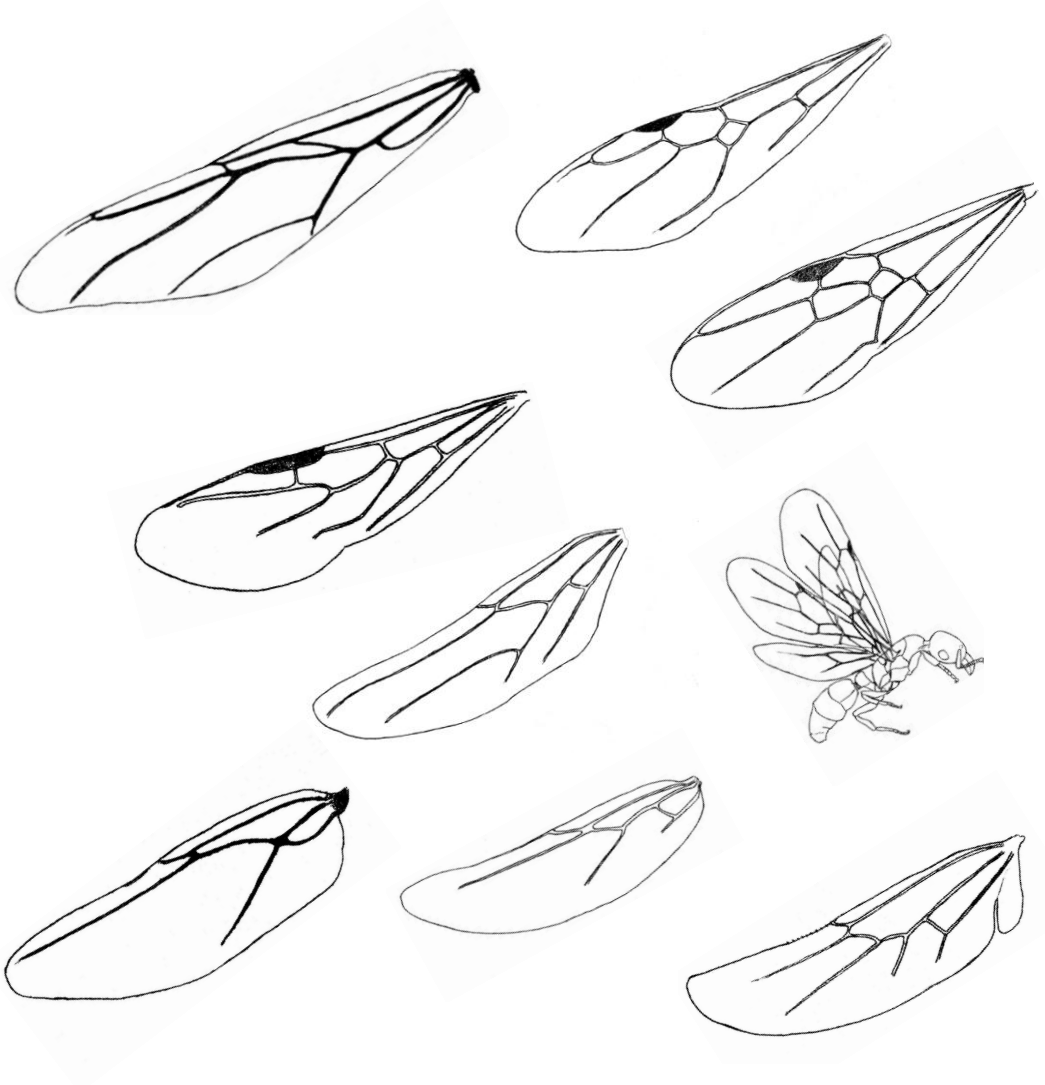
Winged Ants

The Queen ♀

Dichotomous key to genera of winged ♀♀ ants in the World
The Wings of Ants: morphological and systematic relationships

Stefano Cantone



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Winged Ants

The Male ♂ - The Queen ♀

Dichotomous key to genera of winged ♂♂ ants in the World
Behavioral Ecology of Mating flight
Dichotomous key to genera of winged ♀♀ ants in the World
The Wings of Ants: morphological and systematic relationships

With this second book, I conclude a first review about to the caste of Winged Ants.

The goal of this works has been to provide an overview of current knowledge on the wings of ants and features on the morphology of the winged caste in extant genera.

The presentation of Dichotomous Keys of the Winged Male (Cantone, 2017) and Winged Queen (Cantone, 2018), represents the first comprehensive taxonomic study on the winged caste of ants, showing the distribution of the different morphologies of Forewings and Hindwings in the genera of the family Formicidae.

I promise myself in the near future, if I have the chance, to improve and expand these works by publishing a second edition of Winged Ants.

Stefano Cantone

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Introduction

Continuing the study published in the first book “Winged Ants, The Male” (Cantone, 2017), I present this second book “Winged Ants, The Queen”.

In the first Chapter, I present the morphology of the ant wings by dividing the Forewings into four Typologies and the Hindwings into three Typologies, using the same criteria of the book concerning the Winged Male (Cantone, 2017).

In the second Chapter, I present a Dichotomous Key for a taxonomic identification of Winged Queen of 244 genera.

In the third Chapter, I describe the salient morphological characteristics of the Winged Queens genera used in the dichotomous key and other morphological characteristics useful for a first identification. For each genus described, moreover, I list the main bibliographic references and the data related to the strategy and the mating flight period.

In the four Chapter, I present an analysis of distribution of the different Typologies of wings, fore and hind, both male and queen, for each Subfamily of ants.

I thank the recherchers of the website AntCat taxonomic catalog Bolton, AntWeb and AntWiki for the support bibliografico and the photos available: ¨fantastic¨ contribution for scientific avance in the known of family Formicidae (Insecta: Hymenoptera).

1. Morphology of Ant Wings

For an identification at the taxonomic level of genus of the Winged ♀♀, I found morphological descriptions in 244* genera, from about 334 genera extant known in the World (AntCat, 2018) and belonging to all the 17 subfamilies of the family Formicidae (Hymenoptera). Are unknown 95 genera of Winged Queen or known only ♀♀ dealate or Wingless (Ergatogyne or Gamergate).

This study based in: publications of morphological descriptions; some photos published on Antweb websites that deposited in entomological collections of various Museums; my personal collection of Winged Ants.

In order to write up a Dichotomous Key on 244 genera of Winged ♀♀ ants in the World, I have chosen some morphological characteristics that are encountered in the majority of published descriptions. For each genus studied, I provide bibliographic references so is possible to confirm the taxonomic identification using other morphological features.

* In some genera of the Subfamily Ponerinae (6), Formicinae (2), Leptanillinae (3), Myrmecinae (9) is unknown the wings of Queen but, I assume that have the same wings of the other genera in the Subfamily Ponerinae or same wings of the Male and, when possible, they have been included in the Key.

1.1 The study of the wings

In this study, I deepen the morphology aspects of the forewings and hindwings of Winged ♀♀ ants, which represent the main characteristic on which my dichotomous key is written.

1.1.1 Brief review of ants' wings studies

The scholar Nylander (1846) was the first one to describe the wings of the European Formicidae family. Later, Mayr (1855), in the study of the morphology of the Formicidae family of the Austrian Empire, provided a more detailed description of the ants' wings giving the name to the nervation that forms the cells using as the model the forewings of the genus *Formica*.

The first real comparative analysis of the ants forewings, was written by Prof. Carlo Emery (1877 and 1913), the most illustrious taxonomist of the Formicidae family.

Subsequently other comparative studies of the ants forewings was published by: Brown and Nutting (1949) with a phylogenetic interpretation; Ogata (1991) who classified the forewings of the Formicidae family into four types, according to the structure of the venation and cells; Perfilieva (2010) classifying the forewings into five types, relying, like Ogata.

The only one, comparative study on the hindwings of the family Formicidae was made by Kusnezov (1962).

A new comparative studie published by Cantone (2017), shows a classification of the forewing and hindwing with a dichotomous key of the Winged Males ants in the World.

1.1.2 Classification and analysis of the forewings and hindwings of Winged Ants

In this study, in the same way as the previous study on Winged Male ♂ ants (Cantone, 2017), I presented a classification of the Forewings of the Winged Queen ♀ ants divided into four Typologies and I classify the Hindwings into three Typologies (see Table 1 and 2). In both cases, the diversity of the Typologies represented by a gradual reduction in wing venation, as studied by the aforementioned researchers.

This study is based on the Winged ♀♀ of 244 genera of ants belonging to all 17 subfamilies currently present in the World.

In reference to the Forewings, I based my work in particular on the presence/absence of subMarginal cells and Discoidal cells in Typologies I, II and III, and a drastic reduction of veins in Typology IV. Regarding the Hindwings, I based my work on the presence/absence of M2 vein in the Typologies I and II and on a strong reduction of veins in Typology III.

Below I describe the characteristics of the wings in the different Typologies.

1.1.3 Morphology description Forewing

Forewings of Typology I (figs 1-2)

The morphology represented by this Typology called by some authors as "complete". In fact, it represents a more complex structure of ants' wings venations, where the two Submarginal cells, the Discoidal cell and the Marginal cell are always present. The Marginal cell can be open or closed. In some cases, the Submarginal 2 cell can be incomplete due to the reduction of the Rs 2 + 3 vein (see Cantone, 2017).

In the 244 genera, I encountered the forewings of Typology I in Winged ♀♀ ants in 79 genera belonging to 12 Subfamilies (see Tables 3 and 4).

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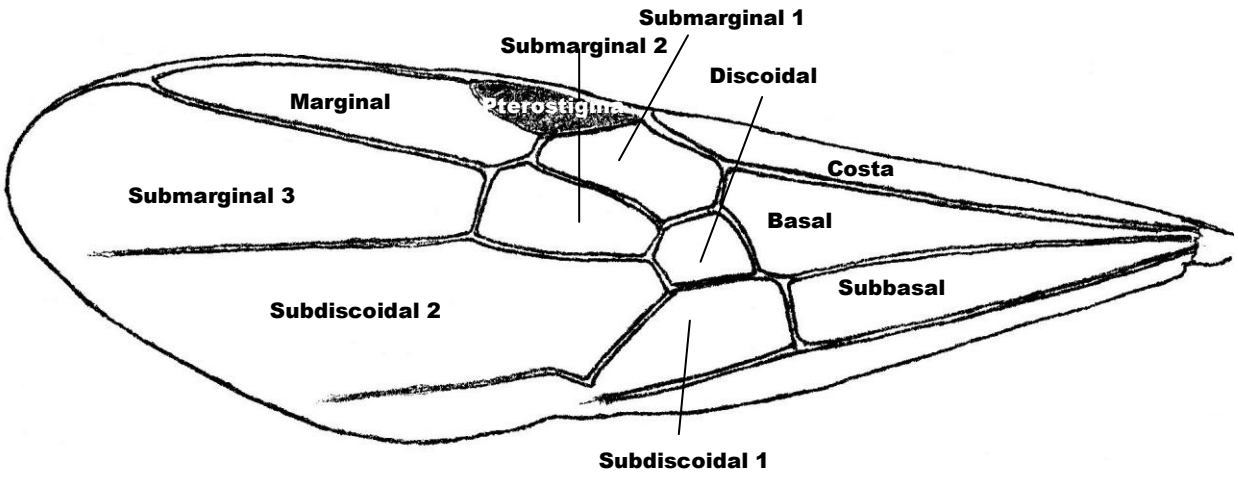

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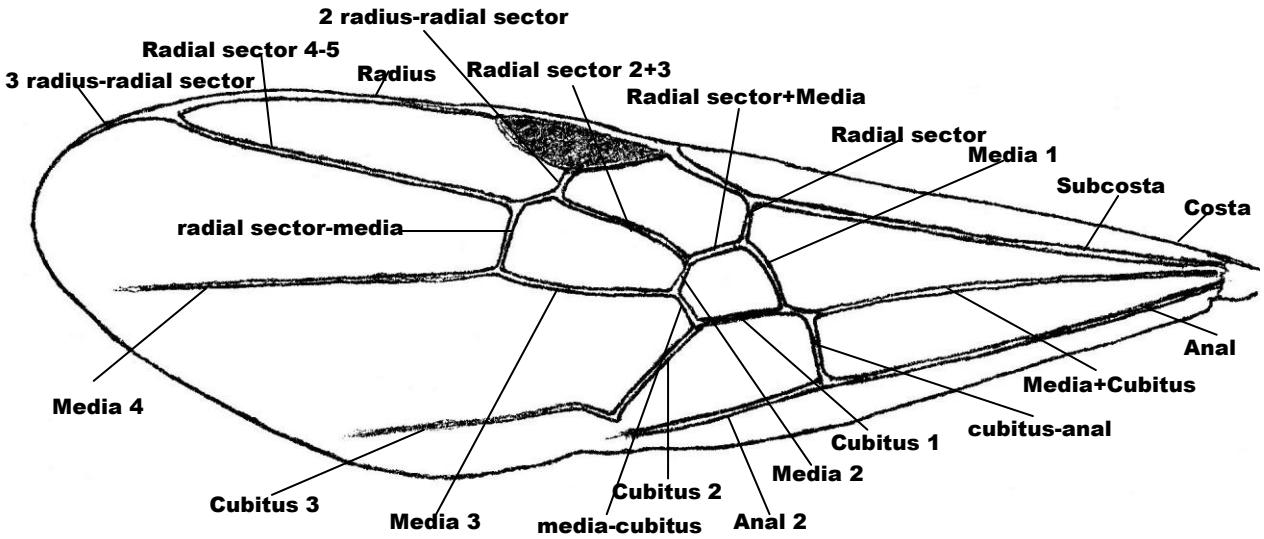

Figure 1 - Forewing of *Odontomachus* sp. ♀

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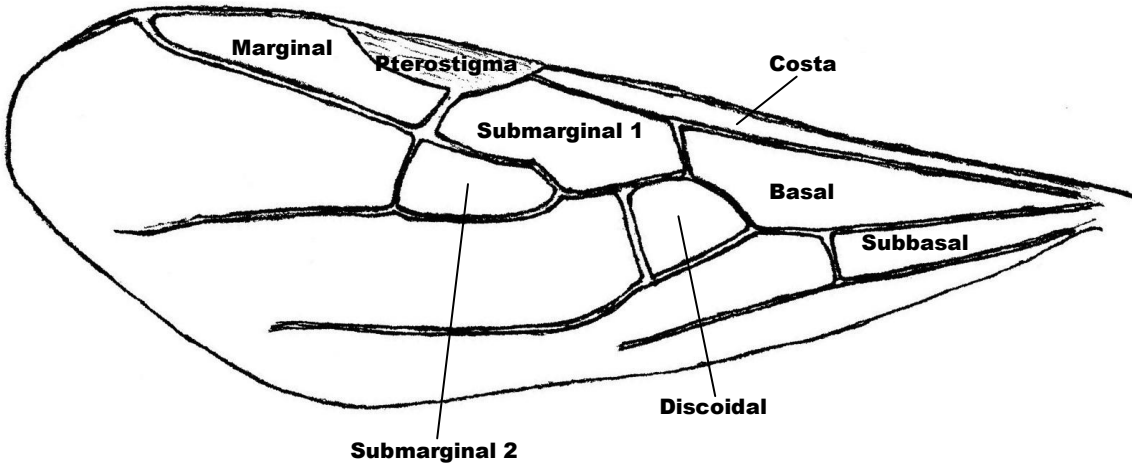

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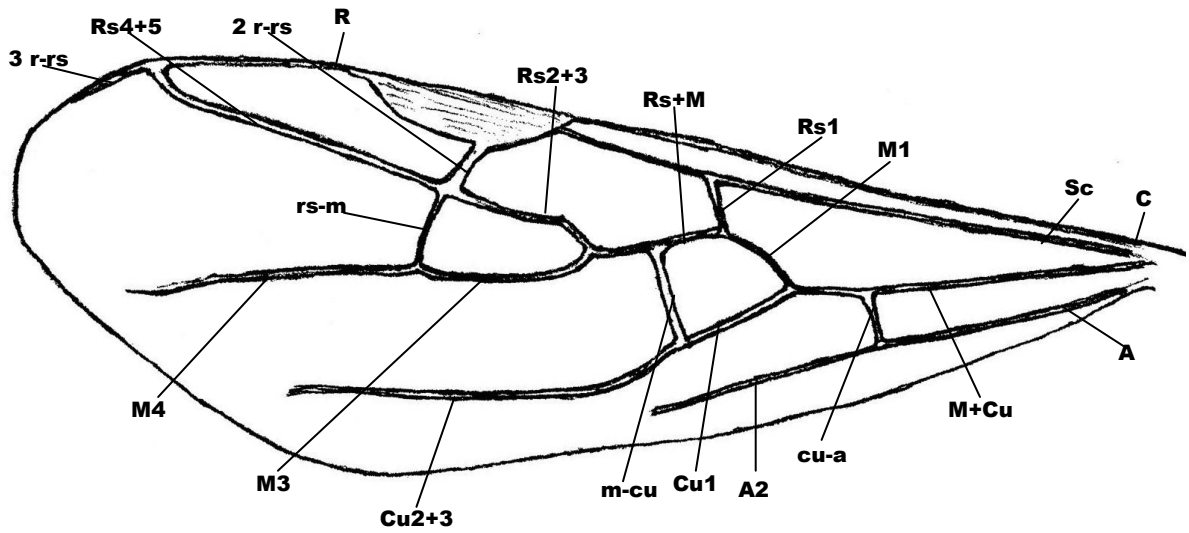

Figure 2 - Forewing of *Pheidole* sp. ♀
Veins: **C**: Costa; **Sc**: SubCosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Cross-veins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **rs-m**: radial sector+media; **r-rs**: radius+radial sector.

Forewings of Typology II (figs 3 to 5)

In this Typology II, the forewings differ from the previous Typology I due to the absence of the Submarginal 2 cell. In the 244 genera studied, the Typology II known in winged ♀♀ of 109 genera belonging to 11 Subfamilies (see Table 5 and 6). The structure of the venation differs in genera, and in rare cases in species belonging to the same genus, for the position of the M4 vein and for this reason, as described by Prof. Carlo Emery, these refer respectively as "solenopsis type" or "formica type".

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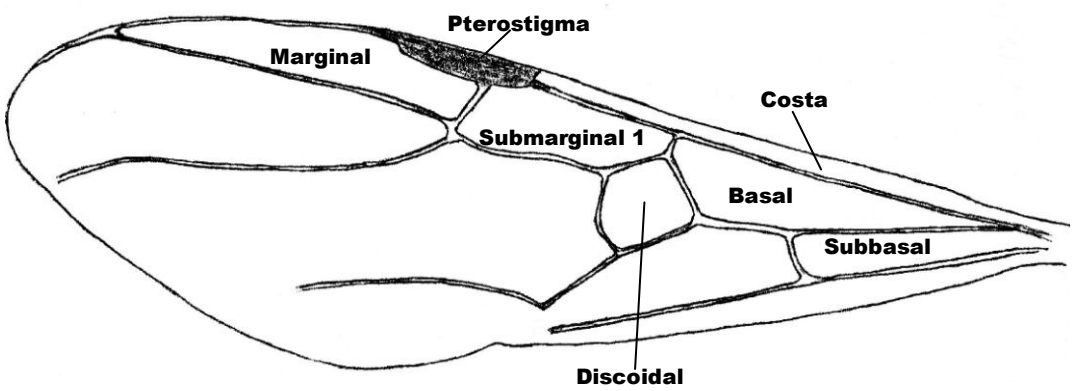

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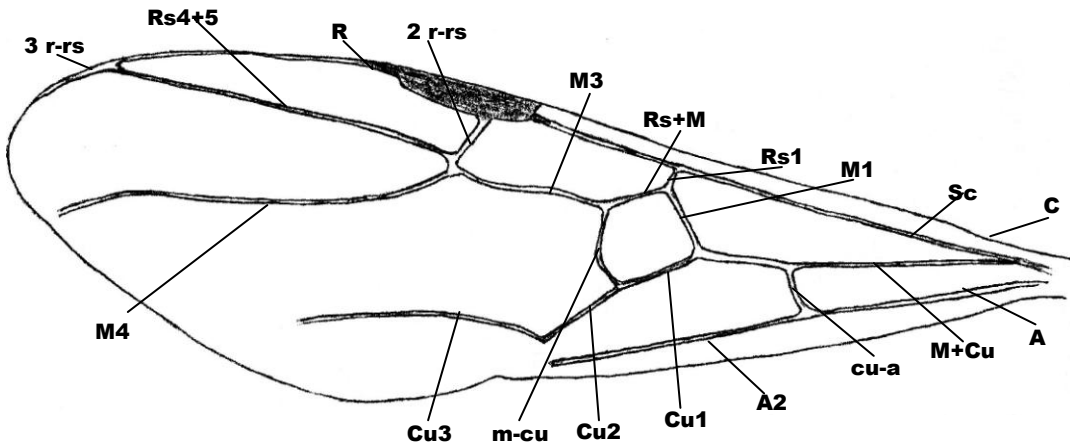

Figure 3 - Forewing of *Azteca* sp. ♀, “formica type”
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **rs-m**: radial sector+media; **r-rs**: radius+radial sector.

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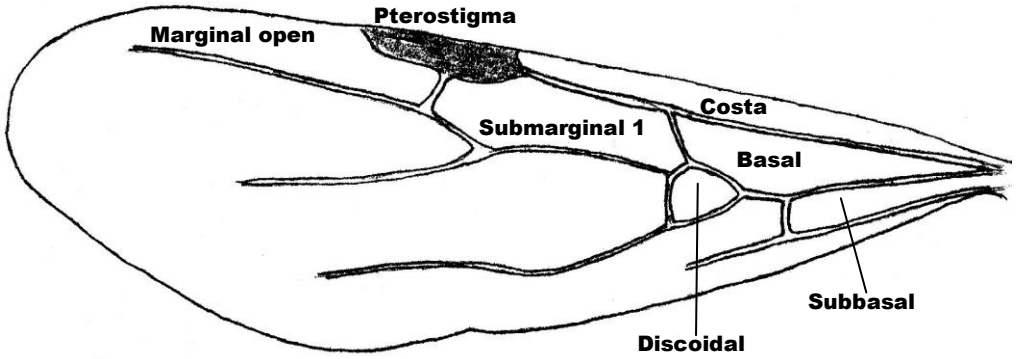

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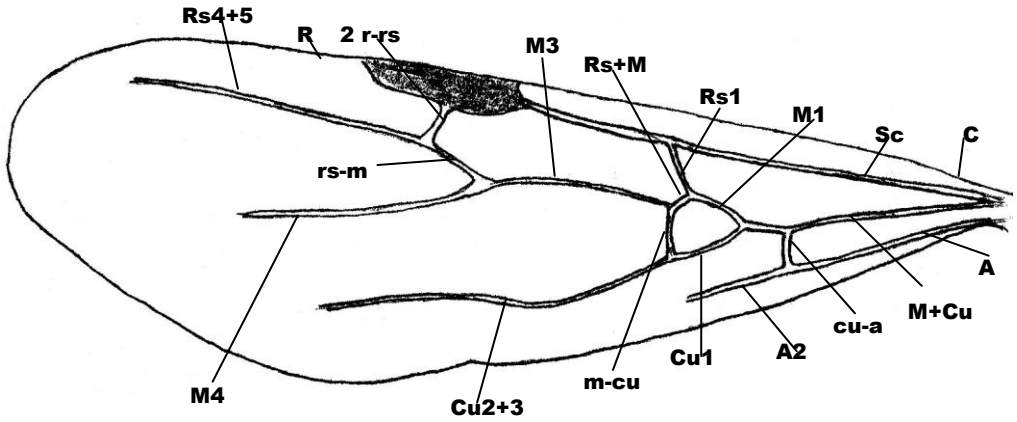

Figure 4 - Forewing of *Solenopsis* sp. ♀, "solenopsis type"
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **rs-m**: radial sector+media; **r-rs**: radius+radial sector.

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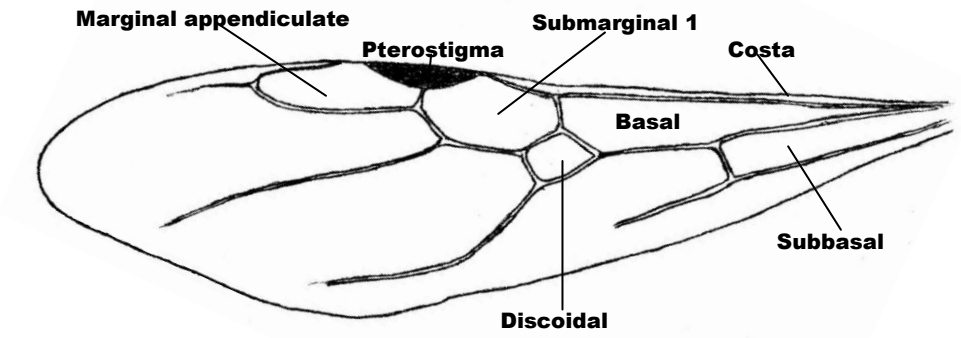

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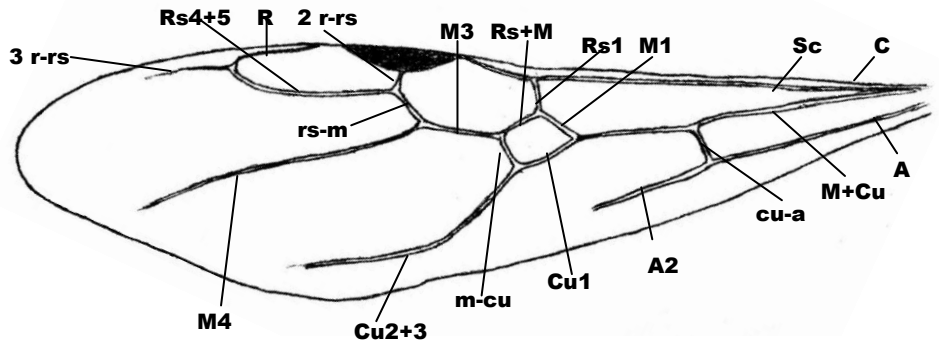

Figure 5 - Forewing of *Cephalotes* sp. ♀, "solenopsis type"
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **rs-m**: radial sector+media; **r-rs**: radius+radial sector.

Forewings of Typology III (figs 6 to 8)

The wings of this Typology characterized by the absence of Submarginal 2 cell and Discoidal cells. In the 244 genera studied there are winged ♀♀ of 96 genera belonging to 6 subfamilies (see Table 7-8). Also in this Typology as in the Typology II, it can be distinguished "solenopsis type" and "formica type" wings according to the position of the M4 vein.

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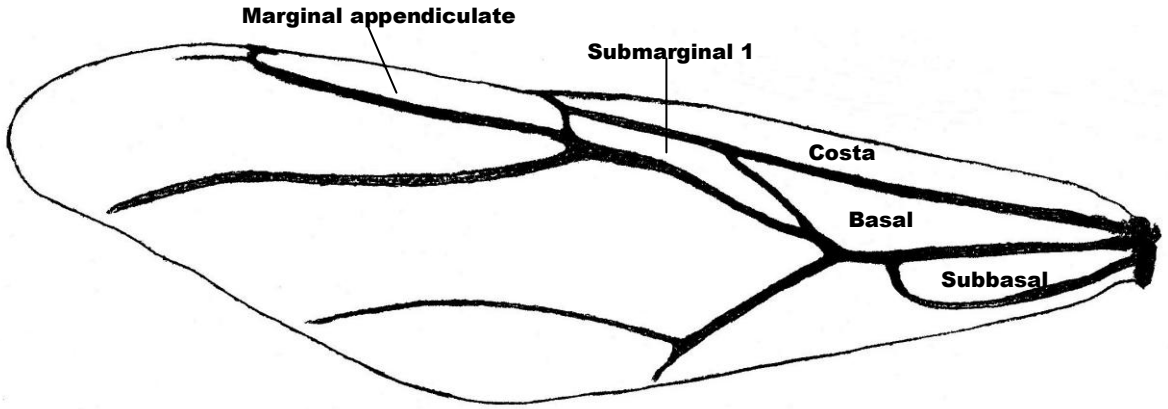

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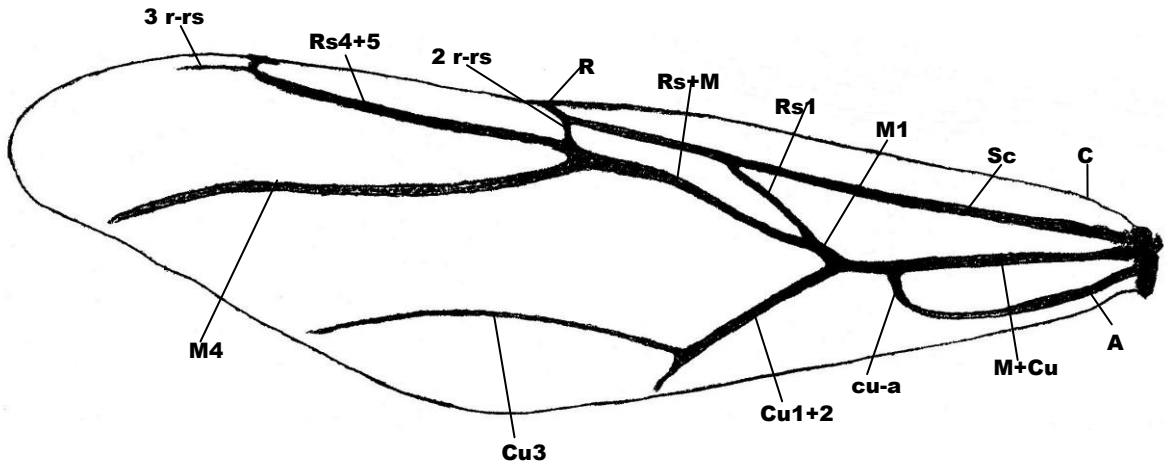

Figure 6 - Forewing of *Atta sexdens* ♀, "formica type"
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **r-rs**: radius+radial sector.

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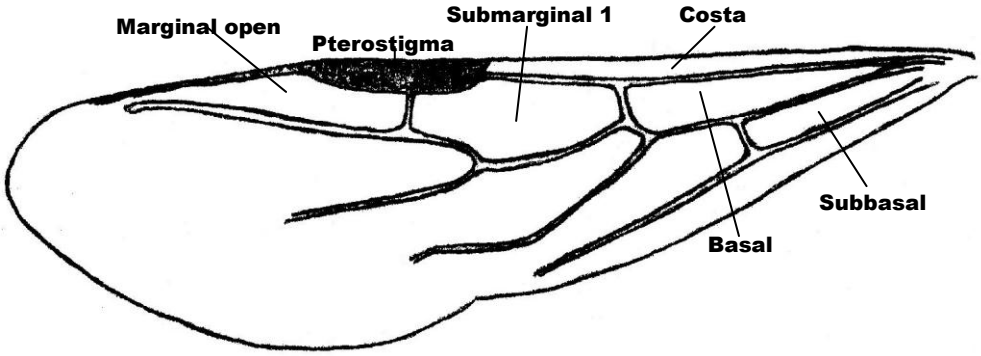

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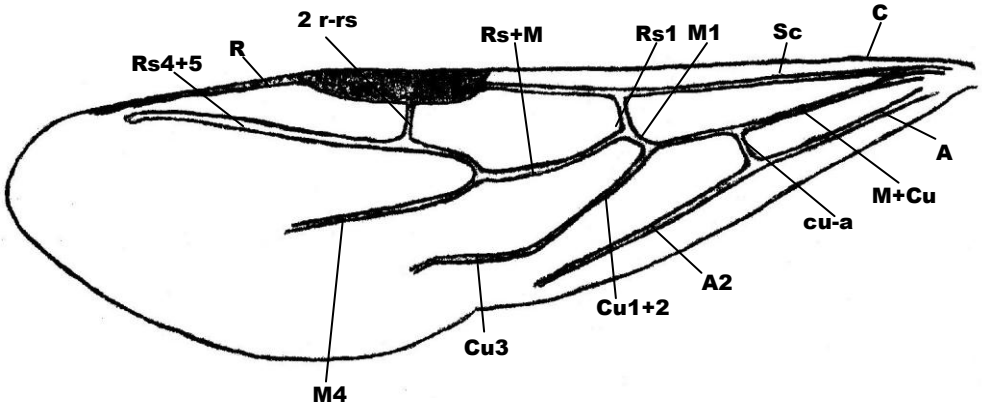

Figure 7 - Forewing of *Dorymyrmex* sp. ♀, "solenopsis type"
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **r-rs**: radius+radial sector.

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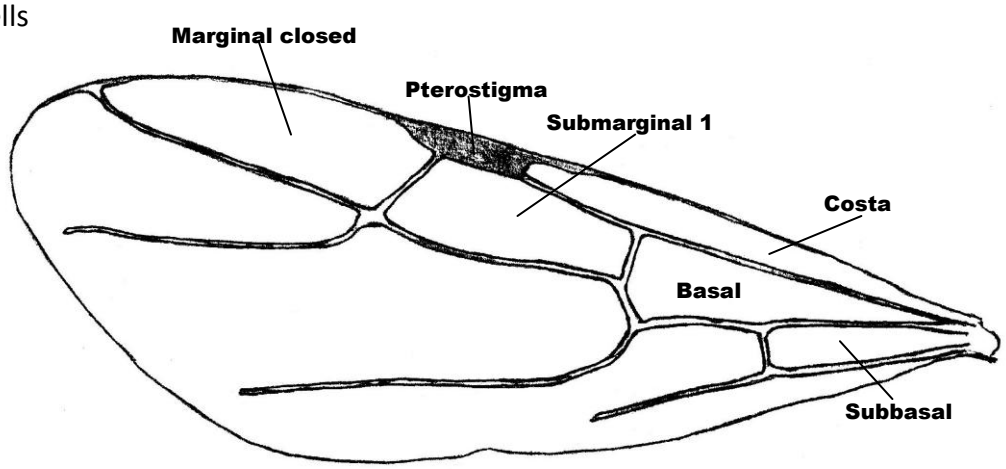

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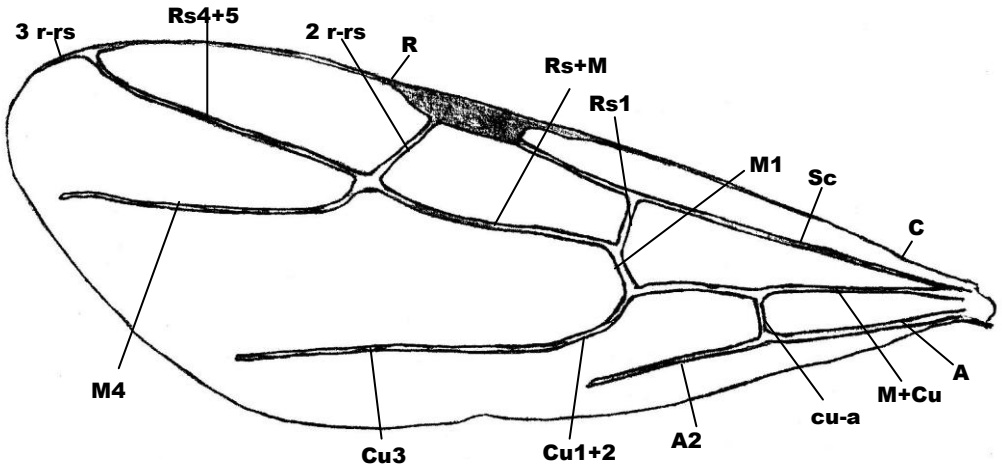

Figure 8 - Forewing of *Nylanderya* sp. ♀, "formica type"
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal; **m-cu**: media+cubitus; **r-rs**: radius+radial sector.

Forewings of Typology IV (figs 9-10)

In this latter Typology, there is a drastic decrease of the venation with the absence of subMarginal and Discoidal cells, the Marginal cell is open or absent. In this Typology are also included those genera that have very few veins. In the 244 genera studied, there are winged ♀♀ of 7 genera belonging to 3 subfamilies (see Tables 9 and 10).

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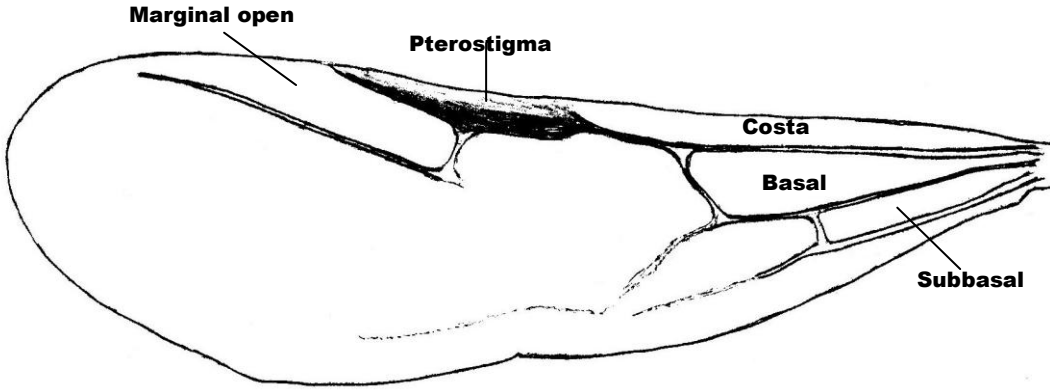

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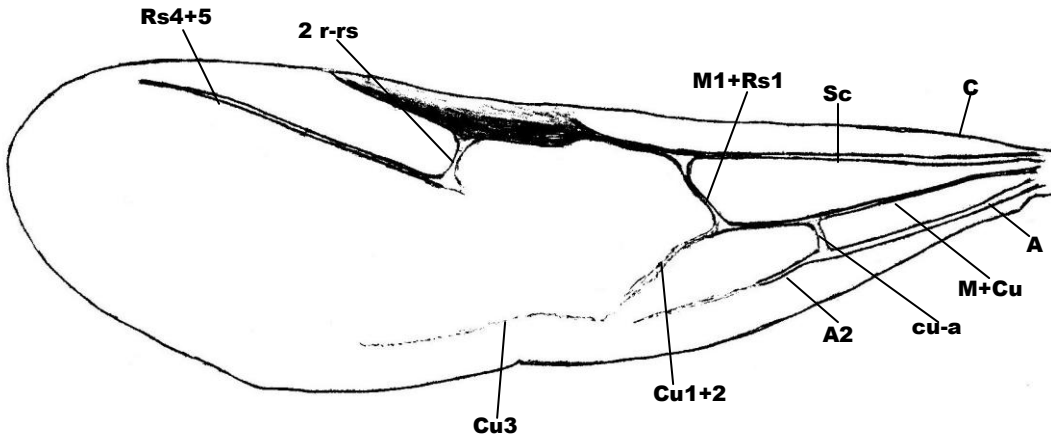

Figure 9 - Hindwing of *Dorymyrmex* sp ♂
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal; **Rs**: Radial sector; **R**: Radius
Crossveins: **cu-a**: cubitus+anal.

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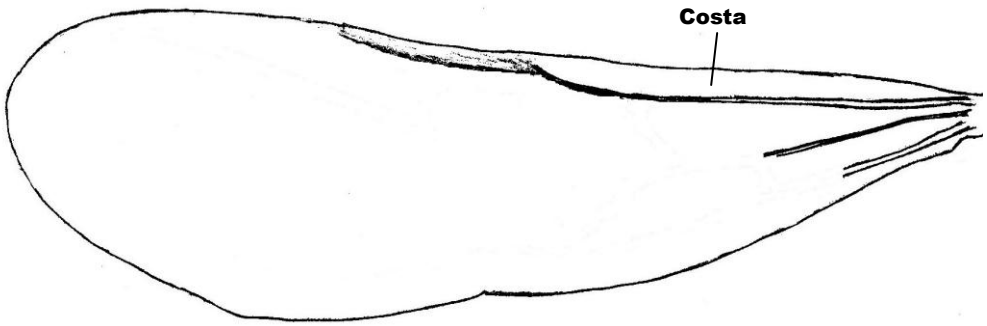

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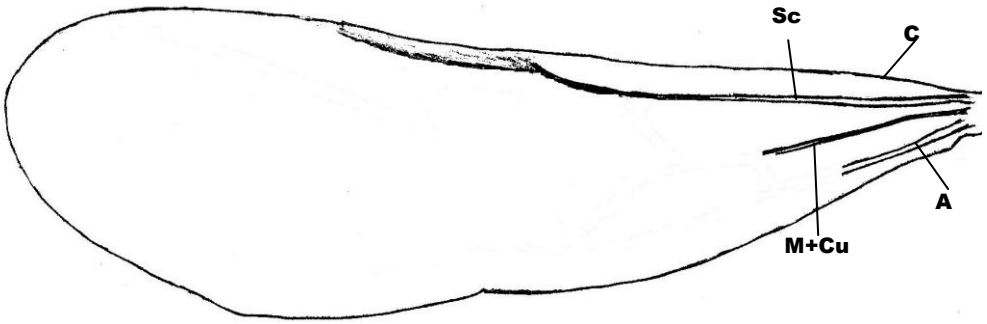

Figure 10 - Forewing with strong vein reduced
Veins: **C**: Costa; **Sc**: Subcosta; **M**: Media; **Cu**: Cubitus; **A**: Anal.

1.1.4 Morphology description Hindwing

Hindwings of Typology I (figs 11 to 13)

In this Typology, are represented wings that have a more complete venation of the family Formicidae. Basal and subBasal cells are always present. They differ in genera for the presence/absence of the Jugal lobe. They are present in the genera of Subfamilies Amblyoponinae, Dolichoderinae, Dorylinae, Ectatomminae, Heteroponerinae, Mirmeciinae, Ponerinae and Paraponerinae. The Jugal lobe is present in some genera of Subfamilies Ponerinae, Ectatomminae, Mirmeciinae and Paraponerinae.

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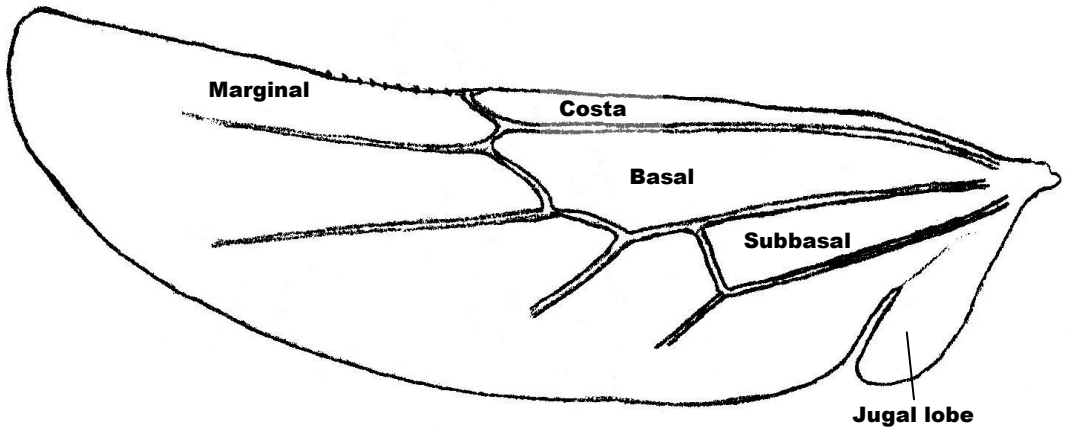

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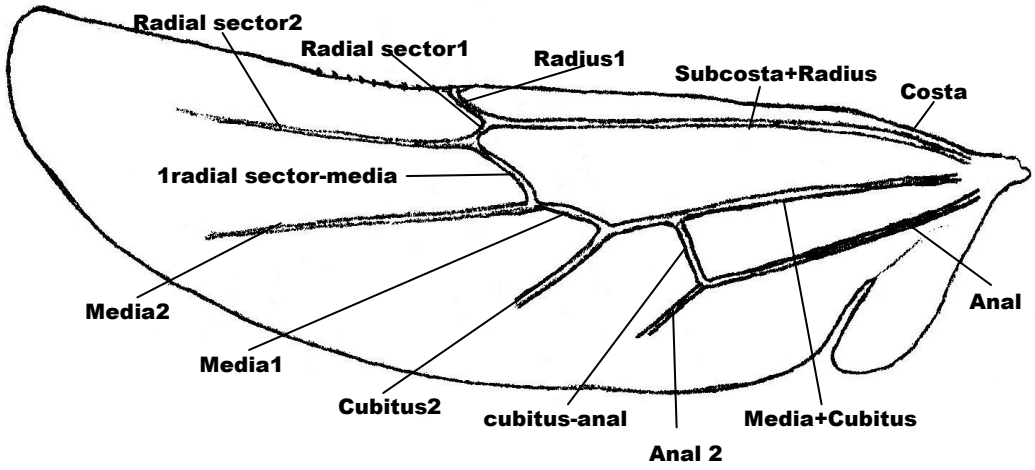

Figure 11 - Hindwing of *Odontomachus* sp. ♀

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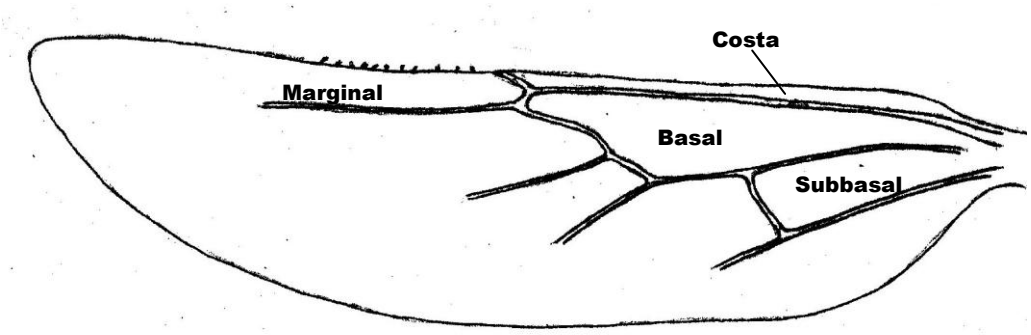

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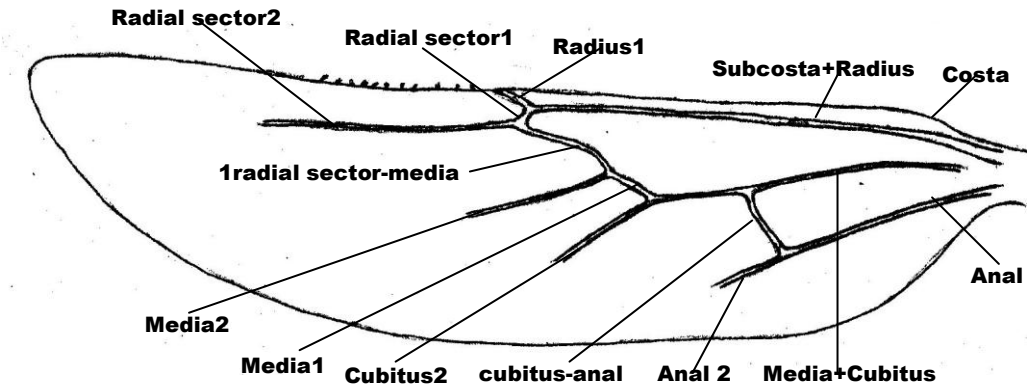

Figure 12 - Hindwing of *Acanthoponera* sp. ♀

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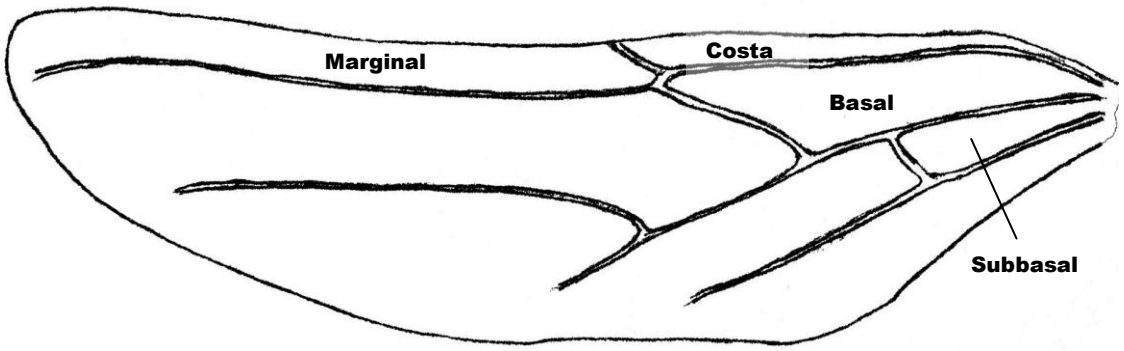

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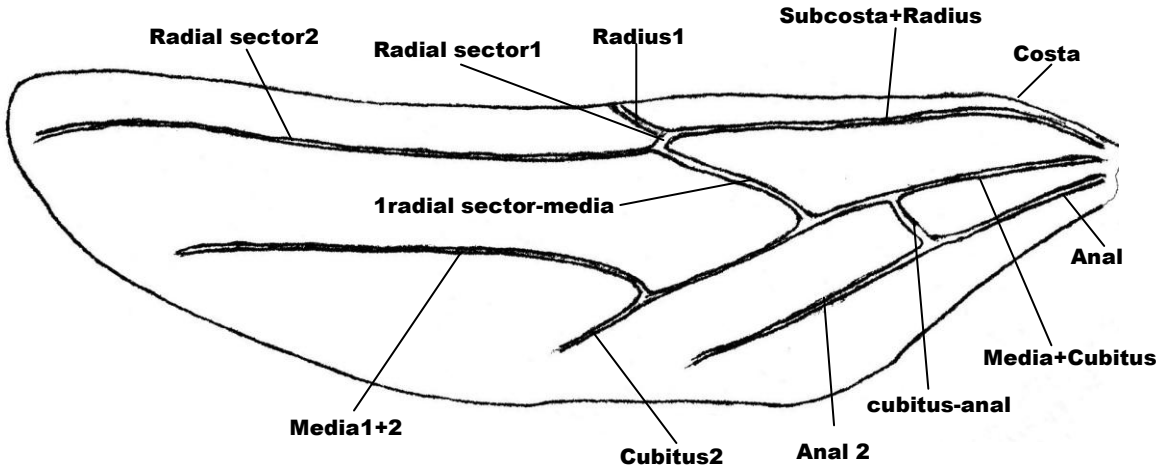

Figure 13 - Hindwing of *Azteca* sp. ♀

Hindwings of Typology II (figs 14 to 17)

In this Typology II the wings differ from the Typology I due to the absence of the Media 2 vein and the never present Jugal lobe. They are present in the genera of Subfamilies Amblyoponinae, Aneuretinae, Agroecomyrmecinae, Dolichoderinae, Dorylinae, Ectatomminae, Heteroponerinae, Formicinae, Myrmicinae, Ponerinae, Proceratiinae and Pseudomyrmecinae.

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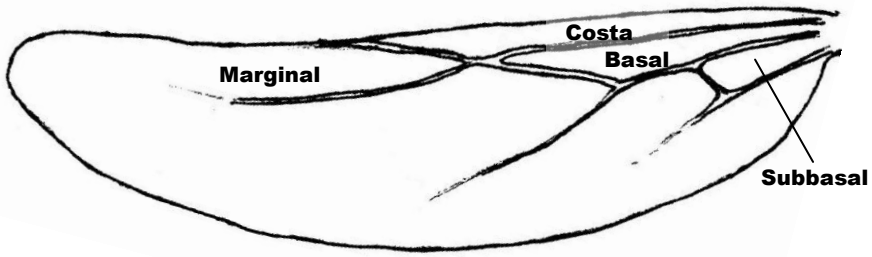

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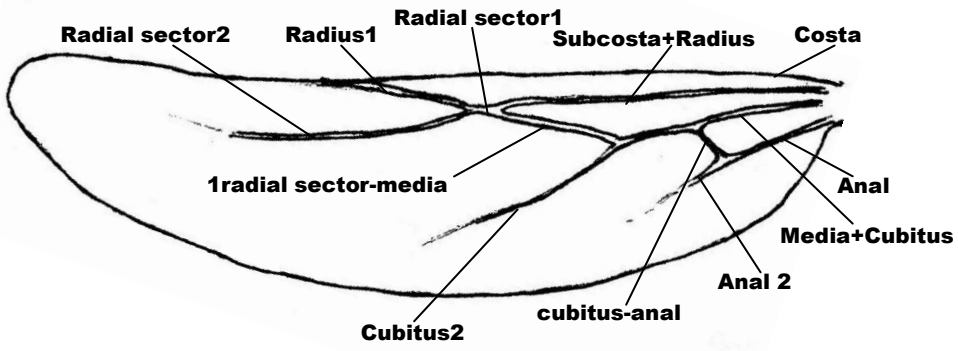

Figure 14 - Hindwing of *Anillidris bruchi* ♀

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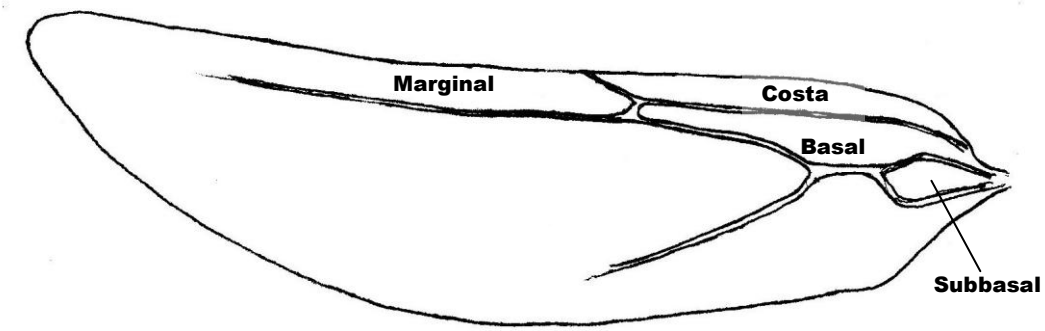

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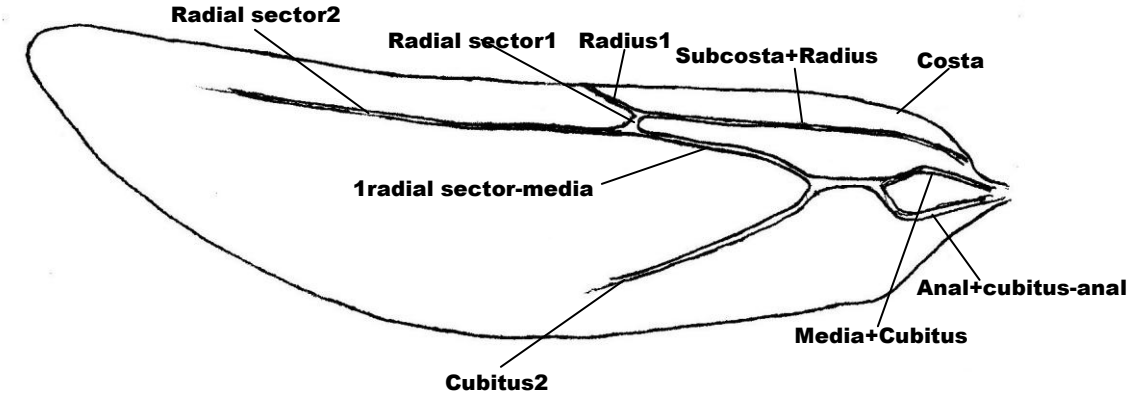

Figure 15 - Hindwing of *Pheidole* sp. ♀

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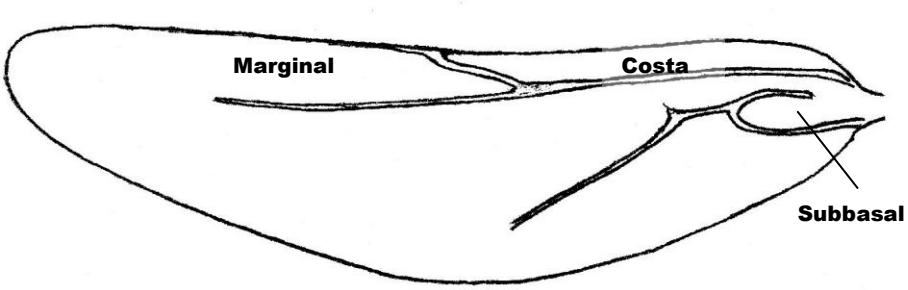

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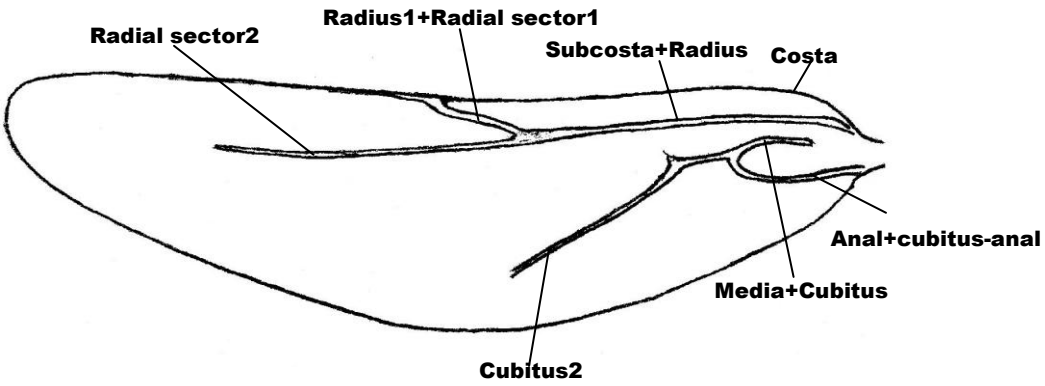

Figure 16 - Hindwing of *Brachymyrmex* sp ♀

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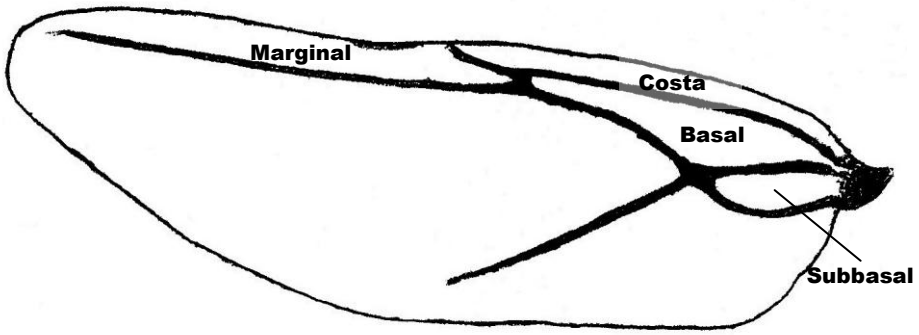

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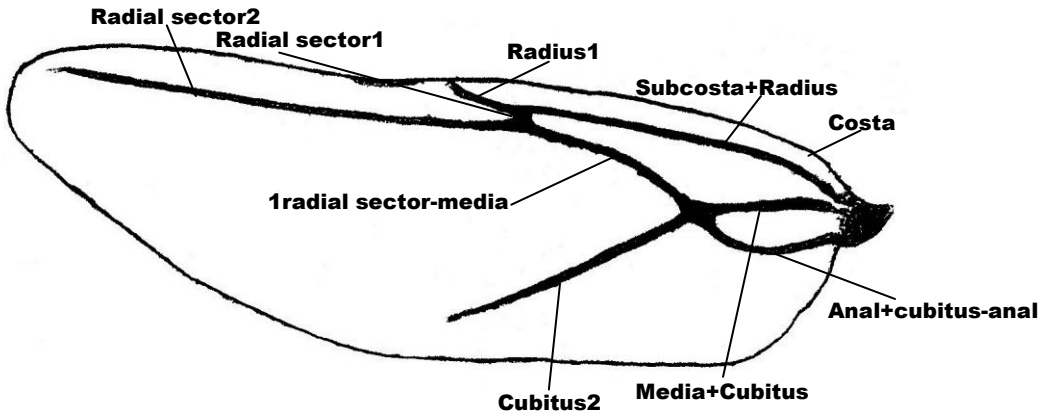


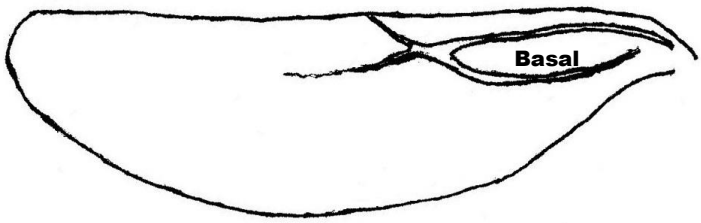
Figure 17 - Hindwing of *Atta sexdens* ♀

Hindwings of Typology III (fig. 18)

In this latter Typology there is such a drastic reduction of veins that in some genera there are reduced or absent Anal vein and the subBasal cell absent. In the extreme cases with cell absent.

They are present in the genera of Subfamilies Amblyoponinae, Apomirminae, Dolichoderinae, Dorylinae, Leptanillinae, Martialinae, Myrmicinae and Proceratiinae.

Cells



Veins and cross-veins

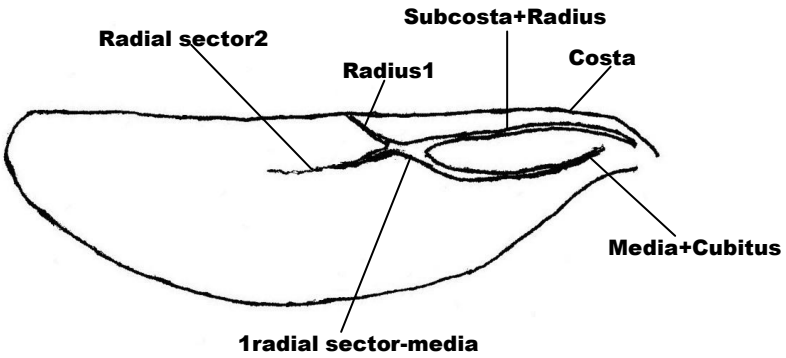


Figure 18 - Hindwing of *Myrmycocrypta* sp ♀

1.1.5 Morphological varations in the Forewing

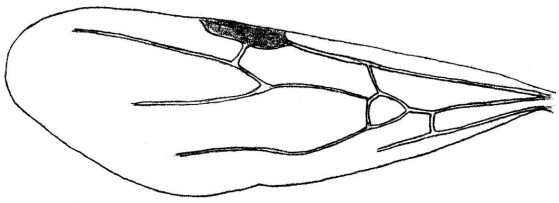
Changes in the Typology of the forewings can be found in species belonging to the same genera and in some cases in individuals belonging to the same species (see Chapter 3).

In some cases, there may be slight changes due to malformations in the development of the veins, are which clearly identifiable and which I do not consider in this study.

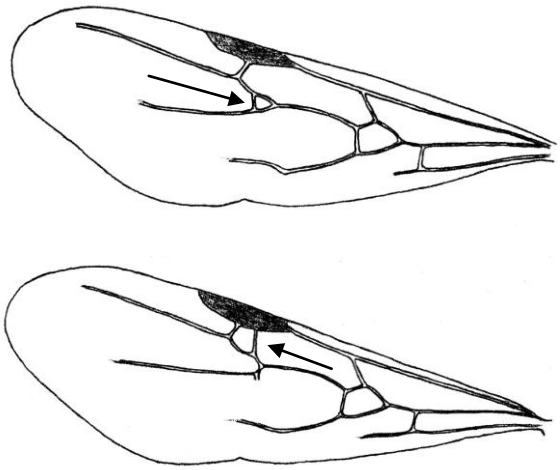
These rare variations in the structure of the veins, could be encountered in individuals of some genera, especially in the Forewings. These variations encountered in individuals in the population, presenting the formation of cells or veins in positions and shapes clearly unusual.

Below, I show an example of these variations in the forewings of some ♀♀ of a population of *Solenopsis* sp.

Normal Forewing



Variation of veins in forewings, highlighted with arrow



1.1.6 References

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1.2 Typologies Summary of the ant wings

The Dichotomous Key uses as the main morphological characteristic the Forewing and Hindwing Typologies. In Table 1 and 2 show the Typologies summary of the Forewings and Hindwings.

Forewings Typologies Summary

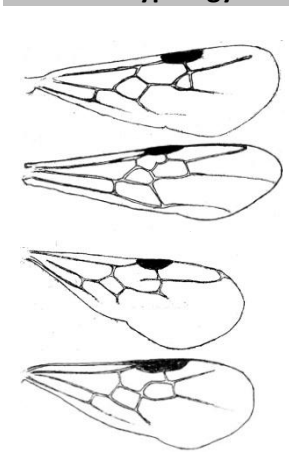
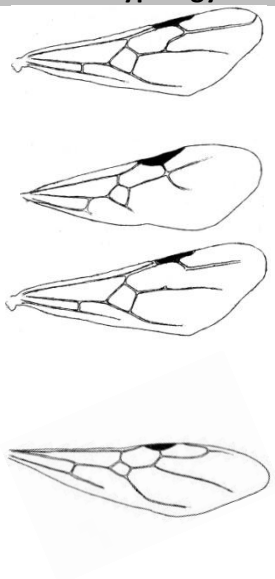
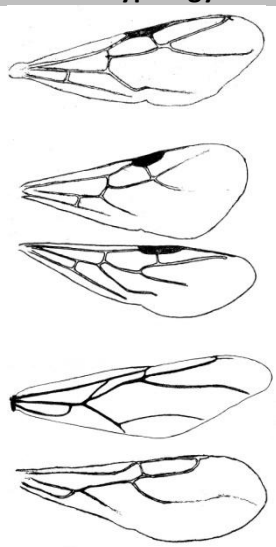
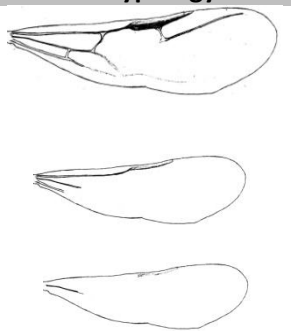
Typology I	Typology II	Typology III	Typology IV
			
p. 31	p. 43	p. 61	p. 70

Table 1 – Forewings Typologies Summary

Hindwings Typologies Summary

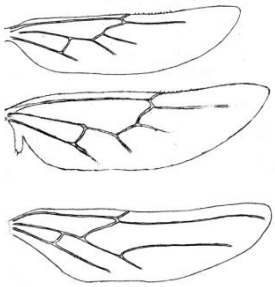
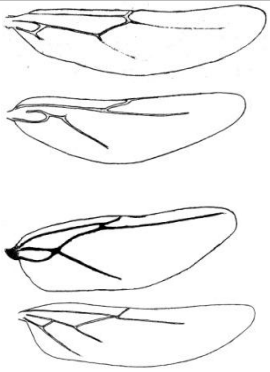
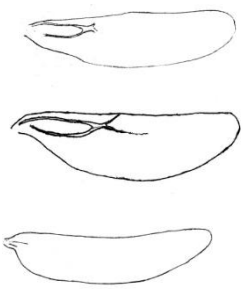
Typology I	Typology II	Typology III
		

Table 2 – Hindwings Typologies Summary

2. Dichotomous key to genera of winged ♀♀ ants in the World

This key based, as main characteristics, on the front and hind wings using the classification by Typologies shown in paragraph 1.2 (Table 1 and 2).

This key uses same criterion used in the previous Book: Winged Ants, The Male (Cantone, 2017*).

For the other morphological characteristic the terminology used in the Winged ♀♀ key is found in Hölldobler and Wilson, 1990* and Bolton, 1994*, relating to the caste of workers.

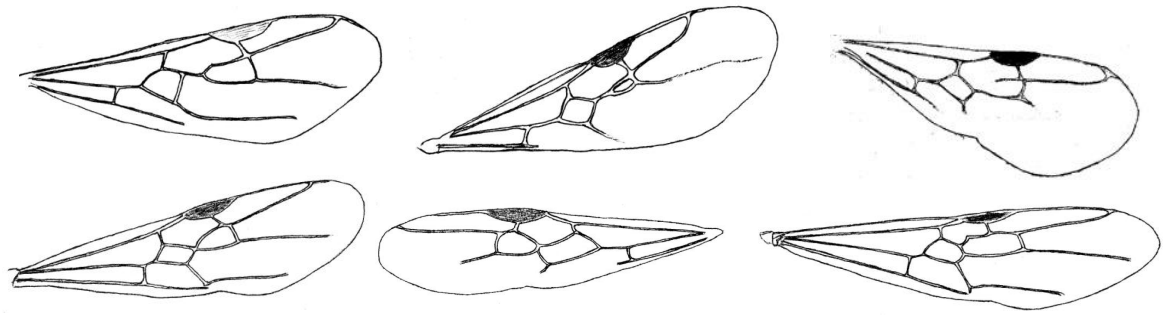
Like all dichotomous key, you require further study of the bibliography to achieve a scientifically exact taxonomic identification.

In some cases, the use of few morphological characteristics did not allow me to separate some genera in the key; in these cases refer to the description and the bibliography present in the genus.

*

-Hölldobler and Wilson (1990) The Ants. Harvard University Press, Cambridge, Mass, 732 pp.
-Bolton B. (1994) Identification guide to the ant genera of the world. Cambridge, Mass.: Harvard University Press, 222 pp.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Italy, ISBN: 979-12-200-23948, www.wingedant.com.

2.1 Dichotomous key to forewings of Typology I



The Winged ♀♀ ants of 79 genera have a structure of the Forewing of Typology I (Table 4). These taxonomically classified in 12 Subfamilies (Table 3).

Forewing of Typology I

subfamily	genera
Amblyoponinae	5
Aneuretinae	1
Dolichoderinae	12
Dorylinae	4
Ectatomminae	3
Heteroponerinae	2
Myrmeciinae	2
Myrmicinae	10
Ponerinae	35
Paraponerinae	1
Proceratiinae	1
Pseudomyrmecinae	3
12	**79**

Table 3 - The Subfamilies of the Family Formicidae and the respective numbers of genera which present Winged ♀♀ with Forewings of Typology I.

Genera of the Winged ♀♀ Ants with Forewings of Typology I			
Acanthoponera	*Ectatomma*	*Mesoponera*	*Phrynoponera*
Acanthostichus (part)	*Ectomomyrmex*	*Messor*	*Plathytyrea*
Amblyopone (part)	*Emeryopone*	*Myopopone*	*Plectroctena*
Aneuretus	*Euponera*	*Myrcidris*	*Pogonomyrmex* (part)
Anillidris	*Froggattella*	*Myrmecia*	*Ponera*
Anochetus	*Fulakora* (part)	*Myrmica* (part)	*Proceratium* (part)
Anonychomyrma (part)	*Gnamtogenys* (part)	*Myopias*	*Promyopias*
Aphaenogaster (part)	*Goniomma*	*Mystrium*	*Psalidomyrmex*
Asphinctopone	*Harpegnathos*	*Neoponera*	*Pseudomyrmex*
Austroponera	*Heteroponera*	*Nothomyrmecia*	*Pseudoneoponera*
Belonopelta	*Hylomyrma*	*Ochetellus*	*Pseudoponera*
Bothroponera	*Hypoponera*	*Odontomachus*	*Rasopone*
Brachyponera	*Iridomyrmex* (part)	*Odontoponera*	*Rhytidoponera*
Buniopone	*Leptogenys*	*Pachycondyla*	*Stegomyrmex* (part)
Centromyrmex	*Linepithema*	*Paltothyreus*	*Stenamma* (part)
Chrysapace	*Liometopum*	*Paraponera*	*Stigmatomma*
Cylindromyrmex	*Loboponera*	*Parasyscia* (part)	*Technomyrmex*
Cryptopone	*Manica*	*Parvoponera*	*Tetraponera* (part)
Doleromyrma	*Mayaponera*	*Pheidole*	*Turneria*
Dolichoderus	*Megaponera*	*Phillidris*	

Table 4 – Winged ♀♀ of 79 genera of the Formicidae family which present Forewings of Typology I. In brackets, the term "part" means that species of the same genus have different Forewings Typologies.

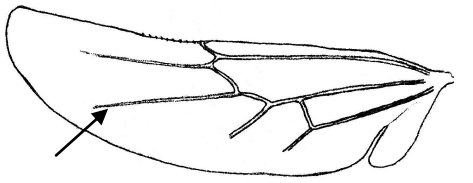
In some genera of the subfamily Ponerinae I do not know the wings of the ♀♀, so I guess they have the same morphology of veins of other genera with Forewing of Typology I and Hindwing of Typology I. In relation to the Hindwing I do not know the presence / absence of Jugal lobe, so in the dichotomous key I inserted these genera into different keys (with Jugal lobe or without Jugal lobe); these genera are: *Asphinctopone*, *Austroponera*, *Belonopelta*, *Buniapone*, *Emeryopone*, *Loboponera*, *Mayaponera*, *Promyopsias*.

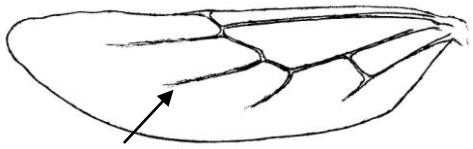
Forewing of Typology I

This key divided into two Sections:
Alpha (α) and **Beta** (β)

Section α p. 34

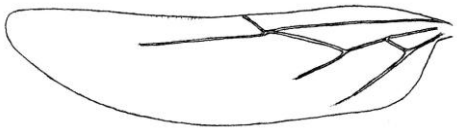
Hindwing Typology I

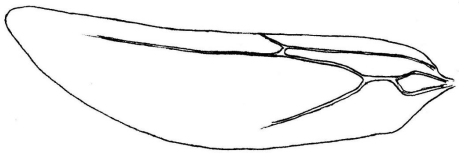




Section β p. 40

Hindwing Typology II





The difference between the two Typology, I and II of the Hindwing evidenced in the presence/absence of 2M vein, indicated in the above figure with an arrow.

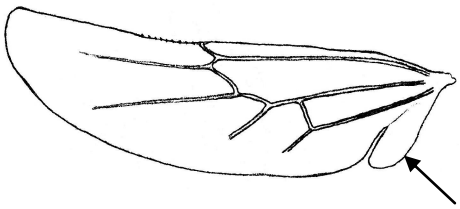
Forewing of Typology I

Section α

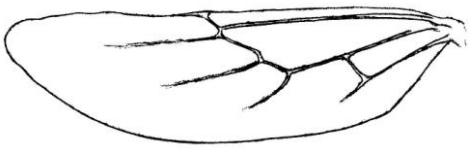
In this Section are presented genera which exhibit the Hindwing of Typology I.

This Section divided into two Parts: **A** and **B**

Part A p. 35



Part B p. 38

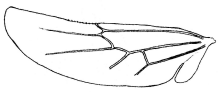


Part A: Hindwing of Typology I with Jugal lobe (arrow in figure)
Part B: Hindwing of Typology I without Jugal lobe

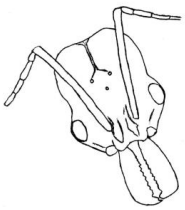
Forewing of Typology I

Section α

Part A

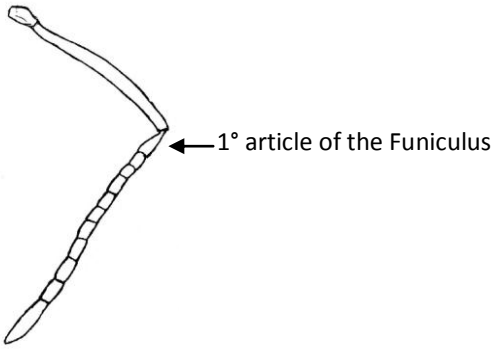


1. Mandibles elongate: linear, subtriangular or falcate…**2**

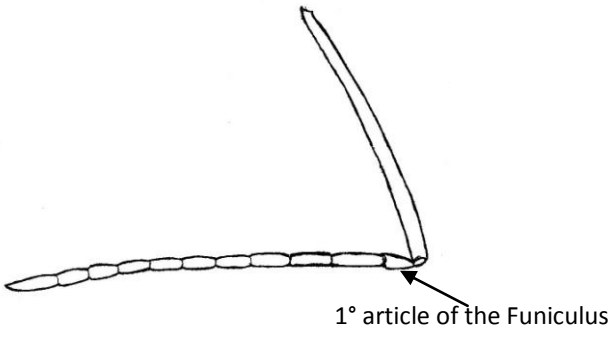


- Mandibles triangular…**10**

2. Antennae with 1° article of the Funiculus in length > than the 2° article…**3**



- Antennae with 1° article of the Funiculus in length ≤ than the 2° article…**6**



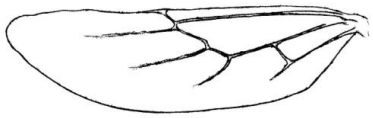
3. Antennae filiform…***Anochetus***
- Antennae versus clavate or clavate…**4**
4. Clypeus with median tooth…**5**
- Clypeus with blunt median projetion…***Buniapone***
5. Mandibles linear/falciform dentate; Neotropical region…***Belonopelta***
- Mandibles subtriangular dentate; Indo-Oriental region…***Emeryopone***
- Mandibles linear edentate or denticulate, Afrotropical region…***Promyopias***
6. Antennae versus clavate; Mandibles subtriangular/falcate dentate…***Psalidomyrmex*** (part)
- Antennae versus clavate; Mandibles linear with median large tooth or edentate…
Plectroctena
- Antennae filiform; Mandibles linear...**7**
7. Petiole with very long peduncule anteriorly…***Nothomyrmecia***
- Petiole sessile or with short peduncle anteriorly…**8**
8. Mandibles apically straight…***Harpegnathus***
- Mandibles apically curved…**9**
9. Head elongate, sub-rectangular…***Odonthomachus***
- Head not as above; in some case with strong constriction between 1° and 2° segment of the Gaster (in some species the 1° segment very short than the 2°, which can be confused with the PosPetiole)…***Myrmecia***
10. Antennae with 1° article of the Funiculus in length > than the 2° article…**11**
- Antennae with 1° article of the Funiculus in length ≤ than the 2° article…**17**
11. MetaTibiae with one Spur…**12**
- MetaTibiae with two Spurs…**14**
12. Frontal lobe strongly developed…***Loboponera***
- Frontal lobe normal…**13**
13. Clypeus with antero-lateral tooth…***Asphinctopone***
- Clypeus not as above; Tarsus with spiniform setae…***Centromyrmex*** (part)
14. Petiole armed with spines dorsally (3 or more); Propodeum armed with two spines…***Phrynoponera***
- Petiole with short teeth dorsally …***Pseudoneoponera***
- Petiole without spines or teeth dorsally…**15**
15. First gastral sternite without Prora or inconspicuous…***Brachyponera***
- First gastral sternite with Prora…**16**
16. ***Bothroponera***, ***Euponera***, ***Austroponera***, ***Ectomyrmex, Centromyrmex***
17. MetaTibiae with one Spur…**18**
- MetaTibiae with two Spurs…**20**
18. Pretarsal Claws simples…***Psalidomyrmex***
- Pretarsal Claws bifid or with submedian tooth…**19**
19. Inferior pronotal margins, just in front of each anterior coxa, with tooth…
Rhytidoponera (part)
- Inferior pronotal margins angulate, without tooth…***Ectatomma***
20. Antennal Scrobe present…***Paraponera***

- Antennal Scrobe absent…**21**
21. Clypeus denticulate…***Odontoponera***
- Clypeus not denticulate…**22**
22. Clypeus elevated medially…***Paltothyreus***
- Clypeus not as above…**23**
23. Broad insertion of the Clypeus between the frontal lobe…**24**
- Narrow insertion of the Clypeus between the frontal lobe…**25**
24. Preocular carine absent; Petiole articuled midheight on the anterior face of the first gastral segment…***Platythyrea***
- Preocular carine present; Petiole articuled low on the anterior face of the first gastral segment…***Megaponera***
25. Inferior pronotal margins, just in front of each anterior coxa, with tooth…***Rhytidoponera***
- Inferior pronotal margins, just in front of each anterior coxa, without tooth …**26**
26. Hypopygium with area of stout setae…***Pachycondyla***
- Hypopygium without area of stout setae…**27**
27. The Propodeum well below the Mesonotum… ***Mayaponera***,
- The Propodeum level with the Mesonotum…**28**
28. Afrotropical, Indo-Australian and Australia region…**Mesoponera**
- Neotropical region...**29**
29. Metapleural gland orifice without a posterior U-shaped cuticular lip… ***Rasopone***
- Metapleural gland orifice with a posterior U-shaped cuticular lip… ***Neoponera***

Forewing of Typology I

Section α

Part B



1. MetaTibiae with one Spur...**2**
- MetaTibiae with two Spurs...**14**
2. Frontal lobe strongly developed…***Loboponera***
- Frontal lobe normal…**3**
3. Propodeum armed with two spines to small teeth…**4**
- Propodeum unarmed…**6**
4. Dorsum of Head lacking a median longitudinal costa…***Gnamptogenys*** (part)
- Dorsum of Head with conspicuous medial longitudinal costa…**5**
5. Palp formula 6:4…***Acanthoponera***
- Palp formula 4:3 or less…***Heteroponera***
6. Scape short and massive…**7**
- Scape long and not massive…**8**
7. Neotropical region…***Acanthostichus***
- Afrotropical and Indo-Ausralian region…***Parasyscia***
8. Sting absent or vestigial…***Anonychomyrma***
- Sting present…**9**
9. Clypeus with antero-lateral tooth…***Asphinctopone***
- Clypeus without antero-lateral tooth…**10**
10. Frontal lobe widely separed throughout their length…**11**
- Frontal lobe closely confluent…**12**
11. Inferior pronotal margins, just in front of each anterior coxa, with tooth…***Rhitydoponera***
- Inferior pronotal margins not as above…***Gnamtogenys***
12. MesoTibiae with stout traction setae dorsally…***Cryptopone*** (Part)
- MesoTibiae without stout traction setae dorsally…**13**
13. Subpetiolar process with a simple lobe…***Hypoponera***
- Subpetiolar process with fovea (depression) postero-ventrally…***Ponera***
14. Petiole entirely articuled on the first segment of the Gaster …**15**
- Petiole articuled ventrally or midheight on the first segment of the Gaster…**17**
15. Mandibles blunt at apex and very long, longer than Head…***Mystrium***
- Mandibles pointed at apex, not as long as Head…**16**

16. Clypeus, on the front margin, with few denticles and with antero-lateral teeth…***Myopopone***

- Clypeus, on the front margin, with more denticles….***Amblyopone***

- Clypeus, on the front margin, with blunt teeth…***Stigmatomma, Fulakora***

17. Mandibles elongate subtriangular/falcate/linear…**18**

- Mandibles triangular, not elongate…**22**

18. Pretarsal Claws pettinate…***Leptogenys***

- Pretarsal Claws simple or with submedian tooth…**19**

19. Clypeus with small tooth antero-medially; Neotropical region…***Belonopelta***

- Clypeus with large tooth antero-medially; Indo-Australian, Oriental and Middle Eastern region…***Emeryopone***

- Clypeus straight antero-medial…**20**

20. Afrotropical region, Mandibles linear edentate or denticulate…***Promyopsias***

- Indo-Australian and Australia region…**21**

21. Mandibles subtriangular elongate dentate…***Buniapone***

- Mandibles linear dentate…***Myopsias***

22. Eyes placed in the back half of the head …**23**

- Eyes placed at the front half of the head…**24**

23. Indo-Australian and Madagascar region…***Chrysapace***

- Neotropical region…***Cylindromyrmex***

24. Tarsus with stout traction setae… ***Cryptopone, Pseudoponera***

- Tarsus without stout traction setae…**25**

25. Maxillary palp of 2 articles…**26**

- Maxillary palp of 4 articles…**27**

26. Mandibles without a basal pit…***Parvaponera***

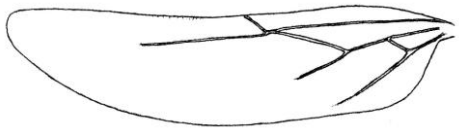
- Mandibles with a basal pit…***Euponera***

27. Neotropical region…***Mayaponera***

- Indo-Australian and Australia region…***Austroponera***

Forewing of Typology I

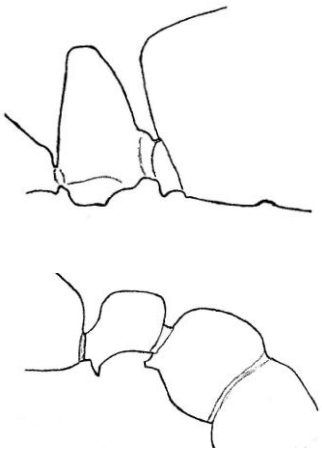
Section β



This Section divided into two Parts: **A** and **B**

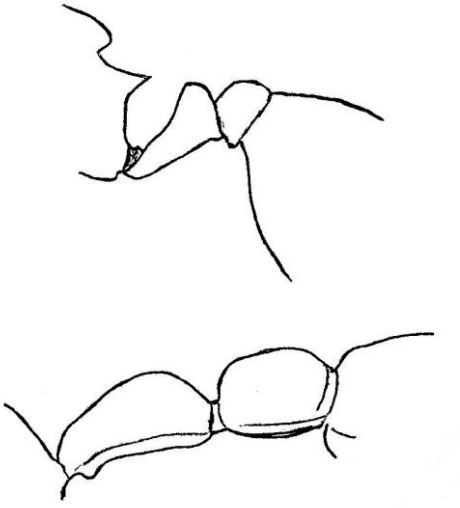
Part A p. 41

Petiole



Part B p. 42

Petiole and PostPetiole



Forewing of Typology I

Section β

Part A

Petiole

1. Sting present and developed...**2**
- Sting vestigial or absent...**8**
2. Petiole with peduncole anteriorly very long…***Aneuretus***
- Petiole sessile…**3**
3. Clypeus with blunt teeth antero-marginally...***Fulakora***
- Clypeus antero-marginally without teeth…**4**
4. Frontal lobe widely separed throughout their length…**5**
- Frontal lobe closely confluent…**6**
5. Dorsum of Head lacking a median longitudinal costa…***Gnamptogenys***
- Dorsum of Head with conspicuous medial longitudinal costa…***Heteroponera***
6. Antennal Socket completely visible; Gaster strongly curved…***Proceratium***
- Antennal Socket completely or partially covered by the Frontal lobe; Gaster not curved…**7**
7. Subpetiolar process with a simple lobe…***Hypoponera***
- Subpetiolar process with fovea (depression) postero-ventrally…***Ponera***
8. Hypostoma antero-laterally in the form of an expanded flange…***Dolichoderus***
- Hypostoma antero-laterally not as above…**9**
9. Palp formula 3:4…***Anillidris***
- Palp formula 6:4…**10**
10. Forewing with Discoidal cell open; Petiole without distinct node…***Technomyrmex***
- Forewing with Discoidal cell closed; Petiole with distinct node…**11**
11. Genera of the subfamily Dolichoderinae**,** see key in Shattuck S. O., 1992* for the genera: ***Anonycomyrma***, ***Iridomyrmex***, ***Liometopum***, ***Doleromyrma***, ***Linepithema***, ***Ochetellus***, ***Philidris***, ***Turneria***, ***Fraggattella.***

*Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

Forewing of Typology I

Section β

Part B

Petiole and PostPetiole

1. Antennae with 10 articles...***Pheidole*** (part)

- Antennae with 11 articles...***Myrcidris***

- Antennae with 12 articles…**2**

2. Propodeum unarmed…**3**

- Propodeum armed with spines or teeth…**6**

3. MetaTibiae with one Spur…**4**

- MetaTibiae with two Spurs…**5**

4. Forewings with Rs2+3 vein incomplete; Mandibles with more than 12 teeth…***Manica***

- Forewings with Rs2+3 vein complete; Mandibles with 7-8 teeth rarely more…***Messor***

5. Mandibles with proximal tooth on the basal margin; Neotropical region…***Pseudomyrmex***

- Mandibles without proximal tooth on the basal margin; Afrotropical, Madagascar, Indo-Australian and Australia regions…***Tetraponera***

6. Eyes anteroventrally in form tapening close to the mandibolar insertion; Mediterranean region…***Goniomma***

- Eyes not as above…**7**

7. Frontal lobe enormously; Antennal Scrobe present; Neotropical region…***Stegomyrmex***

- Frontal lobe normal; Antennal Scrobe absent…**8**

8. Antennae clavate with 3 articles club…***Pheidole***

- Antennae filiform, versus clavate or clavate with 4 articles club…**9**

9. Forewings with Rs2+3 vein incomplete…***Myrmica***

- Forewings with Rs2+3 vein complete…**10**

10. MetaTibiae with Spur absent or vestigial…***Stenamma***

- MetaTibiae with Spur pectinate or simple…**11**

11. Metasternal process vestigial or absent…***Aphenogaster***

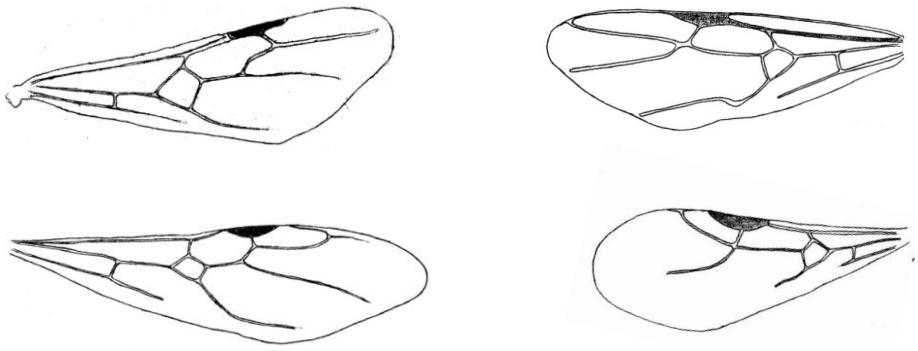
- Metasternal process represented by prominent triangle or tooth…**12**

12. Psammophore absent; Propodeum armed with spines…***Hylomyrma***

- Psammophore present; Propodeum armed with spines/teeth or unarmed…***Pogonomyrmex***

2.2 Dichotomous key to forewings of Typology II

“solenopsis type” “formica type”



The Winged ♀♀ of 109 genera of the ants that have Forewing structure of Typology II taxonomically classified in eleven Subfamilies of the Family Formicidae distributed as in Table (5 and 6).

Forewing of Typology II

subfamily	genera
Agroecomyrmecinae	1
Amblyoponinae	6
Apomyrminae	1
Dolichoderinae	8
Dorylinae	6
Ectatomminae	2
Formicinae	16
Myrmicinae	66
Ponerinae	1
Proceratiinae	1
Pseudomyrmecinae	1
11	**109**

Table 5 – The Subfamilies of the family Formicidae and the respective numbers of genera which present Forewings of Typology II.

Genera of the Winged ♀♀ Ants with Forewings of Typology II

Acanthomyrmex(part)	*Daceton*	*Meranoplus*	*Proformica*
Acanthostichus (part)	*Dicroaspis*	*Mesostruma*	*Rogeria*
Acropyga (part)	*Dilobocondyla*(part)	*Metapone*	*Rostromyrmex*
Adelomyrmex	*Diplomorium*	*Monomorium* (part)	*Royidris* (part)
Adetomyrma	*Dolopomyrmex*	*Myrmecocystus*(part)	*Simopone*
Amblyopone (part)	*Eutetramorium*	*Myrmecorhynchus*	*Solenopsis* (part)
Anonycomyrma (part)	*Formica*	*Myrmica* (part)	*Sphinctomyrmex*
Aphaenogaster (part)	*Formicoxenus*	*Myrmicaria*	*Stenamma* (part)
Apomyrma	*Fulakora* (part)	*Myrmoteras*	*Stigmacros* (part)
Atopomyrmex	*Gesomyrmex*	*Notoncus* (part)	*Stegomyrmex* (part)
Axinidris	*Gnamptogenys* (part)	*Notostigma* (part)	*Strongylognathus*
Azteca	*Harpagoxenus*	*Ochetomyrmex*	*Syllophopsis*
Bariamyrma	*Huberia*	*Onychomyrmex*	*Tapinoma* (part)
Basiceros (part)	*Iberoformica*	*Opistopsis* (part)	*Tatuidris*
Bondroitia	*Indomyrma*	*Orectognathus*	*Temnothorax* (part)
Bothriomyrmex	*Iridomyrmex* (part)	*Oxyepoecus*	*Terataner*(part)
Calyptomyrmex	*Lachnomyrmex*	*Oxyopomyrmex*	*Tetramorium* (part)
Cardiocondyla(part)	*Lasiophanes* (part)	*Papyrius*	*Tetraponera* (part)
Carebara	*Lasius* (part)	*Parasyscia*	*Thaumatomyrmex*
Cataglyphis (part)	*Leptothorax* (part)	*Paratopula*	*Tranopelta*
Cephalotes	*Liomyrmex*	*Patagonomyrmex*	*Trichomyrmex* (part)
Cerapachys	*Lioponera*	*Podomyrma* (part)	*Typhlomyrmex*
Colobostruma	*Lophomyrmex*	*Pogonomyrmex*(part)	*Veromessor*
Crematogaster (part)	*Lordomyrma*	*Polyergus*	*Vitsika*
Chronoxenus	*Malagidris*	*Prionopelta*	*Vollenhovia*
Cyatta	*Mayriella*	*Proceratium* (part)	*Xenomyrmex*
Dacetinops	*Megalomyrmex*(part)	*Procryptocerus*	*Xymmer*
			Zasphinctus

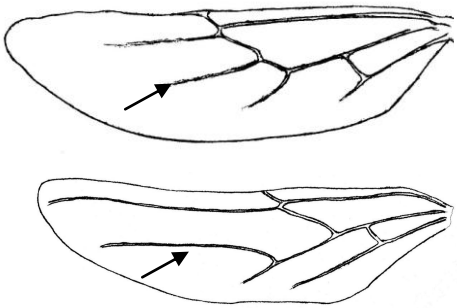
Table 6 - Winged ♀♀ of 109 genera of the family Formicidae which present Forewings of Typology II. In brackets the term "part" means that species of the same genus have different Forewings Typologies.

Forewing of Typology II

This key divided into two Sections:
Alpha (α) and **Beta** (β)

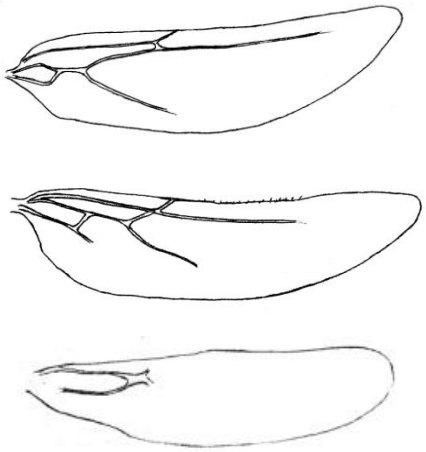
Section α p. 46

Hindwing Typology I



Section β p. 47

Hindwing Typology II and III



The difference between the two Typology I and II of the Hindwing, evidenced in the presence/absence of 2M vein, indicated in the above figure with an arrow.

Forewing of Typology II

Section α

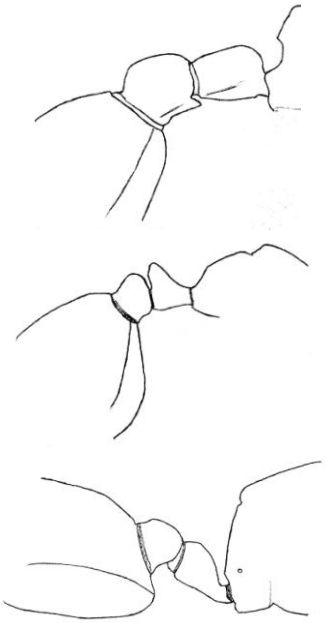
1. Antennae with 11 articles...**2**
- Antennae with 12 articles...**3**
2. Forewing with SubMarginal 1 cell open; Palp formula 6:4 or 5:3…***Simopone***
- Forewing with SubMarginal 1 cell closed; Palp formula 3:2 or 2:2…***Parasyscia*** (part)
3. Sting absent or vestigial…**4**
- Sting present…**5**
4. Indo-Australian and Australian regions…***Anonycomyrma***
- Neotropical region, M1+2 vein in particular position…***Atzeca***
5. Clypeus antero-marginally denticulate…***Amblyopone***
- Clypeus antero-marginally not denticulate…**6**
6. Forewing with Marginal cell closed…**7**
- Forewing with Marginal cell open…**8**
7. Antennal socket totally visible…***Cerapachys***
- Antennal socket covered, at least partially, from the Frontal Lobe…***Gnamptogenys***
8. Forewing with SubMarginal 1 cell open…***Lioponera***
- Forewing with SubMarginal 1 cell closed…**9**
9. Mandibles edentate, Neotropical region…***Acanthostichus***
- Mandibles dentate, Indo-Australian and Afrotropical region…***Parasyscia***

Forewing of Typology II

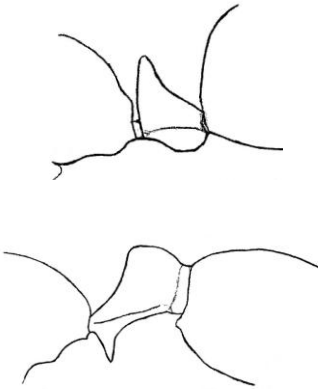
Section β

This Section is divided into two Parts: **A** and **B**

Part A p. 48
Petiole and PostPetiole



Part B p. 59
Petiole



Forewing of Typology II

Section β

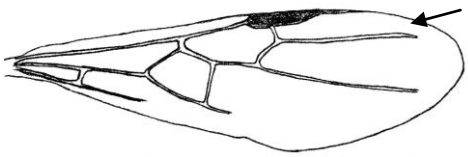
Part A

Petiole and PostPetiole

This Part A divided in two subSections

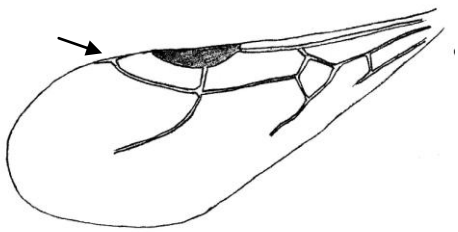
subSection 1 p. 49

Forewing with Marginal cell open



subSection 2 p. 55

Forewing with Marginal cell closed



Forewing of Typology II

Section β

Part A

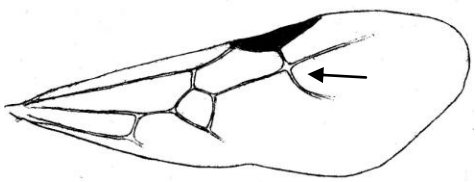
subSection 1

Forewing with Marginal cell open

This subsection 1 divided in two **infraSections**: delta (δ) and gamma (ϒ)

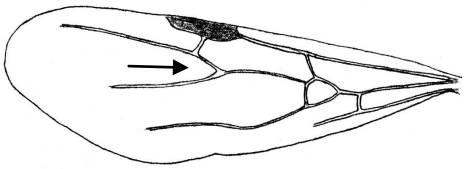
infraSection δ p. 50

Forewing formica type



infraSection ϒ p. 52

Forewing solenopsis type



Forewing of Typology II

Section β

Part A

subSection 1

Forewing with Marginal cell open

infraSection δ

Forewing formica type

1. Antennae with 7 articles…***Myrmicaria***
- Antennae with 9 articles…***Rostromyrmex***
- Antennae with 11 or 12 articles…**2**
2. Antennae with 11 articles…**3**
- Antennae with 12 articles…**11**
3. Mandibles linear, Antennae filiform… ***Daceton***
- Mandibles triangular, Antennae clavate with last 3 articles club…**4**
4. Head with Antennal Scrobe…**5**
- Head without Antennal Scrobe…**8**
5. Propodeum armed with teeth or spines…**6**
- Propodeum unarmed; Legs with all Femurs very enlarged…***Metapone***
6. Antennae Scape stout, curved, strongly depressed…***Harpagoxenus***
- Antennae Scape not as above…**7**
7. Petiole sessile…***Dicroaspis***
- Petiole pedunculate…***Tetramorium*** (part)
8. Propodeum unarmed…***Monomorium*** (part)
- Propodeum armed with teeth or spines…**9**
9. Eyes with short erect hairs between of the ommatidia…***Formicoxenus***
- Eyes without hair between the ommmatid…**10**
10. Petiole pedulculate…***Ochetomyrmex***
- Petiole sessile…***Leptothorax***
- Petiole sessile or pedulculate…***Temnothorax*** (part)
11. Antennae clavate with last 2 articles club…***Adelomyrmex***
- Antennae clavate with last 4 articles club…***Stenamma***(part)
- Antennae clavate o versus clavate with last 3 articles club or enlarged…**12**
12. Propodeum unarmed…**13**
- Propodeum armed…**14**
13. …***Monomorium*** (part), ***Megalomyrmex*** (part)
14. Head with Antennal Scrobe…**15**
- Head without Antennal Scrobe…**16**

15. Antennae with last article very long and large, as long as the sum of the other articles of the Funiculus…***Calyptomyrmex***

- Antennae with last article in length not as above…***Tetramorium*** (part)

16. Mandibles falcate…***Strongylognatus***

- Mandibles triangular…**17**

17. Antennae versus clavate with last 3 articles slightly enlarged…***Veromessor***

- Antennae clavate with last 3 articles club…**18**

18. Maxillary palp of 5 articles; Madagascar region…***Malagidris***

- Maxillary palp of 4 or 3 articles…***Megalomyrmex*** (part), ***Rogeria*** (part)

- …***Temnothorax*** (part)

Forewing of Typology II

Section β

Part A

subSection 1

Forewing with Marginal cell open

infraSection ϒ

Forewing solenopsis type

1. PostPetiole dorsally articuled to the 1° segment of the Gaster…***Crematogaster***

- PostPetiole articoled not as above…**2**

2. Antennae with 5 articles…***Orectognathus***

- Antennae with 6 articles…***Mesostruma***

- Antennae with 10 articles…**3**

- Antennae with 11 articles…**5**

- Antennae with 12 articles…**21**

3. Head with Antennal Scrobe present…**4**

- Head without Antennal Scrobe… ***Solenopsis*** (part)

4. MetaTibiae without Spur, Antennae with last 2 articles club…***Mayriella***

- MetaTibiae with Spur, Antennae with last 3 articles club…***Tetramorium*** (part)

5. Head with Antennal Scrobe… **6**

- Head without Antannal Scrobe…**8**

6. Petiole, PostPetiole and anterior first Gaster segment, with spongiform tissue ventrally on Petiole, PostPetiole and Gaster… ***Dacetinops***

- Petiole, PostPetiole and Gaster without spongiform tissue…**7**

7. Petiole sessile…***Procryptocerus***

- Petiole pedunculate…***Tetramorium*** (part)

8. Propodeum unarmed…**9**

- Propodeum usually armed…**16**

9. Antennae clavate with last 4 articles club and Propodeal spiracle enormously enlarged…***Bondroitia***

- Antennae clavate with last 2 articles club, in some case with ninth article slightly thicker than previous but not club…**10**

- Antennae clavate with 3 articles club…**12**

10. Petiole sessile…***Xenomyrmex***

- Petiole pedunculate...**11**

11. Postpetiole higher than the Petiole in lateral vision, very broadly attached to Gaster and without ventral tooth…***Diplomorium***

- PostPetiole lower in height than the Petiole in lateral vision and usually with ventral tooth …***Solenopsis***

12. Propodeal spiracle notably enlarged…***Tranopelta***

- Propodeal spiracle normal size…**13**

13. Petiole sessile…***Vollenhovia*** (part)

- Petiole pedunculate…**14**

14. Clypeus without carine… ***Dolopomyrmex***

- Clypeus with carine…**15**

15. Clypeus anteriorly bidentate, each tooth laterally with another small denticles…***Oxyepoecus*** (part)

- Clypeus not as above…***Monomorium*** (part)

16. Petiole pedunculate or sessile…***Temnothorax*** (part)

- Petiole with anterior peduncle…**17**

17. Head with Psammophore…***Oxyopomyrmex***

- Head without Psammophore…**18**

18. Palp formula 5:3… ***Huberia***

- Palp formula 2:2…**19**

19. Clypeus anteriorly bidentate, each tooth laterally with another small denticles…***Oxyepoecus***

- Clyepus not as above…**20**

20. Petiole with antero ventral strong tooth…***Indomyrma***

- Petiole without antero ventral tooth…***Lophomyrmex***

21. Head with Antennal Scrobe…**22**

- Head without Antennal Scrobe…**24**

22. Scape massive, body and legs with erect hairs clavate of white color…***Basiceros***

- Scape not massive, body and legs without erect hair clavate…**23**

23. Maxillary palp of 5 articles…***Vitsika***

- Maxillary palp of 4 or 3 articles…***Tetramorium*** (part)

24. Antennae clavate or versus clavate with last 4 articles club…**25**

- Antennae clavate with last 3 articles club…**30**

25. Palp formula 6:4…***Myrmica***

- Palp formula less than 6:4…**26**

26. MetaTibae with Spur pectinate…**27**

- MetaTibae with Spur simple or absent…**28**

27. Palp formula 4:3…***Pogonomyrmex***

- Palp formula 5:4…***Patagonomyrmex***

28. MetaTibiae with Spur vestigial or absent…***Stenamma***

- MetaTibiae with Spur simple…**29**

29. Propodeum armed with spines or teeth…***Aphaenogaster***

- Propodeum unarmed or with very short teeth…***Royidris*** (part)

30. Head, Mesosoma and Gaster without standing hairs dorsally…***Cardiocondyla***

- Head, Mesosoma and Gaster with standing hairs dorsally…**31**

31. Propodeum unarmed or with short tubercles/teeth…**32**
- Propodeum armed with teeth or spines…**34**
32. Maxillary palp of 5 articles…***Royidris***
- Maxillary palp with less of 5 articles…**33**
33. Petiole sessile…***Vollenhovia*** (part)
- Petiole pedunculate…***Megalomyrmex*** (part), ***Monomorium*** (part), ***Syllophopsis***
34. Maxillary palp of 5 or 4 articles, Madagascar region…***Eutetramorium***
- Maxillary palp of 3 or 2 articles; Neotropical and Indo-Australian region …**35**
- …***Temnothorax***
35. Petiole pedulculate…***Rogeria***
- Petiole sessile…***Vollenhovia***

Forewing of Typology II

Section β

Part A

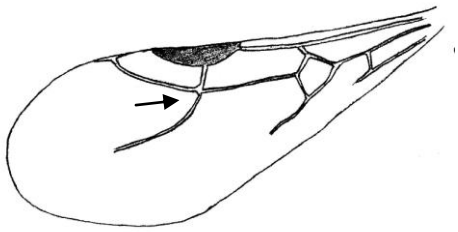
subSection 2

Forewing with Marginal cell closed

This subsection 2 divided in two **infraSection**

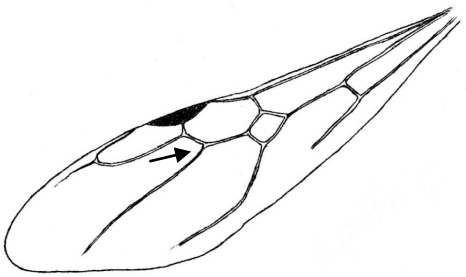
infraSection δ p. 56

Forewing formica type



infraSection ϒ p. 57

Forewing solenopsis type



Forewing of Typology II

Section β

Part A

subSection 2
Forewing with Marginal cell closed

infraSection δ

Forewing formica type

1. Antennae with 6 articles…***Colobostruma***
- Antennae with 11 articles…**2**
- Antennae with 12 articles…**7**
2. Head with Antennal Scrobe…**3**
- Head without Antennal Scrobe…**4**
3. Petiole sessile; Hindwing without Anal 2 vein…***Cephalotes***
- Petiole pedunculate; Hindwing with Anal 2 vein…***Tetramorium*** (part)
4. Petiole pedunculate…**5**
- Petiole sessile…**6**
5. Propodeum unarmed…***Liomyrmex***
- Propodeum armed with spines or teeth…***Temnothorax*** (part)
6. PostPetiole, in dorsal view, with posterodorsal lateral lobes…***Cyatta***
- PostPetiole not as above…***Temnothorax*** (part)
7. Head with Antennal Scrobe…**8**
- Head without Antennal Scrobe…**10**
8. Propodeum unarmed, Petiole cilindric shape…***Dilobocondyla***
- Propodeum armed, Petiole not cilindric shape…**9**
9. Frontal lobe enormously expanded…***Stegomyrmex***
- Frontal lobe not as above…***Tetramorium*** (part)
10. Antennae clavate with last 4 articles club…***Stenamma*** (part)
- Antennae clavate with last 3 articles club…**11**
11. Propodeum usually unarmed, Legs with Femurs swollen…***Teratataner***
- Propodeum unarmed, Legs with Femurs not swollen…***Trichomyrmex***
- Propodeum usually armed, Legs with Femurs not swollen…***Temnothorax***

Forewing of Typology II

Section β

Part A

subSection 2
Forewing with Marginal cell closed

infraSection ϒ
Forewing solenopsis type

1. PostPetiole dorsally articuled to the 1° segment of the Gaster…***Crematogaster***
- PostPetiole not as above…**2**
2. Antennae with 9 or 10 articles…**3**
- Antennae with 11 articles…**4**
- Antennae with 12 articles…**11**
3. Propodeum unarmed or with very short teeth, Antennae clavate with last 2 articles club…***Carebara*** (part)
- Propodeum armed with spines or teeth, Antennae clavate with last 3 articles club…***Meranoplus***
4. Antennae clavate with last 2 articles club…**5**
- Antennae clavate with last 3 articles club…**6**
5. Head without Antennal Scrobe…***Carebara*** (part)
- Head with Antennal Scrobe…***Lachnomyrmex***
6. Head with Antennal Scrobe…**7**
- Head without Antennal Scrobe…**9**
7. Petiole pedunculate…***Tetramorium*** (part)
- Petiole sessile…**8**
8. Eyes situated above or posterioly from the Antennal Scrobe…***Cephalotes***
- Eyes situated below from the Antennal Scrobe…***Procryptocerus***
9. Legs with Meso and MetaFemur considerably incrassated…***Podomyrma***
- Legs with Meso and Meta Femur not incrassated…**10**
10. Petiole sessile or short pedunculate…***Temnothorax*** (part)
- Petiole with long peduncle…***Lophomyrmex*** (part)
11. Antennae with last 2 articles club…***Carebara***
- Antennae with last 3 articles club…**12**
- Antennae with last 4 articles club or enlarged…**18**
12. Head with Antennal Scrobe…**13**

- Head without Antennal Scrobe…**15**

13. Mandibles massive edentate or with subapiacal tooth…***Acanthomyrmex***

- Mandibles not massive dentate…**14**

14. Sting with lamellate or dentiform appendage…***Tetramorium***

- Sting without lamellate appendage…***Lordomyrma*** (part)

15. Petiole sessile…***Atopomyrmex***,

- Petiole pedunculate…**16**

16. Petiole dorsally, in lateral view, stretched in a rounded tip or tooth form…**17**

- Petiole dorsally, in lateral view, straight…***Paratopula***

17. Neotropical region…***Bariamyrma***

- Australia, Indo-Australian and Oriental region...***Lordomyrma***

- ***Temnothorax***

18. Propodeum unarmed, Antennae versus clavate…***Tetraponera***

- Propodeum armed with teeth or spines, Antennae clavate…**19**

19. MetaTibiae with Spur vestigial or absent…***Stenamma*** (part)

- MetaTibiae with Spur pectinate…**20**

20. Palp formula 5:4…***Patagonomyrmex***

- Palp formula 4:3…***Pogonomyrmex***

Forewing of Typology II

Section β

Part B

Petiole

1. Sting present…**2**
- Sting absent or vestigial…**13**
2. MetaTibiae with two Spurs…**3**
- MetaTibiae with one Spur…**6**
3. Forewing with Marginal cell closed…**4**
- Forewing with Marginal cell open…***Adetomyrma***
4. Clypeus antero-marginally dentate…***Fulakora***
- Clypeus antero-marginally not dentate/denticulate…***Xymmer***
- Clypeus antero-marginally denticulate…**5**
5. Petiole pedunculate anteriorly and posteriorly…***Apomyrma***
- Petiole sessile, MetaTibae with Spurs reduced…***Onychomyrmex***
6. Mandibles falcate with 3 very long teeth spine shaped…***Thaumatomyrmex***
- Mandibles triangular, linear or falcate dentate or edentate…**7**
7. Clypeus denticulate marginally…***Prionopelta***
- Clypeus not denticulate marginally…**8**
8. Antennae with 7 articles…***Tatuidris***
- Antennae with 11 or 12 articles…**9**
9. Petiole pedulculate…***Typhlomyrmex***
- Petiole sessile…**10**
10. Antennal socket covert, at least in part, from Frontal lobe…***Gnamptogenys***
- Antennal socket completely visible…**11**
11. Gaster with two visibles Tergite…***Proceratium***
- Gaster with five visibles Tergite...**12**
12. Forewing with Submarginal cell closed and Marginal cell open…**Zasphinctus**
- Forewing with Submarginal cell open and Marginal cell closed…**Sphinctomyrmex**
13. Acidopore present…**14**
- Acidopore absent…**25**
14. Antennae with 7 to 11 articles…**15**
- Antennae with 12 articles…**17**
15. Big Eyes…***Gesomyrmex***
- Normal Eyes …**16**
16. Antennal socket near from posterior edge of the Clypeus; Eyes placed in the lower half of the Head… ***Acropyga***

- Antennal socket confluent from posterior edge of the Clypeus; Eyes placed in the back half of the Head… **Stigmacros**

17. Eyes places in the back angles of the Head …***Opistopsis***

- Eyes places not as above…**18**

18. Maxilar palp with articles 3 and 4 very long…**19**

- Maxilar palp with article 3 and 4 not very long…**20**

19. Neartic and Central America…***Myrmecocystus***

- Afrotropical, Paleartic, Oriental and Indo-Australian regions…***Cataglyphis***

20. Mandibles long linear dentate….***Myrmoteras***

- Mandibles falcate denticulate…***Polyergus***

- Mandibles triangular dentate…**21**

21. Australia region; Subfamily Formicinae: Melophorini tribe…***Notoncus, Notostigma, Myrmecorhynchus***

- Neartic, Neotropical, Paleartic, Oriental and Indo-Australian region…**22**

- Subfamily Formicinae: Formicini tribe...***Proformica, Formica***, ***Iberoformica***

- Subfamily Formicinae: Lasiini tribe...***Lasius***

- Subfamily Formicinae: Melophorini tribe...***Lasiophanes***

25. Petiole without distinct node…**26**

- Petiole with distinct node…**27**

26. Propodeum with teeth or tubercles…***Axinidris***

- Propodeum without teeth or tubercles…***Tapinoma***

27. Forewing with Marginal cell open …**28**

- Forewing with Marginal cell closed …**29**

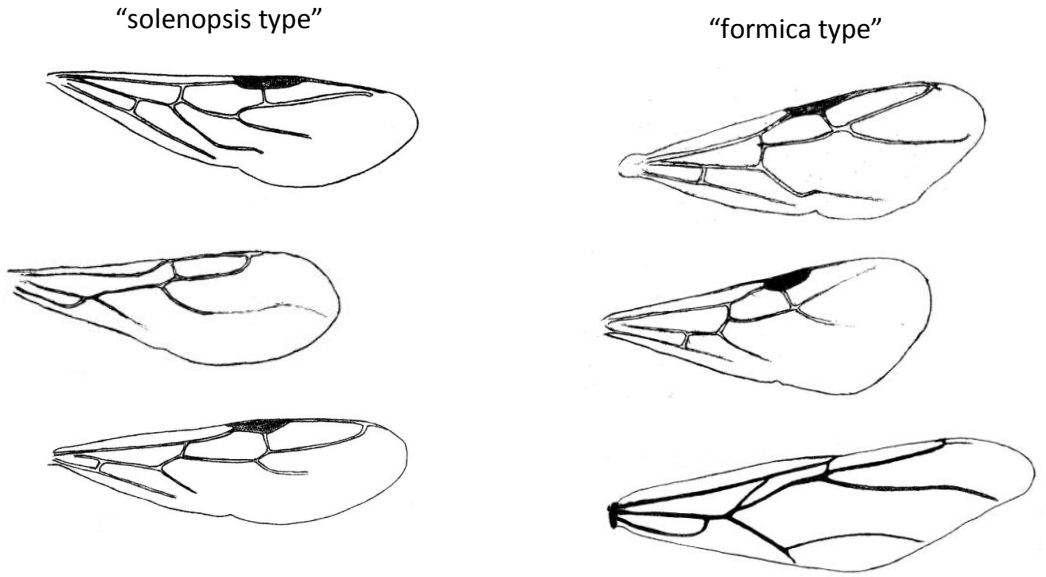
28. Forewing formica type; Palp formula 5:3…***Papyrius***

- Forewing solenopsis type; Palp formula 2:3 or 2:2…***Chronoxenus***

29. Palp formula 6:4…***Iridomyrmex, Anonychomyrma***

- Palp formula 4:3 or 2:2…***Bothriomyrmex***

2.3 Dichotomous key to forewings of Typology III



The winged ♀♀ of 96 genera (Table 8) have a Forewing structure of Typology III and taxonomically classified in five Subfamilies distributed as in Table 7.

Forewing of Typology III

subfamily	**genera**
Amblyoponinae	1
Dolichoderinae	4
Formicinae	37
Myrmecinae	52
Proceratiinae	2
5	**96**

Table 7 - The subfamilies of the family Formicidae and the respective numbers of genera which present Forewings of Typology III

Genera of the Winged ♀♀ Ant with Forewings of Typology III			
Acanthomyrmex (part)	*Dorymyrmex*	*Mirmecocystus* (part)	*Protalaridris*
Acromyrmex	*Echinopla*	*Myrmelachista*	*Pseudoatta*
Acropyga (part)	*Euprenolepis*	*Myrmycocrypta*	*Pseudolasius*
Allomerus	*Eurhopalothryx* (part)	*Nesomyrmex*	*Rhopalomastix*
Anoplolepis	*Forelius*	*Notoncus* (part)	*Rhopalothrix*
Aphomomyrmex	*Formicoxenus* (part)	*Notostigma* (part)	*Romblonella*
Apterostigma	*Fulakora* (part)	*Novomessor*	*Rossomyrmex*
Arnoldius	*Gigantiops*	*Nylanderia*	*Royidris* (part)
Atta	*Kalathomyrmex*	*Octostruma*	*Sericomyrmex*
Basiceros (part)	*Lasiophanes* (part)	*Oecophylla*	*Solenopsis* (part)
Brachymyrmex	*Lasius* (part)	*Opistopsis* (part)	Stenamma (part)
Calomyrmex	*Lenomyrmex*	*Overbeckia*	*Stigmacros* (part)
Camponotus	*Lepisiota*	*Paramycetophylax*	*Strumigenys* (part)
Cardiocondyla (part)	*Leptothorax* (part)	*Paraparatrechina*	*Tapinolepis*
Cataglyphis (part)	Megalomyrmex (part)	*Paratrechina*	*Tapinoma* (part)
Cataulacus	*Melissotarsus*	*Petalomyrmex*	*Temnothorax* (part)
Cladomyrma	*Melophorus*	*Plagiolepis*	*Terataner* (part)
Colobopsis	*Monomorium* (part)	*Podomyrma*	Tetramorium (part)
Crematogaster (part)	*Mycetagroicus*	*Polyrhachys*	*Trachymyrmex*
Cyphomyrmex	*Mycetarotes*	*Prenolepis*	*Trichomyrmex* (part)
Dacatria	*Mycetophylax*	*Pristomyrmex*	*Tyrannomyrmex*
Dinomyrmex	*Mycetosoritis*	*Proatta*	*Wasmannia*
Dilobocondyla (part)	*Mycocepurus*	*Proceratium*	*Xerolitor*
Discothyrea	*Myrmecina*	*Prolasius*	*Zatania*

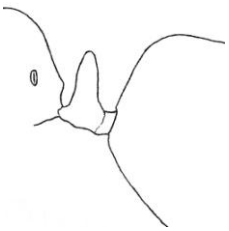
Table 8 – Winged ♀♀ of 96 genera of the Family Formicidae which present Forewings of Typology III. In brackets the term "part" means that species of the same genus have different Forewing Typologies.

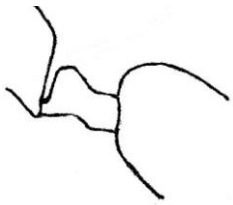
Forewing of Typology III

This key divided into two Sections:
Alpha (α) and **Beta** (β)

Section α p. 64

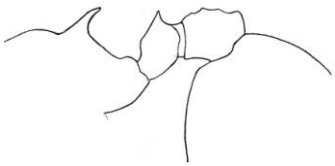
Petiole

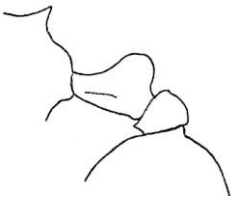




Section β p. 66

Petiole and Postpetiole





Forewing of Typology III

Section α

Petiole

1. Sting present…**2**
- Sting vestigial or absent…**4**
2. Clypeus antero-marginally dentate; Mandibles falcate/linear…***Fulakora***
- Clypeus not antero-marginally dentate; Mandibles triangular or subtriangular…**3**
3. Antennae with 6 to 10 articles…***Discothyrea***
- Antennae with 12 articles…***Proceratium***
4. Acidopore present…**5**
- Acidopore absent…**29**
5. Antennae with 7 to 11 articles…**6**
- Antennae with 12 articles…**15**
6. Antennae with less than 11 articles…**7**
- Antennae with 11 articles…**13**
7. Forewing with Marginal cell open, Antennae with 9 articles…***Brachymyrmex***
- Forewing with Marginal cell closed…**8**
8. Forewing solenopsis type…**9**
- Forewing formica type…**10**
9. Antennae clavate…***Myrmelachysta***
- Antennae filiform or versus clavate…***Acropyga*** (part)
10. Mesosoma conspicouosly flattened…***Petalomyrmex***
- Mesosoma not as above…**11**
11. Maxillary palp with 6 articles…***Cladomyrma***
- Maxillary palp with less than 6 articles…**12**
12. ***Acropyga*** (part), ***Aphomomyrmex***
13. Antennae with last 4 articles club…***Stigmacros***
- Antennae filiform or versus clavate…**14**
14. Maxillary palp of 5 or 4 articles…***Acropyga***
- Maxillary palp of 6 articles; Plagiolepidini tribe…***Plagiolepis, Anoplolepis, Tapinolepis, Lepisiota***
15. Enormous Eyes occupying the whole side of the Head …***Gigantiops***
- Eyes not as above…**16**
16. Last article of the Tarsus elongated and club shaped apically… ***Oecophilla***
- Not as above…**17**
17. Petiole with a fringe of distinct bristles…***Rossomyrmex***
- Not as above…**18**
18. Maxillary palp with 1° article flattened, 3° and 4° articles very long…***Cataglyphis***
- Maxillary palp with 1° articles not flattened, 3° and 4° articles not very long…**19**

19. Antennal socked near or confluent from posterior edge of the Clypeus…**20**
- Antennal socked distant from posterior edge of the Clypeus…**25**
20. Subfamily Formicinae: Lasiini tribe…**21**
- Subfamily Formicinae: Melophorini tribe…**24**
21. Maxillary palp of 3 or 4 articles… ***Euprenolepis, Pseudolasius***, ***Lasius*** (part)
- Maxillary palp of 5 or 6 articles…**22**
22. Maxillary palp with articles very long, the 4° article in length ≥ than the 5°+6° articles… **Myrmecocystus**
- Maxillary palp not as above…**23**
23. Eyes placed slightly posteriorly to the middlelenght of the Head …***Lasius***, ***Zatania***, ***Prenolepis***
- Eyes placed slightly anteriorly to the middlelenght of the Head …***Nylanderia***, ***Paraparatrechina***, ***Paratrechina***
24. Neotropical region...***Lasiophanes***
- Australia region...***Melophorus***, ***Notoncus***, ***Prolasius***.
25. Subfamily Formicinae: Melophorini tribe …***Notostigma***
- Subfamily Formicinae: Camponotini tribe…**26**
26. Big Eyes at the back corners of the Head …***Opistopsis***
- Eyes not as above…**27**
27. Propodeum and Petiole armed with spines or teeth…***Polyrachis***
- Propodeum and Petiole unarmed…**28**
28. ***Calomyrmex***, ***Camponotus***, ***Colobopsis***, ***Dinomyrmex***, ***Echinopla***, ***Overbeckia***
29. Palp formula 4:3 or 2:2…***Arnoldius***
- Palp formula 6:4…**30**
30. Maxillary palp with 3° article long as the sum of 4°+5°+6° articles…***Dorymyrmex***
- Maxillary palp not as above…**31**
31. Forewing with Marginal cell open…***Forelius***
- Forewing with Marginal cell closed…***Tapinoma***

Forewing of Typology III

Section β

Petiole and Postpetiole

1. PostPetiole articulate dorsally with the first segment of the Gaster…***Crematogaster***
- PostPetiole not articulate dorsally with the first segment of the Gaster…**2**
2. Antennae with 6 to 10 articles…**3**
- Antennae with 11 articles…**10**
- Antennae with 12 articles…**44**
3. Antennae with 8 articles…***Octostruma***
- Antennae with 7 articles…**4**
- Antennae with 6 articles…**5**
- Antennae with 9 or 10 articles…**6**
4. Mandibles triangular…***Eurhopalotrix***
- Mandibles linear/falcate…***Rhopalothrix***
5. Forewing with Marginal cell open; Mandibles linear or subtriangular elongate…***Strumigenys***
- Forewing with Marginal cell closed; Mandibles triangular short…***Melissotarsus***
6. Antennae with last three articles club…**7**
- Antennae with last two articles club…**8**
7. Antennal scrobe present; Propodeum armed with teeth…***Tetramorium*** (part)
- Antennal scrobe absent; Propodeum unarmed…***Allomerus*** (part)
8. Mandibles linear dentate; Antennae with 9 articles…***Protalaridris***
- Mandibles triangular dentate; Antennae with 10 articles…**9**
9. Forewing with Marginal cell closed…***Rhopalomastix*** (part)
- Forewing with Marginal cell open…***Solenopsis*** (part)
10. Forewing of solenopsis type…**11**
- Forewing of formica type…**29**
11. Forewing with Marginal cell closed…**12**
- Forewing with Marginal cell open…**21**
12. Antennal Scrobe absent…**13**
- Antennal Scrobe present…**18**
13. Forewing with Pterostigma absent or reduced…**14**
- Forewing with Pterostigma present…**16**
14. Forewing with Rs1 absent; Frontal Lobe very developed…***Apterostigma***
- Forewing with Rs1 present; Frontal lobe normal size…**15**
15. Antennae clavate with last 3 article club…***Myrmycocrypta***
- Antennae filiform or slightly versus clavate…***Acromyrmex*** (part)
16. Antennae with last 2 articles club…***Rhopalomastix***
- Antennae with last 3 articles club…**17**

17. Meso and MetaFemur considerably incrassated…***Podomyrma***
- Meso and MetaFemur not as above…***Nesomyrmex*** (part), ***Temnothorax*** (part)
18. Forewing with Pterostigma present…**19**
- Forewing with Pterostigma absent or reduced…**20**
19. Head cordiform (heart-shaped); Frontal lobe very developed…***Sericomyrmex***
- Head and Frontal lobe not as above…***Tetramorium*** (part)
20. Head with spines dorsally…***Trachymyrmex*** (part)
- Head without spines dorsally…***Mycetophylax*** (part) ***Mycetosoritis*** part), ***Xerolitor***
21. Antennal Scrobe absent…**22**
- Antennal Scrobe present…**27**
22. Antennae with last 2 articles club…**23**
- Antennae with last 3 articles club…**24**
23. Mandible triangular elongate…***Lenomyrmex***
- Mandibles triangular short…***Solenopsis***
24. Forewing with Pterostigma absent or reduced…***Mycetagroicus***
- Forewing with Pterostigma present…**25**
25. Propodeum armed with teeth or spines…***Temnothorax*** (part)
- Propodeum unarmed or with very short teeth/tubercles…**26**
26. Typical sculptures of the Head and body heavily faveate…***Tyrannomyrmex***
- Not as above…***Monomorium*** (part)
27. Head cordiform (heart-shaped)…***Mycetophylax*** (part)
- Head not cordiform…**28**
28. Frontal lobe absent or reduced with Antennal socket exposed…***Pristomyrmex***
- Frontal Lobe present…***Tetramorium*** (part)
29. Antennal scrobe absent…**30**
- Antennal scrobe present…**38**
30. Forewing with Pterostigma absent or reduced…**31**
- Forewing with Pterostigma present…**32**
31. Pronotum without spines dorsally…***Atta***
- Pronotum with two spines dorsally… ***Pseudoatta, Acromyrmex***
32. Petiole armed with two spines or teeth…***Mycetarotes***
- Petiole not armed with two spines…**33**
33. Forewing with Marginal cell closed…***Nesomyrmex*** (part)
- Forewing with Marginal cell open…**34**
34. Eyes with short erect hairs between the ommatidia…***Formicoxenus***
- Eyes not as above…**35**
35. Propodeum unarmed…***Monomorium*** (part) ***Allomerus***
- Propodeum armed with teeth or spines…**36**
36. Mandibles triangular with terminal tooth very long…***Kalathomyrmex***
- Mandibles triangular with terminal tooth not very long…**37**
37. Petiole of the same height than PostPetiole…***Paramycetophylax***
- Petiole higher than the PostPetiole…***Leptothorax***, ***Temnothorax*** (part)

38. Forewing with Marginal cell open…**39**
Forewing with Marginal cell closed…**40**
39. Petiole sessile; Eyes dorsally from the Antennal Scrobe…***Cataulacus*** (part)
- Petiole pedunculate; Eyes ventrally from the Antennal Scrobe….***Wasmannia***
40. Forewing with Pterostigma present …**41**
- Forewing with Pterostigma absent or reduced …**43**
41. Petiole with two spines or teeth dorsally…**42**
- Petiole without spines or teeth…***Tetramorium*** (part)
42. Eyes ventrally from the Antennal Scrobe…***Mycocepurus***
- Eyes dorsally from the Antennal Scrobe…***Cataulacus***
43. Head with spines dorsally…***Trachymyrmex***
- Head without spines dorsally…***Cyphomyrmex***, ***Mycetophylax***, ***Mycetosoritis***
44. Antennal scrobe present…**45**
- Antennal scrobe absent…**51**
45. Forewing solenopsis type…**46**
- Forewing formica type…**48**
46. Forewing with Marginal cell open; Body and legs with scale spatulate/squamiform of with color…***Basiceros***
- Forewing with Marginal cell closed; Body and legs without scale…**47**
47. Mandibles massive; Petiole with usually dorsal tooth…***Acanthomyrmex***
- Mandibles and Petiole not as above…***Tetramorium*** (part)
48. Propodeum unarmed...***Dilobocondyla***
- Propodeum armed with teeth or spines...**49**
49. Petiole with two teeth postero-dorsally…***Proatta***
- Petiole without teeth dorsol-posteriorly…**50**
50. Petiole pedunculate…***Tetramorium***
- Petiole sessile…***Romblonella***
51. Forewing with Marginal cell closed…**52**
- Forewing with Marginal cell open…**56**
52. Antennae with 4 last articles club or enlarged…***Stenamma*** (part)
- Antennae with last 3 articles club…**53**
53. Petiole sessile…***Myrmecina, Temnothorax*** (part)
- Petiole pedunculate…**54**
54. Legs with femur swollen…***Teratanер***
- Legs without femur swollen…**55**
55. Propodeum unarmed…***Trichomyrmex***
- Propodeum armed…***Dacatria*** (part), ***Nesomyrmex***, ***Temnothorax*** (part)
56. Antennae with 4 last articles club/enlarged…***Stenamma, Royidris*** (part)
- Antennae with with last 3 articles club/enlarged or filiform…**57**
57. Forewing solenopsis type…**58**
- Forewing formica type…**61**
58. Propodeum unarmed or with very short teeth/tubercles…**59**

Propodeum armed with teeth or spines…**60**

59. ***Megalomyrmex*** (part), ***Monomorium*** (part), ***Royidris***

60. ***Cardiocondyla, Dacatria, Temnothorax*** (part)

61. Antennae filiform…***Novomessor***

- Antennae clavate or versus clavate…***Megalomyrmex***, ***Monomorium***, ***Temnothorax***.

2.4 Dichotomous key to forewings of Typology IV

The Winged ♀♀ ants of 8 genera (Table 10) have a Forewing structure of Typology IV and are taxonomically classified in three Subfamilies of the Family Formicidae (Table 9).

Forewing of Typology IV

subfamily	**genera**
Amblyoponinae	1
Myrmicinae	6
Proceratiinae	1
3	**8**

Table 9 - Subfamilies of the family Formicidae and the respective numbers of genera which present Forewings of Typology IV

Genera of the ♀♀ Winged Ants with Forewings of Typology IV

Acanthognathus
Cardiocondyla (part)
Crematogaster (part)
Eurhopalothrix
Fulakora (part)
Probolomyrmex
Rhopalothrix (part)
Strumigenys (part)

Table 10 - Winged ♀♀ of 8 genera of the Family Formicidae which present Forewings of Typology IV. In brackets the term "part" means that species of the same genus have different Forewing Typologies.

Forewing of Typology IV

1. Petiole…**2**
- Petiole and PostPetiole…**3**
2. Clypeus antero-marginally dentate; Mandibles linear/falcate...***Fulakora***
- Clypeus antero-marginally not dentate; Mandibles subtriangular… ***Probolomyrmex***
3. PosPetiole articoled dorsally ...***Crematogaster***
- PosPetiole not as above...**4**
4. Antennae with 6 articles...***Strumygenys***
- Antennae with 7 articles...**5**
- Antennae with 11 articles; Mandibles linear...***Acanthognatus***
- Antennae with 12 articles…***Cardiocondyla***
5. Mandibles triangular…***Eurhopalothrix***
- Mandibles linear/falcate…***Rhopalothryx***

3. Morphological description, mating flight and references to Winged ♀♀ Ant Genera

In this chapter, the morphological characteristics used to write the dichotomous key are presented, known data on Mating flight and bibliographic references for Winged ♀♀ of all 244 genera which were been studied and divided into 17 subfamilies.

3.1 SubFamily Agroecomyrmecinae

This subfamily represented by two genera: *Ankylomyrma* present in Afrotropical region and *Tatuidris* present in Neotropical region. Only in the genus *Tatuidris* is known the ♀.

♀ Genus ***Tatuidris*** Brown & Kempf, 1968

Morphological characters used in this dichotomous key

Antennae with 7 articles clavate, with the last two considerably larger articles; Antennae Scape enlarged apically; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular with two blunt apical teeth and setae on the ventral side; MetaTibiae with single pectinate Spur; Propodeum armed, Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Donoso D.A. (2012) Additions to the taxonomy of the armadillo ants (Hymenoptera, Formicidae, Tatuidris). Zootaxa 3503:61-81.

3.2 Subfamily Amblyoponinae Forel, 1893

This subfamily represented for nine genera and the ♀♀ known in all genera.

♀ Genus ***Adetomyrma*** Ward, 1994

Morphological characters used in this dichotomous key

Antennae with 12 articles versus clavate; Antennae Scape not overstep the Occiput; Forewings of Typology II with Submarginal cell open for absence of rs-m cross-vein, Marginal cell open; Hindwings of Typology II, 1rs+m cross-vein absent; Clypeus marginally dentaticulate; Mandibles subfalcate with two apical teeth; Palp formula 3:3; MetaTibiae with two Spurs; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Madagascar

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *A. goblin* (Type).

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Editor: Stefano Cantone, Catania, Italy, ISBN: 979-12-200-23948, www.wingedant.com.
-Yoshimura M. and Fisher B.L. (2012) A revision of the Malagasy endemic genus *Adetomyrma* (Hymenoptera: Formicidae: Amblyoponinae). Zootaxa 3341: 1-31.

♀ Genus ***Amblyopone*** Erichson, 1842

Morphological characters used in this dichotomous key

Antennae with 12 articles versus clavate, Antennae Scape not overstep the Occiput; Forewings of Typology I and II, solenopsis type, Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles falcate/linear dentate, pointed at apex less long than the Head; Clypeus antero-marginally dentaticulate; MetaTibie with two Spurs; Pretarsal Claws simple; Petiole entirely articulated with the first segment of the Gaster; Sting present.

Bio-geographical distribution

Australian and Indo-Australian

Behavioral Ecology of the mating flight

Strategy: female calling
Mating flight: unknown

References for Taxonomic identification and Behavioral Ecology of the nuptial flight

-AntWeb (2018) Photos: *A. australis*. www.antweb.org
-Brown W. L. (1960) Contributions toward a reclassification of the Formicidae, III. Tribe Amblyoponini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 122, n° 4.
-Clark J. (1928) Australian Formicidae. Jour. Roy. Soc. Western Australia, Vol. 14, n° 4.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118
-Wheeler W. M. (1927) Ants of the genus *Amblyopone* Erichson. Prooceeding of the American Academy of Art and Sciences, vol. 62 n° 1

♀ Genus ***Fulakora*** Kusnezov, 1955

Morphological characters used in this dichotomous key

Antennae with 10-12 articles versus clavate or clavate with last 4 articles club (*F. degenerata* 7 articles), Antennae Scape not overstep the Occiput; Forewings of Typology I (*F. celata, F. mystriops*), Typology II and III, solenopsis type, Typology IV (*F. gnoma*); Marginal cell closed; Hindwings of Typology I without Jugal lobe, Typology II and III; Mandibles falcate/linear dentate; Clypeus antero-marginally dentate; MetaTibiae with two Spurs; Sting present.

Bio-geographical distribution

Neotropical and Australian

Behavioral Ecology of the mating flight

Strategy: unknown
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *F. celata*, *F. degenerata*.
-Brown W. L. (1960) Contributions toward a reclassification of the Formicidae, III. Tribe

Amblyoponini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 122, n° 4.
-Brown W. L. (1962) A new ant of the genus *Amblyopone* from Panama. Psyche, vol. 69. N. 2.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Editor: Stefano Cantone, Catania,Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Clark J. (1928) Australian Formicidae. Jour. Roy. Soc. Western Australia, Vol. 14, n° 4.
-Kusnezov N. (1962) El ala posterior de las formigas. Acta zoologica Lilloana, tomo 28: 367-378.
-Taylor R. W. (1978) Melanesian ants of the genus *Amblyopone* (Hymenoptera: Formicidae). Aust. J. Zool., 26: 823-39

♀ Genus ***Myopopone*** Roger, 1861

Morphological characters used in this dichotomous key

Antennae with 12 articles clavate, Antennae Scape not overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles linear/falcate dentate; Palp formula 4:3; Clypeus antero-marginally dentaticulate and with antero-lateral tooth; Petiole entirely articulated with the first segment of the Gaster; MetaTibiae with two Spurs; Sting present.

Bio-geographical distribution

Indo-Oriental and Australian

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *M. castanea* (Type). www.antweb.org.
-Brown W. L. (1960) Contributions toward a reclassification of the Formicidae, III. Tribe Amblyoponini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 122, n° 4.
-Donisthorpe H. (1942) *Myopopone wallastoni* sp.n, with notes on other forms in the genus and description of the males of two species (Hym., Formicidae). The Entomologist's Monthly Magazine, vol.LXXVII.
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-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Xu Z, He Q. (2011) Description of *Myopopone castanea* (Smith) (Hymenoptera: Formicidae) from Himalaya Region. Entomotaxonomia, Vol. 33, n° 3.

♀ Genus ***Mystrium*** Roger, 1862

Morphological characters used in this dichotomous key

Antennae with 12 articles clavate, Antennae Scape not overstep the Occiput; Forewings Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles falcate/linear dentate, blunt at apex and longer than Head; Clypeus marginally denticulate or dentate; Petiole entirely articulated with the first segment of the Gaster; MetaTibiae with two Spurs; Sting present.

Bio-geographical distribution

Afrotropical, Madagascar, Indo-Australian and Australian

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Brown W. L. (1960) Contributions toward a reclassification of the Formicidae, III. Tribe Amblyoponini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 122, n° 4.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Menozzi C. (1929) Revisione delle formiche del genere *Mystrium* Roger. Zoologischen Anzeiger (Wasmann-Festband).

-Yoshimura M. and Fisher B.L. (2014) A revision of the ant genus *Mystrium* in the Malagasy region with description of six new species and remarks on *Amblyopone* and *Stigmatomma* (Hymenoptera, Formicidae, Amblyoponinae). Zookeys 394: 1-99.

♀ Genus ***Onychomyrmex*** Emery, 1895

Morphological characters used in this dichotomous key

Antennae with 12 articles versus clavate or clavate with last 4 articles club, Antennae Scape not overstep the Occiput; Forewings of Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles linear/falcate dentate; Palp formula 2:2?; Clypeus antero-marginally denticulate; MetaTibiae with reduced Spurs; Pretarsal Claws simple very large strongly curvate and pulvilli; Sting present; Eyes very small.

Bio-geographical distribution

Australian

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos *O. glauerti*. www.antweb.org.

-Brown W. L. (1960) Contributions toward a reclassification of the Formicidae, III. Tribe Amblyoponini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 122, n° 4.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, www.wingedant.com.

-Clark J. (1928) Australian Formicidae. Jour. Roy. Soc. Western Australia, Vol. 14, n° 4.
-Wheeler W. M. (1916) The Australian ants of the genus *Onychomyrmex*. Bulletin of the Museum of Comparative Zoology at Harvard college, Vol. LX, N. 2.

♀ Genus ***Prionopelta*** Mayr, 1866

Morphological characters used in this dichotomous key

Antennae clavate with 8 articles (*P. amieti*), 9 articles (*P. lauree*, P. concenta*), 10 articles (*P. humicola*), 11 articles (*P. punctulata*) and 12 articles, Antennae Scape not overstep the Occiput; Forewings of Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology III; Mandibles linear or subtriangular dentate apically; Palp formula 2:2?; Clypeus denticulate marginally; Petiole entirely articulated with the first segment of the Gaster; MetaTibiae with one Spur pectinate; Ptretarsal Claws simple; Sting present.

(*worker)

Bio-geographical distribution

Neotropical, Afrotropical, Madagascar Indo-Australian and Australian.

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Brown W. L. (1960) Contributions toward a reclassification of the Formicidae, III. Tribe Amblyoponini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 122, n° 4.
-Brown W. L. (1974) *Concoctio concenta* species nov. Insecta: Hymenoptera: Formicidae. Pilot Register of Zoology Card N. 30.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Kusnezov N. (1955) Zwei neue Ameisengattungen aus Tucuman (Argentinien). Zoologischer Anzeiger, Bd 154, Heft 11/12.
-Overton R., Fisher B. L. (2015) Taxonomic revision of the genus *Prionopelta* (Hymenoptera, Formicidae) in the Malagasy region. Zookey 507: 115-150.
-Terron G. (1974) Découverte au Cameroun de deux espéces nouvelles du genre *Prionopelta* Mayr (Hym., Formicidae). Extrait des Annales de la faculté des Sciences du Cameroun, n° 17.

♀ Genus ***Stigmatomma*** Roger, 1859

Morphological characters used in this dichotomous key

Antennae clavate with 9-10-11 and 12 articles, Antennae Scape not overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles linear/falcate dentate; Palp formula 4:3; 4:2; 2:2?; Clypeus antero-marginally dentate; Petiole entirely articulated with the first segment of the Gaster; MetaTibiae with two Spurs (one Spur in *S. luyiae*); Sting present.

Bio-geographical distribution

Neartic, Paleartic, Indo-Australian, Oriental, Afrotropical and Madagascar

Behavioral Ecology of the mating flight

Strategy: female calling

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Bharti H., Rilta J.S. (2015) A new species and a new record of the ant genus *Stigmatomma* Roger (Hymenoptara: Formicidae) from India. Sociobiology 62(4): 506-512.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1869) Enumerazione dei Formicidi che rinvengosi nei contorni di Napoli con descrizioni di specie nuove o meno conosciute. Annali dell'Accademia degli Aspiranti Naturalisti, 2: 1-26.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118

-Emery C. (1916) Fauna Entomologica Italiana, Hymenoptera, Formicidae. Bull. Soc. Entoml. It. 47:79-275

-Esteves F. A. and Fisher B. L. (2016) Taxonomic revision of *Stigmatomma* Roger (Hymenoptera: Formicidae) in the Malagasy region. Biodiversity Data Journal 4: e8032, doi: 10.3897/BDJ.

-Euguchi K., Viet B. T., Yamane S. and Terayama M. (2015) Redefinition of the genus *Bannapone* and description of *B. cryptica* sp. nov. (Hymenoptera: Formicidae: Amblyoponinae). Zootaxa 4013 (1): 077-086.

-Gotwals W. and Levieux J. (1972) Taxonomy and Biology of a New West African Ant to the genus *Amblyopone* (Hymenoptera: Formicidae). Annales of the Entomological Society of America, Vol. 65, N° 2.

-Hsu F-C, Esteves F. A, Chou L-S, Lin C-C (2017) A new species of *Stigmatomma* from Taiwan (Hymenoptera, Formicidae, Amblyoponinae). ZooKey 705: 81-94.

-Ogata K. (1987) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part. I. Subfamilies Ponerinae and Cerapachynae.Esakia n° 25: 97-132.

-Onoyama K. (1999) A new and a newly recorded species of the ant genus *Amblyopone* (Hymenoptera: Formicidae) from Japan. Entomological Science, 2(1): 157-161.

-Ward P. S. (1988) Mesic element in the Western Neartic ant fauna: taxonomy and biological notes on *Amblyopone*, *Proceratium* and *Smithistruma* (Hymenoptera: Formicidae). Journal of the Kansas Entomological Society 61(1): 102-124.

-Wheeler W. M. and Chapman J. W. (1925) The ants of the Philippine Island, Part I, Dorylinae and Ponerinae. Philippine J. Science, Vol. 28.

-Xu Z. (2006) Three new species of the ant genera *Amblyopone* Erichson, 1842 and Proceratium Roger, 1863 (Hymenoptera: Formicidae) from Yunnan, China.

♀ Genus ***Xymmer*** Santschi, 1914

Morphological characters used in this dichotomous key

Antennae clavate with 12 articles, Antennae Scape not overstep the Occiput; Wings unknown, I speculate that the wings are like in males: Forewings of Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology II (Cantone, 2017); Mandibles linear/falcate dentate; Clypeus antero-marginally not denticulate; Petiole entirely articulated with the first segment of the Gaster; MetaTibiae with two Spurs; Pretarsal Claws simple, Sting present.

Bio-geographical distribution
Afrotropical, Madagascar and Indo-Australian
Behavioral Ecology of the mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Satria R., Sasaki O., Viet B. T., Oguri E., Syoji K., Fisher B. L., Yamane S. K. and Eguchi K. (2016) Description of the first Oriental species of the ant genus *Xymmer* (Hymenoptera: Formicidae: Amblyoponinae) Zootaxa 4168 (1): 141-150.
-Yoshimura M. e Fisher B.L. (2012) A revision of male ants of the Malagasy Amblyoponinae (Hymenoptera: Formicidae) with resurrections of the genera *Stigmatomma* and *Xymmer*. PLoS ONE Vol. 7(3).

3.3 Subfamily Aneuretinae Emery, 1913

This subfamily represented for one genus.

♀ Genus ***Aneuretus*** Emery, 1893

Morphological characters used in the dichotomous key
Antennae with 12 articles, versus clavate; Antennae Scape long reaching the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 3:4; Propodeum angulate; Petiole with long anterior peduncle and low rounded node; MetaTibiae with one Spur; Pretarsal Claws simple; Sting present.
Bio-geographical distribution
Sri Lanka
Behavioral Ecology of the mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos *A. simoni*. www.antweb.org
-Wilson O., Eisner T., Wheeler G.C., Wheeler J. (1956) *Aneuretus simoni* Emery, a major link in ant evolution. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 115, n° 3.

3.4 Subfamily Apomyrminae Forel, 1893

This Subfamily represented for one genus.

♀ Genus ***Apomyrma*** Brown, Gotwald e Lévieux, 1970

Morphological characters used in this dichotomous key
Antennae with 12 articles clavate with last 4 articles club; Antennae Scape short and incrassate; Forewings of Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology III; Mandibles linear/falcate with bidentate apex; Clypeus antero-marginally

dentaticulate; Femura incrassate; MetaTibiae with two Spurs; Pretarsal Claws simple; Petiole anterorly and posteriorly pedunculate; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: Ivory Coast: Bandama river, *A. stygia*: late June (Brown, Gotwald and Lévieux, 1970).

References for Taxonomic identification

-Brown W.L., Gotwald W.H. and Lévieux J. (1970) A new genus of Ponerinae ants from west Africa (Hymenoptera: Formicidae) with ecological notes. Psyche September.

3.5 Subfamily Dolichoderinae Forel, 1878

This Subfamily represented for 28 genera extant and the winged ♀♀ are known in 21 genera.

Known only the Ergatogyne form in the genera: *Aptinoma* and *Leptomyrmex**.

In the genera *Ecphorella*, *Gracilidris*, *Loweriella, Nebothriomyrmex* and *Ravavy* the ♀♀ are unknown.

**L. burwelli* known a queen dealate;

♀ Genus ***Anillidris*** Santschi, 1936

Morphological characters used in the dichotomous key

Antennae with 12 articles filiform, Antennae Scape long, not overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate marginally with 8 teeth; Maxillary Palp of 3 articles and Labial Palp of 4 articles; MetaTibiae with one Spur; Pretarsal Claws simple; Sting absent or vestigial.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Santschi F. (1937) Les sexués du genre *Anillidris* Santschi. Bulletin de la Société Entomologiquè de la France.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

Figure – **A**: Antennae; **B**: Hindwing of *A. bruchi* ♀, São Paulo, Brazil.

♀ Genus ***Anonychomyrma*** Donisthorpe, 1946

Morphological characters used in the dichotomous key

Antennane fiiform with 12 articles, Antennae Scape short or long, overstep or not the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology I (in some cases with M3 vein incomplete) and Typology II, solenopsis or formica type (only in *A. tigris*), Marginal cell closed; Hindwings of Typology I without Jugal lobe and Typology II; Mandibles triangolar dentate marginally; Palp formula 6:4; MetaTibiae with one Spur; Sting absent or vestigial.

Bio-geographical distribution

Indo-Australian, Australia

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2016) Photos Typus of *A. tigris, A. anguliceps, A. arcadia. A. froggatti, A. gigantean, A. incisa, A. itinerans, A. longicapitata* and *A. longiceps*. www.antweb.org

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ Genus ***Arnoldius*** Dubovikoff, 2005

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape flat, not overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology III, solenopsis type, Marginal cell closed; Hindwings of Typology III; Mandibles triangular dentate; Palp formula 4:3; 2:2.

Bio-geographical distribution

Australian

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018)Photos Typus of *A. flavus*

-Crawley W.C. (1922) New ants from Australia. Annals and magazine of Natural Hystory, ser. 9, vol. X.

-Dubovikoff D.A. (2005) The system of taxon *Bothriomyrmex* Emery, 1869 sensu lato (Hymenoptera: Formicidae) and relatives genera. Caucasian Entomological Bull., 1(1): 89-94.

-Forel A. (1902) Fourmis nouvelle d'Australie. Rev. Suisse Zool. Vol. 10.

-Mayr G. (1876) Die australischen Formiciden. J. Mus. Godeffroy, Vol. 12: 56-115.

♀ Genus ***Axinidris*** Weber, 1941

Morphological characters used in the dichotomous key

Antennae filiform or slightly versus clavate with 12 articles, Antennae Scape can reach the occiput, not overstep the Occiput; Forewings of Typology II with Marginal cell closed; Hindwings of Typology III; Clypeus with distinct median notch on free margin; Mandibles

triangular dentate marginally; Palp formula 6:4; Propodeum armed with two spine which can bee reduced and rounded in the form of tubercles; Petiole very reduced; MetaTibiae with one Spur.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Shattuck S. O. (1991) Revision of the Dolichoderinae ant genus *Axinidris* (Hymenoptera: Formicidae). Systematic Entomology, 16, 105-120.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

-Snelling R. R. (2007) A review of the Arboreal Afrotropical ant genus *Axinidris*. In Snelling, R. R., L. Fisher, and P. S. Ward (eds) Advances in ant systematics (Hyenoptera: Formicidae): homage to E. O. Wilson-50 years of contributions; Memoirs of the American Entomological Institute, 80.

♀ Genus ***Azteca*** Forel, 1878

Morphological characters used in the dichotomous key

Antennae filiform or slightly versus clavate with 12 articles, Antennae Scape not overstep the Occiput; Forewings of Typology II with Marginal cell closed, formica type; Hindwings of Typology I without Jugal lobe and with characteristic position of the vein M1+2; Mandibles triangular dentate; Palp formula 6:4, 5:3, 4:3 or 4;2; MetaTibiae with one Spur.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos 44 species. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1893) Studio monografico sul genere *Azteca* Forel. Mem. Accd. Sci. Bologna. Ser. 5 vol. 3

-Emery C. (1896) Alcune forme nuove del genere *Azteca* Forel e note biologiche. Bollettino dei Musei di Zoologia ed Anatomia comparata, Torino, vol. XI n° 230.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.

-Gallardo A. (1916) Subfamilia Dolicoderinas. Annales del Museo nacional de Historia Natural de Bueno Aires, Tomo 28

-Guerrero R.J., Delabie J.H.C. e Dejean A. (2010) Taxonomic Contribution to the Aurita Group of the ant genus *Azteca* (Formicidae: Dolichoderinae). J. HYM. RES. Vol. 19 (1).

-Longino J. T. (1991) Taxonomy of the Cecropia-inhabiting *Azteca* ants. Journal of Natural History, 25, 1571-1602.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera:

Formicidae. Sociobiology, vol. 21, n° 1.
-Wheeler W. M. (1942) Studies of Neotropical ant-plants and their ants. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. XC, N. 1.

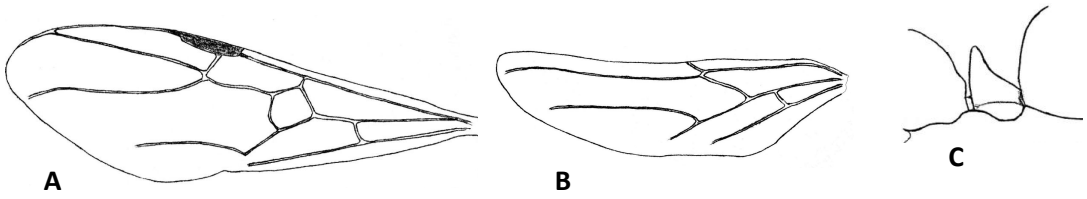

Figure – A: Forewing; B: Hindwing; C: Petiole of *Azteca* sp. 530 ♀

♀ Genus ***Bothriomyrmex*** Emery, 1869

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology II with extremely reduced M3 vein, solenopsis type, with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 4:3 or 2:2; MetaTibiae with one Spur barbulate.

Bio-geographical distribution

Paleartic and Neotropical (Central America exotic?)

Behavioral Ecology of the mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-Crawley B.A. (1922) New ants from Australia. Annals and Magazine of Natural History, Ser. 9, Vol. X.
-Emery C. (1869) Descrizione di una nuova formica italiana. Ann. Mus. Zool. R. Univ. Napoli, Vol. 5.
-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.
-Emery C. (1916) Fauna Entomologica Italiana, Hymenoptera – Formicidae. Bull. Soc. Entomol. It. 47: 79-275.
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-Dubovikoff D.A. e Longino J.T. (2004) A new species of the genus *Bothriomyrmex* Emery 1869 (Hymenoptera: Formicidae: Dolichoderinae) from Costa Rica. Zootaxa 776: 1-10.
-Dubovikoff D. A. (2005) The system of taxon *Bothriomyrmex* Emery, 1869 sensu latu (Hymenoptera: Formicidae) and relatives genera. Caucasian Entomological Bull. 1(1): 89-94.
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-Tohmé H e Tohmé G (1981) Contribution à l'étude systématique et biologique de *Bothriomyrmex syrius* Forel, Formicoidea, Dolichoderinae. Bulletin de la Societé entomologique de France, tome 86.

♀ Genus ***Chronoxenus*** Santschi, 1919

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology II with extremely reduced M3 vein, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate marginally; Palp formula 2:3 or 2:2; MetaTibiae with one Spur barbulate.

Bio-geographical distribution

Indo-Oriental

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *Chronoxenus wroughtonii javanus, C. myops*. www.antweb.org.

-Dubovikoff D. A. (2005) The system of taxon *Bothriomyrmex* Emery, 1869 sensu latu (Hymenoptera: Formicidae) and relatives genera. Caucasian Entomological Bull. 1(1): 89-94.

-Santschi F. (1920) Formis du genre *Bohriomyrmex* Emery. Extrait de la Revue Zoologique Africaine, vol. VII, Fasc. 3

-Zhou S-Y. (2001) A new species of the ant genus *Liometopum* Mayr from Guangxi, China (Himenoptera: Formicidae). Acta Zootaxonomica Sinica, Vol 26, Nº 4.

♀ Genus ***Doleromyrma*** Forel, 1907

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; MetaTibiae with one Spur.

Bio-geographical distribution

Australian

Behavioral Ecology of the mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Forel A. (1907) Formicides du Musée National Hongrois. Annales Musei Nationalis Hungarici V.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ Genus ***Dolichoderus*** Lund, 1831

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Hypostoma antero-lateral in the form of an expanded flange

directed; Palp formula 6:4; MetaTibiae with one Spur; Pretarsal Claws simple.

Bio-geographical distribution

Neotropical, Neartic, Paleartic, Indo-Australian, Oriental, Australian

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *D. abruptus*, *D. affinis*, *D. bispinosus*, *D. debilis*, *D. germaini*, *D. taprobanae*,

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Dill M., Williams D.J. e Maschwitz U. (2002) Herdsmen Ants and their mealybug parteners. Abh. Senckenberg. Naturforsch Ges, Frankfurt, 557:1-373

-Donisthorpe H. (1917) *Dolichoderus* (*Hypoclinea*) *crawley* n.sp., a species of ant new to Science; with o few notes on the genus. The Entomologist's Record, vol. 29.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.

-Emery C. (1916) Fauna Entomologica Italiana, Hymenoptera – Formicidae. Bull. Soc. Entomol. It. 47: 79-275.

-Kempf W. (1959) A revision of the Neotropical ant genus *Monacis* Roger (Hym., Formicidae). Studia Entomologica vol. 2, fasc. 1-4.

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-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Socioniology, vol. 21, n° 1.

-Wheeler W.N. (1905) The North American Ants of the genus *Dolichoderus*. Bulletin American Museum of Natural History, Vol. XXI.

-Wheeler W.N. (1934) Contribution to the fauna of Rottnest Island, Western Australia. Journal of the Royal Society of Western Australia. Vol. XX.

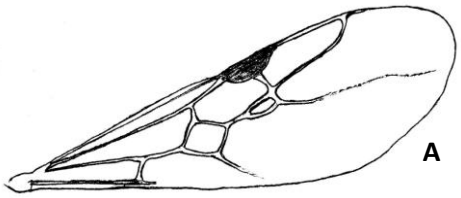

Figure – A: Forewing of *Dolichoderus* sp. 119 ♀, São Paulo, Brazil.

♀ Genus ***Dorymyrmex*** Mayr, 1866

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput; Antennal socket confluent from posterion edge of the Clypeus; Forewings of Typology III, solenopsis type, Marginal cell closed or open (*D. planidens* with two submarginal cell); Hindwings of Typology II; Mandibles triangular dentate; Psammophore present in most species; Palp formula 6:4, Maxillary Palp with 3° article longer as the sum of 4°+5°+6° articles; MetaTibiae with one Spur.

Bio-geographical distribution

Neartic and Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *D. smithi*. www.antweb.org.

-Bruch C. (1921) Estudos Mirmecologicos. Universidade Nacional de La Plata, tomo 26.

-Brethes J. (1914) Sur les formes sexueles de deux Dolichoderines. Anales del Museo Nacional de Historia Natural de Buenos Aires, Tomo XXVI, pag. 231 a 234.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Cuezzo F. e Guerrero R.J. (2011) The ant genus *Dorymyrmex* Mayr (Hymenoptera: Formicidae: Dolichoderinae) in Colombia. Psyche, Vol. 2012.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.

-Gallardo A. (1916) Subfamilia Dolicoderinas. Annales del Museo nacional de Historia Natural de Bueno Aires, Tomo 28

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-Santschi F. (1916) Formigas Sudamericains. Physis (Rev. De la Soc Arg. De Ciencias naturales) tomo 2.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

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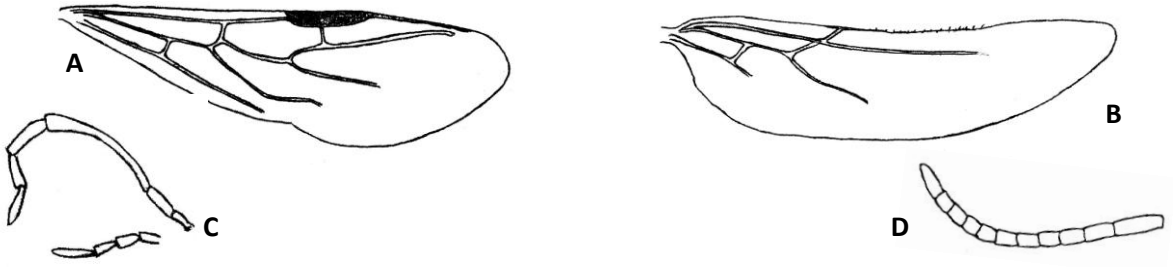

Figure – A: Forewing; B: Hindiwing; C: Palps; D: Funiculus of *Dorymyrmex* sp. 44 ♀, São Paulo, Brazil.

♀ Genus ***Forelius*** Emery, 1888

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput; Antennal socket confluent from the posterior edge of the Clypeus; Forewings of Typology III with Marginal cell open; Hindwings of Typology II or III; Mandibles triangular dentate; Palp formula 6:4; MetaTibiae with one Spur.

Bio-geographical distribution

Neartic and Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Cuezzo F. (2000) Revision del genero *Forelius* (Hymenoptera: Formicidae: Dolichoderinae). Sociobiology, vol 35, n° 2°

-Emery C. (1906) Studi sulle formiche della fauna Neotropica. Bull. Soc. Entomol. Ital. 37: 107-194.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.

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-Kusnezov N. (1957) Nuevas Especies de Hormigas (Hymenoptera, Formicidae). Rev. Soc. Uruguaya Ent. 2 (1).

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Socioniology, vol. 21, n° 1.

♀ Genus ***Froggattella*** Forel, 1902

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape not overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Petiole without ventral lobe; First segment of the Gaster narrowed and marginate anteriorly above a distinct basal cavity which overlies the Petiole; MetaTibiae with one Spur.

Bio-geographical distribution

Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight : unknown

References for Taxonomic identification

AntWeb (2018) Photo: *F. kirbii*. www.antweb.org.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

-Wheeler W.M. (1936) The Australian ant genus *Froggattella*. American Museum Novitates, New York, N° 842

♀ Genus ***Iridomyrmex*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape overstep or not the Occiput; Forewings of Typology I and II (*I. suchieri*) formica or solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; MetaTibiae with one Spur.

Bio-geographical distribution

Oriental, Indo-Australian and Australian.

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *I. anceps, I. rubriceps; I. suchieri, I. victorianus*; Photos: *I. exsanguis, I. lividus*.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Crawley B.A. (1918) Some New Australian Ants. The Entomologist's Record and Journal of Variation.

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-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Socioniology, vol. 21, n° 1.

-Wheeler W.N. (1927) The ants of Lord Howe Island and Norfork Island. American Academy of Arts and Sciences, Vol. 62, N° 4.

♀ Genus ***Linepithema*** Mayr, 1866

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput; Forewings of Typology I, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4.

Bio-geographical distribution

Neotropical (Cosmopolitan exotic)

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *L. humile*; Photos Typus: *L. neotropicum*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Chopard L. (1921) La Fourmi d'Argentine *Iridomyrmex humilis* var. Arrogans Santschi dans le midi de la France. Annals Epiphyties 7: 237-265.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.
-Wild A. L. (2004) Taxonomy and Distribution of the Argentine ant, *Linepithema humile* (Hymenoptera: Formicidae). Ann. Entomol. Soc. Am. 97(6): 1204-1215.
-Wild A. L. (2007) Taxonomic Revision of the Ant genus *Linepithema* (Hymenoptera: Formicidae). University of California Press, Paper Vol. 126.

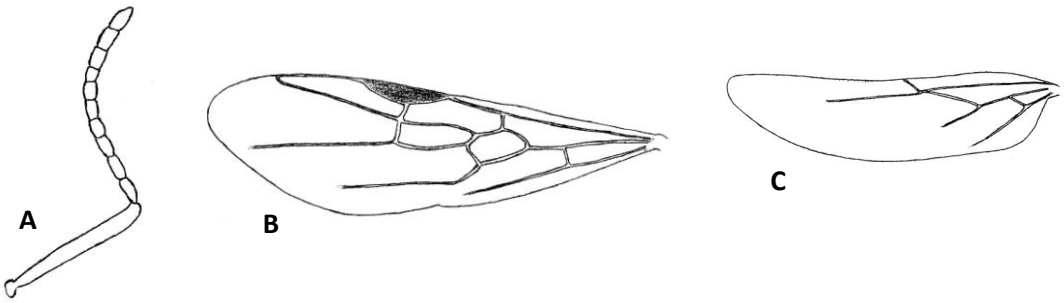

Figure – A: Antennae; B: Forewing; C: Hindwing of *Linepithema neotropicum* ♀, São Paulo, Brazil.

♀ Genus ***Liometopum*** Mayr, 1861

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape reaching or overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palpal formula 6:4; MetaTibiae with one Spur; Pretarsal Claws simple.

Bio-geographical distribution

Neartic, Paleartic, Oriental and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Bingham C. T. (1903) The Fauna of British India – Hymenoptera, Vol. II, edited by W. T. Blanford.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Creighton W. S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology.
-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.
-Emery C. (1916) Fauna Entomologica Italiana, Hymenoptera – Formicidae. Bull. Soc. Entomol. It. 47: 79-275.
-Del Toro I., Pacheco J.A. and Mackay W.P. (2009) Revision of the ant genus *Liometopum* (Hymenoptera: Formicidae). Sociobiology, Vol. 53, N° 2A.
-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ Genus ***Ochetellus*** Shattuck, 1992

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape reaching or overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4.

Bio-geographical distribution

Indo-Australian, Australian, Madagascar and Korea, Japan

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2017) Photos *O. democles* and *O. glaber* Typus. www.antweb.org

-Mann W.M. (1921) The Ants of the Fiji Insland. Bulletin Museum of Comparative Zoology, n° 5.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ Genus ***Papyrius*** Shattuck, 1992

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput; Forewings of Typology II formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 5:3; MetaTibiae with one Spur.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. nitidus oceanicus*. www.antweb.org

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ Genus ***Philidris*** Shattuck, 1992

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape can reach and it does overstep, just a little, the Occiput or not; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; MetaTibiae with one Spur.

Bio-geographical distribution

Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. pubescens*. www.antweb.org.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ Genus ***Tapinoma*** Foerster, 1850

Morphological characters used in the dichotomous key

Antennae with 11-12 articles; Antennae Scape overstep the Occiput or not; insertion of the Antennae confluent from posterior edge of the Clypeus; Forewings of Typology II or III, formica or solenopsis type, Marginal cell closed; Hindwings of Typology II or III; Mandibles triangular dentate; Palp formula 6:4; Petiole reduced, without distinct node; MetaTibiae with one Spur.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *T. annandalei, T. aberrans, T. litorale, T. melanocephalum, T. subtile; T. wilsoni*; Photos Typus: *T. andamanense, T. emeryi, T. festae, T. nigerrimum, T. philippinense, T. schultzei, T. sessile, T. williamsi*. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.

-Emery C. (1925) Revision des espéces paléarctiques du genre *Tapinoma*. Revue Suisse de Zoologie, Vol. 32, n° 2.

-Fisher B. L. and Bolton B. (2007) The ant genus *Pseudaphomomyrmex* Wheeler, 1920 a junior synonym of Tapinoma Foerster, 1850. Zootaxa. 1427: 65-68.

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-Seifert B. (1984) A method for Differentiation of the Female Castes of *Tapinoma ambiguum* Emery and *Tapinoma erraticuma* (Latr.) and Remarks on their distribution in Europe North of the Mediterranean Region. Faunistische Abhandlungen, n° 11.

-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.

♀ **Genus *Technomyrmex*** Mayr, 1892

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape overstep the Occiput, insertion of the Antennae confluent from posterior edge of the Clypeus; Forewings of Typology I, can present the Discoidal cell open; Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Petiole reduced, without distinct node; MetaTibiae with one Spur.

Bio-geographical distribution

Neotropical, Afrotropical, Oriental, Indo-Australian and Australian

Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-AntWeb (2018) Photos: *T. albipes*, *T. anterops*, *T. difficilis*, *T. docens*, *T. innocens*, *T. madecassus*, *T. mayri*; Photos Typus: *T. andrei*, *T. horni*, *T. laurenti*, *T. pallipes.*
-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XVI.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1912) Hymenoptera, Fam. Formicidae, SubFam. Dolichoderinae. Genera Insectorum. Fasc. 137.
- Forel A. (1902) Fourmis nouvelles d'Australie. Rev. Suisse Zool., Vol. 10.
-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.
-Wheeler W. N. (1922) Ants of the American Museum Congo Expedition. A contribute to the myrmecology of Africa. Bulletin of the American Museum of Natural history, Vol XLV.

♀ Genus ***Turneria*** Forel, 1895

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape not overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Petiole strongly inclined anteriorly without ventral lobe; MetaTibiae with one Spur.
Bio-geographical distribution
Australia
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Shattuck S.O. (1990) Revision of the Dolichoderinae ant genus *Turneria* (Hymenoptera: Formicidae). Systematic Entomology 15, 101-117.
-Shattuck S. O. (1992) Generic Revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae. Sociobiology, vol. 21, n° 1.
-Wilson E. O. (1962) The Ants of Rennell and Bellona Island. Natural History of Rennell Island British. Solomon Island, 4: 13-23.

3.6 Subfamily Dolyrinae Leach, 1815

This subfamily represented for 27 genera extant. Are known 9 genera with winged ♀♀. The ♀♀ is unknown or with wings not described in the genera: *Cheliomyrmex, Eburopone, Lividopone, Neocerapachys* and *Vicinopone* (in Brown, 1975: 79 dealate).

Are only known Dichthadiigyne ♀♀, i.e. Ergatogyne form wingless, in the genera: *Aenictogiton, Aenictus*, *Dorylus*, *Eciton, Eusphinctus, Labidus, Leptanilloides, Neivamyrmex, Nomamyrmex, Ooceraea, Syscia, Tanipone* and *Yunodorylus*.

♀ **Genus *Acanthostichus*** Mayr, 1887

Morphological characters used in the dichotomous key

Antennae with 12 articles versus clavate, Antennal socket completely visible, Antennae Scape short and massive, long as the sum of the four articles of the Funiculus; Forewings of Typology I or Typology II (*A. davisi*), Marginal cell open; Hindwings of Typology I without Jugal lobe; Mandibles triangular edentate; Propodeum unarmed; MetaTibiae with one pectinate Spur; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

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-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.

-Brown, W. L., Jr. 1975. Contributions toward a reclassification of the Formicidae. V. Ponerinae, tribes Platythyreini, Cerapachyini, Cylindromyrmecini, Acanthostichini, and Aenictogitini. Search Agric. (Ithaca N. Y.) 5(1): 1-115.

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-MacKay, W.P. 1996. A revision of the ant genus *Acanthostichus*. Sociobiology 27: 129-179.

♀ **Genus *Cerapachys*** F. Smith, 1857

Morphological characters used in the dichotomous key

Antennae with 12 articles clavate, Antennal socket visible, Antennae Scape as long as half the Funiculus not overstep the Occiput; Forewings of Typology II with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles triangular dentate; Palp formula 3:2; MetaTibiae with one pectinate Spur; Pretarsal Claws simple or with submedian tooth; Sting present.

Bio-geographical distribution
Indo-Australian and Oriental
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.
-Brown, W. L., Jr. 1975. Contributions toward a reclassification of the Formicidae. V. Ponerinae, tribes Platythyreini, Cerapachyini, Cylindromyrmecini, Acanthostichini, and Aenictogitini. Search Agric. (Ithaca N. Y.) 5(1): 1-115.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

♀ **Genus *Chrysapace*** Crawley, 1924

Morphological characters used in the dichotomous key

Antennae with 12 articles versus clavate; Antennal socket completely visible, Antennae Scape stout, not overstep the Occiput; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Eyes placed very posteriorly on the Head; Mandibles triangular edentate; Palp formula 5:3; MetaTibiae with two Spurs; Pretarsal Claws with submedian tooth; Sting present.

Bio-geographical distribution
Madagascar and Indo-Australian
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.
-Crawley W. C. (1924) Ants from Sumatra. Annals and Magazine of Natural History, Ser. 9, Vol. 13, p. 380.
-Radchenko A. (1993) Ants from Vietnam in the collection of the Institute of Zoology, Pas, Warsaw. I. Pseudomyrmicinae, Dorylinae, Ponerinae. Polska Akademia Nauk Muzeum Instytut Zoologii, Tom. 44, Nr 7.
-Terayama M., Kubota S., Sakai H. and Kawazoe A. (1988) Rediscovery of *Cerapachys sauteri* Forel, 1913 (Insecta: Hymenoptera: Formicidae) from Taiwan, with notes on the Taiwanese species of the genus *Cerapachys*. Bulletin of the Biogeographical Society of Japan, Vol. 43, N° 1-14.

♀ **Genus *Cylindromyrmex*** Mayr, 1870

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles with spine-like setae, Antennal socket covered, at least partially, from the Frontal lobe, Antennae Scape stout not overstep the Occiput; Forewings of Typology I with Marginal cell closed, Rs 2+3 vein can be incomplete; Hindwings of Typology I without Jugal lobe; Mandibles triangular dentate; Palp formula 3:2 or 2:2;

MetaTibiae with two Spurs; Pretarsal Claws with submedian tooth; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Borowiec M. L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.

-Brown, W. L., Jr. 1975. Contributions toward a reclassification of the Formicidae. V. Ponerinae, tribes Platythyreini, Cerapachyini, Cylindromyrmecini, Acanthostichini, and Aenictogitini. Search Agric. (Ithaca N. Y.) 5(1): 1-115.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-De Andrade M. L. (1998) Fossil and extant species of *Cylindromyrmex* (Hymenoptera: Formicidae). Revue Suisse de Zoologie 105 (3): 581-664.

-De Andrade M.L. (2001) A remarkable Dominican amber species of *Cylindromyrmex* with Brazilian affinities and addition to the generic revision. Beitr. Ent. 51 (1): 51-63.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

♀ **Genus *Lioponera*** Mayr, 1879

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 12 articles, Antennal socket completely visible, Antennae Scape not overstep the Occiput; Wings unknow I speculate that they are like in ♂♂ (Cantone, 2017): Forewings of Typology II with subMarginal 1 cell open, Marginal cell open; Hindwings of Typology I without Jugal lobe; Mandibles triangular dentate; MetaTibiae with one pectinate Spur; Sting present.

Bio-geographical distribution

Afrotropical, Indo-Australian, Oriental and Australian.

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Clark J. (1924) Australian Formicidae. Jour Roy. Soc. Western Australia, Vol. X., N. 12.

-Emery C. (1901) Note Mirmecologiche. Reale Academia delle Scienze dell'Istituto di Bologna.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Forel A. (1902) Fourmis Nouvelle D'Australie. Rev. Suisse Zool., Vol. 10.

♀ Genus *Parasyscia* Emery, 1882

Morphological characters used in the dichotomous key

Antennae clavate with 11-12 articles, Antennal socket completely visible, Antennae Scape stout not overstep the Occiput; Forewings of Typology I (AntWeb, 2018) or Typology II, Marginal cell open; Hindwings of Typology I without Jugal lobe; Mandibles triangular dentate; Palp formula 3:2 or 2:2; Propodeum unarmed; MetaTibiae with one pectinate Spur; Sting present.

Bio-geographical distribution

Afrotropical and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *P. imerinensis.* www.antweb.org.

-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.

-Forel A. (1891) Histoire Naturelle des Hymenopteres. Deuxieme Partie: Les Formicides. Historie Psysique, Naturelle et Politique de Madagascar, Alfred Grandidier editor, Paris.

♀ Genus *Simopone* Forel, 1891

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, Antennal socket completely visible, Antennae Scape stout not overstep the Occiput; Forewings of Typology II with subMarginal 1 cell open and Marginal cell open; Hindwings of Typology I without Jugal lobe; Mandibles triangular edentate; Palp formula 6:4 or 5:3; MetaTibiae with one pectinate Spur; Pretarsal Claws with submedian tooth; Sting present.

Bio-geographical distribution

Afrotropical and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *S. annettae*. www.antweb.org

-Bolton B. and Fisher B. L. (2012) Taxonomy of the Cerapachyine ant genera *Simopone* Forel, *Vicinopone* gen. n. and *Tanipone* gen. n. (Hymenoptera: Formicidae). Zootaxa 3283: 1-101.

-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.

♀ Genus *Sphinctomyrmex* Mayr, 1866

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, Antennal socket completely visible, Antennae Scape stout not overstep the Occiput; Wings unknow, I speculate that they are like to those of the ♂♂ (Cantone, 2017): Forewings of Typology II with subMarginal 1 cell open, Marginal cell closed; Hindwings of Typology III; Mandibles triangular edentate; Palp formula 3:3; MetaTibiae with one pectinate Spur; Sting present.

Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.
-Brown, W. L., Jr. 1975. Contributions toward a reclassification of the Formicidae. V. Ponerinae, tribes Platythyreini, Cerapachyini, Cylindromyrmecini, Acanthostichini, and Aenictogitini. Search Agric. (Ithaca N. Y.) 5(1): 1-115.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Feitosa R. M., Brandão C. R. F., Fernandez F. and Delabie J. c. H. (2011) The ant genus *Sphinctomyrmex* Mayr (Hymenoptera, Formicidae, Cerapachynae) in the Neotropical region, with the description of two new species. Psyche, Vol. 2012, Article ID 342623.

♀ **Genus *Zasphinctus*** Wheeler W. M., 1918

Morphological characters used in the dichotomous key

Antennae clavate with 11-12 articles, last 3 articles clavate, Antennae Scape stout not overstep the Occiput; Wings unknow, I speculate that they are like to those of the ♂♂ (Cantone, 2017): Forewings of Typology II with Marginal cell open; Hindwings of Typology II; Mandibles triangular edentate or dentate; Palp formula 3:3; MetaTibiae with one pectinate Spur; Pretarsal Claws simple; Sting present.

Bio-geographical distribution
Afrotropical, Indo-Australian and Australian
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Borowiec M.L. (2016) Generic revision of the ant subfamily Dorylinae (Hymenoptera, Formicidae). ZooKey 608: 1-280.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Clarck J. (1923) Australian Formicidae. Journal Roy. Soc., Western Australia, Vol IX, Part II.

3.7 Subfamily Ectatomminae Emery, 1895

This subfamily is represented for 4 genera and the winged ♀♀ are known in all.

♀ **Genus *Ectatomma*** F. Smith, 1858

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennal socket covered, at least partially, from the Frontal lobe, Antennae Scape overstep the Occiput, 1° article of the Funiculus in lenght ≤ than the 2°; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe present (*E. lugens* is describe without Jugal lobe in Almeida, 1987); Propodeal spiracle oval shaped elongate, Mandibles triangular dentate; Inferior pronotal angles unarmed or forming an obtuse angle or in the rare case where the angle is present and more nearly toothlike; posterior coxe always unarmed (Brown 1958:185); MetaTibiae with single pectinate Spur; Pretarsal Claws bifid or with submedian tooth; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Almeida A. J. (1987) Descrição de seis femeas do genero *Ectatomma* Smith, 1858 (Hymenoptera, Formicidae, Ponerinae). Na. Soc. Nordestina Zool. 1: 175-183.

-AntWeb (2018) Photos: *E. brunneus, E. gibbum, E. parassiticum, E. ruidum, E. tuberculatum, E. vizzotoi*; Photos Typus: *E. edentatum*. www.antweb.org.

-Borgmeier T. (1934) Contribuição para o conhecimento da fauna mirmecologica dos cafezais de Paramaribo, Guiana Holandesa (Hym. Formicisae). Arq. Inst. Biiol. Veget., Vol. 1, N° 2, Rio de Janeiro.

-Brown W. L. (1958) Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 118, N° 5.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Gallardo A. (1918) Las hormigas de la Republica Argentina, SubFamilia Ponerinas. Anale del Museo Nacional de Historia de Buenos Aires.

-Kugler C. and Brown W. L. (1982) Revisionary & Other Studies on the Ant Genus *Ectatomma*, including the descriptions of two new species. Search Agriculture, N. 24, ISSN 0262-2754.

-Mann W. M. (1916) The Stanford expedition to Brazil, 1911, John C. Branner, Director. The ants of Brazil. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. LX, N° 11.

-Smith F. (1858) Catalogue of Hymenopterous Insects in the Collection of the British Museum. Part VI Formicidae. London.

♀ Genus *Gnamptogenys* Roger, 1863

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 12 articles, Antennal socket covered, at laest partially, from the Frontal lobe, Antennae Scape overstep the Occiput or not; Frontal lobe widely separated throughout their length; Forewings of Typology I, in some cases Rs 2+3 incomplete, or Typology II, Marginal cell closed; Hindwings of Typology I without Jugal lobe or Typology II; Mandibles triangular, subtriangular, linear or falcate edentate or dentate; Propodeal spiracle rounded; Propodeum armed with spines to small teeth or unarmed; Dorsal face of the posterior Coxe with a distinct tooth, spine or tubercle; MetaTibiae with single Spur; Pretarsal Claws bifid or with submedian tooth; Petiole sessile; Sting present.

Bio-geographical distribution

Neotropical, Oriental, Indo-Australian and Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *G. alfaroi, G. annulata, G. coxalis; G. dentihumera, G. haenschi, G. ilimani, G. pittieri, G. quadrutinodules, G. regularis, G. solomonensis, G. stellae, G. sulcata*; Photos: *G. biroi, G. concinna, G. continua, G. cribrata, G. minuta, G. moelleri, G. porcata, G. rastrata, G. simulans, G. striatula, G. triangularis, G. volcano*. www.antweb.org.

-Brown W. L. (1958) Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 118, N° 5.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118

-Camacho G. P. (2013) Estudo taxonômico do grupo striatula de *Gnamptogenys* Roger (Hynmenoptera: Formicidae: Ectatomminae) para o Brasil. Universidade Federal de Viçosa, Dissertaçao (mestrado), f. 109-119.

-Lattke J. E. (1995) Revision of the ant genus *Gnamptogenys* in the New World (Hymenoptera: Formicidae). J. HYM. RES, Vol. 4: 137-193.

-Lattke J. E. (2004) A taxonomic revision and phylogenetic analysis of the ant genus *Gnamptogenys* Roger in Southeast Asia and Australia (Hymenoptera: Formicidae: Ponerinae). Entomology, Vol. 122

-Santschi F. (1929) Revision du genre *Holcoponera* Mayr. Zoologischen Anzeiger, Vol. 82.

♀ Genus *Rhytidoponera* Mayr, 1862

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennal socket covered, at laest partially, from the Frontal lobe, Antennae Scape overstep the Occiput, 1° article of the Funiculus in lenght ≤ than the 2°; Frontal lobe widely separed throughout their length; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe absent (Brown 1958) or present (Boudinot 2015); Mandibles triangular dentate; Palp formula 3:2; Inferior pronotal margins just in front of each anterior coxa with distinct, usually acute tooth (Brown

1958:185); Propodeal spiracle rounded; Propodeum unarmed; MetaTibiae with one or two? Spurs; Pretarsal Claws bifid or with long submedian tooth; Sting present.

Bio-geographical distribution

Australian and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2017) Photos Typus *R. metallica*. www.antweb.org

-Brown W. L. (1954) Systematic and other notes on some of the smaller species of the ant genus *Rhytidoponera* Mayr. Breviora, Museum of Comparative Zoology, Cambridge, Mass., Number 33.

-Brown W. L. (1958) Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 118, N° 5.

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-Crawley W. C. (1918) Some new Australian ants. The Entomologist's Record, Vol. XXX, N° 5.

-Donisthorpe H. (1943) The ants (Hym., Formicidae) of Waigeu Island, North Dutch New Guinea.

-Emery C. (1897) Viaggio di Lamberto Loria nella Papuasia Orientale. XVIII. Formiche raccolte nella Nuova Guinea. Annali del Museo Civico di Storia Naturale, Serie 2, Vol. 18 (38): 547-594.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Emery C. (1914) Les formis de la Nouvelle-Caledonie & des iles Loyalty. Sarasin ans Roux, Nova Caledonia, A. Zoologie Vol. I –L. IV.

-Ward P. S. (1984) A revision of the ant genus *Rhytidoponera* (Hymenoptera: Formicidae) in New Caledonia. Aust. J. Zool., 32: 131-175.

♀ **Genus *Typhlomyrmex*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles (*T. meire* Antennae with 11 articles), last 3 articles club, 1° article of the Funiculus in lenght > than the 2°, Antennal socket covered, at laest partially, from the Frontal lobe, Antennae Scape not overstep the Occiput; Forewings of Typology II, Marginal cell open; Hindwings of Typology II without Anal 2 and R1 vein; Propodeal spiracle oval shaped elongate; Mandibles triangular or subtriangular dentate; MetaTibiae with one or without Spur; Pretarsal Claws bifid or with submedial tooth; Petiole pedunculate; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *T. clavicornis, T. foreli, T. meire*; Photos: *T. major, T. pusillus, T. rogenhoferi*. www.antweb.org.

-Brown W. L. (1965) Contribution to a reclassification of the Formicidae. IV. Tribe Typhlomytmecini (Hymenoptera). Psyche, Vol. 72, N° 1.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Gallardo A. (1918) Las hormigas de la Republica Argentina, SubFamilia Ponerinas. Anale del Museo Nacional de Historia de Buenos Aires.

-Locau S., Villemant C. and Delabie J. H.C. (2004) *Typhlomyrmex meire*, a remarkable new species endemic to Southern Bahia, Brazil (Formicidae: Ectatomminae).

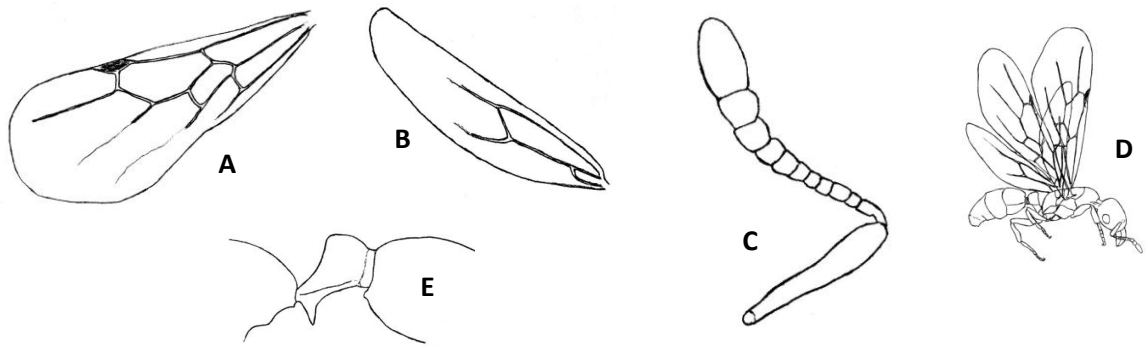

Figure – A: Forewing; B: Hindwing; C: Antennae; D: Habitus; E: Petiole of *Typhlomyrmex* sp. 461 ♀, São Paulo, Brazil.

3.8 Subfamily Formicinae Latreille, 1809

This subfamily is represented for 51 genera and the Winged ♀♀ are known in 47 genera.

The Winged ♀♀ are unknown in the genera: *Alloformica*, Bajcaridis (known ergatoid), *Santschiella* and *Teratomyrmex*.

Wings unknow: Agroulomyrmex, Bregmatomyrma, *Pseudonotoncus.*

♀ Genus ***Acropyga*** Roger, 1862

Morphological characters used in the dichotomous key

Antennae filiform or versus clavate with 7 to 11 articles; Antennae Scape overstep the Occiput or not, 1° article of the Funiculus in lenght > than the 2°; Eyes placed in the lower half of the Head; Forewings of Typology II and Typology III, solenopsis or formica type, Marginal cell closed; Hindwings of Typology II; Mandibles dentate; MetaTibiae with single Spur; Sting absent; Acidopore present.

Bio-geographical distribution

Neotropical, Afrotropical and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: male aggregation

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *A. acutiventris,A. butteli, A. goeldii, A. smithii*; Photos: *A. epedana, A. exsanguis, A. fuhrmanni, A. myops, A. oceânica, A. panamensis, A. silvestrii*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Forel A. (1910) Formicides australiens reçus de MM. Frogatt et Rowland Turner. Revue Suisse de Zoologie, Vol. 18, Fasc. 1.

-LaPolla J. (2004) *Acropyga* (Hymenoptera: Formicidae) of the World. The American Entomological Institute, Vol. 33, N° 3, ISSN: 0569-4450.

-Prins A. J. (1982) Review of *Anoplolepis* with reference to male genitalia and notes on *Acropyga* (Hymenoptera, Formicidae). Annales of the South African Museum Vol. 89, part 3

-Terayama M., Fellowes J.R. e Zhou S. (2002) the East Asian species of the ant genus *Acropyga* Roger 1862 (Hymenoptera: Formicidae: Formicinae). Edaphologia n° 70

-Weber N.A. (1944) The Neotropical Coccid-Tending ants of the genus *Acropyga* Roger. Annals Entomological Society of America Vol 37.

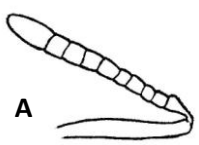

Figure – A: Antennae of *Acropyga* sp. 497 ♀, São Paulo, Brazil.

♀ Genus ***Anoplolepis*** Santschi, 1914

Morphological characters used in the dichotomous key

Antennae filiform with 11 articles, Antennae Scape long overstep the Occiput, 1° article of the Funiculus in length > than the 2°; Forewings of Typology III, formica type, Marginal cell closed,; Hindwings of Typology II, absent the Anal2 vein; Mandibles triangular dentate; Palp formula 6:4; MetaTibiae with one Spur; Pretarsal Claws simple; Sting absent; Acidopore present.

Bio-geographical distribution

Afrotropical (Neotropical, and Indo-Australian exotic)

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *A. custodiens, A. nuptialis, A. opaciventris, A. steingroeveri*. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Prins A. J. (1982) Review of *Anoplolepis* with reference to male genitalia and notes on *Acropyga* (Hymenoptera, Formicidae). Annales of the South African Museum Vol. 89, part 3.

♀ Genus ***Aphomomyrmex*** Emery, 1899

Morphological characters used in the dichotomous key

Antennae versus clavate with 10 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II, Anal2 vein absent; Mandibles triangular dentate; Palp formula 5:3; Pretarsal Claws simple; Sting absent; Acidopore present with fringe of hair.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *A. after*. www.antweb.org

-Emery C. (1899) Fourmis D'Afrique. Extrait des Annales de la Societe Entomologique de belgique, Tome XLIII.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Snelling R. R. (1979) *Aphomomyrmex* and a related new genus of arboreal African ants (Hymenoptera: Formicidae). Contrib. Sci. Natur. Hist. Mus. Los Angeles, 316: 1-8.

♀ Genus ***Brachymyrmex*** Mayr, 1868

Morphological characters used in the dichotomous key

Antennae filiform with 9 articles, Antennae Scape overstep the Occiput or not; 1° article of the Funiculus in length > that the 2° article, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology III in some cases Rs1 vein absent, fomica type, Marginal cell open; Hindwings of Typology II, in some cases Anal2 vein and radial sector+media cross-vein absent; Mandibles dentate; Palp formula 6:4; MetaTibie with one Spur; Acidopore present.

Bio-geographical distribution

Neotropical and Neartic

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *B. coactus, B. cordemoyi, B. depilis, B. heeri, B. leavis, B. longicornis, B. minutus, B. pictus, B. balboae, B. pilipes*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1899) Fourmis D'Afrique. Extrait des Annales de la Societe Entomologique de belgique, Tome XLIII.

-Emery C. (1905) Studi sulle formiche della Fauna Neotropica. Bull. Soc, Entomol. Ital., 37: 107-194.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Quiràn E.M., Martinez J.J. e Bachmann A.O. (2004) The Neotropical genus *Brachymyrmex* Mayr 1868 (Hymenoptera: Formicidae) in Argentina. Redescription of type species, *B. patagonicus* Mayr 1868; *B. bruchi* Forel 1912 e *B. oculatus* Santschi 1919. Acta Zoologica Mexicana 20(1): 273-285

-Quiran E. M. (2005) El genero Neotropical *Brachymyrmex* Mayr (Hymenoptera: Formicidae) en la Argentina. II: Redescripcion de la especies *B. admotus* Mayr, de *B. brevicornis* Emery e *B. guacho* Santschi. Neotropical Entomology 34(5): 761-768.

-Quiran E. M. (2007) El gênero Neotropical *Brachymyrmex* Mayr (Hymenoptera: Formicidae) em la Argentina. III: Redescripcion de las espécies: *B. aphidicola* Forel, de *B. australis* Forel y *B. constrictus* Santschi. Neotropical Entomology 36(5): 699-706.

-Santschi F. (1923) Revue des Fourmis du genre *Brachymyrmex* Mayr. Anales del Museo Nacional de Historia natural de Bueno Aires, Tomno 31 pag: 650-678.

-Wheeler W. M. (1938) Ants from the caves of Yucatan. Carnegie Institution of Washington Publication N° 491, pages 251 to 255.

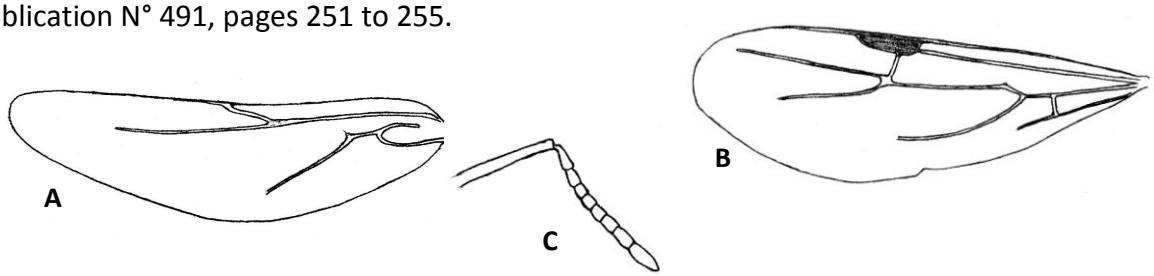

Figure – **A**: Hindwing; **B**: Forewing; **C**: Antennae of *Brachymyrmex* sp. 41 ♀, São Paulo, Brazil.

♀ Genus ***Calomyrmex*** Emery, 1895

Morphological characters used in the dichotomous key

Antennae filiform or slinglty versus clavate with 12 articles, Antennae Scape overstep the Occiput with erect setae, 1° articles of the Funiculus in length > than the 2°, Antennal socket distant from the posterior edge of the Clypeus; Forewings of Typology III, fomica type; Marginal cell closed; Hindwings of Typology II; Metathoracic spiracle lateral; Mandibles triangular dentate; Palp formula 6:4?; Acidopore present.

Bio-geographical distribution

Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Forel A. (1910) Formicides Austrlien reçus de MM. Froggatt et Rowland Turner. Revue Susisse de Zoologie, Tomo 18.

-Mayr G. (1876) Die australischen Formiciden. Journal des Museum Godeffroy 12: 56-115.

♀ Genus ***Camponotus*** Mayr, 1861

Morphological characters used in the dichotomous key

Antennae filiform or slinglty versus clavate with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant from the posterior edge of the Clypeus; Forewings Typology III, fomica type, Marginal cell closed; Hindwings Typology II; Metathoracic spiracle lateral (rarely dorsal); Mandibles triangular edentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Matinf flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: most species. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Crawley W.C. (1922) New ants from Australia. Annal and magazine of Natural History, Ser. 9, Vol. X.

-Emery C. (1903) Intorno ad alcune specie di *Camponotus* dell'America Meridionale. Sessione R. Accademia delle Scienza dell'Istituto di Bologna dell'8 Febbraio.

-Emery C. (1916) Fauna Entomologica Italiana – Hymenoptera, Formicidae. Bull. Soc. Entomol. Ital., 47: 79-275.

-Emery C. (1920) Le genre *Camponotus* Mayr. Nouvel essai de sa subdivision en sous-genres. Revue Zoologique Africaine, Vol. 8, fasc. 2.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

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(Hymenoptera: Formicidae). Papeis Avulsos de Zool. S. Paulo, 42(4): 47-101.
-Karaman C, Aktaç N., Kiran K. (2011) Ants of the genus *Camponotus* Mayr, 1861 (Hymenoptera: Formicidae) in the Kaz Mountains, Turkey, with description of sexual of *Camponotus candiotes* Emery, 1894 and *Camponotus ionius* Emery, 1920. Tubitak, 35(2): 183-197-
-McArthur A. (2014) A Guide to *Camponotus* Ants of Australia. ISBN: 9781864767919.
-Santschi F. (1922) *Camponotus neotropiques*. Ann. Soc. Entomol. Belg,, 62: 97-124.
-Wheeler W. M. (1910) The North American ants of the genus *Camponotus* Mayr. Annals of the New York Academy of Science, Vol. XX, N° 6, Part II: 295-354.

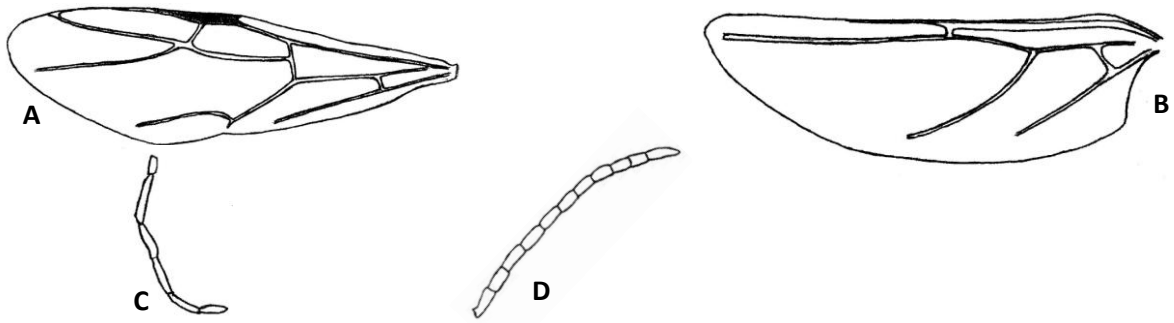

Figure – A: Forewing; B: Hindwing; C: Maxillary palp; D: Antennae Funiculus of *Camponotus* sp. 42 ♀, São Paulo, Brazil.

♀ Genus ***Cataglyphis*** Foerster, 1850

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length > than the 2°, Antennal socket near from the posterior edge of the Clypeus; Maxillar palp with 6 articles: the 1° article flattened, the 3° and 4° very long, the 4° as the sum of the 5°+ 6° articles; Labial palp with 4 articles; Eyes placed in the back half of the Head; Forewings of Typology II with Discoidal cell small or Typology III, fomica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; MetaTibiae with one Spur, Propodeal spiracle elongate, narrow slit; Pretarsal Claws simple; Acidopore present.

Bio-geographical distribution

Afrotropical, Paleartic, Oriental and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Agosti D. (1994) The phylogeny of the ant tribe Formicini (Hymenoptera: Formicidae) with the description of a new genus. Systematic Entomology 19: 93-117.
-AntWeb (2018) Photos Typus: *C. aenecens, C. bicolor, C. cubica*, C. *diehlii, C. floricola, C. marroui*. www.antweb.org
-Amor F., Ortega P., Jowers M. J., Cerdá J., Lenoir A., Boulay R. R. (2011) The evolution of worker-queen polymorphism in *Cataglyphis* ants: interplay between individual and colony

level selections. Behavioral Ecology and Sociobiology, Vol. 65, Issue 7, pp. 1472-1482.
-Cagniant H. (2009) Le genre *Cataglyphis* Foerster, 1850 au Maroc (Hymenopteres Formicidae). Oris 24: 41-71.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Delye G. (1965) *Cataglyphis* (Paraformica*) emmae* Forel sexues et soldats. Bolletin de la Societe entomologique de France Vol. 70
-Haro A. e Collingwood C.A. (2000) *Cataglyphis douwesi* sp. nov. Del grupo albicans de color negro de Cadiz, en la costa subaltantica de la penisula Iberica (Hymenoptera, Formicidae). Oris 15: 57-67.
-Haro A. e Collingwood C.A. (2001) *Cataglyphis* sp. (Hym. Formicidae) nueva especie del grupo albicans de color negro del Cabo de Gata (Almeria) Espana. Oris 16: 89-92.
-Haro A. e Collingwood C.A. (2003) *Cataglyphis gadeai* sp. nov (Hym. Formicidae), del grupo albicans de color negro del Cabo de Gata (Almeria), SE de Espana. Oris 18:19-27.
-Radchenko A. G. (1997) *Cataglyphis zakharovi* sp. n. –Second socially parasitic species in the genus *Catglyphis* Forster (Hymenoptera, Formicidae). Annales Zoologici 46: 207-210.
-Santschi F. (1929) Etude sur les *Cataglyphis*. Revue Suisse de Zoologie Tome 36, n° 2.
-Tinaut A. (1990) Situacion taxonomica del genero *Cataglyphis* Forster 1850 en la Penisula Iberica. III. El grupo de *C. velox* Santschi, 1929 y descipcion de *Cataglyphis humena* sp. n. (Hymenoptera, Formicidae). Eos, 66(2): 215-227.
-Tinaut A. and Heinze J. (1992) Wing reduction in ant queen from arid habitat. Naturwissenschaften 79: 84-85.
-Tinaut A. (1993) *Cataglyphis floricola* nov. sp. for the genus *Cataglyphis* Foerster, 1850 (Hymenoptera, Formicidae) in the Iberian Penisula. Bulletin de la Societe Entomologique Suisse, 66, 123-134.
-Tohmé Henriette et Georges (1985) Contribution a l'etude systematique et bioecologique de *Cataglyphis frigida* (André) (Hymenoptera, Formicidae, Formicinae). Revue fr. Ent. 7(2): 83-88.

♀ Genus ***Cladomyrma*** W.M. Wheeler, 1920

Morphological characters used in the dichotomous key

Antennae versus clavate with 8 articles, Antennae Scape not overstep the Occiput; Antennal socket near from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Agosti D. (1991) Revision of the oriental ant genus *Cladomyrma*, with an outline of the higher classification of the Formicinae (Hymenoptera: Formicidae). Systematic Entomology, 16: 293-310.
-Agosti D., Moog J. and Maschwitz U. (1999) Revision of Oriental Plant-ant Genus *Cladomyrma*. American Museum of natural History, New York, N° 3283.

-AntWeb (2018) Photos Typus: *C. andrei, C. crypteroniae, C. dianeae, C. hewitti, C. hobbyi, C. marytiae, C. maschwitzi, C. petalae, C. yongi*. www.antweb.org.
-Jaitrong W., Laedprathom K. and Yamane S. (2013) A new species of the ant genus *Cladomyrma* Wheeler (Hymenoptera: Formicidae: Formicinae) from Thailand. Species Diversity 18:15-22.

♀ Genus ***Colobopsis*** Mayr, 1861

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant from the posterior edge of the Clypeus, Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Metathoracic spiracle lateral; Mandibles triangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Paleartic, Neotropical, Afrotropical and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus most species. www.antweb.org.
-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.
-Ward P. S., Blaimer B. B. And Fisher B. L. (2016) A revised phylogenetic clasification of the ant subfamily Formicinae (Hymenoptera: Formicidae), with resurrection of the genera *Colobopsis* and *Dinomyrmex*. Zootaxa 4072 (3): 342-357.

♀ Genus ***Dinomyrmex*** Ashmead, 1905

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant from the posterior edge of the Clypeus, the 1° article of the Funiculus in length subequal than the 2° article; Metathoracic spiracle lateral; Forewings of Typology III, formica type, Marginal cell closed; Hindwing of Typology II; Mandibles dentate with teeth in the basal margins; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *D. gigas*. www.antweb.org.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

♀ Genus ***Echinopla*** Smith F., 1857

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant from the posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwing of Typology II; Metathoracic spiracle lateral; Mandibles triangular dentate; Palp formula 5:4; Acidopore present.

Bio-geographical distribution

Indo-Australian, Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *E. deceptor*, *E. lineata*, *E. maeandrina*, *E. pallipes*, *E. silvestri*, *E. tritschleri*, *E. vermiculata*. www.antweb.org.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

♀ Genus ***Euprenolepis*** Emery, 1906

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape overstep the Occiput, Scape with erect setae, Antennal socket near from posterior edge of the Clypeus; Forewing of Typology III, formica type, Marginal cell closed; Hindwing of Typology II; Mandibles triangular dentate; Palp formula 3:4 (4:4 in *E. negrosensis*).

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-LaPolla J. (2009) Taxonomic Revision of the Southeast Asian Ant genus *Euprenolepis*. Zootaxa 2046:1-25

♀ Genus ***Formica*** Linnaeus, 1758

Morphological characters used in the dichotomous key

Antennae filiform of 12 articles, Antennae Scape overstep the Occiput, Antennal socket confluent from the posterior edge of the Clypeus; Forewings Typology II, formica type, Marginal cell closed; Hindwing Typology II; Mandibles triangular dentate; Palp formula 6:4 or 5:4 in some species *exsecta*-group, with maxillar palp with 4° article slingtly > than the 5° article.

Bio-geographical distribution

Neartic, Central America, Indo-Australian, Oriental, Paleartic and Mediterranean.

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017; Italy: Polcenigo (PN) *Formica* sp. June; USA: Gibraltar

Island (Ohio), *F. sanguine*, July (Talbot and Kennedy 1940); S. George Reserve (Michigan), *F. vinculans*, *F. gynocrates*, *F. subintegra*, *F. rubicunda*, *F. pergandei*, *F. subnuda*, July and August (Talbot, 1985)

References for Taxonomic identification

-Agosti D. and Bolton B. (1990) New characters to differentiate the ant genera *Lasius* and *Formica* (Hymenoptera: Formicidae). Entomologist's Gazette, Vol. 41.

-Agosti D. (1994) The phylogeny of the ant tribe Formicini (Hymenoptera: Formicidae) with the description of a new genus. Systematic Entomology 19: 93-117.

-AntWeb (2018) Photos Typus most species. www.antweb.org.

-Bondroit J. (1918) Les fourmis de France et de Belgique. Annales de La Societè Entomologique de France, Vol. 87.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Dlussky G. M. (1965) Ants of the genus *Formica* L. of Mongolia and Northeast Tibet (Hymenoptera, Formicidae). Annales Zoologici, Tomo XXIII, N° 3, Warszawa.

-Dlussky, G. M. (1967) Ants of the genus *Formica* (Hymenoptera, Formicidae, g. Formica). Moskva: Nauka Publishing House, 236 pp.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Francoeur A. (1973) Revision taxonomique des especes nearctiques du groupe Fusca, genere *Formica* (Formicidae, Hymenoptera). Memoires de la Societe Entomologique du Quebec N° 2.

-Perfilieva K. S. (2000) Wing venation anomalies in sexual individuals of ants (Hymenoptera, Formicidae) with different strategies of mating behavior. Entomological Review, Vol. 80, n° 9, pp. 1181-1188.

-Talbot M. and Kennedy C. H. (1940) The slave-making ant, *Formica sanguine subintegra* Emery, its raid, nuptial flights and nest structure. Annals of the Entomological Society of America, Vol. 33, n° 3.

-Talbot M. (1985) The slave-making ant *Formica gynocrates* (Hymenoptera: Formicidae). The Great Lakes Entomologist, Vol. 18, n° 3, art. 6.

-Trager J. C., MacGown J.A., Trager M. D. (2007) Revision of the Neartic endemic *Formica pallidefulva* group, pp. 610-636. In Snelling R. R., Fisher B. L. and Ward P. S.. Advances in ant systematic (Hymenoptera: Formicidae): homage to E. O. Wilson- 50 years of contributions. Memoirs of the American Entomological Institute, 80.

-Wheeler W. M. (1913) A revision of the ants of the genus *Formica* (Linné) Mayr. Bulletin Museum of Comparative Zoology, N° 10.

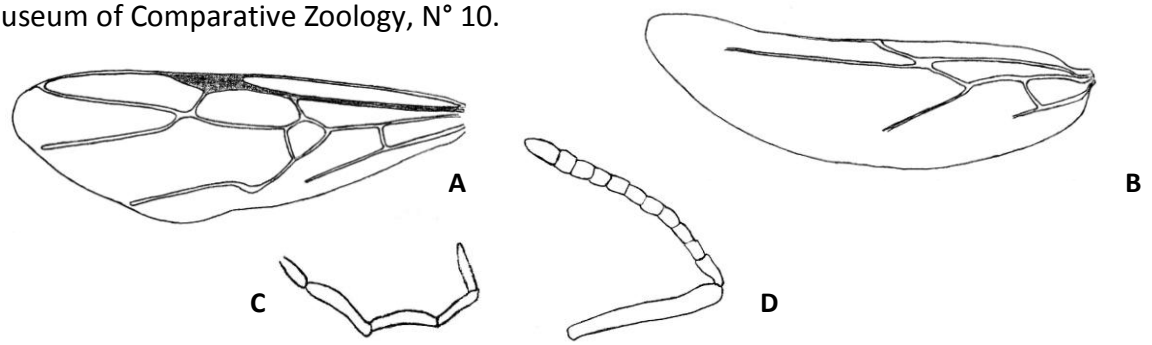

Figure – A: Forewing; B: Hindwing; C: Maxillary palp; D: Antennae of *Formica* sp.1 ♀ *exsecta*-group, Polcenigo (PN), Italy.

♀ Genus ***Gesomyrmex*** Mayr, 1868

Morphological characters used in the dichotomous key

Antennae slinglty versus clavate with 10 articles, Antennae Scape very short not overstep the Occiput, Forewings of Typology II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; big Eyes.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Wheeler W. N. (1929) Note on *Gesomyrmex*. Psyche, Vol. 36, N° 2.

-Wheeler W.M. (1930) A second note on *Gesomyrmex*. Psyche, Vol 37, N° 1.

♀ Genus ***Gigantiops*** Roger, 1863

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket near the edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4 with articles very long, Enormous Eyes.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *G. destructor*. www.antweb.org

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Smith F. (1958) Catalogue of Hymenopterous Insect in collection of the British Museum. Part IV Formicidae, London.

♀ Genus ***Iberoformica*** Tinaut, 1990

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennal socket confluent from the posterior edge of the Clypeus; Antennae Scape overstep the Occiput; Forewings of Typology II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Maxilary Palp of 5 articles?; Acidopore present.

Bio-geographical distribution

Paleartic (Iberian Peninsula and France)

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus *I. subrufa*. www.antweb.org

-Tinaut A. (1989) Descripcion del macho de *Formica subrufa* Roger 1859 y creacion de un nuevo subgenero (Hymenoptera: Formicidae). Eos t. 65(2), pags. 281-291.

♀ Genus ***Lasiophanes*** Emery, 1895

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology II and Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula: 6:4.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus; *L. atriventris, L. perplexus, L. valviensis*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Santschi F. (1920) Formicides africans et americains. Annales de la Societé Entomologique de France, 88: 361-390.

-Donisthorpe H. (1933) On a small Collection of Ants made by Dr. F. W. Edwaeds in Argentina. Annals and magazine of natural History, Ser. 10, Vol. 12.

♀ Genus ***Lasius*** Fabricius, 1804

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput, Antennal socket near from posterior edge of the Clypeus; Forewings of Typology II, not very rare anomalies (Emery 1887), and Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formua 6:4, 3:4.

Bio-geographical distribution

Neartic and Central America, Paleartic and North Africa, Indo-Oriental.

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Agosti D. and Bolton B. (1990) New characters to differentiate the ant genera *Lasius* and *Formica* (Hymenoptera: Formicidae). Entomologist's Gazette, Vol. 41.

-AntWeb (2018) Photos Typus most species. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.
-Collingwood C. A. (1957) The species of ants of the genus *Lasius* in Britain. Society for British Entomology, Vol. 5, Part 7.
-Collingwood C. A. (1982) Himalayan ants of the genus *Lasius* (Hymenoptera: Formicidae). Systematic Entomology 7:283-296.
-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.
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-Wing M. W. (1968) Taxonomic revision of the Neartic genus *Acanthomyops* (Hymenoptera: Formicidae). Cornell University, Agricoltural Experiment Station, New York State College of Agriculture, Ithaca. Memoir 405.

♀ Genus ***Lepisiota*** Santschi, 1926

Morphological characters used in the dichotomous key

Antennae versus clavate or filiform with 11 articles, Antennae Scape overstep the Occiput, insertion of the Antennae near from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwing of Typology II; Mandibles dentate; Palp formula 6:4; Propodeum with teeth or tubercles.

Bio-geographical distribution

Afrotropical and Malagasy, Paleartic, Indo-Australian, Oriental.

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-André E. (1880) Catalogue Raisonné des Formicides provenant du Voyage en orient de M. Abelle de Perrin et description des espécies nouvelles. Séance, Novembre
-Arnold G. (1920) A monograph of the Formicidae of South Africa (Myrmicinae). Annals of the South African Museum, Vol, 14, Part 4.
-Menozzi C. (1927) Formiche raccolte dal Marchese Saverio Patrizi nella Somalia italiana ed in alcune localitá dell'Africa Orientale Inglese. Raccolte Mirmecologiche del'Africa Orientale conservate nel Museo Civico di Storia Naturale "Giacomo Doria" di Genova. Parte Prima.
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♀ Genus ***Melophorus*** Lubbock, 1883

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape overstep the Occiput or not, Antennal socket near or confluent from the posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Clypeus with very long, curved hairs; Mandibles dentate; Palp formula 6:4, rarely 3:4, 3:3, 3:2.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic Identification

-AntWeb (2018) Photos Typus: *M. anderseni*. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Forel A. (1910) Formicides australiens reçus de MM. Frogatt et Rowland Turner. Revue Suisse de Zoologie, Vol. 18, Fasc. 1

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-McAreavey J. J. (1947) New species of the genera *Prolasius* Forel and *Melophorus* Lubbock (Hymenoptera, Formicida) Mem. Nat. Mus. Vict., 15.

-McAreavey J. J. (1949) Australian Formicidae. New genera and species. Linnean Society of New South Wales, Vol. LXXIV, Parts 1-2.

-Wheeler W. N. (1915) Hymenoptera. Trassaction of the Royal Society of South Australia, Vol. 39.

♀ Genus ***Myrmecocystus*** Wesmael, 1838

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, insertion of the Antennae near from posterior edge of the Clypeus; Forewings of Typology II or III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles dentate; Palp formula 6:4, Maxillary Palp with 3° and 4° articles long, 4° article in length ≥ than the 5°+6° articles; Eyes placed in the back half of the Head; MetaTibiae with one Spur; Pretarsl Claws simple; Acidopore present.

Bio-geographical distribution

Neartic and Central America

Behavioral Ecology of the Mating flight

Strategy: male agregation

Mating flight: USA: Southern California: *M. ewarti*: February and March, *M. semirufus*: November, *M. minicus* and *M. depilis*: August and September, *M. flaviceps*: October,

November and December, *M. kennedy*: late summer; Idaho, Butte Co.: *M. pyramicus*: July; Texas, Van Horn: *M. navaio*: July; Arizona, New Mexico, Colorado: *M. mexicanus*: summer months; Pachuca, Hidalgo: *M. melanoticus*: July; (Snelling, 1976).

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. arenarius, M. creightoni, M. lugubris*. www.antweb.org.
-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.
-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.
-Snelling R. R. (1969) Taxonomic notes on the *Myrmecocystus* Mellinger Complex (Hymenoptera: Formicidae). Contribute in Science, N° 170.
-Snelling R.R. (1976) A revision of the honey ants genus *Myrmecocystus* (Hymenoptera: Formicidae). Bulletin of Los Angeles county Museum of Natural Hystory n° 24.
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♀ Genus ***Myrmecorhyncus*** André, 1896

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, last 3 articles enlarged/club, Antennae Scape not overstep the Occiput (*M. emeryi*), Antennal socket near from posterior edge of the Clypeus; Forewings of Typology II, formica type; Marginal cell closed, Discoidal cell small; Hindwings of Typology II; Mandibles subtriangular dentate; Palp formula 6:4 with article short; MetaTibiae with one Spur; Acidopore present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. emeryi*. www.antweb.org;
-Clark J. (1934) New Australian Ant. Mem. Nat. Mus. Vict., VIII.

♀ Genus ***Myrmelachista*** Roger, 1863

Morphological characters used in the dichotomous key

Antennae clavate with 9-10 articles with last 3 articles club, Antennae Scape not overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology III, solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles subtriangular dentate; Palp formula 6-5:4 Acidopore present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus most species. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
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-Gallardo A. (1915) Observaciones sobre algunas hormigas de la Republica Argentina. Anales Del Museo Nacional de historia Natural de Buenos Aires, Tomo 27: 1-35.
-Longino J. T.(2006) A taxonomic review of the genus *Myrmelachista* (Hymenoptera: Formicidae) in Costa Rica. Zootaxa 1141:1-54.
-Wheeler W.M. (1934) Neotropical ants colected by Dr Elisabeth Skwarra and others. Bullein of the Museum of Comparative Zoology at Harvard College Vol 77, n° 5.

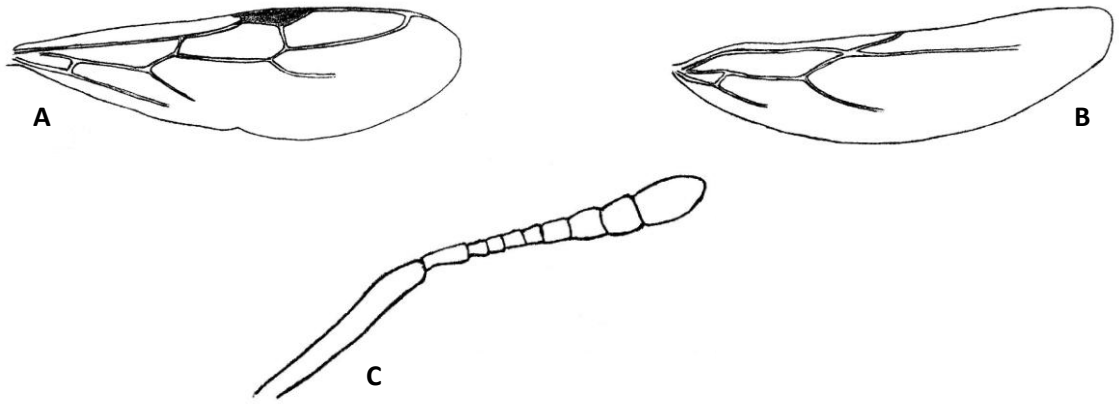

Figure – A: Forewing; B: Hindwing; C: Antennae of *Myrmelachista* sp. 213♀, São Paulo, Brazil

♀ Genus ***Myrmoteras*** Forel, 1893

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant, relatively, from posterior edge of the Clypeus; Forewings of Typology II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles long linear dentate; Palp formula 6:4 (most species) to 3:3; Eyes enormous; Acidopore present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Agosti D. (1994) Revision of the ant genus *Myrmoteras* of the Malay Archipelago (Hymenoptera, Fomicidae). Revue Suisse Zool., Tome 99, Fasc. 2, p. 405-429.
-Bharti H. e Akbar S.A. (2014) Taxonomic studies on the genus *Myrmoteras* Forel (Hymenoptera: Formicidae), with desciptiion of two new species from India. J. Entoml. Res. Soc., 16(2): 71-80.
-Bui V. T., Eguchi K. And Yamane S. (2013) Revision of the ant genus *Myrmoteras* of the Indo-Chinese Penisula (Hymenoptera: Formicidae: Formicinae). Zootaxa 3666 (4): 544-558.
Creighton W. S. (1930) A review of the genus Myrmoteras (Hymenoptera: Formicidae). Journal of the New York Entomological Society, Vol. 38.
-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium,

Fasc. 183.
-Gregg R. E. (1954) Geographical distribution of genus *Myrmoteras*, including the description of a new species (Hymenoptera: Formicidae). Psyche, March.
-Moffet M.W. (1985) Revision of the genus *Myrmoteras* (Hymenoptera: Formicidae). Bulletin of the Museum of Comparative Zoology 151:1-53.
-Zettel H., Sorger D. M. (2011) New *Myrmoteras* ants (Hymenoptera: Formicidae) from the Southeastern Philippines. The Raffles Bulletin of Zoology, 59 (1): 61-67.

♀ Genus ***Notoncus*** Emery, 1865

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, last 3 articles enlarged; Antennae Scape overstep the Occiput with erect setae, Antennal socket near from posterior edge of the Clypeus; Forewings of Typology II and III?, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; MetaTibae with one Spur; Pretarsal Claws simple; Acidopore present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017
Mating flight: see Cantone, 2017

References for Taxonomic identification

-Andre E. (1896) Fourmis nouvelle d'Asie et D'Australie. Rev. Entomol. (Caen) 15: 251-256.
-Antweb (2018) Photos Typus: *N. capitatus, N. ectatommoides, N. gilberti*. www.antweb.org.
-Brown W.L. (1955) A revision of the Australian ant genus *Notoncus* Emery, with notes on the other genera of Melophorini.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

♀ Genus ***Notostigma*** Emery, 1920

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant from posterior edge of the Clypeus; Clypeus with lateral lobes posteriorly; Forewings of Typology II and III?, formica type, Metathoracic spiracle dorsal; Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Acidopore present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

AntWeb (2018) Photos: *N. foreli*. www.antweb.org.
-Emery C. (1920) Le genre *Camponotus* Mayr. Revue Zoologique Africane vol. VIII, fasc. 2.
-Emery C. (1925) Hymenoptera, Formicidae, SubFam. Formicinae. Genera Insectorium,Fasc. 183.

♀ Genus ***Nylanderia*** Emery, 1906

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket near from the posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II with Anal 2 vein absent; Mandibles dentate; Antennae Scape and Tibiae with erect setae; Palp formula 6:4 (5:3 in *N. nodo*); Propodeum with one pair erect setae; MetaTibiae with one Spur; Acidopore present.

Bio-geographical distribution

Cosmopolitan, except Paleartic

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Kallal R. J. and LaPolla J. S. (2012) Monograph of *Nylanderia* (Hymenoptera: Formicidae) of the World, Part II: Nylanderia in the Nearctic. Zootaxa 3508: 1-64

-LaPolla J., Brady S.G. e Shattuck S.O. (2011) Monograph of *Nylanderia* (Hymenoptera: Formicidae) of the World: An introduction to the systematics and biology of the genus. Zootaxa 3110:1-9.

-La Polla J. S., Hawkes P. G., and Fisher B. L. (2011) Monograph of *Nylanderia* (Hymenoptera: Formicidae) of the World, Part I: *Nylanderya* in the Afrotropics. Zootaxa 3110: 10-36.

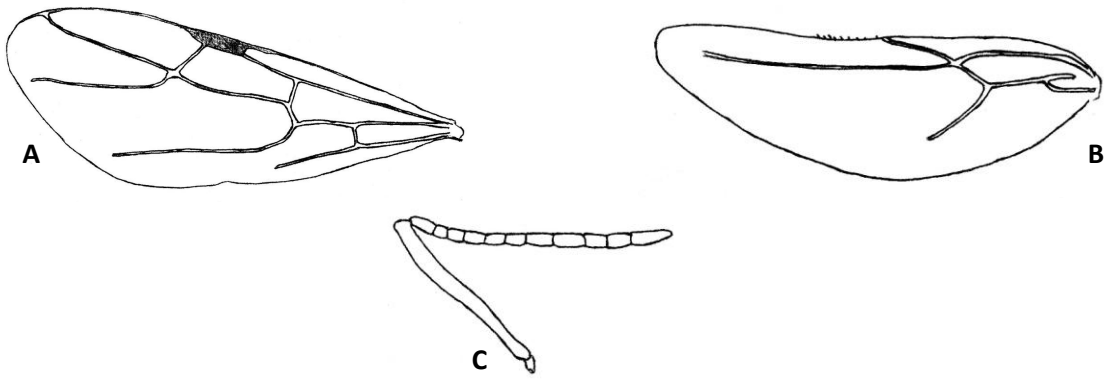

Figure – **A**: Forewing; **B**: Hindwing; **C**: Antennae of *Nylanderya* sp. 8 ♀, São Paulo, Brazil.

♀ Genus ***Oecophylla*** Smith, 1860

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennal socket distant from the posterior edge of the Clypeus, Antennae Scape overstep the Occiput; Forewings of Typology III, formica type,

Marginal cell closed; Hindwings of Typology II; Metathoracic spiracle dorsal; Mandibles triangular dentate; Palp formula 5:4; Pretarsal Claw with submedian thoot and large Arolium, last article of the Tarsus elongated and club-shaped apically; MetaTibiae with one Spur; Acidopore present.

Bio-geographical distribution

Afrotropical, Indo-Australian and Australian

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017; Australia: 12°22’13’’S, 130°51’53’’E: *O. smaragdina*: January and February (Nielsen et al. 2015).

References for Taxonomic identification

-AntWeb (2018) Photos: *O. smaragdina*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1921) Formiche tessistrici del genere *Oecophylla* fossili e viventi. Nota letta alla R. Accademia delle Scienza dell’Istituto di Bologna nella Sessione del 22 maggio.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Neisen M. G., Peng R., Offenberg J. And Birkmose D. (2015) Mating strategy of *Oecophylla smaragdina* (Hymenoptera: Formicidae) in northen Australia. Austral Entomology, doi: 10.111/aen.12182.

-Wheeler, W. M. (1922). Ants of the American Museum Congo expedition. A contribution to the myrmecology of Africa. VII. Keys to the genera and subgenera of ants. Bull. Am. Mus. Nat. Hist. 45: 631-710

♀ Genus ***Opisthopsis*** Emery, 1893

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput, Antennal socket near from posterior edge of the Clypeus; Forewings of Typology II and Typology III (ex. *O. respiciens moestus*), formica type, Marginal cell closed, Discoidal cell triangular very small; Hindwings of Typology II; Metathoracic spiracle lateral; Mandibles triangular dentate; Palp formula 6:4; Big Eyes at the back corners of the Head; MetaTibiae with one Spur; Acidopore present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Wheeler W. N. (1918) The ants of the genus *Opisthopsis* Emery Bulletin of the Museum of Comparative Zoology at Harvard College Vol. 62 n° 7.

♀ Genus ***Overbeckia*** Viehmeyer, 1916

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant relatively from posterior edge of the Clypeus, Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Metathoracic spiracle lateral; Mandibles triangular dentate; Palp formula 6:4; MetaTibiae with one Spur; Acidopore present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *O. subclavata*. www.antweb.org

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

♀ Genus ***Paraparatrechina*** Donisthorpe, 1947

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket near from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 6:4 or (maxillar of 5 articles in *P. bufonus* and *P. weissi*); Pronotum with two pair erect setae; Mesonotum one pair erect setae; Propodeum one pair erect setae; MetaTibiae with one spur; Acidopore present.

Bio-geographical distribution

Afrotropical and Madagascar, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-La Polla J. S., Cheng C.H. e Fischer B.L. 2010 Taxonomic revision of the ant (Hymenoptera: Formicidae) genus *Paraparatrechina* in the Afrotropical and Malagasy Region. Zootaxa 2387:1-27.

-La Polla J.S., Fisher B.L. (2014) Two new *Paraparatrechina* (Hymenoptera, Formicidae) species from the Seychelles, with notes on the hypogaeic weissi species-group. ZooKey 414: 139-155

♀ Genus ***Paratrechina*** Motschoulsky, 1863

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, insertion of the Antennae near from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Propodeum without erect setae; MetaTibiae with one Spur; Acidopore present.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-LaPolla J. S., Hawkes P. G., Fisher J. N. (2013) Taxonomic review of the ant genus *Paratrechina* with a description of a new species from Africa. Jurnal of Hymenoptera, 35: 71-82.

-La Polla J; S., Fisher B. L. (2014) Then there were five: a reexamination of the ant genus *Paratrechina* (Hymenoptera. Formicidae). ZooKey 422: 35-48.

-Trager J. C. (1984) A revision of the genus *Paratrechina* (Hymenoptera: Formicidae) of the Continental Unided States. Sociobiology, Vol 9, N° 2.

♀ Genus ***Petalomyrmex*** Snelling, 1979

Morphological characters used in the dichotomous key

Antennae with 10 articles, Antennae Scape not overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus, Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 3:3; Mesosoma conspicouosly flattened; Acidopore present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. phylax*. www.antweb.org

-Snelling R.R. (1979) *Aphomomyrmex* and a related new genus of arboreal African ants (Hymenoptera: Formicidae). Contrib. Sci. Natur. Hist. Mus. Los Angeles Country, 316:1-8

♀ Genus ***Plagiolepis*** Mayr, 1861

Morphological characters used in the dichotomous key

Antennae with 11 articles, Antennae Scape overstep the Occiput; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II, Anal 2 vein absent; Mandibles triangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution
Afrotropical, Paleartic, Oriental, Indo-Australian and Australia
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos some species. www.antweb.org
-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.
-Menozzi C. (1936) Nuovi contribute alla conoscenza della Fauna delle Isole italiane dell'Egeo. R. Laboratorio di Entomologia Agraria, Portici.
-Santschi F. (1920) Cinq nouvelle notes sur les Fourmis. Bull. Soc. Vaud. Sc. Nat., 53: 163-186.
-Santschi F. (1926) Description de nouveaux formicides Ethiopiens, 3° Partie. Revue Zoologique Africaine, Vol XIII, Fasc. 3-4.
-Wheeler, W. M. (1922). Ants of the American Museum Congo expedition. A contribution to the myrmecology of Africa. VII. Keys to the genera and subgenera of ants. Bull. Am. Mus. Nat. Hist. 45: 631-710.
-Wheeler W. M. (1934) Contribution to the fauna of Rottnest Island, western Australia. N° IX – The Ants. Journal of the Royal society of Western Australia, Vol. XX.

♀ Genus ***Polyergus*** Latreille, 1804

Morphological characters used in the dichotomous key
Antennae filiform with 12 articles, Antennae Scape not reaching the Occiput, insertion of the Antennae confluent from posterior edge of the Clypeus; Forewings of Typology II, formica and solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles falcate denticulate; Palp formula: 4:2 or 4:3.
Bio-geographical distribution
Neartic, Paleartic and Indo-Oriental
Behavioral Ecology of the Mating flight
Strategy: see Cantone, 2017
Mating flight: see Cantone, 2017
References for Taxonomic identification
-Agosti D. (1994) The phylogeny of the ant tribe Formicini (Hymenoptera: Formicidae) with the description of a new genus. Systematic Entomology 19: 93-117.
-AntWeb (2018) Photos Type: *P. breviceps, P. lucidus, P. nigerrimus, P. oligergus, P. samurai, P. vinosus*. www.antweb.org.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.
-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.
-Marikovsky, P. I. (1963) A new ant, *Polyergus nigerrimus* Marik., sp. n., (Hymenoptera, Formicidae) and some features of its biology. Entomol. Rev. (Wash.) 42: 58-59

-Tragger J. C. (2013) Global revision of the dulotic ant genus *Polyergus* (Hymenoptera: Formicidae, Formicinae, Formicini). Zootaxa 3722 (4): 501-548.

♀ Genus ***Polyrhachis*** F. Smith, 1857

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket distant from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Metathoracic spiracle lateral; Propodeum and Petiole usually armed with spines or teeth, in some species also the Pronotum; Mandibles subtriangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Afrotropical, Middle Orient, Oriental, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org.

-Bolton B. (1973) The ant genus *Polyrhachis* F. Smith in the Ethiopian region (Hymenoptera: Formicidae). Bulletin of the British Museum (Natural Hystory) Entomology, Vol. 28, N° 5.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Dorow W. H. O. and Kohout R. J. (1995) A review of the subgenus *Hemioptica* Roger of the genus *Polyrhachis* Fr. Smith with description of a new species (Hymenoptera: Formicidae: Formicinae). Zool. Med. Leinden, 69.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Kohout R. J. (2013) a review of the *Polyrhachis Aculeata* species-group of the subgenus *Myrma* Billberg (Hymenoptera: Formicidae: Formicinae), with keys and descriptions of new species. Australian Entomologist, 40 (3): 137-171.

-Kohout R. J. (2013) A review of the *Polyrhachis xiphias* species group of the subgenus *Campomyrma* Wheeler (Hymenoptera: Formicidae: Formicinae). Asian Myrmecology, Vol. 5, 21-27.

-Kohout R. J. (2013) Revision of *Polyrhachis* (*Hagiomyrma*) Wheeler, 1911 (Insecta: Hymenoptera: Formicidae: Formicinae). Memoirs odf the Queensland Museum/Nature, 56 (2).

-Kohout R. J. (2014) A review of the subgenus *Polyrhachis* (*Polyrhachis*) Fr. Smith (Hymenoptera: Formicidae: Formicinae) with keys and description of a new species. Asian Myrmecology, Vol. 6, 1-31.

-Hung A. C. F. (1970) A revision of ants of the subgenus *Polyrhachis* Fr. Smith (Hymenoptera: Formicidae: Formicinae). Orient al Insects, Vol. 4 (1): 1-36.

-Rigato F. (2016) The ant genus *Polyrachis* F. Smith in sub-Saharan Africa, with description of ten new species (Hymenoptera: Formicidae). Zootaxa 4088 (1): 001-050.

-Wheeler, W. M. (1922). Ants of the American Museum Congo expedition. A contribution to the myrmecology of Africa. VII. Keys to the genera and subgenera of ants. Bull. Am. Mus. Nat. Hist. 45: 631-710.

♀ Genus ***Prenolepis*** Mayr, 1861

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket near from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Neartic and Central America, Paleartic, Oriental and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic Identification

-AntWeb (2018) Photos Typus: *P. fisheri, P. impairs, P. naoroji*. www.antweb.org

-Bharti H., Wachkoo A.A. (2012) *Prenolepis fisheri*, an Intriguing New ant species, with a re-description of *Prenolepis naoroji* (Hymenoptera: Formicidae) from India.

-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-LaPolla J. S., Brady S. G., and Shattuck S. O. (2010) Phylogeny and taxonomy of the *Prenolepis* genus-group of ants (Hymenoptera: Formicidae). Systematic Entomology, 35, 118-131.

-Williams J. L. and LaPolla J. S. (2016) Taxonomic revision and phylogeny of the ant genus *Prenolepis* (Hymenoptera: Formicidae). Zootaxa 4200 (2): 201-258.

♀ Genus ***Proformica*** Ruzky, 1902

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4, Palp maxillary with 4° article in lenght > than the 5 °article.

Bio-geographical distribution

Paleartic and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Agosti D. (1994) The phylogeny of the ant tribe Formicini (Hymenoptera: Formicidae) with the description of a new genus. Systematic Entomology 19: 93-117.

-Bondroit J. (1918) Les fourmis de France et de Belgique. Annales de La Societè Entomologique de France, Vol. 87.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

♀ Genus ***Prolasius*** Forel, 1892

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Clark J. (1934) Ants from the Otway ranges. Mem. Nat. Mus. Victr., VIII.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-McAreavey S. J. (1947) New species of the genera *Prolasius* Forel and *Melophorus* Lubbock (Hymenoptera, Formicidae). Mem. Nat. Mus. Vict., 15.

♀ Genus ***Pseudolasius*** Emery, 1887

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles (one species has 11 articles), Antennae Scape overstep the Occiput or not, with erect setae, Antennal socket near from the posterior edge of the Clypeus, Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 3:3 or 3:2; Acidopore present.

Bio-geographical distribution

Afrotropical, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus many species. www.antweb.org

-Emery C. (1887) Formiche della regione Indo-Malese e dell'Australia. Catalogo delle formiche esistenti nelle collezioni del Museo Civico di Genova. Parte terza.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Santschi F. (1932) Formicidae. Extrait des Resultats scientifiques du Voyage aux Indes Orientales Néerlandaises de LL. AA. RR. Le Prince et La Princesse Leopold de belgique, Vol. IV, fascicule 5.

-Wheeler, W. M. (1922). Ants of the American Museum Congo expedition. A contribution to the myrmecology of Africa. VII. Keys to the genera and subgenera of ants. Bull. Am. Mus. Nat. Hist. 45: 631-710.

♀ Genus ***Rossomyrmex*** Arnoldi, 1928

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape not overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus, 1° article of the Funiculus very long; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4 with 3° maxillary article in lenght > than the 4° and 4° article in lenght > than the 5°; Petiole with a fringe of distinct bristles; Acidopore present.

Bio-geographical distribution

Paleartic

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Agosti D. (1994) The phylogeny of the ant tribe Formicini (Hymenoptera: Formicidae) with the description of a new genus. Systematic Entomology 19: 93-117.

-Tinaut Ranera J. A. (1980) *Rossomyrmex minuchae* nov. sp. (Hym. Formicidae) encontrada en Sierra Nevada, España. Bol. Asoc. Esp. Entom., Vol. 4: 195-203, Salamanca.

♀ Genus ***Stigmacros*** Forel, 1905

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 11 articles, last 4 articles club, Antennae Scape overstep the Occiput, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology II with small Discoidal cell (McAreavey, 1957), and Typology III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Eyes placed in the back half of the Head; Acidopore present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-McAreavey S.J. (1957) Revision of the genus *Stigmacros* Forel. Memoirs of the National Museum of Victoria Melbourne, n° 21.

-Wheeler W. M. (1936) Ecological relation of Ponerine and other Ants to Termites. American Academy of Art and Science, Vol. 71, N° 3.

♀ Genus ***Tapinolepis*** Emery, 1925

Morphological characters used in the dichotomous key

Antennae slingtly versus clavate with 11 articles, Antennae Scape overstep the Occiput, Antennal socket near or confluent from posterior edge of the Clypeus, 2°, 3° and 4° articles of the Funiculus subequal in lenght; Forewings of Typology III, formica type, Marginal cell

closed; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Afro-Mediterranean, Afrotropical and Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Arnold G. (1926) A monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. 23.

-Arnold G. (1962) New species of African Hymenoptera N° 16. Occasional papers of the National Museum of Souther Rhodesia, N° 26B.

-Emery C. (1915) Formiche raccolte nell'Eritrea dal Prof. F. Silvestri. Boll. Lab. Zool. Gen. Agrar. R. Sc. Super. Agric., 10: 3-26, Portici.

-Emery C. (1925) Hymenoptera, Fam. Formicidae, SubFam. Formicinae. Genera Insectorium, Fasc. 183.

-Santschi F. (1908) Nouvelles fourmis de l'Afrique du Nord (Egypte, Canaries, Tunisie). Ann. Soc. Entomol. De France, 77.

♀ Genus ***Zatania*** La Polla, Kallal e Brady, 2012

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape very long overstep the Occiput, Antennal socket near from posterior edge of the Clypeus; Forewings of Typology III, formica type, Marginal cell closed; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 6:4; Acidopore present.

Bio-geographical distribution

Central America

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-LaPolla J. S., Kallal R.J. e Brady S.G. (2012) A new ant genus from the Greater Antilles and Central America, *Zatania* (Hymenoptera: Formicidae), exemplifies the utility of male and molecular character system. Systematic Entomology, 37, 200-214.

3.9 Subfamily Heteroponerinae Bolton, 2003

This subfamily represented for three genera. In the genus *Aulocopone* the Winged ♀♀ are known but unknown the wings.

♀ Genus ***Acanthoponera*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Dorsum of the Head with conspicuous median longitudinal costa; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe absent; Mandibles triangular dentate; Palp formula 6:4; Propodeum armed with teeth; Petiole dorsal sharpened; MetaTibiae with one Spur; Pretarsal Claws bifid; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Brown W. L. (1958) Contribution toward a reclassification of the Formicidae. II Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 118, N° 5.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Feitosa R. (2011) Revisão taxonômica e analise filogenética de Heteroponerinae (Hymenoptera, Formicidae). Tese de Doutorado – Facultade de Filosofia Ciências e Letras de Riberão Preto da USP. Departamento de Biologia. Programa de Pos-Graduaçao em Entomologia.

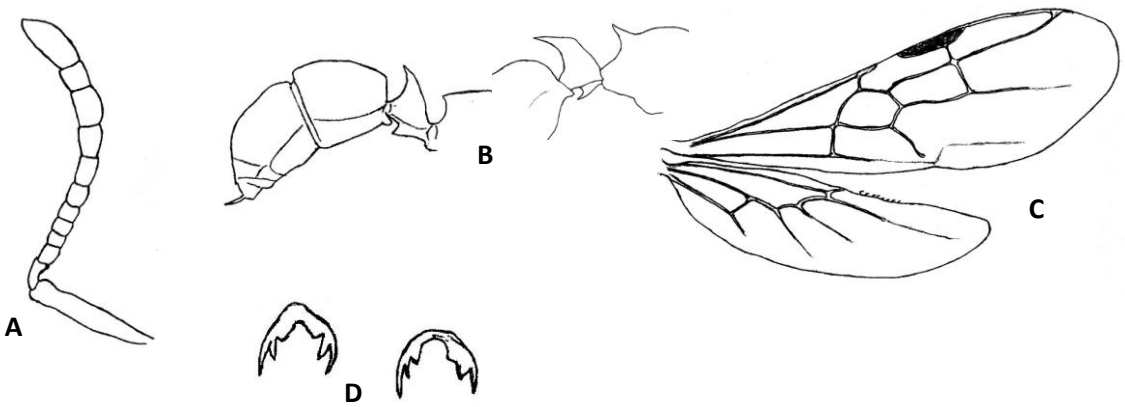

Figure – A: Antennae; B: Petiole, Gaster; C: Wings; D: Claws of *Acanthoponera* sp. 394 ♀ and 491 ♀, São Paulo, Brasil.

♀ Genus ***Heteroponera*** Mayr, 1887

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, Antennae Scape not overtstep the Occiput, Antennal Scrobe present or absent; Forewings of Typology I, Marginal cell closed; Hindwings of Typology I without Jugal lobe and Typology II; Mandibles dentate; Palp formula 4:3, 3:3, 3:2; Propodeum armed with spines to small teeth; MetaTibiae with single Spur; Pretarsal Claws simple or with median small tooth.

Bio-geographical distribution

Australia and Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Brown W. L. (1958) Contribution toward a reclassification of the Formicidae. II Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 118, N° 5.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Feitosa R. (2011) Revisão taxonômica e analise filogenética de Heteroponerinae (Hymenoptera, Formicidae). Tese de Doutorado – Facultade de Filosofia Ciências e Letras de Riberão Preto da USP. Departamento de Biologia. Programa de Pos-Graduaçao em Entomologia.

-Gallardo A. (1918) Las hormigas de la Republica Argentina, SubFamilia Ponerinas. Anales del Museo Nacional de Historia de Buenos Aires, Tomo XXX: 1-112.

-Wheeler W. M. (1915) *Paranomopone*, a new genus of Ponerine ants from Queensland. Psyche, Vo, 22, N° 4.

3.10 Subfamily Leptanillinae Emery, 1910

This subfamily is represented for 8 genera and the Winged ♀♀ are known in the genera *Anomalomyrma*, *Opamyrma, Protanilla* but unknown wings.

In the genera *Noonilla*, *Phaulomyrma*, *Scyphodon* and *Yavnella* the ♀♀ are unknown.

In the genus *Leptanilla* are known only Ergatogyne/Dichthadiigyne (Baroni Urbani, 1977; Bolton, 1990, Masuko, 1990).

3.11 Subfamily Martialinae Rabeling and Verhaagh, 2008

This subfamily is represented for the genus *Martialis* and the Winged ♀♀ is unknown.

3.12 Subfamily Myrmeciinae Emery, 1877

This subfamily is represented for two genera and the Winged ♀♀ are known.

♀ Genus ***Myrmecia*** Fabricius, 1804

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape in lenght overstep the Occiput or not, 1 articles of the Funiculus in length < than the 2 article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe present; Mandibles linear dentate; Palp formula 6:4; Petiole sessile or with short pedulcule; Gaster with a strong constriction between the 1° and 2° segment, in some cases the 1° segment very little than the 2°, resembling a PosPetiole; MetaTibiae with two Spurs (simple and pectinate); Pretarsal Claws with strong median tooth or bifid, Sting present.

Bio-geographical distribution

Australia

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. fulviculis, M. picta, M. piliventris, M. qeenslandica, M. rugose*; Photos: *M. gulosa, M. tarsata*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Clark J. (1934) Notes on Australian ants, with description of new species and new genus. Mem. Nat. Mus. Vict., Melbourne, N° 8.

-Clark J. (1943) A revision of the genus *Promyrmecia* Emery (Formicidae). Mam Nat. Mus. Vict., 13.

-Clark J. (1951) The Formicidae of Australia, Subfamily Myrmeciinae, Volume I. Commonwealth Scientific and Industrial Research Organization, Australia, Melbourne.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Narendra A., Reid S. F., Greiner B., Peters R. A., Hemmi J. M., Ribi W. A. and Zeil J. (2010) Caste-specific visual adaptations to distinct daily activity schedules in Australian *Myrmecia* ants. Proc. R. Soc. B, doi: 10.1098/rspb.2010.1378.

-Ogata K. and Taylor R. W. (1991) Ants of the genus *Myrmecia* Fabricius: a preliminary review and key to the named species (Hymenoptera: Formicidae: Myrmeciinae). Journal of History, 25: 6, 1623-1673.

-Ward P. S. and Brady S. G. (2003) Phylogeny and biogeography of the ant subfamily Myrmeciinae (Hymenoptera: Formicidae). Invertebrate Systematics, 17: 361-386.

♀ Genus ***Nothomyrmecia*** Clark, 1934

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep he Occiput; 1 article of the Funiculus in lenght < than the 2 article. Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe present; Mandibles linear dentate; Petiole with long peduncle anteriorly; Gaster with a constriction between the 1° and 2° segment with the 1°

segment little than the 2°; MetaTibiae with two Spurs (simple and pectinate); Pretarsal Claws with strong median tooth or bifid.

Bio-geographical distribution

Australia

Behavioral Ecology of the nuptial flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Taylor R. W. (1978) *Nothomyrmecia macrops* a living-fossil ant rediscovered. Science, Vol. 201: 979-985.

-Ward P. S. and Brady S. G. (2003) Phylogeny and biogeography of the ant subfamily Myrmeciinae (Hymenoptera: Formicidae). Invertebrate Systematics, 17: 361-386.

3.13 Subfamily Myrmicinae Lepeletier de Saint-Fargeau, 1835

This subfamily represented for 143 genera extant and the Winged ♀♀ are known in 106 genera.

The ♀♀ are unknown in the genera: *Adlerzia, Ancyridris, Anillomyrma, Aretidris, Austromorium, Chimaeridris, Cyphoidris, Diaphoromyrma, Erromyrma, Formosimyrma, Gaoligongidris, Gauromyrmex, Ishakidris, Kartidris, Kempfidris*, *Peronomyrmex Phalacromyrmex, Pilotrochus, Poecilomyrma, Propodilobus, Recurvidris, Secostruma*, *Tetheamyrma.*

The winged ♀♀ are known, but unknown to me the wings in the genera: *Baracidris, Cryptomyrmex, Epopostruma, Lasiomyrma*, *Microdaceton*, *Perissomyrmex, Rotastruma, Talaridris, Vombisidris.*

The ♀♀ known only in form Ergatogyne in the genera: *Blepharidatta, Epelysidris*, *Ocymyrmex, Stereomyrmex, Tropidomyrmex.*

♀ Genus ***Acanthognathus*** Mayr, 1887

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology IV with Marginal cell open; Hindwings of Typology III; Mandibles longer linear dentate; Palp formula 5:3; Propodeum armed with spines or teeth; Petiole with long peduncle; Sting present; MetaTibiae without Spur; Pretarsal Claws simple.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Baroni Urbani C. and Andrade M. L. de (1994) First description of fossil Dacetini ants with a critical analysis of the current classification of tribe (amber collection Stuttgart:

Hymenoptera, Formicidae. VI: Dacetini). Stuttgarter Beitr. Naturk, Ser. B, Nr. 198.
-Brown W.L. and Kempf W.W. (1969) A revision of the Neotropical Dacetine ant genus *Acanthognathus* (Hymenoptera: Formicidae). Psyche, Vol. 76, n° 2.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174: 207-397.

♀ Genus ***Acanthomyrmex*** Emery, 1893

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II (*A. ferox, A. thailandensis*) and Typology III (*A. glabfemoralis*), solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles massive edentate or with subapical tooth; Palp formula 4:3; Propodeum usually armed with spines or teeth; Petiole pedunculate with dorsal tooth; MetaTibiae with one Spur.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *A. ferox*. www.antweb.org
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Eguchi K., Bui T.V. & Yamane S. (2008) Vietnamense species of the genus *Acanthomyrmex* Emery 1893 – *A. humilis* sp. N and *A. glabfemoralis* Zhou & Zheng, 1997 (Hymenoptera: Formicidae: Myrmicinae). Myrmecological News, 11, 231-241.
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-Terayama M. (1995) A new species of the ant genus *Acanthomyrmex* (Hymenoptera, Formicidae) from Thailand. Jpn. J. Ent., 63(3): 551-555.
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♀ Genus ***Acromyrmex*** Mayr, 1865

Morphological characters used in the dichotomous key

Antennae with 11 articles filiform or versus clavate with last four articles slightly enlarged ; Antennae Scape overstep the Occiput, Antennal Scrobe absent, 1° article of the Funiculus in length > than the 2°; Pronotum with two spines dorsally; Forewings of Typology III, formica type (rared solenopsis type), Marginal cell closed, Pterostigma absent or reduced, Anal 2 vein absent; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Propodeum armed with spines; Petiole pedunculate; Tarsus 1 of Prolegs dilated, MetaTibiae without Spur.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017; Uruguay: 33.9042° S, 55.59418° W, *A. charruanus*: February (Rabeling et al., 2015)

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *A. ameliae, A. asperses, A. coronatus, A. disciger, A. niger, A. rugosus, A. volcanus*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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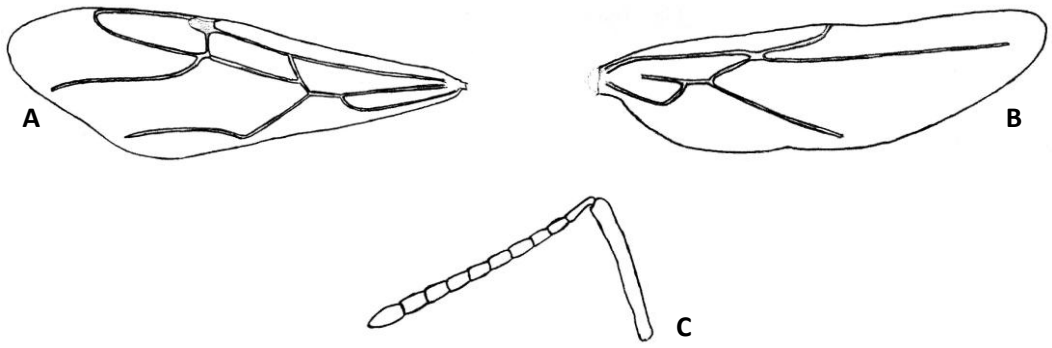

Figure – A: Forewing; B: Hindwing; C: Antennae of *Acromyrmex* sp. 430 ♀, São Paulo, Brazil

♀ Genus ***Adelomyrmex*** Emery, 1897

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 2 articles club, Antennae Scape not overstep the Occiput, 1° article article of the Funiculus very long that the following, last article large and ovoid shape, Antennal Scribe absent; Forewings of Typology II, formica type, SubMarginal 1 cell open, Marginal cell open, Hindwings of Typology III; Mandibles triangular dentate with 5-7 teeth (4 teeth in *A. biroi*); Palp formula 2:2 or less; Anterior Clypeal border usually with a bidentate projection medially and with tooth laterally; Propodeum armed with spines or Teeth; MetaTibiae without Spur.

Bio-geographical distribution

Central America and Amazonas, Galapagos Island, Oceania, Papua New Guinea, Solomon Island, Seychelles

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos most species. www.antweb.org

-Emery C. (1897) Formicidarum species novae vel minus cognitae in collectione Musaei Nationalis Hungarici quas in Nova-Guinea, colonia germanica, Collegit L. Biró. Természetrajzi Fuzetek 20: 571-599.

-Fernandez F.C. (2003) Revision of the Myrmicinae ants of the *Adelomyrmex* genus-group (Hymenoptera: Formicidae). Zootaxa, 361: 1-52.

-Longino J. T. (2012) A review of the ant genus *Adelomyrmex* Emery 1897 (Hymenoptera, Formicidae) in Central America. Zootaxa 3456: 1-35.

♀ Genus ***Allomerus*** Mayr, 1878

Morphological characters used in the dichotomous key

Antennae clavate with 9-11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, formica type, Marginal cell open; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 3:2; Propodeum unarmed; MetaTibiae with one Spur; Sting present.

Bio-geographical distribution

Neotropical (Amazonas)

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *A. octoarticulatus*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.

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Formicidae). Caldasia 29(1): 159-175.
-Kempf W.W. (1975) Miscellaneous Studies on Neotropical Ants. VI (Hymenoptera: Formicidae). Studia Ent., Vol. 18, fasc. 1-4.

♀ Genus ***Aphaenogaster*** Mayr, 1853

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, last 4 articles club, Antennae Scape overstep or not the Occiput, Antennal Scrobe absent; Forewings of Typology I and II, solenopsis type, Marginal cell open, venation variations are known (Emery 1915); Hindwings of Typology II; Mandibles elongate triangular dentate; Palp formula 4:3 or 5:3; Propodeum armed with spines; Petiole with long anterior peduncle; MetaTibiae with one simple Spur.

Bio-geographical distribution

Paleartic, Mediterranean, Oriental, Neartic, Indo-Australian, Neotropical, Australian and Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org
-Boer P. (2013) Revision of the European ants of the *Aphaenogaster testaceopilosa*-group (Hymenoptera: Formicidae). Tijdshrift voor Entomologie 156, 57-93.
-Cagniant H. (1966) Nouvelle description d'*Aphaenogaster* (*Attomyrma*) *crocea* (André) Hymenoptera Formicidae. Representation des trois castes notes biologiques. Bolletin de la Societé Zoologique de France, Tome 91, n° 1, p. 61.
-Cagniant H. (1986) Contribution à la connaissance des fourmis marocaines: Description des sexués et complements à la definition de l'espéce *Aphaenogaster theryi* Santschi 1923 (Hymenoptera, Formicidae, Myrmicinae). Societé d'Histoire Naturelle de Touluse, 122:139-143.
-Cagniant H. (1988) Contribution à la connaissance des Fourmis marocaines. Description des trois castes d'*Aphenogaster torossiani* n. sp. et notes biologiques. Bull. Soc. Ent. Fr., 92 (7-8).
-Cagniant H. (1988b) Contribution a la connaissance des fourmis marocaines. Description des trois castes d'*Aphaenogaster wilsoni* n. sp. (Hymenoptera, Myrmicidae). Nouv. Revue Ent. T. 5, Fasc. 1 p. 49-55.
-Cagniant H. (1989) Contribution a la connaissance des Fourmis marocaines. Description de trois castes d'*Aphaenogaster weulersseae* n. sp.; notes biologiques et ecologiques; etude compare de trois populations. Bull. Soc. Ent. Fr. 94 (3-4).
-Cagniant H. (1990) Contribution a la connaissance des fourmis marocaines: *Aphaenogaster atlantis* Santschi, 1929 bona species (n. status) (Hymenoptera, Formicidae, Myrmicinae). Bull. Mus. Natn. Hist. nat., Paris, 4° ser., 12, section A, n° 1: 123-133.
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ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
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-Emery C. (1915) Definizione del Genere *Aphaenogaster* e partizione di esso in Sottogeneri. *Parapheidole* e *Novomessor* nn. gg. R. Accademia delle Scienza dell'Istituto di Bologna, Sessione 21/03.
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-Smith M.R. (1961) Study of New Guinea ants of the genus *Aphaenogaster* Mayr (Hymenoptera, Formicidae). Acta Hymenopterologica 1(3): 213-237.
-Tinaut A. (1985) Descripcion del macho de *Aphaenogaster cardenai* Espadaler, 1981 (Hymenoptera, Formicidae). Miss. Zool., 9:245-249.
-Wheeler W. M. (1915) Some addition to the North American ant-fauna. American Museum of Natual History, Vol. 34, art. 12, pp. 389-421, New York.
-Wheeler W. M. (1916) The australian ants of the genus *Aphenogaster* Mayr. Royal Society of South Australia, vol. XL.
-Wheeler W. M. (1921) Chinese Ants. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 64, N. 7.
-Wheeler W. M. (1928) Ants collected by Professor F. Silvestri in Japan and Korea. Bollettino del Laboratorio di Zoologia generale ed agraria del R. Istituto superiore agrario di Portici, Vol. 21.

♀ Genus ***Apterostigma*** Mayr, 1865

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 11 articles, last 3 articles club, Antennae Scape overstep the Occiput, Antennal socket distant from posterior edge of the Clypeus, Antennal Scrobe absent; Frontal lobe very developed; Forewings of Typology III often Rs1 vein absent with Basal and subMarginal cell not divided, solenopsis type, Marginal cell closed and Pterostigma absent or reduced; Hindwings of Typology II or III with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 3:2 (worker); Scutellum bidentate; MetaTibiae without Spur; Tarsus 1 of the prolegs dilated; Propodeum unarmed to angulate; Petiole pedunculate; Sting present.

Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-AntWeb (2018) Photos: *A. auriculatum, A. chococoense, A. collare*, *A. dentigerum, A. goniodes, A. pilosus*, *A. robustum* Typus. www.antweb.org
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174: 207-397.
-Lattke J.E. (1997) Revision del genero *Apterostigma* Mayr (Hymenoptera: Formicidae). Arq. Zool. S. Paulo 34(5): 121-221.
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-Wheeler W. M. (1907) The fungus-growing ants of North America. Bulletin of the American Museum of Natural History, Vol. 23, article 31, 669-807.
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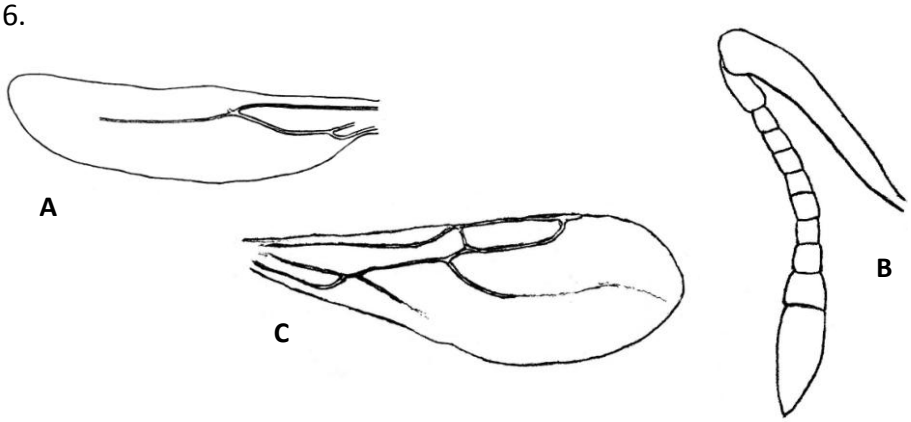

Figure – A: Hindwing; B: Antennae; C: Forewing of *Apterostigma* sp. 417 ♀, São Paulo, Brazil.

♀ Genus ***Atopomyrmex*** André, 1889

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape short not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II with Marginal cell closed, solenopsis type; Hindwings of Typology II?; Mandibles dentate; Palp formula 4:3 (worker); Petiole and Propodeum armed with tubercles or teeth (except *A. calpocalycola* with Petiole unarmed); Propodeal spiracle large and circular; Femurs enlarged; MetaTibiae without Spur; Petiole sessile; Sting present.

Bio-geographical distribution
Afrotropical
Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *A. cryptoceroides*. www.antweb.org.
-Arnold G. (1916) A monograph of the Formicidae of South Africa (Myrmicinae). Annals of the South African Museum, Vol. XIV, Part II.
-Emery C. (1891) Voyage de M. Ch. Alluaud dans le territoire d'Assinie (Afrique Occidentale). Ann. Soc. Ent. Fr.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174: 207-397.
-Forel A. (1913) Formicides du Congo Belge, recoltes par MM. Bequaert, Luja, etc. Revue Zoologique Africane (Brussels) 2: 306-351.
-Wheeler W. M. (1922) Ants of the American museum Congo Expedition. A contribute to the myrmecology of Africa. Bulletin of the American Museum of Natural history, Vol XLV.

♀ Genus ***Atta*** Fabricius, 1804

Morphological characters used in the dichotomous key

Antennae versus clavate with 11 articles, last 4 articles enlarged; Antennae Scape overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, formica type, Marginal cell closed and appendiculate, Pterostigma absent or reduced, Anal 2 vein absent; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 4:2; Pronotum without spines; Tarsus 1 of the Prolegs enlarged; MetaTibae without Spur; Propodeum armed with two small spines.

Bio-geographical distribution

Neotropical and Neartic

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *A. mexicana, A. sexdens, A vollenweideri*. www.antweb.org.
-Borgmeier T. (1959) Revision der Gattung *Atta* Fabricius (Hym., Formicidae). Studia Entomologica, Vol. 2, fasc. 1-4.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174: 207-397.
-Fontenela J. L. (1995) Nueva espécies de *Atta* (Hymenoptera: Formicidae) del archipielago cubano. Avicennia, 3: 77-86.
-Gonçalves C.R. (1942) Contribuição para o conhecimento do gênero *Atta* Fabr., das Formigas Sauvas. Boletim da Sociedade Brasileira de Agronomia, Vol. V, n° 3.
-Wheeler W. M. (1907) The fungus-growing ants of North America. Bulletin of the American Museum of Natural History, Vol. 23, article 31, 669-807.

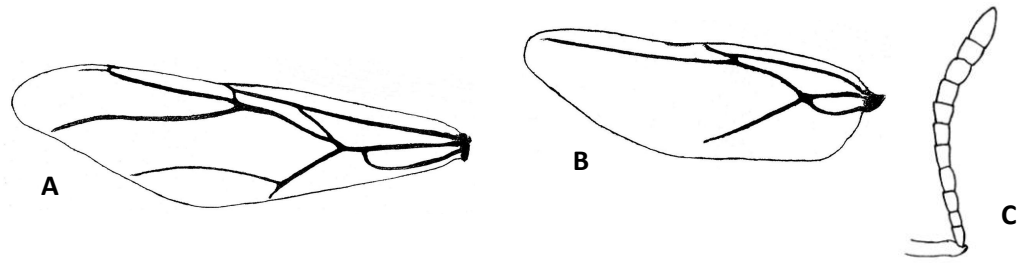

Figure – A: Forewing; B: Hindwing; C: Funiculus of *Atta sexdens* ♀, São Paulo, Brazil.

♀ Genus ***Bariamyrma*** Lattke, 1990

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate (9 teeth); Palp formula 3:2; MetaTibiae without Spur; Propodeum armed with teeth; Petiole pedunculate without ventral tooth; Sting present and ending in a prominent lobular flange.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Lattke J. (1990) A new genus of myrmicine ants (Hymenoptera: Formicinae) from Venezuela. Ent. Scand. 21: 173-178.

♀ Genus ***Basiceros*** Shultz W.A., 1906

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennal Scrobe present, Antennae Scape massive not overstep the Occiput; Forewing of Typology III and Typology II rarely, solenopsis type, Marginal open, Anal 2 vein absent; Hindwing of Typology II with Anal 2 vein absent; Mandibles triangular elongate dentate; MetaTibiae without Spur; Propodeum armed with short teeth; Sting present; Body and Legs with reclinate Scale spatulate or squamiform and erect hair clavate of white color.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *B. conjugans, B. disciger, B. scambognathus.* www.antweb.org

-Baroni Urbani C. and De Andrade M. L. (2007) The ant Tribe Dacetini: Limits and constituent genera, with description of new species. Anali del Museo Civico di Storia Naturale “G. Doria”, 99: 1-191.

-Brown W.L. and Kempf W.W. (1960) A World revision of the ant Tribe Basicerotini (Hym. Formicidae). Studia Ent., Vol. 3, fasc. 1-4.
-Brown W.L. (1974) A supplement to the revision of the ant genus *Basicerus* (Hymenoptera: Formicidae). New York Entomological Society, LXXXII: 131-140.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174: 207-397.
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♀ Genus ***Bondroitia*** Forel, 1911

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 4 articles club, Antennal Scrobe absent, Antennae Scape not overstep the Occiput; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 2:2; Propodeum unarmed; Propodeal spiracle enormously enlarged and circular; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *B. saharensis*. www.antweb.org
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174: 207-397.
-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.
-Forel A. (1909) Fourmis du Musèe de Bruxelles: Fourmis de Benguela, Fourmis Du Congo. Annuales de La Societé de Belgique, Tome LIII.
-Santschi F. (1923) Descriptions de nouveux Formicides ethiopiens et notes diverses. Revue Zoologique Africaine, Vol. XI, Fasc. 3.

♀ Genus ***Calyptomyrmex*** Emery, 1887

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, last article very long, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, formica type, Discoidal cell small, Marginal cell open; Hindwings of Typology II; Mandible triangular dentate; Palp formula 2:2; Propodeum armed with teeth; MetaTibiae without Spur; Petiole anteriorly pedunculate and without tooth or process ventrally; Sting present.

Bio-geographical distribution

Afrotropical, Indo-Australian and Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Bolton B. (1981) A revision of ant genera *Meranoplus* F. Smith, *Dicroaspis* Emery and *Calyptomyrmex* Emery (Hymenoptera: Formicidae) in the Ethiopian zoogeographical region. Bull. Br. Mus. Nat. Hist. (Ent.) 42 (2): 43-81.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

♀ Genus ***Cardiocondyla*** Emery, 1869

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, III and IV, solenopsis type, Marginal cell open; Hindwings of Typology II or III; Mandibles triangular dentate (5 teeth); Palp formula 5:3; MetaTibiae without Spur; Propodeum armed with teeth or spines; Sting present; Head, Mesosoma and Gaster lacking standing hairs dorsally.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017;

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *C. emery, C. fajumensis, C. kagutsuchi, C. kushanica, C. mauritania, C. minutior, C. obscurior, C. papuana, C. pirata, C. venustula*. www.antweb.org

-Arnold G. (1916) A monograph of the Formicidae of South Africa (Myrmicinae). Annals of the South African Museum, Vol. XIV, Part II.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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♀ Genus ***Carebara*** Westwood, 1840

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 9-10-11 articles or 12 articles in *C. polita*, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles dentate; Palp formula 3:3, 3:2; Propodeum unarmed or with very short teeth.

Bio-geographical distribution

Neotropical, Paleartic (Mediterranean), Afrotropical, Orietal, Indo-Australian, Australian

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017; Sudan: Yei, Equatoria: *C. bartrumi*: August, 6:00 AM (Weber, 1943)

References for Taxonomic identification

-AntWeb (2018) Photos Typus many species. www.antweb.org

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-Santschi F. (1912) Un *Carebara* americain (Hym. Formicidae). Extrait du Bulletin de la Societé entomologique de France.

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-Weber N. A. (1943) The ants of the Imatong Mountains, Anglo-Egyptian Sudan. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. XCIII, N° 2.
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-Wheeler W.N. (1922) Neotropical ants of the genera *Carebara*, *Tranopelta* and *Tranopeltoides* new genus. American Museum Novitates, N° 48.
-Wheeler W.N. (1936) Ecological relation of Ponerinae and other ants to Termites. American Academy of Arts and Sciences, Vol. 71, N° 3.

♀ Genus ***Cataulacus*** Smith F., 1853

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennal Scrobe present with eyes placed dorsally; Forewings of Typology III, formica type, Marginal cell open (in Bolton 1974 *C. egenus* Santschi Marginal cell closed); Hindwings of Typology II; Mandibles triangular dentate; Palp formula 5:3; Propodeum armed (unarmed in *C. inermis*); MetaTibiae Spur absent; Petiole sessile; Sting present.

Bio-geographical distribution

Afrotropical, Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos 17 species. www.antweb.org
-Bolton B. (1974) A revision of the Paleotropical arboreal ant genus *Cataulacus* F.Smith (Hymenoptera: Formicidae). Bulletin of the British Museum (Natural History) Entomology London, Vol. 30, N° 1.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

♀ Genus ***Cephalotes*** Latreile, 1802

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present with eyes placed postero-dorsally (most species) or placed postero-ventrally (*C. atratus*, *C. alfaroi*, *C. senaticemps*) from the Antennal Scrobe; Forewings of Typology II, formica or solenopsis type, Marginal cell closed and appedinculate; Hindwings of Typology II; Mandibles triangular dentate; MetaTibiae usually without Spur; Propodeum armed with teeth or spines or unarmed; Petiole sessile.

Bio-geographical distribution

Neotropical and Neartic

Behavioral Ecology of the Mating flight

Strategy*:* see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Andrade M.L. de and Baroni Urbani C. (1999) Diversity and Adaptation inthe Ant Genus *Cephalotes*, Past and Present. Stuttgarter Beitr. Naturk. Ser. B, Nr. 271.
-AntWeb (2018) Photos Typus many species. www.antweb.org
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-Kempf W.W. (1951) A Taxonomic study on the ant Tribe Cephalotini (Hymenoptera: Formicidae). Rev. de Entomologia, Vol. 22, fasc. 1-3, Rio de Janeiro, Brasil.
-Smith M. R. (1947) Ants of the genus *Cryptocerus* F., in the United States. Proc. Ent. Soc. Wash., Vol. 49, N° 1.

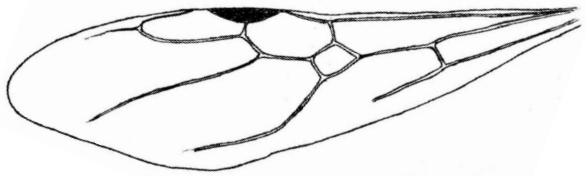

Figure – A: Forewing of *Cephalotes* sp. ♀, São Paulo, Brazil.

♀ Genus ***Colobostruma*** Wheeler W. M., 1927

Morphological characters used in the dichotomous key

Antennae clavate with 6 articles, last article very long e large, Antennae Scape not overstep the Occiput; Forewings of Typology II, formica type, Marginal cell closed, Hindwings of Typology II; Mandibles dentate; Palp formula 5:3 or less; Propodeum armed with spines; Post Petiole with lateral flange.

Bio-geographical distribution

Australia, Papua New Guinea

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-Shattuck S. O. (2000) The epopostrumiform genus group, pp. 30-67. In Bolton B. The ant tribe Dacetini. Memoirs of the American Entomological Institute 65: 1-1028.
-Wheeler W. M. (1927) The physiology of insect. The Quarterly Review of Biology, Vol. II, N° 1, pp. 1-36.

♀ Genus ***Crematogaster*** Lund, 1831

Morphological characters used in the dichotomous key

Antennae clavate or filiform with 9, 10 or 11 articles, Antennae Scape not overstep Occiput; Forewings of Typology II or III, solenopsis type, and Typology IV in *C. subnuda subnuda,* Marginal cell closed or open; Hindwings of Typology II or III; Mandibles triangular dentate; Propodeum unarmed or armed with short denticles/tubercles or with spines;

Post-Petiole articulate dorsally with the first segment of the Gaster.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus many species. www.antweb.org

-Barthi H. (2008) Redescription of *Crematogaster subnuda subnuda* Mayr, 1879 (Hymenoptera: Formicidae: Myrmicinae). J. ent. Res., 32(1): 83-88.

-Blaimer B.B. and Fisher B. (2013) Taxonomy of the *Crematogaster degeeri*-species-assemblage in the Malagasy region (Hymenoptera: Formicidae). European Journal of Taxonomy 51: 1-64.

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-Crawley W.C. (1922) New ants from Australia. Annals and Magazine of Natural History, Sr. 9, vol. X.

-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.

-Delange-Darchen B. (1973) Evolution de l'aile chez lês fourmis *Crematogaster* (Myrmicinae) d'Afrique. Insectes Sociaux, Vol. 20, N° 3.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Feldhaar H, Maschwitz u., Fiala B. (2016) Taxonomic revision of the obligate plant-ants of the genus *Crematogaster* Lund (Hymenoptera: Formicidae: Myrmicinae), associed with *Macaranga* Thouars (Euphorbiaceae) on Borneo and the Malay Peninsula. Sociobiology 63(1): 651-681.

-Gallardo A. (1931) Algunas formas sexuales aun no descriptas de las hormigas del gênero *Crematogaster* de la Republica Argentina. Revista de La Sociedad Entomologica Argentina, N° 17.

-Gallardo A. (1934) Las Hormigas de la Republica Argentina, SubFamilia Mirmicinas, Tribu Crematogastrini (Forel). Annales del Museo Argentino de Cencias Naturales, Tomo 38, Buenos Aires.

-Longino J. T. (2003) The *Crematogaster* (Hymenoptera, Formicidae, Myrmicinae) of Costa Rica. Zootaxa, 151: 1-150.

-Kusnezov N. (1949) *Crematogaster* (*Neocrema*) *descolei* n. sp. (Hymenoptera, Formicidae). Acta Zoologica Lilloana, Tomo 8, p. 587-590.

-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. 14: 61-149.

-Santschi F. (1937) Contribution a l'étude dês *Crematogaster* paleartiques. Memoires de La Societé Vaudoise dês Sciences Naturalles. Vol. 5, N°7.

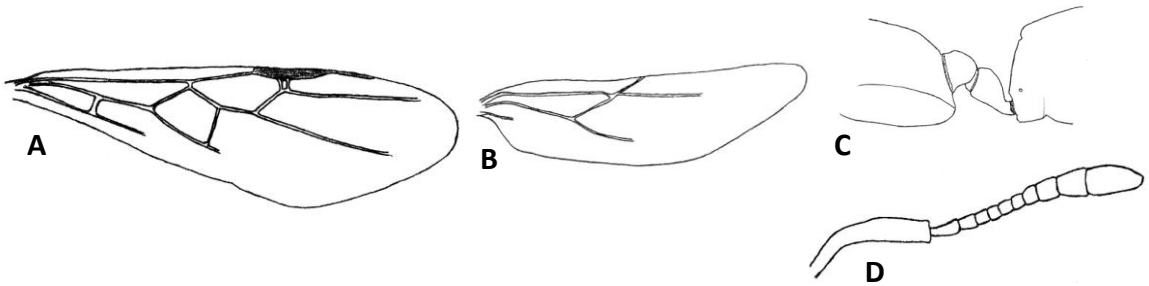

Figure – A: Forewing; B: Hindwing; C: Petiole and Postpetiole; D: Antennae of *Crematogaster* sp. 73 ♀, São Paulo, Brazil.

♀ Genus ***Cyatta*** Sosa-Calvo, Schultz, Brandão et al., 2013

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate (4 teeth); Palp formula 4:2; Propodeum armed with two teeth; Petiole sessile; PostPetiole, in dorsal view, with posterodorsal lateral lobes.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus *C. abscondita*. www.antweb.org

-Sosa-Calvo J., Schultz T.R., Brandão C.R.F., Klingenberg C., Feitosa R.M., Rabeling C., Bacci M., Lopes C.T., Vasconcelos H.L. (2013) *Cyatta abscondita*: Taxonomy, Evolution, and Natural History of a New Fungus-Farming ant genus from Brazil. PLOS ONE, Vol. 8, Issue 11.

♀ Genus ***Cyphomyrmex*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III, formica type, Marginal cell closed, Pterostigma absent or reduced; Hindwings of Typology III; Mandibles dentate; Frontal lobe developed; Scutellum bidentate posteriorly; Propodeum armed with spines or unarmed tuberculate.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus; *C. minutus, C. rimosus, C. salvini*. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Kempf W. W. (1964) A revision of the Neotropical ants of the genus *Cyphomyrmex* Mayr. Part I. Group of *strigatus* Mayr (Hym. Formicidae). Studia Entomologica, Vol. 7, fasc. 1-4
-Kempf W. W. (1965) A revision of the Neotropical Fungus-growing Ants of the Genus *Cyphomyrmex* Mayr. Part II: Group of *rimosus* (Spinola) (Hym. Formicidae). Studia Entomologica, Vol. 8, fasc. 1-4.
-Kusnezov N. (1949) El gênero *Cyphomyrmex* (Hymenoptera, Formicidae) em la Argentina. Acta Zoologica Lilloana, tomo 8, pp. 427-456.
-Kusnezov N. (1957) Nuevas espécies de hormigas (Hymenoptera, Formicidae). Ver. Soc. Uruguaya Ent. 2 (1).
-Schultz T.R., Solomon S.A., Mueller U.G., Villesen P., Boomsma J.J., Adams R.M.M. and Norden B. (2002) Cryptic speciation in the fungus-growing ants *Cyphomyrmex longiscapus* Weber and *Cyphomyrmex muelleri* Schultz and Solomon, new species (Formicidae, Attini). Insectes soc., Vol. 49, 331-343.
-Snelling R.R. and Longino J.T. (1992) Revisionary notes on the Fungus-growing Ants of the genus *Cyphomyrmex*, rimosus group (Hymenoptera: Formicidae: Attini). Insects of Panama and Mesoamerica: selected studies. Oxford University Press.
-Wheeler W. M. (1907) The fungus-growing ants of North America. Bulletin of the American Museum of Natural History, Vol. 23, article 31, 669-807.

♀ Genus ***Dacatria*** Rigato, 1994

Morphological characters used in the dichotomous key

Description based on the Photos in AntWeb (2018) of *D. templaris*.

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent, Antennal socket distant from posterior edge of the Clypeus; Forewings of Typology III, solenopsis type, Marginal cell closed or open (forewing broken in photo); Hindwings of Typology II; Mandibles dentate; Palp formula 3:2 (worker); Propodeum armed with spines; MetaTibiae without Spur; Petiole pedunculate.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos *D. temporalis*. www.antweb.org.
-Rigato F. (1994*) Dacatria templaris* gen. n., sp. n. A new myrmicine ant from the Republic of Korea (Hymenoptera, Formicidae). Desch. Ent. Z., N. F. 41, 1, 155-162.

♀ Genus ***Dacetinops*** Brown and Wilson, 1957

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, last two articles elongate,

Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular elongate dentate; Palp formula 2:2; Propodeum armed with two spines or unarmed; MetaTibiae without Spur; Spongiform tissue/appendages ventrally on Petiole, PostPetiole and first segment of the Gaster; Petiole sessile; Sting present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *D. cibdelus, D. cirrosus, D. concinnus*. www.antweb.org.

-Brown W. L. and Wilson E. O. (1957) *Dacetinops*, a new ant genus from New Guinea. Breviora, N° 77.

-Taylor R.W. (1985) The ants of the Papuasian genus *Dacetinops* (Hymenoptera: Formicidae: Myrmicinae). G.E. Ball (ed), Taxonomy, Phylogeny and Zoogeography of Beetles and Ants. Dordrecht ISBN 90-6193-511-3

♀ Genus ***Daceton*** Perty, 1833

Morphological characters used in the dichotomous key

Antennae filiform with 11 articles; Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Head cordiform (heart shaped); Mandibles linear with two teeth distally; Palp formula 5:3; Propodeum armed with two spines; Petiole pedunculate.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *D. armigerum*. www.antweb.org

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Smith F. (1853) Monograph of the genus *Cryptocerus*, belonging to the group Cryptoceridae, Family Myrmicindae, Division Hymenoptera Heterogyna. Entomological Cociety of London, Vol. II.

♀ Genus ***Dicroaspis*** Emery, 1908

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 2:2; Propodeum armed with two spines; Petiole sessile.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Emery C. (1908) Description dún genre nouveau et de plusieurs forme nouvelle de fourmis du Congo. Annales de la Societé entomologique de Belgique, Tome 52.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

♀ Genus ***Dilobocondyla*** Santschi, 1910

Morphological characters used in the dichotomous key
Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present with eyes placed ventrally from Antennal scrobe; Forewings of Typology II or Typology III in *D. chapmani*, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles dentate; Palp formula 4:3; Propodeum unarmed; Femur and Tibiae incrassated; MetaTibiae without Spur; Petiole cilindric shape.
Bio-geographical distribution
Indo-Australian and Australian
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos Typus: *D. fouqueti*, *D. fulva*, *D. gasteroreticulata*, *D. selebensis*. www.antweb.org.
-Bharti H. and Kumar R. (2013) Five new species of *Dilobocondyla* (Hymenoptera: Formicidae) with a revised key to the known species. Asian Myrmecology, Vol. 5, 29-44.
-Emery C. (1898) Descrizioni di formiche nuove Malesi e Australiane. Lette alla R. Accademia dlle Scienze dell'Istituto di Bologna nell'Adunanza del 23 Maggio 1898.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Varghese T. (2006) A new species of the ant genus *Dilobocondyla* (Hymenoptera: Formicidae) from India with notes on its nesting behavior. Oriental Insect, Vol. 40: 23-32.
-Wheeler W. M. (1935) News ants from the Philippines. Psyche, Vol. XLII, N° 1.

♀ Genus ***Diplomorium*** Mayr, 1901

Morphological characters used in the dichotomous key
Antennae clavate with 11 articles, last 2 articles club (3 club with 9° article slingly enlarged in Bolton, 1987), last article very long, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles dentate; Palp formula 2:2; Propodeum unarmed; PostPetiole biger than the Petiole, in lateral view, very broadly articulated to Gaster and without ventral tooth.
Bio-geographical distribution
Afrotropical

Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos Typus: *D. longipenne.* www.antweb.org.
-Bolton B. (1987) A review of the *Solenopsis* genus-group and revision of Afrotropical *Monomorium* Mayr (Hymenoptera: Formicidae). Bulletin of the British Museum (Natural History), Entomology series Vol. 54, N° 3.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

♀ Genus ***Dolopomyrmex*** Cover & Deyrup, 2007

Morphological characters used in the dichotomous key
Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell open and Discoidal cell small; Hindwings of Typology II; Mandibles triangular elongate dentate; Clypeus lacking carinae; Palp formula 3:2; Propodeum unarmed.
Bio-geographical distribution
Neartic (South Arizona)
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos Typus: *D. pilatus*. www.antweb.org
-Cover S. and Deyrup M. (2007) A new ant genus from the SoutWestern Unided States. Memoirs of the American Entomological Institute, Vol. 80.

♀ Genus ***Eurhopalothrix*** Brown & Kempf, 1960

Morphological characters used in the dichotomous key
Antennae clavate with 7 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III and IV, in some cases Anal 2 vein absent, Marginal cell open, solenopsis type; Hindwings of Typology III; Mandible triangular dentate; Palp formula 1:1; Propodeum armed with two spines; MetaTibiae without Spur; Petiole pedunculate; Body and Legs with reclinate Scale spatulate or squamiform and erect hair clavate of white color.
Bio-geographical distribution
Neotropical and Indo-Australian
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-AntWeb (2018) Photos Typus many species. www.antweb.org
-Baroni Urbani C. and De Andrade M. L. (2007) The ant Tribe Dacetini: Limits and constituent genera, with description of new species. Annali del Museo Civico di Storia Naturale “G. Doria”, 99: 1-191.

-Brown W.L. and Kempf W.W. (1960) A World revision of the ant Tribe Basicerotini (Hym. Formicidae). Studia Ent., Vol. 3, fasc. 1-4.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Longino J. (2013) A review of the Central American and Caribbean species of the ant genus *Eurhopalothrix* Brown and Kempf, 1961 (Hymenoptera, Formicidae), with a key to New World species. Zootaxa 3693 (2): 101-151.
-Taylor R. W. (1990) New Asian ants of the Tribe Basicerotini, with an on-line computer interactive key to the twenty-six known Indo-Australian species (Hymenoptera: Formicidae: Myrmicinae). Invertebr. Taxon., 4, 397-425.

♀ Genus ***Eutetramorium*** Emery, 1899

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 5:3, 4:3 or 4:2; Propodeum armed with teeth or spines; MetaTibiae without Spur or with one Spur.

Bio-geographical distribution

Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus all species. www.antweb.org.
-Bolton B. and Fisher B. (2014) The Madagascan endemic myrmicine ants related to *Eutetramorium* (Hymenoptera: Formicidae): taxonomy of the genera *Eutetramorium* Emery, *Malagidris* nom.n., *Myrmisaraka* gen. n., *Royidris* gen. n., and *Vitsika* gen. n. Zootaxa 3791 (1): 001-099.

♀ Genus ***Formicoxenus*** Mayr, 1855

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, formica type, Marginal cell open; Hindwings of Typology III; Eyes with short erect hairs between the ommatidia; Mandibles triangular dentate; Palp formula 5-4:3; Propodeum armed with two teeth; MetaTibiae with one Spur or absent.

Bio-geographical distribution

Paleartic and Neartic

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *F. nitidulus, F. provancheri*. www.antweb.org.

-Emery C. (1908) Beitrage zur monographie der Formiciden des palaarktischen faunengebietes (Hym.) Deutsch. Ent. Zeitschr.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Francoeur A. and Loiselle R. (1985) Biosystématique de la Tribu Leptothoracini (Formicidae, Hymenoptera). 1. Le genre *Formicoxenus* dans la Region Holarctique. Naturaliste can. (Rev. Ecol. Syst.), 112: 343-403.
-Wheeler W. M. (1904) Three new genera of inquiline ants from Utath and Colorado. American museum of Natural History, Vol. 20, article 1, pp. 1-17.

♀ Genus ***Goniomma*** Emery, 1895

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 4 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology I with Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 4:3; Eyes drawn out antero-ventrally in abroad lobe which almost close to the mandibular insertions; Propodeum armed with two teeth; Petiole pedulculate.

Bio-geographical distribution

Mediterranean

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: South Spain: *G. baeticum and G. hispanicum*: 06/01/1982, 16:00-17:00, *G. baeticum*: 11/11/1983, 15:00 (Reyes et al. 1987)

References for Taxonomic identification

-AntWeb (2018) Photos: *G. hispanicum, G. kugleri.* www.antweb.org
-Emery C. (1921) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Espadaler G. and Muñoz (1979) *Goniomma blanci* (André, 1881) (Hym., Formicidae): description de la hembra. Bol. Asoc. Esp. Entom, Vol. 3, pp. 11-15.
-Espadaler X. (1986) *Goniomma kugleri*, a new granivorous ant from the Iberian Penisula (Hymenoptera: Formicidae). Istrael Journal of Entomology, Vol. 19: 61-66.
-Reyes Lopes J.L. and Porras Castillo A. (1984) Alar biometry in the Taxonimy of the species *Goniomma hispanicum* and *G. baeticum*. Insectes Sociaux, Vol. 31, n° 4, PP. 473-475.
-Reyes J.L., Espadaler X. and Rodriguez A. (1987) Description de *Goniomma baeticum* nov, sp. (Hym. Formicidae). Eos, Tomo 63, 269-276.

♀ Genus ***Harpagoxenus*** Forel, 1893

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape stout, curved and strongly depressed not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Petiole sessile; Propodeum armed with two spines.

Bio-geographical distribution

Neartic, Paleartic and Oriental

Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos: *H. canadensis*. www.antweb.org.
-Emery C. (1916) Fauna entomologica italiana – Hymenoptera, Formicidae. Bull. Soc. Entomol. It. 47:79-275.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Smith M. R. (1939) The Nord American ants of the genus *Harpagoxenus* Forel, with the description of a new species (Hymenoptera: Formicidae). Entomological Society of Washington, Vol. 41 N° 5.

♀ Genus ***Huberia*** Forel, 1890

Morphological characters used in the dichotomous key
Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewing of Typology II, solenopsis type, Marginal cell open; Hindwing of Typology II; Mandibles triangular dentate; Palp formula 5:3; Propodeum armed.
Bio-geographical distribution
New Zeland
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Antweb (2018) Photos; *H. striata*. www.antweb.org
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.
-Forel A. (1894) Qualques Fourmis. Ann. Soc. Ent. Belg. Vol. 38.

♀ Genus ***Hylomyrma*** Brown, 1986

Morphological characters used in the dichotomous key
Antennae clavate with 12 articles, last 4 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewing of Typology I with Marginal cell open or closed; Hindwing of Typology II; Mandibles dentate; Palp formula 4:3; Propodeum armed with spines.
Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-AntWeb (2018) Photos Typus: *H. versuta*. www.antweb.org.
-Kempf W. W. (1960) Miscellaneous Studies on Neotropical Ants (Hymenoptera,

Formicidae). Studia Entomologica, Vol. 3, fasc. 1-4.
-Kempf W. W. (1973) A revision of the Neotropical Myrmicine ant genus *Hylomyrma* Forel (Hymenoptera, Formicidae). Studia Entomologica, vol. 16, fasc.1-4.

♀ Genus ***Indomyrma*** Brown, 1986

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewing of Typology II with Marginal cell open, solenopsis type; Hindwing of Typology II; Mandibles triangular dentate; Palp formula 2:2; Propodeum armed with two spines; Petiole with antero-ventral strong tooth; Sting present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *I. dasypyx*. www.antweb.org
-Brown W.L. (1986) *Indomyrma dasypyx*, new genus and species a Myrmicinae ant from Peninsular India (Hymenoptera: Formicidae). Israel Journal of Entomology, Vol. 19: 37-49.
-Zryanin V. A. (2012) A new species of the genus *Indomyrma* Brown, 1986 (Hymenoptera: Formicidae: Myrmicinae) from Vietnam. Russian Entomol. J. 21 (2): 223-228.

♀ Genus ***Kalathomyrmex*** Klingenberg & Brandão, 2009

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape overstep the Occiput, Antennal Scrobe absent; Forewing of Typology III, formica type, Marginal cell open; Hindwing of Typology II; Mandibles triangular dentate with terminal tooth very long; Propodeum armed with two short teeth; Petiole sessile.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus; *K. emeryi*. www.antweb.org.
-Klingenberg C. and Brandão C.R.F. (2009) Revision of the fungus-growing ant genera *Mycetophylax* Emery and *Paramycetophylax* Kusnezov rev. stat., and description of *Kalathomyrmex* n. gen. (Formicidae:Myrmicinae: Attini). Zootaxa 2052: 1-31.

♀ Genus ***Lachnomyrmex*** Wheeler, 1910

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewing of Typology II, solenopsis type, Marginal

cell closed; Hindwing of Typology II; Mandibles dentate; Palp formula 2:2; Propodeum armed with teeth or spines; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Feitosa R. M. and Brandão C. R. F. (2008) A taxonomic revision of the Neotropical myrmicine ant genus *Lachnomyrmex* Wheeler (Hymenoptera: Formicidae). Zootaxa 1890: 1-9.

♀ Genus ***Lenomyrmex*** Fernández and Palacio, 1999

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 2 articles club Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewing of Typology III, solenopsis type, Marginal cell open; Hindwing of Typology II; Mandibles triangural elongate denticulate; Palp formula 2:2; Propodeum armed with two spines or unarmed angulate; Petiole pedunculate; MetaTibiae without Spur; Pretarsal Claws simple elongated; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Delsinnet T., Fernandez f. (2011) First record of *Lenomyrmex inusitatus* (Formicidae: Myrmicinae) in Ecuador and description of the queen. Psyche, doi: 10.1155/2012/145743.

-Fernández F. C. and Palacio E. E. (1999) *Lenomyrmex*, an enigmatic new ant genus from the Neotropical Region (Hymenoptera: Formicidae: Myrmicinae). Systematic Entomology 24, 7-16.

-Rabeling C., Sosa-Calvo J., O'Connell L. A. O., Coloma L. A., Fernandez F. (2016) *Lenomyrmex hoelldobleri*: a new ant species discovered in the stomach of the dendrobatid poison frog, Oophaga sylvatica (Funkhouser). ZooKeys 618: 79-95.

♀ Genus ***Leptothorax*** Mayr, 1855

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Mandible triangular dentate; Palp formula 5:3; Forewing of Typology II and III, formica type, Marginal cell open; Hindwing of Typology III; Propodeum armed with two teeth; Petiole sessile, MetaTibiae without Spur.

Bio-geographical distribution

Neartic, Paleartic, Indo-Oriental

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus most species. www.antweb.org.
-Buschinger A. (1955) *Leptothorax* (*Mychothorax*) *kutteri* n. sp. eine sozialparasitische ameise (Hymenoptera, Formicidae). Insects Sociaux, Vol. 12, N° 4, pp. 327-334.
-Buschinger A. (1982) *Leptothorax faberi* n. sp., an apparently parasitic ant from Jasper National Park, Canada (Hymenoptera: Formicidae). Psyche, Vol. 89 N° 3-4
-Buschinger A. and Schulz A. (2008) *Leptothorax athabasca* sp. n. (Hymenoptera: Formicidae) from Alberta, Canada, an ant with an apparently restricted range. Myrmecological News, 11, 243-248.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Francoeur A. (1986) Deux nouvelle fourmis nearctiques: *Leptothorax retractus* et *L. sphagnicolus* (Formicidae, Hymenoptera). Can. Ent. 118: 1151-1164.
-Kutter H. (1967) Beschreibung neuer Sozialparasiten von *Leptothorax acervorum* F. (Formicidae). Bulletin de la Societé Entomologique Suisse, Band 40, Heft 1-2.
-Heinze J. (1989) *Leptothorax wilsoni* n. sp., a new parasitic ant from Eastern North America (Hymenoptera: Formicidae). Psyche, Vol. 96, N° 1-2
-Terayama M. and Onyama K. (1999) The ant genus *Leptothorax* Mayr (Hymenoptera: Formicidae) in Japan. Mem. Myrmecol. Soc. Jpn., 1: 71-97.

♀ Genus ***Liomyrmex*** Mayr, 1865

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Propodeum unarmed; Petiole pedunculate; PostPetiole with one spine or tooth ventrally.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *L. gestroi*. www.antweb.org.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.
-Donisthorpe H. (1940) Description of new species of ant (Hym. Formicidae). Annals and Magazine of Natural History, Ser. 11, Vol. V.

♀ Genus ***Lophomyrmex*** Emery, 1892

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell

open (Rigato 1994) or closed (Emery 1922); Hindwings of Typology II; Mandibles triangular dentate; Palp formula 2:2; Propodeum armed with spines; Petiole without antero-ventrally tooth and pedunculate; MetaTibiae with Spur.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.

-Rigato F. (1994) Revision of the Myrmicine ant genus *Lophomyrmex* with a review of its taxonomic position (Hymenoptera: Formicidae). Systematic Entomology 19:47-60

♀ Genus ***Lordomyrma*** Emery, 1897

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present (most species); Forewings of Typology II, solenopsis type, Marginal cell closed and appendiculate; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 4:3 (*L. azumai, L. infundibuli*); Propodeum armed; Petiole dorsally stretched in a rounded tip or tooth form, pedunculate; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Australia, Indo-Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *L. sukuna* and *L. tortuosa.* www.antweb.org

-Donisthorpe H. (1940) *Lordomyrma infundibula* (Hym. Formicidae) a new species of ant from Dutch New Guinea. Entomologist Monnthly Magazine Vol. 76.

-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. 14: 61-149.

-Taylor R. W. (2012) Ants of the genus *Lordomyrma* Emery (2) The Japanese *L. azumai* (Santschi) and six new species from India, Viet Nam and the Philippines (Hymenoptera: Formicidae: Myrmicinae).

♀ Genus ***Malagidris*** Bolton & Fisher, 2014

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape long reaching or overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate with 8-13 teeth; Palp formula 5:3; Propodeum armed with two spines; Petiole with long peduncle;

Metatibia with one Spur; Sting present.

Bio-geographical distribution

Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. alperti, M. belti, M. jugum, M. sofina*. www.antweb.org

-Bolton B. and Fisher B. (2014) The Madagascan endemic Myrmicine ants related to *Eutetramorium* (Hymenoptera: Formicidae): taxonomy of the genara *Eutetramorium* Emery, Malagidris nom.n., *Myrmisaraka* gen. n., *Royidris* gen. n., and *Vitsika* gen. n. Zootaxa 3791 (1): 001-099.

♀ Genus ***Manica*** Jurine, 1807

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 4 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology I with Rs2+3 vein incomplete and Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate with more than 12 teeth; Palp formula 6:4; Propodeum unarmed; Petiole pedunculate; MetaTibiae with one pectinate Spur; Sting present.

Bio-geographical distribution

Neartic, Paleartic and Oriental

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Cole A.C. (1957) description of sexual castes of some ants in the genera *Myrmica*, *Manica* and *Xiphomyrmex* from the Western Unided States (Hymenoptera: Formicidae). Journal of the Tennesee Academy of Science, Vol. 32, N° 3.

-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Lenoir A., Devers S., Marchand P., Bressac C. and Savolainen R. (2010) Microgynous queens in the Paleartic ant, *Manica rubida*: dispersal morphs or social parasites? Journal of Insect Science, Vol. 10, art. 17.

-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. !4: 61-149.

-Wheeler G. and Wheeler J. (1970) The Natural History of *Manica* (Hymenoptera: Formicidae), Journal of the Kansas Entomological Society, Vol. 43, N° 2.

-Wheeler W.M. (1914) The American species of *Myrmica* allied to *M. rubuda* Latrelle.Psyche, August.

♀ Genus ***Mayriella*** Forel, 1902

Morphological characters used in the dichotomous key

Antennae clavate with 10 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology III; Mandibles triangular dentate; Propodeum armed with two spines; MetaTibiae without Spur; Sting vestigial.

Bio-geographical distribution

Australia, Indo-Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *M. abstinens, M. overbecki, M. spinosior, M. transfuga*. www.antweb.org

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Wheeler W. M. (1935) The Australian ant genus *Mayriella* Forel. Psyche, Vol. 42, N° 3.

♀ Genus ***Megalomyrmex*** Forel, 1885

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 12 articles, last 3 aticles club, Antennae Scape reaching or overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III with Marginal cell open, formica or solenopsis type; Hindwings of Typology II; MetaTibiae with one Spur; Mandibles triangular dentate; Palp formula 4:3, 3:3, 3:2; Propodeum unarmed or angulate with two short tubercles/teeth; Petiole pedunculate; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Boudinot B. E., Sumnicht T.P. and Adams R.M.M. (2013) Central American ants of the genus *Megalomyrmex* Forel (Hymenoptera: Formicidae): six new species and keys to workers and males. Zootaxa 3732 (1): 1-82.

-Brandão C.R.F. (1990) Systematic revision of the Neotropical ant genus *Megalomyrmex* Forel (Hymenoptera: formicidae: Myrmicinae) with the description of thirteen new species. Arquivo de Zoologia, Vol. 31, Fasc. 5, São Paulo.

-Brandão C.R.F. (2003) Further revisionary studies on the ant genus *Megalomyrmex* Forel (Hymenoptera: Formicidae: Myrmicinae: Solenopsidini). Papeis Avulso de Zoologia, Vol. 43(8): 145-159, São Paulo, Brazil.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Ettershank G. (1966) A generic revision of the world Myrmicinae related to *Solenopsis* and

Pheidologeton (Hymenoptera: Formicidae). Aust. J. Zool., 14:73-171.
-Longino J.T. (2010) A taxonomic review of the ant genus *Megalomyrmex* Forel (Hymenoptera: Formicidae) in Central America. Zootaxa 2720: 35-58.

♀ Genus ***Melissotarsus*** Emery, 1877

Morphological characters used in the dichotomous key

Antennae clavate with 6 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, solenopsis type, Marginal closed, Pterostigma reduced; Hindwing of Typology II; Mandibles triangular dentate; Propodeum unarmed or angulate; Post Petiole short; first article of the Tarsus greatly enlarged, 1° article of the Meso and MetaTarsus with apical circlets of small teeth; Sting very reduced.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. insularis, M. weissi*. www.antweb.org
-Arnold G. (1916) A monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. 14, Part. II.
-Bolton B. (1982) Afrotropical species of the myrmicine ant genera *Cardiocondyla*, *Leptothorax*, *Melissotarsus*, *Messor* and *Cataulacus* (Formicidae). Bull. Br. Mus. Nat. Hist. (Ent.) 45 (4): 307-370.
-Delage-Darchen B. (1972) Une formi de Cote D'Ivoire *Melissotarsus titubans* Del., n. sp. Insect. Soc., Vol. 19, N° 3.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Forel A. (1914) Formicides d'Afrique et d'Amerique nouveaux ou peu connus. Bull. Soc. Vaud. Sc. Nat., 50, 184.

♀ Genus ***Meranoplus*** Smith F., 1853

Morphological characters used in the dichotomous key

Antennae clavate with 9 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, solenopsis type, Marginal cell closed and apendiculate; Hindwings of Typology II; Mandibles triangular dentate; Propodeum armed with teeth or spines; MetaTibiae with one Spur.

Bio-geographical distribution

Afrotropical, Madagascar, Indo-Australian and Australia.

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org
-Boudinot B.E. and Fisher B.L. (2013) A taxonomic revision of the *Meranoplus* F. Smith of Madagascar (Hymenoptera: Formicidae: Myrmicinae) with keys to species and disgnosis of

the males. Zootaxa 3635 (4): 301-339.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Donisthorpe H. (1949) A fifth instalment of the Ross Collection of ants from New Guinea. Annals and Magazine of Natural History, Ser. 12, Vol. I, p. 487.
-Wheeler W.M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. The American museum of natural History, Vol XLV.

♀ Genus ***Mesostruma*** Brown, 1948

Morphological characters used in the dichotomous key

Antennae clavate with 6 articles, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular elongate dentate; Propodeum armed with two spines; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. browni, M. eccentrica*. www.antweb.org
-Taylor R.W. (1962) New Australian Dacetine ants of the genera *Mesostruma* Brown and *Codiomirmex* Wheeler (Hymenoptera-Formicidae). Cambridge, Mass., N° 152.
-Taylor R. W. (1973) Ants of the Australian genus *Mesostruma* Brown (Hymenoptera: Formicidae). The Journal of the Australian Entomological Society, Vol. 12, pp. 24-38.

♀ Genus ***Messor*** Forel, 1890

Morphological characters used in the dichotomous key

Antennae with 12 articles filiform or versus clavate with last 4 articles enlarged, Antennae Scape not overstep the Occiput (most species), Antennal Scrobe absent; Forewings of Typology I and Marginal cell open rarely closed; Hindwings of Typology II; Mandible triangular dentate (7-8 teeth rarely more); Palp formula 4:3 or 5:3; Propodeum unarmed; Petiole pedunculate; MetaTibiae with simple Spur.

Bio-geographical distribution

Paleartic, Afrotropical and Indo-Oriental

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Bondroit J. (1918) Les formis de France et de Belgique. Societé Entomologique de France, Vol. 87.
-Cagniant H. (1967) Description de *Messor bernardi* n. sp. (Hym. Formicidae). Societé Entomologique de France, Vol. 72.
-Cagniant H. and Espadaler X. (1997) Le genre *Messor* au Maroc (Hymenoptera:

Formicidae). Ann. Soc. Entomol. Fr., 33(4): 419-434.
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-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. !4: 61-149.
-Tohme G. (1971) Description de *Messor ebeninus* Forel (Hymenoptera: Formicidae). Bull. Sov. Ent. Egypte, LIV.
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♀ Genus ***Metapone*** Forel, 1911

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape very short, Antennal Scrobe present; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II, Mandibles dentate; Palp formula 1:3; Propodeum unarmed; Petiole sessile; Femurs very enlarged; MetaTibiae with one Spur pectinate; first article of the Tarsus enlarged; MetaTibiae e basiTarsus with traction spines.

Bio-geographical distribution

Afrotropical, Madagascar, Australian and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: Australia: 13°39’ S; 142° 40’ E: *M. tricolor*, February and March; 17°37’ S; 145°46’ E: *M. hoelldobleri*: January; 27°20’ S; 153°48’ E, 850m: *M. tillyardi*: October and February; 28.142° S; 153.133° E, 248m: *M. tillyardi*: January (Taylor and Alpert, 2016)

References for Taxonomic identification

-Alpert G. D. (2007) A review of the ant genus *Metapone* Forel from Madagascar. Pp. 8-18 in Snelling R.R., Fisher B.L. and Ward P.S: (eds). Advances in ant systematic (Hymenoptera: Formicidae): homage to E.O. Wilson – 50 years of contribution. Memoirs of the American Entomological Institute, 80.
-AntWeb (2018) Photos Typus: *M. africana, M. emersoni, M. madagascarica, M. manni, M. sauteri, M. vincimus*. www.antweb.org
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Forel A. (1911) Sur le genre *Metapone* n. g. Revue Suisse de Zoologie, Vol. 19, n° 19.
-Karawajew W. (1933) Ameisen aus dem Indo-Australischen Gebiet, VII. Sonder-Abdruck aus “Konowia”, Bd. XII, Helf 1-2.
-Taylor R.W. and Alpert G.D. (2016) The Myrmicinae ant genus *Metapone* Forel (Hymenoptera: Formicidae): a global taxonomic review with description of twelve new species. Zootaxa 4105 (6): 501-545.
-Taylor R. W. (2018) New species of the ant genus *Metapone* Forel, 1911: first records from New Caledonia and Vanuatu (Hymenoptera: Formicidae). Myrmecol. New 26: 97-100.

♀ Genus ***Monomorium*** Mayr, 1855

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 11-12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, solenopsis or formica type, Marginal cell open; Hindwings of Typology II, Mandibles triangular dentate; Propodeum usually unarmed.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org.

-Arnold G. (1916) A monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. 14, Part. II.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.

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-Heterick B. (2001) Revision of the Australian ants of the genus *Monomorium* (Hymenoptera: Formicidae). Invertebrate Taxonomy, 15: 353-459.

-Heterick B. (2006) A revision of the Malagasy ants belonging to genus *Monomorium* Mayr, 1855 (Hymenoptera: Formicidae). Vol. 57, N° 3: 69-202.

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-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. 14: 61-149.

♀ Genus ***Mycetagroicus*** Brandão & Mayhé-Nunes, 2001

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, Anal 2 vein absent; solenopsis type, Marginal cell open, Pterostigma absent or reduced; Hindwings of Typology II with

Anal 2 vein absent; Mandibles triangular dentate; Palp formula 4:2; Propodeum armed with two teeth.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus *M. inflatus*. www.antweb.org.

-Brandão and Mayhé-Nunes (2001) A new fungus-growing ant genus, *Mycetagroicus* gen. n., with the description of three new species and comments on the monophyly of the Attini (Hymenoptera: Formicidae). Sociobiology, Vol. 38, N° 3B.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Jesovnik A., Sosa-Calvo J., Lopes C.T., Vasconcelos H.L., Schulz T.R. (2013) Nest archicteture, fungus garden, Queen, males and larvae of the fungus-growing ant *Mycetagroicus inflatus* Brandão and Mayhé-Nunes. Insect. Soc. DOI 10.1007/s00040-013-0320-8

♀ Genus ***Mycetarotes*** Emery, 1913

Morphological characters used in the dichotomous key

Antennae versus clavate with 11 articles, last 3 articles enlarged, Antennae Scape overstep the Occiput or not, Antennal Scrobe absent; Forewings of Typology III, Anal 2 vein absent, formica type, Marginal cell closed or open; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Propodeum armed with two spines or reduced in tubercles; Petiole armed with two spines.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos *M. parallelus*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Mayhé-Nunes A.J. and Brandão C.R.F. (2006) Revisionary notes on the fungus-growing ant genus *Mycetarotes* Emery (Hymenoptera, Formicidae). Revista Brasileira de Entomologia 50(4): 463-472.

-Mayhé-Nunes A.J. and Lanziotti A.M. (2004) description of the female and male of *Mycetarotes carinatus* (Hymenoptera: Formicidae). Rev. Biol. Trop. 52(1): 109-114.

-Kempf W.W. (1960) A review of the ant genus *Mycetarotes* Emery (Hymenoptera, Formicidae). Rev. Brasil Biol., 20 (3): 277-283.

♀ Genus ***Mycetophylax*** Emery, 1913

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles; last 3 articles club, Scape not overstep the Occiput, Antennal Scrobe present; Head without spines dorsally; Forewings of Typology III, solenopsis or formica type, Marginal cell closed or open?, Pterostigma absent or reduced; Hindwings of Typology II; Mandibles triangular dentate; Propodeum armed with two teeth; MetaTibiae without Spur.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Kusnezov N. (1957) Nuevas espécies de hormigas (Hymenoptera, Formicidae). Ver. Soc. Uruguaya Ent. 2 (1).

-Sosa-Calvo J., Jesovnik A., Vasconcelos H. L., Bacci M., Schultz T. R. (2017) Rediscovery of the enigmatic fungus-farming ant "*Mycetosoritis*" asper Mayr (Hymenoptera: Formicidae): implication for taxonomy, phylogeny, and the evolution of agriculture in ants. PloS ONE 12(5): e0176498.

♀ Genus ***Mycetosoritis*** Wheeler W.N., 1907

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III, formica or solenopsis type, Marginal cell closed and appendiculate, Pterostigma absent or reduced; Hindwings of Typology II with Anal 2 vein absent; Propodeum armed with two teeth; Mandibles dentate.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

- -Sosa-Calvo J., Brady S. G. and Schultz T. R. (2009) The gyne of the enigmatic Fungus-Farming ant species *Mycetosoritis explicate*. Vol. 18(1), pp. 113-120.

-Wheeler W. M. (1907) The fungus-growing ants of North America. American Museum of Natural History, Vol. 23, art. 31: 669-807.

♀ Genus ***Mycocepurus*** Forel, 1893

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Eyes ventrally from the Antennal Scrobe; Forewings of Typology III, formica type, Marginal cell closed, Hindwings of Typology II; Mandibles dentate; Propodeum armed with teeth or spines; Petiole with two spines; ProTarsus with articles 2 to 4 dilated.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1913) Etudes sur les Myrmicinae. V. – Les genre dês Attini; sescriptin de nouvelles formes de *Mycocepurus* et de *Myrmicocrypta*.

-Kempf W.W. (1963) A review of the ant genus *Mycocepurus* Forel, 1893 (Hymenoptera: Formicidae). Studia Ent., Vol. 6, fasc. 1-4.

-Rabeling C. and Bacci M. (2010) A new workerless inquilines in the lower Attini (Hymenoptera: Formicidae), with a discussion of social parasitism in fungus-growing ants. Systematic Entomology, 35:379-392

♀ Genus ***Myrmecina*** Curtis, 1829

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, solenopsis type, Marginal cell closed and apendicolata; Hindwings of Typology II, Mandibles triangular dentate, Palp formula 4:3 or 3:2; Propodeum armed with two spines; Petiole sessile; MetaTibiae without Spur.

Bio-geographical distribution

Neartic, Paleartic, Oriental, Indo-Australian and Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. Americana, M. graminicola, M. pauca*. www.antweb.org.

-Emery C. (1916) Fauna entomologica italiana – Hymenoptera, Formicidae. Bull. Soc. Entomol. It. 47:79-275.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.

-Lyu D.P. and Cho S. (2003) Review of genus *Myrmecina* (Hymenoptera: Formicidae:

Myrmicinae) of Korea. Ins. Koreana, 20 (2): 187-193.
-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. 14: 61-149.
-Varghese T. (2018) Description of dealate of *Myrmecina urbanii* Tiwari (Hymenoptera: Formicidae) from Karnataka, India; with notes on workers castes. Halteres, Vol 9, 45-56.

♀ Genus ***Myrmica*** Latreille, 1804

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 4 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology I with Rs2+3 vein incomplete and Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 6:4; Propodeum armed with spines; MetaTibiae with pectinate Spur; Sting present.

Bio-geographical distribution

Neartic to Mexico, Paleartic, Oriental, Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org
-Bondroit J. (1918) Les Formis de France et de Belgique. Annales de La Societè Entomologique de France, Vol. 87.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
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-Czechowska W. and Radchenko A. (1997) *Myrmica* hirsute Elmes, 1978 (Hymenoptera, Formicidae) – a socially parasitic ant species new to Poland.Fragm. faun., 40, 5: 53-57, Warszawa.
-Czekes Z., Radchenko A.G., Csosz S., Szasz-Len A., Tausan I., Benedek K. and Marko B. (2012) The genus *Myrmica* Latreille, 1804 (Hymenoptera: Formicidae) in Romania: distribution of species and key for their identification. Entomologia romanica 17: 29-50.
-Elmes G.W., Radchenko A. and Aktaç N. (2002) Four new *Myrmica* species (Hymenoptera: Formicidae) from Turkey. Annales Zoologici, 52(1): 157-171, Warszawa.
-Finzi B. (1926) Le forme Europee del genere *Myrmica* Latr. Bollettino della Società Adriatica di Scienze Naturali, Trieste, Vol. 29.
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14: 61-149.
-Radchenko A., Czechowski W. and Czechowska W. (1997) The genus *Myrmica* Latr. (Hymenoptera, formicidae) in Poland – A survey of species and a key for their identification. Annales Zoologici, 47(3/4): 481-500, Warszawa.
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-Radchenko A., Elmes G.W., Czechowska W., Stankiewicz A., Czechowski W. and Sielezniew M. (2003) First record of *Myrmica vandeli* Bondroit and *M. tulinae* Elmes, Radchenko et Aktaç (Hymenoptera: Formicidae) for Poland, with a key for the scabrinodis and sabuleti complex Fragmenta Faunistica, 46: 47-57.
-Radchenko A., Elmes G.W. and Alicata A. (2006) Taxonomic revision of the Schencki-group of the ant genus Myrmica Latreille (Hymenoptera:Formicidae) from the Paleartic region. Annales Zoologici, 56(3): 499-538.
-Seifert B. (1988) A taxonomic revision on the *Myrmica* species of Europe, Asia minor, and Caucasia (Hymenoptera, Formicidae). Abh. Ber. Naturkundemus. Gorlitz 62, 3:1-75.
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-Wheeler G. and Wheeler J. (1970) The Natural History of Manica (Hymenoptera: Formicidae), Journal of the Kansas Entomological Society, Vol. 43, N° 2.

♀ Genus ***Myrmicaria*** Saunders W.W., 1842

Morphological characters used in the dichotomous key

Antennae with 7 articles versus clavate, Antennae Scape overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 3:3; Propodeum armed with spines; Petiole with very long peduncle; MetaTibiae with Spur.

Bio-geographical distribution

Afrotropical, Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. natalensis, M. arachnoides, M. brunnea, M. carinata, M. fodiens*. www.antweb.org
-Arnold G. (1916) A monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. 14, Part. II.
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-Wheeler W.M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. The American museum of natural History, Vol XLV.

♀ Genus ***Myrmicocrypta*** Smith F., 1860

Morphological characters used in the dichotomous key

Antennae versus clavate with 11 articles, last 3 articles club, Antennae Scape overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, solenopsis tipe, Marginal cell closed, Pterostigma absent or reduced; Hindwings of Typology III; Mandibles triangular dentate; Scutellum bidentate; Propodeum armed with two spines; Petiole with long peduncle; MetaTibiae without Spur.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. collaris, M. rudiscapa, M. squamosa*. www.antweb.org.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1913) Etudes sur les Myrmicinae. Ann. Soc. Ent. Belg., 51.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Sosa-Calvo J. and Schultz T.R. (2010) Three remarkable new fungus-growing ant species of the genus *Myrmicocrypta* (Hymenoptera: Formicidae), with a reassessment of the characters that define the genus and its position within the Attini. Annales of the Entomological society of America, Vol. 103, N° 2.

♀ Genus ***Nesomyrmex*** W.N. Wheeler, 1910

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 or 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, solenopsis or formica type, Marginal cell closed and short; Hindwings of Typology II; Mandibles dentate; Palp formula 5:3; Propodeum armed with two spines/teeth or unarmed; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Neotropical and Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Kempf W.W. (1959) A synopsis of the New World species belonging to the *Nesomyrmex*-Group pf the ant genus *Leptotorax* Mayr (Hymenoptera: Formicidae). Studia Entomol., 2.
-Wheeler W. M. (1910) Three new genera of Myrmicinae ants from Tropical America. Bulletin American Museum of Natural History, Vol. 28, article 23.

Figure – A: Forewing of *Nesomyrmex* sp. ♀, São Paulo, Brazil

♀ Genus ***Novomessor*** Emery, 1915

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape slightly overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Propodeum armed with two spines.

Bio-geographical distribution

Neartic to Mexico

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References

-AntWeb (2018) Photos Typus *N. albisetosus*. www.antweb.org.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.
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-Wheeler W. N. and Mann W. M. (1914) The ants of Haiti. American Museum of Natural History, Vol. 33, art. I: 1-61.
-Wheeler W.M. and Creighton W.S. (1934) A study of the ant genera *Novomessor* and *Veromessor*. American Academy of Arts and Sciences, Vol. 69, N° 9.

♀ Genus ***Ochetomyrmex*** Mayr, 1868

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape in length not overstep the Occiput, Antennal Scrobe absent; Forewings Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandible triangular dentate; Palp formula 4:3; Propodeum armed with short teeth; MetaTibiae without Spur; Sting present.

Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.
-Fernandez F. (2003) Myrmicinae ants of genera *Ochetomyrmex* and *Tranopelta* (Hymenoptera: Formicidae). Sociobiology, Vol. 41, N° 3.
-Kempf W. W. (1975) Miscellaneous Studies on Neotropical Ants. VI. (Hymenoptera: Formicidae). Studia Ent., Vol. 18, fasc. 1-4.
-Kusnezov N. (1957) Die Solenopsidinen-Gattungen von Sudamerika (Hymenoptera, Formicidae). Sonderdruck aus, Zoologischer Anzeiger Bd. 158, Heft 11/12.

♀ Genus ***Octostruma*** Forel, 1912

Morphological characters used in the dichotomous key

Antennae clavate with 8 articles, last 2 articles club, Antennae Scape flattened not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III with Marginal cell open, solenopsis type; Hindwings of Typology II; Mandible triangular dentate; Palp formula 2:2; Propodeum armed with two spines; Tibiae short and enlarged; MetaTibiae without Spur; Sting present; Body and Legs with reclinate Scale spatulate or squamiform and erect hair clavate of white color.

Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-AntWeb (2018) Photo many species. www.antweb.org
-Baroni Urbani C. and De Andrade M. L. (2007) The ant Tribe Dacetini: Limits and constituent genera, with description of new species. Anali del Museo Civico di Storia Naturale “G. Doria”, 99: 1-191.
-Brown W.L. and Kempf W.W. (1960) A World revision of the ant Tribe Basicerotini (Hym. Formicidae). Studia Ent., Vol. 3, fasc. 1-4.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

♀ Genus ***Orectognathus*** F. Smith, 1853

Morphological characters used in the dichotomous key

Antennae clavate with 5 articles, last 2 articles club, Antennae Scape not overstep the Occiput, 2° articles of the Funiculus extremely long; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles linear dentate; Palp formula 5:3?; Propodeum armed with spines; Petiole with an elongate anterior peduncole; MetatTibiae without Spur.

Bio-geographical distribution
Indo-Australian, Australia
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: unknown
References for Taxonomic identification
-Brown W.L. (1953) A revision of the Dacetine ant genus *Orectognatus*. Memoirs of the Queensland Museum, 13: 84-104.
-Emery C. (1914) Les formis de la Nouvelle-Caledonie & des iles Loyalty. A. Zoologie, Vol. I, L. IV, Wiesbaden.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

♀ Genus ***Oxyepoecus*** Santschi, 1926

Morphological characters used in the dichotomous key
Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 2:2; Clypeus anteriorly bidentate, each tooth laterally with another small denticle; Propodeal armed with teeth; Petiole strongly pedunculated; MetaTibiae without Spur.
Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-Albuquerque N.L.d. and Brandão C.L.F. (2004) A revision of the Neotropical Solenopsidini ant genus *Oxyepoecus* Santschi, 1926 (Hymenoptera: Formicidae: Myrmicinae). 1. The Vezenyii species-group. Papeis Avulso de Zoologia, Vol. 44(4): 55-80.
-Albuquerque N.L.d. and Brandão C.L.F. (2009) A revision of the Neotropical Solenopsidini ant genus *Oxyepoecus* Santschi, 1926 (Hymenoptera: Formicidae: Myrmicinae). 2. Final. Key for species and revision of the Rastratus species-group. Papeis Avulso de Zoologia, Vol. 49(23): 289-309.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Ettershank G. (1966) A generic revision of the World Myrmicinae related to *Solenopsis* and *Pheidologeton* (Hymenoptera: Formicidae). Australian Journal of Zoology, 14: 73-171.
-Kempf W.W. (1974) A review of the Neotropical Ant genus *Oxyepoecus* Santschi (Hym. Formicidae). Studia Entomologica, Vol. 17.

♀ Genus ***Oxyopomyrmex*** André, 1881

Morphological characters used in the dichotomous key
Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Psammophore present

(series of long curved setae arranged ventrally in the Head and Mandibles); Eyes prolonged anteriorly towards the articulation of the mandibles; Propodeum armed with spines; MetaTibiae with Spur.

Bio-geographical distribution

Mediterranean

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus *O. saulcyi*. www.antweb.org.

-Délye G. (1971) *Oxyopomyrmex emeryi* Santschi (Hym. Formicidae) dans le grand ERG Occidental. Description des sexues. Nouv. Rev. Ent., 1: 211-214.

-Salata S. and Borowiec L. (2015) A taxonomic revision of the genus *Oxyopomyrmex* André, 1881 (Hymenoptera: Formicidae). Zootaxa 4025(1): 1-66.

♀ Genus ***Paramycetophylax*** Kusnezov, 1956

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape flattened not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology III, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Propodeum armed with short teeth; Petiole sessile; petiole of the same height than PostPetiole.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Klingenberg C. and Brandão C.R.F. (2009) revision of the fungus-growing ant genera *Mycetophylax* Emery and *Paramycetophylax* Kusnezov rev, stat., and description of *Kalathomyrmex* n. gen. (Formicidae: Myrmicinae: Attini). Zootaxa 2052: 1-31.

♀ Genus ***Paratopula*** W.M. Wheeler, 1919

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell closed and appendiculate, SubMarginal 1 cell can be opened; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Palp formula 5:3; Propodeum armed with two spines; Petiole with long peduncle; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. ceylonica*, *P. longispina*, *P. macta*, *P. oculata*, *P.*

sumatrensis. www.antweb.org
-Bolton B. (1988) A review of *Paratopula* Wheeler, a forgotten genus of Myrmicine ants (Hymenoptera, Formicidae). Entomologist's Monthly Magazine, Vol. 124.

♀ Genus ***Patagonomyrmex*** Johnson & Moreau, 2016

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 4 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell closed or open; Hindwings of Typology II; Mandibles dentate; Palp formula 5:4; Propodeum armed with spines or teeth; Petiole pedunculate; MetaTibiae with pectinate Spur; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus all secies. www.antweb.org.
-Johnson R.A. and Moreau C.S. (2016) A new ant genus southern Argentina and souther Chile, *Patagonomyrmex* (Hymenoptera: Formicidae). Zootaxa 4139(1): 1-31.

♀ Genus ***Pheidole*** Westwood, 1839

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles (10 articles *Ph. perpusilla*), last 3 articles club, Antennae Scape overstep or not the Occiput, Antennal Scrobe present or absent; Forewings of Typology I with Marginal cell open or rarely closed; Hindwings of Typology II, in some species Anal 2 vein absent and Typology III, Mandibles triangular dentate; Propodeum armed with teeth or spines.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy*:*
Mating flight: see Cantone, 2017

References for Taxonomic identification

-Borgmeier T. (1937) Formigas novas ou pouco conhecidas da America do Sul e Central, principalmente do Brasil (Hym., Formicidae). Ach. Inst. Biol. Veget. Rio de Janeiro, Vol. 3 n. 2.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Forel A. (1910) Formicides australiens reçus de MM. Frogatt et Rowland Turner. Annales de la Societé Zoologique Suisse,Tome 18, Fasc. I.
-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ.

14: 61-149.
-Scupola A. (2012) Description of the male and queen of the North Andean ant *Pheidole unicornis* Wilson,2003 (Hymenoptera: Formicidae). Atti Soc. It. Sci. nat. Museo civ. Stor. Nat. Milano, 153(II): 203-210.
-Wheeler W.M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. The American museum of natural History, Vol XLV.

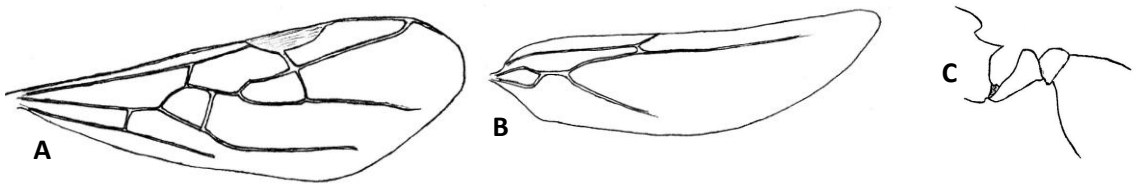

Figure – A: Forewing; B: Hindwing; C: Petiole and Postpetiole of *Pheidole* sp. 240 ♀, São Paulo, Brazil.

♀ Genus ***Podomyrma*** F. Smith, 1859

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 11 articles, last 3 article club/enlarged, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, solenopsis type, Marginal cell closed; Hindwings of Typology II, Mandibles dentate; Palp formula 4:3; Propodeum armed with short teeth or unarmed; Petiole armed with short teeth/spine or unarmed; Meso and MetaFemur considerably incrassated; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Australia, Indo-Australian, New Guinea and nearby Island

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. abdominalis, P. elongate, P. femorata, P. gratiosa, P. kitschneri, P. maligna, P. micans*. www.antwiki.org
-Clark J. (1926) Australian Formicidae. Jour. Roy. Soc., Western Australia, Vol. XII, pp. 43-52.
-Emery C. (1897) Viaggio di Lamberto Loria nella Papuasia Orientale. Ann. Mus. Civ. Stor. Nat. 38: 546-576.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Santschi F. (1932) Resultats Scientifiques du Voyage aux indes Orientales Neerlandaises de LL. AA. RR. Le Prince et la Princesse Leopold de Belgique. Formicidae. Memories du Musee Royal d'Histoire Naturelle de Belgique, Vol. IV, Fascicule 5.
-Smith F. (1859) Catalogue of Hymenopterous Insects collected by Mr. A. R. Wallance at the Islands of Aru and Key. Journal and Proceedings of the Linnean Society of London. Zoology 3: 132-158.

♀ Genus ***Pogonomyrmex*** Mayr, 1868

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 4 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology I with Marginal cell closed or Typology II, solenopsis type with Marginal cell open or closed; Hindwings of Typology II in some species Anal 2 vein absent; Mandibles dentate; Palp formula 4:3; Psammophore present in most species; Propodeum armed with spines or teeth or unarmed; MetaTibiae with one Spur pectinate rarely simple; Sting present.

Bio-geographical distribution

Neartic and Neotropical

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Kusnezov N. (1949) *Pogonomyrmex* del grupo *Ephebomyrmex* en la fauna de la Patagonia. Acta Zoologica Lilloana, Tomo VIII: 291-307.

-Kusnezov N. (1951) El genero *Pogonomyrmex* Mayr. Acta Zoologica Lilloana, Tomo XI, 227-333.

-Kusnezov N. (1954) Descripcion de *Pogonomyrmex marcusi* Kusnezov. Folia Universitaria, Vol. 7, Bolivia.

-Johnson R. A., Holbrook C. T., Strehl C., Gadau J. (2007) population and colony structure and morphometrics in the queen dimorphic harvester ant, *Pogonomyrmex pima*. Insectes Sociaux Vol. 54, Issue 1, pp. 77-86.

-Johnson R. A., Overson R. P. and Moreau C. S. (2013) A new species of see-harvester ant, *Pogonomyrmex hoelldobleri* (Hymenoptera, Formicidae), from the Mohave and Sonoran Desert of North America. Zootaxa 3646 (3): 201-227.

-Johnson R. A. (2015) A taxonomic revision of South America species of the seed-harvester ant genus *Pogonomyrmex* (Hymenoptera: Formicidae). Part I. Zootaxa 4029 (1): 001-142.

-Snelling R.R. (1982) The Taxonomy and distribution of some North American *Pogonomyrmex* and description of two new species (Hymenoptera: Formicidae). Bull. Southern California Acad. Sci., 80(3): 97-112.

-Snelling R.R., Snelling G.C., Schmidt J.O. and Cover S.P. (2009) The sexual castes of *Pogonomyrmex* anzensis Cole (hymenoptera: Formicidae). J. Hym. Res., Vol. 18(2): 315-321.

-Taber S. (1988) The gyne of the harverster ant, *Pogonomyrmex texanus* (Hymenoptera: Formicidae) Journal of the Kansas Entomological Society, 61(2), pp. 244-246.

♀ Genus ***Pristomyrmex*** Mayr, 1866

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III, solenopsis type, Marginal cell open; Hindwings of Typology II; Clypeus anteriorly, in most species, denticulate or crenulate shapes; Mandibles subtriangular dentate; Palp formula 1:2, 1:3, 2:2, 2:3, 4:3 or 5:3; Frontal lobe reduced or absent with Antennal socket exposed; Propodeum armed with two spines or teeth; Sting present.

Bio-geographical distribution

Afrotropical, Oriental, Indo-Australian and Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Taylor R. W. (1965) The Australian ants of the genus *Pristomyrmex*, with a case of apparent character displacement. Psyche, March.

-Wang M. (2003) A monographic revision of the ant genus *Pristomyrmex* (Hymenoptera: Formicidae). Bull. Mus. Comp. Zool., 157(6): 383-542.

♀ Genus ***Proatta*** Forel, 1912

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape reaching the Occiput, Antennal Scrobe present; Forewings of Typology III, Anal 2 vein absent, formica type, Marginal cell closed, Pterostigma narrow; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Propodeum armed with three spines; Petiole with long peduncle and two teeth postero-dorsally.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Crawley W. C. (1924) Ants from Sumatra. Annals and Magazine of Natural History, Ser. 9, Vol. 13, p. 380.

-Moffet M.W. (1986) Behavior of the group-predatory ant *Proatta butteli* (Hymenoptera: Formicidae): na Old World reltive of the Attine ants. Insectes Sociaux, Vol. 33, N° 4: 444-457.

♀ Genus ***Procryptocerus*** Emery, 1887

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Eyes placed ventrally from the Antennal Scrobe; Forewings of Typology II, solenopsis type or M4 vein with insertion in m-cu vein, Marginal

cell open or closed; Hindwings of Typology II; Mandibles triangular dentate; Propodeum armed with spines or teeth; Petiole sessile.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *P. attenuates*, *P. clathratus*, *P. paleatus*, *P.scabriusculus*. www.antweb.org

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Kempf W.W. (1951) A taxonomic study on the ant Tribe Cephalotini (Hymenoptera: Formicidae). Rev. Entomologica, Vol. 22, fasc. 1-3.

-Longino J. T. and Snelling R. R. (2002) A taxonomic revision of the *Procryptocerus* (Hymenoptera: Formicidae) of Central America. Contribution in Science (Los Angeles) 495:1-30.

-Serna F. and MacKay W. (2010) A descriptive morphology of the ant genus *Procryptocerus* (Hymenoptera: Formicidae). Journal of Insect Science, Vo. 10, article 111.

-Serna F. Bolton B. and MacKay W. (2011) On the morphology of *Procryptocerus* (Hymenoptera: Formicidae). Some comments and corrigenda. Zootaxa 2923: 67-68.

-Wheeler D. E. (1984) Behavior of the ant *Procryptocerus scabriusculus* (Hymenoptera: Formicidae) with comparison to other Cephalotines. Psyche Vol. 91, N° 3-4.

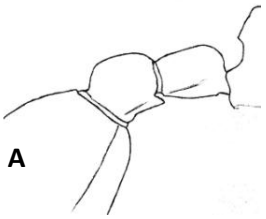

Figure – A: Petiole of *Procryptocerus* sp. 466 ♀, São Paulo, Brazil.

♀ Genus ***Protalaridris*** Brown, 1980

Morphological characters used in the dichotomous key

Antennae clavate with 9 articles, last two articles club, Antennae Scape not overstep the Occiput, flattened and massive, Antennal Scrobe absent or very shallow; Forewings of Typology III, solenopsis type, Marginal cell open, Hindwings of Typology II; Mandibles linear dentate with strong apical tooth; Propodeum armed with spines; Petiole pedulculate; Scape, Legs, Head and Body with scale spatulate or squamiform and erect hair clavate of white color.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos *P. armata*. www.antweb.org

-Brown W.L. (1980) *Protalaridris* genus nov. Pilot Regist. Zool. Card N° 36.
-Lattke J. E., DelSinne T, Alpert G. D. and Guerrero R. J. (2018) Ants of the genus *Protalaridris* (Hymenoptera: Formicidae), more than just deadly mandibles. European Journal of Entomology, 115: 268-295.

♀ Genus ***Pseudoatta*** Gallardo, 1916

Morphological characters used in the dichotomous key

Antennae versus clavate with 11 articles, Antennae Scape overstep the Occiput, Antennal Scrobe absent, 1° article of the Funiculus in leght > than the 2°; Forewings of Typology III, Anal 2 vein absent, formica type, Marginal cell closed, Pterostigma absent or reduced; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Pronotum with two spines dorsally; Propodeum armed with spines.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus *P. argentina*. www.antweb.org
-Gallardo A. (1916) Notes Systematiques et Ethologiques sur les Formis Attines de la Republique Argentine. Anales del Museo Nacional de Historia Natural de Buenos Aires, Tome 28: 317-344.
-Gallardo A. (1929) Note sur lês moeurs de La Fourmi *Pseudoatta argentina*. Revista de la Sociedad Entomologica argentina, N° 10

♀ Genus ***Rhopalomastix*** Forel, 1900

Morphological characters used in the dichotomous key

Antennae short and clavate with 10-11 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal scrobe absent; Forewings of Typology III, solenopsis type, Marginal cell closed and appendiculate; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 0-1:1-2; Propodeum unarmed; Sting present.

Bio-geographical distribution

Indo-Australian and Australian

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *R. escherichi, R. rothneyi*. www.antweb.org.
-Donisthorpe H. (1936) *Rhopalomastix janeti* (Hym. Formicidae) a species of ant new to Science. Entomologist Record J., 48:55-56.
-Forel A. (1900) Un nouveau genre et une nouvelle espece de Myrmecide. Annales de la Societé Entomologique de Belgique 44: 24-26.
-Terayama M. (2009) A synopsis of the family Foricidae of Taiwan (Insecta, Hymenoptera). Liberal Arts, Bull. Kanto Univ., 17: 81-266.
-Wheeler W. M. (1929) The ant genus *Rhopalomastix*. Psyche.

♀ Genus ***Rhopalothrix*** Mayr, 1870

Morphological characters used in the dichotomous key

Antennae clavate with 7 articles, Antennae Scape massive not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III, solenopsis type, and Typology IV, Marginal cell open; Hindwings of Typology III; Mandibles falcate/linear dentate; Propodeum armed with teeth; Petiole pedunculate; Body and Legs with reclinate Scale spatulate or squamiform and erect hair clavate of white color.

Bio-geographical distribution

Neotropical, New Guinea and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Brown W. and Kempf W. W. (1960) a World revision of the ant Tribe Basicerotini (Hym. Formicidae). Studia Ent., Vol. 3, fasc. 1-4.

-Longino J. T. and Boudinot B. E. (2013) New species of Central America *Rhopalothrix* Mayr, 1870 (Hymenoptera, Formicidae). Zootaxa 3616 (4): 301-324.

♀ Genus ***Rogeria*** Emery, 1894

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis or formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 2:1, 2:2, 3:2, 3:3; Propodeum armed with teeth or spines; Petiole pedunculate; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Indo-Australian, New Guinea, Polinesia and Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Kugler C. (1994) Revision of the ant genus *Rogeria* (Hymenoptera: formicidae) with description of the sting apparatus. J. Hym. Res., Vol. 3: 17-89.

-Kusnezov N. (1958) La position sistemática del genero *Rogeria*, com description de una nueva espécie. Acta Zoologica Lilloana, Tomo 15, pp. 41-45.

♀ Genus ***Romblonella*** W.N. Wheeler, 1935

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennal Scrobe present; Forewings of Typology III with Marginal cell closed, formica type; Hindwings of Typology II;

Mandibles triangular dentate; Palp formula 5:3; Propodeum armed with spines; Petiole sessile.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Smith M.R. (1953) A new *Romblonella* from Palau, and the first description of a *Romblonella* male (Hymenoptera, Formicidae). Journal of the New York Entomological Society, Vol. LXI: 163-167.

♀ Genus ***Rostromyrmex*** Rosciszewski, 1994

Morphological characters used in the dichotomous key

Antennae clavate with 9 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, formica type, Marginal cell open, Pterostigma absent or reduced; Hindwings of Typology III; Mandibles triangular dentate; Palp formula 2:2; Propodeum armed with spines; Petiole pedunculate MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Malaysia and Singapore.

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus *R. pasohensis*. www.antweb.org.

-Rosciszewski K. (1994) *Rostromyrmex*, a new genus of Myrmicine ants from Peninsular Malaysia (Hymenoptera: Formicidae). Ent. Scand. 25: 159-168.

♀ Genus ***Royidris*** Bolton and Fisher, 2014

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, last 3-4 articles enlarged/club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate (5 teeth); Palp formula 5:3; Metatibiae with one simple Spur; Propodeum armed with short teeth or angulate; Petiole pedunculate.

Bio-geographical distribution

Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *R. adixta, R. diminuita*, *R. notorthotenes, R. shuckardi.* www.antweb.org

-Bolton B. and Fisher B. (2014) The Madagascan endemic Myrmicine ants related to *Eutetramorium* (Hymenoptera: Formicidae): taxonomy of the genara *Eutetramorium*

Emery, *Malagidris* nom.n., *Myrmisaraka* gen. n., *Royidris* gen. n., and *Vitsika* gen. n. Zootaxa 3791 (1): 001-099.

♀ Genus ***Sericomyrmex*** Mayr, 1865

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Head cordiform (heart-scaped) with Frontal lobe very developed; Forewings of Typology III, Anal 2 vein absent; solenopsis type, Marginal cell closed, Pterostigma present; Hindwings of Typology II with Anal 2 vein absent; Mandibles dentate; Palp formula 4:2; Propodeum whit small blunt teeth or angulate; Petiole sessile or with short peduncle.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.

-Forel A. (1905) Miscellanea Myrmecologiques II. Ann. Soc. ent. Belg., 49: 155-185.

-Jesovnik A. and Schultz T. R. (2017) Revision of the fungus-farming ant genus *Sericomyrmex* Mayr (Hymenoptera, Formicidae, Myrmicinae). ZooKey 670: 1-109.

-Wheeler W.M. (1916) Ants collected in British Guiana by Expedition of the American Museum of Natural History during 1911. American Museum of Natural History, Vol. 35, art. I: 1-14, New York.

♀ Genus ***Solenopsis*** Westwood, 1840

Morphological characters used in the dichotomous key

Antennae clavate with 10 or 11 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Mandibles triangular dentate; Palp formula 2:2 or 1:2; Forewings of Typology II and III, solenopsis type, Marginal cell open; Hindwings of Typology II; Propodeum unarmed; Petiole pedunculate.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone 2017

References for Taxonomic identification

-Arnold G. (1916) A monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. 14, Part. II.

-Borgmeier T. (1937) Formigas novas ou pouco conhecidas da America do Sul e Central, principalmente do Brasil (Hym.,Formicidae). Ach. Inst. Biol. Veget. Rio de Janeiro, Vol. 3.

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-Creighton W.S. (1930) The New World species of the genus *Solenopsis* (Hymenoptera: Formicidae). American Academy of Art and Sciences, Vol. 66. N° 2.
-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
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-Kusnezov N. (1953) *Bisonelopsis sea*, un Nuevo genero y especie de hormigas y sus relaciones con los generous vecinos (Hymenoptera, Formicidae). Memorias del Musu de Entre Rios, N° 31.
-Kusnezov N. (1954) Un genero Nuevo de hormigas (*Paranamyrma solenopsidis* nov. gen. nov. sp.) y los problemas relacionados. Memorias del Musu de Entre Rios, N° 30.
-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. 14: 61-149.
-Pacheco J. A. and MacKay W.P. (2013) The Systematic and Biology of the New World Thief ants of the genus *Solenopsis* (Hymenoptera: Formicidae). The Edwin Mellen press Lewiston, Queebston, Lampeter.
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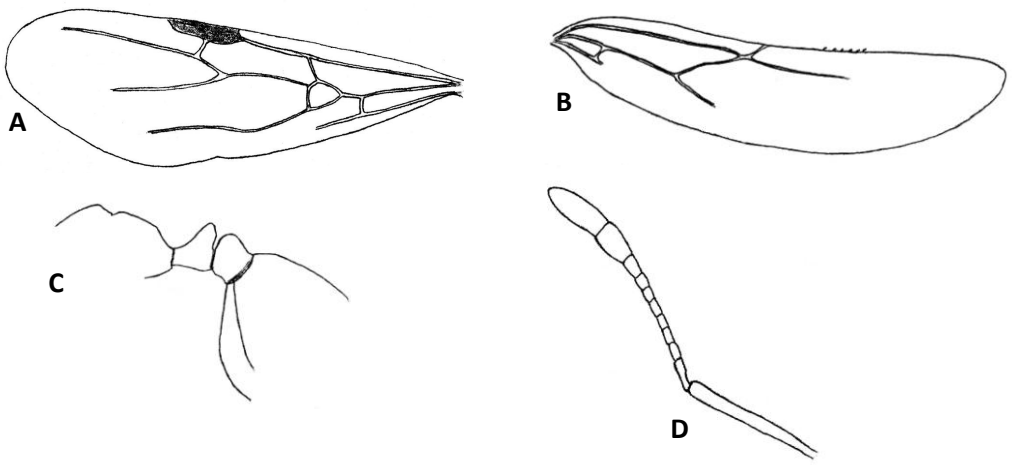

Figure – **A**: Forewing; **B**: Hindwing; **C**: Petiole; **D**: Antennae of Solenopsis sp. 28 ♀, São Paulo, Brazil.

♀ Genus ***Stegomyrmex*** Emery, 1912

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Frontal lobe enormously expanded laterally and anteriorly; Forewings of Typology I and II, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular with 7 or more teeth or denticles; Palp formula 2:2; MetaTibiae without Spur; Propodeum armed with teeth; Petiole with long peduncle.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *S. connectens, S. vizottoi*. www.antweb.org

-Diniz Machado J.L. (1990) Revisão sistematica da tribo Stegomyrmicini, com a descrição de uma nova especie (Hymenoptera, Formicidae). Ver. Bras. Ent., 34(2): 277-295.

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-Feitosa R.M., Brandão C.R.F. and Diniz J.L.M. (2008) Revisionary studies on the enigmatic Neotropical ant genus *Stegomyrmex* Emery, 1912 (Hymenoptera: Formicidae: Myrmicinae), with the description of two new species. J. Hym. Res., Vol. 17(1): 64-82.

♀ Genus ***Stenamma*** Westwood, 1839

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, last 4 articles enlarged/club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology I, II and III, solenopsis or formica type, Marginal cell open or closed and appendiculata, solenopsis or formica type; Hindwings of Typology II; Mandibles triangular dentate; Propodeum usually armed with short teeth or spines, angulate rarely; Petiole pedunculate.

Bio-geographical distribution

Neartic, Neotropical, Paleartic, Indo-Oriental

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org

-Bondroit J. (1918) Les fourmis de France et de Belgique. Annales de La Societè Entomologique de France, Vol. 87.

-Branstetter M. G. (2013) Revision of the Middle American clade of the genus *Stenamma* Westwood (Hymenoptera, Formicidae, Myrmicinae). ZooKey 295: 1-277.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Dubois M.B. (1998) A revision of the ant genus *Stenamma* in the Paleartic and Oriental Region. Sociobiology, Vol. 32, N° 2, 1998.

-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Ogata K. (1991) A generic synopsis of the Poneroid complex of the family Formicidae in Japan (Hymenoptera). Part II. Subfamily Myrmicinae. Bull. Inst. Trop. Agr., Kyushu Univ. 14: 61-149.
-Smith M.R. (1957) Revision of the genus *Stenamma* Westwood in America North of Mexico (Hymenoptera, formicidae). The American Midland Naturalist, 57(1).

♀ Genus ***Strongylognathus*** Mayr, 1853

Morphological characters used in the dichotomous key

Antennae clavate of 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandibles falcate edentate; Palp formula 4:3; Propodeum armed with short teeth; Petiole sessile or with short anterior peduncle; MetaTibiae with one Spur.

Bio-geographical distribution

Paleartic and Sicily, Indo-Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *S. afer, S. caeciliae, S. destefanii, S. italicus, S. kratochvili, S. testaceus*. www.antweb.org.
-Baroni-Urbani C. (1969) Gli *Strongylognathus* del grupo Huberi nell'Europa Occidentale: Saggio di una revisione basata sulla casta operaia. Boll. Soc. Entomol. Italiana, Vol XCIX.CI, N° 7-8.
-Emery C. (1916) Fauna entomologica italiana – Hymenoptera, Formicidae. Bull. Soc. Entomol. It. 47:79-275.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
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-Radchenko A. G. (1985) Ants of the genus *Strongylognathus* (Hymenoptera: Formicidae) in the European part of the USSR. Zool. Zh. 6 64: 1514-1523
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♀ Genus ***Strumigenys*** F. Smith, 1860

Morphological characters used in the dichotomous key

Antennae clavate with 6 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings Typology III and IV, solenopsis type, Marginal cell open; Hindwings of Typology III; Mandibles linear or sutriangular elongate dentate; Propodeum armed with spines or teeth; Petiole with long peduncle; MetaTibiae without Spur; Head cordiform (heart-shaped).

Bio-geographical distribution

Neotropical, Neartic, Afrotropical, Indo-Australian, Australian, Oriental and Mediterranean.

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos many species. www.antweb.org

-Baroni Urbani C. and De Andrade M. L. (2007) The ant Tribe Dacetini: Limits and constituent genera, with description of new species. Anali del Museo Civico di Storia Naturale “G. Doria”, 99: 1-191.

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-Brown W.L. (1954) The Neotropical species of the ant genus *Strumigenys* Fr. Smith: group of Saliens (Mayr). New York Entomological Society, Vol. LXII.

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-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Wheeler W.M. (1908) The ants of Porto Rico and the Virgin Island. Bulletin American Museum of Natural History, Vol. XXIV.

♀ Genus ***Syllophopsis*** Santschi, 1915

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiut, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell

open; Hindwings of Typology II, Mandibles dentate; Palp formula 2:2; Propodeum with short tubercles or angulate; Petiole peduculate; Sting present.

Bio-geographical distribution

Afrotropical, Indo-Australian, Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *S. adiastolon, S. australica, S. cryptobia, S. fisheri. S. hildebrandti, S. infusca, S. sechellensis*. www.antweb.org

-Heterick B. (2006) A revision of the Malagasy ants belonging to genus *Monomorium* Mayr, 1855 (Hymenoptera: Formicidae). Proceedings of the California Academy of Science, Vol. 57, N° 3: 69-202.

♀ Genus ***Temnothorax*** Mayr, 1861

Morphological characters used in the dichotomous key

Antennae clavate with 11 or 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, III, formica or solenopsis type, Marginal cell open or closed; Hindwings Typology II or III; Mandibles dentate; Propodeum armed with spines or teeth; Petiole pedunculate or rarely sessile.

Bio-geographical distribution

Neartic, Central America, Paleartic, Oriental, Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus many species. www.antweb.org

-Cagniant H. (1966) Description des trois castes de *Leptothorax tyndalei* (Forel) (Hym. Formicidae). Bulletin de la Societe entomologique de France, Vol. 71.

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-Cagniant H. (1969) Nouvelle description de *Leptothorax spinosus* (Forel) d'Algerie. Representation des trois castes et note biologiques. Bulletin de la Societe Entomologique de France, Tome 74: 201-208.

-Cagniant H. and Espadaler X. (1997) Les *Leptothorax*, *Epimyrma* et *Chalepoxenus* du Maroc (Hymenoptera: Formicidae). Clé et catalogue des espèces. Ann. Soc. Entomol. Fr. 33 (3): 259-284.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative

Zoology at Harvard College, Vol. 104.
-Emery C. (1916) Fauna entomologica italiana – Hymenoptera, Formicidae. Bull. Soc. Entomol. It. 47:79-275.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174.
-Espadaler X. and Collingwood C.A. (1982) Notas sobre *Leptothorax* Mayr, 1855, con descripcion de *L. gredosi* n. sp. (Hym. Formicidae). Boletin Asoc. Esp. Entom., Vol. 6: 41-48 - Salamanca.
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-Finzi B. (1924) Secondo contributo alla conoscenza della fauna mirmecologica della Venezia Giulia. Bollettino della Società Entomologica Italiana, Anno LVI, N° 8.
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-Wheeler W. N. (1908) The ants of Porto Rico and the Virgin Island. Bulletin American Museum of Natural History, Vol, 24.
-Wheeler W. M. (1914) The ants of Haiti. American Museum of Natural History, Vol. 33, art. 1: 1-61.

♀ Genus ***Teratataner*** Emery, 1912

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, formica type, Marginal cell closed and appendicolate; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 5:3, 4:3; Propodeum unarmed or with very short teeth; Petiole pedunculate; Femurs swollen; MetaTibiae with one Spur.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Alpert G.D. (1992) Observations on the genus *Teratataner* in Madagascar (Hymenoptera: Formicidae). Psiche, Vol. 99.
-Arnold G. (1952) The genus *Teratataner* Emery (Formicidae). Journal ent. Soc. S. Africa: Vol. 15, N° 2.
-Bolton B. (1981) A revision of six minor genera of Myrmicinae (Hymenoptera: Formicidae) in the Ethiopian zoogeographical region. Bulletin of the British Museum (Natural History), Entomology series Vol. 43 N° 4.
-Hita Garcia F., Fischer G., Liu C., Audisio T. L., Alpert G. D. Fisher B. L., Economo E. P. (2017) X-Ray microtomography for ant taxonomy: an exploration and case study with two new *Teratataner* (Hymenoptera, Formicidae, Myrmicinae) species frim Madagascar. PloS ONE 12(3): e0172641.

♀ Genus ***Tetramorium*** Mayr, 1855

Morphological characters used in the dichotomous key

Antennae clavate with 11 or 12 articles rared 10 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Eyes ventrally from the Antennal Scrobe; Forewings of Typology II and III, solenopsis or formica type, Marginal cell open or closed; Hindwings of Typology II; Mandible triangular dentate; Palp formula 4-3:3-2; Propodeum usually armed with spines/teeth or angulate; Petiole usually pedunculate rarely sessile; MetaTibiae with one Spur; Sting present with an apical lamelliform triangular/dentiform appendage.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017. Brazil: 23°35'17.46"S, 46°38'58.02"W, 800 meters sea level, *Tetramorium* sp. 415a: October to December.

References for Taxonomic identification

-Bolton B. (1980) The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus *Tetramorium* Mayr in the Ethiopian zoogeographical region. Entomology series, Vol. 40, N° 3.

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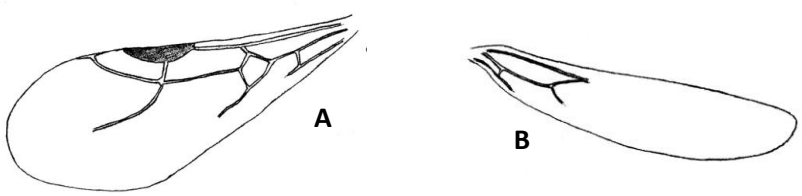

Figure – A: Forewing; B: Hindwing of *Tetramorium* sp. 415b ♀, São Paulo, Brazil.

♀ Genus ***Trachymyrmex*** Forel, 1893

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape overstep the Occiput, Antennal Scrobe present; Forewings of Typology III, Anal 2 vein absent, solenopsis or formica type, Marginal cell closed, Pterostigma absent or reduced; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Propodeum armed with spines; Head with spines dorsally.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
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♀ Genus ***Tranopelta*** Mayr, 1866

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Propodeum unarmed; propodeal spiracle notably enlarged

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
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Figure – A: Antennae; B: Mesosoma and Petiole-PostPetiole of *Tranopelta gilva* ♀, Serra da Canastra, Brazil.

♀ Genus ***Trichomyrmex*** Mayr, 1865

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, last 3 articles enlarged/club Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II and III, formica type, Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate; Propodeum unarmed; Petiole pedunculate.

Bio-geographical distribution

Afrotropical, India, Arabia Saudita, Mediteranean, Madagascar, Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

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♀ Genus ***Tyrannomyrmex*** Fernandez, 2003

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club with last one very long, Antennae Scape not overstep the Occiput Antennal Scrobe absent; Forewings of Typology III, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles dentate; Propodeum with very short teeth/tubercles; Sting present; Typical scultures of the Head and body heavily faveate.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Sadasivan K. and Kripakaran M. (2017) A new species of *Tyrannomyrmex* Fernandez 2003 (Formicidae, Myrmicinae, Solenopsidini) from Western Ghats, Kerala, India. Zootaxa, 4344 (2): 261-276.

♀ Genus ***Veromessor*** Forel, 1917

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, last 3 articles enlarged, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, formica type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Propodeum armed with teeth/spines; Petiole pedunculate.

Bio-geographical distribution

Neartic

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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♀ Genus ***Vitsika*** Bolton & Fisher, 2014

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwings of Typology II; Mandibles triangular dentate; Palp formula 5:3; Propodeum armed with a pair of spines; MetaTibiae with one or without Spur; Sting present.

Bio-geographical distribution

Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

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♀ Genus ***Vollenhovia*** Mayr, 1865

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles rarerly 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, and Typology IV, Marginal cell open; Hindwings of Typology III; Mandibles triangular

dentate; Palp formula usually 2:2; Pronotum unarmed or armed with teeth; Petiole sessile; MetaTibiae without Spur; Sting present.

Bio-geographical distribution

Oriental, Indo-Australian, Australian, Seychelles, Neartic

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: Samoa, Naval Station: *V. samoensis,* July (Wilson and Taylor, 1967)

References for Taxonomic identification

-AntWeb (2018) Photos Typus of 20 species. www.antweb.org
-Donisthorpe H. (1947) Ants from New Guinea oncluding new species and new genus. Annals and Magazine of Natural History, Ser. 11, Vol. 13, p. 577.
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♀ Genus ***Wasmannia*** Forel, 1893

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Eyes ventrally from Antennal Scrobe; Forewings of Typology III, formica type, Marginal cell open; Hindwings of Typology II, Mandibles triangular dentate; Palp formula 3:2; Propodeum armed with spines or teeth; Petiole pedunculate.

Bio-geographical distribution

Neotropical, (exotic Afrotropical and Australia)

Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-AntWeb (2018) Photos Typus:
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Cuezzo F., Calcaterra L.A., Chifflet L., Follett P. (2015) *Wasmannia* Forel (Hymenoptera: Formicidae: Myrmicinae) in Argentina: Systematics and distribution. Sociobiology 62(2): 246-265.
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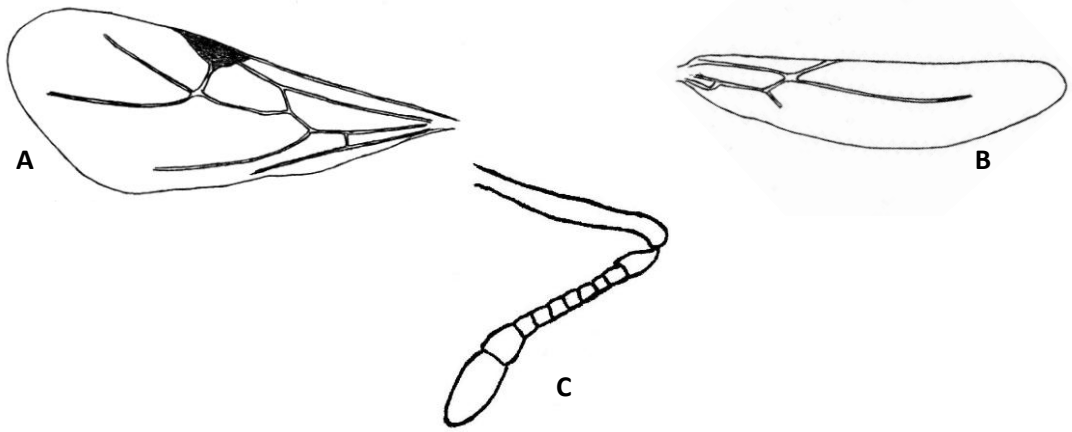

Figure – **A**: Forewing; **B**: Hindwing; **C**: Antennae of *Wasmannia* sp. 236 ♀, São Paulo, Brazil.

♀ Genus ***Xenomyrmex*** Forel, 1885

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 2 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe absent; Forewings of Typology II, solenopsis type, Marginal cell open; Hindwing of Typology III whitout cells; Mandibles triangular dentate; Palp formula 4:2; Propodeum unarmed; Petiole sessile.

Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male

ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Creighton W.S. (1950) The ants of North America. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 104.
-Creighton W.S. (1957) A study of the genus *Xenomyrmex* (Hymenoptera, Formicidae). American Museum of Natural History, New York, N° 1843.
-Emery C. (1922) Hymenoptera. Fam. Formicidae. Subfam. Myrmicinae. Genera Insectorum Fasc. 174
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♀ Genus ***Xerolitor*** Sosa-Calvo et al. 2018

Morphological characters used in the dichotomous key

Antennae clavate with 11 articles, last 3 articles club, Antennae Scape not overstep the Occiput, Antennal Scrobe present; Forewings of Typology III, Anal 2 vein absent, solenopsis type, Marginal cell closed and apendiculate; Hindwing of Typology II with Anal 2 vein absent; Mandibles triangular dentate; Petiole sessile; Propodeum armed with teeth.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

Sosa-Calvo J., Schultz T. R., Jesovnik A., Dahan R. A. And Rabeling C. (2018) Evolution systematic, and natural history of a new genus of cryptobiotic fungus-growing ants. Systematic Entomology, 43, 549-567.

3.14 Subfamily Paraponerinae Emery, 1901

This subfamily represented for one genus and the winged ♀♀ are known.

♀ Genus ***Paraponera*** F. Smith, 1858

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length < than the 2°, Antennal Scrobe present; Eyes placed ventrally from Antennal Scrobe; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Hypopygium with an upwardly-directed comb of fine teeth on each side (Brown 1958:185); Mandibles triangular dentate; Palp formula 5:3; Pronotum armed with two dorsal teeth; Petiole peduncolate anteriorly; MetaTibiae with two Spurs; Metalegs with 2°-3°-4° articles of the Tarsus with Spine/Spur; Pretarsal Claws bifid; Sting present.

Bio-geographical distribution
Neotropical
Behavioral Ecology of the Mating flight
Strategy: see Cantone, 2017
Mating flight: see Cantone, 2017; Brazil: 00°07'36,6''S, 67°02'00,6''W, *P. clavata*: November (Cantone collection).
References
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-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
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3.15 Subfamily Ponerinae Lepeletier de Saint-Fargeau, 1835

This subfamily represented for 47 genera and the Winged ♀♀ known in 36 genera.
The ♀♀ are unknown in the genera: *Boloponera, Feroponera, Fisheropone, Iroponera.*
Presence of only ♀♀ Ergatogyne known in the genera: *Simopelta, Dolioponera.*
Presence of only Gamergate (mated, egg-laying worker that reproduces like the queen caste with functional spermathecal) known in the genera: *Diacamma, Dinoponera, Hagensia, Ophthalmopone, Streblognathus.*

♀ Genus ***Anochetus*** Mayr, 1861

Morphological characters used in the dichotomous key
Antennae filiform with 12 articles, Antennae Scape overstep the occiput or not, 1° article of the Funiculus > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles linear dentate; Palp formula 4:4; Propodeal spiracle with orifice elliptical; MetaTibiae with two Spurs; Pretarsal Claws simple; Sting present.
Bio-geographical distribution
Neotropical, Afrotropical, Indo-Australian, Australia, Spain.
Behavioral Ecology of the Mating flight
Strategy: unknown
Mating flight: see Cantone, 2017
References for Taxonomic identification
-AntWeb (2018) Photos: *A. africanus, A. bequaerti, A. bytinskii, A. cato, A. cryptus, A. goodmani, A. graeffei, A. grandidieri, A. hohenbergiae, A. isolatus, A. katonae, A. levaillanti, A. madascarensis, A. maynei, A. mayri, A. mixtus, A. neglectus, A. obscuratus, A. pattersoni, A. pellucidus, A. pubescens, A. traegaordhi, A. validus*. www.antweb.org.
-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South

African Museum, Vol. XVI.
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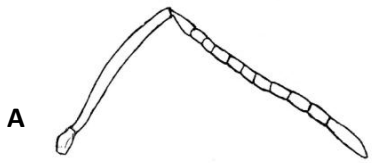

Figure – A: Antennae of *Anochetus* sp. 143 ♀, São Paulo, Brazil.

♀ Genus ***Asphinctopone*** Santschi, 1914

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, last 3 articles club, Antennae Scape not overstep the Occiput, 1° article of the Funiculus > than the 2° article; unknown wings, I assume they are like most of the other genera of the subfamily: Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe?; Clypeus with antero-lateral tooth; Mandibles triangular dentate; Palp formula 3:3; MetaTibiae with one Spurs; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Afrotropical.

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos worker: *A. differens, A. silvestri*. www.antweb.org.
-Bolton B. and Fisher B. L. (2008) The Afrotropical ponerine ant genus *Asphinctopone* Santschi (Hymenoptera: Formicidae). Zootaxa 1827: 53-61.

♀ Genus ***Austroponera*** Schmidth and Shattuck, 2014

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus ≥ than the 2° article; unknown wings, I assume they are like most of the other genera of the subfamily: Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe?; Mandibles triangular dentate; Palp formula 4:3 or 4:2; Propodeal spiracle round; MetaTibiae with two Spurs; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Indo-Australian and Australian, New Zeland

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos worker: *A. castanea, A. castaneicolor, A. rufonigra*. www.antweb.org.

-Brown W. L. (1958) A review of the ants of New Zeland (Hymenoptera). Acta Hymenopterologica 1(1): 1-50.

-Clark J. (1934) New Australian Ants. Mem. Nat. Mus. Vict., VIII.

-Smith F. (1876) Descriptions of three new species of Hymenoptera (Formicidae) from New Zealand. Transaction of the Entomological Society of London, 489-492.

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

-Wheeler W. M. (1934) Contribution to the fauna of Rottnest Island, Western Australia. N° IX – The Ants. Journal of the Royal Society of Western Australia, Vol. XX.

♀ Genus ***Belonopelta*** Mayr, 1870

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus > than the 2° article; unknown wings, I assume they are like most of the other genera of the subfamily: Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe?; Clypeus on the front edge armed with one median tooth; Mandibles elongate linear or falcate dentate; Palp formula 3:3 in *B. deletrix*, 0:1 in *B. attenuata* (Baroni Urbani, 1975); MetaTibiae with two Spurs, medial spur reduced; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos worker: *B. attenuata, B. deletrix*. www.antweb.org.

-Baroni Urbani C. (1975) Contributo alla conoscenza dei generi *Belonopelta* Mayr e *Leiopelta* gen. n. (Hymenoptera: Formicidae). Bulletin de la Societé Entomologique

Suisse, Band 48, Hefte 3-4.
-Wheeler W. M. (1935) Ants of the genera *Belonopelta* Mayr and *Simopelta* Mann. Rev. de Entomologia, Vol. 5, fasc. 1.
-Wilson E. O. (1955) Ecology and behavior of the ant *Belonopelta deletrix* Mann (Hymenoptera: Formicidae). Psyche, Vol. 62.

♀ Genus ***Bothroponera*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, Antennae Scape not overstep the Occiput, 1 article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Palp formula 4:4 (wasmannii-group); MetaTibiae with two Spurs; Pretarsal Claws simple or with submedian tooth; Sting present.

Bio-geographical distribution

Afrotropical and Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: South Africa, Southern Cape, Knysna, Mkuzi, *B. kruegeri*: March and October (Peeters and Crewe,1986)

References for Taxonomic identification

-AntWeb (2016) Photos Typus: *B. cambouei, B. cariosa, B. perroti, B. pumicosa, B. rubescens, B. wasmannii*. www.antweb.org.
-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XVI.
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-Bingham C. T. (1903) The fauna of British India including Ceylon and Burma. Hymenoptera, Vol. II, Edited by W. T. Blanford.
-Forel A. (1900) Les formicides de l'Empire des Indes et de Ceylan, Part VII. J. Bombay Nat. Hist. Soc. 13: 303-332.
-Rakotonirina J. C. and Fisher B. L. (2013) Revision of the *Pachycondyla wasmannii*-group (Hymenoptera: Formicidae) from the Malagasy region. Zootaxa 3609 (2): 101-141.
-Joma A. and Mackay W.P. (2015) Revision of the African Ants of the *Bothroponera pumicosa* species complex (Hymenoptera: Formicidae: Ponerinae). Sociobiology 62 (4): 538-563.
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-Peeters C. P. and Crewe R. M. (1986) Queenright and queenless breeding systems within the genus *Pachycondyla* (Hymenoptera: Formicidae). J. ent. Soc. Sth. Afr., Vol. 49, N° 2, pp. 251-255.
-Wheeler W. M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. Bulletin of the American Museum of Natural History, Vol. XLV.

♀ Genus ***Brachyponera*** Emery, 1900

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep the Occiput (not overstep in *B. sennaarensis*), 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Palp formula 3:3; MetaTibiae with two Spurs; Pretarsal Claws simple; Prora on the anterior margin of first gaster sternite inconspicuous; Sting present.

Bio-geographical distribution

Neartic (introduced), Afrotropical, Indo-Australian, Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *B. arcuate, B. obscurans, B. sennearensis*. www.antweb.org.

-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XVI.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Bingham C. T. (1903) The fauna of British India including Ceylon and Burma. Hymenoptera, Vol. II, Edited by W. T. Blanford.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.

-Yashiro T., Matsuura K., Guenard B., Terayama M., and Dunn R. R. (2010) on the evolution of the species complex *Pachycondyla chinensis* (Hymenoptera: Formicidae: Ponerinae), including the origin of its invasive form and description of a new species.

♀ Genus ***Buniapone*** Schmidt & Shattuck, 2014

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length ≥ to 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; blunt median clypean projection; Mandibles elongate subtriangular dentate; MetaTibiae with two Spurs; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos worker Typus: *B. amblyops*. www.antweb.org.

-AntWiki (2018) Photos worker: *B. amblyops.* www.antwiki.org.
-Emery C. (1887) Catalogo delle Formiche esistenti nelle collezioni del Museo Civico di Genova, Parte Terza, Formiche della regione Indo-Malese e dell'Australia.
-Emery C. (1889) Viaggio di Leonardo Fea in Birmania e regioni vicine. Estratto degli Annali del Museo Civico di Storia Naturale di Genova, Serie 2, Vol. VII(XXVII).
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Centromyrmex*** Mayr, 1866

Morphological characters used in the dichotomous key

Antennae versus clavate of 12 articles, Antennae Scape not overstep the Occiput (*C. raptator* Scape overstep the Occiput), 1° article of the Funiculus > than the 2° article; Forewings Typology I with Marginal cell closed; Hindwings Typology I with Jugal lobe (omitted in Kempf, 1966); Mandibles triangular dentate; Palp formula 4:3; Propodeal spiracle with orifice elliptical; MetaTibiae with one or two Spurs; Meso and MetaTarsus with spiniform sclerotised setae; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Neotropical, Afrotropical, Indo-Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2016) Photos Typus: *C. alfaroi, C. bequaerti, C. raptor*; Photos: *C. angolensis*, *C. brachycola*, *C. gigas*. www.antweb.org.
-Bolton B. and Fisher B. L. (2008) Afrotropical ants of the Ponerinae genera *Centromyrmex* Mayr, *Promyopias* Santschi gen rev. and *Feroponera* gen. n., with a revised key to genera of African Ponerinae (Hymenoptera: Formicidae). Zootaxa 1929: 1-37.
-Borgmeier T. (1937) Formigas novas ou pouco conhecidas da America do Sul e Central, principalmente do Brasil (Hym., Formicidae). Ach. Inst. Biol. Veget. Rio de Janeiro, Vol. 3 n. 2.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Forel A. (1900) Les formicides de l'Empire des Indes et de Ceylan, Part VII. J. Bombay Nat. Hist. Soc. 13: 303-332.
-Kempf W. W. (1966) A sinopsis of the Neotropical ants of the genus *Centromyrmex* Mayr (Hymenoptera: Formicidae). Studia Entomologica, vol. 9, fasc. 1-4.

♀ Genus ***Cryptopone*** Emery, 1893

Morphological characters used in the dichotomous key

Antennae clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than half the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Propodeal spiracle round; Mandibles triangular dentate; Palp formula 2:2 or less; MetaTibiae with one or two Spur; Tarsus armed with stout traction setae dorsally; Pretarsal Claws simple or with sub median tooth; Sting present.

Bio-geographical distribution

Cosmopolitan

References for Taxonomic identification

-AntWeb (2018) Photos: *C. crassicornis, C. gilva, C. guianensis, C. holmgreni, C. motschulskyi, C. ochracea, C. rotundiceps*. www.antweb.org.

-Brown W. L. (1963) Character and synonymies among the genera of ants. Part III. Some members of the tribe Ponerini (Ponerinae, Formicidae). Breviora, Museum of Comparative Zoology, N° 190, Cambrige, Mass. USA.

-Creighton W. S. and Tulloch G. S. (1930) Notes on *Euponera gilva* (Roger) (Hymenoptera, Formicidae). Psyche, March.

-Donisthorpe H. (1942) Ants from the Colombo Museum Expedition to Southern India, September-October 1938. Annals and Magazine of Natural history, Ser. 11, Vol. IX.

-Emery C. (1916) Fauna Entomologica Italiana I. Himenoptera. Formicidae. Bull. Soc. Entomol. It. 47: 79-275.

-Mackay W. P. and Mackay E. E. (2010) The systematic and biology of the New World Ants of the genus *Pachycondyla* (Hymenoptera: Formicidae). The Edwin Mellen Press, Lewiston, Queenston, Lampeter.

-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

-Wheeler W. M. (1933) Three obscure genera of Ponerine ants. American Museum Novitates, N° 672, The American Museum of Natural History, New York city.

♀ Genus ***Ectomomyrmex*** Mayr, 1867

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculusin length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Propodeal spiracle with orifice elliptical; MetaTIbiae with two Spurs; Pretarsal Claws simples; Sting present.

Bio-geographical distribution

Indo-Australian, Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *E. annamitus, E. javanus, E. puncatus, E. sauteri, E. simillimus, E. vermiculatus.* www.antweb.org.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Emeryopone*** Forel, 1912

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; unknown wings, I assume they are like most of the other genera of the subfamily: Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe?; Clypeus on the frot edge armed with one median tooth; Mandibles elongate subtriangular dentate; Palp formula 2:1 or 1:1; Propodeal spiracle with orifice round; MetaTIbiae with two Spurs, medial Spur can be reduced; Pretarsal Claws simples; Sting present.

Bio-geographical distribution

Indo-Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *E. buttelreepeni, E. franzi, E. loebli.* www.antweb.org.

-Baroni Urbani C. (1975) Contributo alla conoscenza dei generi *Belonopelta* Mayr e *Leiopelta* gen. n. (Hymenoptera: Formicidae). Bulletin de la Societé Entomologique Suisse, Band 48, Hefte 3-4.

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

-Varghese T. (2006) Description of a new species of the Ponerinae ant genus, *Emeryopone* (Hymenoptera: Formicidae) from Karnataka, India. Biospectra, Vol. 1. pp. 89-92.

-Xu Z. (1998) Two new record genera and three new species of Formicidae (Hymenoptera) from China. Entomologia Sinica, Vol. 5, N° 2, pp. 121-127.

♀ Genus ***Euponera*** Forel, 1891

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed (in *E. sikorae* cross-veis 1 r-rs present); Hindwings of Typology I with Jugal lobe or without; Mandibles triangular dentate; Palp formula 2:2; Propodeal spiracle with orifice elliptical; MetaTIbiae with two Spurs; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Afrotropical, Madagascar, Indo-Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: Madagascar: 14°26.29' S, 49°44' E, *E. sikorae*: December (AntWeb, 2018)

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *E. brunoi, E. fossigera, E. ivolo, E. nosy, E. sikorae, E. wroughtonii, E. zoro*. www.antweb.org

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Forel A. (1901) Nouvelle species de Ponerinae. Rev. Suisse Zool., Vol. 9.

-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.

-Rakotonirina J. C. and Fisher B. L. (2013) Revision of the *Pachycondyla sikorae* species-group (Hymenoptera: Formicidae) in Madagascar. Zootaxa 3683 (4): 447-485.

♀ Genus ***Harpegnathos*** Jerdon, 1851

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length ≤ than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe present; Mandibles linear dentate, straight apically; Propodeal spiracle with orifice elliptical; MetaTibiae with two Spurs; Pretarsal Claws bifid; Sting present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *H. hobby, H. saltator, H. venator*. www.antweb.org

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-General D. E. M. (2016) A review of the ant genus *Harpegnathos* Jerdon, 1851 (Hymenoptera: Formicidae) in the Philippines, with the description of two new species. Halteres, Vol. 7, 99-105.

♀ Genus ***Hypoponera*** Santschi, 1938

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep or not the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe and Typology II,; Mandibles triangular dentate; Palp formula 0-1:1-2; Propodeal spiracle with orifice round or slightly elliptical; Petiole with subpetiolar process without fovea (depression); MetaTibiae with one Spur; Pretarsal Claws simple; Eyes with minute setae projecting from between the ommatidia (ocular setae).

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos 48 species. www.antweb.org

-Bolton B. and Fisher B. L. (2011) Taxonomy of Afrotropical and West Paleartic ants of the ponerine genus *Hypoponera* Santschi (Hymenoptera: Formicinae). Zootaxa 2843: 1-118.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Donisthorpe H. (1943) The ants (Hym., Formicidae) of Waigeu Island, North Dutch New Guinea. Annals and Magazine of Natural History, Ser. 11, Vol. X.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

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-Santschi F. (1921) Nouvelle fourmis Paleartiques, Boletin de la Real Sociedad Espanola de Historia natural, abril.

-Seifert B. (2003) *Hypoponera punctatissima* (Roger) and *H. shauinslandi* (Emery). Two morphological and biologically distinct species (Hymenoptera: Formicidae). Abh. Ber. Naturkundemus. Görlitz, Band 75, Helf 1, S. 61-81.

-Taylor R. W. (1967) A monographic revision of the ant genus *Ponera* Latreille (Hymenoptera: Formicidae). Pacific Insects Monograph 13: 1-112.

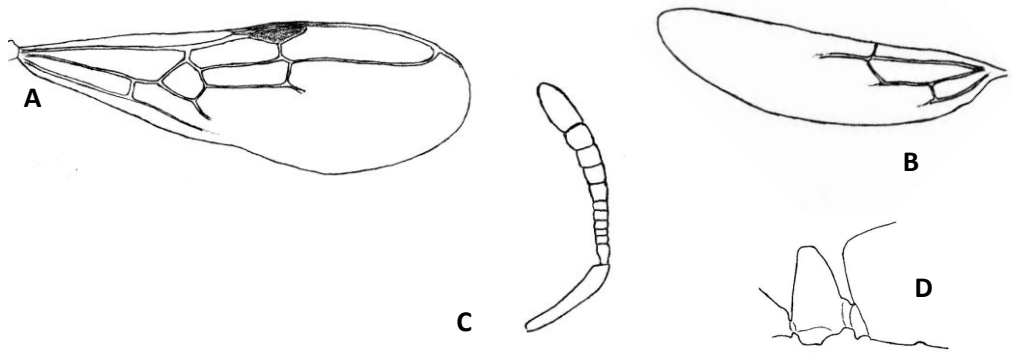

Figure – A: Forewing; B: Hindwing; C: Antennae; D: Petiole of *Hypoponera* sp. 80 ♀, São Paulo, Brazil.

♀ Genus ***Leptogenys*** Roger, 1861

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape overstep the Occiput, 1 article of the Funiculus in length < or ≥ than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles linear/subtriangular dentate apically; Palp formula 4:4 or 4:3; Propodeal spiracle with orifice elliptical or round; MetaTibiae with two Spurs; Pretarsal Claws pectinate (rarely simple); Sting present. Winged ♀♀ are known in *L. langi* and *L. nigricans*.

Bio-geographical distribution

Neotropical, Afrotropical, Indo-Australian, Australia, Oriental

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Bolton B. (1975) A revision of the ant genus *Leptogenys* Roger (Hymenoptera: Formicidae) in the Ethiopian region. With a review of the Malagasy species. Bulletin of the Britysh Museum (Natural History) Entomology, Vol. 31 N° 7, 235-305.

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-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Lattke J. E. (2011) Revision of the New World species of the genus *Leptogenys* Roger (Insecta: Hymenoptera: Formicidae: Ponerinae) Arthropod Systematics & Phylogeny, 69 (3): 127-264.

-Wheeler W. M. (1923) The occurrence of winged female in the ant genus *Leptogenys* Roger, with description of new species. The American Museum of Natural Hystory New York City, American Museum Novitates, N. 90.

♀ Genus ***Loboponera*** Bolton and Brown, 2002

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape stout overstep or not the Occiput, 1° article of the Funiculus in length > than the 2° article; Frontal lobe strongly developed; unknown wings, I assume they are like most of the other genera of the subfamily: Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe?; Mandibles triangular dentate; Palp formula 2:2; Propodeal spiracle with orifice round; MetaTibiae with one Spur and with mid-dorsal longitudinal groove; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Bolton B. and Brown W. L. (2002) *Loboponera* gen. n. and a review of the Afrotropical Plectroctena genus group (Hymenoptera: Formicidae). Bull. Nat. Hist. Mus. Lond. (Ent.) 71(1): 1-18.

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Mayaponera*** Schmid & Shattuck, 2014

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length subequal than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe? (present probably); Mandibles triangular dentate; Palp formula 4:4; Propodeum well bellow the Mesonotum; Propodeal spiracle with orifice round; MetaTibiae with two Spurs; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Forel A. (1908) Formis de Costa Rica. Bulletin de la Societé Vaudoise des Sciences Naturelles, Vol. 44, N° 162.

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-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily

Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Megaponera*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape flattened reaching or overstep the Occiput, 1° article of the Funiculus in length < than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jungal lobe; Mandibles triangular dentate; preocular carine present; Broad insertion of the Clypeus between the Frontal lobe; Propodeal spiracle with orifice elliptical; Meta-Tibiae with two Spurs; Pretarsal Claws with sub median tooth; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. analis*. www.antweb.org

-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XVI.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

♀ Genus ***Mesoponera*** Emery, 1900

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape reaching or overstep the Occiput, 1° article of the Funiculus in length subequal than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Palp maxillary of 4 articles; Propodeal spiracle with orifice round; MetaTibiae with two Spurs, Sting present.

Bio-geographical distribution

Afrotropical, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-André E. (1890) Materiaux pour server a la faune myrmecologique de Sierra-Leone (Afrique Occidentale). Revue d'Etomologie (Caen) 9: 311-327.

-AntWeb (2018) Photos Typus: *M. ambigua, M. caffraria, M. elisae, M. elisae rotundata, M. rubra*. www.antweb.org.

-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XVI.

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-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

♀ Genus ***Myopias*** Roger, 1861

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, Antennae Scape reaching or overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Clypeus with blunt median projection; Mandibles linear or subtriangular elongate, dentate; Propodeal spiracle with orifice round; Palp formula 3:3, 2:3; MetaTibiae with two Spurs; Sting present.

Bio-geographical distribution

Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *M. chapmani, M. cribriceps, M. hollandi. M. kuehni, M. latinoda, M. maligna, M. tenuis*. www.antweb.org.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Probst R.S., Guenard B., Boudinot B. E. (2015) Toward understanding the predatory ant genus *Myopias* (Formicidae: Ponerinae), Including a key to global specie, male-based generic diagnosis, and new species description. Sociobiology, 62 (2): 192-212.

-Wheeler W. M. (1919) The Ants of Borneo. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 43, N° 3.

-Willey R. B. And Brown W. L. (1983) New species of the ant genus *Myopias* (Hymenoptera: Formicidae: Ponerinae). Psyche, Vol. 90, N° 3.

-Xu Z-H. and Liu X. (2012) Three new species of the ant genus *Myopias* (Hymenoptera: Formicidae) from China with a key to the known chinese species. Sociobiology Vol. 59, N° 1.

♀ Genus ***Neoponera*** Emery, 1901

Morphological characters used in the dichotomous key

Antennae filiform or slightly versus clavate with 12 articles, Antennae Scape overstep the Occiput (rarely not overstep ex. *N. fisheri*), 1° article of the Funiculus in length < than the 2° article (rarely subequal); Preocular carine present; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Propodeal spiracle with orifice elliptical or round; Metapleural gland orifice with a posterior U-shaped cuticular lip; Meta-Tibiae with two Spurs; Pretarsal Claws simple or with sub-median tooth; Hypopygium without area of stout setae; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *N. apicalis, N. commutate, N. fauveli, N. goeldii, N. procidua, N. rostrate, N. stratinodis, N. unidentata, N. verenae, N. villosa*. www.antweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Fernandes I. O., Oliveira M. L. D. and Delabie J.H.C. (2014) Description of two new species in the Neotropical *Pachycondyla foetida* complex (Hymenoptera: Formicidae: Ponerinae) and taxonomic notes on the genus. Myrmecological News, 19: 133-163.

-Mackay W. P. and Mackay E. E. (2010) The systematic and biology of the New World Ants of the genus *Pachycondyla* (Hymenoptera: Formicidae). The Edwin Mellen Press, Lewiston, Queenston, Lampeter.

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

-Wheeler W. N. (1936) Ecological relation of Ponerinae and other ants to Termites. American Academy of Art and Sciences, Vol. 71, N° 3.

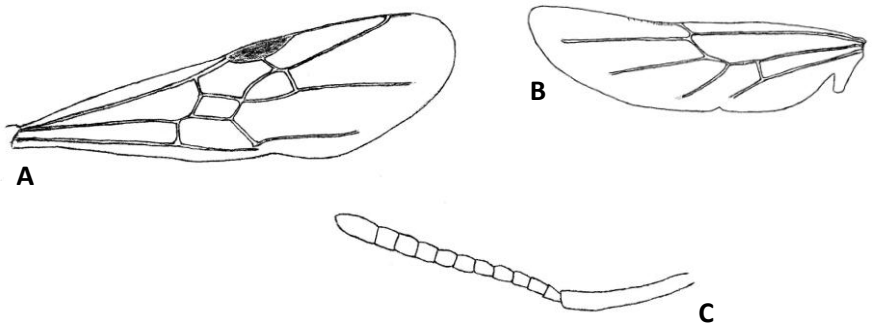

Figure – **A**: Forewing; **B**: Hindwing; **C**: Antennae of *Neoponera* sp. 162 ♀, São Paulo, Brazil.

♀ Genus ***Odontomachus*** Latreille, 1804

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput or not, 1° article of the Funiculus in length < than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles linear dentate, curved apically; Palp formula 4:4 or 4:3 in *haematodus* group; Propodeal spiracle with orifice elliptical; MetaTibiae with two Spurs; Pretarsal Claws simple or with sub-median tooth; Sting present.

Bio-geographical distribution

Neotropical, Neartic, Afrotropical, Indo-Australian, Australian and Oriental

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos: *O. affinis, O. assiniensis, O. banksi, O. bauri, O. biumbonatus, O. bradleyi, O. brunneus, O. chelifer, O. coquereli, O. hastatus, O. insularis, O. monticola, O. procerus, O. ruficeps, O. ruginodis, O. simillimus, O. troglodytes*. www.antweb.org.

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-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

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-Fisher B. L., Smith M. A. (2008) A revision species of *Anochetus* Mayr and *Odontomachus* Latreille (Hymenoptera: Formicidae). Plos One, Vol. 3, Issue 5.

-Mcgown J. A., Boudinot B., Deyrup M. and Sorger D. M. (2014) A review of the Neartic *Odontomachus* (Hymenoptera: Formicidae: Ponerinae) with a treatment of the males. Zootaxa 3802 (4): 515-552.

-Molet M, Peeters C. and Fisher B. L. (2007) Permanent loss of wings in queens of the ant *Odontomachus coquereli* from Madagascar. Insectes Sociaux, doi: 10.1007/s0004a-007-0930-0.

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-Satria R., Kurushima H., Herwina H., Yamane S. and Eguchi K. (2015) The trap-jaw ant genus *Odontomachus* Latreille (Hymenoptera: Formicidae) from Sumatra, with a new species description. Zootaxa 4048 (1): 1-36.

-Sorger D. M. and Zettel H. (2011) On the ants (Hymenoptera: Formicidae) of the Philippine Island: V. The genus *Odontomchus* Latreille, 1804. Myrmecological News, 14, 141-163.

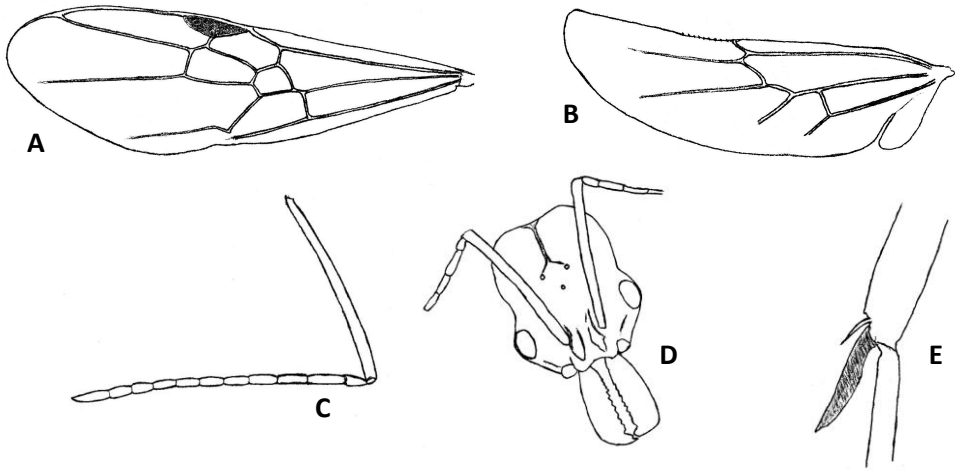

Figure – **A**: Forewing; **B**: Hindwing; **C**: Antennae; **D**: Head; **E**: MetaTibiae spurs of *Odontomachus* sp. 380 ♀, São Paulo, Brazil.

♀ Genus ***Odontoponera*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae filiform with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length subequal than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; anterior edge of the Clypeus denticulate; Mandibles triangular dentate; Palp formula 4:4; Pronotum with two symmetric antero-dorsal teeth; Propodeal spiracle with orifice elliptical; MetaTibiae with two Spurs; Pretarsal Claws simple, Sting present.

Bio-geographical distribution

Indo-Australian

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *O. denticulata*, *O. transversa*. www.antweb.org.

-Bingham C. T. (1903) The fauna of British India including Ceylon and Burma. Hymenoptera, Vol. II, Edited by W. T. Blanford.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Smith F. (1858) Catalogue of Hymenopterous insect in the collection of the British Museum. London.

♀ Genus ***Pachycondyla*** F. Smith, 1858

Morphological characters used in the dichotomous key

Antennae filiform slightly versus clavate with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length subequal than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Propodeal spiracle with orifice elliptical; Meta-Tibiae with two Spurs; Pretarsal Claws simple or with sub-median tooth; Sting present; Hypopygium with court and stout setae along each side of the Sting.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: see Cantone, 2017

Mating flight: see Cantone, 2017. Peru: 13° 9'25.94"S, 72°32'47.63"O, 2500 meters sea level, *P. impressa*, 30 April (Ortius and Lechner, 1997)

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. harpax, P. impressa, P. striata*. wwwantweb.org.

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Kempf W. (1961) As formigas do genero *Pachycondyla* Fr. Smith no Brasil (Hymenoptera: Formicidae). Rev. Brasil. Ent., 10: 189-204.

-Mackay W. P. and Mackay E. E. (2010) The systematic and biology of the New World

Ants of the genus *Pachycondyla* (Hymenoptera: Formicidae). The Edwin Mellen Press, Lewiston, Queenston, Lampeter.
-Ortius D. and Lechner K. (1997) Nuptial flight in two Ponerine ants, *Pachycondyla impressa* and *P. fauveli*, overlooking Machu Picchu, Peru. Stud Neotrop Fauna & Environm, Vol. 32: 227-229.
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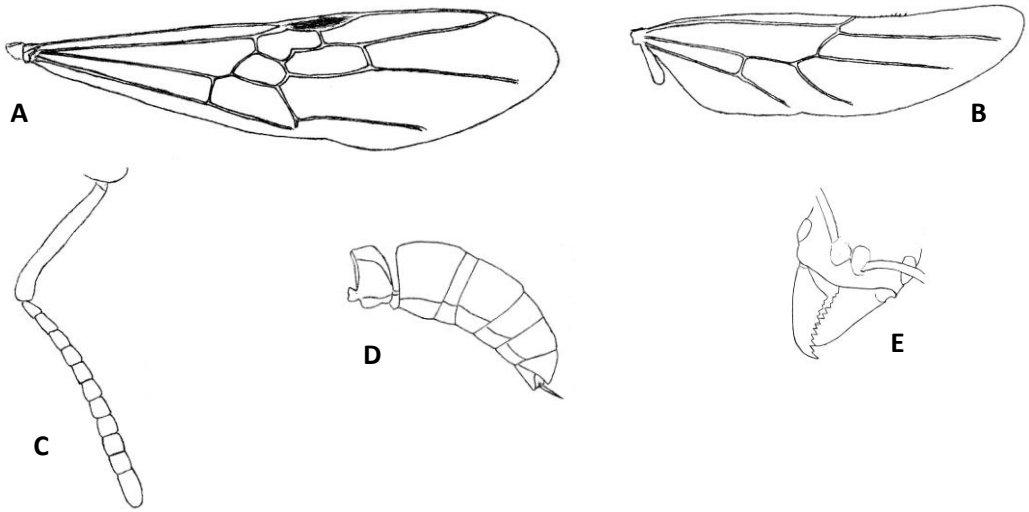

Figure – A: Forewing; B: Hindwing; C: Antennae; D: Petiole and Gaster; F: Mandibles of *Pachycondyla striata* ♀, São Paulo, Brazil.

♀ Genus ***Paltothyreus*** Mayr, 1862

Morphological characters used in the dichotomous key

Antennae filiform or slightly versus clavate with 12 articles, Antennae Scape overstep the Occiput, 1° article of the Funiculus in length < than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Clypeus with a median raised portion, the latter is deeply excavated in the middle; Mandibles triangular dentate; MetaTibiae with two Spurs; Propodeal spiracle with orifice elliptical; Pretarsal Claws bifid; Hypopygium with court and stout setae along each side of the Sting; Sting present;

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: female calling

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. tarsatus*. www.antweb.org
-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XIV.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Parvaponera*** Schmidt and Shattuck, 2014

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles triangular dentate; Palp formula 2:?; MetaTibiae with two Spurs; Propodeal spiracle with orifice elliptical; Sting present.

Bio-geographical distribution

Afrotropical, Indo-Australian and Australian.

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P.darwinii, P. darwinii indica, P. darwinii madecassa*. www.antweb.org
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Forel A. (1893) Nouvelle fourmis d'Australie et des Canaries. Extrait des Annales de la Societé Entomologique de Belgique, Tome 37.
-Menozzi C. (1925) Nouvelle fourmis des Philippines. The Philippine Journal of Science, Vol. 28, N° 3.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Phrynoponera*** Wheeler, 1920

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape reaching or overstep slightly the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Palp formula 4:4; Propodeum bispinose; Propodeal spiracle with orifice elliptical; Petiole armed with spine or thick tooth; MetaTibiae with two Spurs; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. bequaerti, P. gabonensis, P. sveni*. www.antweb.org.
-Bolton B. and Fisher B. L. (2008) The Afrotropical Ponerinae ant genus *Phrynoponera* Wheeler (Hymenoptera: Formicidae). Zootaxa 1892: 35-52.

♀ Genus ***Platythyrea*** Roger, 1863

Morphological characters used in the dichotomous key

Antennae filiform or slinghtly versus clavate with 12 articles (11 articles in *P. clypeata*), Antennae Scape overstep or not the Occiput; 1° article of the Funiculus in length ≤ than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe present; Mandibles triangular dentate or edentate marginally; Palp formula 6:4, 4:4, 4:3, 3:3 and 3:2; Clypeus with broad insertion between the Frontal lobe; Preocular carine absent; MetaTibiae with two Spurs; Pretarsal Claws with submedian tooth or bifid; Propodeal spiracle with orifice round or rarely elliptical; Petiole articoled at midheight of anterior face of first gastral segment; Sting present.

Bio-geographical distribution

Neotropical, Afrotropical, Indo-Australian and Australia.

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. clypeata, P. gracillima, P. mocquerysi, P. occidentalis, P. parallela, P. pilosula, P. punctate*. www.antweb.org.
-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XIV.
-Arnold G. (1926) A monograph of the Formicidae of South Africa. Appendix. Annales of the South African Museum, Vol. 23.
-Brown W. L. (1975) Contribution toward e reclassification of the Formicidae. V. Ponerinae, Tribe Platythyreini, Cerapachyni, Cylindromyrmecini, Acanthostichini and Aectogitini. Search Agriculture, Cornell University, Vol. 5, N° 1: 1-115.
-Donisthorpe H. (1943) The ants (Hym., Formicidae) of Waigeu Island, North Dutch New Guinea. Annals and Magazine of Natural History, Ser. 11, Vol. X.
-Emery C. (1899) Fourmis D'Afrique. Annales de la Societé Entomologique de Belgique, Tome XLIII.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.
-Wheeler W. M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. Bulletin of the American Museum of Natural History, Vol. XLV.

♀ Genus ***Plectroctena*** F. Smith, 1858

Morphological characters used in the dichotomous key

Antennae versus clavate or clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length ≤ than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles linear edentate or with median large tooth; Palp formula 3:4, 2:3, 2:2; Propodeal spiracle with orifice round; MetaTibiae with one Spur; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Antweb (2018) Photos Typus: *P. anops, P. latinodis, P. lygaria, P. mandibularis, P. minor, P. subtrrranea, P. ugandensis*. www.antweb.org.

-Arnold G. (1915) A Monograph of the Formicidae of South Africa. Annals of the South African Museum, Vol. XIV.

-Bolton B. (1974) A revision of the Ponerinae ant genus *Plectroctena* F. Smith (Hymenoptera: Formicidae). Bulletin of the British Museum (Natural History) Entomology, Vol. 30, N° 6, London.

-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.

-Wheeler W. M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. Bulletin of the American Museum of Natural History, Vol. XLV.

♀ Genus ***Ponera*** Latreille, 1804

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 12 articles, Antennae Scape not overstep or rarely reaching the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe or Typology II; Mandibles triangular dentate; Palp formula 2:2; Propodeal spiracle with orifice round; Petiole with subpetiolar process with fovea (depression); MetaTibiae with one Spur, Sting present.

Bio-geographical distribution

Neartic, Paleartic, Oriental, Indo-Australian and Australia and Central America, South Africa, Madagascar

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: USA: *P. pennsylvanica*: August to October (Taylor, 1967)

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. coarctata P. exótica, P. indica, P. japônica, P. manni, P. pennsylvanica, P. petila, P. swezeyi, P. tenuis*. www.antweb.org.

-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae

in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.
-Taylor R. W. (1967) A monographic revision of the ant genus *Ponera* Latreille (Hymenoptera: Formicidae). Pacific Insects Monograph 13: 1-112.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Promyopias*** Santschi, 1914

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; unknown wings, I assume they are like most of the other genera of the subfamily: Forewings of Typology I with Marginal cell closed; Hindwings of Typology I, Jugal lobe?; Mandibles linear denticulate or edentate; Palp formula 4:4; Propodeal spiracle with orifice round; MetaTibiae with two Spurs, MetaTarsus with strongly sclerotized spiniform setae; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. silvestri*. www.antweb.org.
-Bolton B. and Fisher B. L. (2008) Afrotropical ants of the Ponerinae genera *Centromyrmex* Mayr, *Promyopias* Santschi gen rev. and *Feroponera* gen. n., with a revised key to genera of African Ponerinae (Hymenoptera: Formicidae). Zootaxa 1929: 1-37.

♀ Genus ***Psalidomyrmex*** André, 1890

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles; Antennae Scape not overstep or reaching the Occiput; 1° article of the Funiculus in length ≤ than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe present; Mandibles triangular elongate to falcate, dentate; Palp formula 3:4; Propodeal spiracle with orifice round; MetaTibiae with one Spur; Pretarsal Claws simples.

Bio-geographical distribution

Afrotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos: *P. procerus*. www.antweb.org.
-Bolton B. and Brown W. L. (2002) *Loboponera* gen. n. and a review of the Afrotropical *Plectroctena* genus group (Hymenoptera: Formicidae). Bull. Nat. Hist. Mus. Lond.

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-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Menozzi C. (1922) Miscellanea Mirmecologica. Ann. Mus. Civ. Stor. Nat. (3) 10.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Pseudoneoponera*** Donisthorpe, 1943

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape not overstep or reaching the Occiput; 1° article of the Funiculus in length ≥ than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Propodeal spiracle with orifice elliptical; Petiole often dentate dorsally; MetaTibiae with two Spurs; Pretarsal Claws simple or with submedian tooth.

Bio-geographical distribution

Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.
-Wheeler W. M. (1919) The ants of Borneo. Bulletin of the Museum of Comparative Zoology at Harvard College, N° 3.

♀ Genus ***Pseudoponera*** Emery, 1900

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape overstep or not the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I without Jugal lobe; Mandibles triangular dentate; Palp formula 3:3 (*P. stigma*); Propodeal spiracle with orifice elliptical; MetaTibiae with two Spurs; Tarsus with strongly sclerotized spiniform setae; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Neotropical, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. stigma*, *P. succedanea*. www.antweb.org.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera

Insectorum, P. Wytsman, Fasc. 118.
-Mackay W. P. and Mackay E. E. (2010) The systematic and biology of the New World Ants of the genus *Pachycondyla* (Hymenoptera: Formicidae). The Edwin Mellen Press, Lewiston, Queenston, Lampeter.
-Schmidt C. A. and Shattuck S. O. (2014) The higher classification of the subfamily Ponerinae (Hymenoptera: Formicidae), with a review of ponerine ecology and behavior. Zootaxa, 3817, 1-242.

♀ Genus ***Rasopone*** Schmid & Shattuck, 2014

Morphological characters used in the dichotomous key

Antennae with 12 articles, Antennae Scape not overstep or reaching the Occiput; 1° article of the Funiculus in length subequal than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology I with Jugal lobe; Mandibles triangular dentate; Propodeal spiracle with orifice round; MetaTibiae with two Spurs.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: Panama: 9°19’ N, 79°50’15’’, 50-80 meters sea level, *R. arhuata*: all year (Kaspari et al. 2001).

References for Taxonomic identification

-Kaspari M., Pickering J., Longino J.T and Windsor D. (2001) The phenology of a Neotropical ant assemblage: evidence for continuous and overlapping reproduction. Behav. Ecol. Sociobiol., 50: 382-390.
-Mackay W. P. and Mackay E. E. (2010) The systematic and biology of the New World Ants of the genus *Pachycondyla* (Hymenoptera: Formicidae). The Edwin Mellen Press, Lewiston, Queenston, Lampeter.

♀ Genus ***Thaumatomyrmex*** Mayr, 1887

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep the Occiput (in the some specie reaching and slingtly overstep), 1° article of the Funiculus in length > than the 2° article; unknown wings, I assume which are the same as those of the male (Cantone, 2017): Forewings of Typology II with Marginal cell closed; Hindwings of Typology II; Mandibles falcate with three very long teeth; Palp fomula 3:2 (*T. paludis*); Clypeus with broad insertion between the Frontal lobe; Clypeus with strong lateral teeth; Propodeal spiracle with orifice round; Petiole sessile; MetaTibiae with one Spur; Pretarsal Claws simple; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *T. ferox*. www.antweb.org.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Kempf W. W. (1975) A revision of the Neotropical Ponerinae Ant genus *Thaumatomyrmex* Mayr (Hymenoptera: Formicidae). Studia Ent., Vol. 18, fasc. 1-4.
-Vasquez M., Dash S. T. and Mackay W. P. (2010) Description of the gyne of the ant *Thaumatomyrmex ferox* Mann, 1922 (Hymenoptera: Formicidae). Entomologia Amaricana 116 (3\4): 25-28.

3.16 Subfamily Proceratiinae Emery, 1895

This subfamily represented for 3 genera and the Winged ♀♀ are all known.

♀ Genus ***Discothyrea*** Roger, 1863

Morphological characters used in the dichotomous key

Antennae clavate with 6, 7, 8, 9 and 10 articles, Antennae Scape massive not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article, last one article huge and in length equal to the sum of the other items together, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology III, solenopsis type, Marginal cell closed; Hindwings of Typology III; Mandibles triangular edentate; Palp formula 1:3, 4:3, 4:4; Propodeal spiracle with orifice round; Petiole entirely articulated with the first segment of the Gaster; MetaTibiae with one Spur; Pretarsal Claws simple; Sting present; Habitus in length 1,2-2,5 mm.

Bio-geographical distribution

Neotropical, Afrotropical, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *D. bidens, D. hewitti, D. horni, D. mixta, D. sauteri, D. sexarticulata, D. testacea, D. turtoni*. www.antweb.org.
-Arnold G. (1916) A Monograph of the Formicidae of Sauth Africa. Annals of the South African Museum, Vol. 14, Part II.
-Barthi H., Akbar Sh. A., Singh J. (2015) *Discothyrea periyarensis* sp. n., a new Proceratiinae ant species (Hymenoptera: Formicidae: Proceratiinae) from India. Caucasian Entomological Bull. 11(1): 121-124.
-Borgmeier (1949) Formigas novas ou pouco conhecidas de Costa Rica e da Argentina (Hymenoptera, Formicidae). Ver. Brasil. Biol. 9(2): 201-210.
-Borgmeier T. (1954) Uma nova Discothyrea com seis artículos antenais (Hymenoptera, Formicidae). Ver. Brasil. Ent. 1: 191-194.
-Brown W. L. (1958) Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at

Harvard College, Vol. 118, N° 5.
-Bruch C. (1919) Description de una curiosa Ponerina de Cordoba *Discothyrea neotropica* n. sp.. Physis, Vol 4, pp. 400-403.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.
-Emery C. (1901) Notes sul lês sub familles dês Dorylines et Ponerines (Famille dês Formicides). Extrait des Annales de la Societè Entomologique de Belgique, Tome XLV.
-Emery C. (1911) Hymenoptera Fam. Formicidae, SubFam. Ponerinae. Genera Insectorum, P. Wytsman, Fasc. 118.
-Mann W. M. (1919) The ants of the British Solomon Island. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 63, N° 7.
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-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.
-Weber N. A. (1939) New ants of rare genera and a new genus of Ponerine Ants. Annals of the Entomological Society of America, Vol. 33, N° 1.
-Wheeler W. M. (1916) *Prodiscothyrea*, a new genus of Ponerinae ants from Queensland. Royal Society of South Australia, Vol. 40.

♀ Genus ***Probolomyrmex*** Mayr, 1901

Morphological characters used in the dichotomous key

Antennae clavate or versus clavate with 12 articles, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article, Antennal socket confluent from posterior edge of the Clypeus; Forewings of Typology IV with Marginal cell open; Hindwings of Typology III; Mandibles small subtriangular dentate; Palp formula 4:2; Propodeal spiracle with orifice round; MetaTibiae with one Spur; Pretarsal Claws simple; Sting present; Habitus 2, 4 to 4,2 mm.

Bio-geographical distribution

Neotropical, Afrotropical, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-Agosti D. (1994) A revision of the South American species of the ant genus *Probolomyrmex* (Hymenoptera: Formicidae). J. New York Entomol. Soc. 102(4): 429-434.
-AntWeb (2018) Photos Typus: *P. brujitae, P. curculiformis, P. greavesi, P. guanacastensis, P. guineensis, P. procne, P. tani, P. watanabei*. www.antweb.org.
-Brown W. L. (1975) Contribution toward e reclassification of the Formicidae. V. Ponerinae, Tribe Platythyreini, Cerapachyni, Cylindromyrmecini, Acanthostichini and Aectogitini. Search Agriculture, Cornell University, Vol. 5, N° 1: 1-115.
-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Eguchi K., Yoshimura M. and Yamane S. (2006) The Oriental species of the genus *Probolomyrmex* (Insecta: Hymennoptera: Formicinae: Proceratiinae). Zootaxa 1376: 1-35.
-Garcia F. H. and Fisher B.L. (2014) Taxonomic revision of the cryptic anr genus *Probolomyrmex* Mayr (Hymenoptera, Formicidae, Proceratiinae) in Madagascar. Dtsch. Entomol. Z. 61 (1): 65-76.
-Shattuk S. O., Gunawardene N. R. and Heterick B. (2012) A revision of the ant genus *Probolomyrmex* (Hymenoptera: Formicidae: Proceratiinae) in Australia and Malanesia. Zootaxa 3444: 40-50.
-Taylor R. W. (1965) A monographic revision of the rare tropicopolitan ant genus *Probolomyrmex* Mayr (Hymenoptera: Formicidae). R. ent. Soc. Lond. 117 (12): 345-365.

♀ Genus ***Proceratium*** Roger, 1863

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, Antennae Scape not overstep or slinghtly reacher the Occiput, 1 article of the Funiculus in length > than the 2° article, Antennal socket visible completely and confluent from posterior edge of the Clypeus; Forewings of Typology I, II and III with Marginal cell open or closed; Hindwings of Typology II; Mandibles triangular subtriangular; Palp formula 2:2, 3:2, 3:3, 4:3; Propodeal spiracle with orifice round; Petiole sessile; Gaster with two visible Tergite; MetaTibiae with one Spur; Pretarsal Claw simple; Sting present.

Bio-geographical distribution

Cosmopolitan

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: *P. austral, P. avium, P. carri, P. compitale, P. croceum, P. dominicanum, P. lombokense, P. melinum, P. papuanum, P. pargantei, P. silaceum*. www.antweb.org.
-Baroni Urbani C. and De Andrade M. L. (2003) The ant genus *Proceratium* in the extant and fossil record (Hymenoptera: Formicidae). Monografie XXXVI, Museo Regionale di Scienze Naturali, Torino.
-Borgmeier T. (1937) Formigas novas ou pouco conhecidas da America do Sul e Central, principalmente do Brasil (Hym., Formicidae). Ach. Inst. Biol. Veget. Rio de Janeiro, Vol. 3 n. 2.
-Brown W. L. (1958) Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 118, N° 5.
-Ogata K. (1987) A generic synopsis of the Poneroid complex of the Family Formicidae in Japan (Hymenoptera). Part I. SubFamilies Ponerinae and Cerapachyinae.ESAKIA N° 25: 97-132.

3.17 Subfamily Pseudomyrmecinae Smith M. R., 1952

This subfamily represented for 3 genera and the Winged ♀♀ are all known.

♀ Genus ***Myrcidris*** Ward, 1990

Morphological characters used in the dichotomous key

Antennae versus clavate with 11 articles, Antennae Scape short not overstep the Occiput; 1° article of the Funiculus in length > than 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles subtriangular dentate; Palp formula 5:3; MetaTibiae with two Spurs; Propodeal spiracle with orifice elliptical; Sting present.

Bio-geographical distribution

Neotropical

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: unknown

References for Taxonomic identification

-ANTWEB (2018) Photos Typus: *M. epicharis*. www.antweb.org.

-Ward P. S. (1990) The ant subfamily Pseudomyrmecinae (Hymenoptera: Formicidae): generic revision and relationship to other formicids. Systematic Entomology 15, 449-489.

♀ Genus ***Pseudomyrmex*** Lund, 1831

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, last 4 articles enlarged, Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I with Marginal cell closed; Hindwings of Typology II; Mandibles triangular dentate with 5-10 teeth; Palp formula 6:4, 6:3, 5:4, 5:3, 4:3; Propodeal spiracle with orifice round or elliptical; MetaTibiae with two Spurs; Pretarsal Claws simple or with submedian tooth; Sting Present.

Bio-geographical distribution

Neotropical and Neartic

Behavioral Ecology of the Mating flight

Strategy: unknown

Mating flight: see Cantone, 2017

References for Taxonomic identification

-AntWeb (2018) Photos Typus: most species. www.antweb.org

-Cantone S. (2017) Winged Ants, The Male, Dichotomous key to genera of winged male ants in the World, Behavioral ecology of mating flight. Stefano Cantone editor, Catania, Italy, ISBN: 979-12-200-23948, pp. 1-318. www.wingedant.com.

-Gallardo A. (1932) Las hormigas de la Republica Argentina Subfamilia Mirmicinas, seccion Promyrmicinae. Anales del Museo Nacional de Historia natural, Buenos Aires, Tomo 37: 38-88.

-Ward P. S. (1985) The Neartic species of the genus *Pseudomyrmex* (Hymenoptera: Formicidae). Quaestiones Entomologicae, 21: 209-246.

-Ward P. S. (1989) Systematic studies on Pseudomyrmecinae ants: revision of the *Pseudomyrmex oculatus* and *P. subtilissimus* species group, with taxonomic comment on other species. Quaestiones Etomologicae, 25: 393-468.
-Ward P. S. (1990) The ant subfamily Pseudomyrmecinae (Hymenoptera: Formicidae): generic revision and relationship to other formicids. Systematic Entomology 15, 449-489.
-Ward P. S. (1993) Systematic studies on *Pseudomyrmex* acacia-ants (Hymenoptera: Formicidae: Pseudomyrmecinae). J. Hym. Res. 2(1): 117-168.
-Ward P. S. (1996) A new woekerless social parasite in the ant genus *Pseudomyrmex* (Hymenoptera: Formicidae), with a discussion of the origin of social parasitism in ants. Systematic Entomology, 21: 253-263.
-Ward P. S. (1999) Systematic, biogeography and host plant associations of the *Pseudomyrmex* Viduus group (Hymenoptera: Formicidae), Triplaris- and Tachigali-inhabiting ants. Zoological Journal of the Linnean Society, 126: 451-540.

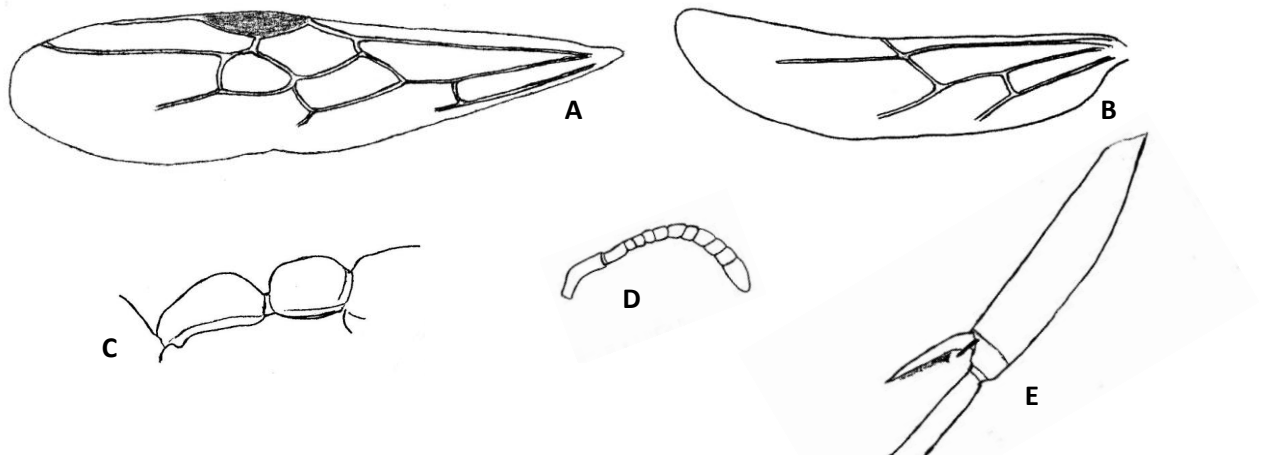


Figure – A: Forewing; B: Hindwing; C: Petiole and PostPetiole; D: Antennae; E: MetaTibiae Spurs of *Pseudomyrmex* sp. 176 ♀, São Paulo, Brazil.

♀ Genus ***Tetraponera*** F. Smith, 1852

Morphological characters used in the dichotomous key

Antennae versus clavate with 12 articles, last 4 articles enlarged; Antennae Scape not overstep the Occiput, 1° article of the Funiculus in length > than the 2° article; Forewings of Typology I and Typology II, solenopsis type, Marginal cell closed; Hindwings of Typology II; Mandibles dentate with 3-6 teeth; Palp formula 6:4 (4-3:3 in *T. tesmanni*); MetaTibiae with two Spurs; Pretarsal Claws bifid or with submedian tooth; Propodeum unarmed; Propodeal spiracle with orifice round or elliptical; Sting present.

Bio-geographical distribution

Paleartic, Oriental, Afrotropical, Indo-Australian and Australia

Behavioral Ecology of the Mating flight

Strategy: unknown
Mating flight: unknown

References for Taxonomic identification

-AntWeb (2018) Photos Typus: most species. www.antweb.org
-Arnold A. (1916) A monograph of the Formicidae of South Africa (Myrmicinae). Annals

of the South African Museum, Vol. XIV, Part II.
-Terron G. (1967) Description des castes de *Tetraponera anthracina* Santschi (Hym., Formicidae, Promyrmicinae). Insectes Sociaux, Vol. XIV, N° 4.
-Terron G. (1969) Description de *Tetraponera ledouxi* espece nouvelle Du Cameroun, parasite temporaire de *Tetraponera anthracina* Santschi (Hym., Formicidae, Promyrmicinae). Bulletin de l'Institut Fondamental d'Afrique Noire, Tome 31, serie A, n° 2.
-Terron G. (1971) Description des castes de *Tetraponera nasuta* Bernard (Hym. Formicidae, Promyrmicinae). Ann. De la Fac. Des Sciences du Cameroun, N° 6: 73-84.
-Ward P. S. (1990) The ant subfamily Pseudomyrmecinae (Hymenoptera: Formicidae): generic revision and relationship to other formicids. Systematic Entomology 15, 449-489.
-Ward P. S. (2001) Taxonomy, phylogeny and biogeography of the ant genus *Tetraponera* (Hymenoptera: Formicidae) in the Oriental and Australian regions. Invertebrate Taxonomy, 15: 589-665.
-Ward P. S. (2009) The ants genus *Tetraponera* in the Afrotropical region: *T. grandidieri* group (Hymenoptera: Formicidae). J. Hym. Res., Vol. 18(2): 285-304.
-Wheeler W. M. (1922) Ants of the American Museum Congo Expedition. A contribution to the Myrmecology of Africa. Bulletin of the American Museum of Natural History, Vol. XLV.

4. The Wings of Ants: morphological and systematic relationships

4.1 **Introduction**

From the study carried out on the morphology of ant wings, I have analyzed that, out of a total 334 extant genera (AntCat, 2018), the winged caste, male and female, known in 297 genera, of which Winged ♂♂ in 261 genera and the Winged ♀♀ in 258 genera (Table 11). In the 37 genera are unknown winged caste.

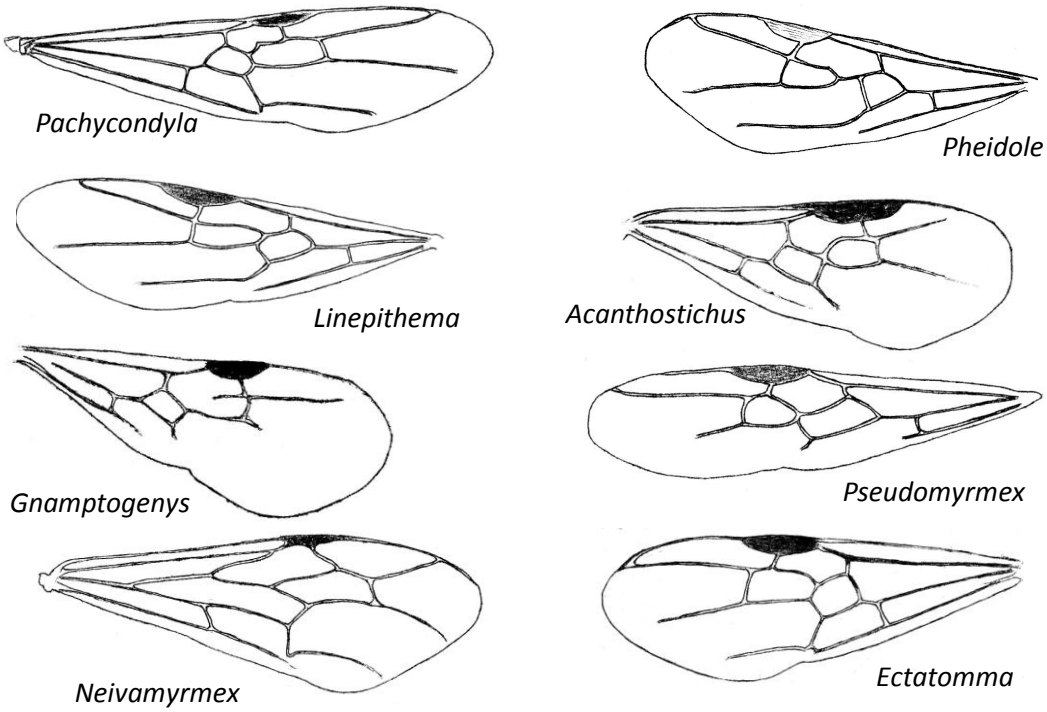
Subfamily	n° Genera	n° Genera with know Winged Caste	Winged ♀♀	Winged ♂♂
Agroecomyrmecinae	2	1	1	1
Amblyoponinae	9	9	9	9
Aneuretinae	1	1	1	1
Apomyrminae	1	1	1	1
Dolichoderinae	28	24	22	24
Dorylinae	27	27	10	26
Ectatomminae	4	4	4	4
Formicinae	51	48	47 (2 dealate)	43
Heteroponerinae	3	2	2	2
Leptanillinae	8	8	3 (3 dealate)	5
Martialinae	1	1	0	1
Myrmeciinae	2	2	2	2
Myrmecinae	143	121	113 (9 dealate)	102 (1 undescribed)
Paraponerinae	1	1	1	1
Ponerinae	47	41	36 (6 dealate)	33
Proceratiinae	3	3	3	3
Pseudomirmecinae	3	3	3	3
17	334	297	258	261

Table 11 – Analysis of genera with Winged Caste for Subfamily

4.2 **Distribution of the Forewings Typologies in the ♂♂ and ♀♀ of the family Formicidae**

As I showed in Table 1, I divide the Forewing of the ants in four Typologies, based on presence / absence of the Submalginals and Discoidal Cells. Below I show how are distributed, in the two sexes or only in the ♂♂ of those genera that have only Ergatogyne or Gamergate ♀♀, these four Typologies in the differents Subfamilies

A. Distribution of the Forewing of **Typology I** in the ♂♂ and ♀♀ ants



In the ♂♂ of ants, I met 72 genera with Forewings di Typology I in **12** Subfamilies; Figure 19 and 20 (Table 15 in Cantone, 2017; see Errata Corrige 2018).

In the ♀♀ of ants, I met 79 genera with Forewing di Typology I in 12 Subfamilies; Figure 19 and 21, Table 4 and 5.

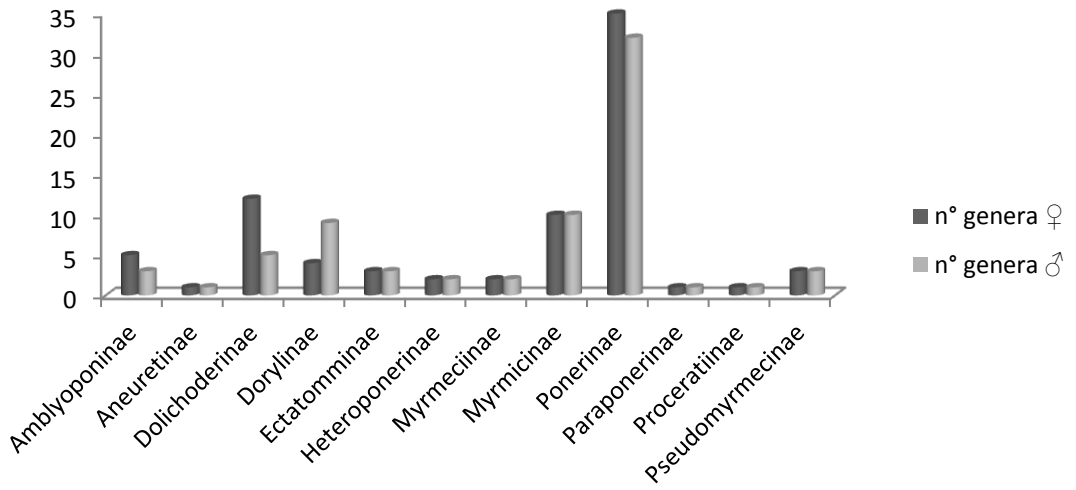


Figure 19 – Distribution of the Forewing of Typology I in the Subfamilies and respective numbers genera among ♀♀ and ♂♂.

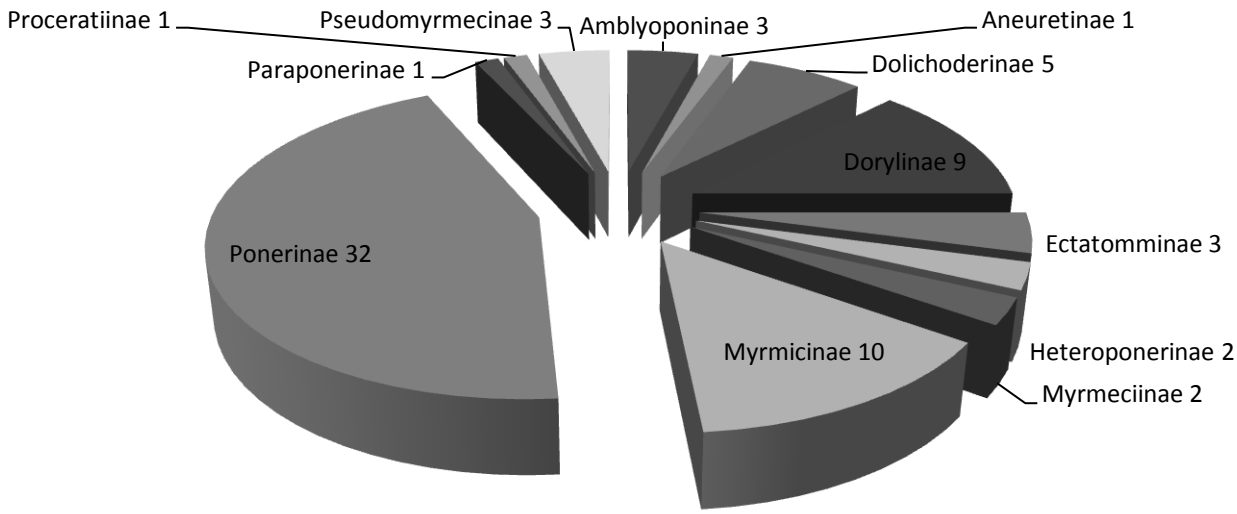


Figure 20 – Distribution of the Forewing di Typology I in the ♂♂ for Subfamily with respective numbers of genera.

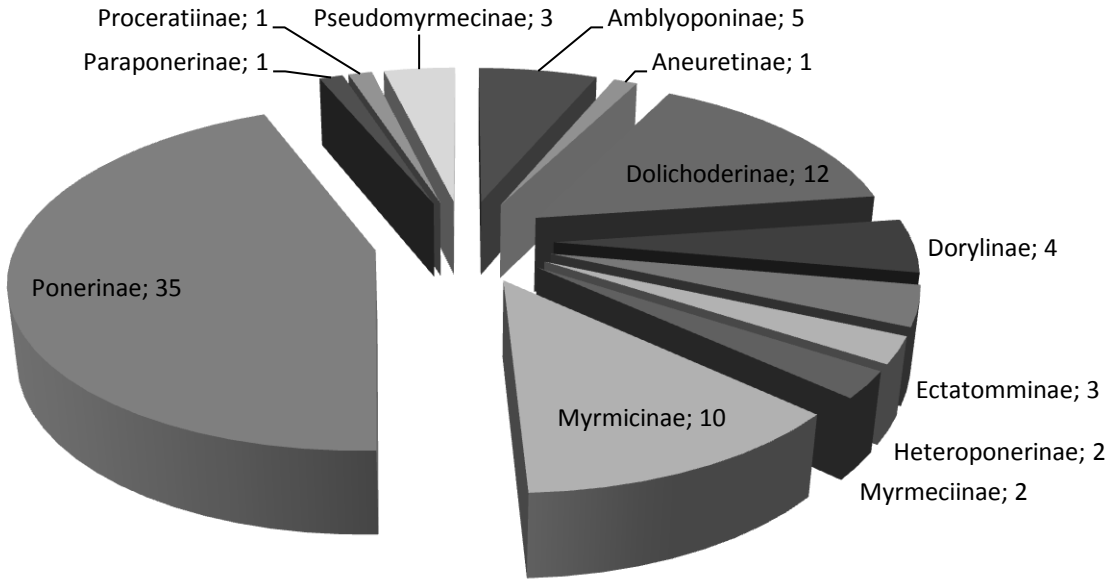
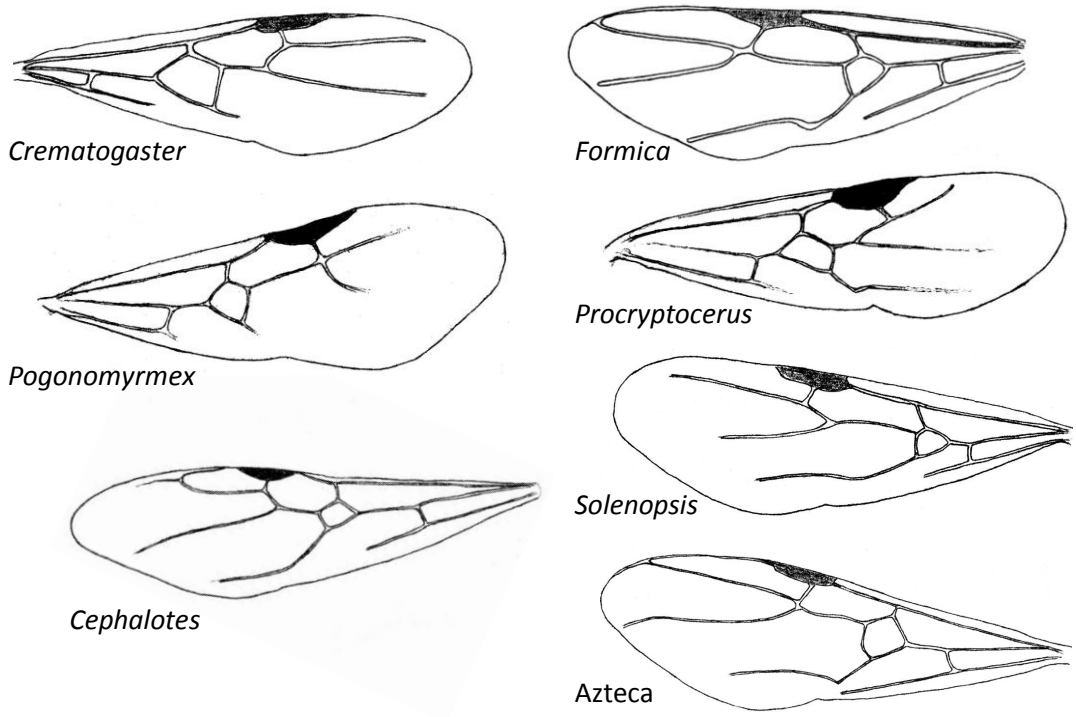


Figure 21 – Distribution of the Forewing of Typology I in the ♀♀ for Subfamily with respective numbers of genera.

B. Distribution of the Forewing of **Typology II** in the ♂♂ and ♀♀



In the ♂♂ of ants, I met **117** genera with Forewings of Typology II in **11** Subfamilies; Figure 22 and 23 (Table 18 in Cantone, 2017; see Errata Corrige 2018).

In the ♀♀ of ants, I met **109** genera with Forewing of Typology II, in **11** Subfamilies; Figure 22 and 24, Table 5 and 6.

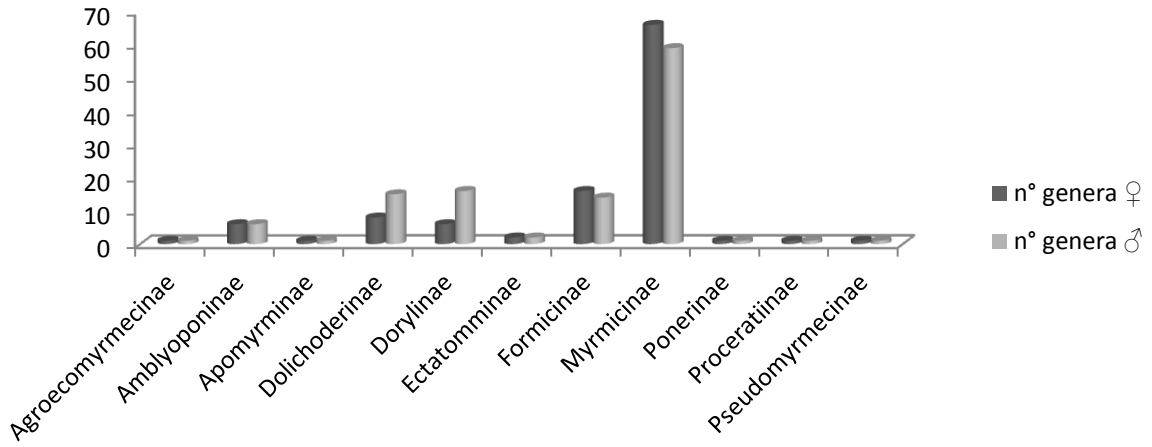


Figure 22 – Distribution of the Forewing of Typology II in the Subfamilies and rispective numbers genera among ♀♀ and ♂♂.

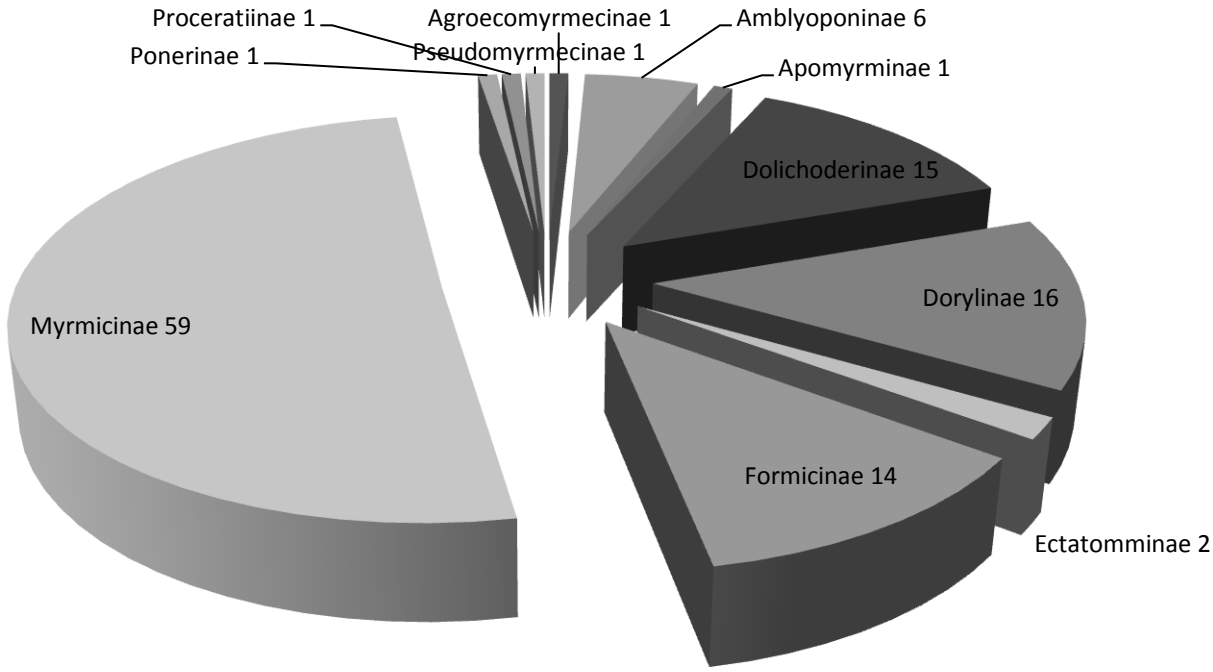


Figure 23 – Distribution of the Forewing of Typology II in the ♂♂ for Subfamily with rispective numbers of genera.

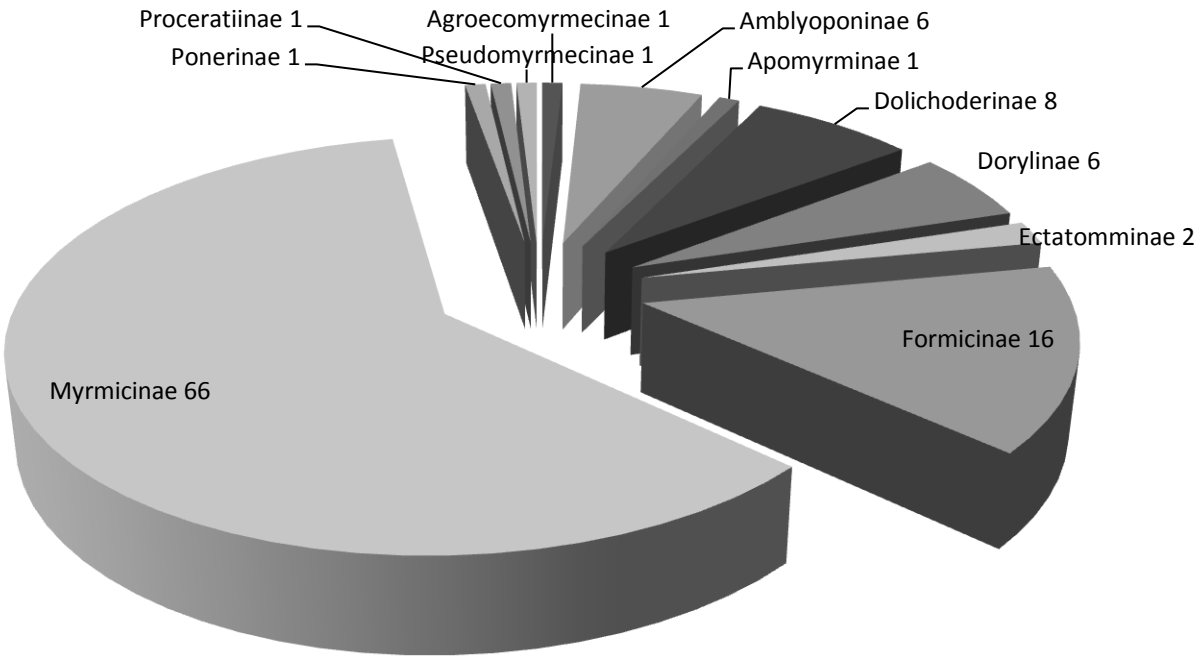
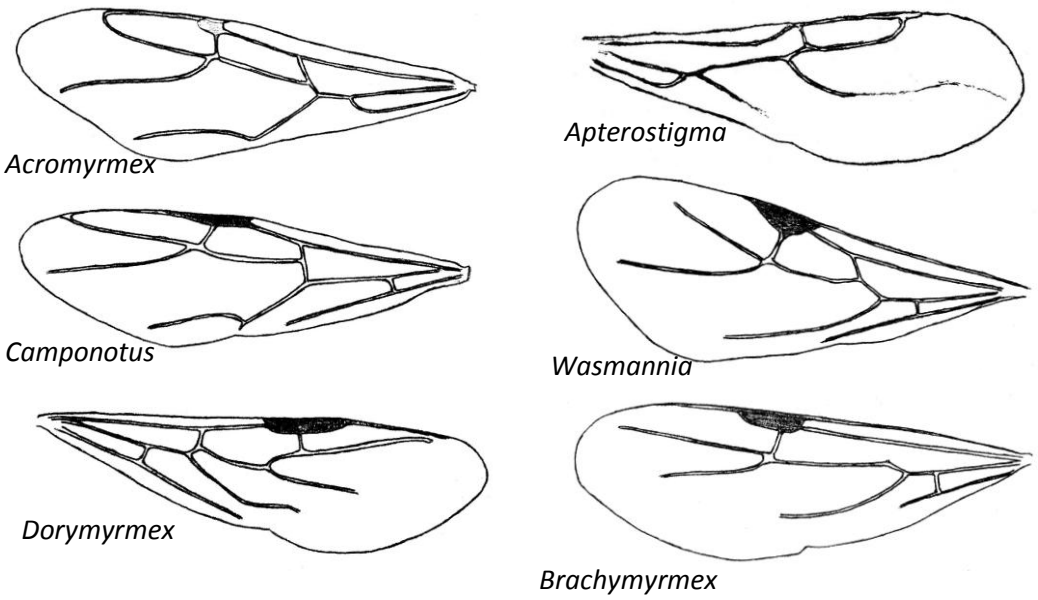


Figure 24 – Distribution of the Forewing of Typology II in the ♀♀ for Subfamily with respective numbers of genera.

C. Distribution of the Forewing of **Typology III** in the ♂♂ and ♀♀



In the ♂♂ of ants, I met **102** genera with Forewings of Typology III, in **7** Subfamilies; Figure 25 and 26 (Table 20 in Cantone, 2017; see Errata Corrige 2018).

In the ♀♀ of ants, I met **96** genera with Forewing di Typology III, in **5** Subfamilies; Figure 25 and 27, Table 7 and 8.

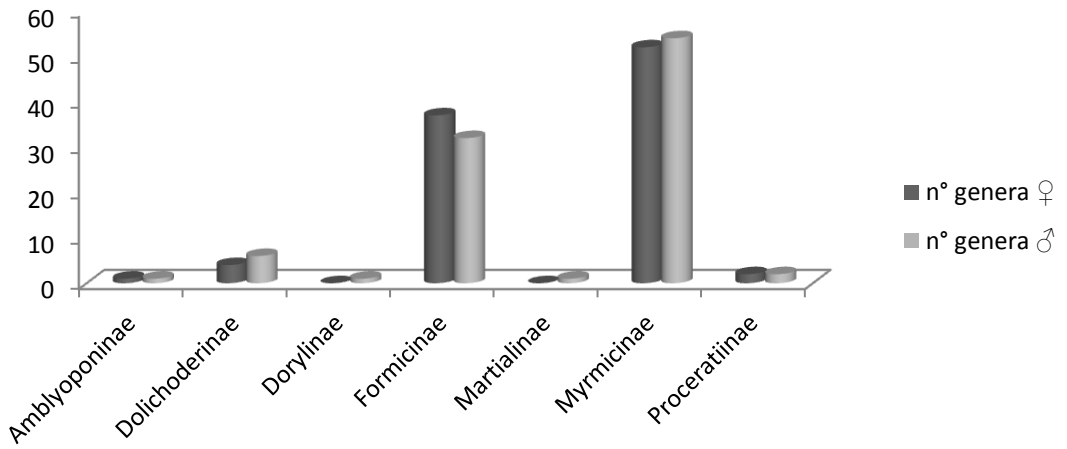


Figure 25 – Distribution of the Forewing of Typology III in the Subfamilies and rispective numbers of genera among ♀♀ and ♂♂.

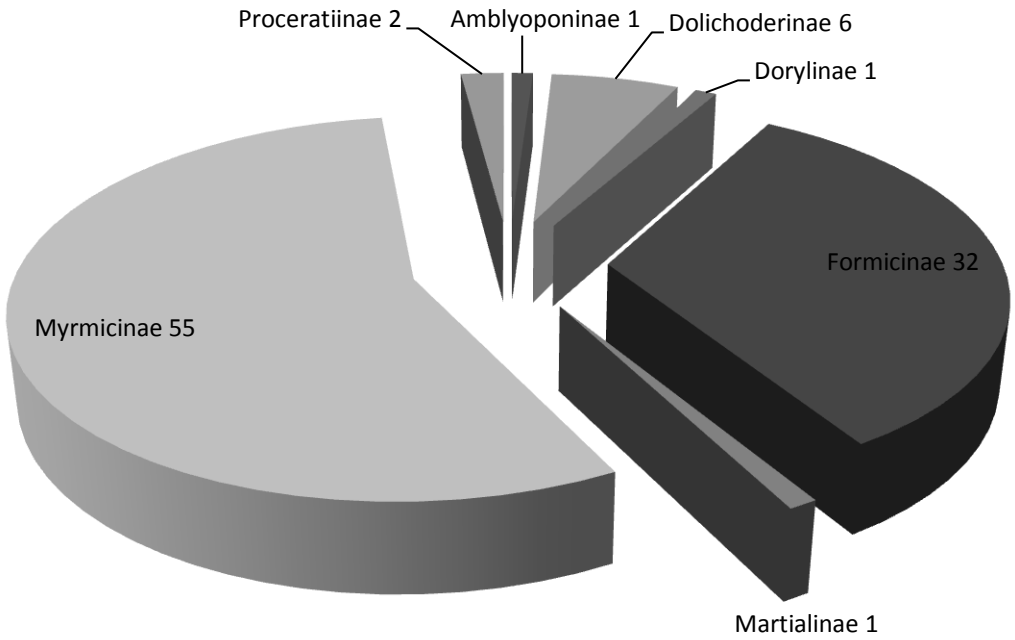


Figure 26 – Distribution of the Forewing of Typology III in the ♂♂ for Subfamily with rispective numbers of genera.

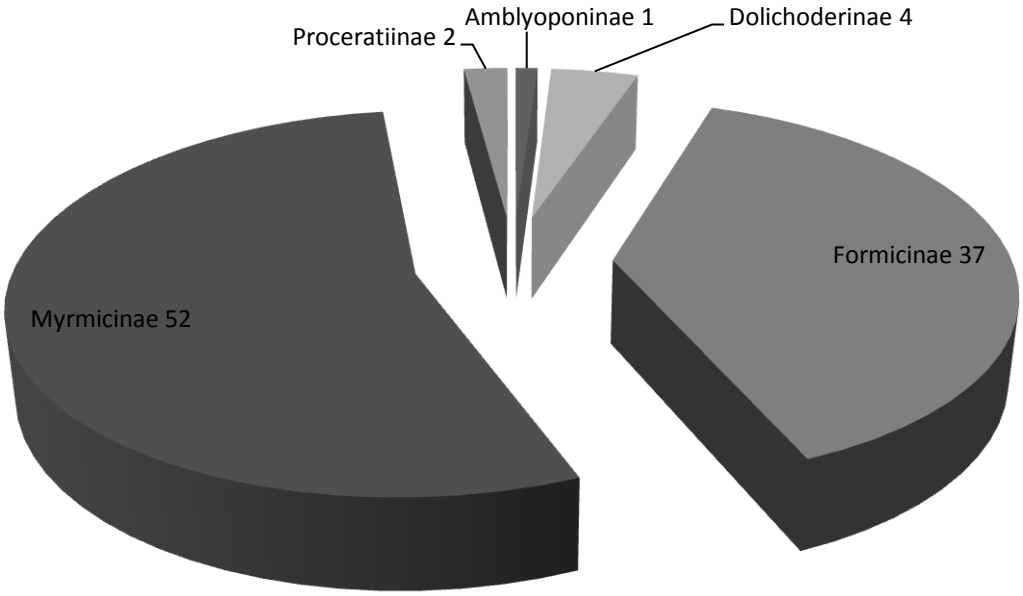
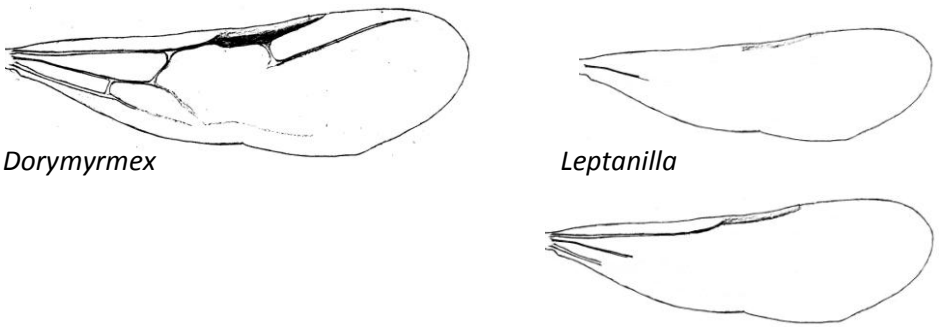


Figure 27 – Distribution of the Forewing of Typology III in the ♀♀ for Subfamily with rispective numbers of genera.

D. Distribution of the Forewing of **Typology IV** in the ♂♂ and ♀♀



In the ♂♂ of ants, I met **23** genera with Forewings of Typology IV, in **6** Subfamilies; Figura 28 and 29 (Table 22 in Cantone, 2017; see Errata Corrige 2018).

In the ♀♀ of ants, I met **8** generi with Forewing of Typology IV, in **3** Subfamilies; Figura 28 and 30, Table 9 and 10.

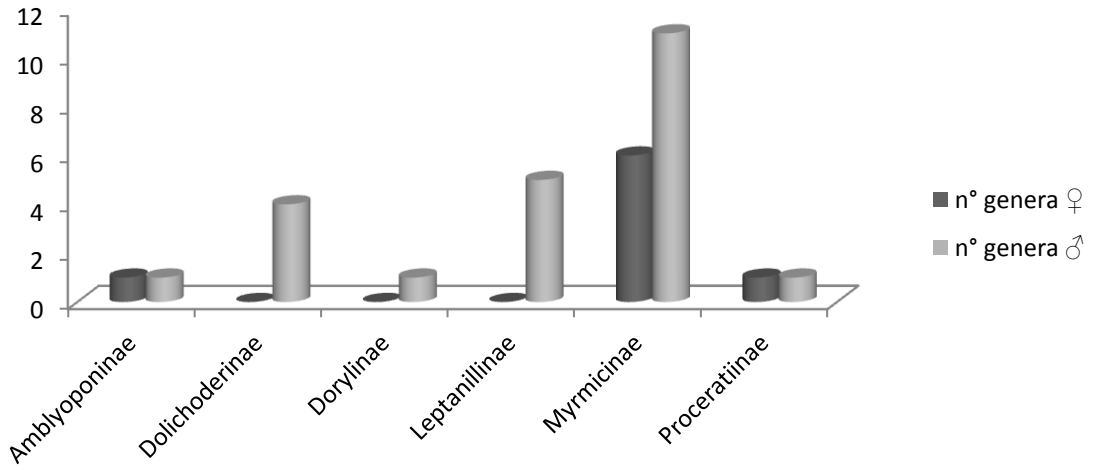


Figure 28 – Distribution of the Forewing of Typology IV in the Subfamilies and rispective numbers of genera among ♀♀ and ♂♂.

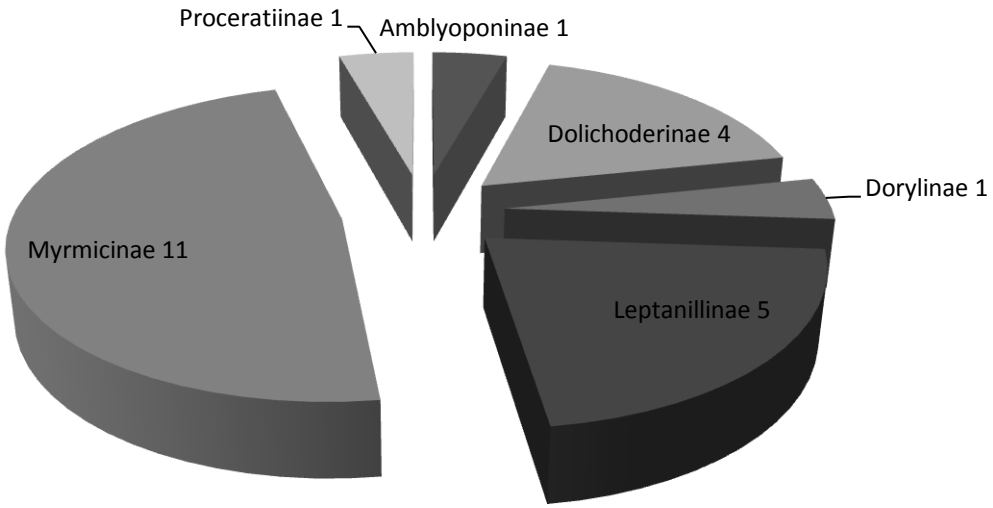


Figure 29 – Distribution of the Forewing of Typology IV in the ♂♂ for Subfamily with rispective numbers of genera.

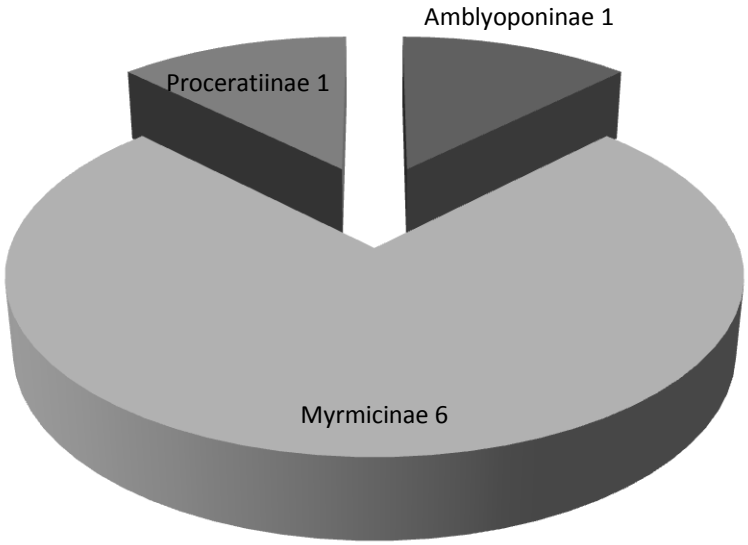


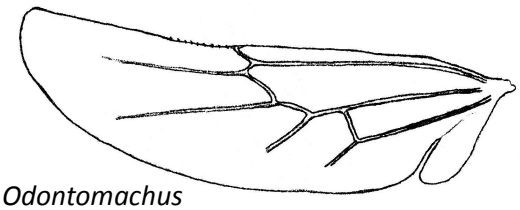
Figure 30 – Distribution of the Forewing of Typology IV in the ♀♀ for Subfamily with rispective numbers of genera.

4.3 **Distribution of the Hindwings Typologies in ♂♂ and ♀♀ of the family Formicidae**

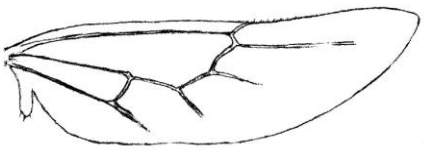
As I have shown in Table 2, have divided the Hindwing in three Typologies based on presence/absence of the M2 vein and presence/absence of the Subbasal Cell. I did not notice any significant differences among winged ♀♀ and ♂♂, therefore, below I show how these three Typologies are distributed in the different Subfamilies, in the two sexes or only in the ♂♂ of those genera that have only Ergatogyne or Gamergate ♀♀.

A. Distribution of the Hindwing of **Typology I***

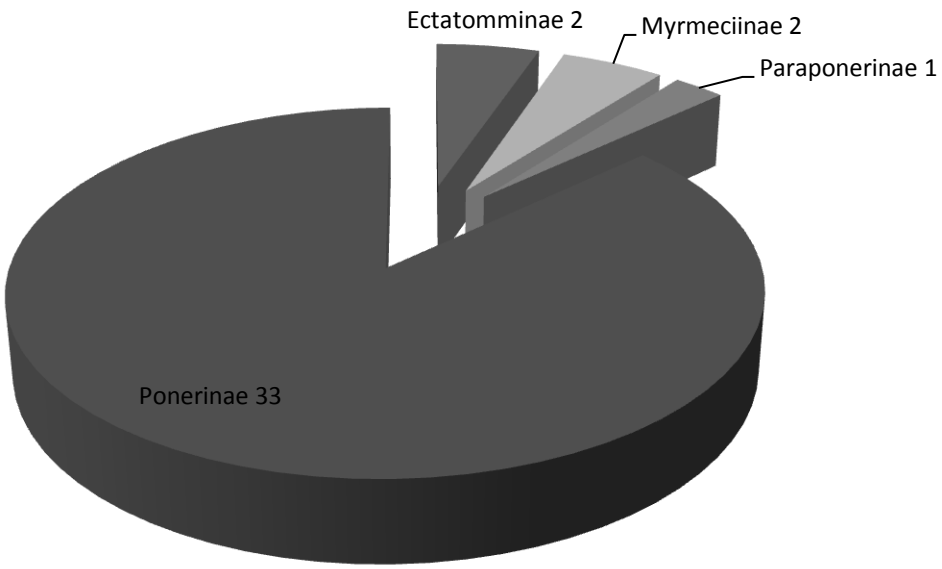
1. Hindwing of Typology I with Jugal lobe



Odontomachus

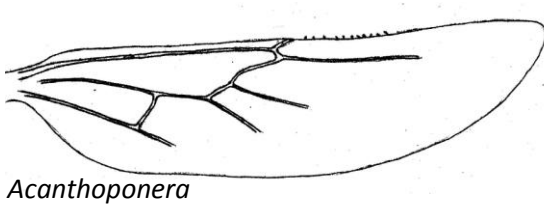


Ectatomma

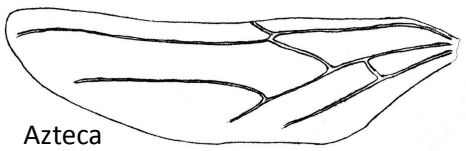


***** In eight genera of the Subfamily Ponerinae I do not know the hindwing therefore, I assume are of Typology I and I analyze it both in genera with or without Jugal lobe.

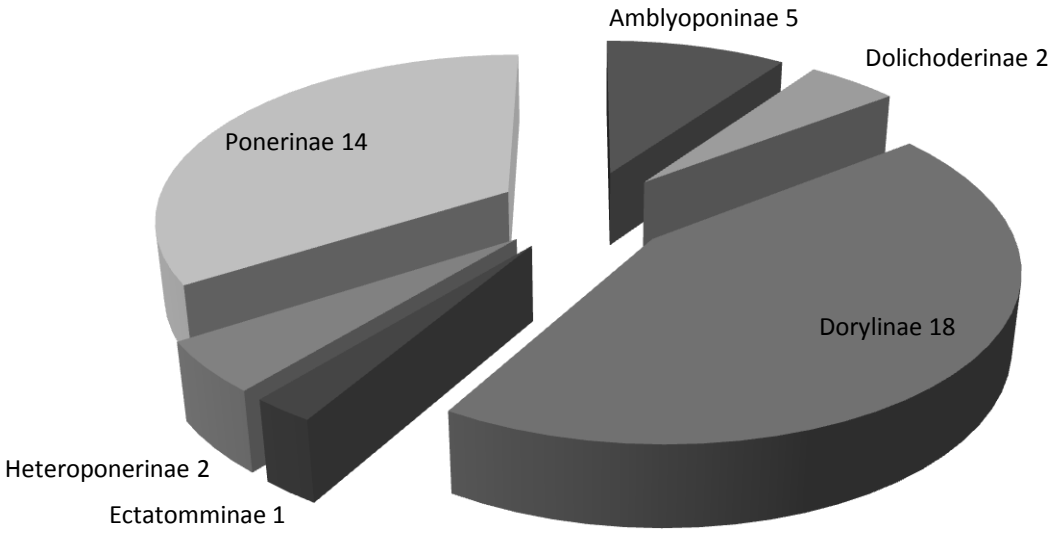
2. Hindwing of Typology I without Jugal lobe

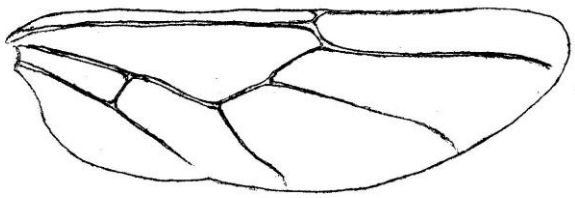


Acanthoponera

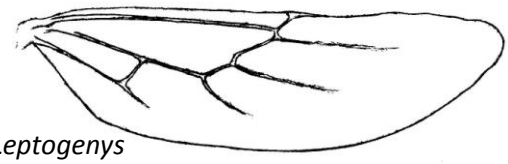


Azteca



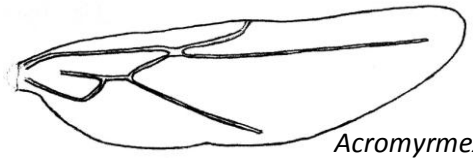


Neivamyrmex

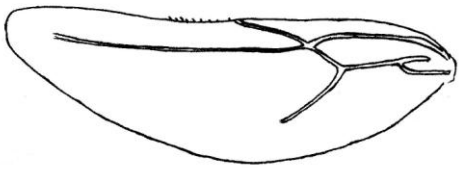


Leptogenys

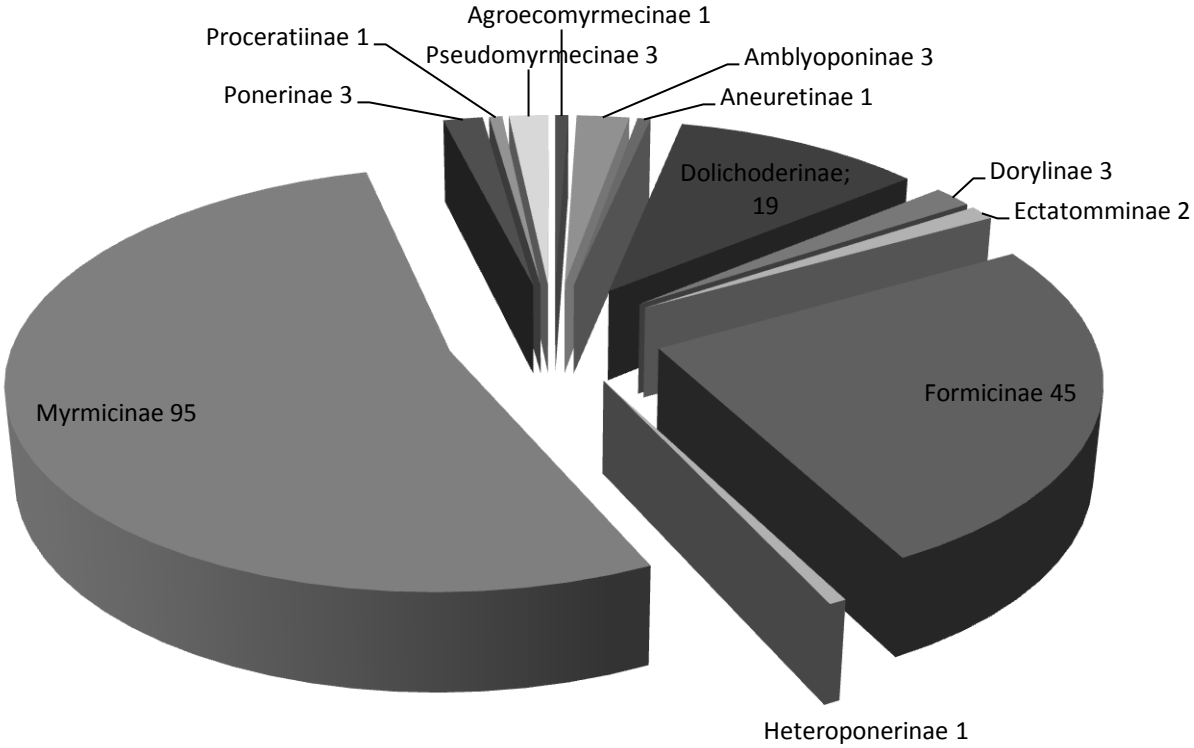
B. Distribution of the Hindwing of **Typology II**

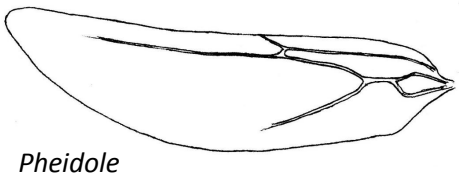


Acromyrmex

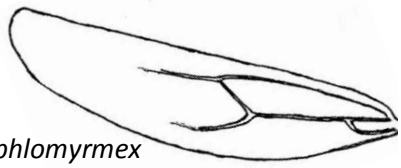


Nylanderya

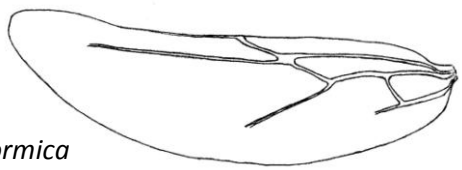




Pheidole

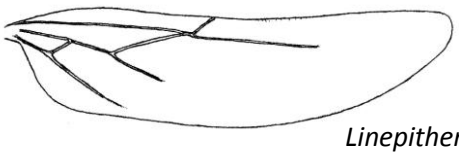


Typhlomyrmex

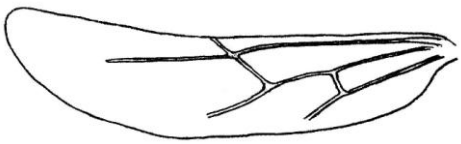


Formica

Solenopsis

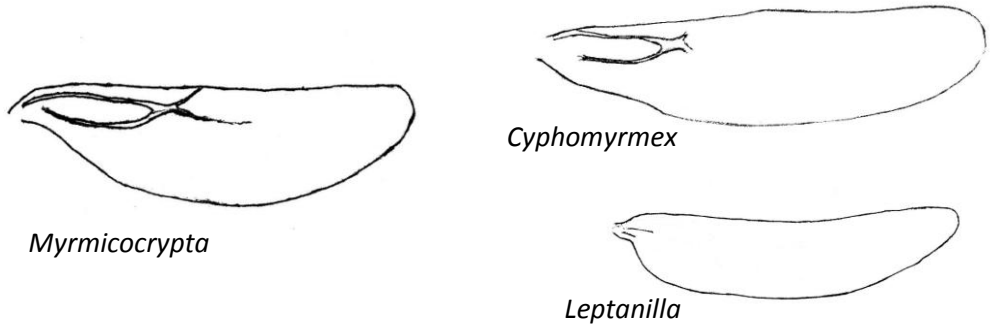


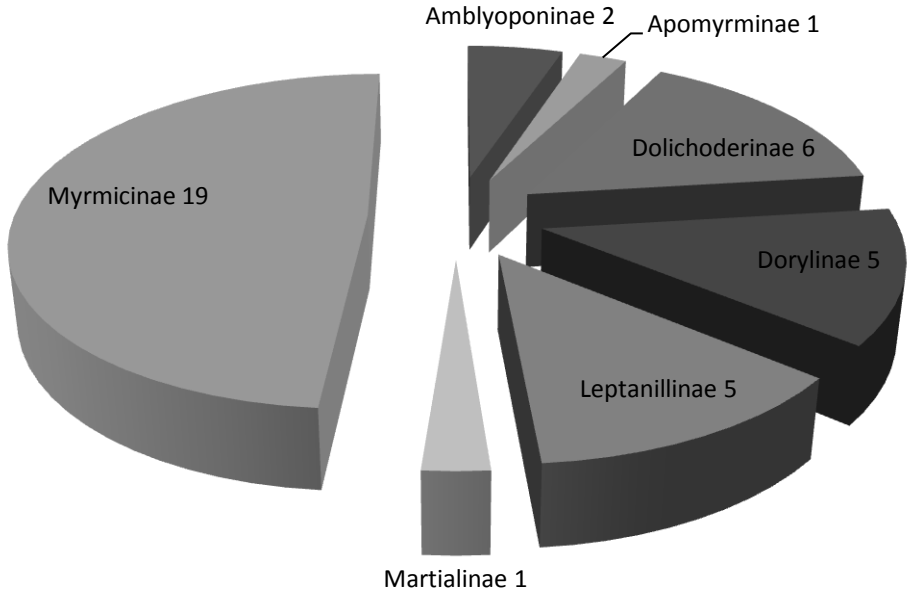
Linepithema



Pseudomyrmex

C. Distribution of the Hindwing of **Typology III**





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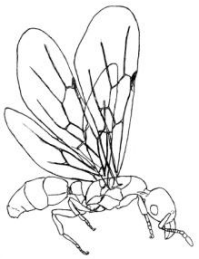

Winged Ants

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