
New records of hunting ants (Poneroids and Ectatomminoids) in the northern part of the Colombian Orinoquia region

J. C. Agudelo Martínez & N. Pérez–Buitrago

Agudelo Martínez, J. C. & Pérez–Buitrago, N., 2017. New records of hunting ants (Poneroids and Ectatomminoids) in the northern part of the Colombian Orinoquia region. *Arxius de Miscel·lània Zoològica*, 15: 229–248.

Abstract

New records of hunting ants (Poneroids and Ectatomminoids) in the northern part of the Colombian Orinoquia region.— We reviewed 466 specimens of hunting ant species collected in flooded savanna environments and their adjacent forest fragments in the rural area of Arauca municipality (Arauca, Colombia). Samples were taken from eight forest fragments with sizes between 0.25 and 220 ha. In each location we set linear transects with seven sampling points separated by 20 m. In each sampling point we used three capture methods: a pitfall trap (left 24 hours), a sample of 1 m² of soil and litter to be processed with a mini Winkler extractor, and direct capture. Fifteen species were recorded; the most diverse genus was *Neoponera* with six species, followed by *Odontomachus* with two species and *Ectatomma*, *Anochetus*, *Gnamptogenys*, *Prionopelta* *Pseudoponera*, *Pachycondyla* and *Thaumatomyrmex* each with one species. This study extends the geographical distribution of 15 hunting ant species to the northern part of the Colombian Orinoquia region and documents for the first time the presence of *Thaumatomyrmex* cf. *mutilatus* in Colombia.

Key words: Biodiversity, Ponerinae, Orinoco, Biogeography

Resumen

Nuevos registros de hormigas cazadoras (Poneroides y Ectatomminoides) en el norte de la Orinoquia Colombiana.— Se revisaron 466 especímenes de hormigas cazadoras recolectadas en ambientes de sabana inundable y bosques en la zona rural del municipio de Arauca (Arauca, Colombia). En ocho zonas de bosque con tamaños de entre 0,25 y 220 ha se ubicó un transecto lineal con siete puntos de muestreo separados por 20 m con

una superfície de 10 m² cada uno. En cada punto de muestreo se utilizaron tres tipos de tècniques: una trampa de caïda por 24 horas, una muestra de 1 m² de hojarasca procesada en saco mini Winkler y la captura directa. Se registraron 15 especies siendo el género más diverso *Neoponera* con seis especies, seguido de *Odontomachus* con dos especies y *Ectatomma*, *Anochetus*, *Gnamptogenys*, *Prionopelta*, *Pseudoponera*, *Pachycondyla* y *Thaumatomyrmex* con una sola especie cada uno. En este estudio se amplía la distribución geográfica de 15 especies para el norte de la Orinoquia colombiana y se registra por primera vez la presencia de *Thaumatomyrmex* cf. *mutilatus* en Colombia.

Palabras clave: Biodiversidad, Ponerinae; Orinoquia, Biogeografía

Resum

Nous registres de formigues caçadores (Poneroides i Ectatomminoides) al nord de l'Orinoquia Colombiana.— Es van revisar 466 espècimens de formigues caçadores recol·lectades en ambients de sabana inundable i boscos a la zona rural del municipi d'Arauca (Arauca, Colòmbia). En vuit zones de bosc amb grandàries de 0,25 a 220 ha es va situar un transsecte lineal amb set punts de mostreig separats per 20 m amb una superfície de 10 m² cadascun. En cada punt de mostreig es van utilitzar tres tipus de tècniques: una trampa de caiguda per 24 hores, una mostra d'1 m² de fullaraca processada en sac mini Winkler i la captura directa. Es van registrar 15 espècies, entre les quals el gènere més divers va ser *Neoponera*, amb sis espècies, seguit d'*Odontomachus*, amb dues espècies i *Ectatomma*, *Anochetus*, *Gnamptogenys*, *Prionopelta*, *Pseudoponera*, *Pachycondyla* i *Thaumatomyrmex*, amb una sola espècie cadascun. En aquest estudi s'amplia la distribució geogràfica de 15 espècies per al nord de l'Orinoquia colombiana i es registra per primera vegada la presència de *Thaumatomyrmex* cf. *mutilatus* a Colòmbia.

Paraules clau: Biodiversitat, Ponerinae, Orinoquia, Biogeografia

Received: 20/03/17; Conditional acceptance: 12/06/17; Final acceptance: 04/08/17

Juan Carlos Agudelo Martínez & Néstor Pérez–Buitrago, Colección Entomológica de la Orinoquia (CEO) Univ. Nacional de Colombia Sede Orinoquia Kilómetro 9 vía Arauca–Caño Limón,....

Corresponding author: J. C. Agudelo. E–mail: jcagudelo@gmail.com

Introduction

The Orinoquia region has an area of 251,185 km² and represents 22% of the territory of Colombia. It includes the departments of Meta, Casanare, Vichada, Guaviare and Arauca (Hernández–Camacho 1992). This biogeographical region includes ecosystems such as 'altillanuras' (plains), eolic and flooded savannas, with riparian forest, forest remnants and 'morichales' (palm swamps) (Rippstein et al., 2001). These forest habitats are within a savanna matrix, creating a mosaic or reticulated pattern landscape. The biodiversity of the Orinoquia region is presumably similar to the Apure basin in Venezuela. However, the proximity to the Amazonian and Andes regions results in a unique composition of flora and fauna.

The Orinoquia is one of the last wild and virgin landscape regions of the planet (Lasso et al., 2011). However, and possibly due to its "apparent" structural simplicity, studies by the academic and scientific communities on its biodiversity and ecological interactions are scarce in the Orinoquia departments, including Arauca (Arbeláez–Cortéz, 2013). This lack of knowledge may imply a risk for the strategic potential for sustainable development and conservation of the region and its existence in the near future (Agudelo & Pérez–Buitrago, 2015).

Insects play many important ecological roles in tropical savannas, shaping fundamental processes to maintain the structure and function of ecosystems (Andersen et al., 2003). Some ants, for example, may serve as seed dispersers, while others may regulate invertebrate populations (Majer, 1983; Alonso, 2000). Also, as a group, ants contribute largely to biomass, abundance and species richness in animal communities in most terrestrial ecosystems (Folgarait, 1998; Underwood & Fisher, 2006). These attributes, along with a well-known and stable taxonomy, high ecological fidelity and easiness of sampling, make ants an optimal taxon for use as ecological indicators both in disturbed and natural environments (Arcila & Lozano–Zambrano, 2003; Andersen & Majer, 2004; Andersen et al., 2004).

Based on their morphology and behavior, hunting ants are considered a primitive group. They are present in all biogeographical regions and occupy several ecological niches. They vary in size, from tiny and cryptic species to large, predator species (Ouelette et al., 2006; Serna & Vergara–Navarro, 2008; Delabie et al., 2015). Bolton (2003) suggested the name "Poneromorph" as an informal and non-monophyletic taxon which was previously considered to be in the Ponerinae subfamily (Bolton, 1994). This large taxon includes the families Amblyoponinae, Ectatomminae, Heteroponerinae, Paraponerinae, Ponerinae and Proceratiinae (sensu stricto, Bolton, 2003).

In this study we document the species richness and abundance of hunting ant species in flooded savanna and forest fragments in the municipality of Arauca (Arauca, Colombia). We considered a gradient that included three environments: forest, edge, and flooded savanna matrix. This gradient could contribute to the understanding of the geographical distribution of hunting ants and their natural history in the northern Orinoquia of Colombia.

Material and methods

Study site

Samplings were carried out in eight forest fragments ranging from 0.25 to 200 ha embedded in a matrix of flooded savanna in the Arauca municipality (fig. 1). Altitudes within the study area range from 125 to 130 m a.s.l., with an unimodal eight-month rainy season between April and November (95% of yearly precipitation), and a dry season from December to March. The average annual rainfall is 2,200 mm with relative humidity between 65% for the dry season and 80% for the rainy season (Rippstein et al., 2001).

Field and laboratory work

A modification of the ALL protocol (Ants of the Leaf Litter protocol) was used in each of the eight selected areas to rapidly assess and record a high percentage of ant species in a short period of time (Agosti & Alonso, 2003). In each forest fragment sampled, we used a transect of 190 m, perpendicular to the edge of the forest as reference, and in each transect, we arranged seven sampling points every 20 m. Thus, three of the sampling points were located in the flooded savannah, one on the edge and three inside the forest patch. Three ant capture techniques were used at each sampling point: first, a pit-fall trap barley with 7 g of protein was installed for 24 hours; second, a sample of 1 m² of litter was collected, sieved and processed in a Winkler bag; and third, direct capture was performed at each sampling point for ten minutes using entomological forceps and aspirators.

The samples were transported to the Colección Entomológica de la Orinoquia (CEO) (Entomologic Collection of the Orinoquia) of the Orinoquia campus at the Universidad Nacional de Colombia for separation, cleaning and taxonomic identification of the specimens. We used the taxonomic keys of Bolton (1994), Schmidt & Shattuck (2014) and Fernández (2003) to identify specimens to the subfamily and genus level; while the taxonomic keys of Brown (1976, 1978), Fernández (1991), Jiménez et al. (2007) and MacKay & Mackay (2010) were used to identify species level.

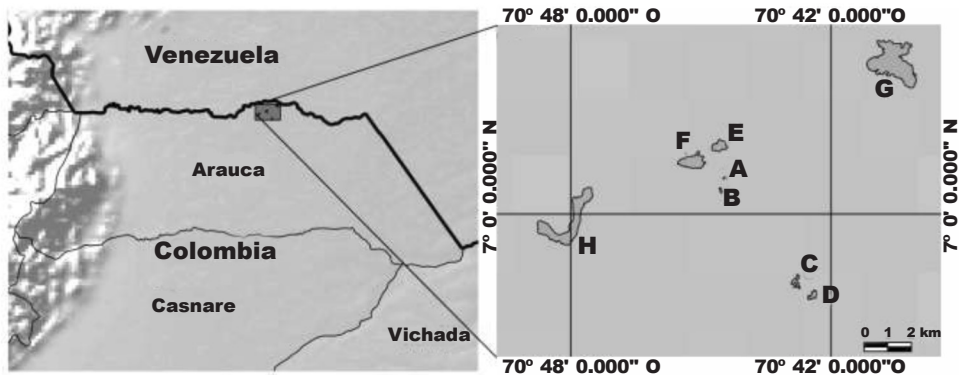


Fig. 1. General view of the study area: A. Sendero Ecológico Universidad Nacional; B. Granja Universidad Nacional; C. Finca Las Mercedes del Llano site I; D. Finca Las Mercedes del Llano site II; E. Finca Piedraca; F. Finca Mata de Gallina; G. Finca El Desastre; and H. Finca Los Laureles.

Fig. 1. Vista general del área de estudio: A. Sendero Ecológico Universidad Nacional; B. Granja Universidad Nacional; C. Finca Las Mercedes del Llano sitio I; D. Finca Las Mercedes del Llano sitio II; E. Finca Piedraca; F. Finca Mata de Gallina; G. Finca El Desastre; y H. Finca Los Laureles.

A range–abundance plot was used to assess the evenness of the hunting ant community. Based on species abundances collected during the study, species were classified as abundant (more than 30 specimens captured), intermediate (between 30 and five specimens collected) or rare (with less than five specimens collected).

Results

Using the three sampling methods we collected 30496 specimens of the Formicidae family. Of these, 466 were hunting ants and they were assigned in three subfamilies (Ponerinae, Amblyoponinae and Ectatomminae), three tribes, nine genus, and 15 species, using the taxonomy proposed by Schmidt & Shattuck (2014), Bolton (2003) and Brady et al. (2006) (table 1). Appendix 1 shows detailed information about location and habitat type of all specimens. The data set cited in this work could be consulted in [GBIF](#) and in [SiB Colombia](#) (doi: 10.15472/vp8v42).

The genus *Neoponera* had the highest species richness with six species, followed by *Odontomachus* with two species. The genus *Prionopelta*, *Anochetus*, *Pachycondyla*, *Pseudoponera*, *Thaumatomyrmex*, *Ectatomma* and *Gnamptogenys* were each represented only by one species. The species with highest abundances were *Ectatomma ruidum* Roger, 1861 with 51.9% (242) and *Odontomachus bauri* Emery, 1892 with 28.8% (134). Intermediate abundances were recorded for *Pachycondyla harpax* (Fabricius, 1804) 6.8% (32) and *Neoponera verenae* Forel 1922 with 4.9% (23). The other eleven species had abundances lower than 4% and were considered rare species (fig. 2).

In terms of spatial distribution of the species in the gradient forest, edges, and flooded

Table 1. Poneroid and Ectatomminoid species collected in Arauca municipality. Habitat type (H: B. Forest patch border; F. Inside forest patch; M. Flooded savanna matrix) and abundance (A).

Tabla 1. Lista de especies de Poneroides y Ectatomminoides recolectadas en el municipio de Arauca. Tipos de hábitat (H: B. Borde de fragmento de bosque; F. Dentro del fragmento de bosque; M. Matriz de sabana inundable) y abundancia (A).

Subfamily				
Tribe	Genus	Species	H	A
Amblyoponinae				
Amblyoponini	<i>Prionopelta</i>	<i>amabilis</i> Borgmeier, 1949	F	2
Ponerinae				
Ponerini	<i>Anochetus</i>	<i>diegensis</i> Forel, 1912	F	14
	<i>Neoponera</i>	<i>apicalis</i> (Latreille, 1802)	F, B	7
	<i>Neoponera</i>	<i>foetida</i> (Linnaeus, 1758)	F	1
	<i>Neoponera</i>	<i>goeldii</i> Forel, 1912	B	1
	<i>Neoponera</i>	<i>unidentata</i> Mayr, 1862	F	2
	<i>Neoponera</i>	<i>verenae</i> Forel, 1922	F, B	23
	<i>Neoponera</i>	<i>villosa</i> (Fabricius, 1804)	B	2
	<i>Odontomachus</i>	<i>bauri</i> Emery, 1892	M, F, B	134
	<i>Odontomachus</i>	<i>haematodus</i> (Linnaeus, 1758)	M, F	2
	<i>Pachycondyla</i>	<i>harpax</i> (Fabricius, 1804)	M, F, B	32
	<i>Pseudoponera</i>	<i>stigma</i> (Fabricius, 1804)	M	1
	<i>Thaumatomyrmex</i>	<i>mutilatus</i> Mayr, 1887	B	1
Ectatomminae				
Ectatommini	<i>Ectatomma</i>	<i>ruidum</i> Roger, 1861	M, F, B	242
	<i>Gnamptogenys</i>	<i>regularis</i> Mayr, 1870	B	2

savanna matrix, the most abundant species *E. ruidum* and *O. bauri* were found in all three habitats (table 1), probably because they are generalist and can occupy different habitats. Habitat preferences by lesser abundant species were variable. While *P. harpax* was found in all three habitats, *N. verenae* was only found in forest fragments and edges. Finally, rare species showed affinity for forest and edges, but not for savanna (table 1).

Discussion

Hunting ant studies across different successional stages and landscapes in Colombia show that species richness in forests is higher than in savanna ecosystems. This trend is attributed to higher vegetation coverage favouring higher microhabitat availability (Serna & Vergara–Navarro, 2008; Chavez et al., 2008; Abadía et al., 2010; Sanabria–Blandón & Chacón de Ulloa, 2011).

This study broadens the geographical distribution of 15 hunting ants species collected

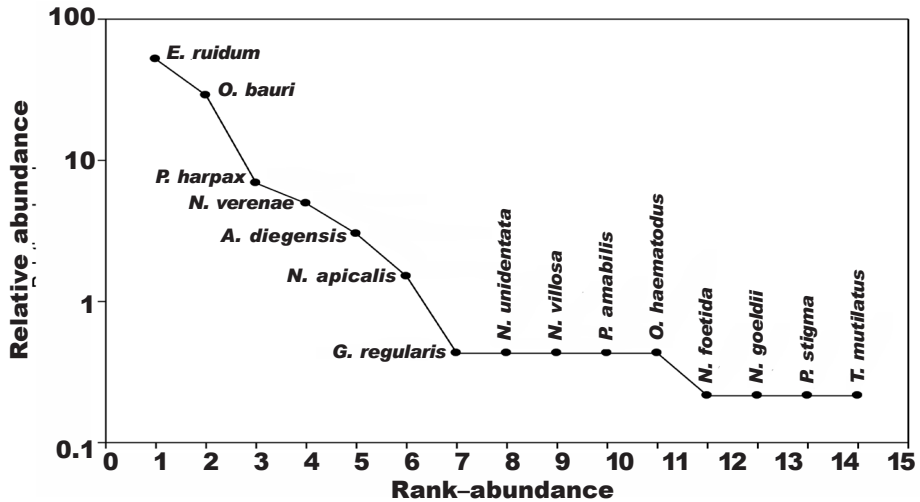


Fig. 2. Rank–abundance relationship of hunting ant species from the northern part of the Colombian Orinoquia region in the Arauca municipality.

Fig. 2. Relación rango–abundancia de las especies de hormigas cazadoras del norte de la Orinoquia Colombiana en el municipio de Arauca.

in the Orinoquia. Four of these species were previously documented for the Colombian Amazonian: *Neoponera foetida* (Linnaeus, 1758) and *Neoponera goeldii* Forel, 1912 previously found only in Amazonas department (Jiménez et al., 2007); *Prionopelta amabilis* Borgmeier, 1949 for the Amazonas and Caquetá departments (Jiménez et al., 2007); and *Neoponera unidentata* Mayr, 1862 for all the Colombian Amazonian region except Vaupés department (Jiménez et al., 2007). Finally, this is the first report for *Thaumatomyrmex* cf. *mutilatus* Mayr, 1887 in Colombia, a species previously documented in Brazil (southern of the Amazon basin), northern Argentina and Paraguay (Jahyny et al., 2008).

Compared with other departments of the Colombian Orinoquia region, the species richness of hunting ants (15 species) in Arauca is higher than in Casanare department (10 species), sharing three species, *Neoponera villosa*, *Neoponera verenae* and *Neoponera apicalis* (Jiménez et al., 2007). However, Arauca species richness is lower than that in the Guaviare department (19 species) and Vichada (17 species) (Jiménez et al., 2007) with which Arauca shares four and five species respectively. For the Meta department, 55 species have been reported (Jiménez et al., 2007), nine of which are shared with the Arauca department.

The large variations in species richness across Orinoquia departments suggest that the biodiversity of hunting ants is presently underestimated, probably due to two factors. The first of these is the low number of ants shared by Arauca and Casanare departments, despite their geographical proximity and the similarity of their ecosystems. The second factor is that the much higher value (55 species) reported for the Meta department probably reflects higher sampling effort and research there due to the area's proximity to cities that have institutions concerned with biodiversity studies (Fernández, 2003; Jiménez et al., 2007; Sanabria–Blandón & Chacón de Ulloa, 2011; Chávez et al., 2008; Abadía et al., 2010).

The rank–abundance relationship indicates that *E. ruidum*, *O. bauri*, and *P. harpax* are the dominant species in the hunting ant community. These species were collected in the

three habitats, confirming their generalist ecology as reported by many authors (Fernández, 2003, Jiménez et al., 2007; Sanabria–Blandón & Chacón de Ulloa, 2011; Chávez et al., 2008; Abadía et al., 2010).

The first record for Colombia of *T. cf. mutilatus* may have implications in many biological aspects. First, it confirms the prediction that the *mutilatus* complex occurs not only in savannas in the southern Amazon basin (i.e. as the Cerrado and the Catinga between the 3°S y 29°S), but also in the Orinoquia biogeographical region of Colombia and Venezuela (Helobioma Amazonia–Orinoquia) (Jahyny, 2010; Jahyny et al., 2015). Second, it shows that there should be a taxonomic revision of the genus since there are sporadic new records in the neotropical region of probable new species that are not fully described and classified. This results in difficulties in reaching a consensus on species number in this taxonomic complex (Delabie, personal communication).

The results of our study support the Lozano–Zambrano & Fernández (2007) statement suggesting that hunting ants are still poorly studied in some areas of Colombia. This study is the first approach to determine the distribution of hunting ant species in the northern part of the Colombian Orinoquia region, and the findings broaden the geographical distribution of 14 species for Colombia and one species (*T. cf. mutilatus*) for South America.

Acknowledgements

The authors of this paper wish to express their gratitude to a Jacques Hubert Charles Delabie (Departamento de Ciências Agrárias e Ambientais de la Universidade Estadual de Santa Cruz UESC), Benoit Jean Bernard Jahyny (Universidade Federal do Vale do São Francisco–UNIVASF) and William P. Mackay (Laboratory for Environmental Biology, Centennial Museum, University of Texas at El Paso) for their assistance in the confirmation and identification of some of the specimens cited in this publication and their valuable bibliographic contributions. We also thank the interns Evelyn Gómez Tapia and Ana María Romero and students Maikol Jiménez, Sebastián Peralta and Carlos Gamba for their collaboration in the phases of field work, cleaning and organizing the collected entomological material. Pilar Angulo–Sandoval kindly reviewed the English version of this manuscript. Financial support for this project came from the "Convocatoria de Investigación para Financiar Pasantías, Trabajos de Grado en Pregrado o Posgrado en Temáticas Relacionadas con la Orinoquia 2013 II" from the Sede Orinoquia–Universidad Nacional de Colombia. We thank the owners of the areas where the ant collections were conducted: Juan Carlos Castañeda Forero, Santiago Cuenza, the Garcés Bona family, Jairo Dario Piedrahita Sabogal, and Luis Ernesto Rodríguez Cuenza.

References

- Abadía, J. C., Bermúdez, C., Lozano–Zambrano, F. H. & Chacón de Ulloa, P., 2010. Hormigas cazadoras en un paisaje subandino de Colombia: riqueza, composición y especies indicadoras. *Revista Colombiana de Entomología*, 36(1): 127–134.
- Agosti, D. & Alonso L. E., 2003. El protocolo ALL: Un estándar para la colección de hormigas del suelo. In: *Introducción a las Hormigas de la región Neotropical*: 415–418 (F. Fernández, Ed.). Instituto de investigación de recursos biológicos Alexander Von Humboldt, Bogotá, Colombia.
- Agudelo, M. J. C. & Pérez–Buitrago, N., 2015. Notas acerca de la distribución de Papilionidae (Lepidoptera: Papilionoidea) en el norte de la Orinoquia colombiana. *Boletín Científico de Museos de Historia Natural, Universidad de Caldas*, 19(1): 203–214.
- Alonso, L. E., 2000. Ants as indicators of diversity. In: *Ants: standard methods for measuring*

- and monitoring biodiversity*: 80–88 (D. Agosti, J. D. Majer, L. E. Alonso & T. R. Schultz, Eds.). Smithsonian Institution Press, Washington and London.
- Andersen, A. N., Fisher, A., Hoffmann, B. D., Read, J. L. & Richards, R., 2004. Use of terrestrial invertebrates for biodiversity monitoring in Australian rangelands, with particular reference to ants. *Austral Ecology*, 29: 87–92.
- Andersen, A. N. & Majer, J. D., 2004. Ants show the way down under: invertebrates as bio-indicators in land management. *Frontiers in Ecology and the Environment*, 2(6): 291–298.
- Andersen, A. N., Orgeas, J., Blanche, R. D. & Lowe, L. M., 2003. Terrestrial insects. In: *Fire in Tropical Savannas. The Kapalga Experiment*: 107–125 (A. N. Andersen, G. D. Cook & R. J. Williams, Eds.). Springer–Verlag, Berlin.
- Arbeláez–Cortéz, E., 2013. Knowledge of Colombian biodiversity: published and indexed. *Biodiversity Conservation*, 22: 2875–2906.
- Arcila, C. A. & Lozano–Zambrano, F. H., 2003. Hormigas como herramienta para la bioindicación y el monitoreo. In: *Introducción a las hormigas de la región Neotropical*: 159–166 (F. Fernández, Ed.). Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Bogotá, Colombia.
- Bolton, B., 1994. *Identification guide to the ant genera of the world*. Harvard University Press. Cambridge (Massachusetts). London (England).
- 2003. Synopsis and classification of Formicidae. *Memoirs of the American Entomological Institute*, 71: 1–370.
- Brady, S. G., Schultz, T. R., Fisher, B. L. & Ward, P. S., 2006. Evaluating alternative hypothesis for the early evolution and diversification of ants. *Proceedings of the National Academy of Sciences*, 103(48): 18172–18177.
- Brown, J. W. L., 1976. Contributions toward a reclassification of the Formicidae. Part VI. Ponerinae, tribe Ponerini, Subtribe, Odontomachiti, Section A. Introduction, Subtribal Characters. Genus *Odontomachus*. *Studia Entomologica*, 19(4): 66–171.
- 1978. Contributions toward a reclassification of the Formicidae. Part VI. Ponerinae, tribe Ponerini, Subtribe, Odontomachiti, Section B Genus *Anochetus* and biogeography. *Studia Entomologica*, 20(4): 549–652.
- Chávez, M. C., Chacón de Ulloa P. & Lozano–Zambrano, F. H., 2008. Riqueza y rareza de hormigas cazadoras en el gradiente bosque–borde–pastizal de un fragmento de bosque subandino (Quindío, Colombia). In: *Sistemática, biogeografía y conservación de las hormigas cazadoras de Colombia*: 425–438. (F. Lozano–Zambrano, F. Fernández, E. Jiménez & T. Arias, Eds.). Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Bogotá, Colombia.
- Delabie, J. H. C., Feitosa, R., Serrão, J. E., Mariano, C. & Majer, J., 2015. As formigas Poneromorfas do Brasil – Introdução. In: *As formigas Poneromorfas do Brasil*: 9–12 (J. H. C. Delabie, R. M., Feitosa, J. E., Serrão, C. S. F., Mariano & J. D. Majer, Eds.). Ilhéus, Editus.
- Fernández, F., 1991. Las hormigas cazadoras del género *Ectatomma* (Formicidae: Ponerinae) en Colombia. *Caldasia*, 16(79): 551– 564.
- Fernández, F. (Ed.), 2003. *Introducción a Las Hormigas de la Región Neotropical*. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Bogotá, Colombia.
- Folgarait, P. J., 1998. Ant biodiversity and its relationship to ecosystem functioning: a review. *Biodiversity and Conservation*, 7(9): 1221–1244.
- Hernández–Camacho, J., 1992. Caracterización geográfica de Colombia. In: *La diversidad biológica de Iberoamérica*: 45–54 (G. Halffter, Ed.). Acta Zoológica Mexicana. Volumen Especial 1992. Instituto de Ecología, A. C. México.
- Jahyny, B., 2010. Histoire naturelle du genre de fourmis néotropical *Thaumatomyrmex* Mayr 1887 (Arthropoda, Insecta, Hymenoptera, Formicidae, Ponerinae, Thaumatomyrmecini). Tese (Doutorado em Etologia), Université Paris XIII, Villetaneuse.
- Jahyny, B., Alves, H. S. R., Fresneau, D. & Delabie, J. H. C., 2015. Estudos biogeográficos sobre o gênero *Thaumatomyrmex* Mayr, 1887 (Ponerinae, Ponerini). In: *As formigas*

- Poneromorfas do Brasil*: 327–343 (J. H. C. Delabie, R. M. Feitosa, J. E. Serrão, C. S. F. Mariano & J. D. Majer, Eds.). Ilhéus, Editus.
- Jahyny, B., Lacau, S., Delabie, J. H. C., Fresneau, D., 2008. Le genre *Thaumatomyrmex* Mayr 1887, cryptique et prédateur spécialiste de Diplopoda Penicillata. In: *Sistemática, biogeografía y conservación de las hormigas cazadoras de Colombia*: 329–345 (F. Lozano-Zambrano, F. Fernández, E. Jiménez, T. Arias, Eds.). Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Bogotá, Colombia.
- Jiménez, E., Fernández, F., Arias, T. M. & Lozano–Zambrano, F. H., 2007. *Sistemática, biogeografía y conservación de las hormigas cazadoras de Colombia*. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt. Bogotá, Colombia.
- Lasso, C. A., Rial, A., Matallana, C., Ramírez, W., Señaris, J., Díaz–Pulido, A., Corzo, G. & Machado–Allison, A. (Eds.), 2011. *Biodiversidad de la Cuenca del Orinoco. II Áreas prioritarias para la conservación y el uso sostenible*. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Ministerio de Ambiente, Vivienda y Desarrollo Territorial, WWF Colombia, Fundación Omacha, Fundación La Salle de Ciencias Naturales e Instituto de Estudios de la Orinoquia (Universidad Nacional de Colombia). Bogotá, Colombia.
- Lozano–Zambrano, F. H. & Fernández, F., 2007. Aproximación al análisis zoogeográfico de las hormigas cazadoras (Hymenoptera: Formicidae) de Colombia. *Boletín del Museo de Entomología de la Universidad del Valle*, 8(1): 22–31.
- Mackay, W. & Mackay, E., 2010. *The Systematics and biology of the new world ants of the genus Pachycondyla (Hymenoptera: Formicidae)*. The Edwin Mellen Press, Lewiston, New York.
- Majer, J. D., 1983. Ants: Bio–indicators of Minesite Rehabilitation, land–use, and land conservation. *Environmental Management*, 7(4): 375–383.
- Ouellette, G. D., Fisher, B. L. & Girman, D. J., 2006. Molecular systematics of basal subfamilies of ants using 28S rRNA (Hymenoptera: Formicidae). *Molecular Phylogenetics and Evolution*, 40: 359–369.
- Rippstein, G., Escobar, G. & Motta, F., 2001. *Agroecología y biodiversidad de las sabanas en los Llanos Orientales de Colombia. Cali, Colombia*. Centro Internacional de Agricultura Tropical CIAT.
- Sanabria–Blandón, M. C. & Chacón de Ulloa, P., 2011. Hormigas cazadoras en sistemas productivos del piedemonte amazónico colombiano: diversidad y especies indicadoras. *Acta Amazónica*, 41(4): 503–512.
- Schmidt, C. A. & Shattuck, S. O., 2014. The higher classification of the ant subfamily ponerinae (Hymenoptera: Formicidae), with a review of Ponerine ecology and behavior. *Zootaxa*, 3817(1): 1–242.
- Serna, F. & Vergara–Navarro, E. V., 2008. Hormigas cazadoras de Porce (Antioquia, Colombia). In: *Sistemática, biogeografía y conservación de las hormigas cazadoras de Colombia*: 472–553 (F. Lozano–Zambrano, F. Fernández, E. Jiménez & T. Arias, Eds.). Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Bogotá, Colombia.
- Underwood, E. C. & Fisher, B. L., 2006. The role of ants in conservation monitoring: If, when, and how. *Biological Conservation*, 132: 166–182.

Appendix 1. Records reviewed: CEO. Catalogue number at the Colección Entomológica de la Universidad Nacional de Colombia Sede Orinoquia.

Apéndice 1. Registros de material revisado: CEO. Número de catálogo colección entomológica de la Universidad Nacional de Colombia sede Orinoquia.

Family Formicidae Latreille, 1809

Subfamily Amblyoponinae Forel, 1893

Tribe Amblyoponini Forel, 1893

Genus *Prionopelta* Mayr, 1866

Prionopelta amabilis Borgmeier, 1949

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 2 workers, 128 m a.s.l., 7° 0' 32.32" N 70° 44' 32.70" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3984

Subfamily Ponerinae Lepeletier de Saint–Fargeau, 1835

Tribe Ponerini Lepeletier de Saint–Fargeau, 1835

Genus *Anochetus* Mayr, 1861

Anochetus diegensis Forel, 1912

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 7 workers, 128 m a.s.l., 7° 0' 33.94" N 70° 44' 38.84" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3979

Colombia, Arauca, Arauca, Finca Piedraca frente a la Universidad Nacional sede Orinoquia, bosque secundario: 1 worker, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3980

Colombia, Arauca, Arauca, Finca Piedraca frente a la Universidad Nacional sede Orinoquia, osque secundario: 1 worker, 129 m a.s.l., 7° 1' 5.30" N 70° 45' 14.03" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3981

Colombia, Arauca, Arauca, Finca Piedraca frente a la Universidad Nacional sede Orinoquia, borde de bosque: 1 worker, 129 m a.s.l., 7° 1' 3.41" N 70° 45' 11.93" W, 30/03/2014, J. Agudelo & N. B. Pérez leg., CEO 3982

Colombia, Arauca, Arauca, Finca Piedraca frente a la Universidad Nacional sede Orinoquia, bosque secundario: 3 workers, 129 m a.s.l., 7° 1' 36.80" N 70° 45' 12.34" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3983

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 1 worker, 128 m a.s.l., 7° 0' 32.32" N 70° 44' 32.70" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4562

Genus *Neoponera* Emery, 1901

Neoponera apicalis (Latreille, 1802)

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3991

Colombia, Arauca, Arauca, Finca el Desastre: 1 worker, 129 m a.s.l., 7° 3' 5.90" N 70° 40' 18.72" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4000

Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 4 workers, 129 m a.s.l., 7° 1' 3.4" N 70° 45' 11.93" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4011

Appendix 1. (Cont.)

Colombia, Arauca, Arauca, Finca El Desastre: 1 worker, 126 m a.s.l., 7° 3' 5.90" N 70° 40' 18.72" W, 09/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4023

Neoponera foetida (Linnaeus, 1758)

Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 40.10" N 70° 47' 30.70" W, 13/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4007

Neoponera goeldii Forel, 1912

Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 39.55" N 70° 47' 46.58" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4026

Neoponera unidentata. Mayr, 1862

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 2 workers, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 4003

Neoponera verena. Mayr, 1862

Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l., 6° 58' 12.70" N 70° 42' 18.61" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3989

Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l., 6° 58' 27.19" N 70° 42' 49.91" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3997

Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 9 workers, 126 m a.s.l., 6° 58' 70.97" N 70° 42' 21.32" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4010

Colombia, Arauca, Arauca, Finca Las Mercedes del Llano sitio II: 1 worker, 126 m a.s.l., 6° 58' 11.76" N 70° 42' 19.61" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4013

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers, 129 m a.s.l., 7° 1' 36.80" N 70° 44' 40.41" W, 08/09/20, J. Agudelo & N. B. Pérez leg., CEO 4015

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, sendero ecológico: 2 workers, 128 m a.s.l., 7° 0' 51.01" N 70° 44' 26.84" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4016

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 5.30" N 70° 45' 14.03" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4018

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 5 workers, 129 m a.s.l., 7° 1' 5.30" N 70° 45' 14.03" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4019

Neoponera villosa (Fabricius, 1804)

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 4003

Colombia, Arauca, Arauca, Finca Los Laureles: 1 worker, 129 m a.s.l., 6° 59' 39.55" N 70° 47' 46.53" W, 13/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4009

Appendix 1. (Cont.)

Genus *Odontomachus* Latreille, 1804*Odontomachus bauri* Emery, 1892

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia Sede Orinoquía, sendero ecológico: 1 worker, 128 m a.s.l., 7° 0' 50.06" N 70° 44' 27.64" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4039

Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 2 workers, 126 m a.s.l., 6° 58' 27.19" N 70° 42' 49.91" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4040

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquía, granja: 3 workers, 128 m a.s.l., 7° 0' 32.32" N 70° 44' 32.70" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4041

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia Sede Orinoquía, sendero ecológico: 1 worker, 128 m a.s.l., 7° 0' 51.01" N 70° 44' 26.84" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4043

Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquía: 2 workers, 130 m a.s.l., 7° 1' 29.69" N 70° 44' 39.86" O, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 4044

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia Sede Orinoquía, sendero ecológico: 2 workers, 128 m a.s.l., 7° 0' 51.01" N 70° 44' 26.84" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4045

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia Sede Orinoquía, sendero ecológico: 4 workers, 128 m a.s.l., 7° 0' 50.06" N 70° 44' 27.64" W, 09/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4046

Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquía: 1 worker, 129 m a.s.l., 7° 1' 4.74" N 70° 45' 12.84" W, 30/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4047

Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia Sede Orinoquía, sendero ecológico: 3 workers, 128 m a.s.l., 7° 0' 48.20" N 70° 44' 28.65" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4048

Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 2 workers, 126 m a.s.l., 6° 58' 61.32" N 70° 42' 21.52" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4051

Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 2 workers, 126 m a.s.l., 6° 58' 10.97" N 70° 42' 21.32" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4052

Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 1 worker, 126 m a.s.l., 6° 58' 11.73" N 70° 42' 21.52" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4053

Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 3 worker, 128 m a.s.l., 6° 58' 28.09" N 70° 42' 48.80" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4054

Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 3 workers, 126 m a.s.l., 6° 58' 27.19" N 70° 42' 49.91" W, 06/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4055

Colombia, Arauca, Arauca, Finca los Laureles: 3 workers, 129 m a.s.l., 6° 59' 39.80" N 70° 47' 53.59" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4056

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 40.10" N 70° 47' 50.78" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4059
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquía. Granja: 2 workers, 128 m a.s.l., 7° 0' 33.94" N 70° 44' 38.84" W, 22/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4061
- Colombia, Arauca, Arauca, Finca el Desastre: 1 worker, 126 m a.s.l., 7° 3' 5.84" N 70° 40' 16.62" W, 12/05/2014, J. Agudelo & N. B. Pérez leg., CEO 4062
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 2 workers, 130 m a.s.l., 7° 1' 29.69" N 70° 44' 39.86" O, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 4063
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 11.37" N 70° 42' 21.52" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4064
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 26.26" N 70° 42' 50.53" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4065
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 28.09" N 70° 42' 48.80" W, 06/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4066
- Colombia, Arauca, Arauca, Finca los Laureles: 1 workers, 129 m a.s.l., 6° 59' 40.01" N 70° 47' 50.78" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4067
- Colombia, Arauca, Arauca, Finca las Mercedes sitio II: 2 workers, 128 m a.s.l., 6° 58' 28.32" N 70° 42' 47.89" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4068
- Colombia, Arauca, Arauca, Finca el Desastre: 1 worker, 123 m a.s.l., 7° 3' 3.30" N 70° 40' 19.81" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4069
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 131 m a.s.l., 7° 1' 1.64" N 70° 45' 11.42" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4070
- Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 133 m a.s.l., 6° 59' 39.80" N 70° 47' 53.59" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4071
- Colombia, Arauca, Arauca, Finca el Desastre: 4 workers, 124 m a.s.l., 7° 3' 5.90" N 70° 40' 18.72" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4072
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquía, granja: 3 workers, 127 m a.s.l., 7° 0' 36.34" N 70° 44' 29.99" W, 29/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4073
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquía, granja: 1 worker, 128 m a.s.l., 7° 0' 36.34" N 70° 44' 29.99" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4074
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 130 m a.s.l., 7° 1' 0.63" N 70° 45' 11.42" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4075
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquía, granja: 3 workers, 126 m a.s.l., 7° 0' 33.40" N 70° 44' 30.25" W, 22/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4076
- Colombia, Arauca, Arauca, Finca el Desastre: 2 workers, 124 m a.s.l., 7° 3' 4.06" N 70° 40' 18.53" W, 09/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4077

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 130 m a.s.l., 7° 1' 28.80" N 70° 44' 40.41" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4078
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 131 m a.s.l., 7° 1' 1.64" N 70° 45' 11.12" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4079
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 128 m a.s.l., 6° 58' 28.09" N 70° 42' 48.80" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4080
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 3.83" N 70° 45' 12.34" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4081
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 2 workers, 128 m a.s.l., 6° 58' 28.32" N 70° 42' 47.89" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4082
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 1 worker, 126 m a.s.l., 6° 58' 26.26" N 70° 42' 50.53" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4083
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 2 workers, 131 m a.s.l., 7° 1' 3.4" N 70° 45' 11.93" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4084
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 2 workers, 127 m a.s.l., 7° 0' 37.20" N 70° 44' 29.70" W, 29/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4085
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, sendero ecológico: 1 worker, 128 m a.s.l., 7° 0' 49.18" N 70° 44' 28.12" W, 09/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4086
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 1 worker, 127 m a.s.l., 6° 58' 11.82" N 70° 42' 20.75" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4087
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 1 worker, 127 m a.s.l., 7° 0' 36.34" N 70° 44' 29.99" W, 22/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4088
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 3 workers, 127 m a.s.l., 6° 58' 27.98" N 70° 42' 44.97" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4089
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 1 worker, 128 m a.s.l., 6° 58' 10.97" N 70° 42' 21.32" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4090
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, sendero ecológico: 1 worker, 127 m a.s.l., 7° 0' 47.58" N 70° 44' 29.11" W, 20/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4091
- Colombia, Arauca, Arauca, Finca el Desastre: 7 workers. 126 m a.s.l., 7° 3' 5.84" N 70° 40' 16.62" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4092
- Colombia, Arauca, Arauca, Finca los Laureles: 2 workers, 129 m a.s.l., 6° 59' 39.80" N 70° 47' 53.59" W, 13/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4093

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 4 workers, 130 m a.s.l., 7° 1' 3.30" N 70° 45' 14.03" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4094
- Colombia, Arauca, Arauca, Finca el Desastre: 3 workers, 124 m a.s.l., 7° 3' 4.06" N 70° 40' 18.53" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4095
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 1 worker, 126 m a.s.l., 6° 58' 26.26" N 70° 42' 50.53" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4096
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 130 m a.s.l., 7° 1' 28.80" N 70° 44' 40.41" W, 09/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4097
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 9 workers, 126 m a.s.l., 6° 58' 27.72" N 70° 42' 43.52" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4098
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 8 workers, 127 m a.s.l., 6° 58' 28.04" N 70° 42' 46.15" W, 15/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4099
- Colombia, Arauca, Arauca, Finca el Desastre: 8 workers, 124 m a.s.l., 7° 3' 4.06" N 70° 40' 18.53" W, 12/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4100
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 1 worker, 128 m a.s.l., 7° 0' 33.94" N 70° 44' 38.84" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4101
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 127 m a.s.l., 6° 58' 27.98" N 70° 42' 44.97" W, 06/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4102
- Colombia, Arauca, Arauca, Finca los Laureles: 5 workers, 129 m a.s.l., 6° 59' 39.80" N 70° 47' 53.59" W, 11/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4103
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 30.35" N 70° 44' 40.59" W, 09/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4104
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 2 workers, 129 m a.s.l., 7° 1' 27.65" N 70° 44' 40.53" W, 09/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4105
- Odontomachus haematodus* (Linnaeus, 1758)
- Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 40.39" N 70° 47' 52.02" W, 13/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4042
- Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 39.80" N 70° 47' 52.39" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4060

Genus *Pachycondyla* Smith, 1858*Pachycondyla harpax* (Fabricius, 1804)

- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3985

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 28.32" N 70° 42' 47.89" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 3986
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 28.09" N 70° 42' 48.80" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3987
- Colombia, Arauca, Arauca, Finca los Laureles: 2 workers, 129 m a.s.l., 6° 59' 42.39" N 70° 47' 52.02" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3988
- Colombia, Arauca, Arauca, Finca el Desastre: 1 workers, 129 m a.s.l., 7° 3' 5.90" N 70° 40' 18.72" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3990
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 27.19" N 70° 42' 49.91" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3992
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 11.37" N 70° 42' 21.52" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 3993
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3994
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia. Granja: 2 workers, 128 m a.s.l., 7° 0' 32.32" N 70° 44' 32.70" W, 22/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3995
- Colombia, Arauca, Arauca, Finca el Desastre: 1 worker, 129 m a.s.l., 7° 3' 5.90" N 70° 40' 18.72" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3996
- Colombia, Arauca, Arauca, Finca el Desastre: 1 worker, 129 m a.s.l., 7° 3' 4.06" N 70° 40' 18.53" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3998
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sirio 1. 1 worker. 129 m a.s.l. 6° 58' 28.32" N 70° 42' 47.89" W. 01/11/2014. J. Agudelo & N. B. Pérez leg., CEO 3999.
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 2 workers, 126 m a.s.l., 6° 58' 27.19" N 70° 42' 49.91" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4001
- Colombia, Arauca, Arauca, Finca el Desastre: 2 workers, 129 m a.s.l., 7° 3' 4.06" N 70° 40' 18.53" W, 10/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4002
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 2 workers, 126 m a.s.l., 6° 58' 27.19" N 70° 42' 49.91" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4004
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 36.80" N 70° 45' 12.34" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4006
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l., 6° 58' 28.09" N 70° 42' 47.89" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4012
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia. Sendero ecológico: 3 workers, 128 m a.s.l., 7° 0' 51.01" N 70° 44' 26.84" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4014

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 2.56" N 70° 45' 11.93" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4017
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers, 129 m a.s.l., 7° 1' 3.4" N 70° 45' 11.93" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4020
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l., 6° 58' 26.26" N 70° 42' 50.53" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4021
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, sendero ecológico: 1 worker, 128 m a.s.l., 7° 0' 80.06" N 70° 44' 27.06" W, 10/08/2014, J. Agudelo & N. B. Pérez leg., CEO 4025
- Colombia, Arauca, Arauca, Finca Las Mercedes del Llano sitio I: 1 worker, 126 m a.s.l., 6° 58' 26.26" N 70° 42' 50.53" W, 05/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4563

Genus *Pseudoponera* Emery, 1900

Pseudoponera stigma (Fabricius, 1804)

- Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 40.10" N 70° 47' 30.70" W, 13/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4005

Genus *Thaumatomyrmex* Mayr, 1887

Thaumatomyrmex mutilatus Mayr, 1887

- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 25.06" N 70° 44' 38.70" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 4057

Subfamily Ectatomminae Emery, 1895

Tribe Ectatommini Emery, 1895

Genus *Ectatomma* Smith, 1858

Ectatomma ruidum Roger, 1861

- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 1 workers, 128 m a.s.l., 6° 58' 10.97" N 70° 42' 22.32" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 3762
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 10 workers, 126 m a.s.l., 6° 58' 28.09" N 70° 42' 48.80" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3957
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers, 129 m a.s.l., 7° 1' 27.65" N 70° 44' 40.53" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3958
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia. Granja: 1 worker, 128 m a.s.l., 7° 0' 37.20" N 70° 44' 29.70" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3959

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 17 workers, 129 m a.s.l., 7° 1' 27.65" N 70° 44' 40.53" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3960
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 14 workers, 126 m a.s.l., 6° 58' 10.97" N 70° 42' 29.32" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3961
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers. 129 m a.s.l., 7° 1' 30.35" N 70° 44' 40.51" W. 19–oct–14. J. Agudelo & N. B. Pérez leg., CEO 3962.
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers, 129 m a.s.l., 7° 1' 5.30" N 70° 45' 14.03" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3963
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 3 workers, 129 m a.s.l., 7° 0' 34.73" N 70° 44' 30.25" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3964
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 2 workers, 129 m a.s.l., 7° 1' 5.30" N 70° 44' 40.41" W, 08/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3965
- Colombia, Arauca, Arauca, Finca los Laureles: 3 workers, 129 m a.s.l., 6° 59' 40.36" N 70° 47' 50.01" W, 13/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3966
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l., 6° 58' 28.09" N 70° 42' 48.80" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3967
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers, 129 m a.s.l., 7° 1' 30.35" N 70° 44' 40.51" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3968
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 1 worker, 126 m a.s.l., 7° 0' 32.32" N 70° 44' 32.70" W, 28/03/2014, J. Agudelo & N. B. Pérez leg., CEO 3969
- Colombia, Arauca, Arauca, Finca los Laureles: 7 workers, 129 m a.s.l., 6° 59' 40.36" N 70° 47' 50.01" W, 14/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3970
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 2 workers, 126 m a.s.l., 6° 58' 10.97" N 70° 42' 22.32" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3971
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio2: 1 worker, 126 m a.s.l., 6° 58' 10.97" N 70° 42' 22.32" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3972
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 29 workers, 129 m a.s.l., 7° 1' 28.80" N 70° 44' 40.41" W, 19/10/2014, J. Agudelo & N. B. Pérez leg., CEO 3973
- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 1 worker, 128 m a.s.l., 7° 0' 36.34" N 70° 44' 29.99" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3974
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 6 workers, 126 m a.s.l., 6° 58' 11.62" N 70° 42' 21.52" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 3975

Appendix 1. (Cont.)

- Colombia, Arauca, Arauca, Campus Universidad Nacional de Colombia sede Orinoquia, granja: 1 worker, 128 m a.s.l., 7° 0' 33.40" N 70° 44' 31.84" W, 21/09/2014, J. Agudelo & N. B. Pérez leg., CEO 3976
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano sitio II: 2 workers, 126 m a.s.l., 6° 58' 12.41" N 70° 42' 18.19" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 3977
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 4 workers, 128 m a.s.l., 7° 1' 3.41" N 70° 45' 11.93" W, 30/03/2014, J. Agudelo & N. B. Pérez leg., CEO 3978
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 3 workers, 128 m a.s.l., 7° 1' 3.41" N 70° 45' 11.93" W, 07/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4008
- Colombia, Arauca, Arauca, Finca los Laureles: 3 workers, 129 m a.s.l., 6° 59' 40.36" N 70° 47' 50.01" W, 10/09/2014, J. Agudelo & N. B. Pérez leg., CEO 4027
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l., 6° 58' 26.26" N 70° 42' 50.53" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4028
- Colombia, Arauca, Arauca, Finca los Laureles: 1 worker, 129 m a.s.l., 6° 59' 40.36" N 70° 47' 50.01" W, 10/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4029
- Colombia, Arauca, Arauca, Finca los Laureles: 7 workers, 129 m a.s.l., 6° 59' 40.36" N 70° 47' 50.01" W, 10/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4030
- Colombia, Arauca, Arauca, Finca Piedraca, frente a la Universidad Nacional de Colombia Sede Orinoquia: 4 workers, 129 m a.s.l., 7° 1' 27.65" N 70° 44' 40.53" W, 09/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4031
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia. Vereda mata de gallina: 2 workers, 129 m a.s.l., 6° 58' 28.32" N 70° 42' 47.89" W, 29/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4032
- Colombia, Arauca, Arauca, Finca los Laureles: 42 workers, 129 m a.s.l., 6° 59' 39.94" N 70° 47' 47.98" W, 10/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4033
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 15 workers, 126 m a.s.l., 6° 58' 28.32" N 70° 42' 47.89" W, 01/11/2014, J. Agudelo & N. B. Pérez leg., CEO 4034
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 7 workers, 126 m a.s.l., 6° 58' 28.32" N 70° 42' 47.89" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4035
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia. Vereda mata de gallina: 17 workers, 129 m a.s.l., 7° 1' 3.41" N 70° 45' 11.93" W, 30/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4036
- Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 4 workers, 126 m a.s.l., 6° 58' 11.62" N 70° 42' 20.78" W, 05/04/2014, J. Agudelo & N. B. Pérez leg., CEO 4037
- Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de Colombia Sede Orinoquia: 18 workers, 129 m a.s.l., 7° 1' 3.41" N 70° 45' 11.93" W, 29/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4038

Appendix 1. (Cont.)

Genus *Gnamptogenys* Roger, 1863

Gnamptogenys regularis Mayr, 1870

Colombia, Arauca, Arauca, Finca las Mercedes del Llano: 1 worker, 126 m a.s.l.,
6° 58' 28.32" N 70° 42' 47.89" W, 05/04/2014, J. Agudelo & N. B. Pérez leg.,
CEO 4050

Colombia, Arauca, Arauca, Finca Mata de Gallina Frente a la Universidad Nacional de
Colombia Sede Orinoquia: 1 worker, 129 m a.s.l., 7° 1' 3.41" N 70° 45' 11.93" W,
30/03/2014, J. Agudelo & N. B. Pérez leg., CEO 4058
