

GREATER ANTILLEAN NASUTITERMITINAE (ISOPTERA:  
TERMITIDAE): *CONstrictotermes GUANTANAMENSIS*, A  
NEW SUBTERRANEAN TERMITE FROM EASTERN CUBA

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ABSTRACT

The soldier and worker castes of *Constrictotermes guantanamensis* n. sp., are described. Known distribution of *C. guantanamensis* is confined to the arid extreme southeastern coastal zone of Cuba. This is the fourth described species of this endemic neotropical genus and the first island record.

Key Words: Nasute, soldier, worker, taxonomy, West Indies, Caribbean.

RESUMEN

Se describen las castas soldado y obrero de *Constrictotermes guantanamensis* n.sp. La distribución conocida de *C. guantanamensis* está restringida a la árida zona costera del extremo sureste de Cuba. Esta es la cuarta especie descrita de este género neotropical endémico y el primer registro isleño.

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The termite genus *Constrictotermes* Holmgren (1910) is one of 37 nasutitermitine genera found in the New World and, except for the pantropical *Nasutitermes* Dudley and the southern nearctic limits of *Tenuirostritermes* Holmgren, all remaining genera are restricted solely to the Neotropics (Pearce & Waite 1994, Constantino 1994, Roisin et al. 1996). Three species of *Constrictotermes*, all from mainland South America, are currently recognized (Silvestri 1903, Holmgren 1910, Araujo 1977). The descriptions of *C. cyphergaster* (Silvestri) and *C. cavifrons* (Holmgren) are based on the soldier and imago caste. Both occur in Bolivia and Brazil, while the former is also reported from Paraguay and the latter from Venezuela, Guyana, and Surinam (Araujo 1977, Fontes 1983). No soldiers have been described from the lone Ecuadorian species, *C. latinotus* (Holmgren).

Having originally reported the species as *Constrictotermes?* n. sp. (Scheffrahn et al., 1994), we now confirm the suspected generic status of this new Cuban termite, based primarily on the soldier head capsule shape and on worker mandible and digestive tube characters. We herein describe the soldier and worker caste of *C. guantanamensis* n. sp.

MATERIALS AND METHODS

Field-collected foraging groups composed of soldiers and workers were preserved in 75% aqueous ethanol. Two different colony samples of *C. guantanamensis* were col-

lected under stones in Loma de Macambo (20°09'N, 75°28'W) on 1-XII-1971 by Jorge de la Cruz (collection reference nos. C233 and C236), and one was collected from an epigeal nest on 24-V-1978 (no. C991) in Tortuguilla (19°58'N, 75°03'W) by J. Krčěk. Both sites are in Guantánamo Province, Cuba. The latter sample, containing many workers and soldiers, could not be used for descriptive work because alcohol had accidentally evaporated.

The holotype soldier from Loma de Macambo, labeled C236B, will be deposited in the termite collection of National Museum of Natural History in Washington, D.C. Paratype soldiers (from colony samples nos. C233, 11 soldiers, and C236, 9 soldiers) will be placed at the Institute of Systematics and Ecology of Cuban Academy of Sciences, Havana, in the Florida State Collection of Arthropods, Florida Dept. Agric. Cons. Serv., Division of Plant Industries, Gainesville, Florida, and at their respective institutions.

Measurements of specimens were made with a calibrated ocular micrometer and follow those defined by Sands (1965) and Roonwal (1970), except soldier maximum head height (Table 1). Terms used to describe soldier and worker morphology and color follow those of Sands (1965). Left mandible index of workers equals the distance between the apical and first marginal tooth divided by the distance between first and third marginals (Emerson 1960). Scanning electron micrographs of a soldier head and right worker mandible dehydrated by the method of Nation (1983) were made with a Hitachi S-4000 field emission microscope at 10kV.

The worker digestive tube was exposed by removal of the abdominal wall and fat tissue under a dissecting microscope. The digestive tube configuration of *C. guantanamensis* was drawn with the aid of a camera lucida at 50X and described using the terminology of Noirot & Noirot-Timothee (1969) and Kovoov (1969). The enteric valve was split longitudinally with a fine scalpel. Mandibles and the enteric valve were dehydrated and mounted in toto for microphotography. Although our description relies on older material, the cuticular pigmentation of the specimens appears to have remained essentially intact.

TABLE 1. MEASUREMENTS OF *CONSTRICOTERMES GUANTANAMENSIS* SOLDIERS.

| Measurements in mm (n=20)         | Range     | Mean±SD    | Holotype |
|-----------------------------------|-----------|------------|----------|
| Head length with nasus            | 1.52-1.61 | 1.56±0.026 | 1.55     |
| Head length without nasus         | 0.99-1.05 | 1.01±0.024 | 1.00     |
| Head width, maximum               | 0.88-0.96 | 0.92±0.021 | 0.93     |
| Forehead width, maximum           | 0.59-0.65 | 0.62±0.015 | 0.62     |
| Head width, minimum               | 0.53-0.59 | 0.58±0.017 | 0.55     |
| Nasus width at base               | 0.14-0.15 | 0.15±0.006 | 0.15     |
| Nasus width at middle             | 0.11-0.12 | 0.12±0.006 | 0.12     |
| Head height, maximum <sup>1</sup> | 0.68-0.71 | 0.69±0.009 | 0.70     |
| Pronotum width                    | 0.47-0.55 | 0.52±0.018 | 0.52     |
| Pronotum length, maximum          | 0.23-0.30 | 0.26±0.020 | 0.24     |
| Hind tibia length                 | 1.62-1.78 | 1.70±0.042 | 1.72     |
| Hind tibia width, maximum         | 0.08-0.09 | 0.08±0.005 | 0.08     |
| Total body length                 | 3.00-4.25 | 3.52±0.32  | 3.50     |

<sup>1</sup>Measured at constriction, postmentum included.

*CONRICTOTERMES GUANTANAMENSIS*, new species

**IMAGO.** Unknown.

**SOLDIER** (Figs. 1-2, Table 1). Apparently monomorphic. Head capsule brown; clypeus, labrum, postmentum, tip of mandibular point, and area adjacent to antennal socket pale brown. Antenna, palpi, mandible excluding tip, all sternites, and legs yellow-white. Nasus yellow brown apically, basally sepia brown. Pronotum brown anteriorly, remaining tergum pale brown.

Head conspicuously constricted near middle. Posterior lobe bulbous, abruptly raised behind constriction. In profile, nasus and posterior lobe raised above vertex of anterior lobe thereby forming concavity. Anterior lobe with inconspicuous but well-marked hunch behind antennal sockets. Nasus rather long, cylindrical, and weakly rugose on ventral base; raised about 35° above dorsal plane of head. Rear of head unusually high and relatively flat. Mandibles vestigial, but adorned with long points; tips of points turned outward very slightly. Posterior lobe of head with 2-3 pairs of setae; lateral pairs long (approximately a nasus middle diam), median setae shorter, usually in pair, sometimes singular or absent. Anterior lobe with seta above each antennal socket. Nasus usually with 1 (0-2) inconspicuous seta near middle.

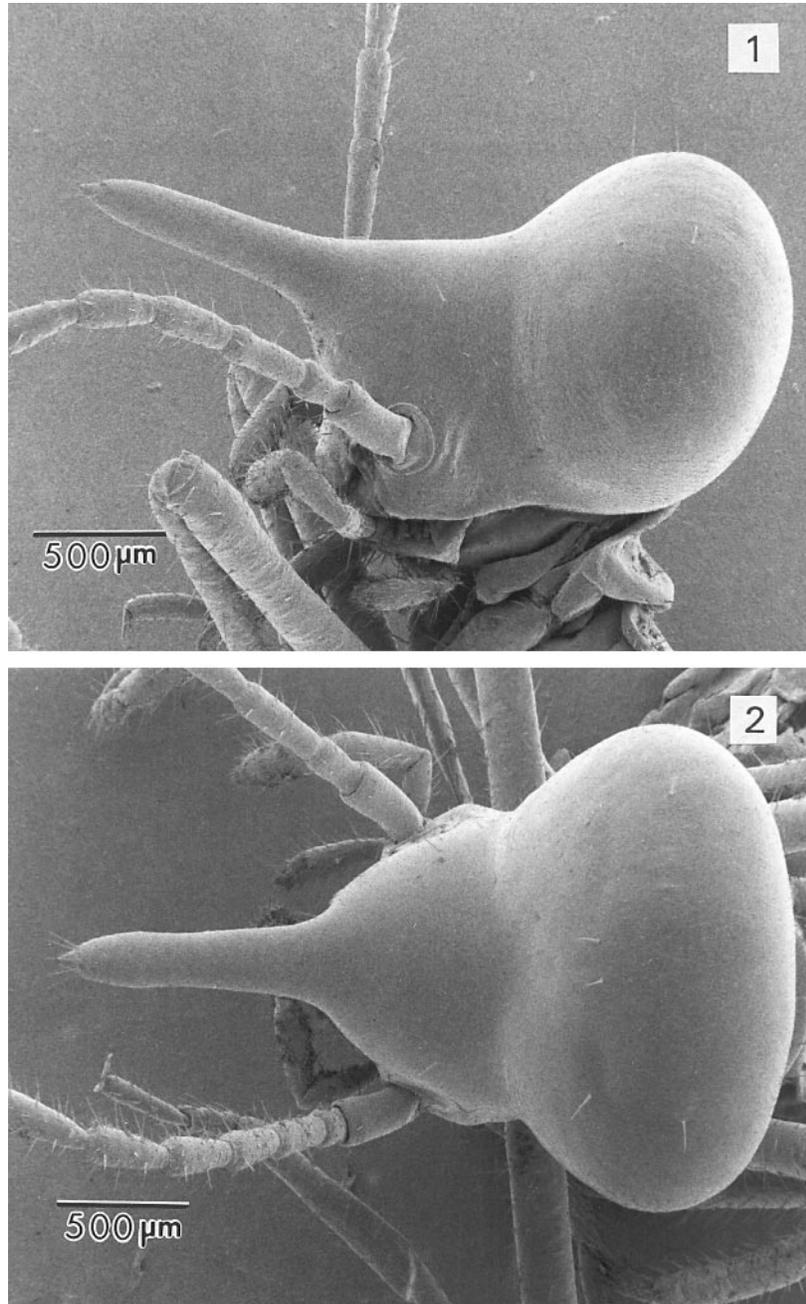
Antenna very long, with 14 articles; articles of subequal length (about 0.2 mm) except 2nd, penultimate and last which are shorter. Legs, including femora and tibiae, long; hind legs longest. Pronotum saddle-shaped with roundly raised unnotched anterior lobe; margin of anterior lobe with about 6-8 long setae. Posterior margins of all thoracic nota with several alternating short and long (2X) setae. Abdominal tergites with row of long setae near posterior margins of same length as those on thoracic nota, and accompanied in parallel by an additional row of shorter (about 2X) setae with sinuous course; glabrous anteriorly. Abdominal sternites with setae of medium length covering surface and several longer setae near posterior margins.

**Comparisons.** Head color of *C. guantanamensis* is primarily brown and its nasus cylindrical, while head color in *C. cavifrons* and *C. cyphergaster* is very dark sepia brown, and their nasi are conical. Most *C. guantanamensis* soldier measurements are smaller than *C. cavifrons* and *C. cyphergaster* (Silvestri 1903, Emerson 1925, Mathews 1977), namely head width, head height (no data for *C. cavifrons*), pronotum width and hind tibia length. Soldier antenna of *C. cavifrons* is 15-segmented (Holmgren 1910, Emerson 1925), compared with 14 segments in both *C. guantanamensis* and *C. cyphergaster* (Silvestri 1903, Mathews 1977).

Comparisons with *C. cavifrons* are based on Holmgren's (1910) and Emerson's (1925) descriptions and Constantino's (1991) figures. Comparisons with *C. cyphergaster* are based on soldiers and workers collected from arboreal nest in cerrado formation on X-1961 by Araujo in Brasília, D.F., Brazil (MZ-USP sample no. 0155).

**WORKER** (Figs. 3-5, Table 2). Apparently monomorphic. Head pigmentation mostly sepia brown anteriorly, grading to dark sepia brown posteriorly, with yellow-white cranial suture. Corners between antennal sockets and postclypeus, postmentum, postclypeus and adjacent frontal area very pale brown. Labrum, palpi, and antenna white or yellow-white, including median part of mandibles. Pronotum pale brown anteriorly, remaining dorsum yellow-brown, except pale brown posterior areas of abdominal tergites. Coxa and femur very pale brown; tarsal claws yellow-brown. Sternum white, yellow-white, or colorless.

Head with conspicuously inflated postclypeus, elevated at near right angle to frons. Postclypeus about twice as broad as long. Head slightly longer than broad, posteriorly broadly rounded and with Y-shaped spot, a conspicuous remnant of the cranial suture.



Figures 1-2. Scanning electron micrographs of lateral (1) and dorsal (2) views of *Constrictotermes guantanamensis* n. sp. soldier head.

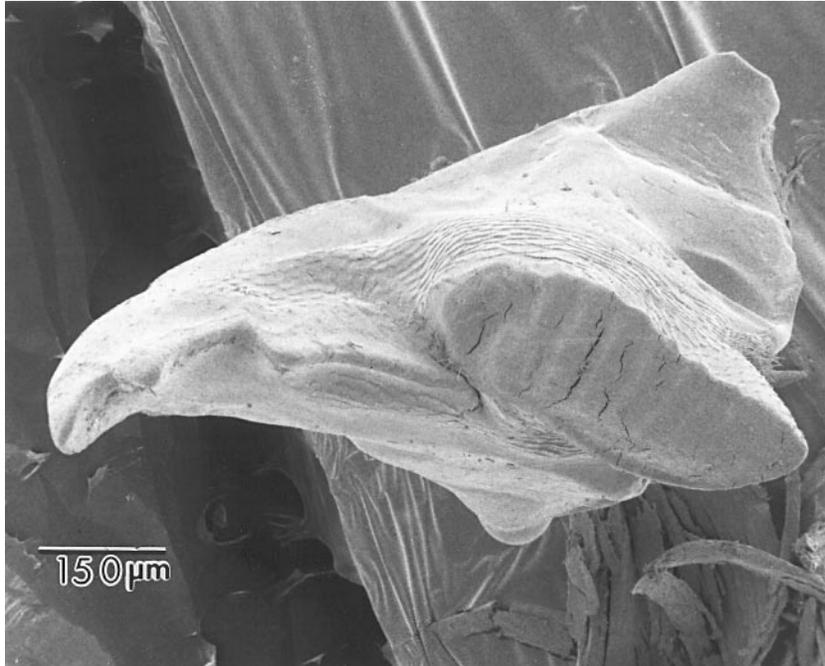


Figure 3. Scanning electron micrograph of *C. guantanamensis* right worker mandible from molar plate view.

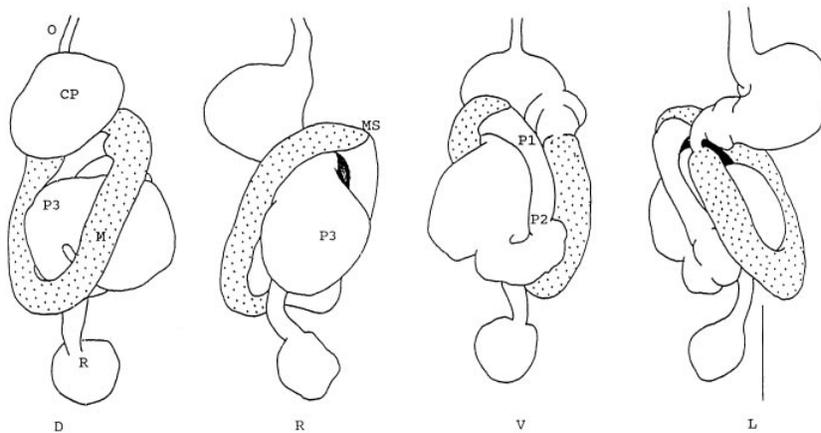


Figure 4. Dorsal (D), right (R), ventral (V), and left (L) configurations of the digestive tube *in situ* of *C. guantanamensis* worker. CP, crop; M, mesenteron (stippled) including mesenteric part of MS, mixed segment; O, oesophagus; P1, first proctodeal segment; P2, enteric valve; P3, paunch; R, rectum. Scale bar = 0.5 mm.

Antenna with 15 articles (n=3); all elongated and of subequal length, except the seventh to tenth somewhat longer. Pronotum shallowly saddle-shaped; anterior margin convex, with median line but lacking median notch. Femora and tibiae long. Abdomen voluminous, dorsally arched and laterally slightly flattened.

Head, including postclypeus, with about 8 longer setae and about 40-50 shorter setae. Pronotum with one row of longer setae on anterior margin and two rows along the posterior margin; meso- and metanotum with two posterior rows of setae only.

Mandibles of *Constrictotermes* type (Fig. 3). Apical and first marginal teeth of both mandibles short and deflected downward. Left mandible index 0.32-0.33 (n=3). Molar plates large, boat-like, and composed of about 10 ridges.

Digestive tube configuration (Fig. 4) with strikingly enlarged crop and moderately long mesenteron; mixed segment short (length 1.5X width of mesenteron); paunch large. Enteric valve armature composed of three weakly sclerotized swellings, each bearing 5-10 stout, sharply-pointed spines measuring about 8mm long by 7µm wide (Fig. 5).

**Comparisons.** Only large worker of *C. cyphergaster* (type species) was available for comparison. Cranial suture in *C. guantanamensis* reduced to a Y-shaped spot, while complete in large worker of *C. cyphergaster*. The latter condition is similar in the small worker of *C. cavifrons* (Emerson 1926). Frons and vertex around cranial suture bifurcation uneven in *C. cyphergaster*, while even in *C. guantanamensis*.

Pilosity of head including postclypeus is characterized by about 8 long setae in both species, but only in *C. guantanamensis* complemented by about 40-50 additional shorter setae. *C. cyphergaster* has about 10-15 more prominent setae on abdominal tergites, while *C. guantanamensis* has more than 50 setae of different lengths on ab-

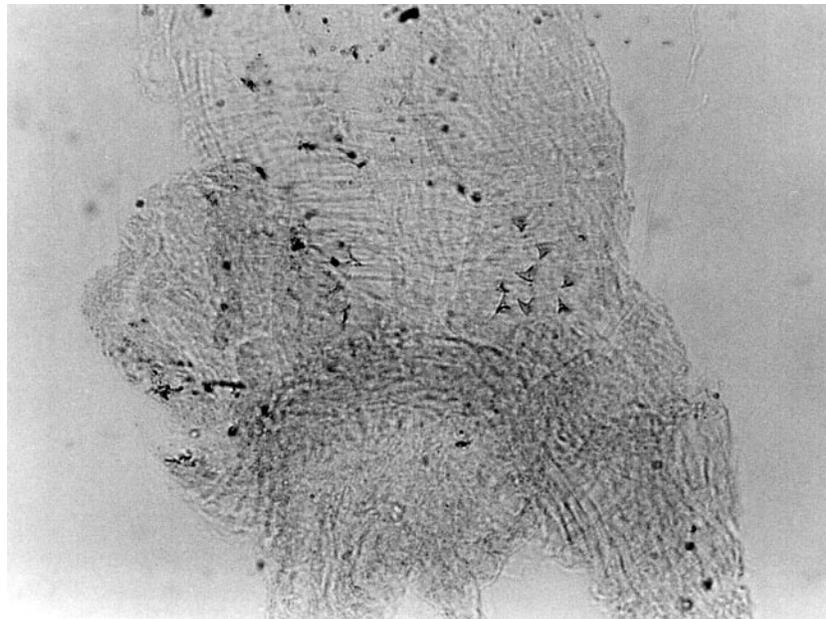


Figure 5. Section of enteric valve of *C. guantanamensis* worker showing one of three spine-bearing swellings.

TABLE 2. MEASUREMENTS OF *CONRICTOTERMES GUANTANAMENSIS* WORKERS.

| Measurements in mm (n=2)   | Range     | Mean |
|----------------------------|-----------|------|
| Head length to postclypeus | 0.70-0.71 | 0.71 |
| Head width, maximum        | 0.97-0.99 | 0.98 |
| Postclypeus width          | 0.50-0.52 | 0.51 |
| Postclypeus length         | 0.26-0.23 | 0.25 |
| Pronotum width             | 0.49-0.55 | 0.52 |
| Pronotum length, maximum   | 0.33-0.36 | 0.35 |
| Hind tibia length          | 1.51-1.53 | 1.52 |
| Hind tibia width, maximum  | 0.08-0.10 | 0.09 |
| Total body length          | 3.90-3.50 | 3.70 |

dominal tergites. Worker antennae of *C. cavifrons* 16-segmented, compared with 15 segments in both *C. guantanamensis* and *C. cyphergaster*.

**Etymology.** Derived from name of type locality.

#### DISCUSSION

The new species described here bears all of the following characteristics of the genus *Constrictotermes*: soldier external morphology habitus including typically constricted head capsule shape, worker mandibles with long molar areas and deflected apical teeth, enlarged crop, short mixed segment (length about 1.5X the width of mesenteron), armature of enteric valve consisting of 3 equal swellings with robust, pointed spines.

*Constrictotermes guantanamensis* is the second recently described species in the family Termitidae from Cuba with *Parvitermes subtilis* Scheffrahn and Krčec̆ek 1993. The latter occurs also on Hispaniola. The existence of *C. guantanamensis* on Cuba is especially remarkable, since we have recently shown (Roisin et al. 1996) that the Greater Antillean nasute fauna is more endemic than previously suggested.

*Constrictotermes guantanamensis* is apparently restricted to a xeric and rocky coastal habitat in extreme southeastern Cuba. The zone represents one of the most arid and warm ecotypes on the island and contrasts with the moister habitats of known congeners (Emerson 1925, Araujo 1970, Mathews 1977).

Observations regarding *C. guantanamensis* biology are limited. Only one epigeal nest of *C. guantanamensis* was observed by the first author. Both *C. cavifrons* and *C. cyphergaster*, in contrast, are arboreal nesters (Araujo 1970). Biology of *C. latinotus* is unknown (Holmgren 1910). The *C. guantanamensis* nest was constructed on rocky ground, and stood a little broader than high, about 0.5 m in horizontal diameter and rather pale grayish in color. Peripheral surface layers were not hardened or thickened. Excluding the ubiquitous *Nasutitermes*, *C. guantanamensis* is the only species in the Greater Antilles which constructs conspicuous nests.

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