



## A catalogue of the ants of Paraguay (Hymenoptera: Formicidae)

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### Abstract

The ant communities of the Paraná River drainage in South America have spawned several major invasive species and a number of cosmopolitan tramp species, including the fire ant *Solenopsis invicta* Buren and the Argentine ant *Linepithema humile* (Mayr). Paraguay sits at the center of the Paraná drainage but hosts one of the most poorly-documented ant faunas in the Neotropics, imposing a taxonomic impediment to ant studies in the region. In order to establish a baseline of knowledge about Paraguay's myrmecofauna, I surveyed nineteen entomological collections and the published literature for records of Paraguayan ants. The resulting catalogue lists 541 ant species, 423 of which could be associated with available names. The Chao-2 estimate of species richness, calculated from the incidence of uniques and doubletons, estimates that the total ant species richness for Paraguay is 698 +/- 35, suggesting that the catalogue is about 80% complete and more than 100 species remain to be discovered. The Paraguayan ant fauna is characterized by many typical Neotropical elements but shows low endemism, an elevated diversity of attine ants, and only six non-native species. No new taxa are described here, but 40 taxonomic changes are introduced to clean antiquated trinomials from the fauna. The history of Paraguayan myrmecology is discussed, and a reference list is provided for species-level identifications.

**Key words:** biodiversity, taxonomy, invasive species, neotropics

### Introduction

The landlocked South American country of Paraguay encompasses, in part, the native ranges of several of the most damaging invasive ant species. These species include the fire ant *Solenopsis invicta* Buren (Mescher *et al.* 2003), the little fire ant *Wasmannia auropunctata* (Roger) (Wetterer and Porter 2003), and the Argentine ant *Linepithema humile* (Mayr) (Wild 2004). In spite of the relevance of the region's fauna to the emerging field of invasion biology, the ants of Paraguay are among the most poorly known in the Neotropics (Fernández

and Sendoya 2004). An understanding of the origin of invasiveness will require an understanding of the ecology of source communities, and in turn this understanding will require a baseline of taxonomic knowledge currently lacking for the region. The present study represents a step towards creating that knowledge.

The goals of this study are threefold: first, to assemble a catalogue of Paraguayan ant species from the literature and from entomological collections; second, to evaluate the completeness of the catalogue by assessing the occurrence of unique and doubleton records; and third, to streamline the taxonomy by purging unjustified trinomials and dubious literature records from the fauna. This catalogue precedes an effort to create a set of online identification tools for the regional ant fauna in conjunction with Antweb, a centralized ant biodiversity site ([www.antweb.org](http://www.antweb.org)).

## Ecology

Paraguay is a low-lying South American country of 407,000 square kilometers, roughly equal in size to California, divided latitudinally by the Tropic of Capricorn and longitudinally by the Paraguay River. The country hosts few unique habitat types and little endemism, but it forms an ecotone between the major Neotropical biomes of Chaco, Pampas, Cerrado, Atlantic Coastal Forest, and Pantanal (Hayes 1995, Rios and Zardini 1989, Spichiger *et al.* 2004). The biota contains elements from all these assemblages, with many species occurring near their distributional limit (Hayes 1995, Willig *et al.* 2000).

Rainfall increases along a longitudinal gradient from less than 400 mm/year in the west to more than 1500 mm/year in the east (Hayes 1995, Keel *et al.* 1993), a pattern that divides the country between the semi-arid Chaco to the west of the Paraguay River, composed largely of scrub and gallery forests, and the more humid eastern Paraguay, a mix of grasslands, cerrados, and *terra firme* tall forests. Deforestation has been rapid and devastating, particularly in the tall forests of eastern Paraguay that now cover less than 10% of their original extent (Naidoo and Ricketts 2006).

## History of myrmecology in Paraguay

A remarkable aspect of Paraguayan myrmecology is the rarity with which studies of Paraguayan ants have been conducted within Paraguay's borders, or even by Paraguayans themselves. By the early part of the 20<sup>th</sup> century, neighboring countries supported active resident researchers such as Bruch (Argentina), Gallardo (Argentina), and Borgmeier (Brazil). In contrast, the broad history of Paraguayan myrmecology has been one of initial neglect followed by occasional foreign-based collectors removing specimens for taxonomic study elsewhere. As a consequence, the Paraguayan myrmecofauna is among the more poorly known in the Neotropics. Studies within Paraguay remain difficult because most specimens collected there, including primary types, no longer reside in the country.

Human history in Paraguay from pre-Colombian times until the recent past has been largely agrarian, and Paraguayan culture remains intimately associated with the biota of the region. The rich folk taxonomy of the predominant Guaraní-speaking population includes the country's ubiquitous ant fauna. Most rural Paraguayans, for instance, can differentiate between the leaf-cutting ant genera *Acromyrmex* (akeké, in Guaraní) and *Atta* (ysaú), and they did so long before western taxonomists divided the two genera (Mayr 1865, Emery 1913b). Other commonly recognized ants are tahyí guaikurú (*Eciton burchellii*), tahyí nê (*Labidus praedator*), tahyí hû pukú (*Pachycondyla* spp.), tahyí heví pu'a (*Crematogaster* sp.), tahyí pytâ'i (*Solenopsis saevissima*-complex spp.), and tahyí tarová (*Dorymyrmex* spp. and *Paratrechina fulva*).

Paraguay's myrmecofauna first attracted the attention of European scientists in the late 1800s. Although studies as early as 1830 reported on other aspects of the country's biota (e.g., Rengger 1830), few ant specimens made their way to taxonomists until around 1890. In relatively quick succession, several European expeditions traveled the Paraguay River and inland to various sites in eastern Paraguay, taking collections around Asunción, Concepción, San Pedro, Villarica, and Lago Ypoa. This first wave of collectors were largely Italian, following a surge in Italian immigration into Paraguay during that period, and included Luigi Balzán

(Emery 1890a, Emery 1890b), J. Bohls (Emery 1896b), Alfredo Borelli (Emery 1894a, Emery 1894b, Emery 1905), and P. Jordan. The resulting collections included ants that ended up in the hands of eminent Italian myrmecologist Carlo Emery, who described them in numerous papers over the next 15 years. Specimens from these early expeditions are stored mostly at MCSN, MHNG, NHMB, and NHMW (museum abbreviations explained below).

A number of collectors were active in Paraguay around the turn of the century. Argentinean mycologist Carlos Spegazzini collected ants around Asunción (Santschi 1923c), ethnographer Guido Boggiani collected specimens in the Chaco, Hungarian zoologist Alejandro Vezényi collected around Asunción (Forel 1907b, Forel 1911b), and entomologist Filippo Silvestri collected in Pilar and Alto Paraná (Emery 1906). The bulk of collections from this period, however, come from Karl Fiebrig.

Fiebrig, a scientist from Hamburg, arrived in Paraguay in 1902. In 1910 he took a professorship of botany and zoology at the University of Asunción and in 1914 founded a botanical and zoological garden near the capitol. Fiebrig collected across a broad range of taxa, but sent many ant specimens to the Swiss myrmecologist Auguste Forel (Forel 1906, Forel 1908b, Forel 1909, Forel 1912a, Forel 1912d). Prior to his departure in 1936, Fiebrig also published some brief natural history observations on the local ant fauna (Fiebrig 1935). The majority of Fiebrig's ant collections were made in the German colony of San Bernadino in the Cordillera Department northeast of Asunción, and his specimens are now divided among many museums including MCSN, MCZC, MHNG, MZSP, NHMB, and NHMW.

The period from 1936 to the mid-1950s saw little collecting. Eastern Paraguay, more heavily populated and accessible than the Chaco, received the bulk of sporadic collecting effort from the 1950s to the mid 1970s. Argentinean myrmecologist Nicolás Kusnezov collected in Colonia Independencia and Caacupé in 1958, depositing specimens at IFML and MZSP. Noel Louis Hilmer Krauss visited Paraguay in 1961, leaving specimens at USNM. Swiss biologist Peter Duelli made extensive collections in Itapua in 1974. Duelli's specimens reside at MZSP.

Two developments in the late 1970s added substantial Paraguayan material to the world's museums and, at long last, to Paraguay's own nascent national museum. The first development was a pair of Swiss expeditions in 1979 and 1982 by Baud, Dlouhy, Mahnert, Perret, and Vaucher employing intensive litter-sifting methods at sites across eastern Paraguay, including locations now submerged by the reservoir behind the Itaipu dam. Although no ant publications emerged directly from these expeditions, a vast amount of material was distributed between BMNH and MHNG that has been used in subsequent taxonomic revisions of *Rogeria* (Kugler 1994) and the Dacetini (Bolton 2000).

The second development was the creation of the Inventario Biológico Nacional del Paraguay in 1977, a joint project between the Paraguayan government and the United States Peace Corps. The Inventario Biológico Nacional was the first systematic effort to catalogue the biodiversity of the entire country and to retain material locally. Ants collected using pitfall traps, blacklights and a variety of other methods by Kochalka, Ferreira, Mueller, Boone, and others are stored at INBP in San Lorenzo. The organization has since morphed into the Museo Nacional de Historia Natural del Paraguay and researchers with the museum continue conducting biological surveys throughout the country. The most active collector of ants associated with the museum at the time of this writing is the hymenopterist Bolivar Garcete-Barrett.

The Inventario Biológico Nacional included an American researcher, Harold Fowler, who has the distinction of being the first ant specialist to reside in Paraguay for any length of time. Fowler published a list of new species records for Paraguay (Fowler 1981), some notes on the army ant *Labidus praedator* (Fowler 1979a), a description of a new *Trachymyrmex* (Fowler 1982), and a series of papers on leaf-cutting ants (Fowler 1977, Fowler 1979b, Fowler and Robinson 1979, Fowler 1983, Fowler 1985, Fowler 1988). Unfortunately, many of Fowler's Paraguayan collections were lost in a shipping mishap and are no longer available for study (Kochalka, pers. comm.).

Recent myrmecological efforts in Paraguay include applied research on leaf-cutting ants conducted at the Universidad Nacional de Asunción (Lajarthe Cassanello 2000) and local studies on the ant genera *Pogonomyrmex* and *Camponotus* (J. Jara, unpublished). The field work involved in the present study, conducted by the author between 1995 and 2002 in numerous locations across Paraguay, has resulted in a key to the Paraguayan species of *Pachycondyla* (Wild 2003) and the discovery of a previously undescribed genus, *Gracilidris*, in the Chaco (Wild and Cuezco 2006). In an ongoing project, a team of Belgian ecologists headed by Maurice LePonce and Thibaut Delsinne has been systematically sampling ants across a moisture gradient in the Chaco since 2002 (Delsinne *et al.* 2004). A preliminary look at this new material, some of which has been included in the present catalogue, reveals potential new records for the country and at least one new species, *Linepithema cryptobioticum* Wild 2007.

## Material and methods

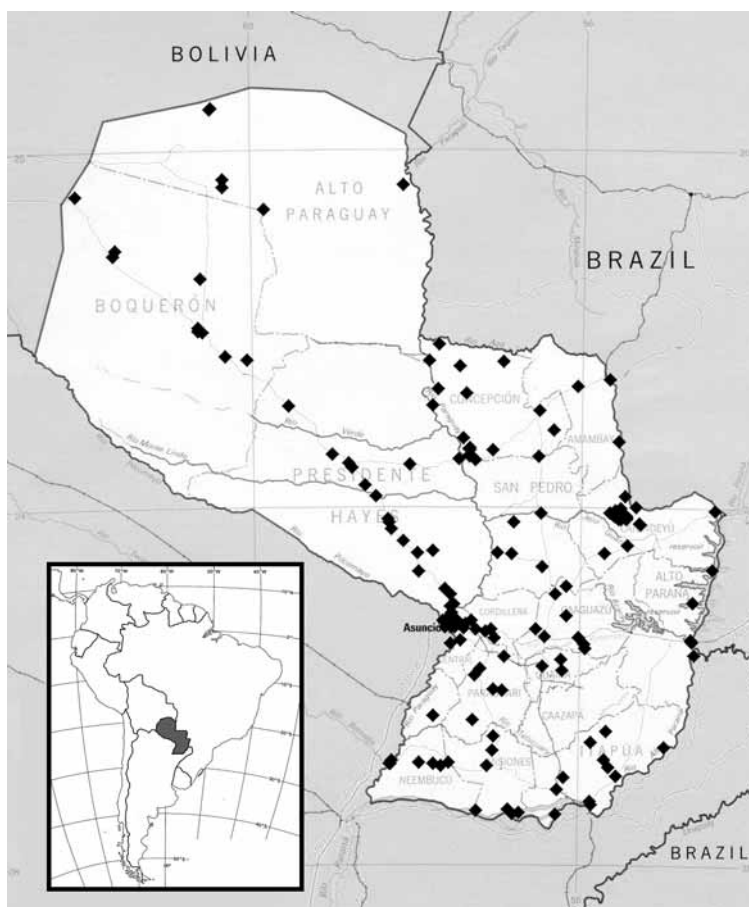
### Species records

Ant species records were gathered from museum collections known to have significant Neotropical holdings, from recent field collections, and from the published literature. Published accounts of Paraguayan species were accepted only when deemed credible and amounted to 270 occurrence records. I confirmed all but 37 of these credible records by locating referenced material during several museum visits to Europe, Paraguay, and Brazil in 2002 and 2004. Many of the unconfirmed records refer to Fowler's material (Fowler 1981) that was lost in shipping. Non-credible records are listed, with justification, as "dubious and erroneous records" at the end of the catalogue.

A majority of records originate from specimens held in over a dozen entomological institutions in Europe, South America, and North America. Paraguayan collection localities of all the examined material are plotted in Figure 1. Abbreviations of entomological collections used in this study are as follows:

ALWC	Alexander L. Wild personal collection, Tucson, Arizona, USA.
BMNH	British Museum of Natural History, London, UK.
CASC	California Academy of Sciences, San Francisco, California, USA.
IFML	Instituto Fundación Miguel Lillo, Tucumán Argentina.
INBP	Museo Nacional de la Historia Natural del Paraguay, San Lorenzo, Paraguay.
JTLC	John T. Longino personal collection, Evergreen, Washington, USA.
LACM	Natural History Museum of Los Angeles County, Los Angeles, California, USA.
MACN	Museo Argentina de Ciencias Naturales, Buenos Aires, Argentina.
MCSN	Museo Civico de Historia Natural 'Giacomo Doria', Genoa, Italy.
MCZC	Museum of Comparative Zoology, Cambridge, Massachusetts, USA.
MHNG	Muséum d'Histoire Naturelle, Geneva, Switzerland.
MZSP	Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil.
NHMB	Naturhistorisches Museum, Basel, Switzerland.
NHMW	Naturhistorisches Museum Wien, Vienna, Austria.
PSWC	Philip S. Ward personal collection, Davis, California, USA.
QCAZ	Museo de Zoología de la Pontificia Universidad Católica del Ecuador, Quito, Ecuador.
UCDC	R. M. Bohart Museum of Entomology, Davis, California, USA.
USNM	National Museum of Natural History, Washington, D.C., USA.
WPMC	William P. MacKay personal collection, El Paso, Texas, USA.

I supplemented existing museum material with occasional field collections in Paraguay from 1995 to 1998 and again in 2002. Over the course of the study I was able to collect in most of the major terrestrial habitat types in Paraguay in the departments of Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Misiones, Ñeembucú, Paraguari, Pte. Hayes, and San Pedro. Particular effort was expended in the Mbaracayú forest reserve in Canindeyú, a 65,000 hectare fragment of Atlantic forest and cerrado habitats and among the most biologically rich areas of the country (Keel *et al.* 1993). I used several methods including hand-collecting, blacklighting, Malaise traps, Berlese funnels, and tuna baits. On several occasions I took advantage of tree falls and logging activities to collect canopy-dwelling species. This collecting effort was not systematic but rather a function of available time and resources. I have also received useful recent material from Thibaut Delsinne, who is systematically sampling ants in the Chaco for a dissertation project.



**FIGURE 1.** Collection locations of Paraguayan ants based on museum specimens. Collections unaccompanied by specific location information (e.g., “Chaco”) are omitted.

To evaluate the completeness of this catalogue I used the program EstimateS 8.0 (Colwell 2006) to calculate Chao-2, a non-parametric estimator that uses the incidence of uniques and duplicates to infer the total species richness and the number of unsampled species in a location (Chao 1987). Calculation of Chao-2 requires discrete samples, so I treated each record as a separate sample. A record was considered either as a unique literature account or as a single collector by date by location combination, a measure that avoids the redundancy inherent in counting individuals within nest series. Care was taken to avoid multiple counts of single records reported in more than one literature account or of single collection series divided across multiple museums. EstimateS was also used to generate smoothed rarefaction curves over 50 iterations of random sampling, without replacement, from the records data base.

## Specimen identification and vouchering

Specimens were identified using a variety of resources. After sorting all assembled collections to morphospecies, I consulted published taxonomic keys and descriptions (Table 1) to identify candidate names. In many cases I sent specimens to specialists of particular groups. These include Jack Longino (*Crematogaster*), Phil Ward (*Pseudomyrmex*), Gordon Snelling (Ecitoninae), Bill MacKay (*Acanthostichus* and *Camponotus*), John Lattke (*Gnamptogenys*, *Apterostigma*, *Amblyopone*), Fabiana Cuzzo (*Forelius*, *Dorymyrmex*), Jeffrey Sossa (*Myrmicocrypta*), Christiana Klingenberg (*Mycetophylax*), and Bodo Dietz (Basicerotini). Finally, I checked representatives of all morphospecies against material in several identified museum collections. The collections of F. Smith (BMNH), Mayr (NHMW), Forel (MHNG), Emery (MCSN), Santschi (NHMB), Borgmeier (MZSP), and Kempf (MZSP) were rich in relevant type material, and I was able to compare Paraguayan material to primary type specimens for a majority of taxa in the catalogue. Voucher specimens of my own collections from Paraguay have been deposited in several museums, with the largest amount of material in INBP, LACM, and ALWC.

To the best of my knowledge, all names presented here are the currently valid names according to the International Commission on Zoological Nomenclature code of nomenclature (ICZN 1999). Taxon names generally follow Bolton *et al.* (2006) except for taxa that have undergone subsequent revision and for the taxonomic changes proposed here. Some specimens eluded positive identification, especially in genera such as *Camponotus*, *Hypoponera* and *Solenopsis* that lack modern revisions. These specimens were sorted to morphospecies and are listed in the catalogue with the format “sp. alw-##”, except in a few cases where the relevant taxonomic specialists have already affixed their own labels to undescribed species (e.g., Phil Ward’s “*Pseudomyrmex* psw-57”). These names are unavailable according to the zoological code (ICZN 1999). Some of the morphospecies records may pertain to undescribed species, but many are likely described taxa that I was unable to identify with the available resources.

## Taxonomic changes

Neotropical ant taxonomy is rife with outdated and meaningless trinomens (Fernández and Sendoya 2004) that are largely an artifact of taxonomic practice prior to the NeoDarwinian synthesis (Mayr 1942, Wilson and Brown 1953). In the present study I attempt to purge trinomens from previous literature records of Paraguayan ants by either raising names to the species level or synonymizing them with older names. These changes are given in Appendix 2, presented in the same taxonomic order as in the catalogue.

**TABLE 1.** Selected resources for identifying Paraguayan ants to the species level.

<i>Acanthognathus</i>	Brown and Kempf 1969
<i>Acanthoponera</i>	Kempf and Brown 1968
<i>Acanthostichus</i>	Mackay 1996
<i>Acromyrmex</i>	Fowler 1985, Fowler 1988 ( <i>Moellerius</i> ), Gonçalves 1961
<i>Acropyga</i>	LaPolla 2004
<i>Adelomyrmex</i>	Fernández 2003a
<i>Amblyopone</i>	Lattke 1991
<i>Anochetus</i>	Brown 1978
<i>Apterostigma</i>	Lattke 1997
<i>Atta</i>	Borgmeier 1959b, Fowler 1985
<i>Azteca</i>	Longino 2007 ( <i>aurita</i> species group)
<i>Bariamyrma</i>	Lattke 1990
<i>Basicerros</i>	Brown and Kempf 1960
<i>Brachymyrmex</i>	Quirán <i>et al.</i> 2004 (in part), Santschi 1923a (out of date)

<i>Camponotus</i>	Hashmi 1973 ( <i>Myrmothrix</i> )
<i>Carebara</i>	Fernández 2004
<i>Centromyrmex</i>	Kempf 1967b
<i>Cephalotes</i>	Andrade and Baroni Urbani 1999; Kempf 1951
<i>Cylindromyrmex</i>	Andrade 1998
<i>Cyphomyrmex</i>	Kempf 1964c ( <i>strigatus</i> group), Snelling and Longino 2002 ( <i>rimosus</i> group)
<i>Dinoponera</i>	Kempf 1971
<i>Discothyrea</i>	Borgmeier 1949
<i>Dolichoderus</i>	MacKay 1993
<i>Eciton</i>	Borgmeier 1955; Watkins 1976
<i>Ectatomma</i>	Kugler and Brown 1982
<i>Eurhopalothrix</i>	Ketterl <i>et al.</i> 2004
<i>Forelius</i>	Cuezzo 2000
<i>Gracilidris</i>	Wild and Cuezzo 2006
<i>Gnamptogenys</i>	Lattke 1995
<i>Heteroponera</i>	Kempf 1962
<i>Hylomyrma</i>	Kempf 1973
<i>Labidus</i>	Borgmeier 1955; Watkins 1976
<i>Linepithema</i>	Wild 2007
<i>Megalomyrmex</i>	Brandão 1990
<i>Mycetarotes</i>	Mahyé-Nunes 1995
<i>Mycetosoritus</i>	Kempf 1968
<i>Mycocepurus</i>	MacKay <i>et al.</i> 2004
<i>Neivamyrmex</i>	Borgmeier 1955; Watkins 1976
<i>Nesomyrmex</i>	Kempf 1959
<i>Nomamyrmex</i>	Borgmeier 1955; Watkins 1976
<i>Ochetomyrmex</i>	Fernández 2003b
<i>Octostruma</i>	Brown and Kempf 1960
<i>Odontomachus</i>	Brown 1976
<i>Oxyepoecus</i>	Albuquerque and Brandão 2004 ( <i>vezenyii</i> group), Kempf 1974
<i>Pachycondyla</i>	Wild 2003, Wild 2005 ( <i>apicalis</i> species group)
<i>Pheidole</i>	Wilson 2003
<i>Platythyrea</i>	Brown 1975
<i>Pogonomyrmex</i>	Taber 1998
<i>Prionopecta</i>	Brown 1960
<i>Procryptocerus</i>	Kempf 1951, Longino and Snelling 2002
<i>Pseudomyrmex</i>	Ward 1989 ( <i>oculatus</i> and <i>subtilissimus</i> groups); Ward 1999 ( <i>viduus</i> -group).
<i>Pyramica</i>	Bolton 2000
<i>Rhopalothrix</i>	Brown and Kempf 1960
<i>Rogeria</i>	Kugler 1994
<i>Solenopsis</i>	Trager 1991 ( <i>saevissimus</i> complex)
<i>Strumigenys</i>	Bolton 2000
<i>Thaumatomyrmex</i>	Kempf 1975
<i>Trachymyrmex</i>	Mayhé-Nunes and Brandão 2002, Mayhé-Nunes and Brandão 2005
<i>Tranopelta</i>	Fernández 2003b
<i>Typhlomyrmex</i>	Brown 1965

My decisions to elevate or to synonymize trinomens draw heavily on the Biological Species Concept of Mayr (1942), where consistent differences in sympatry between hypothesized species are indicative of species boundaries. Thus, trinomial taxa that are sympatric with and distinct from their putative conspecific taxa are generally elevated, while trinomial taxa that are allopatric with conspecific taxa are synonymized. I avoid synonymy of binomens except in a few cases where examination of primary type specimens reveals a relatively unambiguous case of species identity.

## Results

A total of 3,912 records revealed 541 species of ants occurring in Paraguay (Appendix 1). 504 of these species were represented at least in part by museum records whose identity could be verified, and the remaining 37 were literature records of species whose known distributions suggest that Paraguayan occurrence is credible. 423 species could be assigned to named species-level taxa, while 118 additional morphospecies (23% of the total) were not identified as belonging to known species. The genera with the highest rate of unassignable species were *Eurhopalothrix* (4 of 5 species unassigned), *Trachymyrmex* (7/11), *Hypoponera* (12/22), *Paratrechina* (4/7), and *Cyphomyrmex* (7/13). The 50 most frequently recorded ant species from Paraguay are listed in Table 2.

155 species were represented by a single record each, and 75 were represented by just two records. The Chao-2 estimate of species richness, based on the incidence of uniques and duplicates, is 698 +/- 35 species. Thus, the estimate of total richness suggests that this catalogue is about 80% complete and that roughly 160 species remain to be discovered in Paraguay. The smoothed rarefaction curve from the data set is given in Figure 2. As the rarefaction curve does not asymptote the Chao-2 estimate is probably conservative, representing a lower bound of what may be expected with additional sampling.

**TABLE 2.** The 50 most frequently recorded ant species from Paraguay. The combined records of these species comprise nearly 40% of all ant records from Paraguay. Minor workers in the abundant *Solenopsis saevissima* complex are not easily identifiable to species (Trager 1991) and have been grouped together here.

<i>Solenopsis saevissima</i> complex indet minor workers ( <i>S. invicta</i> + <i>S. macdonaghi</i> + <i>S. saevissima</i> )	88
<i>Atta sexdens</i>	68
<i>Cephalotes pusillus</i>	63
<i>Camponotus crassus</i>	53
<i>Acromyrmex fracticornis</i>	52
<i>Paratrechina fulva</i>	51
<i>Pseudomyrmex gracilis</i>	51
<i>Pachycondyla striata</i>	49
<i>Ectatomma brunneum</i>	43
<i>Cephalotes atratus</i>	41
<i>Pheidole reflexans</i>	41
<i>Wasmannia auropunctata</i>	40
<i>Acromyrmex crassispinus</i>	38
<i>Dorymyrmex spurius</i>	36
<i>Pheidole obscurithorax</i>	35
<i>Pogonomyrmex naegeli</i>	35
<i>Pseudomyrmex flavidulus</i>	34
<i>Brachymyrmex cordemoyi</i>	33
<i>Pachycondyla villosa</i>	33
<i>Brachymyrmex aphidicola</i>	31



<i>Camponotus pellitus</i>	31
<i>Labidus praedator</i>	31
<i>Acromyrmex rugosus</i>	30
<i>Crematogaster curvispinosa</i>	30
<i>Crematogaster quadriformis</i>	30
<i>Acromyrmex balzani</i>	29
<i>Dolichoderus bispinosus</i>	29
<i>Dorymyrmex thoracicus</i>	28
<i>Camponotus renggeri</i>	27
<i>Ectatomma edentatum</i>	27
<i>Brachymyrmex patagonicus</i>	25
<i>Labidus coecus</i>	25
<i>Cephalotes depressus</i>	24
<i>Crematogaster chodati</i>	24
<i>Pheidole flavens</i>	24
<i>Camponotus sericeiventris</i>	23
<i>Camponotus sexguttatus</i>	23
<i>Cephalotes minutus</i>	23
<i>Pheidole oxyops</i>	23
<i>Hypoponera distinguenda</i>	22
<i>Dorymyrmex brunneus</i>	21
<i>Pheidole radoszkowskii</i>	21
<i>Camponotus melanoticus</i>	20
<i>Camponotus punctulatus</i>	20
<i>Camponotus rosariensis</i>	20
<i>Camponotus rufipes</i>	20
<i>Cephalotes clypeatus</i>	20
<i>Linepithema humile</i>	20
<i>Mycocepurus smithii</i>	20
<i>Nesomyrmex spininodis</i>	20

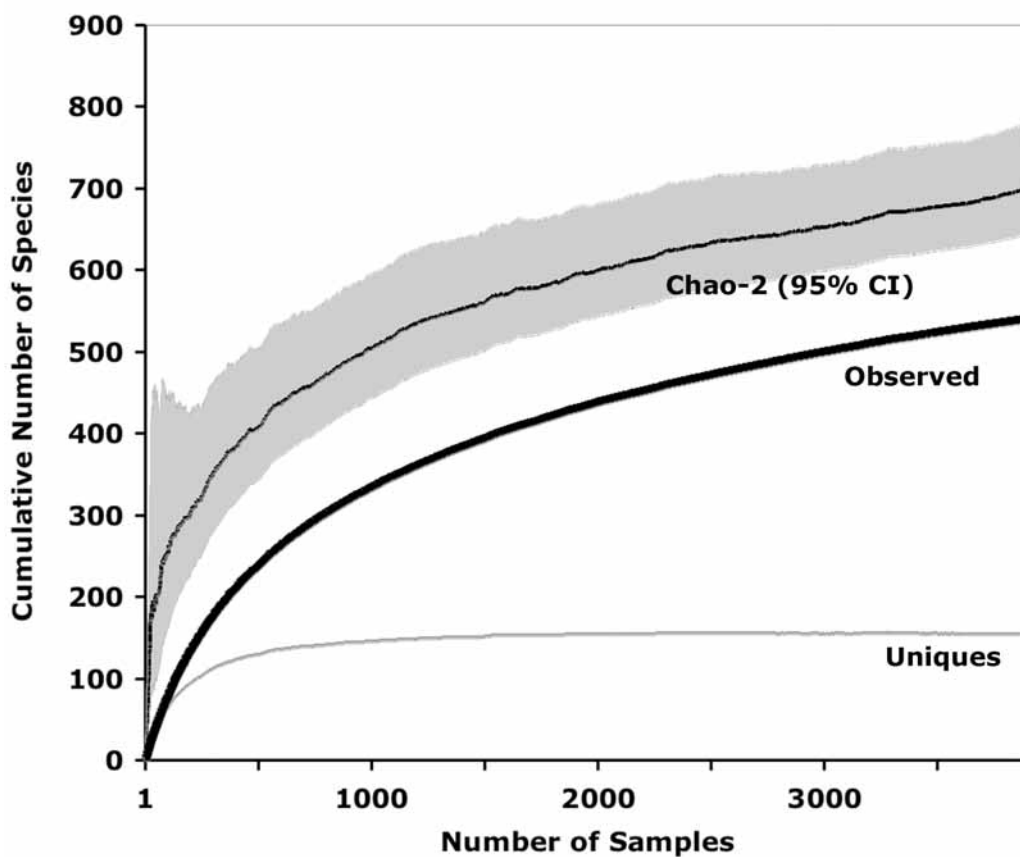
The overwhelming majority of species records (536 of 541; 98.9%) and of specimen records (3,893 of 3,912; 99.5%) are of species that are likely native to the region. Only six non-native species were recorded. *Monomorium pharaonis* and *Tetramorium simillimum* were first noted by Fowler (1981), while *Monomorium floricola*, *Paratrechina longicornis*, *Hypoconera punctatissima*, and *Tapinoma melanocephalum* are reported here for the first time from specimens collected in the mid-1990s at several locations in eastern Paraguay.

At least twelve species presumably native in Paraguay have been successfully introduced elsewhere in the world. These species (*Brachymyrmex patagonicus*, *Cyphomyrmex rimosus*, *Hypoconera opaciceps*, *Linepithema humile*, *Pachycondyla stigma*, *Paratrechina fulva*, *Pheidole obscurithorax*, *Pseudomyrmex gracilis*, *Solenopsis invicta*, *Solenopsis richteri*, *Strumigenys louisianae*, and *Wasmannia auropunctata*) account for 2.4% of species records and 9.3% of specimen records.

## Discussion

The Paraguayan ant fauna is in many respects typical for the Neotropics, and the country hosts 77 of the 113 known Neotropical genera (Fernández and Sendoya 2004). The fauna contains impressive numbers of the cosmopolitan groups *Camponotus*, *Hypoconera*, *Pheidole*, *Crematogaster*, *Strumigenys* and *Solenopsis*, as well as a diversity of ants from the endemic New World genera *Acromyrmex*, *Cephalotes*, *Neivamyrmex*, and *Pseudomyrmex*. However, Paraguay's myrmecofauna is notable for at least three exceptional patterns.

First, the Paraguayan ant fauna occupies an interface between many different biomes and contains elements from each, a pattern previously documented in the region for bats (Willig *et al.* 2000), birds (Hayes 1995) and plants (Keel *et al.* 1993). Tropical humid forest species at the southern extent of their range include, for example, *Paraponera clavata*, *Pachycondyla crassinoda*, *Atta laevigata*, *Eciton burchellii*, and *Camponotus sericeiventris*. Temperate pampas species towards the northern extent of their range include *Pogonomyrmex uruguayensis*, *Acromyrmex heyeri*, and *Camponotus termitarius*. Chacoan species finding their eastern limit in Paraguay include *Dorymyrmex exsanguis* and *Atta vollenweideri*. Atlantic forest species at their westernmost extent include *Heteroponera flava*, *Tapinoma atriceps*, and *Acanthognathus rudis*. Correspondingly, Paraguay shows low endemism. A few rare species such as *Pyramica metrix*, *Cephalotes guayaki* and *Linepithema cryptobioticum* are known only from Paraguay, but this apparent endemism could stem from an overall rarity of these species and an incomplete sampling throughout the Neotropics, rather than reflecting actual endemism.



**FIGURE 2.** Smoothed species accumulation curves for Paraguayan ants, generated over 50 sampling iterations on 3,912 randomized species records.

Second, Paraguay supports an elevated diversity of fungus-growing attine species. 65 species, or 12% of the Paraguayan fauna, are attines. This diversity has been noted previously for the leaf-cutting genera (Fowler and Claver 1991), and is of consequence not only for the pest status of the leaf-cutters in the region (Lajarthe Cassanello 2000) but because the attines are a model system for studies of mutualism and co-evolution (Muel-ler *et al.* 2005). Studies of attine evolution and diversification could benefit from an increased effort in the region.

Finally, Paraguay- or at least the larger Paraná drainage- is unique on a global scale in that it appears to have exported more invasive species than it has received. Whether the paucity of exotics in Paraguay stems

from a simple lack of opportunity (e.g., Suarez *et al.* 2005), or reflects something deeper about the ecology of the region, is an open question. Likewise, the propensity of the regional ant fauna to produce so many invasive species is also poorly understood, although recent work in northern Argentina has begun to address the issue (LeBrun *et al.* 2007).

An abundance of unnamed morphospecies in this catalogue underscores the woefully incomplete state of Neotropical taxonomy. Many groups, including the ubiquitous genera *Camponotus* and *Hypoponera*, have not received modern revisionary attention. Species limits are often poorly understood, the nomenclature cluttered with artifacts, and resources for species-level identification non-existent. Regional catalogues such as the one generated in the present study are only as good as the underlying taxonomy, and it is clear that a concerted effort to describe and revise the Neotropical fauna at the species level will greatly enhance the utility of future such studies.

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## Appendix 1. Ant taxa occurring in Paraguay

### Catalogue entries have the following format:

#### Subfamily Name

**Genus name** Author, year of publication

**species name and infraspecific name** Author, year of publication. Departmental locations of examined specimens (collections where examined material resides). Literature records: departmental locations of literature records (sources for literature records).

Within each Linnean rank taxa are listed alphabetically. Locality data for each examined specimen and literature record are listed at the level of Department, the primary administrative division of Paraguay. Records from the city of Asunción are included in the Central Department. In most cases, more specific locality information is available and can be obtained from the author. An asterisk (\*) denotes species not native to Paraguay.

#### Subfamily Amblyoponinae

*Amblyopone* Erichson 1842

*armigera* Mayr 1887. Boquerón, Central, Misiones (ALWC, BMNH, MHNG).

*lurilabes* Latke 1991. Alto Paraná, Amambay, Canindeyú, Itapúa (ALWC, BMNH, INBP, MHNG).

*Prionopelta* Mayr 1866a

*antillana* Forel 1909. Alto Paraná, Amambay, Canindeyú (ALWC, BMNH, IFML, INBP, LACM, MHNG).

*punctulata* Mayr 1866a. Canindeyú, Concepción, Misiones (ALWC, BMNH, MHNG).

#### Subfamily Cerapachyinae

*Acanthostichus* Mayr 1887

*brevicornis* Emery 1894a. Canindeyú (ALWC, INBP, LACM, MHNG). Literature records: Canindeyú (MacKay 2004).

*kirbyi* Emery 1895b. "Paraguay" (s. loc.) (MCSN). Literature records: "Paraguay" (s. loc.) (Emery 1895b).

*laticornis* Forel 1908b. Cordillera (MCSN, MHNG, NHMB). Literature records: Cordillera, "Paraguay" (s. loc.) (Forel 1908b, Forel 1911a, MacKay 1996, Santschi 1916).

*longinodis* MacKay 2004. Alto Paraguay (INBP, MCZC, WPMC). Literature records: Alto Paraguay (MacKay 2004).

*serratulus* (F. Smith 1858). Literature records: Cordillera, "Paraguay" (s. loc.) (Emery 1894d, Forel 1895, Forel 1906).

*Cerapachys* F. Smith 1857

**sp. alw-01.** Canindeyú (ALWC, INBP).

*Cylindromyrmex* Mayr 1870b

*brasiliensis* Emery 1901. Paraguairí, San Pedro (ALWC, PSWC). Literature records: Cordillera (de Andrade 1998, Forel 1906).

#### Subfamily Dolichoderinae

*Anillidris* Santschi 1936

*bruchii* Santschi 1936. Literature records: Pte. Hayes (Fowler 1981).

*Azteca* Forel 1878

*adrepens* Forel 1911b. Canindeyú, Cordillera, San Pedro (ALWC, IFML, INBP, LACM, MHNG, NHMB). Literature records: Cordillera (Forel 1911b).

- alfari* Emery 1893a. Alto Paraná, Caaguazú, Canindeyú, Central, Cordillera, Itapúa, Ñeembucú, “Paraguay” ( s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MCZC, MHNG). Literature records: Alto Paraná, Cordillera, “Paraguay” (s. loc.) (Emery 1893l, Forel 1908b, Longino 1989).
- leuderwaldti* Forel 1909. Central, Cordillera, “Paraná R.” (Dept. unknown) (ALWC, MCZC, MHNG, NHMB). Literature records: Cordillera (Forel 1909).
- schimperii* Emery 1893b. Cordillera, “Paraná R.” (Dept. unknown) (LACM, MCZC, MHNG, MZSP, NHMB). Literature records: Central, Cordillera, “Paraguay” (s. loc.) (Forel 1909 [as “*fiebrigi*”], Fowler 1981 [as “*clariceps*”], Longino 2007, Santschi 1916 [as “*fiebrigi*”]).
- sp. alw-01.** Alto Paraná, Amambay, Canindeyú, Central, Ñeembucú, Pte. Hayes (ALWC, IFML, INBP, LACM, MZSP, NHMB).

#### *Dolichoderus* Lund 1831a

- bispinosus* (Olivier 1792). Alto Paraná, Canindeyú, Central, Concepción, Cordillera, Guairá, Ñeembucú, San Pedro, “Paraná R.” (Dept. unknown), “Paraguay” ( s. loc.) (ALWC, IFML, INBP, LACM, MCZC, MZSP, NHMB, NHMW). Literature records: Central, Cordillera (Emery 1906, Forel 1909).
- germaini* Emery 1894a. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MCZC, MZSP). Literature records: “Paraguay” (s. loc.) (Emery 1896b).
- lamellosus* (Mayr 1870a). Alto Paraná, Caaguazú, Canindeyú, Central (ALWC, INBP, LACM).
- lutosus* (F. Smith 1858). Canindeyú, Cordillera, San Pedro (ALWC, INBP, LACM). Literature records: “Paraguay” (s. loc.) (Emery 1894b).

#### *Dorymyrmex* Mayr 1866a

- bituber* Santschi 1916. Boquerón (ALWC, IFML).
- brunneus* Forel 1908b. Caaguazú, Canindeyú, Central, Cordillera, Guairá, Ñeembucú, Paraguairí, San Pedro, “Chaco” (Dept. unknown) (ALWC, IFML, INBP, LACM, MZSP, NHMB, NHMW). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1913a, Forel 1911a).
- exsanguis* Forel 1912d. Boquerón (ALWC, IFML).
- jheringi* Forel 1912d. Canindeyú (ALWC, IFML).
- paranensis* Santschi 1922a. Amambay, Caaguazú, Central, Concepción, Cordillera, Paraguairí (ALWC, IFML, INBP, LACM, MHNG, MZSP, NHMB). Literature records: Central, Cordillera, “Paraguay” (s. loc.) (Emery 1913a, Forel 1911b, Santschi 1922a). **NEW STATUS.**
- spurius* Santschi 1929b. Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Paraguairí, Pte. Hayes, San Pedro (ALWC, IFML, INBP, LACM, MHNG). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1913a, Forel 1911b, Kempf 1975c).
- thoracicus* Gallardo 1916. Boquerón, Canindeyú, Central, Misiones, Ñeembucú, Paraguairí, Pte. Hayes, San Pedro (ALWC, IFML, INBP, LACM).
- sp. alw-03.** Boquerón (ALWC).

#### *Forelius* Emery 1888b

- brasiliensis* (Forel 1908b). Boquerón, Central, Cordillera (ALWC, IFML, INBP, LACM, MHNG, NHMB). Literature records: Cordillera, Pte. Hayes (Forel 1909a, Forel 1912d, Cuezco 2000).
- nigriventris* Forel 1912d. Boquerón, Pte. Hayes (ALWC, IFML, INBP). Literature records: Boquerón (Cuezco 2000).
- pusillus* Santschi 1922a. Canindeyú (ALWC, IFML).
- sp. alw-01.** Boquerón (ALWC).
- sp. alw-02.** Pte. Hayes, Ñeembucú (ALWC, IFML).
- sp. alw-03.** Pte. Hayes (ALWC, IFML).

#### *Gracilidris* Wild and Cuezco 2006

- pombero* Wild and Cuezco 2006. Pte. Hayes (ALWC, BMNH, CASC, IFML, LACM, MCZC, MHNG, MZSP, UCDC, USNM). Literature records: Pte. Hayes (Wild and Cuezco 2006).

#### *Linepithema* Mayr 1866a

- aztecoides* Wild 2007. Canindeyú, Cordillera (ALWC, BMNH, CASC, IFML, INBP, JTLC, LACM, MCZC, MHNG, MZSP, NHMB, NHMW, QCAZ, UCDC, USNM). Literature records: Canindeyú, Cordillera (Wild 2007).
- cerradense* Wild 2007. Canindeyú, Central, Cordillera (ALWC, BMNH, CASC, IFML, INBP, LACM, MCZC, MHNG, MZSP, NHMB, UCDC, USNM). Literature records: Canindeyú, Central, Cordillera (Wild 2007).
- cryptobioticum* Wild 2007. Boquerón (ALWC, BMNH, INBP, LACM, MCZC, MHNG, MZSP, USNM). Literature



records: Boquerón (Wild 2007).

**gallardoi** (Brèthes 1914). Canindeyú, Central, Guairá, Itapúa, Pte. Hayes (ALWC, BMNH, CASC, INBP, IFML, LACM, MCZC, MHNG, MZSP, UCDC, USNM). Literature records: Canindeyú, Central, Guairá, Itapúa, Pte. Hayes (Wild 2007).

**humile** (Mayr 1868). Alto Paraguay, Boquerón, Central, Ñeembucú, Pte. Hayes, San Pedro, “Paraná R.” (Dept. unknown) (ALWC, BMNH, IFML, INBP, MACN, MCSN, MCZC, MHNG, MZSP, NHMB). Literature records: Alto Paraguay, Boquerón, Central, Ñeembucú, Pte. Hayes, San Pedro (Wild 2004, Wild 2007).

**iniquum** (Mayr 1870a). Canindeyú, Cordillera, Itapúa (ALWC, BMNH, CASC, INBP, LACM, MCZC, MZSP, UCDC). Literature records: Canindeyú, Cordillera, Itapúa (Wild 2007).

**micans** (Forel 1908b). Central (ALWC). Literature records: Central (Wild 2007).

**neotropicum** Wild 2007. Alto Paraná, Canindeyú (ALWC, BMNH, CASC, IFML, INBP, JTLC, MCZC, MHNG, MZSP, NHMB, PSWC, QCAZ, UCDC, USNM, WPMC). Literature records: Alto Paraná, Canindeyú (Wild 2007).

**pulex** Wild 2007. Canindeyú (ALWC, BMNH, CASC, IFML, LACM, MCZC, MHNG, MZSP, NHMW, UCDC, USNM). Literature records: Canindeyú (Wild 2007).

#### **Tapinoma** Foerster 1850a

**atriceps** Emery 1888a. Canindeyú (ALWC, IFML, INBP).

\***melanocephalum** (Fabricius 1793). Central, Concepción (ALWC, INBP).

**sp. alw-01**. Canindeyú (ALWC, IFML, INBP).

### Subfamily Ecitoninae

#### **Eciton** Latreille 1804

**burchellii** (Westwood 1842). Amambay, Canindeyú, Guairá, “Paraguay” (s. loc.) (ALWC, BMNH, INBP, IFML, LACM, MCSN, MZSP, NHMB, NHMW). Literature records: “Paraguay” (s. loc.) (Borgmeier 1955, Santschi 1920a).

**dulcium** Forel 1912a. Literature records: Canindeyú (Fowler 1981).

**mexicanum** Roger 1863a. Central, “Paraguay” (s. loc.) (MCSN, MHNG, MZSP, NHMB, NHMW). Literature records: Cordillera, “Paraguay” (s. loc.) (Borgmeier 1939, Emery 1894a, Forel 1911a).

**mexicanum argentinum** Borgmeier 1955. “San Alfredo, Paraguay” (Dept. unknown). (MZSP).

**quadriglume** (Haliday 1836). Literature records: Cordillera (Forel 1909).

**vagans** (Olivier 1792). Central, Paraguairí, “Paraná R.” (Dept. unknown) (ALWC, INBP, LACM, MCZC). Literature records: “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1896b, Santschi 1920a).

**vagans dubitatum** Emery 1896a. Caaguazú, Cordillera, “Paraguay” (s. loc.) (MCSN, MHNG, MZSP, NHMB, NHMW). Literature records: “Paraguay” (s. loc.), “San Alfredo, Paraguay” (Dept. unknown). (Borgmeier 1936, Borgmeier 1955, Emery 1910).

#### **Labidus** Jurine 1807

**coecus** (Latreille 1802). Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Ñeembucú, San Pedro, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MZSP, NHMW). Literature records: “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1894a, Emery 1896b, Santschi 1916, Wheeler 1921).

**mars** (Forel 1912a). Canindeyú (ALWC, INBP, LACM).

**praedator** (F. Smith 1858). Alto Paraná, Canindeyú, Central, Cordillera, Pte. Hayes, San Pedro, “Paraná R.” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCZC, NHMB, NHMW). Literature records: Central, Concepción, Cordillera, Ñeembucú, Pte. Hayes, San Pedro (Borgmeier 1955, Emery 1906, Forel 1906, Forel 1908b, Fowler 1979, Santschi 1916).

#### **Neivamyrmex** Borgmeier 1940

**angustinodis** (Emery 1888c). Canindeyú, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MZSP). Literature records: “Paraguay Centrale”, “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1894a, Emery 1894b).

**bohlsi** (Emery 1896b). Concepción(?) (MCSN, MHNG, MZSP). Literature records: Concepción(?) (Borgmeier 1955, Emery 1896b).

**carettei** (Forel 1913). Central (ALWC, INBP, LACM).

**clavifemur** Borgmeier 1953. Cordillera (LACM).

**diversinodis** (Borgmeier 1933). Central, Paraguairí (?), “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MZSP,

NHMW). Literature records: Central (?) (Borgmeier 1933, Borgmeier 1955).  
*goeldii* (Forel 1901d). Canindeyú (ALWC, INBP, LACM).  
*halidaii* (Schuckard 1840a). Literature records: Central (Santschi 1916).  
*hetchkoi* (Mayr 1886a). Caaguazú, Paraguari, “Paraguay” (s. loc.) (BMNH, MZSP, NHMB). Literature records: “Paraguay” (s. loc.) (Watkins 1976) [some records may refer to *diversinodis*].  
*hopei* (Schuckard 1840b). Canindeyú (ALWC). Literature records: “Paraguay” (s. loc.) (Watkins 1976).  
*jerrmanni* (Forel 1901e). Central, “Paraguay” (s. loc.) (MHNG, MZSP). Literature records: “Paraguay” (s. loc.) (Borgmeier 1955, Forel 1901e, Forel 1907d).  
*laevigatus* (Borgmeier 1948). Literature records: Pte. Hayes (Fowler 1981).  
*legionis* (F. Smith 1855). Literature records: Alto Paraná, “Paraguay” (s. loc.) (Borgmeier 1930, Fowler 1981).  
*orthonotus* (Borgmeier 1933). Canindeyú (ALWC, INBP, LACM).  
*peritii* (Schuckard 1840b). Central, “Paraguay” (s. loc.) (MCZC, MZSP, NHMB). Literature records: Guairá, “Paraguay” (s. loc.) (Borgmeier 1955, Forel 1895).  
*pilosus* (F. Smith 1858). Canindeyú, Cordillera, Paraguari, “Paraná R.” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, LACM, MCZC, MHNG, MZSP, NHMB). Literature records: Cordillera, “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1894a, Forel 1895, Forel 1909).  
*planidorsus* (Emery 1906). Literature records: Guairá (Borgmeier 1955, Emery 1906c).  
*pseudops* (Forel 1909). Cordillera, “Paraná R.” (Dept. Unknown) (LACM, MHNG, MZSP, NHMB). Literature records: Cordillera (Borgmeier 1955, Forel 1909).  
*puncticeps* (Emery 1894a). Canindeyú, Central, Cordillera, “Paraná R.” (Dept. unknown) “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, MCZC, MHNG, MZSP, NHMB). Literature records: Cordillera, “Paraguay” (s. loc.) (Borgmeier 1955, Santschi 1916).  
*romandii* (Schuckard 1840b). Concepción (MZSP). Literature records: Boquerón, Concepción, “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1900, Forel 1895, Forel 1907d).  
*shuckardi* (Emery 1900). Itapúa, “Paraguay” (s. loc.) (MCSN, MZSP). Literature records: Itapúa, “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1900, Emery 1910b).  
*sulcatus* Mayr 1868. Boquerón (MZSP).  
*swainsonii* (Schuckard 1840a). Itapúa, “Chaco Paraguay” (Dept. unknown), “Paraguay” (s. loc.) (MCSN, MHNG, MZSP). Literature records: Guairá, Itapúa, “Paraguay” (s. loc.) (Borgmeier 1955, Emery 1900, Emery 1910, Forel 1895).  
**spp.** (indet males) Alto Paraguay, Amambay, Boquerón, Concepción (ALWC, INBP, MCSN).

#### *Nomamyrmex* Borgmeier 1936

*esenbeckii* (Westwood 1842). Caaguazú, Canindeyú, Central, Concepción, Cordillera, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, MZSP, NHMB, NHMW). Literature records: Cordillera, “Paraguay” (s. loc.) (Borgmeier 1955, Forel 1906 [as “*crassicornis*”], Forel 1908b [as “*crassicornis*”], Forel 1909 [as “*crassicornis*”], Santschi 1929a).  
*hartigii* (Westwood 1842). Canindeyú, Central, Concepción (INBP, LACM, NHMB). Literature records: Central, Guairá (Borgmeier 1955, Santschi 1916).

### Subfamily Ectatomminae

#### *Ectatomma* F. Smith 1858

*brunneum* F. Smith 1858. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Cordillera, Guairá, Itapúa, Misiones, Paraguari, Pte. Hayes, San Pedro (ALWC, IFML, INBP, LACM, NHMB, NHMW). Literature records: Central, Guairá, “Paraguay” (s. loc.) (Emery 1906, Forel 1895b, Forel 1907b).  
*edentatum* Roger 1863a. Alto Paraguay, Caaguazú, Canindeyú, Central, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguari, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MHNG, MZSP). Literature records: “Paraguay” (s. loc.) (Emery 1896b, Forel 1912a).  
*opaciventre* Roger 1861b. Amambay (ALWC, INBP, LACM). Literature records: “Paraguay” (s. loc.) (Emery 1894a, Forel 1895, Forel 1907d, Santschi 1916).  
*permagnum* Forel 1908b. Alto Paraguay, Amambay, Caaguazú, Canindeyú, Central, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, MZSP). Literature records: “Paraguay” (s. loc.) (Kempf 1972).  
*planidens* Borgmeier 1939. Amambay (INBP).  
*tuberculatum* (Olivier 1792). Alto Paraguay, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Paraguari, “Chaco” (Dept. unknown) (ALWC, BMNH, IFML, INBP, LACM, MHNG, MZSP, NHMB, NHMW). Literature records: Central, “Paraná R.” (Dept. unknown) (Brown 1958, Santschi 1916, Santschi 1921b).

### *Gnamptogenys* Roger 1863a

- bruchii* (Santschi 1922c). Canindeyú, Paraguari (ALWC, BMNH, INBP).  
*caelata* Kempf 1967a. Literature records: Alto Paraná (Fowler 1981).  
*continua* (Mayr 1887). Alto Paraná (MHNG).  
*moelleri* (Forel 1912a). Boquerón, Caaguazú, Central, Itapúa, Ñeembucú, Paraguari (ALWC, BMNH, MHNG). Literature records: Ñeembucú (Lattke 1995).  
*rastrata* (Mayr 1866b). Canindeyú, Cordillera, Misiones (ALWC, MHNG, NHMW).  
*regularis* Mayr 1870b. Central (INBP). Literature records: Cordillera (Forel 1909).  
*striatula* Mayr 1884. Amambay, Cordillera, “Paraguay” (s.loc) (ALWC, INBP, MHNG, NHMB, NHMW). Literature records: Cordillera, “Paraguay” (s. loc.) (Forel 1911g, Santschi 1929c).  
*sulcata* (F. Smith 1858). Central, Guairá, Misiones, Pte. Hayes (ALWC, IFML, INBP).

### *Typhlomyrmex* Mayr 1862

- clavicornis* Emery 1906. Central, Cordillera, Misiones (ALWC, INBP, MHNG). Literature records: Cordillera (Forel 1906 [as “*divergens*”]).  
*pusillus* Emery 1894a. Concepción (MHNG). Literature records: Pte. Hayes (Fowler 1981).  
*roenhoferi* Mayr 1862. Canindeyú (ALWC, INBP, LACM).

## Subfamily Formicinae

### *Acropyga* Roger 1862a

- goeldii* Forel 1893b. Canindeyú (ALWC, MHNG). Literature records: Alto Paraná (Emery 1906 [as “*pachycera*”]).

### *Brachymyrmex* Mayr 1868

- aphidicola* Forel 1909. Amambay, Boquerón, Canindeyú, Central, Concepción, Cordillera, Itapúa, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, BMNH, INBP, LACM, MHNG, NHMB). Literature records: Cordillera, “Paraguay” (s. loc.) (Forel 1909, Santschi 1923a [as “*fallax*”]). **NEW STATUS.**  
*cordemoyi* Forel 1895a. Caaguazú, Canindeyú, Central, Concepción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguari, San Pedro (ALWC, BMNH, IFML, INBP, LACM, MHNG). Literature records: Cordillera (Forel 1908b).  
*fiebrigi* Forel 1908b. Cordillera, Itapúa (ALWC, MHNG). Literature records: Cordillera, “Paraguay” (s. loc.) (Forel 1908b, Santschi 1923a).  
*heeri* Forel 1874. Canindeyú, Central (ALWC, BMNH, LACM, MHNG).  
*leuderwaldti* Santschi 1923a. Amambay, Boquerón, Canindeyú, Cordillera, Itapúa, Misiones (ALWC, BMNH, INBP, LACM, MHNG, MZSP).  
*patagonicus* Mayr 1868. Amambay, Boquerón, Canindeyú, Central, Concepción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguari, Pte. Hayes (ALWC, IFML, INBP, LACM, MHNG, NHMW). Literature records: Cordillera (Forel 1906, Forel 1909).  
*termitophilus* Forel 1896e. Boquerón, Central (ALWC). Literature records: “Paraguay” (s. loc.) (Kempf 1972). **NEW STATUS.**  
**sp. alw-01.** Canindeyú (ALWC, INBP, LACM).  
**sp. alw-02.** Boquerón (ALWC).

### *Camponotus* Mayr 1861

- arboreus* (F. Smith 1858). Central (ALWC, INBP).  
*atriceps* (F. Smith 1858). Caaguazú, Central (ALWC, IFML, INBP, LACM, MZSP). Literature records: Cordillera (Forel 1911b, Hashmi 1973).  
*balzani* Emery 1894a. Canindeyú (ALWC).  
*bonariensis* Mayr 1868. Caaguazú, Canindeyú, Cordillera (ALWC, INBP, LACM, MHNG).  
*borellii* Emery 1894b. Alto Paraguay (ALWC).  
*brasiliensis* Mayr 1862. Alto Paraná, Caaguazú, Canindeyú, Central (ALWC, INBP, MZSP). Literature records: “Paraguay” (s. loc.) (Kempf 1972).  
*cameranoi* Emery 1894b. Amambay, Canindeyú, Central, Misiones, Paraguari, “Paraná R.” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MCZC, NHMW). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1894b, Emery 1896c, Forel 1909, Santschi 1922b).  
*cingulatus* Mayr 1862. Canindeyú, Central, Cordillera, Itapúa, Paraguari(?), San Pedro (ALWC, MCSN, MHNG). Literature records: Central, Cordillera, San Pedro, “Paraguay” (s. loc.) (Emery 1894b, Emery 1896c [as “*lessonai*”]), Forel 1909).  
*coloratus* Forel 1904a. Boquerón (ALWC). Literature records: “Paraguay” (s. loc.) (Kempf 1972). **NEW STATUS.**

- crassus* Mayr 1862. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguairí, Pte. Hayes, San Pedro, “Paraguay” ( s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MHNG, MZSP, NHMB). Literature records: Central, Cordillera, Misiones (Forel 1907b [as “vezenyii”], Forel 1911b, Fowler 1981).
- crispulus* Santschi 1922b. Boquerón, Central, Concepción, Pte. Hayes (ALWC, MZSP). **NEW STATUS.**
- depressus* Mayr 1866a. Alto Paraná, Canindeyú (ALWC, INBP, MCZC).
- dimorphus* Emery 1894a. Canindeyú (ALWC, INBP, LACM).
- emeryodicatus* Forel 1901b. Literature records: “Paraguay” (s. loc.) (Forel 1901e). *excisus* Mayr 1870a. Alto Paraná, Canindeyú (ALWC, IFML, INBP, LACM). Literature records: Cordillera (Forel 1911b).
- fastigatus* Roger 1863b. Canindeyú, Ñeembucú (ALWC, IFML, INBP, LACM).
- fiebrigi* Forel 1906. Canindeyú, Cordillera, Ñeembucú (ALWC, MHNG). Literature records: Cordillera (Forel 1906).
- germaini* Emery 1903. Alto Paraná, Canindeyú, Concepción (ALWC, MCSN). Literature records: Alto Paraná (Emery 1911 [as “tacuruensis”]).
- helleri* Emery 1903. Canindeyú. (ALWC, INBP).
- hispidus* Emery 1906. Caaguazú, Central, Ñeembucú (ALWC, IFML, MCSN). Literature records: Ñeembucú (Emery 1906). **NEW STATUS.**
- iheringi* Forel 1908b. Canindeyú, Cordillera (ALWC, INBP). Literature records: Cordillera (Emery 1925 [as “bajulus”]).
- innocens* Forel 1909. Amambay, Cordillera (ALWC, MHNG). Literature records: Cordillera (Forel 1909). **NEW STATUS.**
- lespesii* Forel 1886c. Central, Concepción, Paraguairí, (ALWC, MCSN, MHNG). Literature records: Concepción, Cordillera, “Paraguay” (s. loc.) (Emery 1894b, Emery 1896c [as “melancholicus”], Forel 1906, Forel 1908b, Forel 1911b).
- leydigi* Forel 1886c. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Guairá, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, NHMB). Literature records: “Paraguay” (s. loc.) (Emery 1896j, Forel 1895).
- macrocephalus* Emery 1894a. Literature records: “Paraguay” (s. loc.) (Kempf 1972 [as “geralensis”]).
- melanoticus* Emery 1894a. Alto Paraná, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Misiones, “Paraguay” ( s. loc.) (ALWC, INBP, LACM, MCSN, MZSP, NHMW). Literature records: “Paraguay” (s. loc.) (Emery 1894b, Emery 1896b).
- mus* Roger 1863a. Alto Paraguay, Canindeyú, Central, Guairá, Pte. Hayes, San Pedro (ALWC, IFML, INBP, LACM, MCSN). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1906, Forel 1911b).
- novogranadensis* Mayr 1870a. Canindeyú, San Pedro (ALWC). Literature records: Cordillera (Forel 1906).
- pellitus* Mayr 1862. Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Itapúa(?), Misiones, Paraguairí, San Pedro, “Paraguay” ( s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MHNG, MZSP, NHMB, NHMW). Literature records: “Paraguay” (s. loc.) (Emery 1896b). **REVISED STATUS.**
- personatus* Emery 1894d. Amambay, Central, Cordillera, Itapúa, San Pedro (ALWC, IFML, INBP, MCSN, MHNG, NHMB). Literature records: Central, Cordillera (Emery 1925 [as “alloysii”], Forel 1906, Forel 1908b).
- punctulatus* Mayr 1868. Caaguazú, Central, Concepción, Cordillera, Pte. Hayes, Paraguairí (ALWC, INBP, IFML, MZSP).
- renggeri* Emery 1894b. Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Pte. Hayes, “Paraná R” (Dept. unknown), “Paraguay” ( s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MCZC, MHNG, MZSP, NHMB, NHMW). Literature records: Alto Paraná/Caaguazú, Caaguazú, Central, Cordillera, “Bonpland” (Dept. unknown), “Paraná R.” (Dept. unknown), “Paraguay” (s. loc.) (Emery 1894b, Emery 1906, Forel 1907b, Forel 1908b, Forel 1909, Hashmi 1973, Santschi 1916).
- rosariensis* Forel 1912e. Alto Paraguay, Boquerón, Central, Ñeembucú, Pte. Hayes (ALWC, IFML, INBP, NHMB). Literature records: Misiones (Fowler 1981). **NEW STATUS.**
- rufipes* (Fabricius 1775). Amambay, Caaguazú, Central, Concepción, Itapúa, Misiones, Ñeembucú, Paraguairí, Pte. Hayes, “Paraná R” (Dept. unknown), “Paraguay” ( s. loc.) (ALWC, IFML, INBP, MCSN, MCZC, MZSP, NHMB). Literature records: Concepción, Cordillera, “Paraguay” (s. loc.) (Emery 1894b, Emery 1896h, Forel 1906, Forel 1907b, Hashmi 1973).
- sanctae-fidei* Dalla Torre 1892. Caaguazú, Canindeyú, Ñeembucú, San Pedro (ALWC, IFML, INBP, LACM).
- scipio* Forel 1908b. Amambay, Central, Cordillera (ALWC, MCSN, MHNG, NHMB). Literature records: Central, Cordillera (Forel 1908b, Santschi 1922b).
- sericeiventris* (Guérin-Méneville 1838). Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Cordillera, Guairá, Itapúa, Paraguairí, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MZSP, NHMB, NHMW). Literature records: Central, Cordillera, Itapúa, “Paraguay” (s. loc.) (Forel 1906, Forel 1907d, Forel 1911a, Santschi 1916, Wheeler 1931).

*sexguttatus* (Fabricius 1793). Alto Paraguay, Alto Paraná, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Paraguairí, Pte. Hayes, “Paraná R.” (Dept. unknown), “Chaco” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MCZC, MHNG, MZSP, NHMB, NHMW). Literature records: Central, Concepción, Cordillera (Emery 1906, Forel 1906, Forel 1907d, Forel 1911a).

*silvicola* Forel 1902. Central (ALWC, INBP). Literature records: Central, Cordillera (Emery 1906, Forel 1911b).

*substitutus* Emery 1894c. Alto Paraguay, Boquerón, Central, Concepción, Ñeembucú, Paraguairí(?), Pte. Hayes, “Paraguay” (s. loc.) (ALWC, IFML, INBP, MCSN, MHNG, NHMW). Literature records: Concepción, “Paraguay” (s. loc.) (Emery 1894f, Emery 1896b, Forel 1907d [as “*multipilis*”]).

*termitarius* Emery 1902. Misiones, Ñeembucú (ALWC). **NEW STATUS.**

*trapeziceps* Forel 1908b. Boquerón (ALWC).

*vagus* Forel 1908b. Canindeyú, Central (ALWC). **NEW STATUS.**

*westermanni* Mayr 1862. Amambay, Canindeyú, Misiones, San Pedro (ALWC).

**sp. alw-01.** Boquerón, Pte. Hayes (ALWC).

**sp. alw-02.** Caaguazú, Canindeyú, Central, Ñeembucú (ALWC, IFML, INBP).

**sp. alw-03.** Canindeyú (ALWC).

**sp. alw-04.** Pte. Hayes (ALWC).

**sp. alw-05.** Canindeyú (ALWC).

**sp. alw-06.** Boquerón (ALWC).

**sp. alw-07.** Canindeyú (ALWC).

**sp. alw-08.** Boquerón, Pte. Hayes (ALWC).

**sp. alw-09.** Boquerón (ALWC).

### *Myrmelachista* Roger 1863a

*arborea* Forel 1909. Cordillera (MHNG). Literature records: Cordillera (Forel 1909).

*arthuri* Forel 1903. Canindeyú (ALWC, IFML, LACM).

*bambusarum* Forel 1903. Canindeyú (ALWC).

*catharinae* Mayr 1887. Canindeyú (ALWC, IFML, INBP, LACM).

*gallicola* Mayr 1887. Misiones (ALWC).

*nodigera* Mayr 1887. Canindeyú, Concepción, Cordillera, San Pedro, “Paraná R.” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MCZC, MHNG, NHMB). Literature records: Concepción (Emery 1896b [as “*flavicornis*”]), Forel 1907d, Forel 1909 [as “*pallida*”]).

**sp. alw-01.** Canindeyú (ALWC).

### *Paratrechina* Motschoulsky 1863

*docilis* Forel 1908b. Canindeyú (ALWC, LACM). **NEW STATUS.**

*fulva* (Mayr 1862). Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Misiones, Ñeembucú, Paraguairí, Pte. Hayes, San Pedro (ALWC, BMNH, IFML, INBP, LACM, MHNG, MZSP, NHMB). Literature records: Concepción, “Paraguay” (s. loc.) (Emery 1906, Forel 1909 [as “*fumata*”]).

\**longicornis* (Latreille 1802). Central, Concepción (ALWC, INBP).

**sp. alw-01.** Canindeyú (ALWC, BMNH, IFML, INBP, LACM, MHNG).

**sp. alw-02.** Canindeyú, Central, Pte. Hayes (ALWC, INBP).

**sp. alw-03.** Canindeyú, Concepción (ALWC, MHNG).

**sp. alw-04.** Paraguairí (ALWC).

### Subfamily Heteroponerinae

#### *Acanthoponera* Mayr 1862

*mucronata* (Roger 1860). Caaguazú (MZSP).

#### *Heteroponera* Mayr 1887

*dolo* (Roger 1860). Literature records: Alto Paraná, Caaguazú (Fowler 1981).

*flava* Kempf 1962. Alto Paraná (MHNG).

*mayri* Kempf 1962. Alto Paraná, Central, Itapúa (ALWC, BMNH, MHNG).

*microps* Borgmeier 1957. Alto Paraná, Amambay, Itapúa (ALWC, BMNH, MHNG).

### Subfamily Myrmicinae

*Adelomyrmex* Emery 1897

*boltoni* Fernández 2003a. Itapúa (BMNH). Literature records: Itapúa (Fernández 2003a).

*Acanthognathus* Mayr 1887

*rudis* Brown & Kempf 1969. Caaguazú (MZSP). Literature records: “Paraguay” (s. loc.) (Brandão 1991).

*Acromyrmex* Mayr 1865

*ambiguus* (Emery 1888a). Literature records: Alto Paraná, Misiones, Ñeembucú (Fowler 1985).

*balzani* (Emery 1890a). Caaguazú, Central, Concepción(?), Cordillera, Itapúa, Paraguairí, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, MHNG, MZSP, NHMB, NHMW, USNM). Literature records: Amambay, Caaguazú, Caazapá, Central, Concepción(?), Cordillera, Itapúa, “Paraguay” (s. loc.) (Emery 1890a, Emery 1896b, Forel 1895, Forel 1911a, Fowler 1985, Santschi 1920a, Santschi 1925a).

*coronatus* (Fabricius 1804). Alto Paraná, Canindeyú, Itapúa (ALWC, INBP, LACM, MZSP, USNM). Literature records: Itapúa (Fowler 1985).

*crassispinus* (Forel 1909). Amambay, Canindeyú, Central, Concepción, Cordillera, Guairá, Ñeembucú, Paraguairí, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MHNG, MZSP, NHMB, USNM). Literature records: Canindeyú, Cordillera, Misiones, Ñeembucú, “Paraguay” (s. loc.) (Forel 1909a, Fowler 1985, Santschi 1916 [as “*parallelus*”], Santschi 1925a).

*disciger* (Mayr 1887). Literature records: Alto Paraná, Misiones (Fowler 1985).

*fracticornis* (Forel 1909). Boquerón, Caaguazú, Central, Concepción, Cordillera, Guairá, Ñeembucú, Pte. Hayes, San Pedro, “Paraná R.” (Dept. unknown) (ALWC, IFML, INBP, LACM, MCZC, MHNG, MZSP, USNM). Literature records: Central, Cordillera, Concepción, Guairá, Misiones, Paraguairí, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (Forel 1909, Fowler 1985, Santschi 1925a).

*heyeri* (Forel 1899a). Misiones, Ñeembucú (ALWC, IFML). Literature records: Misiones, Pte. Hayes (Fowler 1985).

*hispidus fallax* Santschi 1925a. Caaguazú (MZSP). Literature records: Alto Paraná, Caaguazú, Central, Guairá, Ñeembucú (Fowler 1985).

*lobicornis* (Emery 1888a). Literature records: Itapúa, Misiones, Ñeembucú, Paraguairí, Pte. Hayes (Emery 1906, Fowler 1985).

*lobicornis ferrugineus* (Emery 1905). Literature records: “Paraguay” (s. loc.) (Kempf 1972).

*lundii* (Guérin-Méneville 1838). Alto Paraguay, Ñeembucú, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, INBP, IFML, MCSN, USNM). Literature records: Central, Misiones, Ñeembucú (Fowler 1985).

*lundii decolor* (Emery 1905). Literature records: “Paraguay” (s. loc.) (Emery 1905).

*niger* (F. Smith 1858). Canindeyú, San Pedro (ALWC, INBP, USNM). Literature records: Cordillera (Forel 1912b).

*nigrosetosus* Forel 1908b. Alto Paraná, Canindeyú (ALWC, MZSP). **NEW STATUS.**

*pubescens* (Emery 1905). “Paraguay” (s. loc.) (MCSN, NHMB). Literature records: Pte. Hayes, “Paraguay” (s. loc.) (Emery 1905, Fowler 1985). **NEW STATUS.**

*rugosus* (F. Smith 1858). Boquerón, Caaguazú, Canindeyú, Central, “Paraguay” (s. loc.) (ALWC, INBP, IFML, LACM, MCSN, MHNG, MZSP, NHMB, USNM). Literature records: Alto Paraná, Caaguazú, Canindeyú, Central, Cordillera, Guairá, Misiones, Paraguairí, “Paraguay” (s. loc.) (Emery 1905, Fowler 1985, Santschi 1925a).

*striatus* (Roger 1863a). Pte. Hayes (ALWC, INBP, LACM, USNM). Literature records: Boquerón, Pte. Hayes (Fowler 1985).

*subterraneus* (Forel 1893a). Canindeyú, Central, Cordillera (ALWC, INBP, LACM, MHNG, MZSP, USNM). Literature records: Alto Paraná, Caaguazú, Canindeyú, Concepción, Cordillera, Guairá, Paraguairí, “Paraguay” (s. loc.) (Emery 1906, Forel 1906h, Forel 1908b, Forel 1909, Fowler 1985, Santschi 1925a).

**sp. alw-01.** Ñeembucú, Pte. Hayes (ALWC).

**sp. alw-02.** Pte. Hayes (ALWC).

**sp. alw-03.** Ñeembucú, Pte. Hayes (ALWC).

**sp. alw-04.** Canindeyú (ALWC).

*Apterostigma* Mayr 1865

*pilosum* Mayr 1865. Alto Paraguay, Alto Paraná, Amambay, Canindeyú, Concepción, Itapúa, Misiones (ALWC, INBP, LACM, MHNG, USNM). Literature records: Alto Paraná (Fowler 1981).

*steigeri* Santschi 1911. Central (NHMB). Literature records: Central (Santschi 1922a [as “*affinis*”]).

*Atta* Fabricius 1804

*capiguara* Gonçalves 1944. Amambay (INBP). Literature records: Alto Paraná, Amambay, Caaguazú (Fowler 1985).

*laevigata* (F. Smith 1858). Amambay, Canindeyú, San Pedro, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM,

MZSP, NHMW, USNM). Literature records: Alto Paraná, Amambay, Caaguazú, Canindeyú, Concepción, Cordillera, San Pedro (Borgmeier 1959b, Forel 1921, Fowler 1985).  
*saltensis* Forel 1913. Boquerón (ALWC, MZSP, USNM). Literature records: Boquerón, Pte. Hayes (Borgmeier 1959b, Fowler 1985).  
*sexdens* (Linnaeus 1758). Caaguazú, Canindeyú, Central, Cordillera, Misiones, Paraguairí, San Pedro, “Guañayos” (Dept. unknown) “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MHNG, MZSP, NHMB, NHMW, USNM). Literature records: Alto Paraná, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguairí, San Pedro, “Pto. Itacurí” (Dept. unknown), “Paraguay” (s. loc.) (Borgmeier 1959b, Emery 1896b, Emery 1906, Fowler 1985, Santschi 1922a).  
*vollenweideri* Forel 1893a. Boquerón, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, IFML, MCSN, MZSP, USNM). Literature records: Alto Paraguay, Boquerón, Central, Concepción, Itapúa, Ñeembucú, Pte. Hayes (Borgmeier 1959b, Fowler 1985).

*Bariamyrma* Lattke 1990

*hispidula* Lattke 1990. Central (BMNH).

*Basiceros* Schulz 1906

*disciger* (Mayr 1887). Alto Paraná, Itapúa (ALWC, BMNH, MHNG).

*Carebara* Westwood 1840

*mayri* (Forel 1901e). Literature records: “Paraguay” (s. loc.) (Forel 1901e).  
**sp. alw-01.** Concepción (ALWC, MHNG).

*Carebarella* Emery 1906

*bicolor* Emery 1906. Literature records: Caaguazú (Fowler 1981).

*Cephalotes* Latreille 1802

*angustus* (Mayr 1862). Central (ALWC).

*atratus* (Linnaeus 1758). Alto Paraguay, Alto Paraná, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Paraguairí, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (ALWC, LACM, MCSN, MHNG, MZSP, NHMB, NHMW). Literature records: Caaguazú, Central, Cordillera, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1896b, Forel 1906, Forel 1907d, Santschi 1920b).

*bohlsi* (Emery 1896b). Concepción(?) (MCSN, MHNG, NHMW). Literature records: Concepción(?) (de Andrade & Baroni-Urbani 1999, Emery 1896b).

*borgmeieri* (Kempf 1951). Alto Paraguay, Alto Paraná, Caaguazú, Canindeyú, Central, Paraguairí, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MCZC, MHNG, MZSP). Literature records: Alto Paraná, Caaguazú, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999).

*bruchii* (Forel 1912b). Central, Pte. Hayes (ALWC, INBP).

*clypeatus* (Fabricius 1804). Alto Paraguay, Amambay, Caaguazú, Canindeyú, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguairí, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MHNG, MZSP, NHMB, NHMW). Literature records: Alto Paraná, Amambay, Caaguazú, Central, Cordillera, Guairá, Misiones, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1896b, Emery 1906, Forel 1906, Santschi 1916).

*depressus* (Klug 1824). Alto Paraguay, Alto Paraná, Boquerón, Caaguazú, Canindeyú, Central, Cordillera, Itapúa, Ñeembucú, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MCZC, MZSP, NHMB). Literature records: Caaguazú, Central, Cordillera, Guairá, San Pedro, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1894b, Emery 1906, Forel 1906, Santschi 1916).

*eduarduli* (Forel 1921). Amambay, Caaguazú, Canindeyú, Central, Concepción, Itapúa, Ñeembucú, Paraguairí (ALWC, INBP, LACM, MHNG, MZSP). Literature records: Caaguazú, Concepción, Cordillera (de Andrade & Baroni-Urbani 1999, Forel 1921).

*fiebrigi* (Forel 1906). Boquerón, Central, Cordillera, Ñeembucú, Pte. Hayes, San Pedro (ALWC, INBP, IFML, MHNG). Literature records: Caaguazú, Cordillera (de Andrade & Baroni-Urbani 1999, Forel 1906).

*guayaki* De Andrade & Baroni-Urbani 1999. Concepción, Ñeembucú (ALWC, BMNH, MHNG). Literature records: Concepción(?) (de Andrade & Baroni-Urbani 1999, Emery 1896b).

*incertus* (Emery 1906). Central, Ñeembucú (ALWC, INBP, MHNG). Literature records: Ñeembucú (de Andrade & Baroni-Urbani 1999, Emery 1906).

*jheringi* (Emery 1894a). Central, Ñeembucú (ALWC). Literature records: Central, Concepción(?), “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1894d, Emery 1896b).

*lanuginosus* (Santschi 1919). Canindeyú (ALWC, INBP, LACM).

- maculatus* (F. Smith 1876). Canindeyú, Central, Ñeembucú, Paraguari, Pte. Hayes (ALWC, IFML, INBP, LACM). Literature records: Central, Cordillera, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1894a, Forel 1911g).
- minutus* (Fabricius 1804). Alto Paraguay, Amambay, Canindeyú, Central, Concepción, Cordillera, Ñeembucú, San Pedro (ALWC, IFML, INBP, LACM, MHNG). Literature records: Caaguazú, Central, Cordillera, “Paraguay” (s. loc.) (Forel, 1909a, de Andrade & Baroni-Urbani 1999).
- pallidoides* de Andrade, in de Andrade & Baroni-Urbani 1999. Canindeyú, Central (ALWC, INBP).
- pellans* de Andrade, in de Andrade & Baroni-Urbani 1999. Canindeyú(?), Cordillera (ALWC, IFML, INBP, LACM, MHNG). Literature records: Boquerón/Alto Paraguay, Cordillera, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1896b, Forel 1895).
- persimilis* de Andrade, in de Andrade & Baroni-Urbani 1999. Canindeyú, Central, Cordillera, Ñeembucú, Paraguari, Pte. Hayes (ALWC, IFML, INBP, MHNG, NHMB). Literature records: Central, Concepción, “Paraguay” (s. loc.) (de Andrade & Baroni-Urbani 1999, Emery 1896b, Forel 1907b, Forel 1907d [as “grandinosus”]).
- pilosus* (Emery 1896b). Concepción(?) (MCSN, MHNG). Literature records: Concepción(?) (de Andrade & Baroni-Urbani 1999, Emery 1896b).
- pinellii* (Guérin-Méneville 1844). Literature records: Ñeembucú (de Andrade & Baroni-Urbani 1999).
- pusillus* (Klug 1824). Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Paraguari, Pte. Hayes, San Pedro, “Chaco” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MCZC, MHNG, MZSP, NHMB, NHMW). Literature records: Alto Paraguay/Boquerón, Alto Paraná, Caaguazú, Central, Concepción, Cordillera, “Chaco” (Dept. unknown) (de Andrade & Baroni-Urbani 1999, Emery 1906, Forel 1906, Forel 1909, Santschi 1916, Santschi 1921c).
- quadratus* (Mayr 1868). Canindeyú, Central, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, NHMW).
- targionii* (Emery 1894a). Canindeyú (ALWC, LACM). Literature records: Cordillera (de Andrade & Baroni-Urbani 1999, Forel 1911b).
- sp. alw-01.** Central (ALWC).

#### *Crematogaster* Lund 1831a

- acuta* (Fabricius 1804). Canindeyú (ALWC, IFML, INBP, JTLC, LACM).
- ampla* Forel 1912c. Canindeyú (ALWC).
- arata* Emery 1906. Canindeyú, Guairá, Misiones (ALWC, BMNH, IFML, INBP, JTLC, LACM, MHNG).
- bruchii* Forel 1912c. Boquerón, Pte. Hayes (ALWC, JTLC).
- chodati* Forel 1921. Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguari, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (ALWC, BMNH, INBP, IFML, JTLC, LACM, MHNG). Literature records: Concepción (Forel 1921).
- cisplatinialis* Mayr 1887. Caaguazú, Canindeyú, Central, Misiones (ALWC, BMNH, IFML, JTLC, MHNG). **REVISED STATUS.**
- corticicola* Mayr 1887. Caaguazú, Canindeyú (ALWC, INBP, JTLC, LACM, MZSP).
- crinosa* Mayr 1862. Caaguazú, Canindeyú, Central, Concepción, Ñeembucú, Pte. Hayes, San Pedro (ALWC, BMNH, IFML, INBP, JTLC, LACM, NHMB). Literature records: Cordillera, Itapúa, “Paraguay” (s. loc.) (Emery 1896b, Emery 1906c, Forel 1901a, Forel 1909, Forel 1911b, Forel 1912c).
- curvispinosa* Mayr 1862. Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Ñeembucú, Pte. Hayes, San Pedro (ALWC, BMNH, IFML, INBP, JTLC, LACM, MHNG, MZSP, NHMB). Literature records: Central, Concepción, Cordillera (Forel 1907b, Forel 1907d, Forel 1909).
- montezumia* F. Smith 1858. Canindeyú (ALWC, JTLC).
- nigropilosa* Mayr 1870a. Alto Paraná, Canindeyú, San Pedro (ALWC, IFML, INBP, JTLC, LACM).
- nitidiceps* Emery 1895a. Caaguazú, Canindeyú, Guairá, San Pedro (ALWC, BMNH, IFML, JTLC, LACM). Literature records: Cordillera (Forel 1911b [as “pergens” (unavailable name, examined)]). **NEW STATUS.**
- quadriformis* Roger 1863a. Boquerón, Caaguazú, Canindeyú, Central, Concepción, Guairá, Itapúa, Misiones, Ñeembucú, Pte. Hayes, San Pedro (ALWC, INBP, JTLC, LACM, NHMB). Literature records: Central, Cordillera, “Paraguay” (s. loc.) (Forel 1911b [as “gracilior”], Kempf 1972).
- rochai* Forel 1903. Alto Paraguay, Canindeyú, Central, Concepción, Pte. Hayes (ALWC, IFML, INBP, JTLC, LACM, NHMB). Literature records: “Paraguay” (s. loc.) (Kempf 1972 [as “malevolens”]).
- sclerata* Santschi 1917. Cordillera (ALWC, JTLC, LACM).
- sericea* Forel 1912c. Canindeyú (ALWC, JTLC). Literature records: “Paraguay” (s. loc.) (Kempf 1972).
- thalia* Forel 1911b. Canindeyú, Cordillera (ALWC, MHNG). Literature records: Cordillera (Forel 1911b).
- torosa* Mayr 1870a. Literature records: Central (Forel 1907b).



*victima* F. Smith 1858. Amambay, Caaguazú, Canindeyú, Central, Paraguari (ALWC, BMNH, INBP, JTLC, LACM, MHNG). Literature records: "Paraguay" (s. loc.) (Emery 1896b).

**sp. alw-01.** Canindeyú (ALWC).

**sp. alw-02.** Boquerón, Paraguari (ALWC).

[*brevispinosa sericea* var. *semisericea* Santschi 1923b, unavailable name]. Literature records: Central (Santschi 1923b).

[*brevispinosa tumulifera* var. *tumulicola* Forel 1909, unavailable name]. Cordillera (MHNG). Literature records: Cordillera (Forel 1909).

### *Cyphomyrmex* Mayr 1862

*laevigatus* Weber 1938. Canindeyú (ALWC).

*lectus* Forel 1911a. Concepción (LACM).

*minutus* Mayr 1862. Canindeyú, Misiones (ALWC, INBP, LACM, USNM).

*olitor* Forel 1893a. Canindeyú (USNM).

*rimosus* (Spinola 1851). Alto Paraná, Caaguazú (MZSP). Literature records: Canindeyú, "Paraguay" (s. loc.) (Emery 1894a, Fowler 1981).

*transversus* Emery 1894a. Boquerón, Canindeyú, Central, Concepción, Pte. Hayes (ALWC, INBP, LACM, MHNG, USNM). Literature records: Ñeembucú (Fowler 1981).

**sp. alw-01.** Canindeyú, Central (ALWC, MHNG).

**sp. alw-02.** Canindeyú (ALWC).

**sp. alw-03.** Alto Paraná (ALWC).

**sp. alw-04.** Amambay (ALWC, USNM).

**sp. alw-05.** Canindeyú, San Pedro (ALWC, USNM).

**sp. alw-06.** Boquerón (ALWC, USNM).

**sp. alw-07.** Amambay, Canindeyú (ALWC, LACM, USNM).

### *Eurhopalothrix* Brown & Kempf 1961

*bruchii* (Santschi 1922c). Itapúa (ALWC).

**sp. A.** Canindeyú (MZSP). [new sp.- Dietz, pers com.]

**sp. alw-01.** Alto Paraná (ALWC, BMNH, MHNG).

**sp. alw-02.** Misiones (ALWC, BMNH, MHNG).

**sp. alw-03.** Central (ALWC).

### *Hylomyrma* Forel 1912h

*balzani* (Emery 1894a). Alto Paraná, Canindeyú, Central, Concepción, Itapúa (ALWC, BMNH, LACM, MCSN, MHNG). Literature records: Central (Emery 1894a).

*reitteri* (Mayr 1887). Alto Paraná, Itapúa (ALWC, BMNH, MHNG).

### *Megalomyrmex* Forel 1885

*driftii* Kempf 1961. Alto Paraná, Amambay, Central, Concepción (ALWC, BMNH, MHNG).

*incisus* M.R. Smith 1947. Amambay (ALWC, INBP).

*silvestrii* Wheeler 1909. Amambay (ALWC). Literature records: Pte. Hayes (Fowler 1981).

**sp. alw-01.** Itapúa (ALWC).

### *Monomorium* Mayr 1855

\**floricola* (Jerdon 1851). Canindeyú, Central (ALWC, INBP, LACM).

\**pharaonis* (Linnaeus 1758). Canindeyú, Central, Concepción (ALWC, IFML, INBP). Literature records: Central, Concepción (Fowler 1981).

### *Mycetarotes* Emery 1913b

*parallelus* (Emery 1906). Central, Misiones, Ñeembucú (ALWC, USNM).

**sp. alw-01.** Caaguazú, Canindeyú (ALWC, IFML, INBP, LACM, USNM).

### *Mycetophylax* Emery 1913b

*emeryi* (Forel 1907a). Boquerón (ALWC, IFML, INBP, MZSP, USNM). Literature records: Central (Fowler 1981).

### *Mycetosoritis* Wheeler 1907

*clorindae* Kusnezov 1949. Literature records: Misiones (Fowler 1981).

*explicata* Kempf 1968. Boquerón (ALWC).

**sp. alw-01.** Canindeyú (USNM).

*Mycocephurus* Forel 1893a

*goeldii* (Forel 1893b). Amambay, Caaguazú, Canindeyú, Central, Concepción, Paraguari, San Pedro (ALWC, LACM, USNM). Literature records: Caaguazú (Fowler 1981).

*smithii* (Forel 1893b). Alto Paraná, Amambay, Canindeyú, Central, Concepción, Misiones, Ñeembucú (ALWC, BMNH, LACM, MHNG, MZSP, USNM). Literature records: Misiones (Fowler 1981).

*Myrmicocrypta* F. Smith 1860

*squamosa* F. Smith 1860. Canindeyú, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, BMNH, INBP, LACM, MHNG, NHMB, NHMW, USNM). Literature records: Cordillera (Forel 1911a [as “*uncinata*”], Forel 1911b).

**sp. alw-01.** Amambay (USNM).

*Nesomyrmex* Wheeler 1910

*asper* (Mayr 1887). Alto Paraná, Canindeyú, Paraguari (ALWC, IFML, INBP, MZSP).

*echinatinodis* (Forel 1886b). Canindeyú, Ñeembucú (ALWC, IFML, INBP, LACM).

*spininodis* (Mayr 1887). Canindeyú, Central, Cordillera, Misiones, Ñeembucú, Paraguari, Pte. Hayes (ALWC, IFML, INBP, LACM, MZSP). Literature records: “Paraguay” (s. loc.) (Emery 1896b).

*vicinus* (Mayr 1887). Caaguazú, Canindeyú (ALWC, MZSP).

**sp. alw-01.** Central, Pte. Hayes (ALWC).

**sp. alw-02.** Pte. Hayes (ALWC).

*Ochetomyrmex* Mayr 1878

*semipolitus* Mayr 1878. Literature records: Misiones (Fowler 1981 [as “*argentinus*”]).

*Octostruma* Forel 1912b

*balzani* (Emery 1894a). Alto Paraná, Caaguazú, Canindeyú, Central, Concepción, Guairá, Itapúa (ALWC, BMNH, INBP, LACM, MHNG, MZSP).

*iheringi* (Emery 1888a). Canindeyú, Concepción (ALWC, BMNH, INBP, LACM, MZSP).

*rugifera* (Mayr 1887). Alto Paraná, Canindeyú, Itapúa (ALWC, BMNH, MHNG).

**sp. M.** Paraguari (MZSP). [undescribed species, B. Dietz pers com.]

**sp. S.** Canindeyú, Concepción (ALWC, BMNH, MHNG, MZSP). [undescribed species, B. Dietz pers com.]

*Oxyepoecus* Santschi 1926

*bruchii* Santschi 1926. Central (ALWC, BMNH).

*rastratus* (Mayr 1887). Canindeyú (ALWC, INBP, LACM).

*reticulatus* Kempf 1974. Itapúa (ALWC, MHNG).

*vezenyii* (Forel 1907b). Central (ALWC, INBP). Literature records: Concepción (Forel 1907d).

*Pheidole* Westwood 1839

*aberrans* Mayr 1868. Caaguazú, Central, Cordillera (ALWC, IFML, INBP, MZSP). Literature records: Central (Fowler 1981).

*auropilosa* Mayr 1887. Caaguazú (MZSP). Literature records: Alto Paraná (Fowler 1981).

*bergi* Mayr 1887. Literature records: Misiones (Fowler 1981).

*bruchii* Forel 1914b. Literature records: Central (Fowler 1981).

*chrysops* Wilson 2003. Amambay, Canindeyú, Central, Concepción (ALWC, IFML, INBP, MCZC, NHMB). Literature records: Canindeyú, Central (Santschi 1923c [as “*deflexa*” {invalid name}], Wilson 2003).

*cornicula* Wilson 2003. Amambay, Canindeyú, Concepción (ALWC).

*cyrtostela* Wilson 2003. Amambay (ALWC, INBP).

*flavens* Roger 1863a. Boquerón, Canindeyú, Central, Ñeembucú, Paraguari, Pte. Hayes, San Pedro (ALWC, IFML, INBP, LACM). Literature records: “Paraguay” (s. loc.) (Emery 1894a).

*fimbriata* Roger 1863a. Alto Paraná, Canindeyú, Central, Cordillera, Guairá, Itapúa, “Paraguay” (s. loc.) (ALWC, BMNH, INBP, LACM, MCZC, MHNG, NHMW). Literature records: “Paraguay” (s. loc.) (Emery 1896b, Forel 1895).

*fracticeps* Wilson 2003. Amambay, Canindeyú, Pte. Hayes (ALWC, INBP, LACM, MCZC). Literature records: Canindeyú (Wilson 2003).

*gertrudae* Forel 1886b. Amambay, Canindeyú, Concepción (ALWC, INBP, LACM, MCZC). Literature records: Canindeyú (Wilson 2003).

*gigaflavens* Wilson 2003. Boquerón, Canindeyú, Central, Concepción (ALWC, IFML, INBP).

*haywardi* Kusnezov 1952a. Central, Ñeembucú (ALWC).

- jelskii* Mayr 1884. Alto Paraguay, Boquerón, Caaguazú, Central, Concepción, Ñeembucú, Paraguari, Pte. Hayes (ALWC, IFML, INBP, MCSN).
- lignicola* Mayr 1887. Cordillera, Itapúa (ALWC, MCZC, NHMB). Literature records: Canindeyú, Cordillera, “Paraguay” (s. loc.) (Forel 1906, Forel 1908b, Kempf 1972, Wilson 2003).
- mosenopsis* Wilson 2003. Alto Paraná, Canindeyú (ALWC, IFML, INBP, LACM, MCZC). Literature records: Canindeyú (Wilson 2003).
- obscurior* Forel 1886b. Pte. Hayes (ALWC).
- obscurithorax* Naves 1985. Caaguazú, Canindeyú, Central, Cordillera, Paraguari, Pte. Hayes, San Pedro, “Paraná R.” (Dept. unknown), “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCZC, MZSP, NHMB, NHMW). Literature records: Canindeyú (Wilson 2003).
- oxyops* Forel 1908b. Amambay, Caaguazú, Canindeyú, Central, Cordillera, San Pedro, “Paraná R.” (Dept. unknown) (ALWC, IFML, LACM, MCZC, MHNG, MZSP, NHMB). Literature records: Cordillera (Forel 1908b, Wilson 2003).
- radoszkowskii* Mayr 1884. Amambay, Boquerón, Canindeyú, Central, Concepción, Cordillera, Itapúa, Misiones, Pte. Hayes, San Pedro (ALWC, INBP, LACM, MCZC). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1896b, Forel 1906d, Forel 1909).
- reflexans* Santschi 1933. Canindeyú, Central, Itapúa (ALWC, BMNH, IFML, INBP, LACM, MCZC). **NEW STATUS.**
- rudigenis* Emery 1906. Central, Misiones (ALWC).
- rugatula* Santschi 1933. Alto Paraná, Canindeyú, Itapúa (ALWC, BMNH, IFML, INBP, LACM, MCZC, MHNG).
- scapulata* Santschi 1923c. Amambay, Boquerón (ALWC).
- sigillata* Wilson 2003. Itapúa (ALWC).
- spininodis* Mayr 1887. Amambay, Boquerón, Canindeyú, Central, San Pedro (ALWC, IFML, INBP, MCZC, NHMB).
- subarmata* Mayr 1884. Alto Paraná, Boquerón, Caaguazú, Canindeyú, Central, Cordillera, Itapúa, Misiones, Pte. Hayes (ALWC, BMNH, INBP, MCSN, MHNG, MZSP, NHMB). Literature records: Central, Cordillera (Emery 1890b [as “*cornutula*”], Forel 1909).
- triconstricta* Forel 1886b. Literature records: Cordillera, “Paraguay” (s. loc.) (Forel 1909a, Wilson 2003).
- tristis* (F. Smith 1858). Canindeyú (ALWC).
- vafra* Santschi 1923c. Boquerón, Central, Itapúa, Ñeembucú (ALWC, INBP, LACM, MCZC). Literature records: “Paraguay” (s. loc.) (Wilson 2003).
- vallifica* Forel 1901b. Amambay, Boquerón, Central (ALWC, INBP, MCZC). Literature records: Amambay (Wilson 2003).
- sp. alw-02.** Central, Cordillera, Itapúa, Pte. Hayes (ALWC, INBP, MCZC).
- sp. alw-03.** Boquerón, Central, Itapúa (ALWC).
- sp. alw-04.** Canindeyú, Itapúa (ALWC, BMNH, MHNG).
- sp. alw-05.** Itapúa, Misiones (ALWC).
- sp. alw-06.** Central (ALWC).
- sp. alw-07.** Canindeyú, Central (ALWC).
- sp. alw-08.** Canindeyú, Central (ALWC).
- sp. alw-10.** Canindeyú (ALWC).
- sp. alw-11.** Boquerón, Pte. Hayes (ALWC).
- sp. alw-12.** Canindeyú (ALWC, INBP).
- sp. alw-14.** Central, Itapúa (ALWC).
- sp. alw-15.** Alto Paraná (ALWC, BMNH).
- sp. alw-16.** Amambay, Canindeyú (ALWC).
- sp. alw-17.** Canindeyú (ALWC, LACM).
- sp. alw-19.** Concepción, Central (ALWC).
- sp. alw-22.** Canindeyú. (ALWC, LACM).
- sp. alw-25.** Canindeyú, Cordillera, San Pedro (ALWC, INBP, LACM).
- sp. alw-26.** Boquerón (ALWC).
- spp.** (*diligens*-group indet). Amambay, Boquerón, Caaguazú, Canindeyú, Central, Cordillera, Itapúa, San Pedro (ALWC, MZSP).
- spp.** (*fallax*-group indet). Canindeyú, Pte. Hayes (ALWC).
- spp.** (*flavens*-group indet). Central, Paraguari (ALWC).
- [*flavens tuberculata* var. *jheringi* Emery 1894a [invalid name]. Literature records: Ñeembucú (Emery 1906).]

***Pogonomyrmex* Mayr 1868**

- cunicularius* Mayr 1887. Boquerón, Pte. Hayes (ALWC, IFML, INBP).

*micans* Forel 1914b. Boquerón (ALWC).

*naegelii* Forel, in Emery 1878. Amambay, Boquerón, Caaguazú, Canindeyú, Central, Cordillera, Guairá, Paraguari, Pte. Hayes, San Pedro, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MSCN, MCZC). Literature records: Paraguari, “Paraguay” (s. loc.) (Emery 1906, Forel 1895, Taber 1998).

*tenuipubens* Santschi 1936. Literature records: Caaguazú (Fowler 1981, Taber 1998).

*uruguayensis* Mayr 1887. Boquerón, Ñeembucú, Pte. Hayes (ALWC, IFML).

#### *Procryptocerus* Emery 1887

*hylaesus* Kempf 1951. Caaguazú, Canindeyú, Central, Cordillera, Guairá, San Pedro (ALWC, IFML, INBP, LACM). Literature records: Guairá (Kempf 1964b).

*montanus* Kempf 1957. Canindeyú (ALWC).

#### *Pyramica* Roger 1862a

*appretiata* Borgmeier 1954b. Itapúa (ALWC, MHNG).

*crassicornis* (Mayr 1887). Alto Paraná, Canindeyú, Concepción, Itapúa, Paraguari (ALWC, MHNG). Literature records: Alto Paraná, Canindeyú, Concepción, Itapúa, Paraguari (Bolton 2000).

*denticulata* (Mayr 1887). Canindeyú, Concepción (ALWC, BMNH, INBP, LACM, MHNG). Literature records: Alto Paraná, Canindeyú, Concepción, Pte. Hayes (Bolton 2000, Fowler 1981).

*eggersi* (Emery 1890b). Canindeyú, Central, Ñeembucú, Paraguari, Pte. Hayes (ALWC, BMNH, MHNG). Literature records: Canindeyú, Central, Ñeembucú, Paraguari (Bolton 2000).

*emilae* (Forel 1907b). Literature records: Central (Bolton 2000, Forel 1907b).

*epinotalis* (Weber 1934). Canindeyú (MHNG).

*fridericimuelleri* (Forel 1886a). Alto Paraná, Amambay, Canindeyú, Itapúa, Ñeembucú (ALWC, BMNH, INBP, LACM, MHNG). Literature records: Alto Paraná, Amambay, Ñeembucú (Bolton 2000).

*metrix* Bolton 2000. Canindeyú (ALWC, BMNH, INBP). Literature records: Canindeyú (Bolton 2000).

*siagodens* Bolton 2000. Itapúa (MHNG). Literature records: Itapúa (Bolton 2000).

*subdentata* (Mayr 1887). Canindeyú (ALWC, INBP, LACM).

*tanymastax* (Brown 1964). Boquerón, Canindeyú (ALWC, BMNH). Literature records: Alto Paraná, Canindeyú (Bolton 2000).

*xenochelyna* Bolton 2000. Canindeyú, Concepción (BMNH, MHNG). Literature records: Canindeyú, Concepción (Bolton 2000).

#### *Rhopalothrix* Mayr 1870a

**sp. NHM\_A.** [Dietz, ms name]. Central, Itapúa (BMNH).

#### *Rogeria* Emery 1894a

*alzatei* Kugler 1994. Amambay, Central, Paraguari, Pte. Hayes (ALWC, BMNH, INBP, LACM, MHNG). Literature records: Central, Concepción, Paraguari (Kugler 1994).

*besucheti* Kugler 1994. Alto Paraná (MHNG). Literature records: Alto Paraná (Kugler 1994).

*bruchii* Santschi 1922a. Concepción, Misiones (BMNH, MCZC, MHNG). Literature records: Concepción, Misiones (Kugler 1994).

*germaini* Emery 1894a. Amambay, Canindeyú, Central, Itapúa, Misiones (ALWC, BMNH, INBP, LACM, MCZC, MHNG). Literature records: Alto Paraná, Central, Itapúa, Misiones (Kugler 1994).

*scobinata* Kugler 1994. Alto Paraná, Amambay, Caaguazú, Canindeyú, Concepción (ALWC, BMNH, INBP, LACM, MHNG). Alto Paraná, Amambay, Caaguazú, Canindeyú, Concepción (Kugler 1994).

**sp. alw-01.** Boquerón (ALWC).

#### *Sericomyrmex* Mayr 1865

**sp. alw-01.** Canindeyú (ALWC, USNM).

#### *Solenopsis* Westwood 1840

*albidula* Emery 1906. Alto Paraná, Canindeyú, Central, Ñeembucú (ALWC, IFML, INBP, LACM).

*clytemnestra* Emery 1896a. Caaguazú, Canindeyú, Central, Concepción (ALWC, IFML, INBP, LACM). Literature records: “Paraguay” (s. loc.) (Emery 1896a).

*daguerrei* (Santschi 1930). Canindeyú (ALWC).

*franki* Forel 1908b. Cordillera (MCZC). Literature records: Cordillera (Forel 1909).

*iheringi* Forel 1908b. Canindeyú, Concepción, Misiones, Ñeembucú, Paraguari (ALWC, INBP, MHNG).

*invicta* Buren 1972. Boquerón, Caaguazú, Canindeyú, Central, Guairá, Ñeembucú, Paraguari, Pte. Hayes (ALWC, LACM). Literature records: Central (Santschi 1923c), “all of Paraguay” (Trager 1991).

- loretana* Santschi 1936. Amambay, Caaguazú, Canindeyú, Central, San Pedro (ALWC, IFML, INBP, LACM, MZSP).
- macdonaghi* Santschi 1916. Alto Paraguay, Canindeyú, Central, Cordillera, Guairá, Paraguairí, San Pedro (ALWC, INBP, LACM, MCSN). Literature records: "Paraguay" (s. loc.) (Trager 1991).
- medioclara* Santschi 1923b. Canindeyú (ALWC, INBP, LACM).
- megegates* Trager 1991. Boquerón (ALWC).
- richteri* Forel 1909. Literature records: Ñeembucú (Fowler 1981).
- saevisima* (F. Smith 1855). Canindeyú, Central, Ñeembucú (ALWC, INBP, LACM). Literature records: Cordillera (Forel 1911b).
- scelestia* Forel 1908b. Concepción, Cordillera, Pte. Hayes (ALWC, MHNG). Literature records: Cordillera (Forel 1911b).
- schmalzi* Forel 1901a. Canindeyú (ALWC, INBP).
- steigeri* Santschi 1916. Pte. Hayes (ALWC).
- stricta* Emery 1896a. Canindeyú (ALWC, LACM).
- substituta* Santschi 1925d. Amambay (ALWC).
- subtilis* Emery 1896a. Central, "Paraguay" (s. loc.) (MCZC, MZSP, NHMW). Literature records: Central, "Paraguay" (s. loc.) (Emery 1896a, Santschi 1923b).
- tetracantha* Emery 1906. Canindeyú, Itapúa (ALWC).
- wasmannii* Emery 1894a. Caaguazú, Central, Misiones, Pte. Hayes, "Paraná R." (Dept. unknown), "Paraguay" (s. loc.) (ALWC, BMNH, IFML, INBP, MCZC, MHNG, MZSP, NHMW). Literature records: Central, Concepción, Cordillera, Itapúa, Guairá, "Paraguay" (s. loc.) (Emery 1894a, Emery 1896b, Emery 1906, Forel 1911e [as "transformis"], Fowler 1981).
- sp. alw-01.** Canindeyú (ALWC, INBP, LACM).
- sp. alw-02.** Boquerón, Central, Pte. Hayes (ALWC, IFML, INBP).
- sp. alw-03.** Canindeyú (ALWC, IFML, INBP, LACM).
- sp. alw-05.** Canindeyú (ALWC).
- sp. alw-06.** Canindeyú (ALWC, INBP, LACM).
- sp. alw-07.** Canindeyú (ALWC, IFML, INBP, LACM, MHNG).
- sp. alw-08.** Pte. Hayes (ALWC, INBP).
- sp. alw-09.** Boquerón, Caaguazú (ALWC, INBP).
- sp. alw-10.** Canindeyú, Central (ALWC, INBP).
- sp. alw-11.** Canindeyú, Central (ALWC, INBP).
- sp. alw-12.** Canindeyú (ALWC).
- sp. alw-13.** Caaguazú, Central, Paraguairí, Pte. Hayes (ALWC, INBP).
- sp. alw-14.** San Pedro (ALWC).
- sp. alw-15.** Canindeyú (ALWC).
- sp. alw-16.** Central, Itapúa, Paraguairí (ALWC, MHNG).
- sp. alw-18.** Ñeembucú (ALWC).
- sp. alw-19.** Canindeyú (ALWC).
- sp. alw-20.** Amambay (ALWC).
- sp. alw-21.** Amambay (ALWC).
- sp. alw-22.** Itapúa (ALWC).
- spp.** (*saevisima*-complex, indet.). Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Pte. Hayes, San Pedro, "Rinconada" (Dept. unknown) (ALWC, INBP, LACM, MCSN, NHMB, NHMW).

### *Strumigenys* F. Smith 1860

- cariniithorax* Borgmeier 1934. Canindeyú, Concepción (ALWC, BMNH, MHNG). Literature records: Canindeyú, Concepción (Bolton 2000).
- cordovensis* Mayr 1887. Concepción (BMNH, MHNG). Literature records: Concepción (Bolton 2000).
- elongata* Roger 1863a. Canindeyú, Central Concepción (ALWC, BMNH, INBP, LACM, MHNG). Literature records: Canindeyú, Central, Concepción (Bolton 2000, Fowler 1981).
- epelys* Bolton 2000. Paraguairí (MHNG). Literature records: Paraguairí (Bolton 2000).
- hindenburgi* Forel 1915. Literature records: Itapúa (Fowler 1981).
- insolita* Bolton 2000. Central (MHNG). Literature records: Central (Bolton 2000).
- louisianae* Roger 1863a. Alto Paraná, Canindeyú, Central, Concepción, Itapúa, Paraguairí (ALWC, BMNH, MHNG). Literature records: Alto Paraná, Canindeyú, Central, Concepción, Itapúa, Paraguairí (Bolton 2000, Fowler 1981).
- ogloblini* Santschi 1936. Literature records: Central (Fowler 1981).

*prospiciens* Emery 1906. Literature records: Alto Paraná (Fowler 1981).  
*saliens* Mayr 1887. Literature records: Alto Paraná (Fowler 1981).  
*schmalzi* Emery 1906. Canindeyú (ALWC, MHNG).  
*silvestrii* Emery 1906. Boquerón (ALWC).  
**sp. alw-01.** Canindeyú (ALWC).

***Tetramorium* Mayr 1855**

\**simillimum* (F. Smith 1851). Literature records: Concepción (Fowler 1981).

***Trachymyrmex* Forel 1893a**

*dichrous* Kempf 1967a. Amambay (ALWC, INBP, LACM, USNM).  
*fiebrigi* Santschi 1916. “Paraguay” (s. loc.) (NHMB). Literature records: “Paraguay” (s. loc.) (Santschi 1916).  
*holmgreni* Wheeler 1925. Canindeyú (ALWC, USNM).  
*kempfi* Fowler 1982. Boquerón, Canindeyú, Paraguari (ALWC, INBP, LACM, MZSP, USNM). Literature records: Boquerón, Canindeyú (Fowler 1981, Mayhé-Nunes and Brandão 2005).  
**sp. alw-01.** Canindeyú, Central, Concepción, Ñeembucú (ALWC, INBP, LACM, MHNG, USNM).  
**sp. alw-02.** Amambay, Canindeyú, Concepción, Cordillera (ALWC, INBP, LACM, USNM).  
**sp. alw-03.** Amambay (USNM).  
**sp. alw-04.** Canindeyú (ALWC).  
**sp. alw-05.** Pte. Hayes (ALWC).  
**sp. alw-06.** Pte. Hayes (ALWC).  
**sp. alw-07.** Pte. Hayes (ALWC).

***Tranopelta* Mayr 1866a**

*gilva* Mayr 1866a. Alto Paraguay, Cordillera, “Paraguay” (s. loc.) (ALWC, INBP, MCZC, MHNG, NHMB, NHMW). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1919, Fernández 2003b, Forel 1909 [as “*amblyops*”]).

***Wasmannia* Forel 1893b**

*europunctata* (Roger 1863a). Boquerón, Caaguazú, Canindeyú, Central, Pte. Hayes (ALWC, IFML, INBP, LACM, MHNG, MSCN, MZSP). Literature records: Alto Paraná, Concepción (Emery 1894a, Emery 1906, Forel 1907b; [also as “*australis*”, “*nigricans*”, and “*rugosa*”]).  
*lutzi* Forel 1908b. Itapúa (ALWC).  
*sulcaticeps* Emery 1894a. Caaguazú, Central, Itapúa (ALWC, BMNH, MHNG).  
**sp. alw-01.** Alto Paraná, Canindeyú, Concepción (ALWC, MHNG).  
**sp. alw-02.** Amambay, Canindeyú, Concepción, Ñeembucú (ALWC, MHNG).

***Xenomyrmex* Forel 1885**

**sp. alw-01.** Canindeyú (ALWC).

## Subfamily Paraponerinae

***Paraponera* F. Smith 1858**

*clavata* (Fabricius 1775). Amambay (INBP). Literature records: “Paraguay” (s. loc.) (Forel 1895).

## Subfamily Ponerinae

***Anochetus* Mayr 1861**

*altisquamis* Mayr 1887. Itapúa (ALWC, BMNH, MHNG).  
*neglectus* Emery 1894a. Canindeyú, Central, Concepción, Itapúa, Pte. Hayes (ALWC, BMNH, INBP, LACM, MHNG).

***Centromyrmex* Mayr 1866b**

*brachycola* (Roger 1861a). Amambay (INBP).

***Dinoponera* Roger 1861a**

*australis* Emery 1901. Amambay, Canindeyú, Concepción, Guairá, Itapúa, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MZSP, NHMB, NHMW). Literature records: Concepción, Itapúa, “Paraguay” (s. loc.) (Borgmeier 1937, Emery 1896b, Emery 1901b, Forel 1907d, Santschi 1929a).

*mutica* Emery 1901. Alto Paraguay, Boquerón (INBP).

#### *Hypoconera* Santschi 1938

*argentina* (Santschi 1922c). Canindeyú, Central, Cordillera, San Pedro, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN).

*distinguenda* (Emery 1890a). Alto Paraná, Amambay, Caaguazú, Canindeyú, Concepción, Itapúa (ALWC, INBP, LACM, MHNG, MZSP). Literature records: “Paraguay” (s. loc.) (Emery 1890a, Forel 1895).

*fiebrigi* (Forel 1908b). Cordillera (MHNG). Literature records: Cordillera, Misiones (Forel 1908b).

*foreli* (Mayr 1887). Alto Paraná, Amambay, Canindeyú, Itapúa (ALWC, INBP, LACM, MHNG).

*opaciceps* (Mayr 1887). Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Ñeembucú, Paraguairí, Pte. Hayes (ALWC, INBP, MHNG, MZSP). Literature records: Cordillera (Forel 1908b [as “postangustata”]).

\**punctatissima* (Roger 1859). Central, Concepción (ALWC, MHNG). Literature records: Central (Forel 1907b [as “ergatandria”]).

*reichenspergeri* (Santschi 1923c). Alto Paraná, Canindeyú, Paraguairí (ALWC).

*schmalzi* (Emery 1986g). Amambay (ALWC).

*trigona* (Mayr 1887). Itapúa (ALWC). Literature records: Ñeembucú, “Paraguay” (s. loc.) (Emery 1896a, Fowler 1981).

*wilsoni* (Santschi 1925b). Literature records: “Paraguay” (s. loc.) Brandão 1991.

**sp. alw-01.** Canindeyú, Concepción (ALWC, INBP, LACM, MZSP).

**sp. alw-02.** Caaguazú, Canindeyú, Central, Itapúa, Pte. Hayes (ALWC, INBP, LACM, MZSP).

**sp. alw-03.** Alto Paraná, Amambay, Canindeyú, Central, Concepción (ALWC, INBP, LACM, MHNG).

**sp. alw-04.** Amambay, Boquerón, Canindeyú, Central, Concepción, Pte. Hayes (ALWC, INBP, LACM).

**sp. alw-05.** Amambay, Canindeyú (ALWC, INBP, LACM).

**sp. alw-06.** Canindeyú, Itapúa (ALWC, MHNG).

**sp. alw-08.** Canindeyú, Misiones, Ñeembucú (ALWC).

**sp. alw-09.** Paraguairí (ALWC).

**sp. alw-10.** Alto Paraná, Canindeyú, Central, Concepción (ALWC).

**sp. alw-11.** Itapúa (ALWC).

**sp. alw-12.** Concepción (ALWC).

**sp. alw-13.** Caaguazú, Misiones, Ñeembucú (ALWC).

#### *Leptogenys* Roger 1861a

*bohlsi* Emery 1896b. Concepción, Ñeembucú, Pte. Hayes (ALWC, BMNH, INBP MCSN, MHNG, NHMW). Literature records: Concepción(?) (Emery 1896b).

#### *Odontomachus* Latreille 1804

*bauri* Emery 1892f. Boquerón (ALWC, INBP). Literature records: Cordillera (Forel 1909a).

*chelifer* (Latreille 1802). Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Itapúa, Misiones, Paraguairí, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, MHNG, MZSP). Literature records: Cordillera (Forel 1909).

*haematodus* (Linnaeus 1758). Canindeyú, Central, Guairá, Misiones, Ñeembucú, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MHNG). Literature records: Cordillera (Forel 1909).

*meinerti* Forel 1905. Alto Paraná, Canindeyú, Central, Cordillera, Itapúa, Paraguairí, San Pedro (ALWC, BMNH, IFML, INBP, LACM, MHNG). Literature records: “Paraguay” (s. loc.) (Kempf 1972).

**sp. alw-01.** Alto Paraguay, Caaguazú, Central, Cordillera, Itapúa (ALWC, IFML, INBP, MZSP).

#### *Pachycondyla* F. Smith 1858

*commutata* (Roger 1860). Literature records: Central (Fowler 1981, Wild 2003).

*crassinoda* (Latreille 1802). Concepción (INBP). Literature records: Concepción (Wild 2003).

*crenata* (Roger 1861a). Alto Paraná, Amambay, Caaguazú, Canindeyú, Cordillera, Guairá, Itapúa, Paraguairí, San Pedro (ALWC, INBP, LACM, MHNG, MZSP). Literature records: Alto Paraná, Amambay, Canindeyú, Cordillera, Guairá, Paraguairí, San Pedro (Forel 1906, Forel 1912a, Wild 2003).

*harpax* (Fabricius 1804). Amambay, Canindeyú, Concepción, Cordillera, Guairá, Itapúa (ALWC, BMNH, IFML, INBP, MHNG). Literature records: Amambay, Canindeyú, Cordillera “Paraguay” (s. loc.) (Emery 1890a, Forel 1895, Wild 2003).

*lunaris* (Emery 1896a). Canindeyú, Concepción, Itapúa, Paraguairí (ALWC, BMNH, MHNG). Literature records: Canindeyú, “Paraguay” (s. loc.) (Emery 1896a, Wild 2003).

*marginata* (Roger 1861a). Canindeyú, Central, Cordillera, Misiones, Paraguairí, “Paraguay” (s. loc.) (ALWC, INBP, LACM, MCSN, MHNG, NHMW). Literature records: Cordillera, Misiones, Paraguairí “Paraguay” (s. loc.) (Borgmeier 1959a, Emery 1890a, Forel 1895, Wild 2003).

*obscuricornis* Emery 1890. Canindeyú (ALWC, INBP). Literature records: Canindeyú (Wild 2005).

*stigma* (Fabricius 1804). Boquerón, Caaguazú, Canindeyú, Central, Concepción, San Pedro (ALWC, INBP, LACM, MZSP). Literature records: Boquerón, Canindeyú, Central, Concepción, San Pedro (Wild 2003).

*striata* F. Smith 1858. Amambay, Caaguazú, Canindeyú, Cordillera, Guairá, Itapúa, Misiones, Paraguairí, San Pedro, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, LACM, MCSN, MHNG, MZSP, NHMB, NHMW). Literature records: Amambay, Canindeyú, Cordillera, Guairá, Itapúa, Misiones, Paraguairí, San Pedro, “Paraguay” (s. loc.) (Forel 1895, Forel 1906, Wild 2003).

*verenae* (Forel 1922). Amambay, Caaguazú, Canindeyú, Misiones, Paraguairí (ALWC, INBP, LACM, MCZC, MZSP). Literature records: Amambay, Caaguazú, Canindeyú, Misiones, Paraguairí (Wild 2005).

*villosa* (Fabricius 1804). Alto Paraguay, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Paraguairí, San Pedro, “Paraguay” (s. loc.) (ALWC, IFML, INBP, LACM, MCSN, MHNG, NHMB, NHMW). Literature records: Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Paraguairí, San Pedro, “Paraguay” (s. loc.) (Emery 1906, Forel 1895, Forel 1907b, Wild 2003).

#### *Platythyrea* Roger 1863a

*exigua* Kempf 1964a. Canindeyú (ALWC).

*pilosula* (F. Smith 1858). Canindeyú, Central, Cordillera, Pte. Hayes (ALWC, INBP).

#### *Thaumatomyrmex* Mayr 1887

*mutilatus* Mayr 1887. Amambay (BMNH).

### Subfamily Proceratiinae

#### *Discothyrea* Roger 1863a

*neotropica* Bruch 1919. Itapúa (BMNH).

*sexarticulata* Borgmeier 1954a. Alto Paraná, Itapúa (BMNH).

### Subfamily Pseudomyrmecinae

#### *Pseudomyrmex* Lund 1831b

*acanthobius* (Emery 1896b). Alto Paraguay, Alto Paraguay/Boquerón, Concepción, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, BMNH, MCSN, MCZC, MHNG, PSWC). Literature records: Central, Concepción, Cordillera (Emery 1896b, Forel 1907b, Forel 1909).

*cubaensis* (Forel 1901b). Canindeyú, Central (ALWC, INBP).

*denticollis* (Emery 1890b). Alto Paraguay, Boquerón, Central, Ñeembucú, Pte. Hayes, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, MHNG, MZSP). Literature records: Central, “Paraguay” (s. loc.) (Emery 1890b, Emery 1896b, Kempf 1960).

*elongatus* (Mayr 1870a). Canindeyú, Central, Ñeembucú, Pte. Hayes, San Pedro (ALWC, IFML, INBP).

*euryblemma* (Forel 1899b). Canindeyú (ALWC).

*fiebrigi* (Forel 1908b). Cordillera (MHNG). Literature records: Cordillera (Forel 1908b, Forel 1909).

*filiformis* (Fabricius 1804). Canindeyú, San Pedro (ALWC).

*flavidulus* (F. Smith 1858). Amambay, Boquerón, Caaguazú, Canindeyú, Central, Cordillera, Misiones, Ñeembucú, Paraguairí, Pte. Hayes, San Pedro (ALWC, IFML, INBP, MZSP, NHMB).

*gracilis* (Fabricius 1804). Alto Paraguay/Boquerón, Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguairí, San Pedro, “Paraguay” (s. loc.) (ALWC, BMNH, IFML, INBP, MCSN, MCZC, MZSP, NHMB, PSWC). Literature records: Caaguazú, Central, Cordillera, “Paraguay” (s. loc.) (Emery 1890b, Emery 1896b, Forel 1907d, Forel 1908b, Forel 1909, Fowler 1981, Santschi 1916, Santschi 1934 [as “*atrinodis*”]).

*holmgreni* (Wheeler 1925). Amambay, Caaguazú, Canindeyú, Central, Itapúa, Ñeembucú, Paraguairí (ALWC, INBP).



*ita* (Forel 1906). Literature records: “Paraguay” (s. loc.) (Kempf 1972).

*kuenckeli* (Emery 1890b). Central, Guairá, Misiones (ALWC, IFML, MZSP). Literature records: Guairá (Kempf 1961, Ward 1999).

*laevivertex* (Forel 1906). Paraguairí (ALWC).

*lisus* (Enzmann 1944). Canindeyú (ALWC).

*lizeri* (Santschi 1922a). Concepción, San Pedro (ALWC, INBP). **NEW STATUS.**

*longus* Forel 1912c. Canindeyú (ALWC).

*phyllophilus* (F. Smith 1858). Caaguazú, Canindeyú, Central, Guairá, Itapúa, San Pedro (ALWC, INBP, IFML, MZSP). Literature records: Pte. Hayes (Fowler 1981).

*rufiventris* (Forel 1911b). Amambay, Caaguazú, Canindeyú, Central, Cordillera, Guairá, Itapúa, Paraguairí, San Pedro (ALWC, IFML, INBP, PSWC). Literature records: Cordillera (Forel 1911b).

*schuppi* (Forel 1901a). Caaguazú, Canindeyú, Central, Cordillera, Guairá (ALWC, IFML, INBP, MHNG, MZSP, NHMB, PSWC). Literature records: Caaguazú, Central, Cordillera (Forel 1906, Forel 1908b, Forel 1911b, Ward 1989).

*sericeus* (Mayr 1870a). Canindeyú, Central (ALWC, INBP).

*simplex* (F. Smith 1877). Canindeyú, Central, “Paraná R.” (Dept. unknown) (ALWC, IFML, INBP, MCZC).

*subater* (Wheeler & Mann 1914). Canindeyú (ALWC, INBP).

*tenuis* (Fabricius 1804). Pte. Hayes (ALWC).

*tenuissimus* (Emery 1906). Canindeyú, Ñeembucú (ALWC, INBP).

*termitarius* (F. Smith 1855). Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Guairá, Itapúa, Paraguairí, Pte. Hayes, San Pedro (ALWC, IFML, INBP, MCZC, MZSP, PSWC). Literature records: Alto Paraná, Caaguazú, Concepción, Cordillera, Guairá (Emery 1906, Forel 1907d, Forel 1911a, Fowler 1981).

*unicolor* (F. Smith 1855). Guairá (IFML, MZSP). Literature records: Cordillera, Guairá (Forel 1911b, Kempf 1958).

*urbanus* (F. Smith 1877). Canindeyú, “Paraguay” (s. loc.) (ALWC, MHNG). Literature records: Caaguazú, Misiones, “Paraguay” (s. loc.) (Forel 1921, Fowler 1981, Ward 1989).

**sp. PSW-18.** Canindeyú (ALWC).

**sp. PSW-57.** Canindeyú (ALWC).

**sp. alw-01.** Canindeyú (ALWC).

## Dubious and erroneous records

*Acromyrmex laticeps* (Emery 1905). Literature records: Central, Cordillera, Misiones, Ñeembucú, “Paraguay” (s. loc.) (Emery 1905, Fowler 1985). Identity of these records unclear, could pertain to *A. laticeps* or *A. nigrosetosus*.

*Acromyrmex lundii parallelus* Santschi 1916. Literature records: Cordillera (Santschi 1916). Misidentification of *A. crassispinus*; specimens examined (MHNG). *Acromyrmex lundii parallelus* may be a junior synonym of *A. crassispinus* (Wild, pers. obs.).

*Brachymyrmex brevicornis* Emery 1906. Literature records: “Paraguay” (s. loc.) (Emery 1906, Santschi 1923a). Emery’s Paraguay record pertains to *B. cordemoyi*; specimen examined (MCSN). Santschi’s record not verified.

*Brachymyrmex longicornis immunis* Forel 1908b. Literature records: Cordillera (Forel 1909). Misidentification of *B. patagonicus*; specimens examined (MHNG).

*Camponotus blandus* (F. Smith 1858). Literature records: Central (Emery 1906). Possible misidentification of *C. pellitus* or *C. rosariensis*.

*Camponotus blandus denudatus* Emery 1903. Literature records: Pte. Hayes (Fowler 1981). Possible misidentification of *C. pellitus* or *C. rosariensis*.

*Camponotus sericeiventris rex* Forel 1907d. Literature records: “Paraguay?” (Kempf 1972). *Camponotus sericeiventris rex* has a Central American distribution (Wheeler 1931); record probably pertains to *C. sericeiventris*.

*Cephalotes grandinosus* (F. Smith 1860). Literature records: Central(?), Concepción, “Paraguay” (s. loc.) (Emery 1896b, Forel 1907b, Forel 1907d). Records probably pertain to *persimillis*, *C. grandinosus* has a more northerly distribution (De Andrade and Baroni-Urbani 1999).

*Cephalotes pavonii* Latreille 1809. Literature records: Cordillera, “Paraguay” (s. loc.) (Forel 1911b, Forel 1912b). Records refer to *C. borgmeieri*; specimens examined (MHNG). True *pavonii* has a more northerly distribution (De Andrade and Baroni Urbani 1999).

*Dolichoderus diversus* Emery 1894a. Literature records: Cordillera (Forel 1909, as “*leviusculus* Emery”). Probable misidentification of *D. germaini*.

*Dorymyrmex pyramicus* (Roger 1863a). Literature records: “Paraguay” (s. loc.) (Kempf 1972). Record may refer to *D. paranensis*. See discussion under *D. paranensis* below.

*Dorymyrmex flavus* McCook 1880. Literature records: Cordillera (Forel 1909). *Dorymyrmex flavus* is a North American

species unlikely to be conspecific with South American forms, record probably refers to *Dorymyrmex paranensis*.

*Eciton burchelli foreli* Mayr 1886b. Literature records: “Paraguay” (s. loc.) (Emery 1894d). Record probably refers to *E. burchelli* sensu strictu, true *E. foreli* is known from Central America and northern South America (Watkins 1976).

*Hypoponera ergatandria* (Forel 1893b). Literature records: Central (Forel 1907b). Misidentification of *Hypoconera punctatissima*; specimen examined (MHNG).

*Monomorium minimum* (Buckley 1867). Literature records: Central (Forel 1907b). *Monomorium minimum* is a North American species. Record may refer to the introduced species *M. floricola*.

*Mycetophylax simplex* (Emery 1888a). Literature records: Caaguazú (Fowler 1981). Klingenberg (2006) states that *M. simplex* is known only from coastal dune areas and was unable to verify Fowler’s (1981) record, which probably refers to the common inland species *M. emeryi*.

*Myrmicocrypta squamosa uncinata* (Mayr 1887). Literature records: Cordillera (Forel 1911a). The relationship of *M. squamosa uncinata* and *M. squamosa squamosa* is unclear (J. Sosa-Calvo, pers. comm.). I have recorded a single common species in Paraguay related to *M. squamosa*, and Forel’s record (MHNG, examined) belongs to this species. *M. squamosa* is the older name, so I use it here.

*Odontomachus brunneus* (Patton 1894). Literature records: “Paraguay” (s. loc.) (Brown 1976). *Odontomachus brunneus* is a North American species unlikely to be conspecific with South American forms. Name almost certainly refers to *Odontomachus* sp. alw-01.

*Pachycondyla agilis* (Forel 1901b). Literature records: Cordillera (Forel 1911b). Misplaced locality (see Bolton 1995).

*Pachycondyla stigma* var. *attrita* (Forel 1893b). Literature records: “Paraguay” (s. loc.) (Kempf 1972). *Pachycondyla stigma* var. *attrita* is a Caribbean form unlikely to be conspecific with southern South American species.

*Pheidole fallax* Mayr 1870b. Literature records: Pte. Hayes, “Paraguay” (s. loc.) (Fowler 1981, Kempf 1972). *Pheidole fallax* is a Central American/Caribbean species highly unlikely to be conspecific with southern South American forms; Wilson (2003) gives distribution. Records probably refer to *P. jelskii* or *P. obscurithorax*.

*Prionopelta opaca* Emery 1897. Literature record: Central (Forel 1907b). Forel described *Prionopelta mocsaryi* from “Asunción, Paraguay.” Brown (in Wilson 1958) concluded that this was a misplaced locality and synonymized *P. mocsaryi* with the Asian species *P. opaca*, with which it is nearly identical.

*Pseudomyrmex pallidus* (Fr. Smith 1855). Literature records: Alto Paraná (Emery 1906). *Pseudomyrmex pallidus* is a North and Central American form unlikely to be conspecific with southern South American species (Ward 1985); records probably refer to *P. flavidulus*.

*Solenopsis geminata* (Fabricius 1804). Literature records: Cordillera, “Paraguay” (s. loc.) (Emery 1906, Forel 1906, Forel 1908b, Forel 1909). *Solenopsis geminata* is native from southern North America to northern South America (Trager 1991); records probably refer to *S. saevissima* or *S. macdonaghi*.

*Solenopsis pylades* Forel 1904b). Literature records: Cordillera (Forel 1911a). *Solenopsis pylades* was synonymized by Trager (1991) with *S. xyloni*, a North American species. May be a misidentification of *S. macdonaghi* or *S. saevissima*.

## Appendix 2. Taxonomic changes

### *Dorymyrmex paranensis* Santschi 1922a. **NEW STATUS.**

*Dorymyrmex pyramicus* subsp. *flavus* var. *paranensis* Forel 1911b: 285. Unavailable name.

*Dorymyrmex (Conomyrma) pyramicus* var. *paranensis* Santschi 1922a: 372. First available use of *paranensis* Forel 1911b. [w syntypes examined, MHNG; San Bernadino, Cordillera, Paraguay (Fiebrig)].

*Conomyrma pyramicus* var. *paranensis* (Santschi). Kempf 1972: 79. *Dorymyrmex (Conomyrma) pyramicus paranensis* Santschi. Bolton *et al.* 2006: catalogue.

*Dorymyrmex paranensis*, described by Forel from Fiebrig's Paraguayan material and known from additional recent collections in eastern Paraguay, can be distinguished from all other *Dorymyrmex* in the region by the following combination of character states: compound eyes relatively small, about the same diameter as the distance between the frontal carinae; head of largest workers relatively broad, about as broad as long; head, mesosoma, and anterior gastric terga clear yellow to yellow-orange in color; and psammophore present but weakly developed. This ant shares the same small eye size as the common *D. brunneus*, but that species has a more strongly produced propodeal tooth, a more angular mesonotum, and a dark brown body color. The other common light-colored *Dorymyrmex* in Paraguay, the chacoan species *D. exsanguis*, is more gracile; the head of the largest workers at least 1.2x as long as broad and supports a fully-developed psammophore bearing setae roughly equal in length to the head.

The identity of *Dorymyrmex pyramicus* (Roger 1863a), described from Bahia, Brazil, is unclear. Snelling (1995) discusses the problems with this and other names in this taxonomically problematic genus. Apparently, no subsequent taxonomists have seen Roger's material and Roger's description of *D. pyramicus* does not provide enough detail to discern anything other than a bicolored red/brown *Dorymyrmex*. Kusnezov (1952b) and Fabiana Cuezco (pers comm.) use the name for a robust, bicolored, large-eyed species that I have collected near Buenos Aires, Argentina but that has not yet been recorded from Paraguay. In any case, I find no justification for retaining the current trinomen given the uncertainty of *D. pyramicus*.

### *Nomamyrmex esenbeckii* (Westwood 1842).

*Labidus esenbeckii* Westwood 1842: 75.

*Eciton crassicornis* F. Smith 1855: 163. **NEW SYNONYMY.**

*Eciton (Labidus) esenbeckii* (Westwood). Emery 1890b: 39.

*Eciton (Labidus) crassicornis* F. Smith. Wheeler 1916: 324.

*Eciton (Holopone) esenbeckii* (Westwood). Santschi 1925b: 11.

*Eciton (Nomamyrmex) esenbeckii* (Westwood). Borgmeier 1936: 55.

*Eciton (Nomamyrmex) crassicornis* F. Smith. Borgmeier 1936: 55.

*Nomamyrmex crassicornis* (F. Smith). Borgmeier 1953: 14.

*Nomamyrmex esenbecki* (Westwood). Borgmeier 1953: 14.

*Nomamyrmex esenbecki crassicornis* (F. Smith). Borgmeier 1955: 139.

The collections of *Nomamyrmex* that I have examined from Paraguay fall neatly into two species corresponding most commonly to *N. esenbeckii* and more rarely to *N. hartigii*. Watkins (1976) and Borgmeier (1955) provide characters to separate the species.

In contrast, literature records of *Nomamyrmex* from Paraguay pertain to three forms, *N. hartigii* (Borgmeier 1955, Santschi 1916), *N. esenbeckii* (Borgmeier 1955, Santschi 1929a), and *N. esenbeckii crassicornis* (Forel 1906, Forel 1908b, Forel 1909). The literature records of *N. esenbeckii crassicornis*, a subspecies generally known from the more tropical regions of South America, are based on Forel's identifications. Thus, the presence of three forms in the literature is likely an artifact of differing conceptions on the part of earlier taxonomists. Regardless of these conceptual differences, the subspecies of *N. esenbeckii* are largely allopatric across the Neotropics (Watkins 1976). Gordon Snelling, who has examined material from throughout the region, provides a detailed case for the synonymy of all of them at [www.armyants.org](http://www.armyants.org). I concur with Snelling's reasoning and synonymize *N. crassicornis* under *N. esenbeckii* here.

### *Brachymyrmex aphidicola* Forel 1909. **NEW STATUS.**

*Brachymyrmex heeri* var. *aphidicola* Forel 1909: 263. [w syntypes examined, MHNG; San Bernadino, Cordillera, Paraguay (Fiebrig)].

*Brachymyrmex heeri* var. *fallax* Santschi 1923a: 665. **NEW SYNONYMY.** [Holotype examined, NHMB; Paraguay (s. loc.)].

There is little reason to consider *Brachymyrmex heeri* and *B. aphidicola* as conspecific, as both species are locally sympatric and morphologically distinct in eastern Paraguay. *Brachymyrmex aphidicola* is one of the most abundant ground and litter nesting ant species in Paraguayan forests. *Brachymyrmex heeri* is more rarely collected, the two nest records I have from Paraguay are both arboreal. The two species are easily separated by the pubescence on gastric tergite 1 (= abd. tergite 3), with the pubescence dense on *B. heeri* and sparse on *B. aphidicola*. Santschi's type of *B. heeri fallax* (NHMB, examined) falls within the range of variation exhibited by *B. aphidicola* in Paraguay and is synonymized here. It is worth mentioning here that Paraguayan specimens of *B. heeri* are a close match, in both the worker and queen castes, to Forel's types of *B. heeri* (MHNG, examined) described from an introduced population in Switzerland (Forel 1874).

Given the notoriously poor taxonomic state of *Brachymyrmex* and the ubiquity of *B. aphidicola* in the region, there may well exist an older name for this species. A thorough taxonomic revision of this genus is sorely needed.

***Brachymyrmex termitophilus* Forel 1896e. NEW STATUS.**

*Brachymyrmex heeri* var. *termitophilus* Forel 1896e: 179. [w syntypes examined, MHNG; Brazil].

Although *B. termitophilus* shares the dense pubescence and light coloration of *B. heeri*, this ant is more compact than Forel's *B. heeri* types (MHNG, examined). In contrast to the relatively long antennal scapes of *B. heeri*, the scapes of *B. termitophilus* are shorter than the head length, in repose only barely meeting the posterior margin of the head in full-face view. Additionally, the propodeum of *B. termitophilus* in lateral view is only slightly or not at all depressed below the level of the promesonotum, whereas in *B. heeri* the propodeum is always noticeably lower than the promesonotum. Both species occur in Paraguay with no evidence of intergrades, an observation that supports the elevation of *termitophilus* to species.

*Brachymyrmex fiebrigi* Forel (MHNG, types examined) has smaller eyes in the worker caste than *B. termitophilus*, but is otherwise a very similar ant and may merely represent the low end of intraspecific eye size variation in *B. termitophilus*. As only a few specimens of both the large- and small-eyed variants were available in the present study, I prefer to retain *B. fiebrigi* as valid until more material becomes available.

***Myrmelachista nodigera* Mayr 1887.**

*Myrmelachista nodigera* Mayr 1887: 529. [holotype w examined, NHMW; Santa Catharina, Brazil, Hetschko].

*Myrmelachista nodigera* var. *flavicornis* Emery 1896b: 638. **NEW SYNONYMY.** [syntype w examined, MCSN; Concepción, Paraguay (Bohls)].

*Myrmelachista nodigera* subsp. *pallida* Forel 1909: 263. **NEW SYNONYMY.** [syntype w examined, MHNG; San Bernadino, Cordillera, Paraguay (Fiebrig)].

*Myrmelachista (Decamera) nodigera* Mayr. Emery 1925: 33.

*Myrmelachista (Decamera) nodigera* var. *flavicornis* Emery. Emery 1925: 33.

*Myrmelachista (Decamera) nodigera* subsp. *pallida* Forel. Emery 1925: 33.

*Myrmelachista (Hinckisidris) nodigera* Mayr. Kempf 1972: 150.

*Myrmelachista (Hinckisidris) nodigera* var. *flavicornis* Emery. Kempf 1972: 150.

*Myrmelachista (Hinckisidris) nodigera pallida* Forel. Kempf 1972: 150.

Worker head shape in *Myrmelachista nodigera* shows slight allometric variation within nest series, with larger workers having somewhat broader heads, and this variation may have misled Emery and Forel in defining their intraspecific taxa *flavicornis* and *pallida*, both from Paraguay. Mayr's *M. nodigera* type is a larger and more robust worker than the types of *M. flavicornis* and *M. pallida*, yet single nest series I have collected in Canindeyú and San Pedro span the range of variation encompassed by the type specimens for all three taxa. Color is also variable within a nest, presumably related to worker age, so Forel's distinction of *M. pallida* on color is baseless. In my estimation the known Paraguayan collections related to *M. nodigera* comprise a single species.

Forel's type of *Myrmelachista arborea* (MHNG, examined) from San Bernadino is a single queen unassociated with workers. Judging from the shape of the petiole, *M. arborea* may be the queen of *M. nodigera*. Further collections to obtain complete nest series will help establish the identity of this species.

***Paratrechina docilis* (Forel 1908b). NEW STATUS.**

*Prenolepis vividula* subsp. *docilis* Forel 1908b: 402. [w syntypes examined, MHNG; São Paulo, Brazil].

*Paratrechina (Nylanderia) vividula* subsp. *docilis* (Forel). Emery 1925: 223.

*Nylanderia vividula docilis* (Forel). Kempf 1972: 168.

*Paratrechina vividula docilis* (Forel). Brandão 1991: 368.

Forel's *P. docilis*, described from southeastern Brazil and recorded in eastern Paraguay from a variety of forest habitats, cannot be considered conspecific with the cosmopolitan tramp species *P. vividula* (Nylander). *Paratrechina vividula* is likely native to North America (Trager 1984) and has not been recorded from Paraguay. Several consistent morphological differences separate the workers of the two forms. The pilosity on the antennal scapes of *P. vividula* is fine, sparse, and shorter in length than the width of the scape, whereas the pilosity on the scapes of *P. docilis* is stout, black, and at least as long as the width of the scape. The gastric pubescence of *P. docilis* is sparser than that of *P. vividula*, and color of *P. docilis* is normally a clear orange-yellow, lighter than the testaceous to brown color range seen in *P. vividula*.

***Paratrechina fulva* (Mayr 1862).**

*Prenolepis fulva* Mayr 1862: 698. [w syntypes examined, NHMW; Novara, Rio de Janeiro, Brazil].

*Prenolepis (Nylanderia) fulva* Mayr. Forel 1908a: 67.

*Prenolepis fulva* var. *fumata* Forel 1909: 264. **NEW SYNONYMY.** [syntype w examined, NHMB, Sierra Foncière, Paraguay (Fiebrig)].

*Prenolepis (Nylanderia) fulva* v. *fumata* Forel. Forel 1913: 246.

*Paratrechina (Nylanderia) fulva* (Mayr). Emery 1925: 222.

*Paratrechina (Nylanderia) fulva* var. *fumata* (Forel). Emery 1925: 222.

*Nylanderia fulva* (Mayr). Kempf 1972: 166.

*Nylanderia fulva* var. *fumata* (Forel). Kempf 1972: 166.

*Paratrechina fulva* (Mayr). Snelling and Hunt 1976: 122.

*Paratrechina fulva* var. *fumata* (Forel). Brandão 1991: 366.

*Paratrechina fulva* (Mayr). Fernández 2000: 145–149.

*Paratrechina fulva* is among the most abundant ants in Paraguay, particularly in open and riparian habitats. It can be distinguished from all other *Paratrechina* species in Paraguay by the presence of dense pubescence on the meso- and metapleura. Forel's *P. fumata* worker syntypes are also densely pubescent, but they are darker than most collections of *P. fulva*. However, Forel's specimens fall well within the variation of forms that I consider to be conspecific with *P. fulva*, so I synonymize *P. fumata* here. Fernández (2000), who provides a useful redescription and discussion of *P. fulva*, reached a similar conclusion about the identity of "*P. fumata*" from Brazil but stopped short of formal synonymy.

***Camponotus innocens* Forel 1909. NEW STATUS.**

*Camponotus trapeziceps* var. *innocens* Forel 1909: 264. [w syntypes examined, MHNG; San Bernadino, Cordillera, Paraguay (Fiebrig)].

*Camponotus (Myrmaphaenus) trapeziceps* var. *innocens* Forel. Emery 1925: 156.

Both *C. innocens* and *C. trapeziceps* (w syntypes examined, MHNG) occur in Paraguay, but there is little justification for viewing these sympatric forms as conspecific. To my knowledge major workers of *C. innocens* have never been collected, but the minor of *C. innocens* has a markedly more slender head in full-face view than *C. trapeziceps*, a more elongate mesosoma, and thicker, longer pubescence on the head and mesosoma.

***Camponotus pellitus* Mayr 1862. REVISED STATUS.**

*Camponotus pellitus* Mayr 1862:668. [holotype w examined, NHMW; Brazil]

*Camponotus pellitus* var. *scintillans* Forel 1901e: 72. **NEW SYNONYMY.** [w syntypes examined, MHNG; Paraguay (Jerrmann)]

*Camponotus blandus* Emery (nec F. Smith) 1903: 67 (part). Misidentification.

*Camponotus (Myrmamblis) pellitus* Mayr. Bruch 1914: 229.

*Camponotus blandus pellitus* Mayr. Santschi 1922b: 111.

*Camponotus blandus* st. *scintillans* Forel. Santschi 1922b: 111.  
*Camponotus* (*Myrmaphaenus*) *blandus* subsp. *scintillans* Forel. Emery 1925: 154.  
*Camponotus* (*Myrmaphaenus*) *blandus* var. *pellitus* Mayr. Kempf 1972: 44.  
*Camponotus* (*Myrmaphaenus*) *blandus* *scintillans* Forel. Kempf 1972: 45.

The names associated with *Camponotus blandus* present one of the most difficult taxonomic problems in the Paraguayan fauna, and one that is particularly frustrating given the abundance of these ants in open habitats throughout the region. Multiple closely-related species certainly occur in Paraguay, but aside from Santschi's *C. crispulus* (see separate discussion under that species), the taxonomic status of these forms is ambiguous and the arrangement in the present study is tenuous.

In eastern Paraguay, most collections are of dark-colored ants closely matching Mayr's type of *C. pellitus* from Brazil and Forel's types of *C. scintillans* from Paraguay. Workers from western Paraguay are almost universally bicolored with a red head and mesosoma and dark legs and gaster. The major workers of these chaco forms have finer suberect hairs on the sides of the head, spaced more densely, than do workers of *C. pellitus*, and the postero-lateral corners of the head of the largest workers are often more produced. Minor workers of the bicolored forms have smaller eyes than do minors of *C. pellitus*, and they have a slightly lower, less convex propodeum. Both forms co-occur in eastern Paraguay near the Paraguay River with little evidence of interbreeding. Forel's types of *C. rosariensis* fall within the range of variation of these bicolored chacoan forms, so I adopt here a two-species scheme with *C. rosariensis* representing the bulk of the chacoan collections and *C. pellitus* representing most of the eastern collections.

The chacoan forms, while difficult to subdivide further on the basis of external worker morphology, show two distinct nest phenotypes in reproductively mature colonies. I have observed these nest forms within a few meters of each other. One form constructs large, conspicuous crater mounds while the other has cryptic nest entrances in the soil consisting of a single small hole with a slight scattering of excavated earth placed up to half a meter away, a pattern similar to the nests of *C. pellitus*. This sympatric difference in nesting behavior suggests the existence of cryptic species.

F. Smith's holotype of *C. blandus*, a minor worker from Pará (BMNH, examined), is not a close match to any Paraguayan material. This ant has the smaller eyes and the lower propodeum more similar to *C. rosariensis* than to *C. pellitus*, but with denser pubescence on gastric tergites 3 and 4 (= abd. tergites 5 and 6) than in most specimens of *C. rosariensis*. The *C. blandus* type is also colored differently, with the posterior portion of the head quite dark, as in *C. pellitus*, the mesosoma lighter, as in *C. rosariensis*, and the first gastric tergite concolorous with the mesosoma and infuscated posteriorly. However, I have not examined any material occurring between the type locality in Pará and Paraguay, so I cannot dismiss the eventuality that the name *C. blandus* may apply one of these subtropical populations.

***Camponotus rosariensis* Forel 1912e. NEW STATUS.**

*Camponotus blandus* r. *rosariensis* Forel 1912e: 75. [w syntypes examined, MHNG, Rosario de Santa Fe, Argentina (Bruch)].  
*Camponotus* (*Myrmaphaenus*) *blandus* subsp. *rosariensis* Forel. Emery 1925: 154.  
*Camponotus* (*Myrmaphaenus*) *blandus* *rosariensis* Forel. Kempf 1972: 44.

See discussion under *Camponotus pellitus*.

***Camponotus crispulus* Santschi 1922b. NEW STATUS.**

*Camponotus* (*Myrmaphaenus*) *blandus* var. *crispula* Santschi 1922b: 110. [w syntypes examined, NHMB; Cabana, Córdoba, Argentina (Scott)].  
*Camponotus* (*Myrmaphaenus*) *blandus* st. *crispulus* Santschi 1929b: 315.  
*Camponotus* (*Myrmaphaenus*) *blandus* var. *crispulus* Santschi. Kempf 1972: 44.

*Camponotus crispulus* is locally sympatric in Paraguay with at least two other species in the *C. blandus* complex, most frequently the similarly-colored *C. rosariensis*. Both species share a similarly dense pubescence over most of the body and a common bicoloration consisting of a red head and mesosoma and a dark gaster. However, *C. crispulus* is structurally more compact, with shorter appendages and a relatively tall propodeum. In my experience, the easiest character to separate *C. crispulus* from other bicolored *blandus*-complex species is the unique pattern of pubescence on the gaster. While all species in the complex show some degree of medial convergence in the appressed setae on the gastric terga, in *C.*

*crispulus* this convergence is extreme, starting on the first gastric tergite (= abd. tergite 3) well ahead of the posterior margin and continuing to the apex of the gaster almost as a visible line. Because of the distinct morphological separation in sympatry between *C. crispulus* and other closely-related forms, I find unambiguous the elevation of *C. crispulus* to species.

Material from Paraguay is a close match to Santschi's types from Córdoba, although Santschi's material is somewhat more pubescent. F. Smith's *C. blandus* holotype worker (BMNH, examined- see discussion under *C. pellitus*) from Pará is clearly a different species, as that ant is more gracile than *C. crispulus* and lacks the distinct pubescence.

***Camponotus crassus* Mayr 1862.**

*Camponotus crassus* Mayr 1862: 670. [w syntypes examined, NHMW; Novara, Rio de Janeiro, Brazil].

*Camponotus senex* r. *crassus* Mayr: Forel 1879: 99.

*Camponotus vezenyii* Forel 1907b: 34. **NEW SYNONYMY.** [holotype w examined, MHNG; Asunción, Paraguay (Vezényi)].

*Camponotus crassus* subsp. *vezenyii* Forel. Forel 1911b: 291.

*Camponotus (Myrmobrachys) crassus* Mayr. Forel 1914a: 270.

*Camponotus (Myrmobrachys) crassus* r. *vezenyii* Mayr. Forel 1914a: 271.

*Camponotus vezeni* Forel. Emery 1920a: 260.

*Camponotus (Myrmobrachys) crassus* var. *picticornis* Santschi 1936: 421. **NEW SYNONYMY.**

*Camponotus vezenyii* Forel. Kempf 1972: 54.

*Camponotus (Myrmobrachys) crassus* var. *picticornis* Santschi. Kempf 1972: 51.

*Camponotus crassus* is the most frequently recorded *Camponotus* from Paraguay. This ant appears to be found in every terrestrial habitat type with woody vegetation of sufficient diameter to house the arboreal nests in hollow twigs. The coloration of the antennal scapes shows slight variation among collections, from testaceous to dark reddish brown. The amount of pilosity on the mesosomal dorsum also varies somewhat. Forel's type of *C. vezenyii* from Asunción is slightly more pilose and has lighter colored scapes than Mayr's type of *C. crassus*, but it still falls well within the range of variation observed in Paraguay and is synonymized here.

Santschi (1936) distinguished the variety *C. picticornis* from *C. crassus* on the basis of antennal scape color. I was unable to view Santschi's types of *C. picticornis* from Loreto, Argentina, but several other series from northern Argentina at NHMB identified by Santschi as *C. picticornis* are within my conception of *C. crassus*.

***Camponotus iheringi* Forel 1908b.**

*Camponotus iheringi* Forel 1908b: 412. [w syntypes examined, MHNG; São Paulo, Brazil (v. Ihering)]

*Camponotus iheringi* var. *latinota* Forel 1909: 264. **NEW SYNONYMY.** [w syntypes examined, MHNG; San Bernardino, Cordillera, Paraguay (Stengel)]. Junior homonym of *latinotus* Forel 1907c, replacement name is *bajulus* Emery 1925.

*Camponotus (Myrmamblys) iheringi* Forel. Forel 1914a: 271.

*Camponotus (Myrmobrachys) iheringi* Forel. Emery 1920a:260.

*Camponotus iheringi bajulus* Emery 1925: 165. **NEW SYNONYMY.** Replacement name for *latinota* Forel 1909.

*Camponotus jheringi* Forel. Kempf 1972: 52. Misspelling.

*Camponotus jheringi* var. *bajulus* Emery. Kempf 1972: 52. Misspelling.

Forel's *C. latinota* types from San Bernardino (the replacement name is *C. bajulus* Emery) have slightly longer pilosity on the mesosomal dorsum and gastric terga than Forel's *iheringi* type from São Paulo, but the two forms are otherwise similar. Forel (1909a) separated the two based on surface sculpture and mesosomal structure, but the sculpture differences are slight and full nest series of this species I have collected show enough allometric variation in mesosomal structure to call into question the reliability of Forel's distinction. Since *C. iheringi* and *C. bajulus* are allopatric and the differences are ambiguous at best, I find little reason to treat these forms as separate.

***Camponotus sexguttatus* (Fabricius 1793).**

*Formica sexguttata* Fabricius 1793: 354.

*Camponotus sexguttatus* (Fabricius). Mayr 1862: 656.

*Camponotus sexguttatus* var. *fusciceps* Emery 1906: 192. **NEW SYNONYMY.** [syntype w examined, MHNG; Mato Grosso, Brazil].

*Camponotus (Myrmosphincta) sexguttatus* (Fabricius). Forel 1912e: 92.

*Camponotus (Myrmosphincta) sexguttatus* var. *fusciceps* Emery. Wheeler 1916: 14.

*Camponotus sexguttatus* is a common ant throughout the neotropics, particularly in disturbed or edge habitats, that has accumulated an unfortunate number of infraspecific taxa. These names usually pertain to minor color differences. While *C. sexguttatus* in the broad sense may actually contain a number of cryptic species over the full range of the group, there is little chance that the current haphazard assortment of subspecies and varieties accurately represents them. Literature records from Paraguay include both *C. sexguttatus* (Forel 1906, Forel 1907b [as “*bimaculatus*”], Kempf 1972) and *C. sexguttatus* var. *fusciceps* (Emery 1906, Kempf 1972). Examination of the specimens at MHNG on which the records are based shows both to belong to the single common species that I have been calling *C. sexguttatus*. A proper taxonomic study may eventually show that the forms from subtropical South America should have a different name, as the type of *C. sexguttatus* is Antillean in origin, far to the north.

***Camponotus cingulatus* Mayr 1862.**

*Camponotus cingulatus* Mayr 1862: 661. [syntype q examined, NHMW; Brazil].

*Camponotus lessonai* Emery 1894b: 3. **NEW SYNONYMY.** [w syntypes examined, MCSN; San Pedro, Paraguay (Borelli)].

*Camponotus damocles* Forel 1909: 264.

*Camponotus (Myrmothrix) cingulatus* Mayr. Forel 1914a: 268.

*Camponotus (Myrmothrix) lessonai* Emery. Emery 1925: 109.

*Camponotus (Myrmothrix) cingulatus* Mayr. Hashmi 1973: 31.

*Camponotus lessonai* Emery. Hashmi 1973: 129.

Hashmi (1973) never saw the types of *C. lessonai* and subsequently excluded *C. lessonai* from *Myrmothrix*. I located Emery's *lessonai* types from San Pedro at MCSN and they are nearly identical to Forel's type of *C. damocles* from San Bernardino (MHNG, examined). Workers of these forms are considerably darker than Mayr's type of *C. cingulatus* and match several recent collections from eastern Paraguay. I have also encountered light-colored *C. cingulatus* in San Pedro. Whether the presence of sympatric color morphs indicates mere intraspecific variation or the existence of cryptic species is not clear. However, Hashmi (1973) considered *C. damocles* a junior synonym of *C. cingulatus*, and if one adopts Hashmi's broad conception of the species then *C. lessonai* should also be synonymized.

***Camponotus hispidus* Emery 1906. NEW STATUS.**

*Camponotus punctulatus* var. *hispidus* Emery 1906: 190. [syntype w examined, MCSN; Pilar, Encarnación, Paraguay (Silvestri)].

*Camponotus (Tanaemyrmex) punctulatus* var. *hispidus* Emery. Emery 1925: 78.

*Camponotus (Tanaemyrmex) punctulatus* var. *hispidus* Emery. Kempf 1972: 70.

Several species in the *Camponotus punctulatus* complex occur in Paraguay and are among the more common ground-nesting ants in open habitats. *Camponotus hispidus* can be distinguished from the locally sympatric *C. punctulatus* Mayr (syntype w examined, NHMW) by the more extensive pilosity on the head of the major. *Camponotus punctulatus* majors normally lack standing setae on the sides of the head and between the eye and the mandibular insertion, while *C. hispidus* majors have numerous subdecumbent to suberect setae on the sides of the head and > 10 between the eye and the mandibular insertion. As the pilosity of *C. hispidus* is more extensive than that of *C. punctulatus*, the integument of *C. hispidus* appears more densely and deeply punctate. *Camponotus hispidus* is piceous to black in color, while *C. punctulatus* in Paraguay is ordinarily bicolored with a reddish brown head and mesosoma a dark brown gaster. Since these two species are sympatric and distinct in Paraguay, there is no justification for retaining *C. hispidus* as a subspecies.

***Camponotus termitarius* Emery 1902. NEW STATUS.**

*Camponotus punctulatus* subsp. *termitarius* Emery 1902: 297. [w syntypes examined, MCSN; Rio Grande do Sul; Brazil (Schupp)].



*Camponotus (Myrmoturba) punctulatus* r. *termitarius* Emery. Forel 1913: 249.  
*Camponotus (Tanaemyrmex) punctulatus* subsp. *termitaria* Emery. Emery 1925: 78.  
*Camponotus (Tanaemyrmex) punctulatus termitarius* Emery. Kempf 1972: 71.

The aptly-named *Camponotus termitarius* is most commonly collected from old termite mounds in low-lying pastures and pastizales. This ant should be treated as a full species. *Camponotus termitarius* is locally sympatric with *C. punctulatus* (syntype w examined, NHMW), shows consistent differences in nesting site (*C. punctulatus* is a generalist ground-nesting ant), and is morphological distinct in a number of characters. First, *C. termitarius* is more pilose, being intermediate in this regard between the relatively hirsute *C. hispidus* and the relatively bare *C. punctulatus*, lacking extensive standing hairs on the side of the head but bearing >8 between the eye and the mandibular insertions. Second, the propodeum of *C. termitarius* is lower, more elongate, and with a shorter declivitous face than that of *C. punctulatus*. Third, the microsculpture of the gastric tergites is more extensive, giving the gaster a duller appearance than in either *C. hispidus* or *C. termitarius*. Finally, the pubescence is more extensive in *C. termitarius* than in either *C. hispidus* or *C. termitarius*, with the fine appressed setae on the first gastric tergite separated by distances much shorter than the length of the setae and overlapping in places.

***Camponotus substitutus* Emery 1894c.**

*Camponotus melanoticus* var. *substitutus* Emery 1894: 3. [w syntypes examined, MCSN; Salinus, S. Beni, Bolivia (Balzan)].

*Camponotus landolti* r. *substitutus* Emery. Forel 1899c: 136.

*Camponotus melanoticus* var. *multipilis* Forel 1907d: 10. **NEW SYNONYMY.** [w, m, q syntypes examined, MHNG; Estancia Postillón, Puerto Max a. Rio Paraguay, N. Paraguay (Louis Des Arts jr.)]

*Camponotus (Myrmoturba) melanoticus* var. *multipilis* Forel. Bruch 1914: 229.

*Camponotus (Myrmoturba) melanoticus* subsp. *substitutus* Emery. Bruch 1914: 229.

*Camponotus maculatus* st. *substitutus* Emery. Santschi 1916: 396.

*Camponotus fumidus* st. *substitutus* Emery. Santschi 1922b: 101.

*Camponotus (Tanaemyrmex) substitutus* Emery. Emery 1925: 82.

*Camponotus (Tanaemyrmex) substitutus* var. *multipilis* Forel. Emery 1925: 83.

*Camponotus substitutus* is among the more commonly encountered *Camponotus* in open and disturbed habitats, particularly in the chaco and near the Rio Paraguay in eastern Paraguay. This ant can be distinguished from other large Paraguayan *Camponotus (Tanaemyrmex)* by the following combination of character states: numerous (>20) suberect to subdecumbent setae on the sides of the head in the major caste; scape of the major simple, not flattened at base; and striking bicoloration in all female castes, with gastric tergites 1-3 (=abd. tergites 3-6) bearing yellowish-white antero-lateral spots contrasting with a dark brown to black central area. Forel's types of *C. substitutus multipilis* are more pilose than most Paraguayan collections of *C. substitutus*, but still within the range of variation of the species. As I can find no other characters that distinguish *C. multipilis* from *C. substitutus* I synonymize it here.

***Camponotus coloratus* Forel 1904a. NEW STATUS.**

*Camponotus melanoticus* v. *colorata* Forel 1904a: 49. [holotype w examined, MHNG; Ciénaga, Columbia].

*Camponotus (Myrmoturba) melanoticus* var. *colorata* Forel. Bruch 1914: 229.

*Camponotus (Tanaemyrmex) substitutus* var. *colorata* Forel. Emery 1925: 83.

*Camponotus (Tanaemyrmex) substitutus* var. *coloratus* Forel. Kempf 1972: 72.

*Camponotus coloratus* cannot be considered conspecific with *C. substitutus*. Both ants are locally sympatric in the Paraguayan chaco without signs of hybridization. These species share a similar striking bicoloration (see discussion under *C. substitutus*), but workers of *C. coloratus*, in addition to being on average larger than workers of *C. substitutus*, have disproportionately longer legs, a more opaque microsculpture, and considerably reduced pilosity with the sides of the head of the major bearing fewer than 5 standing setae. Paraguayan material is lighter in color and with a broader head in the major caste than Forel's type from Colombia, but given the allopatric nature of the variation I see no reason to divide *C. coloratus* further.

***Camponotus vagulus* Forel 1908b. NEW STATUS.**

*Camponotus fastigatus* subsp. *vagulus* Forel 1908b: 403. [w syntypes examined, MHNG; São Paulo, Brazil (v. Ihering)]

*Camponotus (Myrmaphaenus) fastigatus* subsp. *vagula* Forel. Emery 1925: 155.

*Camponotus (Myrmaphaenus) fastigatus vagulus* Forel. Kempf 1972: 46.

*Camponotus fastigatus* has been interpreted broadly by Forel, Emery, and Santschi, who each named subspecies based on forms that are distinct from *C. fastigatus* in head shape, mesonotal structure, and pilosity. It is unlikely that any of these subspecies, including Forel's *C. vagulus*, are truly conspecific as they maintain their differences in broad sympatry in southern South America.

With minor workers approaching only 3mm in length, *Camponotus vagulus* is one of the smallest *Camponotus* in the region. This ant co-occurs with *C. fastigatus* throughout eastern Paraguay and shows similar associations with open or edge habitats. Both ants share a robust build, a strong medial clypeal carina, and short antennal scapes that in repose fall well short of the posterior cephalic margin. However, differences between the two are numerous. In full face view, the head of the major of *C. vagulus* is rectangular, over 1.1x longer than broad, with sides straight and subparallel, while the head of *C. fastigatus* is rounded, about as long as broad, with the sides clearly convex. The integument of *C. vagulus* over most of the body has little microsculpture, giving the ant a characteristic shiny appearance, while that of *C. fastigatus* is opaque. The pubescence of *C. vagulus* is shorter and more difficult to see than that of *C. fastigatus*, and the head of both worker castes in *C. vagulus* is lighter in color near the mandibular insertions. In light of the numerous differences in sympatry between the forms, the case for raising *C. vagulus* to species is unambiguous.

***Camponotus lespesii* Forel 1886c.**

*Camponotus sexguttatus* r. *lespesii* Forel 1886c: 169. [holotype w examined, MHNG; Colombia].

*Camponotus lespesi* subsp. *melancholicus* Emery 1894b: 2. **NEW SYNONYMY.** [w syntypes examined, MCSN, MHNG; Colonia Risso, Paraguay (Borelli)]

*Camponotus lespesi* Forel. Mayr 1887: 513.

*Camponotus (Dinomyrmex) lespesi* Forel. Forel 1914a: 268.

*Camponotus (Tanaemyrmex) lespesi* Forel. Emery 1925: 83.

*Camponotus (Tanaemyrmex) lespesi* subsp. *melancholica* Emery. Emery 1925: 83.

*Camponotus (Tanaemyrmex) lespesi melancholicus* Forel. Kempf 1972: 68.

In my opinion the literature records of *C. lespesii* and *C. lespesii melancholicus* from Paraguay pertain to a single species, and the differences in identification stem from alternate taxonomic interpretations on the part of Forel and Emery. All of the material I have examined is rather homogenous and closely matches Emery's *melancholicus* types. The distinct appearance of this ant renders it unlikely to be confused with any other species in Paraguay. *Camponotus lespesii* is large (mesosomal length > 3.5mm in major workers) and more gracile than any other Paraguayan *Camponotus* of similar size. Additional diagnostic characters include: head of major worker considerably longer than broad; sides of head of major bearing >15 standing setae; antennal scapes lacking standing setae; antennal scapes longer than head length; mesosoma low and elongate, declivitous propodeal face less than 1/3 length of dorsal face; sculpture of head, mesosoma, and gaster opaque.

Forel's *lespesii* type, a large minor worker from Colombia, is somewhat lighter in color than the Paraguayan specimens but is otherwise similar. For the purpose of eliminating a trinomen I synonymize *C. melancholicus* here.

***Camponotus germaini* Emery 1903.**

*Camponotus germaini* Emery 1903: 71. [w syntypes examined, MCSN; Matto Grosso, Brazil (Germain)].

*Camponotus germaini* subsp. *tacuruensis* Emery 1911: 222. **NEW SYNONYMY.** [w syntypes examined, MCSN; Tacuru Pucu, Alto Paraná, Paraguay (Silvestri)].

*Camponotus (Myrmamblys) germaini* Emery. Forel 1914a: 271.

*Camponotus (Neomyrmamblys) germaini* Emery. Santschi 1921a: 311.

*Camponotus (Myrmaphaenus) germaini* Emery. Emery 1925: 155.

*Camponotus (Myrmaphaenus) germaini* subsp. *tacuruensis* Emery. Emery 1925: 155.

*Camponotus (Myrmaphaenus) germaini tacuruensis* Emery. Kempf 1972: 46.

*Camponotus germaini* is a soil-nesting species recorded from low forests, second growth forests, and edge habitats. Emery (1911d) distinguished *C. tacuruensis* from *C. germaini* on the basis of size and head shape of the major worker. I have examined Emery's types for both taxa. Although it is true that *C. germaini tacuruensis* is slightly larger than most collections of *C. germaini* in Paraguay, I can find no other difference to distinguish *C. tacuruensis*. The head shape of the major worker in spite of Emery's written description is scarcely different between the two forms and both forms fall within the observed range of variation of this species in Paraguay.

***Acromyrmex pubescens* (Emery 1905). REVISED STATUS.**

*Atta (Acromyrmex) pubescens* Emery 1905: 51. [w syntypes examined, MCSN, MHNG; Paraguay (Balzán)].

*Acromyrmex lundii* var. *pubescens* (Emery). Bruch 1914: 216.

*Acromyrmex lundii* st. *pubescens* (Emery). Santschi 1916: 386.

*Acromyrmex lundii pubescens* (Emery). Kempf 1972: 13.

Fowler (1985a) described the differing habitat associations of *Acromyrmex lundii* and *Acromyrmex pubescens*, noting that the former is found in open habitats and the latter in the patchy forest "islands" that occur in the chaco savannah. The two forms are sympatric and structurally similar, both bearing elongate lateral pronotal spines that are longer than the mesonotal spines. However, these ants are distinguishable in pubescence. Much of the integument of *A. pubescens* is covered in a dense decumbent pubescence while the integument of *A. lundii* is relatively bare. This difference is easiest to diagnose on the mesopleura, as the mesopleural pubescence of *A. pubescens* comprises overlapping hairs, while that of *A. lundii* is sparse and the hairs non-overlapping. Given the ecological and morphological differences in sympatry between these two forms, I elevate *A. pubescens* to species here.

***Crematogaster cisplatinalis* Mayr 1887. REVISED STATUS.**

*Crematogaster victima* var. *cisplatinalis* Mayr 1887: 624. [Holotype w examined, NHMW; Uruguay (Berg)]

*Crematogaster cisplatinalis* Mayr. Dalla Torre 1893: 80.

*Crematogaster (Orthocrema) victima* subsp. *cisplatinalis* Mayr. Emery 1924a: 136.

*Crematogaster (Orthocrema) victima cisplatinalis* Mayr. Kempf 1972: 90.

*Crematogaster cisplatinalis* is a twig-nesting species recorded most frequently from low-lying open habitats in the Paraguay river floodplain. This species is distinct in a number of characters from *C. victima*, a slightly larger ant that tends to be found in the better-drained habitats of the eastern forests and cerrados. There is little reason to retain the subspecific status of *C. cisplatinalis* as the two forms overlap substantially in distribution but differ consistently in numerous characters. Among Paraguayan collections these differences include: standing setae present on tibiae and antennal scapes of *C. cisplatinalis* (absent in *C. victima*); dorsum of head almost entirely punctate in *C. cisplatinalis*, or if a smooth medial strip present the strip is narrower than the width of the compound eye (smooth medial strip present, usually wider than width of compound eye, in *C. victima*); color brown to black in *C. cisplatinalis* (testaceous to medium brown in *C. victima*).

Jack Longino, who has conducted extensive taxonomic work on Neotropical *Crematogaster* (Longino 2003), confirmed the identifications for both *C. victima* and *C. cisplatinalis* in Paraguay and concurs with a change in status of *C. cisplatinalis* (Longino, pers. comm.).

***Crematogaster nitidiceps* Emery 1895a. NEW STATUS.**

*Crematogaster victima* var. *nitidiceps* Emery 1895a: 288.

*Crematogaster victima* subsp. *nitidiceps* var. *pergens* Forel 1911b: 274. Unavailable name. [examined, MHNG; Cordillera, Paraguay (Fiebrig)].

*Crematogaster (Orthocrema) victima* subsp. *nitidiceps* Emery. Emery 1924a: 136.

*Crematogaster (Orthocrema) victima nitidiceps* Emery. Kempf 1972: 90.

*Crematogaster nitidiceps* and *Crematogaster victima* occur in local sympatry across eastern Paraguay. There is no reason to consider the two forms conspecific, and indeed the two forms are likely not even close relatives. I have not examined type material of either form, but Jack Longino has confirmed the identification of both species in my Paraguayan mate-

rial and concurs with a change in status for *C. nitidiceps* (Longino, pers. comm.). In Paraguay, the two species differ in a number of characters, including: antennal scapes in repose fail to meet posterior cephalic margin in *C. nitidiceps* but surpass posterior margin in *C. victima*; head in full-face view longer than broad in *C. niticeps* but broader than long in *C. victima*; sculpture of lateral face of pronotum smooth and shining in *C. nitidiceps* but punctate in *C. victima*; dorsum of head bearing only one or two pairs of standing setae in *C. niticeps* but bearing > 20 standing clavate setae in *C. victima*. The two forms show additional differences in eye size, petiolar structure, and mesosomal structure.

***Crematogaster quadriformis*** Roger 1863a.

*Crematogaster quadriformis* Roger 1863a: 207.

*Crematogaster quadriformis* var. *gracilior* Forel 1901c. **NEW SYNONYMY.** [w syntypes examined, MHNG; São Paulo, Brazil]

*Crematogaster quadriformis* subsp. *vezenyii* Forel 1907b: 25. **NEW SYNONYMY.**

*Crematogaster quadriformis* r. *gracilior* Forel. Forel 1912c: 218.

*Crematogaster (Orthocrema) quadriformis* Roger. Santschi 1918: 182.

*Crematogaster (Orthocrema) quadriformis* subsp. *gracilior* Forel. Emery 1924a: 135.

*Crematogaster (Orthocrema) quadriformis* subsp. *vezenyii* Forel. Emery 1924a: 135.

*Crematogaster (Orthocrema) quadriformis gracilior* Forel. Kempf 1972: 88.

*Crematogaster (Orthocrema) quadriformis vezenyii* Forel. Kempf 1972: 89.

*Crematogaster quadriformis* is the most frequently recorded ground-nesting *Crematogaster* in Paraguay. This species can be diagnosed by the following combination of character states: propodeum in profile only slightly or not at all depressed below level of mesonotum; propodeal spines elongate but shorter than length of petiole; antennal scapes equal or greater in length than head length, in repose well exceeding the posterior margins of the head in full-face view; head sculpture densely punctate/striate except for a smooth frontal strip; >20 subdecumbent to suberect setae on the first gastric tergite. *Crematogaster quadriformis* shows considerable variation even within nest series in overall size, pilosity, eye size, and extent of punctuation/striation on the head.

Jack Longino examined some recent Paraguayan collections and confirmed the identity of this species as *C. quadriformis*. I have subsequently viewed Forel's types of *C. quadriformis gracilior* from São Paulo and found them to fall well within the range of variation I have observed in Paraguay, so I synonymize *C. gracilior* here.

I was not able to view Forel's types of *C. quadriformis vezenyii*, described from material collected in Asunción. Forel's description notes small size, a more shiny head, and lack of a well-developed tooth in the propodeal suture. These character states are common in the *C. quadriformis* material I have examined towards the small end of the size distribution of nest series, so I find it likely that *C. quadriformis vezenyii* is a collection of a young nest or small workers of *C. quadriformis*.

***Crematogaster rochai*** Forel 1903.

*Crematogaster rochai* Forel 1903: 255. [w syntypes examined, MHNG; Ceará, Brazil, (Rocha)]

*Crematogaster brevispinosa* r. *rochai* Forel. Forel 1912c: 213.

*Crematogaster (Orthocrema) brevispinosa* st. *malevolens* Santschi 1919: 41. **NEW SYNONYMY.** [w syntypes examined, NHMB; Nueva Pompeya, Chaco, Argentina (Joergensen)].

*Crematogaster (Orthocrema) brevispinosa* subsp. *rochai* Forel. Emery 1924a: 134.

*Crematogaster (Orthocrema) brevispinosa rochai* Forel. Kempf 1972: 86.

*Crematogaster (Crematogaster) rochai* Forel. Longino 2003: 102.

*Crematogaster (Crematogaster) malevolens* Santschi. Longino 2003: 131. Raised to species.

*Crematogaster rochai* can be diagnosed by the following combination of characters: antennal scapes short, less than .8x head length, in repose failing to reach posterior margin of head in full-face view; dorsal surface of head largely devoid of erect setae; promesonotum slightly arched in profile; propodeal suture present but not deep; postero-dorsal face of propodeum forming a single concave slope, not broken into distinct dorsal and posterior faces; propodeal spines short and upturned; first gastric tergite (= abd. tergite 4) with < 6 standing setae exclusive of posterior row.

Mature colonies in the *Crematogaster crinosa* complex, including *C. rochai*, are polymorphic in the worker caste and occasionally produce rather large workers. Santschi's *C. malevolens* seems to be little other than a large *C. rochai*. I can find no consistent characters to separate *C. malevolens* from the *C. rochai* type or from Paraguayan material that Jack

Longino has identified as *C. rochai*. Longino (2003) elevated *C. malevolans* to species with the intent to clear trinomials from the *C. crinosa* complex but did not provide additional reasoning. If *C. malevolans* is indeed conspecific with what I call *C. rochai* in Paraguay, an alternate resolution would be to split these southern populations off from *C. rochai* under the name *C. malevolans*. Specimens from southern South America are more pilose and bear a stronger propodeal suture than more northerly material Longino (2003), character states that apply equally to *C. malevolans*. Considering the allopatric nature of the variation, however, I prefer to retain a single species.

***Pheidole reflexans* Santschi 1933. NEW STATUS.**

*Pheidole radoszkowskii* var. *reflexans* Santschi 1933: 109. [w syntypes examined, NHMB; Argentina, Misiones, Est. Exp. Loreto].

*Pheidole radoszkowskii* var. *reflexans* Santschi. Wilson 2003: 221; junior synonym of *Pheidole radoszkowskii* Mayr.

Wilson (2003) took a broad view of *Pheidole radoszkowskii* and synonymized several names, including Santschi's variety *reflexans*. The evidence for resurrecting *P. reflexans* to species is strong, however. Both *P. radoszkowskii* and *P. reflexans* are locally sympatric across eastern Paraguay, with the former species commonly found in open habitats such as campo cerrado, roadside, and pasture, while the later is restricted to closed forests. *Pheidole reflexans* can be one of the most common forest-floor ants and is frequently recovered in sifted litter samples from subtropical tall forests. The morphological differences between the two forms are consistent across eastern Paraguay. *Pheidole reflexans* is more gracile, with considerably longer legs and antennal scapes, and in Paraguay is also somewhat more pilose in the major caste, supporting > 10 suberect setae on gastric tergite 1 (= abd. tergite 4). This pilosity difference appears to be regional, as Mayr's *P. radoszkowskii* types from French Guiana (NHMW, examined) are more pilose than the Paraguayan populations of the same species.

***Solenopsis scelesta* Forel 1908b. NEW STATUS.**

*Solenopsis decipiens* var. *scelesta* Forel 1908b: 364. [w syntypes examined, MHNG, NHMB; São Paulo, Brasil (Ihering)].

*Solenopsis scelesta* is a relatively gracile species that can be recognized by the following combination of character states: head width > 0.4 mm; compound eyes comprised of about 8-10 ommatidia; dorsal propodeal face about twice as long as declivitous face; dorsal face of propodeum smooth and without sculpture. Material from Paraguay is a close match to Forel's types from São Paulo. I have not examined Emery's type of *S. decipiens*, but Forel's description of *S. scelesta* based on differences in thoracic structure, antennal scape length, and eye size suggests that it is unlikely that both forms are conspecific. I change the status of *Solenopsis scelesta* to eliminate the trinomen.

***Solenopsis wasmannii* Emery 1894a.**

*Solenopsis wasmannii* Emery 1894a: 151. [w syntypes examined, MHNG; Paraguay (Balzan)].

*Solenopsis wasmannii* Emery. Forel 1911a: 297.

*Solenopsis wasmanni* subsp. *transformis* Forel 1911a: 298. **NEW SYNONYMY.** [w syntypes examined, MHNG; San Bernadino, Paraguay (Fiebrig)].

*Solenopsis wasmanni transformis* Forel. Kempf 1972: 241.

*Solenopsis wasmannii* shows a more pronounced worker polymorphism than any other *Solenopsis* in Paraguay. Major workers of this species can be diagnosed as follows: head width > 0.8mm; head in full-face view chordate, wider posterior than anterior to the compound eyes, posterior margin concave; integument between compound eye and antennal insertions bearing deep piligerous punctures; compound eye small, with approximately 20 ommatidia; mesosomal dorsum in profile forming a single convexity, propodeum not depressed below level of mesonotum; propodeal suture distinct; petiole and post-petiole subequal in width; body covered in erect setae of varying length; head and body concolorous light brown to dark reddish brown in color. Minor workers are considerably smaller and lighter in color than the major but share the similarly diagnostic continuous mesosomal profile.

Forel (1911e) distinguished his subspecies *S. transformis* from *S. wasmannii* on the basis of body width, color, and punctuation of the head. However, body width is a difficult character to evaluate in polymorphic species, especially with

sample sizes as small as those available to Forel. In my opinion the structural differences cited by Forel are at least partly allometric in nature and not indicative of a species boundary. Likewise, a distinction based on punctuation is artifactual. The cephalic punctuation of the two forms is similar, but easier to see in *S. transformis* solely as a consequence of the slightly darker color. I find no compelling reason to retain *S. transformis*, so I synonymize it here.

***Solenopsis medioclara* Santschi 1923b. NEW STATUS.**

*Solenopsis brevicornis* var. *medioclara* Santschi 1923b: 254. [w syntypes examined, NHMB; Piracicabo, Minas Gerais, Brazil (Luja)].

*Solenopsis medioclara* is commonly encountered in Paraguay in sifted litter samples from tall forest habitats. This species can be recognized by the short antennal scapes (about ½ head length), the lack of punctuation on the mesopleuron, and the shape of the petiole, which in profile is considerably bulkier than the post-petiole. I have not examined the type specimens of Emery's *Solenopsis brevicornis*, but Santschi's types of *S. medioclara* are a close match to numerous recent collections from humid subtropical semi-deciduous forest in Canindeyú. I change the status of *Solenopsis medioclara* to eliminate the trinomen, but detailed study of *Solenopsis* (*Diplorhoptrum*) will be needed to clarify the identity of this species. *S. brevicornis* may turn out to be the valid name for the Paraguayan populations.

***Solenopsis shiptoni* Santschi 1916. NEW STATUS.**

*Solenopsis shiptoni* Forel 1914b: 276. [syntype w image examined, www.antweb.org (specimens at MHNG); Tucumán, Argentina (Shipton)].

*Solenopsis metanotalis shiptoni* Forel. Creighton 1930: 127.

*Solenopsis shiptoni* can be recognized by the following combination of character states: strong transverse striae present on propodeal dorsum; compound eyes comprised of < 30 ommatidia; postpetiolar node in dorsal view broader than long; head width > 0.4 mm; body color testaceous to light reddish brown. These ants are uncommonly collected in Paraguay, and all records are from the Chaco. The taxonomy of the complex of species associated with *S. metanotalis* is poorly understood and I change the status of *S. shiptoni* to eliminate the trinomen. Most of the material I have seen identified as *S. metanotalis* has less pronounced mesosomal striation, larger eyes, and a narrower postpetiole than *S. shiptoni*, but the question of whether this variation is intra- or inter-specific will require more detailed study than is possible in the present study.

***Hypoponera opaciceps* (Mayr 1887).**

*Ponera opaciceps* Mayr 1887: 536. [lectotype w examined, NHMW; Santa Catharina, Brazil]

*Hypoponera opaciceps* (Mayr). Taylor 1967: 11.

*Ponera opaciceps* var. *postangustata* Forel 1908b: 343. **NEW SYNONYMY.** [holotype w examined, MHNG; San Bernadino, Cordillera, Paraguay (Fiebrig)].

*Hypoponera opaciceps postangustata* (Forel). Kempf 1972: 123.

Forel (1908h) distinguished the variety *postangustata* from *H. opaciceps* on the basis of having a more convex head shape, but having examined and photographed both Mayr's and Forel's types, I can find no discernable difference in shape. Both ants are remarkably similar in most respects except for color- the *H. opaciceps* type is piceous while *H. postangustata* is ferruginous. In any case, *H. opaciceps* is variable in many characters even within nest series. Forel's *H. postangustata* type falls well within the bounds of variation of *H. opaciceps* and I synonymize it here.

***Pseudomyrmex acanthobius* (Emery 1896b).**

*Pseudomyrma acanthobia* Emery 1896b: 628. [w syntypes examined, MCSN, MHNG; Paraguay (Bohls)].

*Pseudomyrma acanthobia* var. *fuscata* Emery 1896b: 629. **NEW SYNONYMY.** [w syntypes examined, MCSN, MHNG; Paraguay (Bohls)].

*Pseudomyrmex acanthobius* (Emery). Kusnezov 1953: 214.

*Pseudomyrmex acanthobius* var. *fuscatus* (Emery). Kempf 1972: 215.

*Pseudomyrmex acanthobius*, a small *pallidus*-group species with large eyes and a relatively swollen fore femur, has been recorded sporadically from Paraguay nesting in Acacia thorns. Emery described both *P. acanthobius* and *P. acanthobius* var. *fuscatus* in the same paper (Emery 1896b), distinguishing the two forms on the basis of color. The collections I have seen of this species can vary from orange-yellow to dark brown. Phil Ward, who is currently revising *Pseudomyrmex*, has examined Emery's types and my recent Paraguayan collections and concluded that the color variation is intraspecific. As there are no other characters that reliably differ between the forms, I see no reason to dissent from Ward's assessment.

***Pseudomyrmex gracilis*** (Fabricius 1804).

*Formica gracilis* Fabricius 1804: 405.

*Leptalea gracilis* (Fabricius). Erichson 1839: 309.

*Pseudomyrma gracilis* (Fabricius). Roger 1862b: 289.

*Pseudomyrma* (*Clavanoda*) *gracilis* (Fabricius). Enzmann 1944: 61.

*Pseudomyrma gracilis* var. *atrinoda* Santschi 1934: 26. **NEW SYNONYMY.** [holotype w examined, NHMB; Rio Negro, Paraná, Brazil (Reichensperger)].

*Pseudomyrmex gracilis* (Fabricius). Kusnezov 1953: 214.

*Pseudomyrmex gracilis* var. *atrinoda* (Santschi). Kempf 1958: 434.

*Pseudomyrmex gracilis* var. *atrinodus* (Santschi). Kempf 1972: 219.

Ants in the *Pseudomyrmex gracilis* species complex are ubiquitous in the neotropics, and the species *P. gracilis* itself presents a confusing array of variation (Ward 1989). Santschi distinguished his variety *P. atrinodus* on the basis of small size and light coloration on parts of the mesosoma, but I have examined the type material and in both these characters *P. atrinodus* is well within the normal range of variation of the species. Phil Ward, who is revising *Pseudomyrmex*, concurs with this synonymy (Ward, *pers comm.*)

***Pseudomyrmex lizeri*** (Santschi 1922a). **NEW STATUS.**

*Pseudomyrma flavidula* st. *lizeri* Santschi 1922a: 346.

*Pseudomyrmex flavidulus lizeri* (Santschi). Kusnezov 1953: 214.

*Pseudomyrmex lizeri* is known from a pair of localities in eastern Paraguay where it is locally sympatric with the common *P. flavidulus*. There is no reason to consider the two forms conspecific. In Paraguay, *Pseudomyrmex lizeri* is a noticeably larger ant than *P. flavidulus* and has a disproportionately broader head. I have not examined the type material of this species, but Phil Ward identified the Paraguayan specimens and concurs with a change in status for *P. lizeri* (Ward, *pers comm.*).

## **Incertae sedis**

*Camponotus scipio insignis* Santschi 1922b. I was unable to view Santschi's material, but it is probable that *C. insignis* is conspecific with either *C. scipio* or *C. crassus*.

