



Caetetermes fontesi, a new nasutiform termite (Isoptera: Termitidae: Nasutitermitinae) from French Guiana

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Abstract

Caetetermes fontesi **sp. nov.** is described from soldiers, workers, and winged imagos collected in French Guiana. Soldiers of *C. fontesi* are distinguished from *Caetetermes taquarussu* Fontes 1981, until now a monotypic genus, by their larger size, deeper coloration, and shorter and thicker nasus. The imago of *C. fontesi* is larger and the enteric valve of the dimorphic *C. fontesi* workers have larger cushions with more and longer spines than *C. taquarussu*. Worker dimorphism for Neotropical nasutitermitinae is discussed.

Key words: new species, soldiers, workers, imagos, enteric valve armature

Introduction

Fontes (1981) described the genus *Caetetermes* and its lone species, *C. taquarussu*, from soldiers and workers collected in primary and secondary rainforests of Amazonian Ecuador. The monomorphic soldier of *Caetetermes* is distinguished from all other genera of Neotropical nasutitermitines by its strongly constricted head and narrow cylindrical nasus. The only genera which remotely resemble the *Caetetermes* soldiers are the monomorphic *Tenuirostritermes* Holmgren, 1912, the dimorphic *Ngauratermes* Constantino and Acioli, 2009, and the dimorphic or trimorphic *Diversitermes* Holmgren, 1912 and *Velocitermes* Holmgren, 1912 (Constantino 2002). In all cases the nasi of the latter genera are proportionally broader, shorter, and less cylindrical than *Caetetermes*. More recently Cuzzo *et al.* 2015a described the imago of *C. taquarussu*, and supplemented the descriptions of the soldier and worker. Herein, I describe *Caetetermes fontesi* **sp. nov.** from soldiers, workers, and winged imagos collected from a lowland rainforest in French Guiana.

Material and methods

Figures were taken as multi-layer montages using a Leica M205C stereomicroscope with a Leica DFC 425 module run with Leica Application Suite version 3 software. Preserved specimens were taken from 85% ethanol and suspended in a pool of Purell® hand sanitizer (70% EtOH) to position the specimens over a transparent plastic Petri dish background. Measurements (Tables 1–3) were obtained using an Olympus SZH stereomicroscope fitted with an ocular micrometer. The field photograph of live specimens, placed in a filter paper-lined Petri dish (Fig. 3), were taken with a Canon EOS 6D camera combined with Canon MP-E 65/2.8 macro lens.

Material examined. *Caetetermes fontesi* **sp. nov.**: Holotype soldier. FRENCH GUIANA. Lowland forest around Petit Saut dam (5.038, -52.956); col. J. Křeček; 11FEB2008; 87 m elev.; in paratype colony sample with soldiers, imagos, narrow-gap and broad-gap workers; vial no. FG241 of the University of Florida Termite Collection (UFTC), Davie, Florida. *Caetetermes taquarussu*: ECUADOR. Old-growth rainforest in P. N. Yasuni (0.6718, -76.3979); cols. J. Chase, J. Křeček, J. Mangold, A. Mullins, T. Myles, R. Setter, T. Nishimura, and R. Scheffrahn; 1JUN2011; 223 m elev.; many soldiers and workers of both types;

UFTC no. EC1193. FRENCH GUIANA. Lowland forest around Petit Saut dam (5.024, -53.025); col. J. Křeček; 6FEB2008; 62 m elev.; many soldiers and workers of both types; UFTC no. FG87.

Caetetermes fontesi sp. nov.

Etymology. This species is named in honor of Luiz Roberto Fontes who described *Caetetermes*, numerous other termite taxa, and demonstrated the importance of gut morphology of Neotropical termites.

Soldier (Fig. 1, 2; Table 1). Monomorphic. Head capsule yellowish brown with lighter patches at posterior and area between constriction and nasus; nasus darkest. In dorsal view, posterior lobe of head capsule rounded, about 1.5X wider than anterior lobe; lateral margins of anterior lobe barely rounded; nasus narrowly cylindrical, tapering to point in last tenth of length. Mandibles without points. In lateral view, head capsule with two undulations, a smaller one above the anterior lobe and a larger one above the posterior lobe; a pair of long setae projecting from the middle of each lobe. Nasus with about 60 short setae from anterior third to apex. In dorsal view anterior margin of pronotum almost straight, with semicircular anterolateral margins, and tapering to a narrow emarginate posterior margin; microscopic hairs along anterior margin of pronotum. Tergites with 8-12 long setae near posterior margins and many finer hairs scattered throughout. Legs long, with scattered long setae and fine hair throughout. Antennae long, with 15 articles, formula 2<3>4≥5.

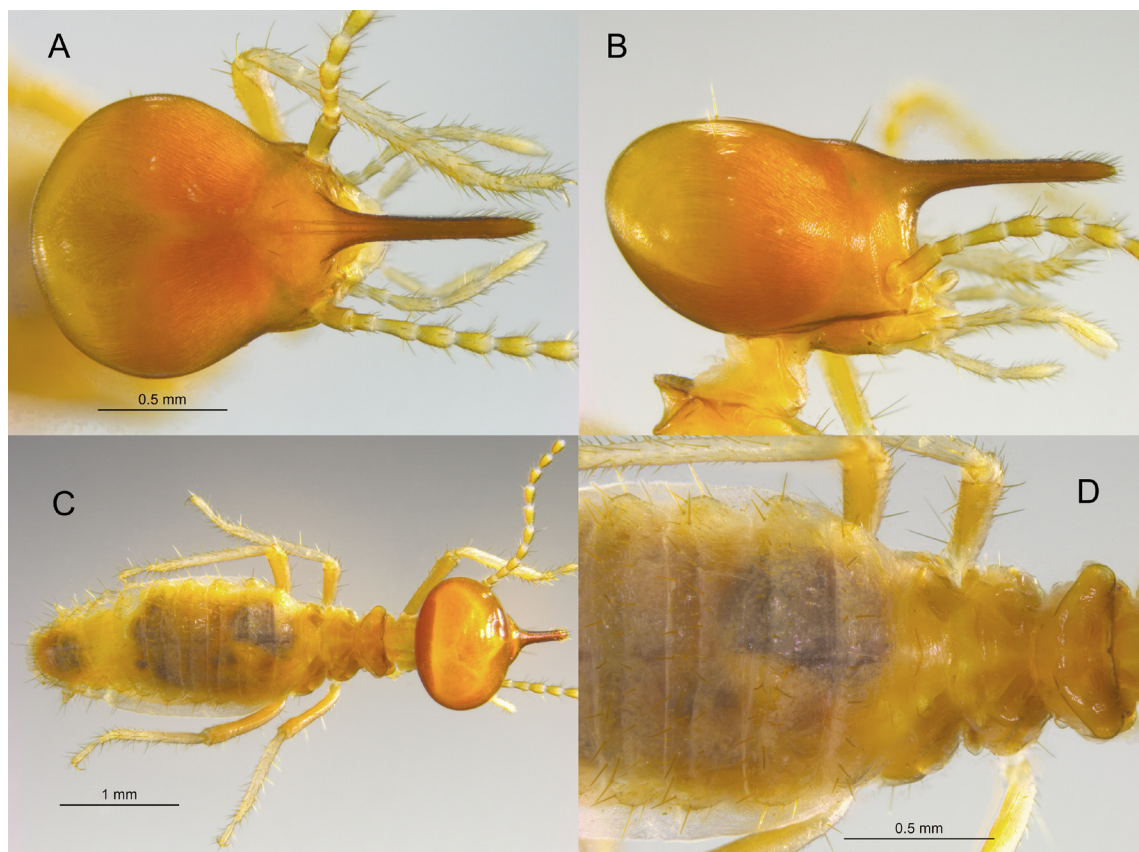


FIGURE 1. *Caetetermes fontesi* soldier: **A**, dorsal view of head capsule; **B**, lateral view of head capsule; **C**, dorsal habitus of preserved specimen; **D**, dorsal view of thorax and anterior abdomen.

Comparisons. The soldier head capsule of *C. taquarussu* shows substantial variability, particularly for the relative widths of the anterior and posterior lobes, the degree of constriction, and the width of the nasus from specimens taken in Brazil (Cuezso *et al.* 2015a) and Ecuador (Fontes 1981). I am inclined to consider the two specimens from Ecuador and French Guyana (Fig. 3) to be heterospecific with the specimen from Ecuador (Fig. 3A, B) possibly being a new species. Future studies are needed to determine the character range of *C. taquarussu*. Nevertheless, in addition to differences of the nasus, the soldier of *C. fontesi* is larger in every measurement, the head capsule has a darker, more patched coloration, and has a less defined constriction.



FIGURE 2. Live habitus of *Caetetermes fontesi* foragers.

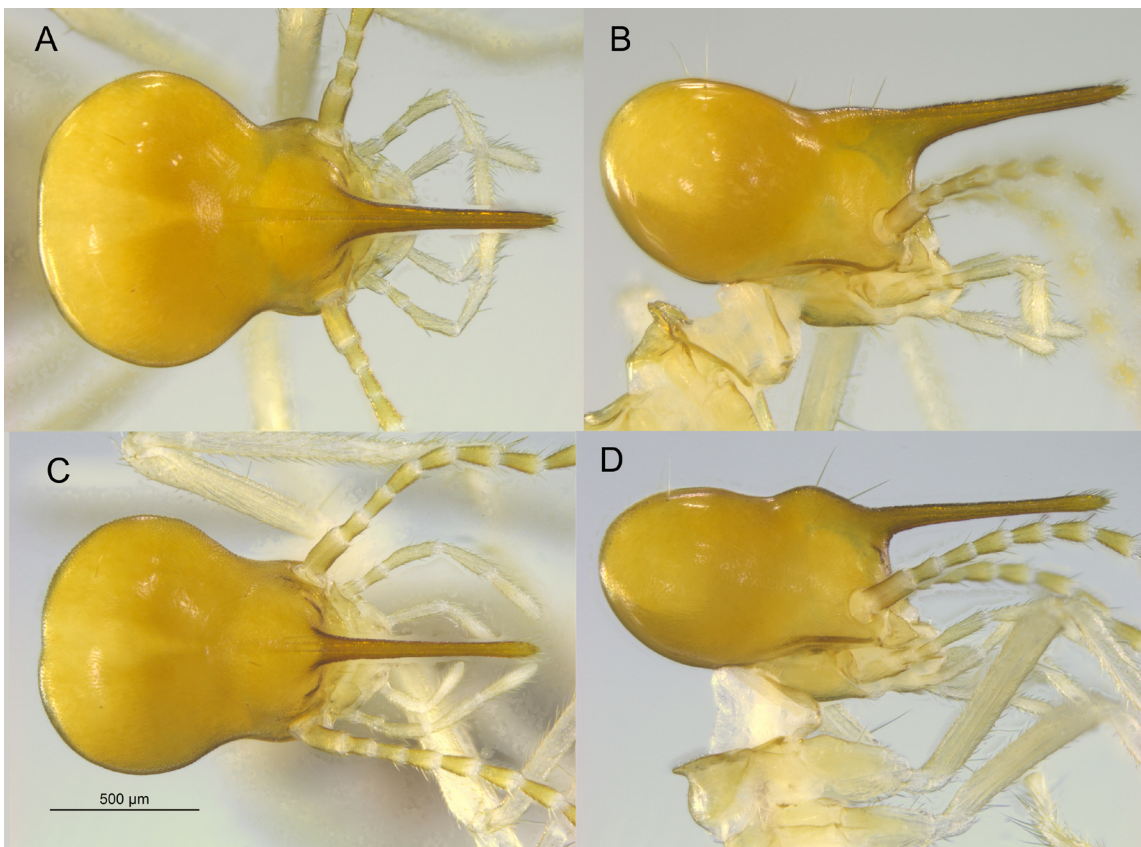


FIGURE 3. *Caetetermes taquarussu* soldier variation: **A, B.** *C. taquarussu* from Ecuador (EC1193); **C, D.** *C. taquarussu* from French Guiana (FG87).

Winged Imago (Fig. 4, Table 2). The description of *C. taquarussu* by Cuezco *et al.* (2015a) is essentially identical to that of *C. fontesi* including the antennal article formula ($2 < 3 > 4 \geq 5$) as gleaned from their fig. 2. Subtle differences in Fig. 4 and their fig. 2 most likely stem from the differences between my wet male specimen (Fig. 3) and their dried specimen (fig. 2, gender unknown). *Caetetermes fontesi* imagos are a bit larger in some measurements.



FIGURE 4. A. dorsal view; and B. lateral view of head and pronotum of male imago of *Caetetermes fontesi*

Worker (Fig. 2, 5: Table 3). Dimorphic. Head capsule pale reddish brown. In dorsal view, head outline trapezoidal; four setae on dorsum, two near occiput and two more anterior. Antennae with 15 articles, formula $2 > 3 < 4 = 5$. Broad-gap major workers are more common than narrow-gap minor workers. Enteric valve armature identical in both morphs; composed of a band of six delicate anterior cushions followed by a band of six more robust posterior cushions. Anterior cushions with about 5-16 pointed scales. Posterior cushions adorned with about 12-22 thorns; thorns near the trailing margin (posterior) much longer. Gut and mandibles as in Cuezco *et al.* (2015).

TABLE 1. Measurements (mm) of *Caetetermes fontesi* soldiers (n=10) from type colony.

Measurements	mean	max	min
Head Length	1.97	2.04	1.90
Head Length to base of nasus	1.14	1.16	1.11
Nasus Length	0.84	0.90	0.79
Max. Head width	1.12	1.16	1.09
Head width Post margin of antennal sockets	0.74	0.77	0.72
Nasus width in middle	0.09	0.09	0.08
Max. Head Height at posterior occiput margin	0.79	0.82	0.77
Pronotum width	0.59	0.64	0.54
Hind Tibia length	1.45	1.53	1.38

TABLE 2. Measurements (mm) of *Caetetermes fontesi* male (n=7) and female (n=2) imagos from type colony.

Measurement	males			females		
	mean	max	min	mean	max	min
Head L to postclypeus	0.94	0.99	0.86	1.03	1.06	0.99
Head W incl. eyes	1.26	1.33	1.21	1.33	1.33	1.33
eye diam	0.35	0.37	0.32	0.36	0.37	0.35
ocellus diam	0.11	0.12	0.10	0.14	0.15	0.12
distance eye to ocellus	0.07	0.09	0.05	0.06	0.07	0.05
Pronotum max width	1.04	1.06	0.99	1.20	1.21	1.19
Pronotum median L	0.65	0.69	0.62	0.70	0.72	0.69
Fore wing L to suture	9.11	9.41	8.91	10.30	10.40	10.20

Comparisons. Both worker morphs of *C. fontesi* are larger than those of *C. taquarussu* but are otherwise similar in all respects except for the EVA. Both cushion bands of the *C. fontesi* EVA have thicker, more robust thorns than those of *C. taquarussu* with the most notable difference in that the trailing thorns are the longer in the former.

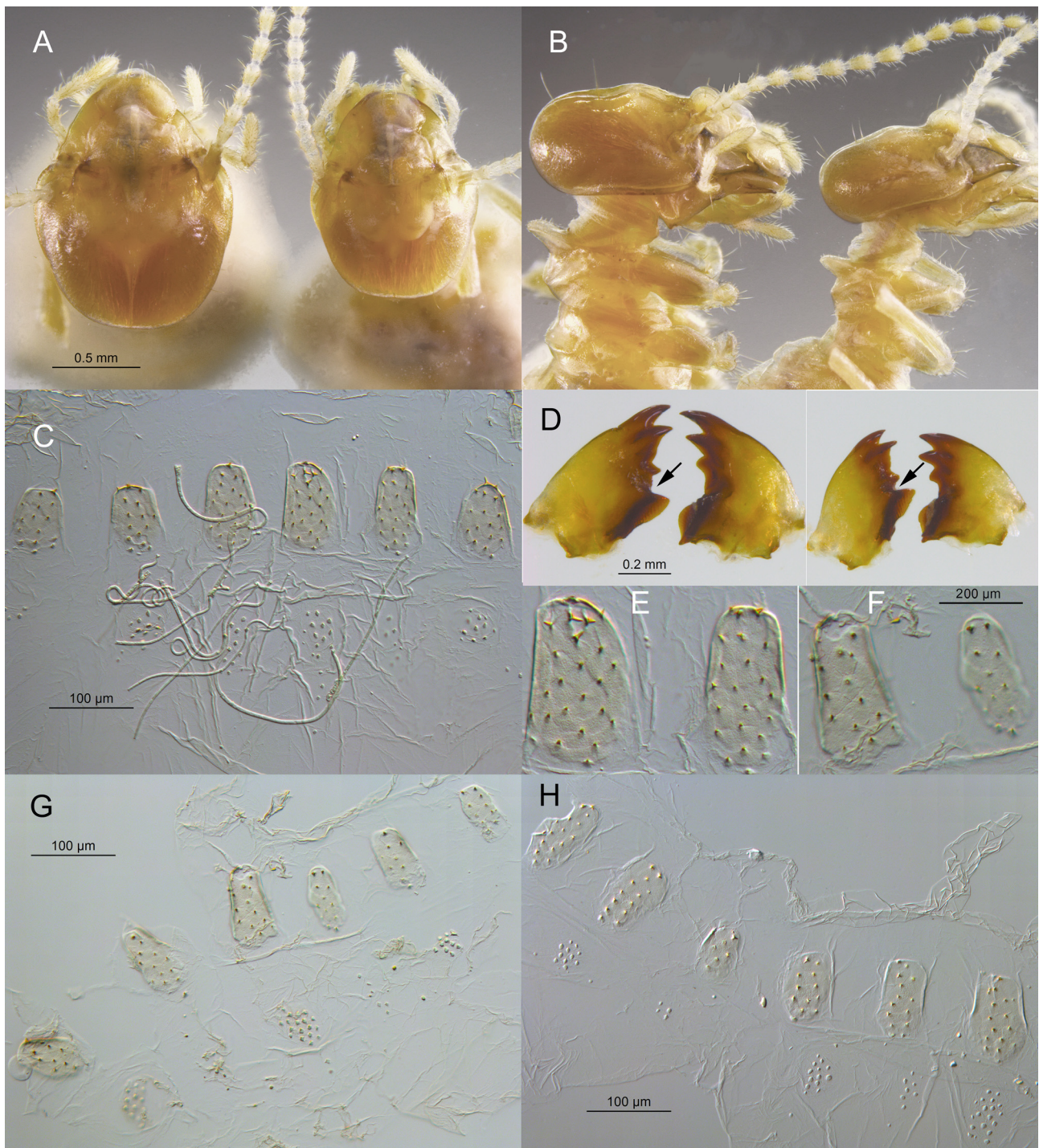


FIGURE 5. *Caetetermes* workers: **A.** dorsal view; and **B.** lateral views of broad-gap (left) and narrow-gap head capsules of *C. fontesi*; **C.** whole enteric valve armature (EVA) of *C. fontesi* (some fungal hyphae in center); **D.** broad-gap (left) and narrow-gap mandibles (arrows) of *C. fontesi*; largest posterior cushions of EVAs from **E.** *C. fontesi* and, **F.** *C. taquarussu* from Ecuador (EC1193); **G.** whole EVA preparations from EC1193 and, **H.** from French Guiana (FG87).

TABLE 3. Measurements (mm) of *Caetetermes fontesi* narrow-gap (n=3) and broad-gap (n=10) workers from type colony.

Measurements	narrow-gap			broad-gap		
	mean	max	min	mean	max	min
Head L to postclypeus	0.69	0.74	0.62	0.80	0.94	0.69
Head Width	0.91	0.94	0.89	1.05	1.14	0.99
Hind Tibia L	1.14	1.19	1.11	1.34	1.51	1.21

Discussion

Fontes (1981) originally described the *C. taquarussu* worker morphs as “major” and “minor” workers. As with *Caetetermes*, Fontes (1987) later discovered that several other Neotropical nasutitermitine genera have dimorphic workers including *Convexitermes*, *Atlantitermes*, *Araujotermes*, *Coatitermes*, *Subulitermes*, and *Agnathotermes* (Fontes 1987). For these genera, Fontes (1987) coined the terms “broad-gap” and “narrow-gap” workers, recognized by the width of the gap between the third marginal tooth and molar prominence of the left mandible. Table 4 provides the terminology for all dimorphic and trimorphic worker (*Diversitermes*) taxa so far recognized in the Nasutitermitinae. If worker morphs are easily separated by size, the terms “major” and “minor” are used. If not easily distinguished by size, Cuzzo *et al.* 2015a,b and in her later publications used the terms “type 1” and “type 2” in place of “narrow gap” and “broad gap” respectively. In addition to gap type, some workers can be distinguished by head capsule pigmentation (Cuzzo & Canello 2009; Cuzzo *et al.* 2015a,b; Cuzzo *et al.* 2017), setae and apical tooth size (Cuzzo 2016), or position of the molar tooth (Canello & Noirot 2003). In *Angularitermes coninasus*, the dimorphic workers can only be determined by size.

TABLE 4. Terms used to define polymorphic nasutitermitine workers having a gap differential between the third marginal tooth and molar prominence of the left mandible.

Species	Major worker morph 1	Major worker morph 2	Minor worker gap	Reference
<i>Agnathotermes glaber</i>	narrow gap	broad gap	none	Fontes 1987
<i>Araujotermes caissara</i>	narrow gap	broad gap	none	Fontes 1987
<i>Atlantitermes quarinim</i>	narrow gap	broad gap	none	Fontes 1987
<i>Atlantitermes spp.</i>	narrow gap	broad gap	none	Constantino & De Souza 1997
<i>Caetetermes fontesi</i>	none	broad gap	narrow gap	herein
<i>Caetetermes taquarussu</i>	type 1 (narrow)	type 2 (broad)	none	Cuzzo <i>et al.</i> 2015a
<i>Coendutermes tucum</i>	type 1 (narrow)	type 2 (broad)	none	Cuzzo 2016
<i>Constrictotermes cyphergaster</i>	narrow gap	broad gap	narrow gap	Fontes 1998
<i>Convexitermes manni</i>	narrow gap	broad gap	none	Fontes 1987
<i>Cortaritermes intermedius</i>	none	type 2 (broad)	type 1 (narrow)	Cuzzo <i>et al.</i> 2015b
<i>Diversitermes spp.</i>	Type I (narrow)	Type II (broad)	narrow gap	Oliveira & Constantino 2016
<i>Ereymatermes piquira</i>	narrow gap	broad gap	none	Canello & Cuzzo 2007
<i>Muelleritermes spp.</i>	narrow gap	none	narrow gap	Oliveira <i>et al.</i> 2015
<i>Obtusitermes formosulus</i>	none	narrow gap	broad gap	Cuzzo & Canello 2009
<i>Paraconvexitermes acangapua</i>	narrow gap	broad gap	none	Canello & Noirot 2003
<i>Sandsitermes robustus</i>	none	type 2 (broad)	type 1 (narrow)	Cuzzo <i>et al.</i> 2017
<i>Subulitermes microsoma</i>	narrow gap	broad gap	none	Fontes 1987

In the Neotropics, the termite diversity of French Guiana, with 104 described termite species, is fourth to Brazil at 369, Bolivia at 145, and Peru at 115 species (Constantino 2020, Scheffrahn 2019). The species count for the Neotropics, and elsewhere, will continue to grow as the termite community continues to define new taxa.

Acknowledgements

I thank Jan Křeček for collecting *Caetetermes fontesi* and Jan Šobotník for Fig. 5.

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