First record of the termite, *Dentispicotermes cupiporanga* Bandeira & Cancello, 1992 (Isoptera, Termitidae, Termitinae) from Venezuela and new genus records from Bolivia and Paraguay

Solange Issa¹, Rudolf H. Scheffrahn²

¹ Departamento de Biología de Organismos. Universidad Simón Bolívar. Apdo. 1080 A. Caracas, Distrito Capital, Venezuela. ² Fort Lauderdale Research and Education Center, 3205 College Avenue, Fort Lauderdale, Florida, 33314, United States of America

Corresponding author: Rudolf H. Scheffrahn, rhsc@ufl.edu

Abstract

*Dentispicotermes* Emerson, 1950 comprises five species confined to the Neotropics. We report the presence of *D. cupiporanga* Bandeira & Cancello, 1992 in northern Venezuela and two undescribed congeners from Bolivia and Paraguay. This soil-feeding termite genus is rare and is characterized by a diagnostic enteric valve armature that we describe for the first time.

Keywords

Distribution, enteric valve armature, soldier, worker.

Introduction

The subfamily Termitinae is a polyphyletic group (Inward et al. 2007) of primarily tropicopolitan soil and wood feeding termites (Krishna et al. 2013). The genus *Dentispicotermes* Emerson, 1950 is an uncommon South American soil-feeding group. Five species are described including *D. brevicarinatus* (Emerson, 1950); *D. conjunctus* Araújo, 1969; *D. cupiporanga* Bandeira; Cancello, 1992; *D. globicepsalus* (Silvestri, 1901); and *D. pantanalis* Mathews, 1977. As in numerous Neotropical termite genera, the soldiers have snapping mandibles (Emerson 1950), which are among the fastest animal movements known (Seid et al. 2008). Soldiers of *D. cupiporanga* are easily distinguished from its congeners by its larger size combined with offset teeth on the inner margins of the mandibles. Until now, *D. cupiporanga* has only been reported from Brazil (Bandeira and Cancello 1992; Araújo et al. 2017).

Over the last decade, the enteric valve armature (EVA) of the worker caste, especially in soil-feeding species, has become a diagnostic, robust, and character-rich structure (Bourguignon et al. 2016). In fact, the description of soldierless termites is often dependent on the morphology of the EVA (Scheffrahn et al. 2017). Likewise, the EVA is useful for the identification of workers in species in which soldiers are rare or not often collected such as *Dentispicotermes*.

Herein, we report for the first time *Dentispicotermes* (as *D. cupiporanga*) from northwestern Venezuela and
describe the worker EVA. We also report the localities of undescribed congeners from Bolivia and Paraguay.

Methods

Termites were aspirated from soil underneath rocks and preserved in 85% ethanol. All samples are housed in the University of Florida Termite Collection (UFTC), Davie, Florida. A soldier of *Dentispicotermes cupiporanga* from Venezuela (UFTC no. VZ1065) was photographed as multi-layer montages using a Leica M205C stereomicroscope controlled by Leica Application Suite v. 3 (Fig. 1). The EVA of a *D. cupiporanga* worker (VZ912) was dissected and slide-mounted (Fig. 2A) following the procedure of Scheffrahn et al. (2017). The *Dentispicotermes* locality map was prepared using ArcMap v. 10.3 (ESRI 2015; Fig 3). Google Earth Pro® (Google LLC 2019) was used to estimate elevations.

Results

*Dentispicotermes cupiporanga* Bandeira & Cancelli, 1992

New records. VENEZUELA • 12 workers; Estado Fal-
cón, La Peña; 11.10959, −69.74886; 917 m a.s.l.; 28 May 2008; R. Scheffrahn; under rock; UFTC no. VZ912 • 15 workers; Estado Lara, El Porvenir semi-dry forest; 10.44095, −69.44018; 590 m a.s.l.; 28 May 2008; J. Chase; VZ1064 • 34 workers, one soldier; same collection data as for preceding; J. Mangold; VZ1065 • 40 workers, larvae; Estado Lara, Road south of Sanare; 9.81319, −69.62881; 1016 m a.s.l.; 29 May 2008; P. Ban; VZ1164.

Table 1 provides collection data of all known *Dentispicotermes* localities from both literature reports and new UFTC records with the exception of new *D. cupi-
poranga* records given above. All UFTC records were made available by Scheffrahn (2019).

Identification. All original descriptions of *Dentispico-
termes* soldiers are reliable with the exception of *D. glo-
biacephalus* (Silvestri 1901, Silvestri 1903). Bandeira
and Cancelli (1992) provide a detailed drawing of the *D. cupiporanga* soldier head while Mathews (1977) and Constantino (2002) provide good line drawings of the heads of soldiers of *D. pentanalis* and the *D. globicepha-
lus*, respectively.

Mathews (1977: pl. 27) was the first and only author to provide a figure of the EVA of a *Dentispicotermes* worker (*D. pentanalis*), although without description or comment. The resolution of Mathews’ (1977) photograp

Figure 1. Dorsal, lateral, oblique, and ventral aspects of the soldier of *Dentispicotermes cupiporanga* from Venezuela.
The positions of the three smaller cushions alternate between those of the three larger ones. A large tentacle-like outgrowth projects into the lumen of the paunch from the posterior of each of the larger cushions. These three projections are semielliptical in lateral view and each has two to three rows of inward-facing, longer conical spines resembling canine teeth. The EVAs of other Dentispicotermes spp. have a very similar gestalt to that of D. cupiporanga (RHS unpubl. observation). Workers of Dentispicotermes spp. have very globous abdomens (Fig. 2B).

As first noted by Araújo (1969), the yellowish anterior of the soldier abdomen is a distinguishing feature of the genus. This coloration is the result of defensive fluid stored in the labial gland and is released through the mouth (Fig. 2B). Immediately after immersion in ethanol, the fluid congeals into a rubbery mass.

Discussion

We report, for the first time, the occurrence of a Dentispicotermes (D. cupiporanga, Figs 1, 2A) in Venezuela from a semiarid forest biome of Falcón and northern Lara states. These new records extend the known range of D. cupiporanga by about 1,250 km northwest (Fig. 3). The Venezuela localities encompass the xeric Guajira and Venezuelan provinces within the Pacific dominion of Morrone (2017), while the nearest previously known D. cupiporanga locality (Fig. 3) is within the hydric Boreal Brazilian dominion. We also report two undescribed Dentispicotermes species from Paraguay (Figs 2B, 3), one being the southernmost record, and at least one species from Bolivia (Fig. 3). The latter localities constitute semiarid forests of the humid Chaco. The distribution of the genus Dentispicotermes is expansive (Fig. 3),
Table 1. Literature and UFTC localities for *Dentispicotermes*.

<table>
<thead>
<tr>
<th>Species</th>
<th>Country</th>
<th>Locality</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Elev. (m)</th>
<th>Ref. or UFTC no.</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>D. brevicarinatus</em></td>
<td>British Guiana</td>
<td>Orono River</td>
<td>2.71</td>
<td>−57.416</td>
<td>213</td>
<td>Emerson 1950</td>
</tr>
<tr>
<td></td>
<td>British Guiana</td>
<td>Itabu Creek</td>
<td>1.700</td>
<td>−57.916</td>
<td>610</td>
<td>Emerson 1950</td>
</tr>
<tr>
<td><em>D. brevicarinatus</em></td>
<td>French Guiana</td>
<td>St. Eugène</td>
<td>4.983</td>
<td>−53.13</td>
<td>83</td>
<td>Davies et al. 2003</td>
</tr>
<tr>
<td><em>D. conjunctus</em></td>
<td>Brazil</td>
<td>Minas Gerais; Poços de Caldas</td>
<td>−21.838</td>
<td>−46.565</td>
<td>1264</td>
<td>Araujo, 1969</td>
</tr>
<tr>
<td><em>D. cupiporanga</em></td>
<td>Brazil</td>
<td>Roraima; Ilha de Maracá</td>
<td>3.42</td>
<td>−61.67</td>
<td>175</td>
<td>Bandeira and Cancelli 1992</td>
</tr>
<tr>
<td><em>D. globicephalus</em></td>
<td>Brazil</td>
<td>Mato Grosso: Guaiabá</td>
<td>−15.6</td>
<td>−56.1</td>
<td>164</td>
<td>Silvestri 1901</td>
</tr>
<tr>
<td><em>D. pantanalis</em></td>
<td>Brazil</td>
<td>Mato Grosso: Xavantina</td>
<td>−14.75</td>
<td>−52.36</td>
<td>349</td>
<td>Mathews 1977</td>
</tr>
<tr>
<td><em>D. conjunctus</em></td>
<td>Brazil</td>
<td>Paraíba; Areia</td>
<td>−6.967</td>
<td>−35.733</td>
<td>614</td>
<td>Moura 2012</td>
</tr>
<tr>
<td><em>D. globicephalus</em></td>
<td>Brazil</td>
<td>Pemambuco; Pesqueria</td>
<td>−8.317</td>
<td>−36.683</td>
<td>931</td>
<td>Moura 2012</td>
</tr>
<tr>
<td><em>D. globicephalus</em></td>
<td>Brazil</td>
<td>Pemambuco; Floresta</td>
<td>−8.650</td>
<td>−38.017</td>
<td>918</td>
<td>Moura 2012</td>
</tr>
<tr>
<td><em>D. globicephalus</em></td>
<td>Brazil</td>
<td>Ceará; Barbalho</td>
<td>−7.367</td>
<td>−39.317</td>
<td>784</td>
<td>Moura 2012</td>
</tr>
<tr>
<td><em>D. conjunctus</em></td>
<td>Brazil</td>
<td>Bahia; Elissio Meldrado</td>
<td>−12.867</td>
<td>−42.88</td>
<td>702</td>
<td>Araújo et al. 2017</td>
</tr>
<tr>
<td><em>D. sp.</em></td>
<td>Brazil</td>
<td>Mato Grosso; Cotriguaçu</td>
<td>−9.821</td>
<td>−58.296</td>
<td>258</td>
<td>de Paula 2016</td>
</tr>
<tr>
<td><em>D. cupiporanga</em></td>
<td>Brazil</td>
<td>Minas Gerais; Viaju</td>
<td>−20.75</td>
<td>−42.88</td>
<td>702</td>
<td>Araújo et al. 2017</td>
</tr>
<tr>
<td><em>D. globicephalus</em></td>
<td>Brazil</td>
<td>Mato Grosso; Cáceres</td>
<td>−16.02</td>
<td>−57.72</td>
<td>122</td>
<td>Plaza and Galbiati 2017</td>
</tr>
<tr>
<td><em>D. conjunctus</em></td>
<td>Brazil</td>
<td>Paraíba; Mata do Buraquinho</td>
<td>−7.444</td>
<td>−34.86</td>
<td>44</td>
<td>Ernesto et al. 2014</td>
</tr>
<tr>
<td><em>D. sp. nov. 2</em></td>
<td>Bolivia</td>
<td>Chochis</td>
<td>−18.107</td>
<td>−60.087</td>
<td>510</td>
<td>BO816</td>
</tr>
<tr>
<td><em>D. sp.</em></td>
<td>Bolivia</td>
<td>Chochis</td>
<td>−18.107</td>
<td>−60.087</td>
<td>510</td>
<td>BO817</td>
</tr>
<tr>
<td><em>D. brevicarinatus</em></td>
<td>French Guiana</td>
<td>Saut Mouche</td>
<td>5.068</td>
<td>−33.059</td>
<td>51</td>
<td>FG740</td>
</tr>
<tr>
<td><em>D. sp.</em></td>
<td>Paraguay</td>
<td>Yby Yai</td>
<td>−22.708</td>
<td>−56.288</td>
<td>216</td>
<td>PA312</td>
</tr>
<tr>
<td><em>D. sp. nov. 1</em></td>
<td>Paraguay</td>
<td>Private forest reserve</td>
<td>−23.050</td>
<td>−56.728</td>
<td>151</td>
<td>PA573</td>
</tr>
<tr>
<td><em>D. sp. nov. 2</em></td>
<td>Paraguay</td>
<td>N. Villa Florida</td>
<td>−26.310</td>
<td>−57.155</td>
<td>158</td>
<td>PA1999</td>
</tr>
</tbody>
</table>

Figure 3. Locality map of *Dentispicotermes* spp. from the literature (lit.) and University of Florida Termite Collection (UFTC) taken from Table 1.
ranging from the rainforests of French Guiana with over 3 m of annual rainfall (*D. brevicarinatus*) to semi-arid landscape at the northern Venezuela, the humid Chaco and the Brazilian Atlantic Forest with 300–1000 mm annual rainfall (Huber and Oliveira 2010). This implies that the genus is adapted to relatively wide ranges of precipitation and temperature. The genus is found at elevations from near sea level to over 1000 m (Table 1). *Dentispicotermes* is a rare genus. Of the 2,633 UFTC colony samples of termitines from South America, only 10 are species of *Dentispicotermes*.

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**Authors’ Contributions**

RHS collected the specimen and produced the figures. SI arranged the expedition, accompanied RHS and other collectors in Venezuela, and acquired collecting permits. RHS and SI wrote the manuscript.

**References**


