

## REVIEW OF THE DOLICHODERINE ANT GENUS *IRIDOMYRMEX* MAYR WITH DESCRIPTIONS OF THREE NEW GENERA (HYMENOPTERA: FORMICIDAE)

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### Abstract

The generic placement of species assigned to the dolichoderine ant genus *Iridomyrmex* Mayr is reviewed. Three new genera (*Ochetellus*, *Papyrius*, *Philidris*) are described, one genus (*Doleromyrma* Forel) is removed from synonymy, and two genera (*Anonychomyrma* Donisthorpe, *Linepithema* Mayr) are redefined and expanded, resulting in numerous new combinations. Worker-based characterisations are given for each genus.

### Introduction

In 1958, Brown questioned the species-level composition of the ant genus *Iridomyrmex* Mayr. He stated that a generic-level revision of the Tapinomini (some 19 genera, including *Iridomyrmex*) would be required to clarify the generic concepts within the subfamily Dolichoderinae. As a first contribution to such a revision, I redefine the genus *Iridomyrmex* and transfer species from it to the following genera: *Anonychomyrma* Donisthorpe, *Doleromyrma* Forel (new status), *Linepithema* Mayr, *Ochetellus* (gen.n.), *Papyrius* (gen.n.), and *Philidris* (gen.n.). These changes reduce the number of named taxa in *Iridomyrmex* from 153 to 62. Diagnostic worker characters are listed below for each genus. A detailed revision of the entire subfamily based on all castes is in preparation.

### *Anonychomyrma* Donisthorpe

*Anonychomyrma* Donisthorpe 1947: 588 (conditional syn. of *Iridomyrmex* by Brown 1973: 178). Type species: *Anonychomyrma myrmex* Donisthorpe 1947, by monotypy.

### Diagnosis of Worker (Figs 1-2)

Mandible with apical tooth slightly longer than subapical; basal angle distinct and with a well developed tooth or angle separating the masticatory and basal margins; basal margin denticulate along entire surface. Petiolar scale vertical and varying from not inclined to moderately inclined anteriorly but with the anterior and posterior faces approximately the same length. Gastral compression absent (gaster circular in cross section); fourth gastral (sixth abdominal) sternite keel-shaped posteriorly.

### Distribution

New Guinea, Solomon Islands, Australia.

### Discussion

The genus *Anonychomyrma* was established by Donisthorpe (1947) for a single male specimen from New Guinea. Comparison of this male specimen to complete nest series containing workers, queens and males permitted a detailed characterisation of the group, and the development of the generic concept proposed here.

These ants are mostly dark-coloured, hairy species found in wetter forests of Australia and New Guinea. Most species have a strong, distinct odour and have been casually referred to as the "stinky *Iridomyrmex*". Species nest in either living or standing dead wood, or in the ground, and the majority forage arboreally.

### Species Notes

The following taxa are transferred from *Iridomyrmex* to *Anonychomyrma* (all comb.n.): *anguliceps* (Forel), *angusta* (Stitz), *arcadia* (Forel), *biconvexa* (Santschi), *constricta* (Mayr) (fossil only), *dimorpha* (Viehmeyer), *dimorpha contenta* (Viehmeyer), *fornicata* (Emery), *froggatti* (Forel), *gigantea* (Donisthorpe), *gilberti* (Forel), *glabrata* (F. Smith), *incisa* (Stitz), *itinerans* (Lowne), *itinerans ballaratensis* (Forel), *itinerans depilis* (Forel), *itinerans perthensis* (Forel), *longicapitata* (Donisthorpe), *longiceps* (Forel), *malandana* (Forel) (= *innocens malandanus* (Forel),

stat.n.), *minuta* (Donisthorpe), *murina* (Emery), *nitidiceps* (André), *polita* (Stitz), *purpurescens* (Lowne), *samlandica* (Wheeler) (fossil only), *scrutator* (F. Smith), *scrutator batesi* (Forel), *sellata* (Stitz), *tigris* (Stitz).

#### **Doleromyrma** Forel stat.n.

*Doleromyrma* Forel 1907: 28 (as subgenus of *Tapinoma*, syn. of *Iridomyrmex* by Emery 1912: 21). Type species: *Tapinoma (Doleromyrma) darwinianum* Forel 1907, by monotypy.

#### *Diagnosis of Worker* (Figs 3-4)

Anterior clypeal margin with moderately ventrally curved setae. Mandibles with 4-5 teeth and 4-5 denticles. Dorsal face of propodeum shorter than declivous face. Petiolar scale moderately inclined anteriorly but with the anterior and posterior faces approximately the same length. First gastral segment projecting anteriorly, but generally not concealing petiole in dorsal view.

#### *Distribution*

Australia, New Zealand.

#### *Discussion*

These small ants are often confused with species of *Tapinoma* Förster but can be recognised by the presence of a strongly inclined but distinct petiolar node (absent in *Tapinoma*) and the weakly defined basal angle of the mandible (rounded and without an angle in *Tapinoma*). Species occur throughout southern Australia, and have been introduced into New Zealand (Keall and Somerfield 1980).

#### *Species Notes*

The following taxa are transferred from *Iridomyrmex* to *Doleromyrma* (all comb.n.): *darwiniana* (Forel), *darwiniana fida* (Forel), *darwiniana leae* (Forel).

#### **Iridomyrmex** Mayr

*Iridomyrmex* Mayr 1862: 702. Type species: *Formica purpurea* F. Smith 1858, designated by Bingham 1903: 297.

#### *Diagnosis of Worker* (Figs 5-6)

Compound eyes placed relatively posteriorly on head (Fig. 5). Anterolateral clypeal margin posterior to mediolateral region and separated from it by a shoulder; anteromedial clypeal margin with central projection, either pointed or rounded (projection sometimes feeble) (see Fig. 5).

#### *Distribution*

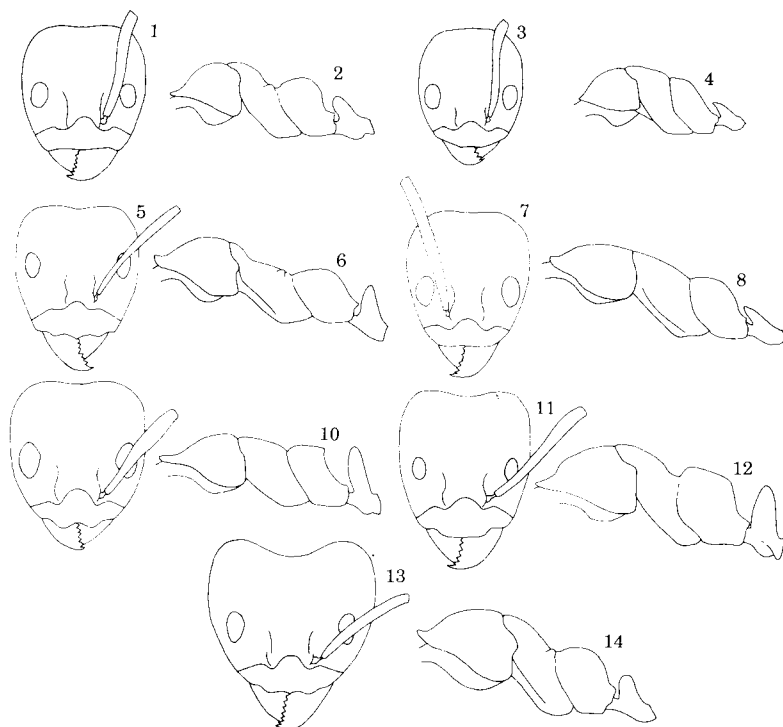
India and east to China and south to Australia.

#### *Discussion*

*Iridomyrmex* has been an ill-defined assemblage of species. In this study the genus is defined as those ants whose workers have the anterior clypeal margin as described above and the compound eyes placed relatively posteriorly on the head (Fig. 5). The eye placement is unique to *Iridomyrmex* while the clypeal condition occurs in several other genera (*Froggattella* Forel and *Philidris*). *Iridomyrmex* can be separated from these latter genera by the lack of propodeal spines (present in *Froggattella*), the upright petiolar scale (anteriorly inclined in *Philidris*), and the convex to weakly concave occipital border (concave in *Philidris*). These characters will allow ready identification of *Iridomyrmex* whereas previous classification systems relied either on characters not found in all species (i.e. regional-based diagnoses) or on the absence of characters used to diagnose other genera.

#### *Species Notes*

The following taxa are retained in *Iridomyrmex*: *agilis* Forel, *albitarsus* Wheeler, *anceps* (Roger), *anceps ignobilis* Mann, *anceps sikkimensis* Forel, *anceps watsoni* Forel, *angusticeps* Forel, *bicknelli* Emery, *bicknelli azureus* Viehmeyer, *bicknelli brunneus* Forel, *bicknelli formosae* Forel, *bicknelli luteus* Forel, *bicknelli splendidus*



FIGS 1-14—Dolichoderinae (workers): (1-2) *Anonychomyrma*, Clyde Mt., N.S.W.: (1) head; (2) mesosoma; (3-4) *Doleromyrma*, 16 km NW Pemberton, W.A.: (3) head; (4) mesosoma; (5-6) *Iridomyrmex*, 23 km NW Wollongong, N.S.W.: (5) head; (6) mesosoma; (7-8) *Linepithema*, Clinton, S.C., U.S.A.: (7) head; (8) mesosoma; (9-10) *Ochetellus*, Glen Osmond, S.A.: (9) head; (10) mesosoma; (11-12) *Papyrius*, Scrubby Peak, Gawler Ra., S.A.: (11) head; (12) mesosoma; (13-14) *Philidris*, nr. Wewak, Papua New Guinea: (13) head; (14) mesosoma.

Forel, *butteli* (Forel), *calvus* Emery, *chasei* Forel, *chasei concolor* Forel, *chasei yalgooensis* Forel, *conifer* Forel, *cyaneus* Wheeler, *discors* Forel, *discors aeneogaster* Wheeler, *discors obscurior* Forel, *discors occipitalis* Forel, *dromus* Clark, *emeryi* Crawley, *exsanguis* Forel, *extensus* Emery, *gracilis* (Lowne), *gracilis fusciventris* Forel, *gracilis mayri* Forel, *gracilis minor* Forel, *gracilis rubriceps* Forel, *gracilis spurcus* Wheeler, *hartmeyer* Forel, *innocens* Forel, *laevigatus* Emery, *mattiroloi* Emery, *mattiroloi continentis* Forel, *mattiroloi parcens* Forel, *mattiroloi splendens* Forel, *meinerti* Forel, *mjobergi* Forel, *obscurus* Crawley, *obsidianus* Emery, *purpureus* (F. Smith), *purpureus castrae* Viehmeyer, *purpureus sanguineus* Forel, *purpureus viridiaeneus* Viehmeyer, *rufoniger* (Lowne), *rufoniger domesticus* Forel, *rufoniger incertus* Forel, *rufoniger metallescens* Emery, *rufoniger pallidus* Forel, *rufoniger septentrionalis* Forel, *rufoniger suchieri* Forel, *rufoniger victorianus* Forel, *vicinus* Clark, *viridigaster* Clark, *wingi* Donisthorpe.

The fossil species *Iridomyrmex goepperti* (Mayr) is here transferred to *Liometopum* (comb.n.). This is based on an examination of two worker syntypes held in the Museum d'Histoire Naturelle, Geneva, Switzerland.

Additionally, an examination of the type material of *Iridomyrmex wheeleri* Emery in the Museum of Comparative Zoology, Harvard University, has revealed that this species belongs to the genus *Technomyrmex* (comb.n.). It is therefore transferred from *Iridomyrmex* to *Technomyrmex*.

Finally, the lack of confidently determined specimens or the condition of available material prevents the accurate generic placement of the following species (formerly placed in *Iridomyrmex*). Therefore they are provisionally placed within *Iridomyrmex*: *breviantennis* Theobald (fossil only), *florissantius* Carpenter (fossil only), *geinitzi* (Mayr) (fossil only), *haueri* (Mayr) (fossil only), *krakatauae* Wheeler, *latifrons*

Karawajew, *macrocephala* (Erichson), *mapesi* Wilson (fossil only), *oblongiceps* Wheeler (fossil only), *obscurans* Carpenter (fossil only), *proceduus* (Erichson).

### **Linepithema** Mayr

*Linepithema* Mayr 1866: 496. Type species: *Linepithema fuscum* Mayr 1866, by monotypy.

#### *Diagnosis of Worker* (Figs 7-8)

Mandible with 5-8 teeth, 5-13 denticles; apical tooth elongate and much longer than subapical. Anteromedial clypeal margin with broad, shallow concavity. Gastral compression absent (gaster circular in cross section); fourth gastral (sixth abdominal) sternite keel-shaped posteriorly.

#### *Distribution*

Central and South America, with an introduced species in North America, Europe, southern Africa and Australia.

#### *Discussion*

This genus, based on a male described by Mayr as *Linepithema fuscum*, contains the native New World species previously placed in *Iridomyrmex*. Workers associated with males in the Museum of Comparative Zoology, Harvard University (collected and pointed out to me by Dr. W. L. Brown) and complete nest series collected by John Latke (Maracay, Venezuela) secured the identity of Mayr's male material.

#### *Species Notes*

The following taxa are transferred from *Iridomyrmex* to *Linepithema* (all comb. n.): *aspidocoptum* (Kempf), *dispertitum* (Forel), *dispertitum micans* (Forel), *hispaniolae* (Wilson) (fossil only), *humile* (Mayr), *humile angulatum* (Emery), *humile arrogans* (Chopard), *humile breviscapum* (Santschi), *humile gallardoi* (Brethes), *humile platense* (Forel), *humile scotti* (Santschi), *humiloides* (Wilson) (fossil only), *impotens* (Santschi), *iniquum* (Mayr), *iniquum bicolor* (Forel), *iniquum nigellum* (Emery), *iniquum succineum* (Forel), *keiteli* (Forel), *keiteli flavescens* (Wheeler and Mann), *keiteli subfasciatum* (Wheeler and Mann), *leucomelas* (Emery), *melleum* (Wheeler), *melleum dominicensis* (Wheeler), *melleum fuscescens* (Wheeler), *oblongum* (Santschi), *piliferum* (Mayr), *pordescens* (Wheeler), *riograndensis* (Borgmeier).

### **Ochetellus** gen.n.

Type species: *Hypoclinea glabra* Mayr 1862, by present designation.

#### *Diagnosis of Worker* (Figs 9-10)

Anterolateral clypeal margin posterior to mediolateral region and separated from it by a shoulder; anteromedial clypeal margin with broad, shallow concavity (Fig. 9). Metanotal groove a narrow, distinct notch in relatively flat, the dorsal mesosomal surface. Declivous face of propodeum concave. Petiolar scale vertical and not inclined anteriorly.

#### *Description of Worker*

*Head*—Occipital border weakly convex to weakly concave. Ocelli absent. Antennae 12-segmented. Anterolateral clypeal margin posterior to mediolateral region and separated from it by a shoulder. Anteromedial clypeal margin with broad, shallow concavity.

*Mouthparts*—Palpal formula 6:4. Mandible with 6-8 teeth; 1-3 denticles; apical tooth slightly longer than subapical tooth; basal angle distinct, with a well-developed tooth or angle separating masticatory and basal margins; basal margin denticulate distally, smooth proximally.

*Mesosoma*—Declivous face of propodeum concave; dorsal face convex, shorter than the declivous face. Propodeal angle distinct (with sharp angle or carina at juncture). Metanotal groove a narrow, distinct notch in the relatively flat dorsal mesosomal surface.

*Petiole*—Scale present; rounded and forming an even arch dorsally (= nodiform), narrowed longitudinally, expanded dorsolaterally; vertical and not inclined anteriorly. Venter with at most a slight lobe.

#### *Distribution*

Japan and south through Burma and the Philippines to Australia.

### Discussion

These ants are small, morphologically similar species inhabiting a variety of habitats. Many species are arboreal and they commonly nest in rotten wood.

### Species Notes

The following taxa are transferred from *Iridomyrmex* to *Ochetellus* (all comb. n.): *epinotalis* (Viehmeyer), *flavipes* (Kirby), *glaber* (Mayr), *glaber clarithorax* (Forel), *glaber consimilis* (Viehmeyer), *glaber sommeri* (Forel), *itoi* (Forel), *punctatissimus* (Emery), *sorosis* (Mann), *vinsoni* (Donisthorpe).

### *Papyrius* gen.n.

Type species: *Iridomyrmex nitida* Mayr 1862, by present designation.

### Diagnosis of Worker (Figs 11-12)

Palpal formula 5:3. Anterior clypeal margin with 8-20 very short, straight setae. Metanotal groove a distinct, deep trough or notch depressed below the level of adjacent mesosomal notum. Mandibles with 11-14 teeth, about 3 denticles, apical tooth elongate and much longer than subapical; basal angle weakly defined by a denticle. Petiolar scale nearly vertical and not inclined anteriorly.

### Description of Worker

*Head*—Occipital border concave. Ocelli absent. Antennae 12-segmented. Anterolateral clypeal margin posterior to mediolateral region and separated from it by a shoulder. Anteromedial clypeal margin entire, without central notch.

*Mouthparts*—Palpal formula 5:3. Mandible with 11-14 teeth, about 3 denticles; apical tooth elongate and much longer than subapical tooth; basal angle weakly defined by a denticle; basal margin smooth and without teeth or denticles.

*Mesosoma*—Declivous face of propodeum flat; dorsal face flat to weakly concave, subequal in length to declivous face. Propodeal angle distinct. Metanotal groove a distinct, deep trough or notch depressed below the level of adjacent mesosomal notum.

*Petiole*—Scale present; rounded and forming an even arch dorsally (= nodiform) (but narrowed dorsolaterally); nearly vertical and not inclined anteriorly. Venter with well-developed lobe.

### Distribution

New Guinea, Australia.

### Discussion

This genus is the only Old World group of dolichoderines with a palpal formula of 5:3. Species occur in dry to moderately moist forests, nest arboreally or in dead wood on the ground, and often use carton in nest construction or over feeding areas.

### Species Notes

The following taxa are transferred from *Iridomyrmex* to *Papyrius* (all comb. n.): *flavus* (Mayr), *nitidus* (Mayr), *nitidus clitellarius* (Viehmeyer), *nitidus oceanicus* (Forel), *nitidus queenslandensis* (Forel).

### *Philidris* gen.n.

Type species: *Formica cordata* F. Smith 1859, by present designation.

### Diagnosis of Worker (Figs 13-14)

Polymorphic, majors with ocelli (occasionally monomorphic). Compound eyes placed relatively anterior on head (Fig. 13). Anterolateral clypeal margin posterior to mediolateral region and separated from it by a shoulder; anteromedial clypeal margin with central projection, either pointed or rounded (projection sometimes feeble) (Fig. 13). Mandibles with 10-12 teeth, 0-3 denticles; basal angle weakly defined by a denticle.

### Description of Worker

Polymorphic (less commonly monomorphic).

*Head*—Occipital border concave. Ocelli present in majors. Antennae 12-segmented. Anterolateral

clypeal margin posterior to mediolateral region and separated from it by a shoulder. Anteromedial clypeal margin with central projection, either pointed or rounded (projection sometimes feeble) (Fig. 13).

*Mouthparts*—Palpal formula 6:4. Mandible with 10-12 teeth, 0-3 denticles; apical tooth slightly longer than subapical tooth; basal angle weakly defined by a denticle; basal margin denticulate distally, smooth proximally.

*Mesosoma*—Declivous face of propodeum convex; dorsal face convex, subequal in length to declivous face. Propodeal angle indistinct. Metanotal groove forming distinct angle between mesonotum and propodeum.

*Petiole*—Scale present; ridged and with a distinct angle dorsally (= scaliform); strongly inclined anteriorly and with anterior face much shorter than posterior face. Venter with well-developed lobe.

### Distribution

Extreme eastern India and east through South-East Asia to the Philippine Islands, northern Australia and the Solomon Islands.

### Discussion

Species of this tropical forest group are closely associated with plants, and often live in myrmecodomatia. Morphologically, species of *Philidris* are most similar to *Iridomyrmex*, but may be separated from species of that genus as discussed above under *Iridomyrmex*.

### Species Notes

The following taxa are transferred from *Iridomyrmex* to *Philidris* (all comb.n.): *cordatus* (F. Smith), *cordatus fuscus* (Forel), *cordatus protensus* (Forel), *cordatus stewartii* (Forel), *crudus* (F. Smith), *laevigatus* (Emery), *myrmecodiae* (Emery), *myrmecodiae andamanensis* (Forel), *myrmecodiae mandibularis* (Santschi), *myrmecodiae nigriventris* (Donisthorpe), *nagasau* (Mann), *nagasau agnatus* (Mann), *nagasau alticola* (Mann), *pubescens* (Donisthorpe).

Additionally, the species *Pseudolasius brunneus* Donisthorpe is transferred to *Philidris* (comb.n.). The name is preoccupied by *bicknelli brunneus* Forel (1902), but a replacement is not proposed because of the uncertain taxonomic validity of Donisthorpe's taxon.

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