

A new species of the fungus-farming ant genus *Mycetagroicus* Brandão & Mayhé-Nunes (Hymenoptera, Formicidae, Attini)

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ABSTRACT. A new species of the fungus-farming ant genus *Mycetagroicus* Brandão & Mayhé-Nunes (Hymenoptera, Formicidae, Attini). The fungus-farming ant genus *Mycetagroicus* Brandão & Mayhé-Nunes was proposed based on three species from the Brazilian "Cerrado": *M. cerradensis*, *M. triangularis* and *M. urbanus*. Here we describe a new species of Attini ant of the genus *Mycetagroicus*, *M. inflatus* n. sp., based on two workers collected in eastern Pará State, Brazil. A new key for species identification, comments on differences among species and new geographical distribution data are furnished.

KEYWORDS. Fungus growing-ants; neotropical; taxonomy.

RESUMO. Uma nova espécie de formiga cultivadora de fungo, do gênero *Mycetagroicus* Brandão & Mayhé-Nunes (Hymenoptera, Formicidae, Attini). O gênero de formigas cultivadoras de fungos, *Mycetagroicus* Brandão & Mayhé-Nunes, foi proposto com base em três espécies do Cerrado: *M. cerradensis*, *M. triangularis* e *M. urbanus*. Neste trabalho descrevemos uma nova espécie de Attini do gênero *Mycetagroicus*, *M. inflatus* n. sp., baseada em duas operárias coletadas no leste do Pará, Brasil. Apresentamos uma nova chave para a identificação das espécies, comentários sobre as diferenças entre as espécies e novos dados sobre a distribuição geográfica.

PALAVRAS-CHAVE. Formigas cultivadoras de fungos; neotropical; taxonomia.

Mycetagroicus was described by Brandão and Mayhé-Nunes (2001) based on worker specimens of three species from Cerrado (see Scariot *et al.* 2005) localities in southeastern Brazil. Because all other eleven now accepted genera of Attini grow special basidiomycete fungi (or yeasts in some cases) for their exclusive nourishment, it is believed that *Mycetagroicus* ants also farm fungus, although we do not have positive observation on any aspect of its biology. However, *Mycetagroicus* species bear the anteclypeal seta noticed by Brandão and Mayhé-Nunes (*op. cit.*) as the first apomorphic morphological character for adult Attini females, so it is reasonable to suppose *Mycetagroicus* grow fungus as well.

MATERIAL AND METHODS

The terminology follows Brandão and Mayhé-Nunes (2001), partially modified by Mayhé-Nunes and Brandão (2007). Measurements were taken using a Leica MZ 9.5 stereomicroscope at 60X magnifications. Abbreviations for measurements and ratios are:

CI: Cephalic index: HW/HL x 100.

FLI: Frontal lobes index: IFW/HW x 100.

GLL: Gaster length: From the anteriormost point of the tergo-sternal gaster suture to the visible tip of the gaster, in lateral view.

HfL: Hind femora length: Maximum chord length of the hind femora, in lateral view.

HL: Head length: Maximum length of head, in full face view, from the median notch of the clypeal anterior margin to the median point of the occipital or vertexal margin, whenever the case.

HW: Head width. Maximum width of head, in full face view (including eyes).

HWL: Head width in view lateral: Maximum width of head, in lateral view, at its maximum width, at the level of the middle of the frontal carinae.

IFW: Inter frontal width: Maximum distance between the lateral margins of the frontal lobes.

MeL: Mesosoma length (= Weber's length): Straight line between the inflexion of the anterior dorsal margin of pronotum to the flange margin of the metapleural gland.

PLL: Petiole length: From the visible insertion point of the petiole to the insertion of the postpetiole, in lateral view.

PPL: Postpetiole length: From the insertion point of the postpetiole in the petiole to the insertion of the gaster, in lateral view.

ScL: Scape length: Maximum chord distance from the base (excluding condyle) to the apex of scape, with head in frontal view.

TL: Total length (the sum of HWL, MeL, PLL, PPL and GLL).

The paratype worker was prepared for scanning electron microscope examination, after being cleaned in acetone. The specimen was critical-point dried in a Balzer (Bal-Tec® CPD 030), and sputtered over with gold (Bal-Tec® SCD 050). After that, the specimen was mounted on the tip of a metallic triangle using silver glue and then fixated on a stub for the electron microscopy. Finally, the images were edited (Adobe PhotoShop® CS) to enhance brightness and contrast.

RESULTS

Mycetagroicus inflatus sp. nov.

(Figs. 1-4)

Worker measurements in mm (holotype-paratype). TL 2.61-2.64; HL 0.75-0.76; HW 0.71-0.72; IFW 0.35-0.35; ScL (only

for holotype) 0.65; HWL 0.46-0.44; MeL 0.94-0.93; PLL 0.13-0.17; PPL 0.34-0.37; GLL 0.75-0.73; HfL 0.85-0.84.

Worker description: Brown-yellowish, with the head's frontal region, tergum I and sternum I of gaster darker; the dorsum of the head being darker than all other body parts. Integument finely reticulated throughout the body. Scattered short hairs all over the body and appendages, slightly curved at tip; longer ones confined to hypostoma, median region of clypeus, and on mandibles, in special on the mandibular apices.

Head in full face view (Fig. 1) a little longer than broad (CI 95). Outer border of mandible straight; masticatory margin with apical, subapical and 4 triangular teeth, gradually diminishing in size towards base. Clypeus divided transversally by a ridge (better seen under the SEM; see also Fig.4), from where the clypeal setae arise; median seta distinct from anteclypeal seta; latero-median area of clypeus with a sharp triangular tooth at each side. Frontal area shallowly impressed. Frontal lobe semicircular, moderately approximate (FLI 49), with smooth free border. Frontal carina ending just after the expansion of the frontal lobes, parallel. Preocular carinae conspicuous, straight in front of the eyes, curving obliquely towards the head's median line, ending a little after the level of the frontal carinae ends. Vertex margin in full-face view strongly notched in the middle; the head posterior corners inflated. Inferior corner of occiput, in side view, more or less angular, emmarginate. Eye bulging, surpassing the lateral border of the head, with about 11 facets across greatest diameter. Antennal scape projecting beyond the tip of the head's posterolateral corner by a distance which exceeds its maximum width; the distal three fourths of scape gently incrassate. Only funicular segments I and VIII-X longer than broad, the others sub-equal in size and width.

Mesosoma (Figs. 2-3). Dorsal and lateral faces of pronotum not separated by a carina, emmarginate, with low and blunt triangular projections at the meeting of these faces; antero-inferior corner of pronotum with a rounded tooth; inferior margin smooth; paired median pronotal teeth separate, conical and blunt. Mesonotum with two very low, wide, flat semicircular tumuli anteriorly, divided by a depression, followed by a widely spaced pair of minute triangular projections and then by a more approximate, not so low, pair of blunt projections; posterior margin oblique in lateral view. Metanotum indistinct, not constricted in dorsal view. Basal face of propodeum emmarginate, with 2 or 3 low rounded unconnected projections; triangular propodeal spine very low, truncate and blunt. Hind femora shorter than mesosoma length.

Waist and gaster (Figs. 2-3). Dorsum of petiolar node without ridges, ascending in lateral view towards two spaced faint projections, bearing each a pit and its hair; petiole broader than long in dorsal view. Postpetiole as long as broad in dorsal view, dorsal and posterior margins straight, in lateral and dorsal view, respectively; dorsally with a swallow impression, near the posterior margin. Gaster, when seen from above, rather suboval, posteriorly rounded. Tergum I without longitudinal keel or furrow. Sternum I without a sagittal keel.

Gyne and male: Unknown.

Holotype and paratype workers: BRAZIL, Pará State: Santa Maria das Barreiras, Rio Araguaia, 30.ix.2005, R.R. Silva & R. Feitosa cols (deposited in Museu de Zoologia da Universidade de São Paulo). The workers were collected manually while foraging outside the nest, in a beach along the West bank of the Araguaia river, part of the Amazon River drainage.

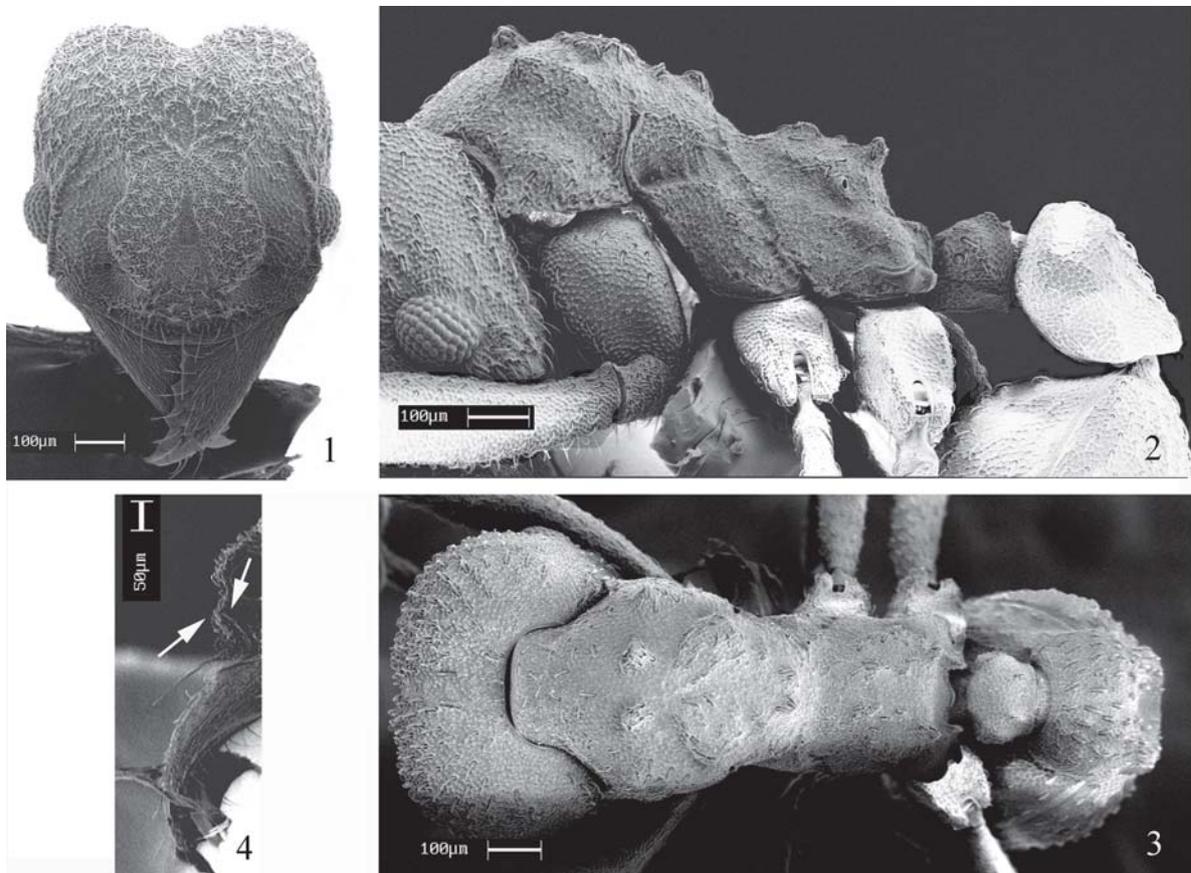
Etymology: The name of this species refers to the inflated head posterior corners that differentiate this species from all other known *Mycetagroicus*.

Comments: According to R. Feitosa field book (our translation from Portuguese) "the ants were collected at mid-afternoon of a cloudy day. In spite of the heavy rains of the preceding days (onset of the rainy season) the river water level was relatively low; leaving exposed a wide sand strip, with scattered bushes. The banks in this particular place are covered by gallery forest. The ants were found moving slowly towards their nest opening, which consisted of a single rounded minute opening in the sand, without any mound or crater. We waited for some minutes for other ants to come out from the nest, but they did not show up. Close to this nest, we found a nest of *Mycetophylax emeryi* and of an unidentified *Dorynrmex*".

Additional geographic distribution. We have recently studied *Mycetagroicus* material not available at the time we described the genus: two workers of *M. cerradensis* from Paraguaçu Paulista, SP, Brazil, collected by Eduardo Arrivabene Diniz, and *M. triangularis* workers from Uberlândia, MG, collected by Heraldo Vasconcellos. Both samples are deposited in the Coleção Entomológica Costa Lima of the Universidade Federal Rural do Rio de Janeiro. Ramos *et al.* (2003) reported the occurrence of *M. cerradensis* in Bom Despacho, MG. These new records support the original statement that *Mycetagroicus* is a typical inhabitant of the Cerrado biome, although sometimes in gallery forests, but mostly in *stricto sensu* Cerrado.

Key for identification of species of *Mycetagroicus* (workers)

1. Lateral clypeal projections absent; frontal lobes rounded, their largest width posterior to the antennal insertions, from where they curve inwards, not forming a strong constriction; median pronotal projections present; posterior face of mesonotum vertical in side view, with a high posterior projection
..... *M. urbanus* Brandão & Mayhé-Nunes
- Lateral clypeal projections present, better seen with head in side view; frontal lobes rounded or subtriangular; median pronotal projections present or absent; posterior face of mesonotum oblique in side view 2
2. Lateral clypeal projections conspicuous, flat, narrow, curved out and forwards, with rounded apex in side view; frontal lobes subtriangular, the anterior borders rounded, crenulated, and almost as long as posterior borders; median pronotal projections very short or absent



Figs. 1-4. Scanning electron micrograph of *Mycetagroicus inflatus* n. sp., paratype worker from Santa Maria das Barreiras, Pará, Brazil. 1, Head in frontal view (both antennae lacking in the specimen). 2, Trunk and waist in lateral view. 3, Trunk, waist and part of the gaster in dorsal view. 4, Detail of the paratype clypeus in side view; right arrow indicates the triangular lateral tooth, while the left arrow indicates the prominent clypeus median area.

- *M. cerradensis* Brandão & Mayhé-Nunes
 Lateral clypeal projections small, triangular in side view;
 frontal lobes rounded; median pronotal projections
 present 3
3. Posterior vertexal margin weakly notched, between the
 occipital lobes; mandibles with eight teeth; pair of
 median pronotal projections laterally flattened, with
 sharp apex; sagittal keel on sternum I of the gaster;
 integument shagreened, without reticulation; longer and
 curved erect hairs on body and appendages
- *M. triangularis* Brandão & Mayhé-Nunes
 Posterior vertexal margin strongly notched, between the
 protrude occipital lobes; mandibles with six teeth; pair
 of median pronotal projections conical, with blunt apex;
 sagittal keel of sternum I of the gaster inconspicuous;
 integument finely reticulated; short and curved appressed
 hairs on body and appendages *M. inflatus* n. sp.

DISCUSSION

The three species thus far described in *Mycetagroicus* (*M. cerradensis* – type-species by original designation, *M.*

triangularis and *M. urbanus*), and *M. inflatus* n.sp., share a peculiar sculpture (Brandão & Mayhé-Nunes 2001, fig. 4), with all body surfaces covered with regularly spaced, round, minute pits (better seen at relatively high magnifications, up to 70 times), bearing each a deeply set hair, one third the diameter of the pit, sometimes effaced by soil particles; antennal scrobes absent; preocular carinae straight at the eyes level, and evenly curving inwards posteriorly; pronotal shoulders as spine-like triangular projections; mesonotum without conspicuous projections anteriorly, with the posterior dorsal margin oblique to vertical or nearly so, in lateral view; compact petiole, with short to indistinct peduncle; postpetiole always larger and broader than the petiole; disk of tergum I of gaster covered by a net of coarse rugulae, more evident anteriorly, sometimes joining similar-sized hair pits.

Mycetagroicus inflatus has the triangular shape of the clypeal minute projections similar to those of *M. triangularis* (Fig. 4), but can be distinguished from it by the frontal carinae not constricted above the frontal lobes, and by the peculiar relatively shorter pilosity. Furthermore, *M. inflatus* differs from all other species of the genus by the comparatively more prominent posterior corners of the head; the deeper notch on the vertexal margin; the reticulated integument (better seen in

the head, Fig. 1), covered with curved, short hairs; mandibles with six teeth; anterior clypeal margin without median notch; weakly impressed, triangular frontal area; conical and blunt pronotal median and propodeal projections; additional minute pair of projections on mesonotum after the anterior tumuli; deeper impression on the posterior region of postpetiole dorsum; and absence of a keel on the sternum I of gaster.

Mycetagroicus species seems to be quite common, although they are seldom collected. This may result from cryptic habits, enhanced by the peculiar soil-binding sculpture, and also probably as a result of the slow movements these ants show in the field. *Mycetagroicus* is related to the higher attines (Brandão & Mayhé-Nunes 2001), that includes *Trachymyrmex*, *Sericomyrmex*, *Acromyrmex*, and *Atta*, although there is no published phylogenetic proposal for this group.

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