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NEW RECORDS OF TERMITES (BLATTODEA: TERMITIDAE: SYNTERMITINAE) FROM COLOMBIA

Olga Patricia Pinzón¹ & Daniel Castro²

¹Laboratorio de Sanidad Forestal, Universidad Distrital Francisco José de Caldas, Carrera 5E 15-82 - Sede Venado de Oro, Bogotá D.C., Colombia

²Instituto Amazónico de Investigaciones Científicas SINCHI, Avenida Vásquez Cobo Calles 15 y 16, Leticia, Amazonas, Colombia

¹opatriciap@udistrital.edu.co, ²danielkaz80@gmail.com (corresponding author)

Abstract: Eight species of termite from the Amazon and Orinoquia regions, belonging to four genera of the subfamily Syntermitinae, are recorded for the first time in Colombia. The species are *Cornitermes cumulans* (Kollar, 1832), *Cornitermes pilosus* Holmgren, 1906, *Cornitermes ovatus* Emerson, 1952, *Cornitermes snyderi* Emerson, 1952, *Mapinguariptermes peruanus* (Holmgren, 1906), *Rhynchotermes amazonensis* Constantini & Cancello, 2016, *Rhynchotermes perarmatus* (Snyder, 1925), and *Uncitermes teevani* (Emerson, 1925). Diagnostic characteristics and geographic distributions for the recorded species are provided, with detailed photographs of the soldier caste. The diversity and distribution of indigenous termite species in Colombia are documented.

Keywords: Amazon, Colombian Llanos, *Cornitermes*, *Mapinguariptermes*, neotropical, Orinoco, *Rhynchotermes*, savannas, termites, *Uncitermes*.

Resumen: Ocho especies de termitas de las regiones de la Amazonía y Orinoquía, pertenecientes a cuatro géneros de la subfamilia Syntermitinae, son registradas por primera vez para Colombia. Las especies son: *Cornitermes cumulans* (Kollar, 1832), *Cornitermes pilosus* Holmgren, 1906, *Cornitermes ovatus* Emerson, 1952, *Cornitermes snyderi* Emerson, 1952, *Mapinguariptermes peruanus* (Holmgren, 1906), *Rhynchotermes amazonensis* Constantini & Cancello, 2016, *Rhynchotermes perarmatus* (Snyder, 1925), and *Uncitermes teevani* (Emerson, 1925). El presente estudio provee los caracteres diagnósticos y la distribución geográfica de las ocho especies estudiadas con fotografías detalladas del soldado. Este trabajo contribuye a documentar la diversidad y la distribución de especies de termitas nativas de Colombia.

Termites are insects of ecological importance in the dynamics of ecosystems that contribute to the biological processes of organic matter decomposition and mineralisation (Lewis 2009). Brazil is documented as the site of greatest termite diversity in the Neotropics (Constantino 2005), whereas Colombian termite fauna is much less well characterised and under-represented in the literature, due to a lack of sampling, taxonomic expertise and fewer investigative studies (Constantino 2002).

The first list of Colombian Termitidae genera, based on material deposited in entomological collections, was compiled in 2005 (Vargas-Niño et al. 2005), but a species list has not yet been published. Previous studies on termites in Colombia have focused on plantations and crops (Galvis 1985; Gutiérrez et al. 2004; Pinzón et al. 2012; Abadía et al. 2013), while natural ecosystems that possess higher species richness have received less attention (Morales-Castaño & Medina 2009; Casalla et al. 2016; Pinzón et al. 2017). Herein, we report eight

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Termitidae species from four genera in Colombia for the first time, thereby expanding our knowledge of termite species occurring in this country.

MATERIALS AND METHODS

Species of the Syntermitinae subfamily deposited in the Colección Entomológica Forestal CEFUD "Universidad Francisco José de Caldas" and the Colección de Artrópodos Terrestres de la Amazonía Colombiana CATAc (Instituto Amazónico de Investigaciones Científicas SINCHI) were identified to species level based on the morphology of the soldier caste using the taxonomic keys of Emerson (1952), Rocha et al. (2012), and Constantini & Cancello (2016).

RESULTS AND DISCUSSION

Four genera and eight Termitidae species are recorded for the first time in Colombia (Figs. 1–4 & Images 1–8). These are the Syntermitinae: *Cornitermes cumulans* (Kollar, 1832), *Cornitermes pilosus* Holmgren, 1906, *Cornitermes ovatus* Emerson, 1952, *Cornitermes snyderi* Emerson, 1952, *Mapinguaritermes peruanus* (Holmgren, 1906), *Rhynchotermes amazonensis* Constantini & Cancello, 2016, *Rhynchotermes perarmatus* (Snyder, 1925), and *Uncitermes teevani* (Emerson, 1925).

Cornitermes cumulans (Kollar, 1832)

Specimens examined: CEFUD 2014-602, 02.xii.2014, 7 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.17935°N & 71.27439°W), coll. D. Castro, id. P. Pinzón & 7 ind. CEFUD 2014-626B, 09.xii.2014, 4 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.17955°N & 71.27450°W), coll. J. Vega, id. P. Pinzón.

Diagnostic features: The head is yellowish, the pronotum is a little lighter than the head, the length of the head with mandibles is 3.29–4.31 mm, the width of the head is 1.85–2.62 mm and the head is sparsely

covered with bristles and numerous relatively long hairs about half the length of the bristles. Antennae have 15–16 articles, the labrum has distinct side angles greater than a right angle (Image 1d) and the front margin of the pronotum is not emarginate and does not have a shallow emargination (modified from Emerson 1952).

Distribution: This species has been recorded in Brazil, Argentina and Paraguay (Krishna et al. 2013). This is the first record for a country in the north of South America, although restricted to Orinoquia in Colombia.

Notes: Workers and soldiers were collected from gallery forest during the rainy season and found only in epigeous monticles.

Cornitermes pilosus Holmgren, 1906

Specimens examined: CEFUD 2014-617, 11.vi.2014, 20 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.17923°N & 71.27462°W), coll. D. Castro, id. P. Pinzón. CEFUD 2014-170, 27.vi. 2014, 4 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.17963°N & 71.27397°W), coll. J. Vega, id. P. Pinzón.

Diagnostic features: The head has numerous long bristles on the upper side and a dense contrasting mat of short hairs on the upper and under sides. The postmentum is covered with shorts hairs, the length of the head with mandibles is 4.00–5.00 mm and the width of the head is 2.06–2.76 mm. The frontal tube is relatively short and depressed in profile. The labrum is rounded and bluntly pointed with lateral angles, and the margins from the base of the median white lobe to the lateral angles are straight (Image 2D). Antennae have 15 articles, and the second, third and fourth are approximately equal (adapted from Emerson 1952).

Distribution: This species has been recorded only in Brazil (Araujo 1977; Constantino 1998; Fontes 1998). In Colombia, it was only recorded in Puerto Gaitán, Meta.

Notes: Workers and soldiers were collected from

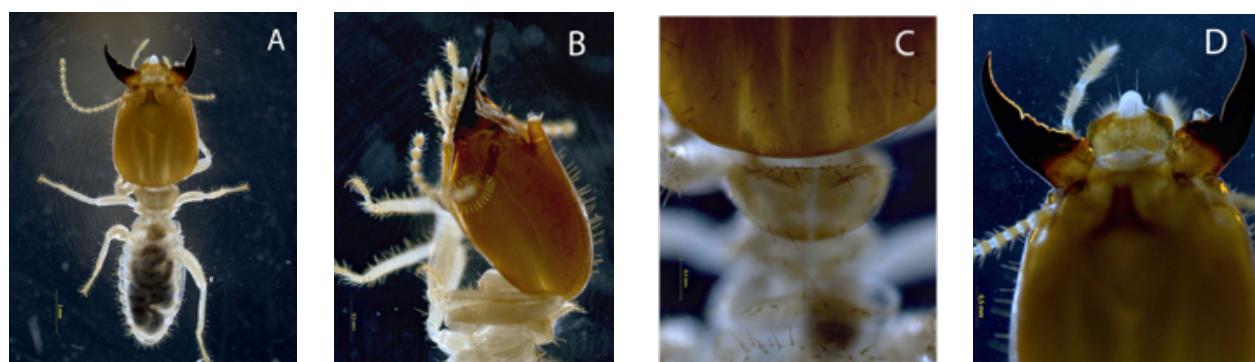


Image 1. *Cornitermes cumulans* (Kollar, 1832)

A - Dorsal view; B - Head lateral view; C - Pronotum; D - Labrum and mandibles. © W. Garcia, 2017.

gallery forest during dry and rainy seasons. Samples were obtained from dry branches and epigeous monticules.

Cornitermes ovatus Emerson, 1952

Specimens examined: CEFUD 2014-165, 11.vi.2014, 1 individual, Colombia, Meta, Puerto Gaitán, Planas (4.17977°N & 71.27399°W), coll. D. Castro, id. P. Pinzón. CEFUD 2014-294, 27.vi.2014, 6 individuals, Colombia,

Meta, Puerto Gaitán, Planas (4.15875°N & 71.23913°W), coll. D. Castro, id. P. Pinzón. CEFUD 2014-336, 29.vi.2014, 4 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.15148°N & 71.24068°W), coll. J. Vega, id. P. Pinzón. CEFUD 2014-572A, 21.xi.2014, 2 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.17977°N & 71.27399°W), coll. D. Castro, id. P. Pinzón. CEFUD 2014-632, 10.xii.2014, 4 individuals, Colombia, Meta, Puerto Gaitán, Planas

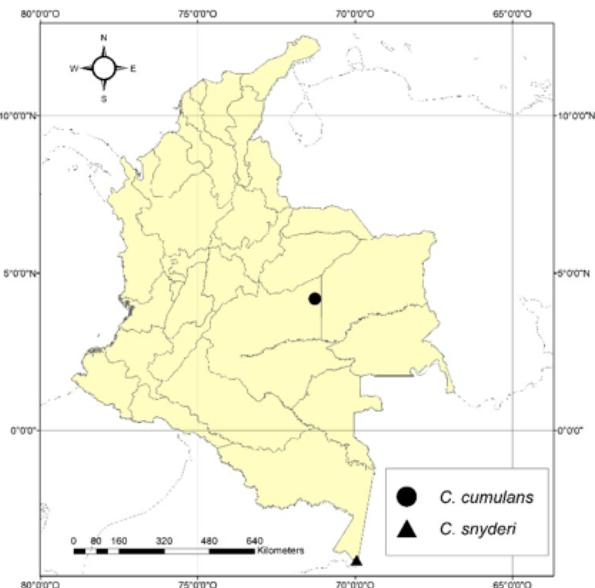


Figure 1. Distribution map of *Cornitermes cumulans* and *Cornitermes snyderi*.

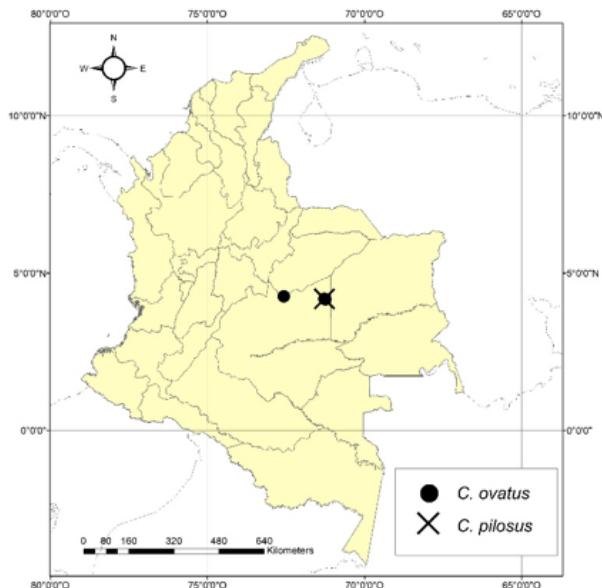


Figure 2. Distribution map of *Cornitermes pilosus* and *Cornitermes ovatus*.

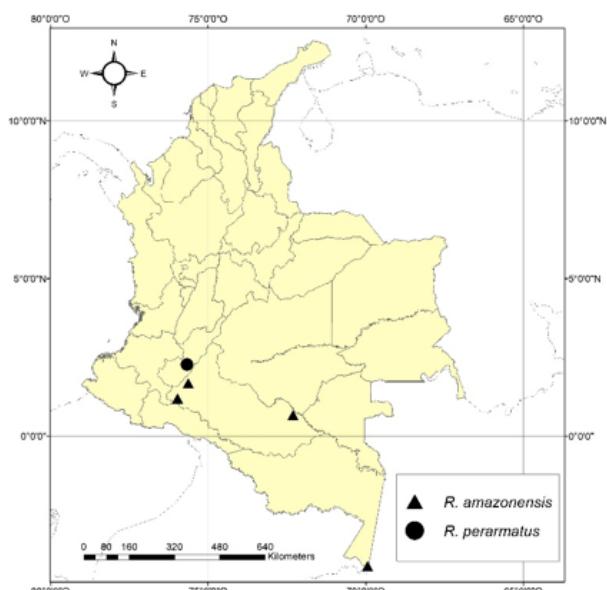


Figure 3. Distribution map of *Rhynchotermes amazonensis* and *Rhynchotermes perarmatus*.

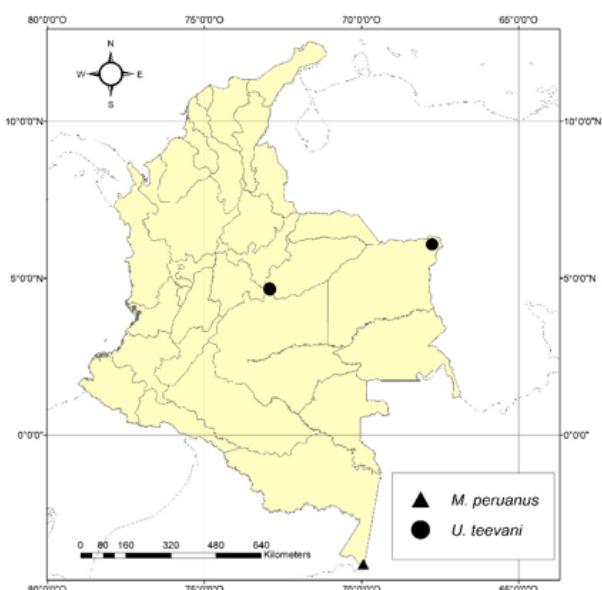


Figure 4. Distribution map of *Mapinguaritermes peruanus* and *Uncitermes teevani*.

(4.17963°N & 71.27450°W), coll. D. Castro, id. P. Pinzón. CEFUD 2014-639, 12.xii.2014, 6 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.17971°N & 71.27477°W), coll. J. Vega, id. P. Pinzón. CEFUD 2014-681, 20.xii.2014, 6 individuals, Colombia, Meta, Puerto Gaitán, Planas (4.15870°N & 71.23914°W), coll. D. Castro, id. P. Pinzón. CEFUD 2009.6.3, 15.x.2014, 16 individuals, Colombia, Meta, Puerto López (4.25555°N & 72.56889°W), coll. P. Pinzón, id. P. Pinzón.

Diagnostic features: The head has numerous bristles on top and a few underneath, and has a mat of contrasting short hairs. The head is light reddish-brown, the length of the head with mandibles is 5.08–5.30 mm and the width of the head is 2.98–3.20 mm. The pronotum has numerous bristles and a few short hairs (Image 3c). Antennae have 15 articles. The sides of the labrum are obtusely pointed or rounded, and the angles at the junction of the white median lobe are distinct (Image 3B) (adapted from Emerson 1952).

Distribution: This species has been previously recorded in Brazil (Krishna et al. 2013). In Colombia, it was recorded in two localities of the Meta Department.

Notes: Workers and soldiers were collected from gallery forests during dry and rainy seasons. Samples were obtained from dry branches, epigeous monticules and soil.

Cornitermes snyderi Emerson, 1952

Specimens examined: CATA 1230, 23.vi.2017, 11 individuals, Colombia, Amazonas, Leticia, Tanimboca Natural Reserve (4.12094°S & 69.95547°W), coll. D. Castro, id. D. Castro. CATA 1231, 23.vi.2017, 1 individual, Colombia, Amazonas, Leticia, Tanimboca Natural Reserve (4.12094°S & 69.95547°W), coll. D. Castro, id. D. Castro.

Diagnostic features: The head is dark yellow and subrectangular, and has numerous bristles and some

shorter hair. The length of the head and mandibles is 2.74–3.47 mm, and the width is 1.50–1.85 mm. The pronotum is yellow with a number of bristles and a few short hairs on the posterior half. Antennae have 15 articles. The labrum has somewhat blunt lateral angles, and the margin between the lateral angles and the base of the median white tip is slightly concave or nearly straight (adapted from Emerson 1952).

Distribution: This species has been reported in Bolivia (Emerson 1952), as well as northeastern (Bandeira & Vasconcellos 1999), central-western (da Cunha et al. 2006) and Amazon (Constantino & Cancello 1992; Fontes 1998) regions of Brazil.

Notes: Workers and soldiers were collected from 20cm depth soil samples in a secondary forest.

Mapinguaritermes peruanus (Holmgren, 1906)

Specimens examined: CATA 633, 26.xi.2015, 38 individuals, Colombia, Amazonas, Leticia, Tacana River (4.161916°S & 69.9569°W), coll. C. Peña, id. D. Castro. CATA 976, 22.viii.2017, 23 individuals, Colombia, Amazonas, Leticia, Cerca Viva Natural Reserve (4.12075°S & 69.94469°W), coll. D. Castro, id. D. Castro.

Diagnostic features: The head capsule is oval in the dorsal view, and the frontal tube is conical, almost parallel with the base of the head capsule and approximately four-fifths of its length in profile. Bristles on the head are sparse, varying in number, but never fewer than 15. The frontal tube always has bristles, at least until the middle of the proximal region. Antennae have 14 articles (adapted description of Rocha et al. 2012).

Distribution: This species has been recorded in Peru and Brazil (Holmgren 1912; Mathews 1977) and is distributed in the Amazon region (Rocha et al. 2012). In Colombia, two records of this species were found 11km from the city of Leticia in the Amazonas Department, at the Natural Reserve Cerca Viva and the Tacana River.

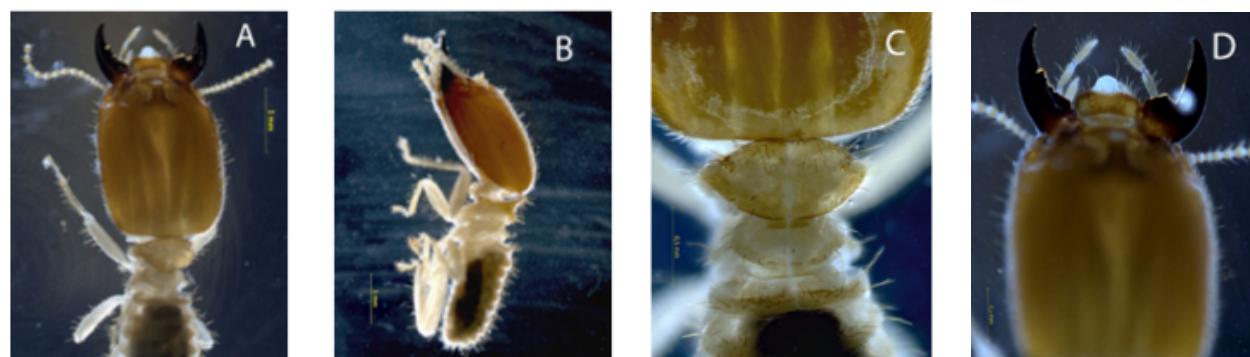


Image 2. *Cornitermes pilosus* Holmgren, 1906

A - Dorsal view; B - Lateral view; C - Pronotum; D - Labrum and mandibles. © W. Garcia, 2017.

Notes: Workers and soldiers were collected from primary and secondary forest in Leticia, close to the Amazon River. They were collected from soil samples in a secondary forest, and also from anthropogenic soil (terra preta) in secondary forests at a depth from 0 to 10 cm.

***Rhynchotermes amazonensis* Constantini & Cancello, 2016**

Specimens examined: CATA 1752, 3.x.2015, 12 individuals, Colombia, Amazonas, Puerto Santander, Aduche (0.66202° N & 72.31061° W), coll. C. Peña, id. D. Castro. CATA 965, 4.ix.2015, 1 individual, Colombia, Amazonas, Leticia (4.16916° S & 69.9569° W), coll. C. Peña, id. D. Castro. CATA 1764, 20.ix.2016, 19 individuals, Colombia, Caquetá, Florencia, Caldas (1.67638° S & 75.63294° W), coll. C. Peña, id. D. Castro. CATA 1245, 15.iii.2016, 5 individuals, Colombia, Caquetá, Florencia, Caldas (1.67638° S & 75.63294° W), coll. C. Peña, id. D. Castro.

Diagnostic features: This species is dimorphic. The head of major soldiers is slightly constricted behind the antennae. In profile, the dorsal margin of the head and the margin of the frontal tube are concave, the length of the head to the lateral base of the mandibles is 0.67–0.85 mm and the width of the head is 0.82–0.92 mm.

Mandibles are strongly curved, with a serrated inner margin. The forecoxa process is subcylindrical, and antennae articles are long (adapted from Constantini & Cancello 2016).

Distribution: This species has previously been recorded only in Brazil (Constantini & Cancello 2016) in an Amazonian forest. In Colombia, it was recorded in two departments of the Amazonian region: Caquetá and Amazonas.

Notes: Workers and soldiers were collected from soil samples in a primary forest and from anthropogenic soil samples (terra preta) in the indigenous community of Aduche (Puerto Santander, Amazonas). They were found in soil samples taken from a depth of 0–20 cm.

***Rhynchotermes perarmatus* (Snyder, 1925)**

Specimens examined: CEFUD 2103, 26.ix.2015, 1 individual, Colombia, Huila, El Agrado (2.2675° N & 75.6733° W), coll. S. Angel, id. P. Pinzón.

Diagnostic features: The head is short, pear-shaped, with a very elongated nasus that is curved downward and gradually attenuated toward the apex, and subcylindrical. The length of the head and nasus is 2.50–2.60 mm, and the width of the head is 0.65–0.67 mm. The mandibles are larger than the head, and clearly visible in the dorsal view when closed (adapted



Image 3. *Cornitermes ovatus* Emerson, 1952
A - Lateral view; B - Head, labrum and mandibles; C - Pronotum.
© W. Garcia, 2017.



Image 4. *Cornitermes snyderi* Emerson, 1952
A - Dorsal view; B - Lateral view;
C - Labrum and mandibles.
© D. Castro, 2018.

from Snyder 1925 and Constantini & Cancello 2016).

Distribution: This species has been recorded in Panama, Honduras, Costa Rica, Guatemala, Ecuador and Belize (Snyder 1925; Snyder 1949; Becker 1953; Araujo 1977). In Colombia, the species was found in a dry forest region of the Huila Department.

Notes: Constantino (1998) reported that this species is distributed from Belize to Ecuador, but there is no published evidence of any report for Colombia. Only a single soldier was collected.

Uncitermes teevani (Emerson, 1925)

Specimens examined: CEFUD 2014-1119, 16.xi.2014, 10 individuals, Colombia, Vichada, Puerto Carreño, (6.07666°N, 67.75000°W), coll. P. Pinzón, id. P. Pinzón. CEFUD 2015-747, 2.ii.2015, 20 individuals, Colombia, Casanare, Villanueva, Refocosta (4.64277°N & 72.92222°W), coll. P. Pinzón, id. P. Pinzón. CEFUD 2015-863, 30.i.2015, 28 individuals, Colombia, Casanare, Villanueva, Refocosta (4.63566°N & 72.90805°W), coll. P. Pinzón, id. P. Pinzón. CEFUD 2015-2202, 12.v.2015, 20 individuals, Colombia, Casanare, Villanueva, Refocosta (4.66627°N & 72.92302°W), coll. P. Pinzón, id. P. Pinzón.

Diagnostic features: Soldiers of this species have a rounded head capsule (in the dorsal view), and the head has a few sparse bristles. The frontal tube is conical and glabrous, and the same length as the base of the head



Image 5. *Mapinguaritermes peruanus* (Holmgren, 1906)

A - Dorsal view; B - Lateral view. © D. Castro, 2018.

capsule, and forms an almost 45° angle with the base of the head (in profile). Antennae have 15 articles. The enteric valve of workers has major ridges that are slightly dilated at the apex (Image 8C), and all are decorated with curved spines (Rocha et al. 2012).

Distribution: This species is restricted to tropical regions of South America. It has been recorded in Bolivia, Brazil, French Guyana, Guyana, Venezuela and Ecuador (Snyder 1949; Constantino 1998; Davies 2002; Carrijo et al. 2016). In Colombia, these first records were restricted to the Colombian Orinoquia.

Notes: Workers and soldiers were collected from

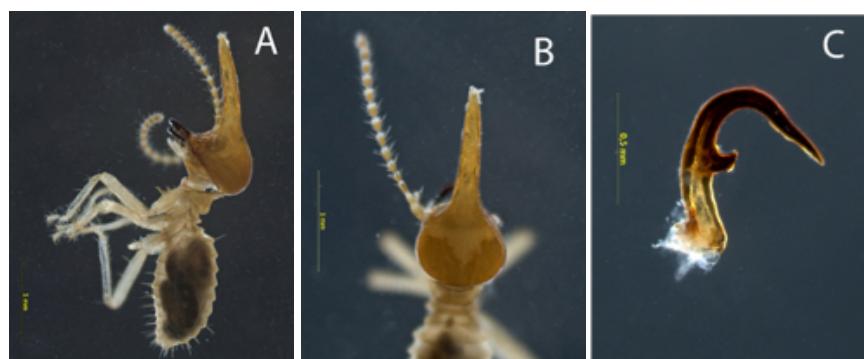


Image 6. *Rhynchotermes amazonensis*

Constantini & Cancello (2016)

A - Lateral view; B - Dorsal view; C - Mandible soldier. © D. Castro, 2018.



Image 7. *Rhynchotermes perarmatus* (Snyder, 1925)

A - Dorsal view; B - Lateral view;

C - Mandibles. © W. Garcia, 2017.



Image 8. *Uncitermes teevani* (Emerson, 1925)
A - Lateral view;
B - Dorsal view;
C - Worker enteric valve.
© Pinzón & Castro, 2017

gallery forest during dry and rainy seasons.

DISCUSSION

Termite genera and species records from the Orinoco and Amazon regions of Colombia, where most of our records are from, are mainly the result of studies focusing on economically important agricultural and forest species (Sánchez 2011; Sterling et al. 2011; Lores & Pinzón 2011; Pinzón et al. 2012), and samples from these regions are scarce in Colombian collections (Vargas-Niño et al. 2005; Morales-Castaño & Medina 2009). Termite diversity in riparian forests in these regions is poorly studied, despite the presence of ecologically important species (Decaëns et al. 2006; Pinzón et al. 2017).

The records presented in the present work expand the known distribution of *Cornitermes*, extending from Panama to northern Argentina. Two species of this genus have been previously listed in Colombia (Krishna et al. 2013), and the present study expands this to six records. By contrast, the genus *Rhynchotermes* is known to be restricted to the north of South America (Constantini & Cancello 2016), and we herein add two new records, *R. perarmatus* from a region of dry forest and *R. amazonensis* from a tropical humid forest. Thus, three species are now known to occur in Colombia, including the previous record of *R. bulbinasus* Scheffrahn in the northern savannas (Scheffrahn 2010). The genera *Uncitermes* and *Mapinguaritermes* were previously known to occur in geographical regions sharing ecological similarities, such as the Brazilian northeast and Venezuelan Orinoco Llanos (Rocha et al. 2012; Carrijo et al. 2016). Herein, we enlarge their known distribution to include the Colombian Oriental Llanos. To conclude, the new records of eight species expand the known geographical distribution of termite genera, and species previously known to occur in Brazil, Paraguay, Bolivia, Argentina, Ecuador, Guyana, Venezuela and Peru (Krishna et al. 2013) have now been identified in Colombia for the first time.

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-- Achyuthan N. Srikanthan, Gandla Chethan Kumar, Aishwarya J. Urs & Sumanthang Rajagopalan Ganesh, Pp. 12147–12162

Communications

Foraging and roosting ecology of the Lesser Dog-faced Fruit Bat *Cynopterus brachyotis* (Mammalia: Chiroptera: Pteropodidae) in southern India

-- T. Karuppudurai & K. Sripathi, Pp. 12163–12172

Diversity and status of avifauna in man-made sacred ponds of Kurukshetra, India

-- Parmesh Kumar & Archna Sharma, Pp. 12173–12193

Diversity and distribution of freshwater turtles (Reptilia: Testudines) in Goa, India

-- Trupti D. Jadhav, Nitin S. Sawant & Soorambail K. Shyama, Pp. 12194–12202

Breeding behaviour of the Coromandel Damselfly

***Ceriagrion coromandelianum* (Fabricius) (Zygoptera: Coenagrionidae) in central India: copulation**

-- Nilesh R. Thaokar, Payal R. Verma & Raymond J. Andrew, Pp. 12203–12209

The status assessment of *Corynandra viscosa* subsp. *nagarjunakondensis* (Magnoliopsida: Cleomaceae), endemic to Nagarjunakonda, Andhra Pradesh, India

-- Veeravarapu Hanumantha Rao, Vaidyula Vasudeva Rao, Anuti Baleeshwar Reddy & Vatsavaya Satyanarayana Raju, Pp. 12210–12217

Short Communications

New records of termites (Blattodea: Termitidae: Syntermatinae) from Colombia

-- Olga Patricia Pinzón & Daniel Castro, Pp. 12218–12225

New reports of thrips (Thysanoptera: Terebrantia: Thripidae) from India

-- R.R. Rachana & R. Varatharajan, Pp. 12226–12229

New records of earthworm fauna (Oligochaeta: Glossoscolecidae and Megascolecidae) collected from Satkosia-Baisipalli Wildlife Sanctuary of Odisha, India

-- Rinku Goswami, Pp. 12230–12234

Diversity and endemism of butterflies of montane forests of Eravikulam National Park in the Western Ghats, India

-- E.R. Sreekumar, S. Nikhil, K.G. Ajay & P.O. Nameer, Pp. 12235–12246

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Angiosperm diversity of Sonbhadra District, Uttar Pradesh: a checklist

-- Arun Kumar Kushwaha, Lalit Mohan Tewari & Lal Babu Chaudhary, Pp. 12247–12269

Contribution to the Macromycetes of West Bengal, India: 23–27

-- Meghma Bera, Soumitra Paloi, Arun Kumar Dutta, Prakash Pradhan, Anirban Roy & Krishnendu Acharya, Pp. 12270–12276

Notes

Animal-fungal interactions 2: first report of mycophagy by the Eastern European Hedgehog *Erinaceus concolor* Martin, 1837 (Mammalia: Eulipotyphla: Erinaceidae)

-- Todd F. Elliott, James M. Trappe & Aziz Türkoglu, Pp. 12277–12279

Rostral anomaly in a juvenile Spiny Butterfly Ray *Gymnura altavela* (Linnaeus, 1758) (Elasmobranchii: Myliobatiformes: Gymnuridae) from the Canary Islands

-- Filip Osaer & Krupskaya Narváez, Pp. 12280–12281

A record after 52 years, and additional description of the emesine assassin bug *Emesopsis nubila* (Hemiptera: Reduviidae: Emesinae) from western India

-- Balasaheb V. Sarode, Nikhil U. Joshi, Pratik P. Pansare & Hemant V. Ghate, Pp. 12282–12285

***Gentiana aperta* (Gentianaceae) - a new record to India from Ladakh Himalaya**

-- Mohd Shabir, Priyanka Agnihotri, Jay Krishan Tiwari & Tariq Husain, Pp. 12286–12289

Notes on *Cinnamomum travancoricum* Gamble (Lauraceae) - a Critically Endangered species from the southern Western Ghats, India

-- A.J. Robi, P. Sujanapal & P.S. Udayan, Pp. 12290–12293

A reassessment and lectotypification of the name *Striga masuria* (Buch.-Ham. ex Benth.) Benth. (Orobanchaceae) and its collection from the Western Ghats of India

-- M. Omalsree & V.K. Sreenivas, Pp. 12294–12297

Miscellaneous

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