

**Confirmation of the establishment of three adventive ants  
(Hymenoptera: Formicidae) in New Zealand:  
*Cardiocondyla minutior* Forel, *Ponera leae* Forel, *Mayriella abstinens* Forel**

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53 ■

**Abstract**

The status of three adventive exotic ant species in New Zealand is discussed. *Cardiocondyla minutior* Forel is recorded for the first time, and is presumed to be established. Recent collections of *Ponera leae* Forel and *Mayriella abstinens* Forel confirm the establishment of these two species. Their establishment was, previously considered doubtful. Collection details and brief descriptions are given for each species.

**Keywords:** New record, distribution.

**Introduction**

New Zealand has a depauperate ant fauna (Berry *et al.* 1997) with from 9 to 11 endemic species and only one endemic genus (Valentine and Walker 1991, Don unpublished in Berry *et al.* 1997). The most recently published list of ants in New Zealand

reported 27 species established with a further 11 species considered doubtful records (Green 1992). Berry *et al.* (1997) confirmed the establishment of three species of *Pheidole* in New Zealand, bringing Green's (1992) tally to 29 species plus nine records in doubt, due either to taxonomic problems or to uncertainty over their establishment. Recent collections offer further information on two of these doubtful records and confirm the establishment of a new species.

Material is deposited in the following institutions: Auckland War Memorial Museum, Auckland (AMNZ); New Zealand Arthropod Collection, Auckland (NZAC) and Landcare Research, Nelson (NZAC – Nelson).

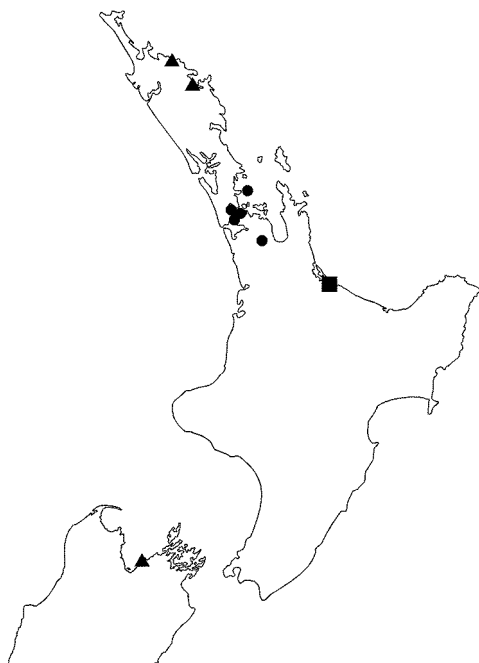
Terminology used follows Shattuck (1999).

**Subfamily Myrmicinae**

***Cardiocondyla minutior* Forel, 1899**

*C. minutior* (det. B. Bolton) was first collected in New Zealand from Totara St, Mt Maunganui on 19 March 2000 (two workers) (Fig 1). The first author (RJH) collected the specimens while searching for the Argentine ant, *Linepithema humile* (Mayr), which is present in the same area (Osborne 1998). During March and April 2001 RJH collected a further seven workers of *C. minutior* at three different localities in Mt Maunganui (Portside Drive, Puriri St, Owens Place, NZAC – Nelson) on protein-based baits left out for three hours to monitor *L. humile* populations. The furthestmost sites are 4.9 km apart.

Foragers do not form trails but display tandem running, where one leads another to a food source (Hölldobler and Wilson 1990). Because of the small size (~ 2.4 mm) of workers, their habit of moving slowly, and the small size of colonies in this genus (20–200 workers, Reimer 1994), they are often overlooked during casual collecting (Shattuck 1999). This species was not collected in two other delimitation surveys of *L. humile* (1997/8 and 2000/1) in Mt Maunganui (Osborne 1998, Dykzeul, 2001).



**Fig.1.** Locations in New Zealand where *Cardiocondyla minutior* (■), *Mayriella abstinens* (●) and *Ponera leae* (▲) have been collected.

*C. minutior* is a successful tramp species with collection records from the old and new world tropics (B. Bolton pers. comm.) including Brazil (Heinze 1999). Information on this species is scarce, probably because of its frequent misidentification as *C. nuda* (Mayr) (B. Bolton pers. comm.). Wilson and Taylor (1967) synonymised the species with *C. nuda* though Heinze (1999) later recognised it as a distinct species. Its route to New Zealand is unknown. It is not reported from Australia, although *C. nuda* is recorded there (Shattuck 1999).

Females have 12 antennal segments and small spines on the propodeum. The swollen postpetiole, wider than long and much broader than the petiole when viewed from above, distinguishes females of this genus from all others in New Zealand (Fig. 2). Males of *C. minutior*, like some other *Cardiocondyla* species, show polymorphism with either winged forms similar to males of other species, or wingless forms that are worker-like in appearance (“ergatoid”) (Heinze 1999).



Fig. 2. *Cardiocondyla minutior* worker showing characteristic swollen postpetiole.

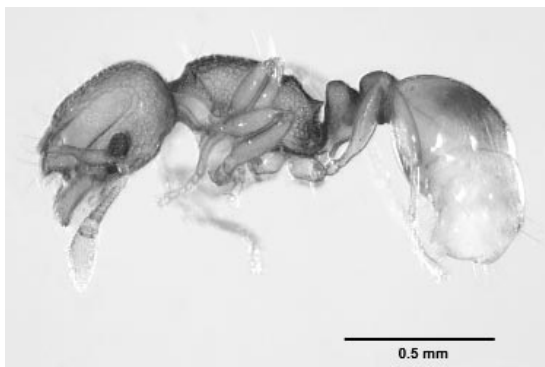


Fig. 3. *Mayriella abstinens* worker showing the characteristic eyes, antennal scrobe, and 10-segmented antennae with a two-segmented club.

### *Mayriella abstinens* Forel, 1902

Australian in origin, this species was first collected in New Zealand at Grey Lynn, Auckland in 1958 (NZAC) and subsequently at Te Atatu North, Auckland in 1981 (NZAC, AMNZ). Green (1992) questioned its establishment, as there were no collection records subsequent to 1981, and the Te Atatu population had been displaced by *L. humile* (Green 1997). Several recent collections from Titiarangi, Auckland (NZAC), Mangatawhiri (NZAC – Nelson), and on Tiritiri Matangi Island (NZAC – Nelson) confirm its establishment (Fig. 1). On Tiritiri Matangi it was regularly collected (> 270 workers) on protein and jam baits at the southern end of Hobbs Beach during the summer of 2001 (RJH unpubl. data).

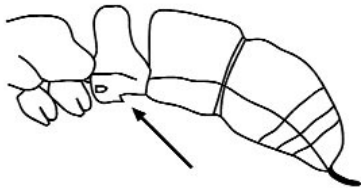
*Mayriella* tends to be patchily distributed and can be locally abundant (Wheeler 1935). The small monomorphic workers (1.4–1.5 mm) move slowly and may lie motionless when disturbed, so are easily overlooked. Nests have 50–100 workers and can have several queens per nest (Wheeler 1935, Shattuck 1999). Nests are located in soil under stones or in the open with a small mound of loose dirt at the entrance.

The eyes are elongate and the lower section narrows into a point (Fig. 3). The head has a pair of narrow and deep grooves (antennal scrobes) that contain the entire antennae when at rest. The propodeum has spines (armed) and the antennae are 10-segmented with a two-segmented club. Only the last feature is shared with *Solenopsis invicta* Buren. A single colony of *S. invicta*, a highly invasive species, was recently detected in New Zealand, but is not considered established (O.R. Green pers. comm.).

### Subfamily Ponerinae

#### *Ponera leae* Forel, 1913

Taylor (1960) first recorded *P. leae* from Paihia in 1958 (NZAC), and collected additional specimens from forest litter using a Berlese funnel in 1959 (Taylor 1967). Further specimens were collected from Butterfly Valley, Tauranga Bay, in 1966 by K. Wise (AMNZ) and originated from both manuka and pohutakawa litters (W. Don pers. comm.). Green (1992) questioned the establishment of *P. leae*, as no further specimens were identified subsequently. In 1997, R. Toft collected a single female of this species in a pitfall trap in a kanuka stand at Cable Bay, Nelson (NZAC) (Fig. 1). *P. leae* also occurs in Eastern Australia, New Caledonia and Norfolk Island. Establishment at the last two of these locations, as in



**Fig. 4.** Stylised diagram of *Ponera leae* that is unique in having the lower surface of the petiole (subpetiole process) with a sharp angle to the rear (arrowed) and a translucent thin spot towards the front when viewed from the side (after Shattuck 1999).

New Zealand, is probably the result of human introductions (Taylor 1967).

Species of *Ponera* have small colonies (<100 workers) in protected sites in the ground (Shattuck 1999). They forage cryptically, spending their entire time within the leaf litter on the ground. *P. leae* belongs with a set of ponerine genera with confusingly similar overall body shape that includes *Hypoponera* and *Pachycondyla*, both of which are represented in New Zealand. They all have forward sections of the frontal lobes and the antennal sockets very close together, and the single petiole has a distinct front, top, and rear face. *Ponera* is unique in that the lower surface of the petiole (subpetiolare process) has a sharp angle to the rear, a translucent thin spot towards the front when viewed from the side (Fig. 4), and an antennae with a 4-segmented club (Taylor 1967).

The lack of collection records specimens for this species, despite two geographically distant records, is likely due to the cryptic nature of its foraging and to possible confusion with other ponerines. Examination of litter extraction samples may reveal additional records.

#### Discussion

The impacts of the cosmopolitan tramp species *L. humile* and *Pheidole megacephala* (Fab.) on invertebrate communities have been extensively documented (e.g., Gillespie & Reimer 1993, Human & Gordon 1997), and similar impacts can be expected in New Zealand. However, little is known about the impact in New Zealand of most of our adventive ants. Distribution records for many adventive species suggest that they are still spreading and neither their presence nor densities in a range of native ecosystems have been determined. The very distant collections

sites for *P. leae* may represent separate introductions.

*C. minutior* is the first new species to be reported established in New Zealand since *L. humile* in 1990 (Green 1990). However, nests of two other species have been found accidentally near points of entry in summer 2001: *Solenopsis invicta* at Auckland airport (O.R. Green pers. comm.) and *Monomorium* sp. (salomonis-group) (det B. Bolton) by RJH at Nelson port (NZAC). For both species the nests have been destroyed, and in the case of *S. invicta* a rigorous eradication and surveillance campaign is underway by the Ministry of Agriculture and Forestry. Without detailed surveys of ports of entry, other species may become established and widespread before action can be taken.

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