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## *RHYNCHOTERMES GUARANY*, NEW SPECIES AND *RHYNCHOTERMES PIAUY*, NEW SPECIES (ISOPTERA, TERMITIDAE, NASUTITERMITINAE) FROM BRAZIL

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### ABSTRACT

*In this paper are described Rhynchotermes guarany, new species and Rhynchotermes piauy, new species. The first one came from Alto Paraíso de Goiás, in the State of Goiás, covered by "campo rupestre" vegetation and the second one from Corrente, in the State of Piauí, an enclave of "cerrado" in the "caatinga" dominium. Drawings of the soldier's head, and mandibles, coxae, and worker's mandibles for each new species are presented.*

Keywords: Termite, Isoptera, Termitidae, Nasutitermitinae, *Rhynchotermes*, Taxonomy.

### INTRODUCTION

This paper is the first one of a series on Isoptera new *taxa* descriptions based on the material collected during the project carried out in some localities of central and northeastern Brazil along 1990-1992 (Proc. FAPESP nr.90/2775-6). Preliminary results were presented in the XII International Congress of IUSSI (International Union for the Study of Social Insects), in Paris (Cancello, 1994).

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*Rhynchotermes* is one of the thirteen genera of the neotropical group with mandibulate soldiers of Nasutitermitinae. The genus was described as a subgenus of *Armitermes* by Holmgren (1912), with *Armitermes nasutissimus* Silvestri as the type-species, by monotypy. It was raised to genus by Snyder (1949).

Four species have been recognized to this date: *Rhynchotermes perarmatus* (Snyder, 1925), *Rhynchotermes nasutissimus* (Silvestri, 1901), *Rhynchotermes nyctobius* Mathews, 1977, and *Rhynchotermes diphyes* Mathews, 1977. *R. perarmatus* is different from all other species of the genus in such an extent that it will not be mentioned in the comparisons between the new species and those formerly described.

Fontes (1985) provided a key based on the soldier caste to identify the species of this genus.

There is scarce information in the literature on the bionomics of this genus. Silvestri (1903) gives a short description of the subterranean nest of *R. nasutissimus*. *R. perarmatus* occurs in rain forest and feeds on soft, decayed wood (Snyder, 1925 and Roisin, 1992). Koor (1969) described the digestive tube of *R. nasutissimus*. Later, Fontes (1987a) studied the mandibles and redescribed the digestive tube of *R. nasutissimus*. The development of non-reproductive castes of *R. perarmatus* was studied by Roisin (*op.cit.*). Mathews (1977) stated that the two species described by him and also *R. nasutissimus* are probably "... litter feeders, foraging on the ground surface that they reach by means of subterranean galleries - down which they quickly disappear when disturbed". This author stated still that these species were never found in mounds of other species. I have some different information about this matter (see below).

In the MZUSP Collection there is a number of *Rhynchotermes* samples collected in Brazil. Some of them were determined as *R. nasutissimus* and *R. diphyes*, collected in abandoned nests (the constructor species of these nests remain unknown). There is also a *R. nyctobius* sample, collected within the cover of leaves and parts of the bulb of a banana tree. This place formerly housed a swarming of *Azteca* sp. (Formicidae). Other samples were collected in *Syntermes wheeleri* and *Syntermes nanus* nests.

The samples of *Syntermes* mentioned above were identified by Reginaldo Constantino (Constantino, 1995).

Other samples have the following associated notes: on the ground, underground, on palm leaves, on grass, under cattle dung, under log, in *Cornitermes* sp. nest, along with other species.

## MATERIAL AND METHODS

The morphometric characters used here are: 1. length of head (LH); 2. length of nasus (LN); 3. width of head (WH); 4. length of pronotum (LP); 5. width of pronotum (WP); 6. length of hind tibia (LT). Some measurements are self-explanatory and some of them were taken as following: 1. length of head (LH) and 2. length of nasus (LN) both as in Mathews (1977: p. 76, fig. 15 LI and N, respectively); 3. WH: focusing the contour of the head and mandibles.

All measurements are presented in millimeters (mm), along with the range (min.-max.).

The terms "bristles" and "hairs" are used as in Emerson (1925). "Short hairs" are those visible at 12 magnifications and "microscopic hairs" are those visible at 60 magnifications.

The terminology adopted for the parts of the worker mandibles follows Fontes (1987b).

The material studied is housed in the Museu de Zoologia da Universidade de São Paulo (MZUSP).

## RESULTS

**Rhynchotermes guarany, sp. n.**

(figs.1 - 6)

*Etymology:* *guarany*- from the name of a native South-American nation of the Tupi-Guarani linguistic group that formerly occupied a territory ranging from the lower counterforts of the Andes mountain chain, across the Paraguay river basin, to the Atlantic Ocean coast, and from the high Parana river basin to the Plata river basin and the Argentine Chaco.

*Imago:* unknown

*Soldier:* excepting nasus, the shape of cephalic capsule appears roundish; very long nasus, tapering towards apex; in profile, forming a variable angle with the dorsal contour of head capsule; distal extremity of nasus very slightly downward oriented in few individuals only. Mandibles long and strongly curved inward with a sharp apical portion, finely serrate in its inner margin, each one with a truncated tooth (left one longer than right) on the proximal third. When closed, the left mandible superimposes the right one along its length. Labrum very small, pyriform, partially hidden beneath the postclypeous, not visible when mandibles are closed. Antennae longer than head, with 14 articles, 2nd subequal to 4th, both

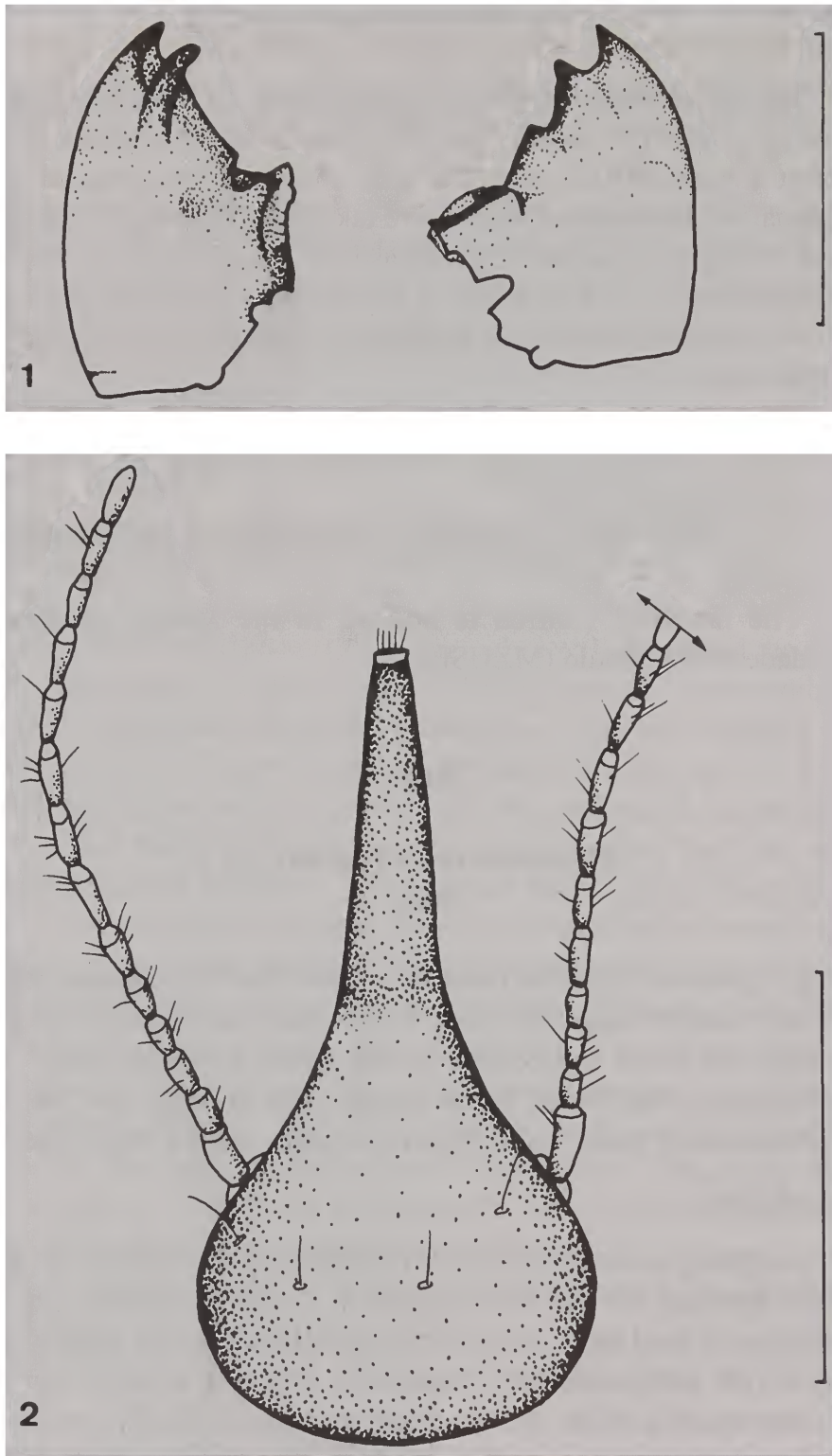


Plate 1. *Rhynchotermes guarany*, sp. n.: 1. workers' mandibles, dorsal view. Scale: 0.5 mm; 2. soldiers' head, dorsal view. Scale: 1 mm.

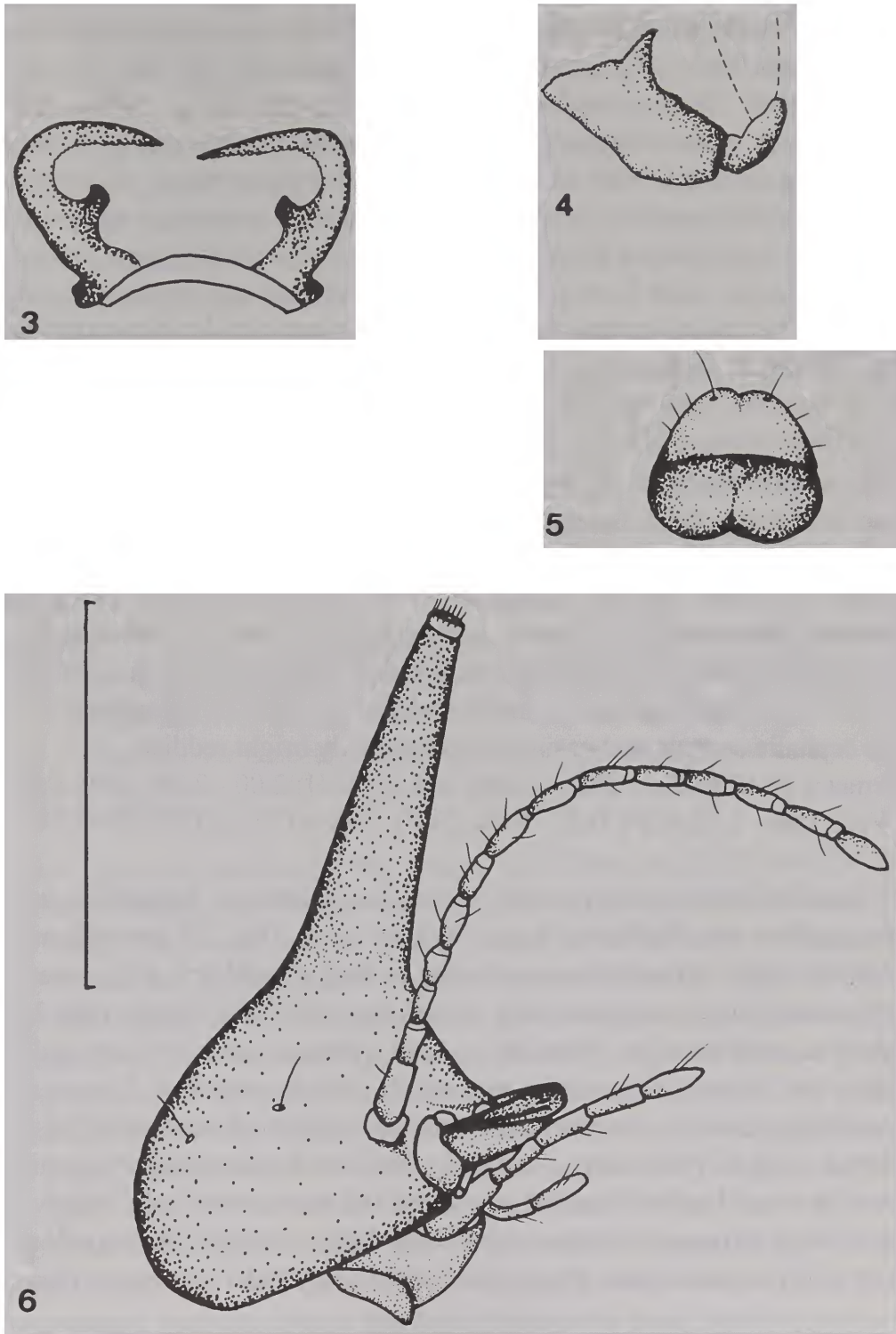


Plate 2. *Rhynchotermes guarany*, sp. n.: 3. soldiers' mandibles; 4. soldiers' forecoxa; 5. soldiers' pronotum; 6. soldier's head, in profile. Scale: 1 mm.

smaller than 3rd; 5th and 6th subequal to 3rd; from 7th to 14th, slightly larger than 3rd and subequal amongst them. Short postmentum, somewhat quadrangular and elevated in profile (fig. 6). Anterior margin of pronotum emarginate, posterior slightly emarginate. Forecoxa with a conical process, somewhat curved in some individuals, always presenting microsculpture. Only few bristles (4 or 6) on head, plus scattered microscopic hairs on the head surface; none on nasus, which bears some hairs around its aperture. Labrum with 4 to 6 bristles on anterior margin and 2 on the surface near the apex. Pronotum with 4 bristles on upper margin, none on its surface and some short hairs on margins; mesonotum and metanotum with few bristles on their posterior margin. Abdominal tergites with 4 to 6 erect bristles on posterior margin, plus short hairs and microscopic hairs backward orientated. Abdominal sternites with bristles on posterior margins, perpendicular to body surface and many hairs on surface, backward orientated. Tibiae with some bristles and spines on inner margins, not organized in a row. Tibiae spurs formula: 2:2:2.. Antennae with many hairs. Orange head, darker ferruginous orange colored at rear part. Distal half part of nasus paler than head. Base of mandibles ferruginous yellow colored; blades and teeth chestnut brown colored, somewhat darker at tips. Pronotum paler than head, mesonotum, metanotum and abdominal tergites yellow. Legs pale yellow. Antennae with its first three articles pale yellow colored, the others orange. After fixation, the individuals lose some of its coloration; when alive, the cephalic capsule and nasus are noteworthy bright reddish.

Measurements of 10 soldiers from a single colony: (LH): 2.00 - 2.08; (LN): 0.98 - 1.10; (WH): 1.04 - 1.12; (LP): 0.37 - 0.40; (WP): 0.43 - 0.51; (LT): 1.08 - 1.14.

*Worker*: rounded head, arched postclypeous. Large labrum. Mandibles as in fig. 1; molar plate very similar to that of *R. piauy* sp. n. (fig. 12) but with more well-marked ridges. Pronotum very similar to that of soldier's with anterior margin not emarginate. Antennae with 14 articles, 3rd slightly larger than 2nd; 5th slightly smaller than 4th; from 6th to 14th, subequal each to other and all larger than 3rd. Forecoxa process very small, slightly rounded. Some erect bristles on head plus some short hairs. Abdominal tergites with some erect bristles on posterior margin, plus many short hairs backward orientated. Abdominal sternites with some bristles forward orientated and many short hairs backward orientated. Head ferruginous yellow, mandibles darker, chestnut brown colored. Antennae: first proximal seven articles pale yellow, last distal seven ones darker.

*Type material*: holotype: soldier, part of lot nr 10089 (MZUSP), kept separately and labeled: "Brasil, Goiás, Alto Paraíso de Goiás, 5/vii/1991, C. R. F. Brandão,

*Comparisons:* The major soldier of *Rhynchotermes diphyes* has a wider head and a wider nasus than those of *Rhynchotermes guarany*, sp. n., and also a different shape of head and nasus (Mathews, 1977: p.156, fig.103). The minor soldier of *R. diphyes* is much smaller and has a different shape of head. *R. nyctobius* has a much longer and thinner nasus, downward oriented. *R. nasutissimus* has a longer and thinner nasus forming an almost straight line with the dorsal profile of rear part of head capsule (in any case, a much less marked angle than in *R. guarany*, sp. n.). The mandibles of *R. guarany*, sp. n. are much more strongly curved inward than those of all other species of the genus.

*Comments:* The material was collected in a “campo rupestre” vegetation, under a stone, among many roots.

### ***Rhynchotermes piauy*, sp. n.**

(figs.7 - 13)

*Etimology:* “Piauy” - from Tupi, meaning “Piau river”. The “piaus” (Tupi: *py-yáú*) are freshwater fishes of the genus *Leporinus* (Anostomidae) living in most Brazilian river basins. “Piauí”, with the same etimology is the name of a Brazilian northeastern state, where the type material was collected.

*Imago:* unknown

*Soldier:* pear-shaped head; long nasus, wide base, tapering towards apex; in profile, forming a continuous line with the rear part of head. Mandibles long and strongly curved inward with sharp apical portion, finely serrated, each one with a truncated tooth (approximately of the same size) on the proximal third of the inner margin. When closed, the left mandible superimposes the right along its length. Labrum very small, pyriform, hidden beneath postmentum and closed mandibles. Anterior margin of pronotum slightly emarginate or not emarginate. Antennae longer than head, with 14 articles, 2nd subequal to 3rd, 4th, smallest; 5th slightly longer than 4th and smaller than 2nd and 3rd; from 6th to 14th, subequal amongst them and larger than those others. Postmentum short, somewhat quadrangular and appearing somewhat raised in profile (fig. 9). Forecoxa process variable in shape: truncated, conical or as in fig 7, always presenting a microsculpture. Six erect bristles on head; none on nasus, which bears some hairs around the aperture. Labrum with six bristles; four bristles and some short hairs on anterior margin of pronotum; rear margin of pronotum with some short hairs. Abdominal tergites with 4 to 6 erect bristles on its posterior margins plus few short hairs and microscopic ones; many short hairs backward

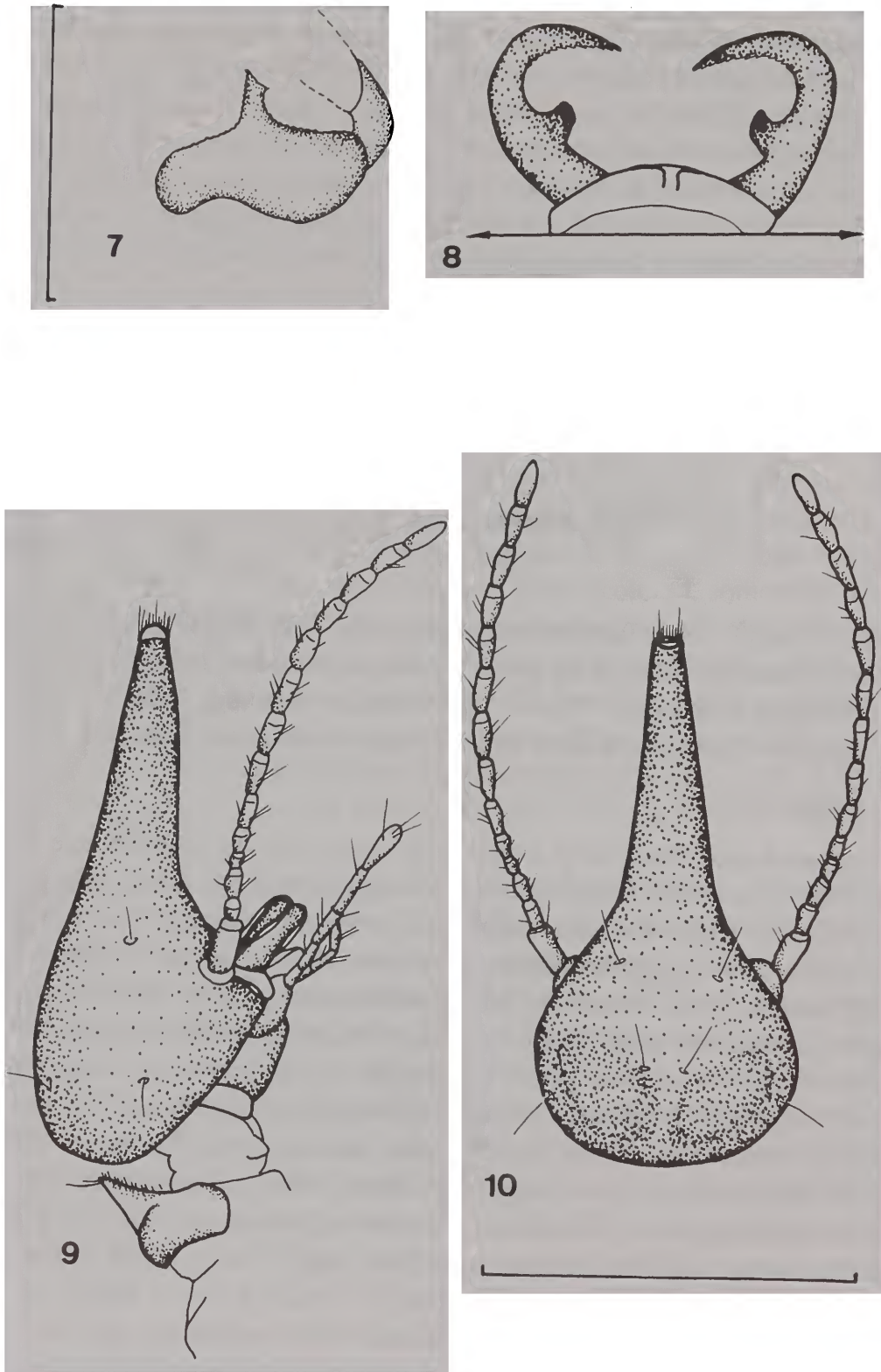


Plate 3. *Rhynchotermes piauy*, sp. n.: 7. soldier's forecoxa; 8. soldier's mandibles. Scale: 0.5 mm. 9. Soldier's head, in profile; 10. soldier's head, dorsal view. Scale: 1mm.



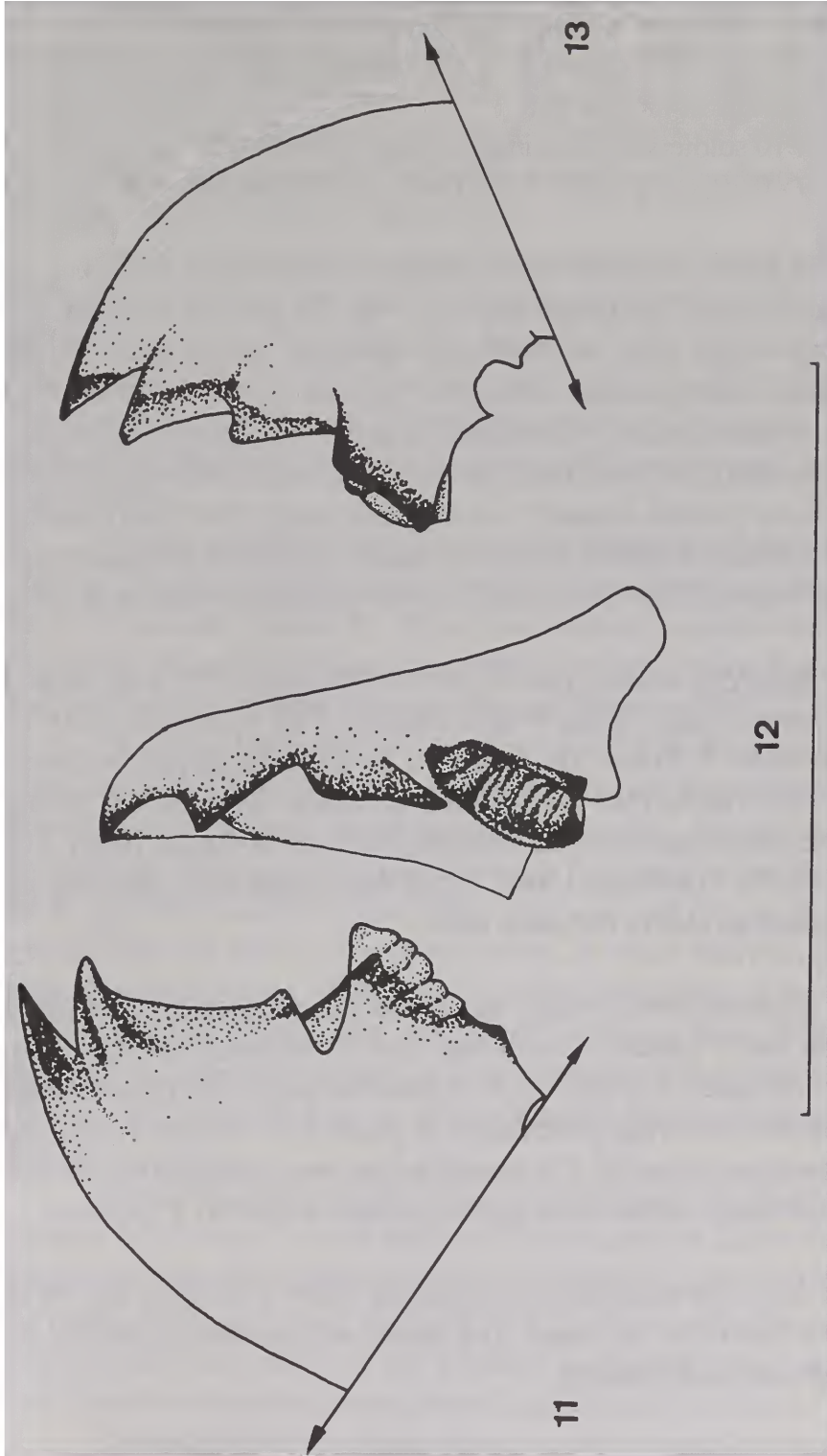


Plate 4. *Rhynchotermes piauui*, sp. n., worker's mandibles: 11. left mandible, dorsal view; 12. right mandible, dorsal view; 13. right mandible, dorsal view. Scale: 0.5 mm.

orientated on the last three tergites. Abdominal sternites with some erect bristles on posterior margin and many short hairs backward orientated on the surface. Forecoxa process with one or two bristles. Tibiae spurs formula: 2:2:2. Coloration almost the same as that of *R. guarany*, sp. n.; some soldiers with head entirely yellow, slightly darker in its rear part.

Measurements of 10 soldiers from a single colony: (LH): 1.43 - 1.55; (LN): 0.69 - 0.82; (WH): 0.69 - 0.80; (LP): 0.26 - 0.35; (WP): 0.35 - 0.40; (LT): 0.73 - 0.84.

*Worker*: rounded head; pronotum as in soldier; mandibles as in figs. 11 - 13. Antennae 14 - articulate, 2nd longer than 3rd; 4th, 5th and 6th subequal to 3rd; 7th to 14 slightly longer than the others and subequal among them. Forecoxa process very small and roundish. Some erect bristles on head plus short hairs, more numerous than in soldier. Abdominal tergites with some erect bristles on posterior margins and short hairs on its surface, backward oriented. Abdominal sternites with some bristles forward oriented and many short hairs backward oriented. Yellow head, mandibles somewhat darker with teeth and molar regions chestnut brown colored. The rest of body is whitish (clearer than pale yellow).

*Type material*: holotype: soldier, part of lot nr 10090 (MZUSP), kept separately and labeled: "Brasil, Piauí, 10 km N de Corrente - Faz. Maracujá, 26/ix/1991, E. M. Canello & M. T. Ponte col. field nr. 120 QL". Paratypes: soldiers and workers of lot nr. 10090 (MZUSP), with the same label of the holotype. Paratypes: soldiers and workers of the following MZUSP samples: 10091, 10092, 10093, 10094, 10095, 10096 and 10097. All of them collected in the same place, by the same collectors and in the same date.

*Comparisons*: *Rhynchotermes piauy*, sp. n. has the smallest soldier hereunto described in the entire genus. *R. nyctobius* and *R. nasutissimus* have a much longer and thinner nasus. *R. piauy*, sp. n. is more similar to the minor soldier of *R. diphyes*, with the following differences: *R. piauy* has a shorter nasus, whose profile is not downward oriented. The mandibles are more strongly curved inward and have fine serrations in the inner apical portion, absent in *R. diphyes*.

*Comments*: the holotype material was collected under a wooden log, in black agglomerates of thin roots and sand. The other samples were collected in the litter, under logs and underground.

## DISCUSSION

*Rhynchotermes perarmatus* was collected in rain forest. *R. nasutissimus*, *R. nyctobius* and *R. diphyes*, in “cerradão”, “cerrado”, and other open formations. This genus was never collected northernmost of the State of Minas Gerais. *R. piauy* sp. n. was collected 10 km north of Corrente, PI (Fazenda Maracujá), a locality covered by “cerrado - cerradão”, that seems to be an enclave of “cerrado” in the “caatinga” dominium.

According to information summarized on introduction, there are some samples of *R. nasutissimus* and *R. diphyes* collected in other specie's nest, abandoned or not by the constructor species. These data are opposite to the Mathews' statement that these species were never found in mound of other species. Actually, concerning the species' nests of this genus we only have certainty about the *R. nasutissimus*, whose subterranean nest was described by Silvestri (1903).

*Rhynchotermes* is a poorly represented genus in Brazilian institutional collections. This fact is probably due to the nocturnal and/ or under litter foraging habits of its species, except for *Rhynchotermes perarmatus* (Mathews, 1977). Few samples, and some others with a little number of individuals, do not allow the elaboration of a reliable intraspecific variation analysis.

Silvestri (1901 and 1903) and Snyder (1925) do not refer to character variation. Mathews (*op.cit.*) make some remarks on the variation observed in *R. nasutissimus* in respect to Silvestri's (1903) data, but does not make any commentary on other important characters, as for example, the forecoxa process. On the *R. nyctobius* samples collected by Mathews and deposited in the MZUSP I observed that the forecoxa process varies in some individuals in a greater measure than that he has registered. In some individuals it is almost conical, with a not very sharpened point and a much narrower base. In *R. piauy*, sp. n., the forecoxa process varies largely, from conical to truncated shape, but it is possible to verify that its base is always broader than the forecoxa processes' base of *R. nyctobius*.

I observed a microsculpture on forecoxa process, which offers a rough appearance. Moreover, I could observe the presence of that microsculpture in all samples of this genus deposited in the collection of the MZUSP. Unless the use of some other and more sophisticated techniques (as Scanning Electron Microscopy, for instance), it is not possible to suggest some meaning for this microsculpture or even determine its real significance or nature.

Comparing the *R. piauy*, sp. n., worker mandibles with the figures presented by Fontes (1987a: 322 - 327) on *R. nasutissimus*, it is possible to verify the same pattern: long, broad sharpened margins, appropriate for vegetal

fibers cutting, concave molar regions with moderately developed ridges. *R. guarany*, sp. n., (fig. 1) also presents the same mandibular pattern, but the ridges on the molar plate are more marked.

Fontes (1987a) affirms that *Cornitermes*, *Rhynchotermes*, *Syntermes*, *Constrictotermes*, *Tenuirostritermes*, *Velocitermes* and *Diversitermes* have the same mandibular pattern.

I agree with Fontes' statement (*op. cit.*) that the *Rhynchotermes* soldier, with its piercing mandibles and long nasus, is an example indicating that it cannot be fully assured that in Nasutitermitinae soldiers evolution, a mandibular regression along with nasus longing had been carried out, as formerly stated in literature.

Miller (1986) is the sole and more recent publication that deals on Nasutitermitinae phylogeny. Leaving in account that such paper includes only part of the subfamily genera and a little number of characters, I see as early maturing to make considerations about the phylogenetical relationships of *Rhynchotermes*.

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#### REFERENCES

- Canello, E.M. 1994. Termites of Northeastern Brazilian formations, p.277. In: A. Lenoir, G. Arnold & M. Lepage (eds). *Les insectes sociaux*. Villetaneuse, Université Paris Nord. xxiv + 583 p.
- Constantino, R. 1995. Revision of the neotropical termite genus *Syntermes* Holmgren (Isoptera: Termitidae). *Univ. Kansas Sci. Bull.*, 55 (13): 455-518.
- Emerson, A.E. 1925. The termites of Kartabo, Bartica District, British Guiana., *Zoologica*, 6: 291-459.
- Fontes, L.R. 1985. New genera and new species of Nasutitermitinae from the Neotropical Region (Isoptera, Termitidae). *Revta bras. Zool.*, 3(1): 7-25.
- Fontes, L.R. 1987a. *Cupins neotropicais da subfamília Nasutitermitinae (Isoptera, Termitidae): morfologia do soldado e das mandíbulas do alado e operário, anatomia do tubo digestivo do operário e filogenia dos gêneros*. Tese de doutoramento, Instituto de Biociências, Universidade de São Paulo, São Paulo, viii+141p (não publicada).
- Fontes, L.R. 1987b. Morphology of the alate and worker mandibles of the soil-feeding nasute termites (Isoptera, Termitidae, Nasutitermitinae) from the Neotropical Region. *Revta bras. Zool.*, 3:503-531

- Holmgren, N. 1912. Termitenstudien. 3. Systematik der Termiten. Die Familie Metatermitidae. *Kongl. Svensk. Vet. Akad. Handl.*, 48(4): 1-166.
- Kovoor, J. 1969. Anatomie comparée du tube digestif des termites. II. Sous-famille des Nasutitermitinae. *Ins. Soc.*, 16(3): 195-234.
- Mathews, A.G.A. 1977. *Studies on termites from the Mato Grosso State, Brazil*. Rio de Janeiro, Academia Brasileira de Ciências. 267p.
- Miller, L. R., 1986. The phylogeny of the Nasutitermitinae (Isoptera, Termitidae). *Sociobiology* 11(3): 203-214.
- Roisin, Y. 1992. Development of non-reproductive castes in the neotropical termite genera *Cornitermes*, *Embiratermes* and *Rhynchotermes* (Isoptera, Nasutitermitinae). *Ins. Soc.*, 39: 313-324
- Silvestri, F. 1901. Nota preliminare sui Termitidi sud-americani. *Boll. Mus. Zool. Anat. Comp. R. Univ. Torino*, 26 (389): 1-8
- Silvestri, F. 1903. Contribuizione alla conoscenza dei Termiti e Termitofili dell'America meridionale. *Redia*, 1: 1- 34
- Snyder, T.E. 1925. New termites and hitherto unknown castes from the Canal Zone, Panama. *J. Agric. Res.*, 29 (4): 179-193.
- Snyder, T.E. 1949. Catalog of the termites (Isoptera) of the world. *Smiths. Misc. Coll.*, 112: 1-490.





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