Notomyrmex*) *smithi* Forel
- \* *Monomorium* (*Notomyrmex*) *succineum* Stitz
- \* *Monomorium* (*Notomyrmex*) *suteri* Forel
- Technomyrmex albipes* F. Smith
- \* *Orectognathus antennatus* F. Smith
- \* *Strumigenys perplexus* F. Smith
- Paratrechina* (*Paratrechina*) *longicornis* F. Smith
- \* *Prolasius advena* F. Smith
- \* *Camponotus* (*Colobopsis*) *zealandicus* F. Smith

The following table gives a summary of the number of forms and genera and the percentage of endemism in the islands under consideration:



Islands	No. of Forms	No of Endemic Forms	Percent- age of Endemism	No. of Genera	No. of Endemic Genera
New Caledonia	78	50	64%	32	2
Loyalty Islands	18	1	5.5%	12	0
Lord Howe Island	14	6	44%	11	0
Norfolk Island	12	9	75%	9	0
New Zealand	23	21	91%	14	1

It will be observed that the percentage of endemic species, subspecies and varieties is very high in all the islands, except the Loyalties, which have a fauna consisting largely of vagrant, or "tramp" species like other small Pacific archipelagoes such as the Cook and Society Islands. The great number of forms in New Caledonia, as compared with the much larger land-mass of New Zealand, is obviously due to its situation within the tropics and its proximity to the rich Papuan region, and the endemism of Lord Howe Island is lowered by its proximity to Australia. New Zealand presents an astonishing endemism, since only two of its 23 forms (*Paratrechina longicornis* and *Technomyrmex albipes*) are tropical vagrants. Generic endemism, however, occurs only in New Caledonia and New Zealand, the former having two peculiar genera, *Promeranoplus* and *Prodicroaspis* and one subgenus, *Chelaner*, the latter only one genus, *Huberia*, which is closely related to *Monomorium*.

When we examine the foregoing lists more carefully and compare them on the one hand with the fauna of Australia, from which nearly 1000 species, subspecies and varieties of ants have been described, and on the other hand with the fauna of the Papuan region, from which more than 700 forms are known, we are impressed by the extreme meagreness of the five insular faunas and by the absence of any representatives of a number of the large or dominant Australian and Papuan genera. The insular faunas under consideration are, therefore, as noticed by Emery in the case of New Caledonia, mainly "remarkable on account of their negative characters." Three whole subfamilies of ants, the *Cerapachyinae*, *Dorylinae* and *Pseudomyrmicinae*, are not represented. There are, moreover, no species of the outstanding Australian genera *Rhytidoponera*, *Onychomyrmex*, *Bothroponera*, *Crematogaster*, *Podomyrma*, *Stigmaeoceros*, *Notoncus*, *Notostigma* and *Melophorus* (I do not agree with Emery in regarding the New Zealand *Prolasius* as a subgenus of *Melophorus*), nor of the equally prominent

Papuan genera *Diacamma*, *Trapeziopelta*, *Crematogaster*, *Pheidologeton*, and *Podomyrma*. There is, perhaps, some doubt as to whether the large Australian genus *Myrmecia* is really represented in New Caledonia, the provenience of *M. apicalis* Emery having been questioned, and *Polyrhachis querini*, which occurs both in New Caledonia and the Loyalty Islands is probably of recent introduction from Australia, where it and several other allied species of the subgenus *Charomyrma* occur. But the most striking negative character of the faunas of New Caledonia, the Loyalty Island, Lord Howe Island, Norfolk Island and New Zealand is the complete absence of any species of *Crematogaster*, because this genus is cosmopolitan and represented by a great number of forms throughout the tropics, especially in the Ethiopian region (88 species). For some unknown reason, however, species of *Crematogaster* are apt to be scarce or absent on islands. Madagascar is an exception, with 21 species, but there are few species in the Antilles, Canary Islands, Philippines and Japan and none in the Galapagos and most of the small islands of the Pacific. Although one of our common North American species, *C. lineolata* Say occurs as far north as Nova Scotia, the common European *C. scutellaris* Oliv. is confined to the Mediterranean littoral and is known from Great Britain only as an accidental importation in virgin cork from Spain (See Donisthorpe's "British Ants, 2nd ed. 1927, p. 388).

#### FAMILY FORMICIDÆ.

##### SUBFAMILY PONERINÆ.

1. *Amblyopone australis* Erichson subsp. *cephalotes* F. Smith var. *norfolkensis* Wheeler.

Wheeler, Proc. Amer. Acad. Arts. Sc. 62, 1927, p. 15, ♀.

Twenty-five workers from Norfolk Island.

2. *Amblyopone australis* subsp. *cephalotes* var. *howensis* Wheeler.

Wheeler, Proc. Amer. Acad. Arts. Sc. 62, 1927, p. 15, ♀ ♀ ♂.

Thirteen workers, six females and a male from Lord Howe Island.

3. *Amblyopone leæ* Wheeler.

Wheeler, Proc. Amer. Acad. Arts. Sc. 62, 1927, p. 16, fig. 3 ♀.

Twenty-four workers from Lord Howe Island.

4. *Ponera pallidula* Emery.

A single worker from Lord Howe Island. This species was origin-

ally described from New Guinea and has been taken more recently by Dr. W. M. Mann in the Solomon Islands. To it also Emery doubtfully refers a female specimen from Luzon, in the Philippines.

5. *Ponera leæ* Forel subsp. *oculata* subsp. nov. (Fig. 1.)

*Worker*. Length 2.2 mm.

Differing from the typical form of the species from Tasmania in the somewhat longer scapes and in possessing very minute but distinct eyes, consisting of a few crowded, pigmented ommatidia placed at the anterior sixth of the sides of the head. The angle between the base and declivity of the epinotum is somewhat more rounded and the declivity is more sloping. The color is more uniformly brownish red and the punctuation of the thorax and abdomen somewhat finer so that the surface is a little more shining.

*Female* (deälated). Length 2.7 mm.

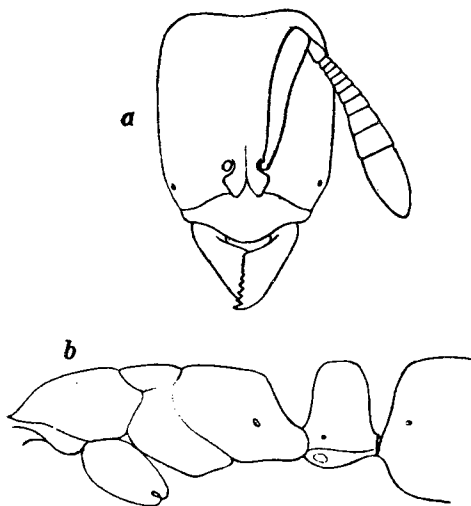


FIGURE 1. *Ponera leæ* Forel subsp. *oculata* subsp. nova. Worker; a, head, b, thorax and petiole in profile.

Resembling the worker. Eyes very small, flattened, less than one-fifth as long as the sides of the head, placed about two-thirds their length from its anterior corners. Thorax long and narrow, rather depressed dorsally though more convex in the mesonotal region, narrower than the head. Mesonotum trapezoidal, broadest in front,

slightly broader than long, not longer than the pronotum with the neck, its anterior border straight; epinotum shaped much as in the worker, petiole distinctly higher and narrower above, with a more distinct ventral convexity, the latter with a small circular translucent fenestra near its anterior end.

Sculpture much as in the worker but the punctuation, especially on the gaster, coarser. Pubescence covering the body also longer and more distinct. Head, thorax and gaster reddish brown, tip of gaster, mandibles, antennæ and legs brownish yellow.

Three workers and one female from Norfolk Island. I possess three workers and a female of the typical *lex* from Tasmania, obviously part of the cotype series. As Forel says, the worker of this form is blind though one of my specimens has unpigmented pits in the place of the minute pigmented eyes of the subsp. *oculata*. The female (undescribed) is deâlated and has slightly smaller eyes and a distinctly darker color than the subspecies, the head, thorax and bases of the gastric segments being dark brown. It also possesses the peculiar fenestra at the anterior end of the ventral protuberance of the petiole.

6. *Ponera mina* sp. nov. (Fig. 2.)

*Worker.* Length 1.8–2 mm.

Head about a fifth longer than broad, slightly broader behind the middle than in front, with rather convex sides and broadly and feebly concave posterior border. Eyes very minute, consisting of 3 or 4 ommatidia placed about at the anterior sixth or seventh of the head. Mandibles triangular, their apical longer than their basal borders, the apical half of the former bearing six rather stout, unequal teeth, the first and third (from the tip) much larger than the four others. Clypeus short, bluntly carinate in the middle behind, rather convex on the sides, the anterior border entire, feebly advanced in the middle. Frontal carinæ well-developed, subtriangular, with ciliate borders. Frontal groove very distinct, continued back somewhat beyond the middle of the head. Antennæ rather stout, scapes enlarged towards their tips and not reaching the occipital border of the head by a distance more than equal to their greatest diameter; funiculi decidedly thickened at the tip to form an indistinctly 5-jointed club; funicular joints 2–6 transverse, twice as broad as long, 7 to 10 about one and one-half times as broad as long, the terminal joint large, about as long as the four preceding joints together. Thorax with very strongly marked promesonotal and mesoëpinotal sutures, narrowed behind and flattened on the sides; in profile feebly convex in the region of the pro-

and mesonotum, the epinotum a little lower, the base straight, distinctly longer than the sloping declivity with which it forms a distinct obtuse angle, the sides of the declivity not marginate. Mesosterna not dentate; pronotum from above semicircular in front, about one and one-half times as broad as long, its posterior border broadly concave; mesonotum somewhat more than half as long as the pronotum, transversely elliptical, with about the same proportion of width to length as the pronotum, epinotum not longer than broad, subcuboidal.

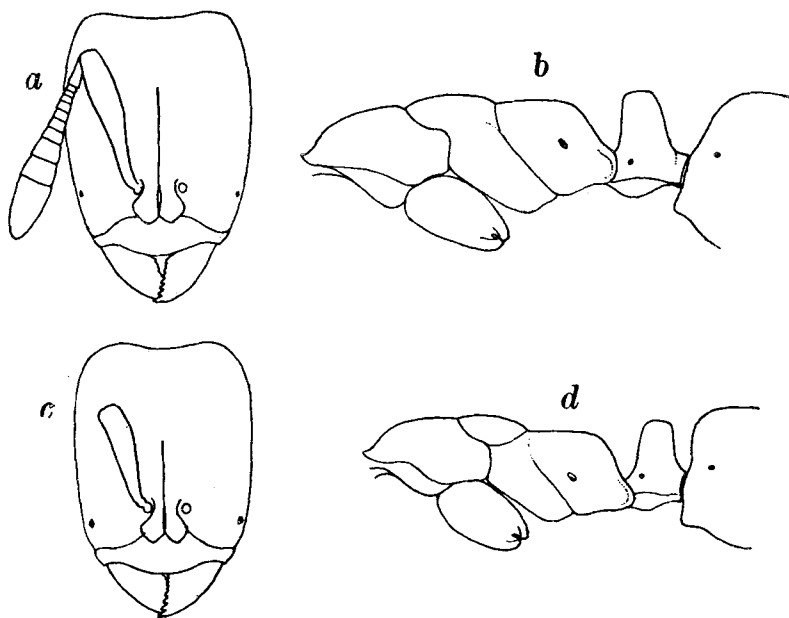


FIGURE 2. *Ponera minn* sp. nov. a, head of worker; b, thorax and petiole of same in profile; c, head of ergatomorphic male; d, thorax and petiole of same.

Petiole only slightly broader than the epinotum, from above twice as broad as long, rounded in front, straight behind; the node in profile higher than the epinotum, about twice as high as long at the base, distinctly narrowed above, with flat, truncated anterior and posterior surfaces and convex, rounded summit; the ventral surface protruding and convex. Postpetiole somewhat broader than long, its anterior surface strongly truncated; the constriction between the postpetiole and first gastric segment pronounced. Legs rather slender.

Shining; mandibles sparsely punctate; head finely and more densely punctate but nevertheless very shining, remainder of body even more finely and densely punctate, but all of the punctures very shallow and superficial.

Hairs and pubescence pale yellow, the hairs only on the clypeus and tip of the gaster, the pubescence very short and dilute, except on the sides of the head and on the gaster, where it is long and dense but does not conceal the shining surface; extremely fine and inconspicuous on the scapes and legs.

Head and first gastric segment dark brown, thorax, petiole and postpetiole paler, reddish brown; mandibles, clypeus, cheeks, appendages and gaster brownish yellow.

*Female.* Length about 3 mm.

Resembling the worker. Head shorter and broader, more subrectangular. Eyes rather small and flat and situated about half their length from the anterior corners of the clypeus. Thorax through the wing-insertions narrower than the head. Mesonotum with rounded anterior border; epinotum more rounded in profile than in the worker, its two surfaces subequal. Petiolar node more compressed, especially towards the summit.

Sculpture and pilosity similar to those of the worker, but there are short, erect, scattered hairs on all the gastric segments and the pubescence on the whole body is longer and denser, so that the surface is more opaque.

Color deeper than in the worker, the dorsal surface of the thorax and all the abdominal segments, including the petiole, except their posterior borders, dark brown. The middle portions of the femora are also infuscated. Wings whitish hyaline, with pale brown veins and pterostigma.

*Male.* Length about 2.5 mm.

Highly ergatomorphic and closely resembling the male of *P. punctatissima* Roger. Head considerably larger than in the worker, broader, more flattened and more nearly oblong, the posterior border more concave. Mandibles more convex, with coarser teeth, clypeus more advanced in the middle and more sinuate on the sides, not carinate but with a blunt elevation behind. Frontal groove extending only to the middle of the head. Eyes larger, deeply pigmented, but consisting of only four ommatidia. Antennal scapes much shorter, reaching only to the posterior third of the head, the funiculi consisting of 11 joints as in the worker. Thorax like that of the worker but the epinotum much more rounded and the mesonotum subcircular and

only slightly broader than long. Petiole and gaster as in the worker.

Sculpture and pilosity as in the female, but the pubescence on the gaster even longer.

Pale yellow, gaster whitish; antennal funiculi slightly reddish.

Described from 9 workers, 16 females and a single male taken from one colony on Norfolk Island. Many of the females are immature and the male, though its integument is completely hardened, seems not to have developed the adult coloration.

I have described this species as new, because it is quite different from any of the known Australian or East Indian species. It resembles *confinis* Roger, but the head is narrower behind, the scapes are shorter, the funiculi have more pronounced clubs, the mandibles are broader, the profile outline of the thorax is different and the petiole is thicker.

SUBFAMILY MYRMICINÆ.

7. *Pheidole ampla* Forel subsp. *norfolkensis* subsp. nov. (Fig. 3.)

*Soldier*. Length 3.8–4 mm.

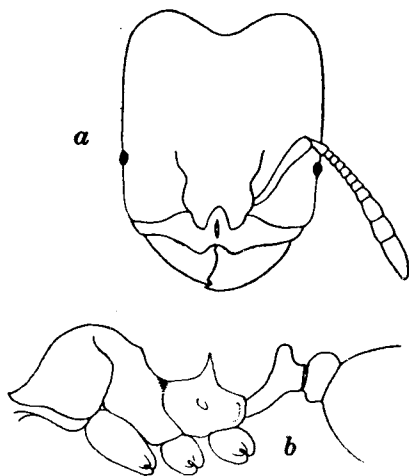


FIGURE 3. *Pheidole ampla* Forel subsp. *norfolkensis* subsp. nov. *a*, head of soldier; *b*, thorax and pedicel of same in profile.

Very similar to the soldier of the var. *parallela* Forel of New South Wales and Victoria but smaller (the latter measures 4.7–5.3 mm.). The sides of the head are straight and parallel as in that form but the

eyes are a little smaller, the epinotal spines distinctly stouter and more erect, the lateral conules of the postpetiole less acute, the pilosity is distinctly more abundant and on the head much shorter. The scapes reach the middle of the head as in *parallela* and the sculpture and color are the same.

*Worker.* Length about 1.5 mm.

Decidedly smaller than the worker of *parallela* which measures 2.6-2.7 mm. In mature specimens the body is fuscous (sordid yellow in *parallela*), with pale yellow mandibles, antennae and legs. The head is slightly longer than broad, rugulose only on the cheeks, and the antennal scapes extend one-fourth their length beyond the posterior corners of the head (one-fifth in *parallela*). The pilosity is somewhat more abundant.

Eleven soldiers and ten workers from Norfolk Island. This form is smaller than any of the described forms of the species, *ampla* sens. str., and Forel's varieties *garrensis*, *parallela*, *mackayensis* and *parviceps*, although the length of the soldier of *parviceps* is only 4.2 mm. I am inclined to believe that these varieties should be raised to sub-specific rank.

8. *Monomorium (Notomyrmex) sanguinolentum* sp. nov. (Fig. 4.)

*Worker.* Length 4.5-5.3 mm.

Head subrectangular, as broad as long, or in some individuals slightly longer than broad, as broad behind as in front, with rather convex sides and posterior corners and very feebly concave posterior border, convex above and behind. Eyes rather small and flat, placed very near the middle of the sides of the head. Mandibles convex at the base, more flattened apically, their apical borders not very oblique, 5-toothed, the two terminal teeth large. Clypeus convex in the middle, not very distinctly bicarinate and the carinae do not terminate in teeth at the anterior border, which is feebly and broadly sinuate in the middle, more deeply on each side. Frontal area deeply impressed, indistinctly outlined posteriorly; frontal groove obsolete. Antennae 12-jointed, slender; scapes not attaining the posterior border of the head by about twice or three times their greatest diameter; funicular joints 2-5 somewhat broader than long, 6 and 7 somewhat longer, the three terminal forming an indistinct club, the last joint as long as the two preceding together. Thorax narrower than the head, the pro- and mesonotum together convex and rounded, hemispherical, the mesoepinotal impression deep and acute; epinotum with base horizontal and nearly straight in profile and about one and two-



thirds times as long as the concave, sloping declivity; the posterior corners of the base forming strong, broad, blunt and somewhat flattened teeth; the metasternal angles large and rectangular. Petiole pedunculate, the node is profile abrupt, as high as the epinotum and longer than the peduncle, from above transverse, fully twice as broad as long, rounded in front, flattened behind, the superior border straight or even slightly concave in the middle. Postpetiole little if any broader than the petiolar node and fully as high; convex, transversely elliptical, twice as broad as long. Gaster oval, larger than the head, very convex above. Legs rather long, femora distinctly thickened in the middle.

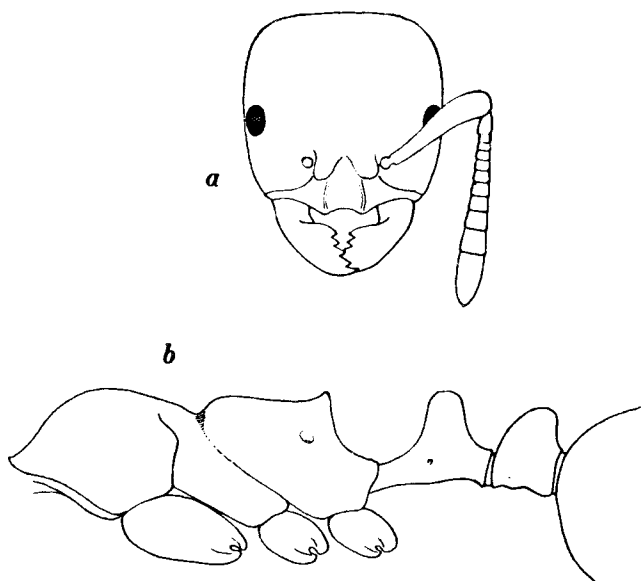


FIGURE 4. *Monomorium* (*Notomyrmex*) *sanguinolentum* sp. nov. Worker. *a*, head; *b*, thorax and pedicel of same.

Very smooth and shining; mandibles subopaque, coarsely punctate-striate, smoother and more shining at the base. Clypeus smooth between the carinae, longitudinally rugulose on the sides. Cheeks sharply longitudinally rugose, a few of the rugae passing around the posterior ends of the antennal foveae and meeting with a few radiating rugae on each side of the frontal area. Mesoöpinotal impression with a series of short, longitudinal rugae; meso- and metapleurae more finely

longitudinally rugulose, epinotal declivity transversely rugose. Remainder of body very smooth with sparse and exceedingly minute, piligerous punctures.

Hairs white, coarser on the abdomen than on the head and thorax, long, moderately abundant and of uneven length, erect or suberect on the body, much shorter and appressed on the appendages.

Blood-red; gaster, nodes of pedicel, scapes, epinotal teeth and metasternal angles and in many specimens also the head, black; mandibles, funiculi and legs, except the coxae and trochanters reddish brown, tarsi paler, the femora and tibiae blackish in the middle. In a number of specimens the head is intermediate between blood-red and black, with a large yellowish inverted V- or Y-shaped spot on the front.

*Male.* Length 5-5.5 mm.

Head decidedly broader than long, with obliquely truncated posterior corners and straight posterior border. Eyes and ocelli rather small, the former about two-fifths as long as the head, not very convex, situated about one-third their length from the anterior corners of the head. Mandibles 4-toothed. Clypeus convex, with entire, rounded anterior border. Antennae long, scapes nearly four times as long as broad, first funicular joint as long as broad, not swollen, remaining joints cylindrical, twice as long as broad, except the last, which is longer. Thorax a little narrower than the head, the mesonotum convex in front, depressed behind, without Mayrian furrows, the scutellum large and very protuberant, with emarginate posterior border, overhanging the epinotum, which is small and low, with subequal base and declivity and the teeth even longer and more acute than in the worker. Petiole and postpetiole similar to those of the worker, but the nodes are lower and that of the petiole has a gradual, straight anterior slope. Gaster and legs of the usual shape.

Shining; mandibles subopaque and like the head, mesonotum and scutellum finely and evenly longitudinally rugulose, the rugules between the ocelli and on the occiput transverse; pleurae less sharply rugulose.

Pilosity brownish, sparser than in the worker, especially on the head and thorax, longer on the venter than on the dorsum of the gaster, fine, even and oblique on the legs.

Black; mandibles, legs, external genital valves and antennae brown; wings distinctly brownish with pale brown veins and pterostigma.

Described from numerous workers and eight males from Norfolk Island.

This handsome species approaches the Australian *M. rubriceps*

Mayr but is larger, with more convex pro- and mesonotum, deeper and more acute mesoepinotal constriction, much more pronounced epinotal teeth, and the summits of the petiolar and postpetiolar nodes are more transverse, the basal joints of the antennal funiculi much longer in proportion to the width, etc.

9. *Momomorium* (*Notomyrmex*) *howense* sp. nov. (Fig. 5.)

*Worker.* Length 2-2.3 mm.

Head subrectangular, distinctly longer than broad, as broad in front as behind, with feebly sinuate posterior and nearly straight lateral borders. Eyes rather small, a little in front of the middle of the sides. Mandibles narrow, with oblique, acutely 5-toothed apical borders. Clypeus projecting in the middle, sinuately emarginate on each side

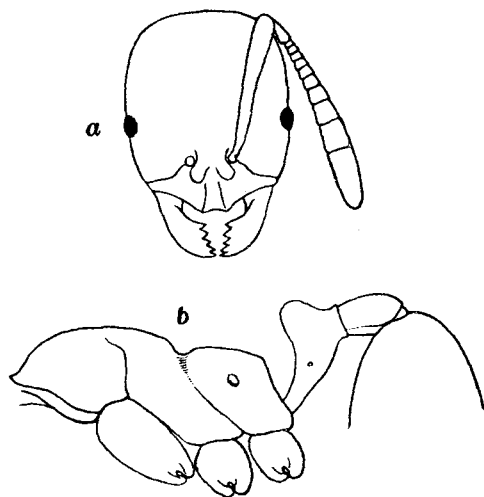


FIGURE 5. *Monomorium* (*Notomyrmex*) *howense* sp. nov. Worker. *a*, head; *b*, thorax and pedicel of same in profile.

and narrowly emarginate in the middle, with two longitudinal ridges that are not prominent and do not terminate in distinct teeth anteriorly. Frontal carinae short; frontal area distinct; frontal groove obsolete. Antennae slender, 12-jointed, nearly reaching the posterior border of the head; first funicular joint as long as the four succeeding joints together, which are transverse; joints 6-8 also transverse; club distinctly 3-jointed, its two basal joints longer than broad, together shorter than the terminal joint. Thorax rather slender, pro- and

mesonotum moderately and evenly convex, narrowed behind to the mesoëpinotal constriction which is distinct and acute but not very deep. Epinotum with subequal base and declivity, both sloping and meeting in profile at a scarcely dentate, obtuse angle, the surface of the declivity longitudinally impressed. Petiole large distinctly pedunculate anteriorly with high, conical, laterally compressed node. Postpetiole scarcely broader than the petiole, fully one and one-half times as long as broad, very low and evenly rounded above. Gaster rather large, legs short.

Smooth and shining; mandibles with numerous small punctures, head and thorax with minute, scattered, piligerous punctures; sides of epinotum below longitudinally, declivity transversely rugulose.

Hairs yellowish, sparse, erect or suberect, of unequal length on the body, shorter, more numerous and oblique on the appendages.

Reddish yellow; head, gaster, mandibles, antennæ and legs paler yellow; the thorax and pedicel usually a little darker than the remainder of the body; mandibular teeth and incisures of antennal joints dark brown.

*Female* (ergatoid). Length 2.6 mm.

Like the worker but with shorter and broader head, somewhat larger eyes and three small widely separated ocelli. First gastric segment sometimes with a broad, transverse brown band near its posterior border. The postpetiole is also more convex above than in the worker.

*Female* (deälated). Length 3.4 mm.

Resembling the ergatoid female, except in the greater size and the structure of the thorax. Eyes scarcely larger, but the ocelli pigmented and closer together. Postpetiole much more convex above. Head scarcely longer than broad, the antennal scapes extending beyond the posterior corners. Thorax short, mesonotum but little longer than broad, epinotum abrupt, bluntly subdentate in profile. Color as in the worker and ergatoid, but posterior borders of gastric segments more or less infuscated. Wing-insertions blackish.

Described from numerous workers, five deälated and two ergatoid females from Lord Howe Island.

This species is distinct from any of the Australian, New Zealand or New Caledonian forms of the genus. Its closest relative is *M. leæ* Forel of Tasmania, but this has a much more rounded though equally projecting clypeal lobe, the postpetiole is much broader in proportion to its length and much more convex and the color is considerably darker.

10. *Monomorium (Lampromyrmea) lae* Mayr subsp. *fraterculus* Santschi.

Numerous workers taken by Mr. A. M. Lea on both Norfolk Island and Lord Howe Island. In the latter locality they were nesting under the leaf axils of *Kentia* palms. The subspecies *fraterculus* was recently described from Townsville, Queensland from specimens collected by Mr. F. P. Dodd. I find in my collection and in that of the Museum of South Australia a number of specimens undoubtedly belonging to the cotype series. Very probably this ant has been recently introduced into the two islands by commerce from Australia, where the typical *lae* and its subspecies *nigrius* Forel, *broomense* Forel and *fraterculus* are not uncommon.

11. *Cardiocondyla nuda* Mayr subsp. *nercis* subsp. nov.

*Worker.* Length 1.3–1.4 mm.

Like the var. *minutior* Forel of Hawaii in size but more like the var. *atalanta* Forel of Northwest Australia in sculpture. The body is shining, the head, except its posterior border, more subopaque. This difference as compared with the typical form of the species and the subsp. *mauritanica* and the var. *minutior* is due to the much finer and more superficial punctuation on the thorax and abdomen. Humeral angles rather blunt; epinotal teeth longer, more slender and more acute than in the forms mentioned; both the peduncle and node of the petiole more slender, the latter more compressed laterally and rising more gradually from the peduncle, and therefore appearing much narrower in proportion to the postpetiole, which is a third again as broad as long. Brownish red to reddish brown, gaster dark brown or black; antennæ, legs and mandibles yellow; clubs of funiculi fuscous or black.

*Female.* Length 1.7–1.8 mm.

Head, thorax and pedicel nearly opaque, more coarsely and densely punctate than in the worker and dark brown. Epinotal teeth blunt, twice as long as broad at their bases; postpetiole twice as broad as long, broadly excised in front. Wings white, with colorless veins and pterostigma.

Described from seventeen workers and five females taken on Norfolk Island.

This form approaches *C. emeryi* Forel in the length of the epinotal teeth and the eyes though smaller are a little nearer than their length to the anterior border of the head. The color of the head, thorax and pedicel of the worker seems to vary considerably.

12. *Lordomyrma leæ* Wheeler. (Fig. 6.)

Wheeler, Psyche 24, 1919, p. 102, fig. 4, ♀ ♂.

Worker.—Length 3.4–3.6 mm.

Head longer than broad, as broad in front as behind, with rounded sides, nearly straight posterior border and broadly rounded posterior corners. Eyes somewhat in front of the middle of the head, small, elongate, rather flat and oblique. Mandibles rather convex, thin, with straight external borders; apical borders with three large anterior and numerous minute basal teeth. Scrobes shallow, sometimes in-

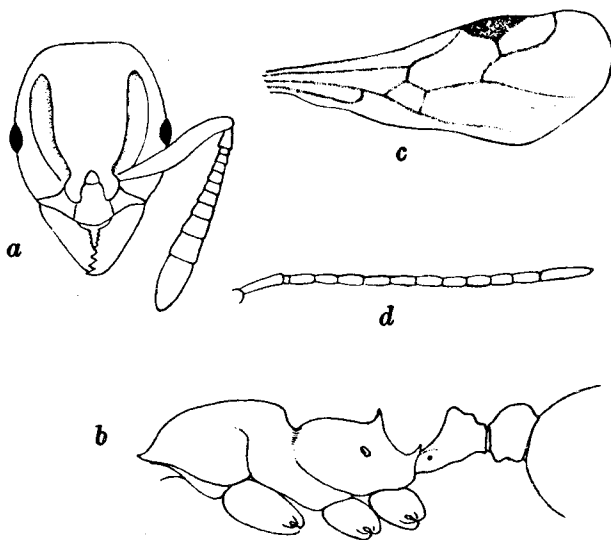


FIGURE 6. *Lordomyrma leæ* Wheeler; a, head of worker; b, thorax and pedicel of same in profile; c, wing, d, antennae of male.

complete behind, about four-fifths as long as the head. Antennal scapes extending to the posterior corners of the head; joints 2–7 of the funiculi narrow but broader than long; ninth and tenth joints distinctly longer than broad, together as long as the terminal joint. Clypeus high and convex in the middle, bluntly bicarinate, its anterior border broadly rounded and entire, feebly sinuate on the sides. Promesonotum gradually narrowed behind, rather straight above in profile, decidedly longer than broad, the humeri subdentate, the mesonotum behind falling abruptly to the pronounced mesoepinotal constriction. Epinotum slightly longer than broad, a little broader

behind than in front, its spines short erect, broad at the base, very acute; metasternal spines slender, acute and like the superior spines directed upward. Base of epinotum in profile feebly convex, longer than the sloping, flattened declivity. Petiole longer than broad, broader behind than in front, its peduncle short, the node in profile angular, its anterior slope slightly concave, its posterior slope slightly convex. Postpetiole broader than long and broader than the petiole, rounded above and on the sides, constricted behind, with a blunt, transverse anteroventral projection. Gaster rather large, somewhat longer than the thorax. Legs not incrassated.

Shining, especially the mandibles, clypeus and gaster. Mandibles sparsely punctate, clypeus smooth, indistinctly rugulose on the sides. Head longitudinally rugose, the rugæ becoming coarsely reticulate on the occipital region. Scrobes and interrugal spaces indistinctly punctate-reticulate. Region of the frontal groove occupied by a smooth shining, longitudinal streak. Thorax, petiole and postpetiole irregularly, their upper surfaces more transversely rugose. Declivity of epinotum smooth and shining. Gaster with sparse, piligerous punctures.

Hairs moderately long and abundant, erect or suberect, yellowish, bristly, covering all parts of the body, shorter and sparser on the scapes, rather dense on the funiculi.

Dark piceous brown; thorax, petiole and postpetiole nearly black; mandibles, clypeus, cheeks, base and tips of gaster, legs, including the coxæ, first joint of funiculi and their clubs reddish brown.

*Male.* Length 3 mm.

Head as broad as long, broadly rounded behind, without posterior corners, somewhat flattened above, with very short cheeks. Clypeus much as in the worker. Pronotum visible from above, not over-arched by the mesonotum, which is as broad as long. Scutellum not very prominent. Epinotum sloping, simple, unarmed. Petiole fully twice as long as high and more than twice as long as broad, parallel-sided. Postpetiole from above broader, nearly square.

Head and thorax subopaque, rather finely and irregularly punctate-rugulose; mesopleuræ, a longitudinal streak on the front of the head, the petiole, postpetiole and gaster smooth and shining, the gaster with fine sparse piligerous punctures.

Hairs finer and more oblique than in the worker, very numerous on the antennæ and wings, which are unusually pubescent.

Dark piceous brown, nearly black; legs and antennæ paler; clypeus and mandibles yellowish. Wings opaque brownish, with brown veins and pterostigma.

Described from numerous workers and five males collected by Mr. A. M. Lea on Lord Howe Island.

I have here reproduced my original description and figure of *lea*, published in *Psyche* 26, 1919, p. 102. In that paper there are two unfortunate errors to which I would call attention. On p. 98 I cited as the type of the genus *Lordomyrma* Ern. André's *Podomyrma caledonica*, forgetting that some years previously I had designated *L. furcifera* Emery as the type. On pp. 103 and 105 the legends of the figures of *L. lea* and *punctiventris* were interchanged by the printer. Fig. 3 represents the latter, Fig. 4 the former species.

### 13. *Tetramorium guineense* Fab.

Numerous workers from both Lord Howe and Norfolk Island. This widely distributed tropicopolitan ant has evidently been introduced into the islands with merchandise.

### 14. *Tetramorium antipodum* sp. nov.

*Worker.* Length 1.5–1.8 mm.

Head distinctly longer than broad, strongly rectangular, with parallel sides and feebly emarginate posterior border. Eyes just in front of the median transverse diameter, moderately large and convex. Mandibles broad, rather convex, their apical borders straight, with three large apical and three or four small and more indistinct basal teeth. Clypeus rather short, sharply carinate, its anterior border entire and broadly rounded. Frontal carinae straight and subparallel, extending to about the posterior sixth of the head and forming the inner borders of distinct, scrobe-like impressions. Frontal area and groove obsolete. Antennae rather stout, scapes reaching a little more than half the distance between the eyes and posterior corners of the head; funicular joints 2–5 very transverse, fully twice as broad as long, joints 6–8 longer, the three terminal joints forming a large club, which is longer than the remainder of the funiculus, its two basal joints considerably longer than broad, together a little shorter than the last joint. Thorax small, only slightly longer than the head including the mandibles, but much narrower, narrowed posteriorly. In profile the dorsal outline is very feebly convex, scarcely impressed between the pro- and mesonotum, where the suture is obsolete. Humeri of pronotum distinct but not very prominent; base of epinotum as long as the sloping declivity and forming a distinct, scarcely dentate angle with it in profile; the metasterna similarly angulate but not dentate. Petiole with short peduncle, not longer than the node,



its dorsal surface rising rather rapidly in a concave curve to the summit of the latter, which is straight but slightly sloping backward and forming an obtuse angle with the abrupt posterior surface. The node is about as high as long; seen from above it is nearly as long as broad, broader behind than in front, with rounded sides. Post-petiole convex above, somewhat lower and distinctly broader than the petiole, from above somewhat broader than long, transversely elliptical. Gaster elliptical, its anterior border narrow and feebly concave. Legs rather long and stout.

Mandibles, head, thorax and pedicels somewhat, gaster more shining; mandibles indistinctly rugulose and sparsely punctuate; clypeus and head between the frontal carinae finely and sharply longitudinally rugulose, the individual rugae not continuous; thorax and sides of nodes finely and rather superficially reticulate-rugulose, the nodes above more shining.

Hairs white; on the body sparse, short, stout and obtuse, on the appendages very fine and appressed.

Yellowish brown; head and first gastric segment dark brown; mandibles, antennae, legs and terminal gastric segments yellow; clubs of funiculi indistinctly infuscated in some specimens.

*Female.* Length 2-2.2 mm.

Differing from the worker in having distinct epinotal teeth, which are stout and fully as long as broad at their bases. The thorax above is dark brown like the head and first gastric segment and the mesonotum and scutellum are longitudinally rugulose. Mesosterna rather smooth and shining. Wings long, white, with colorless veins and pterostigma.

*Male.* Length 2 mm.

Head shaped somewhat as in the worker, longer than broad but with more rounded posterior corners. Eyes rather large and convex, about one-third as long as the sides of the head and situated very near its anterior corners. Ocelli small, not very prominent. Mandibles small but well-developed, convex, with at least four denticles. Clypeus as in the worker but not carinate. Antennae 11-jointed; scapes slender, first funicular joint somewhat swollen, twice as long as broad and less than half as long as the second, joints 3-5 shorter than the first, subequal, about one and two-thirds times as long as broad; remaining joints longer. Mesonotum large and convex, with distinct Mayrian furrows; epinotum sloping, feebly rounded, unarmed, without distinct base and declivity. Petiolar node bluntly conical, from above longer than broad; post-petiole somewhat broader than long, campanulate, rounded, broader than the petiole. Legs slender.

Mandibles smooth and shining; head subopaque, very finely punctate-rugulose; thorax, petiole and postpetiole more shining, the thorax with uneven, indistinctly punctate-rugulose surface, the pedicel below very finely and obscurely punctate, the nodes smooth above; gaster smooth and shining.

Erect hairs on the body very few, delicate and pointed; more numerous, extremely fine and appressed on the appendages.

Color of body and wings as in the female.

Described from sixteen workers, six females and a male from Norfolk Island.

This species is very closely related to *T. simillimum* F. Smith, a common tropicopolitan *Tetramorium*, but there are numerous differences, especially in the shape of the thorax and petiole. It might, perhaps be regarded as an extreme race or subspecies of Smith's species, which has become considerably modified by long sojourn on a small, remote island.

15. *Orectognathus antennatus* F. Smith var. *howensis* var. nov.  
(Fig. 7.)

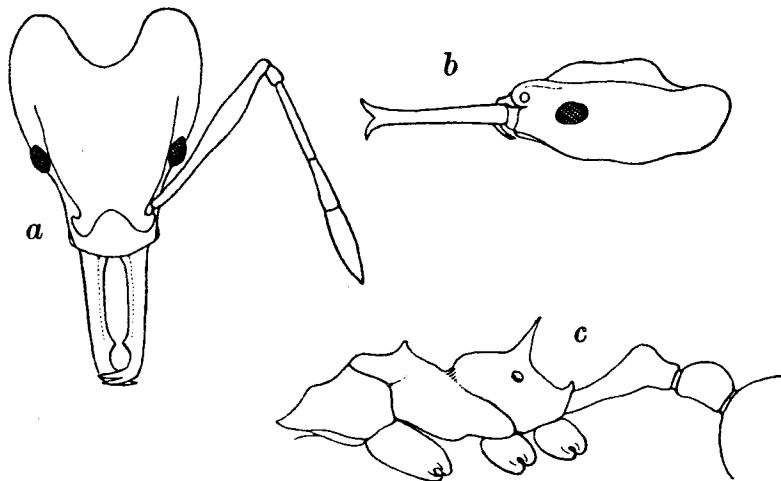


FIGURE 7. *Orectognathus antennatus* F. Smith var. *howensis* var. nov. Worker. a, head from above; b, same in profile; c, thorax and pedicel in profile.

Worker. Length 5 mm.

Differing from the typical *antennatus* of New Zealand in slightly

stronger sculpture and therefore more opaque surface of the head, thorax and pedicel, in having the epinotal spines straight, somewhat shorter and more erect, the preapical expansion of the mandibles sharper and more dentiform, the teeth on the pro- and mesonotum more acute but those on the superior border of the petiole less developed. The color is distinctly darker and more like the var. *septentrionalis* Forel of Eastern Australia.

A single specimen from Howe Island.

*O. sarasini* Emery of New Caledonia is so closely related to the variety here described that it can hardly be regarded as more than a variety of *antennatus*. It is somewhat smaller (4.2–4.6 mm.), less strongly sculptured and more shining than *antennatus* and the petiolar node lacks the small teeth at the sides of its superior border.

The series of species of *Orectognathus* in my collection shows that the workers of some of the Australian forms are more or less polymorphic, so that the description of species based on a few specimens is tentative.

16. *Strumigenys lea* Forel. (Fig. 8.)

Eleven workers from Norfolk Island ("in rotting leaves") and two from Lord Howe Island ("sifted from dead leaves") agree perfectly with a series of specimens taken by Mr. Lea at Kindred, Chudleigh and

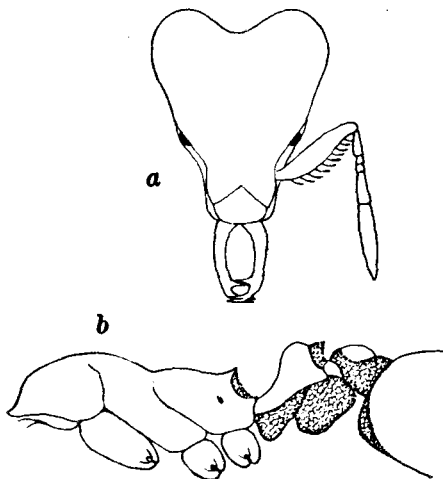


FIGURE 8. *Strumigenys lea* Forel. Worker. a, head; b, thorax and pedicel in profile, showing the distribution of the peculiar spongiform masses.

Railton, Tasmania and belonging to the Museum of South Australia. One of these series evidently comprises cotypes of *S. leæ*. This species is very close to *S. goeffroyi* Mayr, which is widely distributed in the Indian, Malayan and Australian regions and has a variety in Japan. Forel cites the peculiarities of *leæ* as follows: "It differs only in having stouter spines on the epinotum, which is bordered along the declivous surface with a feeble, narrow, yellowish, semitransparent membrane instead of the large spongiform masses which completely surround the spines of *godeffroyi*. Furthermore, the stature of the whole insect is more thickset, the head decidedly broader behind and the scapes shorter, scarcely surpassing the posterior third of the head, whereas it reaches the posterior fourth in *godeffroyi*. The whole head is decidedly shorter. The mandibles are a little more curved and the insect is less pubescent. The spongiform masses cover less of the surface of the two nodes."

*S. leæ* is also closely related to *S. perplexus* F. Sm. of New Zealand, but the latter lacks the spongiform masses on the sides of the petiole.

#### SUBFAMILY DOLICHODERINÆ.

##### 17. *Iridomyrmex albitarsus* sp. nov. (Fig. 9.)

*Worker.* Length 2.8–3 mm.

Head very nearly as broad as long, narrowed anteriorly, with straight posterior border; the sides feebly convex behind, straight and converging anteriorly. Eyes flat, at the middle of the head. Mandibles rather convex, with four regular, acute apical and about four broader and more irregular basal teeth. Anterior border of clypeus straight and transverse in the middle, almost bluntly subdentate on each side. Frontal area obsolete, frontal furrow short and indistinct. Antennal scapes slender, reaching somewhat beyond the posterior border of the head. Thorax rather long and slender; pro- and mesonotum evenly rounded and not very convex, the latter longer than broad, sloping to the pronounced mesoepinotal constriction into which the spiracles project. Epinotum slightly broader than long, in profile with the base rising posteriorly and rounding broadly into the declivity without distinct demarcation between the two surfaces. Petiole higher than long, the node inclined forward, with somewhat narrowed and rounded superior border. Legs long and slender.

Shining; mandibles shagreened and punctate; body and appendages very finely and delicately punctulate.

Hairs delicate, white, erect, confined to the clypeus and terminal

gastric segments. Pubescence very fine, moderately abundant and uniformly covering the body and appendages like a bloom, but not concealing the shining surface.

Black; mandibles and antennæ red; ends of antennal scapes and incisures of funicular joints infuscated; clypeus, legs, petiole and ventral portion of epinotum dark brown; tarsi sordid white with the terminal joint blackish.

*Female.* Length 6.5 mm.

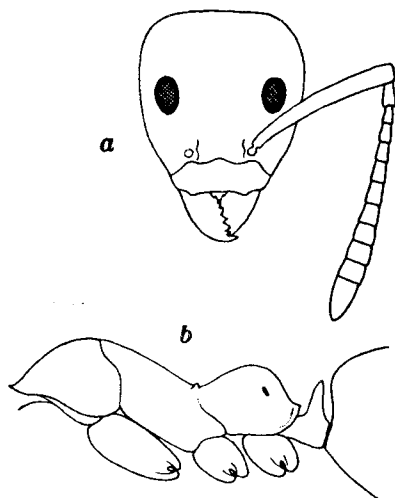


FIGURE 9. *Iridomyrmex albitarsus* sp. nov. Worker; a, head; b, thorax and petiole in profile.

Head similar to that of the worker but with the occipital border broadly concave. Clypeus with a blunt median projection. Antennæ not reaching to the posterior border of the head. Frontal groove represented by a short raised line, frontal carinæ somewhat diverging posteriorly. Eyes just in front of the median diameter of the head, shorter than their distance from the clypeus. Thorax through the wing insertions a little broader than the head; pronotum conspicuously prolonged and narrowed anteriorly; mesonotum subtriangular, as broad as long, convex in front, flattened behind. Epinotum with feebly convex, subequal base and declivity, the two surfaces more differentiated than in the worker. Wings rather long, with two well-developed cubital cells.

Sculpture more pronounced than in the worker. Erect hairs more

numerous but short, present also on the head, pro- and mesonotum and anterior gastric segments. Ends of scapes with numerous short suberect hairs. Pubescence much longer and more abundant on the body and appendages than in the worker. Color very similar but the mandibles, clypeus and antennae darker. Wings grayish hyaline, their veins yellowish, the stigma dark brown.

*Male.* Length 2.5-2.8 mm.

Head, including the eyes, as broad as long, its postocular portion rounded subrectangular, with straight posterior border; cheeks nearly half as long as the eyes. Mandibles small and narrow but triangular, with only the apical tooth developed. Clypeus short and broad, its anterior border broadly rounded. Antennal scapes not longer than the first funicular joint, which is subglobular and scarcely longer than broad and about two-thirds as long as the succeeding joint. Thorax robust, broader than the head; pronotum very short; mesonotum large, convex anteriorly. Epinotum small, similar in shape to that of the female. Petiolar node lower and stouter. Genital valves slender, the outer pair densely fringed with hairs. Wings with a single cubital cell.

Sculpture, pilosity and color like those of the worker, but the pubescence much more dilute and indistinct. Mandibles, clypeus, antennae and terminal tarsal joints brown; remaining tarsal joints whitish. Wings as in the female but with paler veins and stigma.

Described from a number of specimens of all three phases taken on Norfolk Island.

This species is very close to *I. calvus* Emery from New Caledonia, but is smaller, with longer antennal scapes and fewer hairs in the worker and the epinotum much more rounded and less angular in profile. From *I. rufoniger* Lowne of Australia *albitarsus* differs in the shorter head, shorter antennal scapes, more slender thorax, differently shaped epinotal convexity, color, sculpture and pilosity.

18. *Iridomyrmex glaber* Mayr subsp. *sommeri* Forel var.  
*ianthinus* Emery.

Six workers from Lord Howe Island, agree with a cotype of this variety received from Prof. Emery. It was originally described from New Caledonia.

19. *Techomyrmex albipes* F. Smith.

A single worker from Lord Howe Island.

## SUBFAMILY FORMICINÆ.

20. *Paratrechina* (*Nylanderia*) *obscura* Mayr. (Fig. 10.)

Numerous workers, females and males from Lord Howe Island, "nesting under bark on the slopes of Mt. Gervis" and "sifted from fallen leaves."

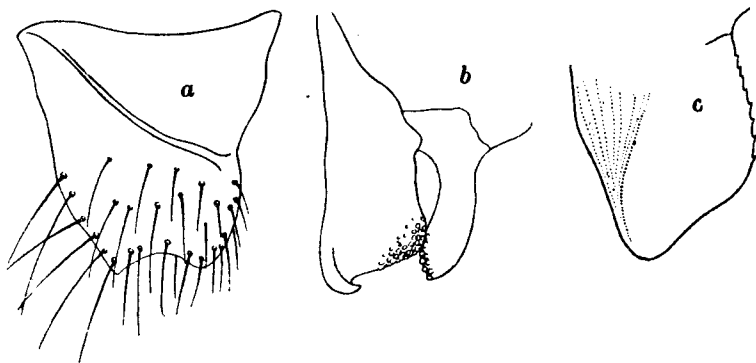


FIGURE 10. External male genitalia of *Paratrechina* (*Nylanderia*) *obscura* Mayr. a, stipes; b, volsella; c, sagitta.

This species is known from Eastern Australia, New Caledonia, Bismarck Archipelago (subsp. *bismarckensis* Forel) and New Guinea (subsp. *papuana* Forel).

21. *Paratrechina* (*Nylanderia*) *vaga* Forel.

Numerous workers, females and males from Norfolk Island.

This species has been recorded previously from New Caledonia, Bismarck Archipelago, New Guinea and Juan Fernandez.

22. *Paratrechina* (*Nylanderia*) *minutula* Forel. (Fig. 11.)

Numerous workers, dealated females and males from Lord Howe Island, "sifted from fallen leaves." I refer these specimens to the typical *minutula* of Australia and not to the subspecies *atomus* Forel of the Bismarck Archipelago, because the head of the worker is slightly narrowed anteriorly and the third funicular joint is as broad as long.

The female (undescribed) measures 2.5-2.8 mm. Head broader than long and very distinctly broader behind than in front, with large, flattened eyes which are fully twice as long as their distance from the anterior border of the cheeks. Clypeus very convex in the

middle. Antennal scapes extending about one-third their length beyond the posterior border of the head; funicular joints 2-10 as broad as long. Thorax very short, less than  $1\frac{1}{2}$  times as long as broad, narrowed at the epinotum, subcircular in front of it, flattened above, the mesonotum nearly twice as broad as long; epinotum with short, slightly convex base, half as long as the straight, sloping declivity. Petiole small, seen from behind, subrectangular. Gaster elongate elliptical, somewhat depressed.

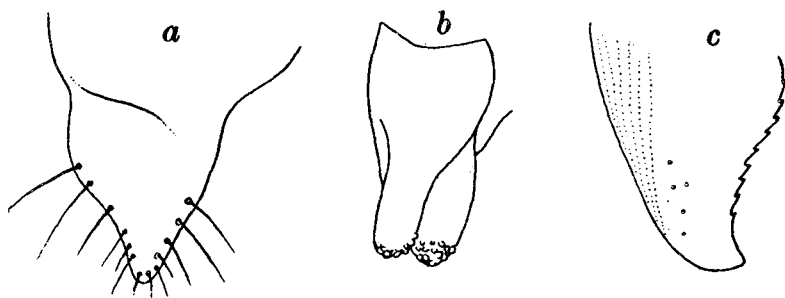


FIGURE 11. External male genitalia of *Paratrechina* (*Nylanderia*) *minutula* Forel; a, stipes; b, volsella; c, sagitta.

Shining; head and gaster more opaque, finely punctulate. Hairs and pubescence yellowish, the former short and delicate, nearly absent on the thorax, the pubescence rather dense on the head and gaster. Head and thorax yellowish brown, gaster dark brown; occiput slightly infuscated; mandibles, mouthparts, antennæ, scutellum, petiole and posterior borders of gastric segments yellow; femora in some specimens a little darker in the middle.

The *male* (undescribed) measures only 1-1.3 mm. Head rounded behind; eyes convex; cheeks very short. Mandibles very slender, linear, curved, indistinctly bidentate. Clypeus short and broad, with rather straight, transverse anterior border. Antennal scapes short, not longer than the first three funicular joints together; all the funicular joints longer than broad. Thorax short, scarcely broader than the head, shaped much as in the female, but the epinotum in profile more sloping and with scarcely distinguishable base and declivity. Genital appendages short and thick, shaped as in the figure (Fig. 11).

Sculpture and pilosity as in the worker. Piceous brown; posterior portion of head and anterior portion of gaster darker; legs somewhat



paler; mouthparts whitish but mandibles and antennæ nearly as dark as the head. Wings grayish, pubescent, with grayish veins and undeveloped stigma.

23. *Camponotus (Colobopsis) howensis* sp. nov. (Fig. 12.)

*Worker minor.* Length 4.5–5 mm.

Head about one-sixth longer than broad, slightly narrower in front than behind, broadest through the eyes, with broadly rounded posterior corners and nearly straight sides. Eyes large, moderately convex, a little more than half again as long as their distance from the anterior corners of the head. Mandibles short and rather convex,

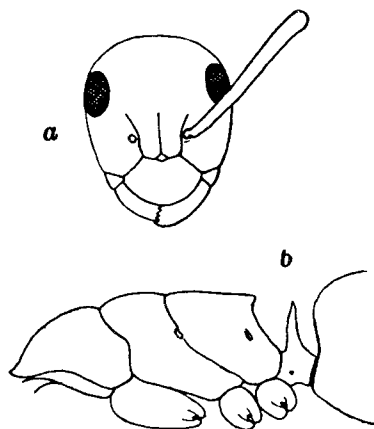


FIGURE 12. *Camponotus (Colobopsis) howensis* sp. nov. Worker minor; a, head; b, thorax and petiole in profile.

their somewhat oblique apical borders with 5 subequal teeth. Clypeus broader than long, subcarinate, its anterior border slightly reflected, forming a short, broadly rounded lobe. Frontal area and groove indistinct; frontal carinae rather straight, diverging posteriorly. Antennae slender; scapes extending about  $\frac{2}{5}$  their length beyond the posterior border of the head. Thorax long, laterally compressed, especially in the epinotal region; promesonotal and mesoepinotal sutures impressed, the former more strongly than the latter. Thoracic dorsum in profile nearly straight, except for the sutural impressions and a slight elevation of the mesonotum anteriorly; pronotum feebly rounded in front. The compression of the epinotum reduces its dorsal surface to a roof-like ridge which terminates behind in a blunt point

from which the triangular declivity falls nearly perpendicularly in profile; the base being nearly straight and horizontal, the somewhat shorter declivity distinctly concave. Petiole node rather high, its anterior surface convex above, its posterior surface flat, the superior border very sharp. Seen from behind the node is rectangular, somewhat narrowed above, the superior border straight and entire, with distinct lateral corners, more rarely somewhat emarginate in the middle. Gaster elongate elliptical; legs somewhat flattened, the fore femora distinctly enlarged.

Shining and very finely and evenly shagreened; mandibles finely striate-punctate; cheeks sparsely but not deeply punctate.

Hairs yellow, very sparse, present only on the clypeus, front, vertex and gaster. Pubescence short, sparse and appressed, distinct only on the gaster, appendages and head.

Black; mandibles, clypeus, cheeks and antennae castaneous; palpi yellow; insertions and tips of antennal scapes, first funicular joint, knees, and tarsi brownish yellow; tibiae brown.

Described from numerous specimens from Lord Howe Island.

This species is related to *C. sommeri* Forel of New Caledonia, but is quite distinct in color, and has a narrower head, more angulate epinotum, etc. The thorax of *howensis* is more like that of several Fijian species (*mayrellus*, *maudella* and *janus*) recently described by Mann, but all these forms have a differently shaped head and coloration. *C. conithorax* Emery of the New Hebrides is also related to *howensis* but is somewhat smaller, has 6-toothed mandibles, is more opaque, and the thorax and petiole have a different shape.