



## Ants of the genus *Lordomyrma* Emery (1) Generic synonymy, composition and distribution, with notes on *Ancyridris* Wheeler and *Cyphoidris* Weber (Hymenoptera: Formicidae: Myrmicinae)

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### Abstract

Synonymy under *Lordomyrma* of *Prodicroaspis* Emery and *Promeranoplus* Emery is reviewed. *Lordomyrma* currently comprises 25 named taxa, with two junior synonyms. Many undescribed species are known. Relative levels of species richness and morphological diversity are compared for the SE Asian/Japanese, Australian, Melanesian, New Caledonian and Fijian *Lordomyrma* faunas. Twelve species, including examples of the related genera *Ancyridris* and *Cyphoidris* are illustrated. The need for conservation and study of the remarkable, threatened ant faunas of New Caledonia, New Guinea and Fiji is discussed, and the relative positions of *Ancyridris* and *Cyphoidris* reviewed.

**Key words:** Formicidae, evolution, speciation, species flocks, systematics, Japan, Southeast Asia, Australia, New Guinea, New Caledonia, Fiji, Africa

### Introduction

Twenty-five valid named species are recognized here in the wonderfully diverse myrmicine genus *Lordomyrma* Emery. Characteristics of these and approximately 40 undescribed species represented in the Australian National Insect Collection (ANIC) and elsewhere are discussed to evaluate the status of the genus, and to justify the synonymy under *Lordomyrma* of the nominal New Caledonian genera *Prodicroaspis* Emery and *Promeranoplus* Emery. The New Guinean genus *Ancyridris* and the Afrotropical *Cyphoidris* Weber are discussed as putative relatives of *Lordomyrma*. This is the introductory paper of a series monographing *Lordomyrma*.

Twelve taxa are illustrated using Extended Focus (Z stack) macrophotographic Images (EFIs) executed by the author using a stand-mounted Olympus E330 digital SLR camera fitted with Olympus OM series bellows and a Zuiko 38mm 3.5 macro lens, above a custom-built electronically-controlled motorized stepper-stage. Images were assembled using 'Combine-Z' software. HW in the figure captions = 'Head Width across eyes'; WL is the conventional 'Weber's Length' of the mesosoma in lateral view.

### Generic synonymy

*Lordomyrma* Emery, 1897: 591. Type species (designated by Wheeler, 1911): *L. furcifera* Emery, 1897: 591 (Lemien, PAPUA NEW GUINEA).

= *Prodicroaspis* Emery, 1914: 414. Type species (by monotypy): *P. sarasini* Emery, 1914: 414 (Mt Ignambi, NEW CALEDONIA). (Junior Synonym of *Lordomyrma*, Bolton, 1994: 106).

= *Promeranoplus* Emery, 1914: 412. Type species (by monotypy): *P. rouxi* Emery, 1914: 413 (Tchalabel, NEW CALEDONIA). (Junior synonym of *Lordomyrma*, Bolton, 1994: 106).

Junior synonymy of *Prodicroaspis* and *Promeranoplus* was anticipated by Hölldobler & Wilson (1990: 110). Taxonomic history is summarized by Bolton (2003: 204). The above synonymy is justified below in notes on the New Caledonian fauna. The type species of *Prodicroaspis* and *Promeranoplus* relate readily to *L. furcifera* (Figs 7, 8; 13-16), the type species of *Lordomyrma*, through bridging taxa with characters intermediate in either expression or combination, so that all may reasonably be considered congeneric.

*Lordomyrma* includes several more-or-less geographically separated Indo-Australian faunas, which appear to represent the products of separate congeneric evolutionary radiations. The faunas of SE Asia and Japan, Australia, lowland New Guinea and the Solomon Islands, New Caledonia, and Fiji differ distinctively in relative known species richness, in the apparent frequency of sympatric associations (and presumably of resulting interspecific competitive encounters), and in levels of interspecific morphological diversity. They are discussed below under individual headings. No fauna, except perhaps those of Australia and Fiji, can be considered well represented in collections.

### Generic diagnosis

*Lordomyrma* is assigned to tribe Stenammini, as diagnosed by Bolton (2003: 58). It is characterized by 12-merous antennae, a simple sting with straight apex, triangular mandibles with seven or more teeth decreasing in size from apex to base, well-developed propodeal spines, a bicarinate clypeus and elongate frontal carinae. Some of these characters will be reassessed in the series of papers projected here.

### Checklist of named *Lordomyrma* species

The following list includes all known described species referable to *Lordomyrma* as delimited here.

*L. accuminata* Stitz, 1912: 504; NEW GUINEA (*L. cryptocera accuminata*). **NEW STATUS.**

*L. azumai* (Santschi), 1941: 3, fig. 3; Minoo, Osaka, JAPAN (*Rogeria (Rogeria) azumai*) (Combination: Brown, 1952: 124).

= *nobilis* Yasumatsu, 1950: 75; Mt Hikosan, Kyushu, JAPAN (Synonymy: Brown, 1952: 124).

*L. bensoni* Donisthorpe: see *L. furcifera*.

*L. caledonica* (André), 1889: 225; Nouméa, NEW CALEDONIA (*Podomyrma caledonica*) (Combination: Emery, 1897: 591).

*L. crawleyi* Menozzi, 1923: 209, fig. 1; Humboldt Bay, WEST PAPUA.

*L. cryptocera* Emery, 1897: 592, pl. 15, fig. 34; Lemien, near Berlinhafen (= Aitape ), PAPUA NEW GUINEA.

*L. curvata* Sarnat, 2006: 15, figs 2, 3; Kasavu village, Vanua Levu, FIJI.

*L. desupra* Sarnat, 2006: 17, figs 4, 5; Monasavu Rd, Viti Levu, FIJI.

*L. epinotalis* (Mann), 1919: 343; Ysabel, SOLOMON ISLANDS (*Rogeria epinotalis*) (Combination: Kugler, 1994: 26).

*L. furcifera* Emery, 1897: 591, pl. 15, figs. 32, 33; Lemien, near Berlinhafen (= Aitape ), PAPUA NEW GUINEA.

= *bensoni* Donisthorpe, 1949: 94, figs 1, 2; Maffin Bay, WEST PAPUA. **NEW SYNONYMY.**

*L. infundibuli* Donisthorpe, 1940: 45, 2 figs; Jutefa Bay, Pim, WEST PAPUA.

*L. leae* Wheeler, 1919: 102, fig. 4 a-e (not fig. 3, as captioned, see Wheeler, 1927:143); AUSTRALIA: Lord Howe Island.

- L. levifrons* (Mann), 1921: 453; Nadarivatu, Viti Levu, FIJI (*Rogeria (Irogeria) tortuosa levifrons*)(Combination in *Lordomyrma*: Kugler, 1994: 26. Species rank: Sarnat, 2006: 20).
- L. nigra* Donisthorpe, 1941: 36; Camp Nok, Waigeu I., WEST PAPUA. (*Lordomyrma niger*).
- L. nobilis* Yasumatsu: see *L. azumai*.
- L. polita* (Mann), 1921: 453; Nadarivatu, Viti Levu, FIJI (*Rogeria (Irogeria) tortuosa polita*) (Combination in *Lordomyrma*: Kugler, 1994: 26. Species rank: Sarnat, 2006: 21).
- L. punctiventris* Wheeler, 1919: 105, fig. 3 a, b (not fig. 4, as captioned, see Wheeler, 1927:143); Kuranda, Queensland, AUSTRALIA.
- L. reticulata* Lucky & Sarnat, 2008: 39, figs 2,3; Danum Valley, Sabah, MALAYSIA.
- L. rouxi* (Emery), 1914: 413, plate 13, fig. 8, a, b; Tchalabel, NEW CALEDONIA (*Promeranoplus rouxi*) (Combination: Bolton, 1995: 248).
- L. rugosa* (Mann), 1921: 455, fig. 20; Nadarivatu, Viti Levu, FIJI (*Rogeria (Irogeria) rugosa*) (Combination: Kugler, 1994: 26).
- L. sarasini* (Emery), 1914: 414, plate 13, figs 9, a, b; Mt. Ignambi, NEW CALEDONIA (*Prodicroaspis sarasini*) (Combination: Bolton, 1995: 248).
- L. stoneri* (Mann), 1925: 5; Tamavua, Suva, Viti Levu, FIJI (*Rogeria (Irogeria) tortuosa stoneri*) (Combination in *Lordomyrma*: Kugler, 1994: 26. Species rank: Sarnat, 2006: 25).
- L. striatella* (Mann), 1921:454, fig. 19; Kadavu, Vanua Ava, FIJI (*Rogeria (Irogeria) striatella*) (Combination: Kugler, 1994: 26).
- L. sukuna* Sarnat, 2006: 29, figs 16, 17; Mt Naqaranibuti, Viti Levu, FIJI.
- L. tortuosa* (Mann), 1921: 452, fig. 18; Levuka, Ovalau, FIJI (*Rogeria (Irogeria) tortuosa*) (Combination: Kugler, 1994: 26).
- L. vanua* Lucky & Sarnat, 2008: 42, figs 2,3; Mt Delaikoro, Vanua Levu, FIJI.
- L. vuda* Sarnat: 2006: 34, figs 20, 21; Savione Falls, Koroyanitu National Park, Viti Levu, FIJI.

The Australian species described as *Lordomyrma rugosa* Clark, 1934, is now assigned to *Podomyrma* Fr. Smith (Brown, 1956; Taylor, 1987) as a junior synonym of *P. christae* (Forel). The nomen nudum *L. longiseta* used in error by Sarnat (2006: 37) does not preoccupy that name in *Lordomyrma*.

All the listed species have worker holotypes or syntypes. The gyne was originally characterized for *L. infundibuli* and males for *L. azumai*, *L. leae* and *L. striatella*. Types of most names have been examined (apart from *L. reticulata* and those described from Fiji by Sarnat). Most species are represented in the ANIC by paratypes, syntypes, type-compared vouchers, or confidently identified specimens assembled during this study.

The new combinations result mostly from the new generic synonymies proposed. The elevation of *L. accuminata* to species rank and the *furcifera* = *bensoni* synonymy follow direct comparison of relevant types (including that of *L. cryptocera*, of which *accuminata* was previously a subspecies) from the Hungarian Natural History Museum, Budapest, or The Natural History Museum, London, UK (BMNH), considered with modern ANIC specimens.

### The Asian *Lordomyrma* fauna

Apart from the Japanese *L. azumai* (Figs 1, 2), known from southern Honshu, Shikoku and Kyushu (Imai et al, 2003: 102), the Bornean *L. reticulata*, and a generic listing from Sabah in Brühl et al (1998), *Lordomyrma* species have not been previously reported from areas north or west of New Guinea. Six or seven undescribed, allopatrically-distributed species are now represented in the ANIC and BMNH collections. Others considered here were provided by Seiki Yamane, Katsuyuki Eguchi, Fuminori Ito and Martin Pfeiffer. These taxa will be reviewed in the second paper of this series, now in preparation. No sympatric associations are known.



**FIGURES 1, 2.** *Lordomyrma azumai*, Honshu, Japan, HW 0.80mm, WL 1.14mm.

**FIGURES 3, 4.** *Lordomyrma cf. punctiventris*, Australia, HW 0.71mm, WL 1.02mm.

**FIGURES 5, 6.** *Lordomyrma cryptocera*, Papua New Guinea, HW 0.66mm, WL 0.92mm.

These species are morphologically conservative, with relatively low disparity (in the sense of Gould, 1989: 49 - i.e. without major interspecific variability in structure). All are basically similar to *L. azumai*. The

latter has palpal formula maxillary 4:labial 3, versus 3:3 in one SE Asian species and 3:2 in others. A small, wide-ranging species from peninsular Malaysia, Sarawak, Sabah and Rakata I (Krakatau) resembles *L. azumai*, as do others from Luzon and Sarawak. Several Bornean species are larger, with heavier sculpturation and long pilosity. Compared to the *Lordomyrma* type-species, *L. furcifera* (Figs 7, 8 - illustrated also in dorsal view as *L. bensoni* by Donisthorpe, 1949, figs 1, 2) all are relatively heavily sculptured, with strongly defined antennal scrobes, which are differently (less heavily) sculptured than other frontal parts of the head, much more conservative mesosomal structure and unexceptionally developed propodeal spines. They lack dorsally rounded or spinose extensions to the petiole or postpetiole. Several have relatively heavy gastral sculpturation (see illustrations of *L. reticulata* (Sarnat & Lucky, 2008)).

The congeneric affinity between *L. azumai* and *L. furcifera* was recognized by Yasumatsu (1950). The extremes between the *azumai* habitus and that of *furcifera* are now more clearly bridged than before by several known New Guinean species, including *L. cryptocera* (Figs 5, 6) and *L. infundibuli* (Figs 9, 10).

Given this wide distributional range with limited records it is certain that more Asian *Lordomyrma* species in nature must await discovery.

### **Australian *Lordomyrma* species**

There are at least 4 or 5 known mainland eastern Australian species represented in the ANIC and confidently referable to *Lordomyrma*. *L. punctiventris* (Figs 3, 4), alone is named. The similar *L. leae* is known only from Lord Howe Island.

Interspecific morphological diversity is low among Australian *Lordomyrma* species, as in the Asian species, which they generally resemble (compare Figs 1, 2 with Figs 3, 4 - undescribed Asian and Australian species are even more alike than these). They likewise relate to bridging elements of the New Guinean fauna, including *L. cryptocera* (Figs 5, 6), sufficiently to confirm their long-recognized congeneric affinity with *L. furcifera*, and assignment to *Lordomyrma*. The palpal formula in four investigated species is 3:3.

The mainland Australian species are deployed along the continental east coast and Great Dividing Range, in rain forest or wet sclerophyll habitats, from Iron Range (12° S lat.) in the north, to central New South Wales (Shattuck, 1999, fig 502). Few sympatric associations are represented. The known Iron Range species has affinities with others from New Guinea (it is for example the only Australian species lacking antennal scrobes, structures absent in several New Guinean and some New Caledonian species). The more southern Australian taxa, with *L. leae*, constitute a close-knit species group, that of *L. punctiventris*. An undescribed species similar to *L. punctiventris* was illustrated by Hölldobler & Wilson, 1990: 110.

### ***Lordomyrma* species of lowland New Guinea and adjacent islands**

Over 20 *Lordomyrma* species are known from New Guinea and adjacent Islands, but only 9 have been named. Most were described originally in *Lordomyrma*.

There is much greater structural variability among these species than those of Asia and Australia combined; the fauna is thus both species-rich and morphologically diverse.

Four taxa (*L. crawleyi*, *L. cryptocera*, *L. infundibuli* and *L. furcifera*, with its junior synonym *L. bensoni*), were described from a 175-180 km section of the north coast of mainland New Guinea, between Maffin Bay (138°51'E), West Papua, and Aitape (142°21'E), Papua New Guinea. The *L. accuminata* and *L. rupicapra* types very likely also came from near the north coast of the former German colony of Kaiser Wilhelms Land, between 141°E and 148°E. *L. niger* was described from 2, 500 ft. on Waigeo (= Waigeu) I., northwest of the West Papuan Vogelkop, and *L. epinotalis* far to the east, from Ysabel I, Solomon Islands.

As indicated above, *L. cryptocera* (Figs 5, 6) is the described Melanesian taxon most similar to those of Asia and Australia. This pivotal species relates separately and easily to *L. accuminata* and *niger* (neither yet illustrated), to the distinctive *infundibuli* (Figs 9, 10), and to a group of aberrant species close to *furcifera* (Figs 7, 8), including *L. crawleyi* (Figs 11, 12).

Other undescribed lowland New Guinean species appear to represent several additional lineages derived from stock similar to *L. cryptocera*, so that recognition of further species groups seems likely. New Guinea species have known palpal formulae of 3:3 or 3:2.

Unknown *Lordomyrma* species must be present in lowland New Guinea and on other Melanesian islands.

### The *Lordomyrma* fauna of New Caledonia

The main Island of New Caledonia is estimated to cover 6, 223 sq.mi., or c. 16, 110 sq.km (Robson, 1963). The ANIC, Institut de Recherche pour le Développement (Noumea) and Queensland Museum collections contain over 25, sometimes bizarre *Lordomyrma* species. Only three of which have been scientifically named, and they were first assigned to separate genera. Considering the small size of the island this fauna is very species-rich and spectacularly morphologically diverse. This is arguably the world's most impressive known formicid species flock.

*L. caledonica* was assigned from *Podomyrma* to *Lordomyrma* when the genus was established by Emery (1897). Its general attributes (Figs 13, 14) relate appropriately to those of *L. furcifera* (Figs 7, 8). *L. sarasini* (Figs 15, 16) and *L. rouxi* (Figs 17, 18) were described by Emery in 1911 as type species respectively of the seemingly distinctive and strikingly aberrant new monotypic genera *Prodicroaspis* and *Promeranoplus*, now synonymised under *Lordomyrma*. They are the only ant genera recently considered endemic to New Caledonia.

The synonymies of *Prodicroaspis* and *Promeranoplus* are justified in light of the extreme morphological diversity seen among the undescribed New Caledonian *Lordomyrma* species. Their type species and *L. caledonica* are linked by other species to more conservative taxa with habitus similar to that of the Australian *punctiventris* group. Also, several other highly aberrant, clearly congeneric, apparently separately derived but linked *Lordomyrma* species are represented on New Caledonia. Details will be presented elsewhere. Nine investigated New Caledonian species have the palpal formula 3:3, one has 3:2.

Most of these taxa are represented by limited material and it is unlikely that New Caledonian *Lordomyrma* species-numeric or morphological diversity is well represented. Even now, however, there is on average 1 known *Lordomyrma* species for approximately each 280 sq.mi. (c. 16.8 mi<sup>2</sup>), or 730 sq.km.(27 km<sup>2</sup>) of New Caledonian mainland. If study of these ants is to yield information of maximum value to the understanding of their evolutionary proliferation, detailed biogeographic data must be gathered before habitat modification or destruction further disrupts the natural species-distribution patterns. The potential scientific importance of the New Caledonian *Lordomyrma* fauna in a world of diminishing nature cannot be overestimated!

*Lordomyrma* is not the only significant, unusually species-rich and morphologically disparate formicid genus known from the biologically very special, but environmentally threatened, island of New Caledonia. Indeed, the taxonomic analysis and evolutionary investigation of the whole New Caledonian ant fauna deserves high scientific priority.

Other significant myrmicine genera include *Monomorium* (= *Chelaner*) and *Vollenhovia*. The ponerine genus *Discothyrea* is known from its representation in the ANIC to comprise more species on New Caledonia than are known from all of Australia, including taxa perhaps as divergent within the genus as those of any continent (even though only one species has been described). The known New Caledonian *Rhytidoponera* species have been reviewed by Ward (1984). With 18 somewhat morphologically disparate taxa this fauna is more species-rich than that of perhaps any comparable land area of Australia, where *Rhytidoponera* is overall the most prominent and species-rich ponerine ant genus.



**FIGURES 7,8.** *Lordomyrma furcifera*, Papua New Guinea, HW 0.89mm, WL 1.32mm.

**FIGURES 9,10.** *Lordomyrma infundibuli*, West Papua, HW 0.99mm, WL 1.36mm.

**FIGURES 11,12.** *Lordomyrma crawleyi*, Papua New Guinea, HW 0.89mm, WL 1.32mm.

*Rhytidoponera* is the most comprehensively known New Caledonian ant genus, yet 11 of its 18 known valid species were unnamed until described by Ward in 1984 (and most of them were first collected by him only shortly before). The remaining 7 species were described in 1839, 1883 (2 species), 1914, 1924 and 1958 (2 species).



**FIGURES 13,14.** *Lordomyrma caledonica*, New Caledonia, HW 1.06mm, WL 1.61mm.

**FIGURES 15,16.** *Lordomyrma sarasini*, New Caledonia, HW 1.01mm, WL 1.42mm.

**FIGURES 17,18.** *Lordomyrma rouxi*, New Caledonia, HW 1.68mm, WL 2.01mm.

The priority for research on New Caledonian ants is now urgent, considering the presence on the island of the myrmecologically super-dominant introduced Central American myrmicine ‘Little Fire Ant’ *Wasmannia auropunctata*, which has the potential to violently disrupt local ant faunas and to eradicate other ants, insects and higher animals from its domain. *Wasmannia* has been present for at least 30 years and was already widespread when first reported (Fabres & Brown, 1978). Modern records show it now to be almost ubiquitous on New Caledonia.

## ***Lordomyrma* species of the Fiji islands**

The Fijian *Lordomyrma* were monographed and comprehensively illustrated by Sarnat (2006), supplemented by Lucky & Sarnat (2008). Five species additional to six recognized by W.M. Mann in the 1920's were described. They constitute the species group of *L. rugosa*. Inclusion in *Lordomyrma* is readily confirmed by comparison of Figs 21-22 with those of *L. azumai* (Figs 1, 2), *L. cryptocera* (Figs 5, 6) and *L. infundibuli* (Figs 9, 10 - see also Sarnat's (2006) figures). The group is significantly species-rich considering the size of Fiji. It evidences morphological variability much less spectacular than in the western Melanesian and New Caledonian faunas, and essentially as low as that of the Asian and Australian species. Nine of the twelve known species are from relatively well-collected Viti Levu, and two only from Vanua Levu. *L. tortuosa* is known from seven of eight investigated islands, and several Viti Levu species are widespread on other islands

Because of this high species richness and low morphological disparity, the Fijian species are of special interest relative to the very species-rich but additionally highly morphologically diverse faunas of lowland New Guinea and New Caledonia. These various faunas could well be important for analysis in comparative studies investigating the nature and mechanisms of speciation (generating species richness) and adaptive radiation (generating morphological and biotic diversity) among ants.

There seems likely to be relatively less interspecific competition between congeneric species in Fiji than in the more richly concentrated *Lordomyrma* faunas of lowland New Guinea and New Caledonia. These differences in relative species density might have influenced the levels of morphological divergence in the several faunas, as effects resulting from ecological displacement among related competing species. The two main Fijian Islands, Viti Levu and Vanua Levu, are together about as large as mainland New Caledonia - their areas are 4, 001 sq.mi. (c. 10, 360 sq.km.) and 2, 137 sq.mi. (c. 5, 535 sq.km.) respectively (Robson 1963).

The collection and study of Fijian *Lordomyrma* species (and those of other ant genera significantly species-rich on the islands - e.g. *Hypoponera*, *Leptogenys*, *Gnamptogenys*, *Strumigenys*, *Pheidole*, *Camponotus* and others, along with the endemic myrmicine genus *Poecilomyrma*) deserves special scientific attention, and highlights the need for more vigorous conservation of the remaining stands of native Fijian rain forest.

## **The status of *Ancyridris* Wheeler**

*Ancyridris* Wheeler, 1935: 1. Type species (by monotypy): *A. polyrhachioides* Wheeler, 1935: 2 (Mt Misim, PAPUA NEW GUINEA).

*A. polyrhachioides* Wheeler, 1935: 2, fig. 1, a-c; Mt. Misim, PAPUA NEW GUINEA.

*A. rupicapra* (Stitz), 1938: 99, fig. 1, a-d; 'DEUTSCH NEU-GUINEA' (*Pheidole* (*Pheidolacanthinus*) (sic!) *rupicapra*) (Combination: Bolton, 1995: 62).

*Ancyridris* (Figs 19, 20) is the only putatively endemic ant genus known from New Guinea. It was provisionally cited as a junior synonym of *Lordomyrma* by Brown (1973: 178), but subsequently listed by him with generic status (Brown, 2000: 47). The suggested synonymy was not followed by Bolton (2003, et al.), and is declined here. Recent studies investigating DNA affinities among a number of myrmicine ants could indicate that the *Ancyridris* species comprise a sister group to the rump of *Lordomyrma* (Lucky, Sarnat & Ward pers.coms). Its species could, however, be considered a lineage within the *Lordomyrma* clade.

The genus is singularly morphologically distinctive and surprisingly species-rich, yet its taxa are structurally only modestly interspecifically diversified. *Ancyridris* appears to be limited to elevations above about 1,500 m. in the New Guinean cordillera, often at altitudes above those where ants are otherwise generally well represented. It includes a compact set of at least six undescribed species (ANIC) in addition to *L. polyrhachioides* and *L. rupicapra*. Its members are very alike, with considerable interspecific size variation; usually largely blackish-brown in color (though the 'red goat', *A. rupicapra*, is reddish-brown) and generally strongly shining, with at most very weak sculpturation, sparse pilosity and strongly developed, elongate, divergent,

apically hooked propodeal spines. The anterior clypeal border carries a median point, the frontal carinae and antennal scrobes are vestigial, the petiole strongly and distinctively dorsolaterally bispinose and the postpetiole usually conical above, the antennae are 12-merous and the palpal formula 3:2 in 4 examined species. The clypeal structure, hooked propodeal spines, paired petiolar spines and dorsally extended postpetiole distinguish *Ancyridris* from *Lordomyrma*. Differently configured bilateral petiolar spines are present in *Lordomyrma rouxi* (Figs 17, 18), but they almost certainly represent a homoplasy.

Available specimens are from scattered sites in Papua New Guinea, with very few known from Indonesian West Papua. Sets of up to four sympatric or near-sympatric species are represented, and sympatric associations with *Lordomyrma* species are unknown. *Ancyridris* species are as distinctive and bizarre as some of the derivative lowland New Guinean *Lordomyrma* species. Despite this, their interspecific morphological diversity is relatively low and quite different in degree from that seen among the structurally diverse lowland New Guinean and New Caledonian *Lordomyrma* species. The genus compares most closely in the nature of its diversity to the Fijian *Lordomyrma* fauna (see above).

One species from moss forest on Mt Kaindi near Edie Creek (07°21'S, 146°40'E) is a morphologically specialized workerless parasite collected from the nest of another free-living species. Two additional sympatric free-living species are found in the vicinity.

The prospects for discovery of further such sympatric assemblages of *Ancyridris* species, including additional undescribed taxa, could relate directly to the large number of myrmecologically unexplored high mountain blocs on New Guinea. This significant group is surely not yet well represented in collections.

### The status of *Cyphoidris* Weber

*Cyphoidris* Weber, 1952: 26. Type species (by monotypy): *Cyphoidris spinosa* Weber, 1952: 26 (Ituri Forest, 15 miles N of Beni, ZAIRE).

*C. exalta* (Bolton), 1981: 258, fig. 17; Korup Reserve, CAMEROON.

*C. parissa* (Bolton), 1981: 258; Gibi, LIBERIA.

*C. spinosa* (Weber), 1952: 26, figs 7, 8; Ituri Forest, 15 miles N of Beni, ZAIRE.

*C. weneri* (Bolton), 1981: 259; Rangiro, RWANDA.

Bolton (1981) suggested affinity between *Lordomyrma* and the Afrotropical genus *Cyphoidris* (Figs. 23, 24) Three characters putatively distinguishing the latter: (1) antennae 11- versus 12-merous; (2) palpal formula unreduced, maxillary 4: labial 3; and (3) propodeal spiracles close to the posterolateral margins of the declivity. The first feature remains characteristic of *Cyphoidris* versus *Lordomyrma*. The second is now known in at least one Asian *Lordomyrma* species (*L. azumai* - see above), where others investigated here have reduced palpal formulae (3:3, 3:2 or 2:2). Bolton (2003) separately records palpal formulae 4:3, 3:3 and 3:2 for *Lordomyrma*. Character (3) is represented in some Indo-Australian species, while others have propodeal spiracles situated further forwards, towards the middle of the lateral wall of the sclerite. The character 'number of antennal segments', while still used with due discretion, is today accorded little of its former broad significance in myrmicine taxonomy and alone is insufficient to sustain *Cyphoidris* as a distinct genus. These African taxa are in fact quite close in habitus to the presumably conservative *Lordomyrma* species of Asia and Australia, and would perhaps have been assigned to *Lordomyrma* were they Indo-Australian.

*Cyphoidris* was comprehensively reviewed by Bolton (1981). *C. parissa* has been reported from West Africa, *L. exalta* and *L. spinosa* from Central Africa, and *C. weneri* from East Africa. *C. spinosa* was recorded by Bolton from Ituri Forest, Zaire (the type locality), Duque de Bragança Falls, Angola, and Agboville, Ivory Coast; the other species only from their type localities (see species list above). *C. spinosa* and *C. exalta* were well illustrated by Bolton (1981, figs 15-17) and the *spinosa* figures reproduced by Hölldobler & Wilson (1990: 103).

The ANIC has specimens of *C. exalta*, *C. spinosa* and *C. weneri*, thanks to the generosity of Barry Bolton (BMNH) and Dr C. Besuchet (Muséum d'Histoire Naturelle, Geneva, Switzerland).



**FIGURES 19,20.** *Ancyridris* cf *polyrhachiodes*, New Guinea, HW 1.26mm, WL 1.98mm.

**FIGURES 21,22.** *Lordomyrma tortuosa*, Fiji, HW 0.83mm, WL 1.10mm.

**FIGURES 23,24.** *Cyphoidris spinosa*, Agboville, Ivory Coast, HW 0.81mm, WL 1.02mm.

*Cyphoidris* might constitute a biogeographically long-separated sister group to the Asian/Indo-Australian *Lordomyrma* species. Relevant phylogenetic investigations will need also to consider other, possibly related genera, including *Bariamyрма* Lattke, 1990, *Dacatinops* Brown & Wilson (see Taylor, 1985) *Lachnomyrmex* Wheeler (see Feitosa & Brandão, 2008) *Lasiomyрма* Terayama & Yamane, 2000, and *Rogeria* Emery (see Kugler, 1994; Lapolla & Sosa-Calvo, 2006).

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