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## Two new *Morganella* species from the Brazilian Amazon rainforest

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Two new *Morganella* species, *M. albostipitata* and *M. rimosa* were found during studies of gasteroid fungi in the Brazilian Amazon rainforest, Adolpho Ducke Forest Reserve, Amazonas State, Brazil. The new taxa are described, and illustrated with photographs and line drawings, and taxonomical comments are made.

**Key words** – Basidiomycota – Gasteromycetes – Neotropics – Taxonomy

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### Article Information

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### Introduction

*Morganella* Zeller is a gasteroid genus with few species described, mostly occurring in tropical regions (Kirk et al. 2008). The genus was established by Zeller (1948) through segregation of species previously accommodated in *Lycoperdon* and later emended by Kreisel & Dring (1967), Ponce de Leon (1971) and Kruger & Kreisel (2003). Field studies are needed to expand the knowledge of this little known group of puffballs. The present study aims to provide new data on tropical species of *Morganella*.

The Adolpho Duke Reserve Forest (ADRF) is being inserted into the Amazon biome; one of the most studied areas of the Amazon rainforest. Recent studies on plant diversity in the ADRF report the presence of several rare and endemic species (Hopkings 2005). High plant diversity in the vegetation of the Amazon biome suggests the diversity of fungi is also significant. According to Mueller

et al. (2004), vegetation influences occurrence and diversity of fungi in the environment, since plants provide a habitat and energy source for most fungi which, in turn, exhibit some degree of specificity with hosts and/or substrates.

### Methods

Collections were made during the rainy seasons of 2008 and 2010 in the Adolpho Ducke Reserve Forest, Manaus, AM, Brazil. Basidiomata were examined and photographed in the field. Macro and microscopic characters were determined according to specialized literature (Zeller 1948, Kreisel & Dring 1967, Ponce de Leon 1969, 1971, Suárez & Wright 1996). The measurement of basidiospores and scanning electron microscopy were made according to Silva et al. (2011). Colours were coded in accordance with Kornerup & Wanscher (1978) and vouchers are deposited in the UFRN Herbarium.



**Figs 1–4** – *Morganella albstipitata* sp. nov. Mature basidiomata.

## Results

***Morganella albstipitata*** Baseia & Alfredo **sp. nov.** Figs 1–4

MycoBank 564373.

(<http://www.mycobank.org>).

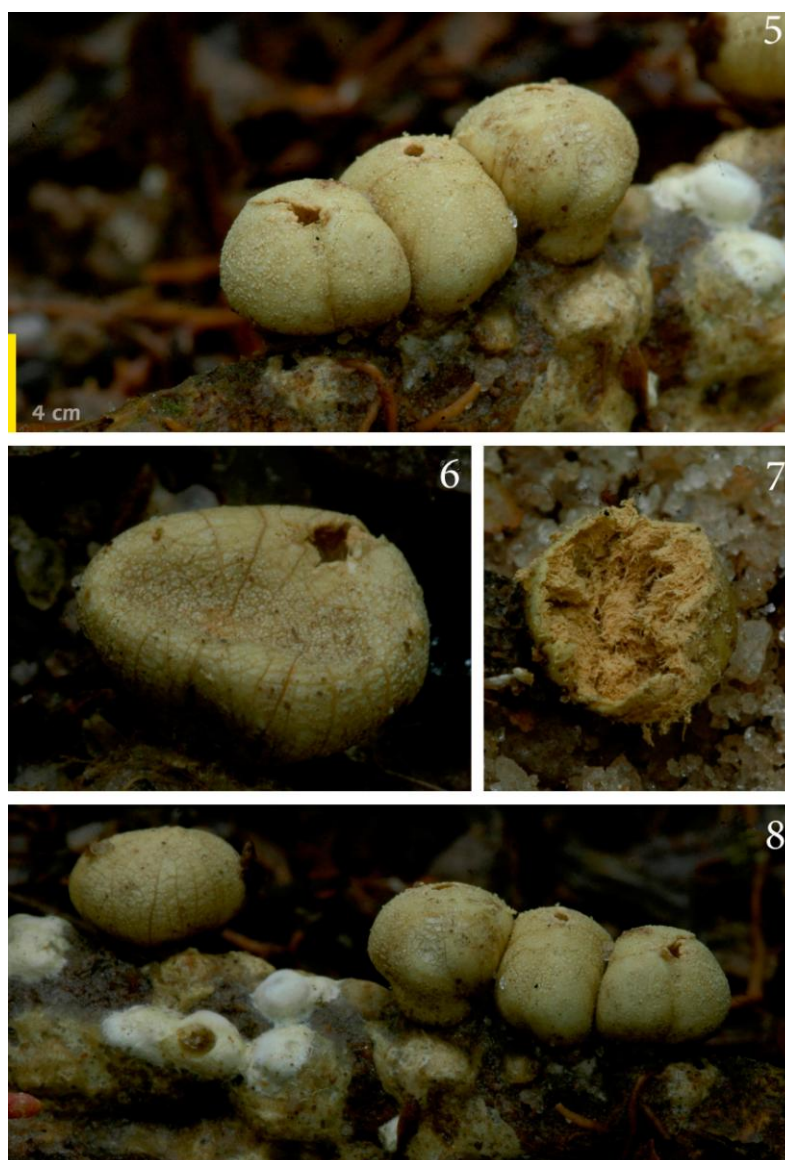
Etymology – In reference to the presence of a white pseudostipite.

*Basidioma juvene epigeum, depresso subglobosum vel pyriformis, 10 mm latum, 7 mm altum. Exoperidium velutinum, brunneus luteo, hyphae setaceis vel subglobosis, crassis.*

*Endoperidium apex cum ostiolum laceratissimum. Subgleba magna cellularis, compacta. Pseudostipite albo conspicuus. Basidiosporae globosae, 5-6  $\mu\text{m}$  latum, valde echinulatae. Paracapillicio tenuis, 3-4  $\mu\text{m}$  latum, hyalinum. In sylva, solitarius.*

Basidiomata 8-10 mm diam., 6-7 mm high, depressed globose to pyriform. Peridium consisting of a persistent velvety exoperidium. Exoperidium granulose, cracked forming units of tufts, brownish yellow (5E7), composed of irregular chains of thickened hyphae (10-120





**Figs 5–8** – *Morganella rimosa* sp. nov. Mature basidiomata.

$\mu\text{m}$  diam.), subglobose to setoid. Endoperidium smooth, pale yellow (4A3), dehiscing by a strongly lacerate peristome, formed from hyaline, irregular thin hyphae (20–30  $\mu\text{m}$  diam.). Sterile base compact (Fig. 2b), pale brown (5D2), 2 mm high. Pseudostipite conspicuous (Fig. 2b), white (4A1), 4 mm high. Gleba brown (5D4). Rhizomorphs inconspicuous. Basidiospores 5–6  $\mu\text{m}$  diam., globose, strongly equinulate, shortly pedicellate, pale brown in 5% KOH. Eucapillitium absent. Paracapillitium abundant, 3–4  $\mu\text{m}$  diam., septate and branched, hyaline, presenting amorphous and hyaline incrustation.

Known distribution – Brazil.

Material examined – Brazil, Amazonas, Manaus Reserva Florestal Adolpho Ducke, on

decaying wood, J.P.M. Araújo (GF23), R. Braga-Neto, F.F. Pezzini 14 November 2010 (INPA 239563, **Holotype**).

***Morganella rimosa*** Baseia & Alfredo **sp. nov.**

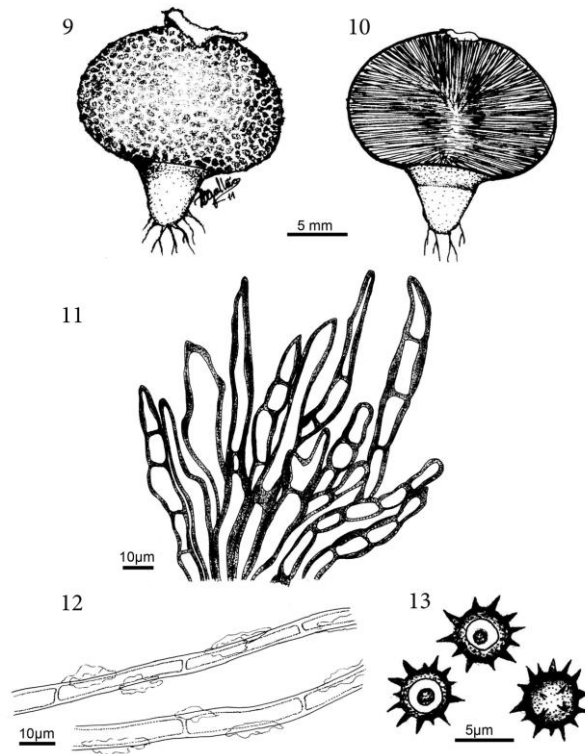
Fig. 5–8

Mycobank 564371

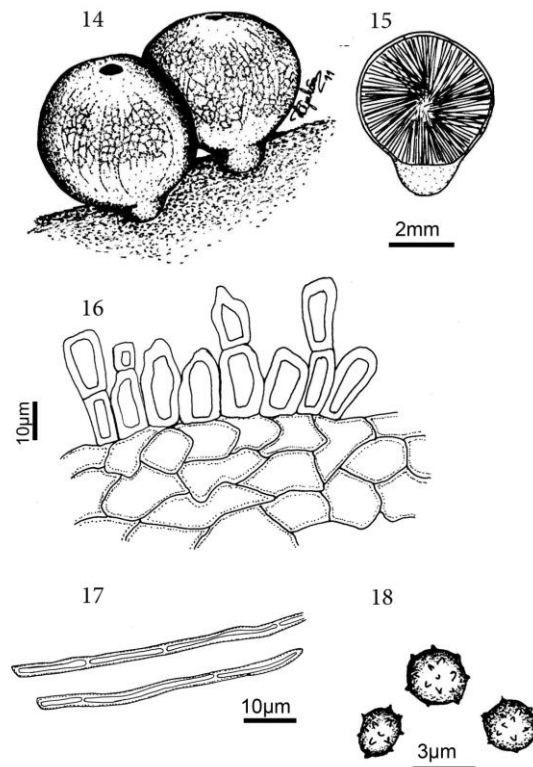
(<http://www.mycobank.org>).

Etymology – Named in reference to the peridium surface, marked with numerous cracks.

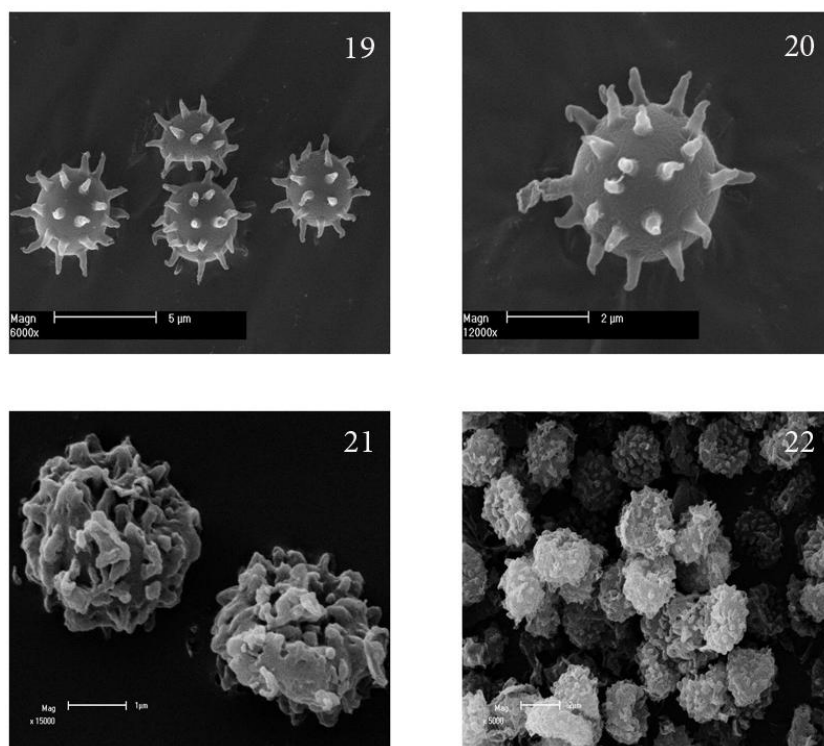
*Basidioma juvene epigeum, depresso subglobosum, subsessile, 5–6 mm latum, 4.5–5.5 mm altum, caespitosum in subiculo albo luteo. Exoperidium granuloso et rimosissimum, albo luteo, hyphae irregularibus, crassisillimus. Endoperidium apex cum ostiolum laceratum.*



**Figs 9–13** – *Morganella albotipitata* sp. nov. **9, 10** Mature basidiomata; **11** Exoperidium; **12** Paracapitium; **13** Basidiospores.



**Figs 14–18** – *Morganella rimosa* sp. nov. **14, 15** Mature basidiomata. **16** Exoperidium. **17** Paracapitium. **18** Basidiospores.



**Figs 19–22** – SEM Basidiospores. **19, 20** *Morganella albostipitata*. **21, 22** *M. rimosa*.

*Subgleba rudimentaris, celularis, compacta Basidiosporae globosae, subglobosae vel ovoideum, 2–3 mm latum, debilis echinulatae. Paracapillicio tenuissimo, 1.5–2 mm latum, hyalinum. In sylva, aggregatus.*

Basidiomata 5–6 mm diam., 4.5–5.5 mm high, globose to subglobose, cespitose, gregarious, growing on a subiculum pale yellow (4A2). Peridium consisting of cracked exoperidium, detaching from the endoperidium at maturity. Exoperidium rimose, granulose, pale yellow (4A3), composed of brown, irregular and thickened hyphae (8–25 µm diam.), either not in chains or forming short chains with two hyphae. Endoperidium smooth, pale yellow (4A2), dehiscing by lacerate peristome, formed from hyaline, irregular thin hyphae (7–40 µm diam.). Sterile base white (4A1), compact, 1 mm high. Gleba reddish yellow (A46). Basidiospores 2–3 µm diam., globose, subglobose to ovoid, verrucose to equinulate, apiculate, pale yellow in 5% KOH. Eucapillitium absent. Paracapillitium scarce, 1.5–2 µm diam., septate and branched, hyaline.

Known distribution – Brazil.

Material examined – BRAZIL, Amazonas, Manaus Reserva Florestal Adolpho Ducke,

on decaying wood R. Braga-Neto, RBN 598, 14 November 2010 (UFRN–Fungos 1680, **Holotype**).

### Discussion

*Morganella albostipitata* is easily recognized by the lignicolous basidiomata, which initially resembles *M. fuliginea* (Berk. & M.A. Curtis) Kreisel & Dring (1967). However, close examination reveals several distinctive characteristics: 1) white pseudostipite conspicuous, seemingly originating from the basal mycelium (Fig. 2 and 10); 2) exoperidium composed of chains of irregular hyphae (Fig. 11); 3) basidiospores shortly pedicellate (Fig. 13). When observed under SEM, spore ornamentation exhibits a striate ring around the base (Fig. 3). In comparison with other *Morganella* species (Ponce de Leon 1971, Suárez & Wright 1996, Bates 2004, Calonge et al. 2005, Trierveiler-Pereira et al. 2010), this character set clearly shows that *M. albostipitata* is a good species.

*Morganella rimosa* displays an unusual set of characters that facilitate species recognition: 1) The presence of subiculum and cespitose basidiomata (Fig. 5, 8 and 14); 2)

cracked and granulose exoperidium (Fig. 6 and 8); 3) compacted sterile base (Fig. 15). This species can be confused with *M. albina* and *Lycogalopsis solmsii* (considered synonymous by Ponce de Leon, 1969). In our specimens, basidiomata grow from a white subiculum, whereas basidiomata in *M. albina* grow in isolation and have no subiculum. An additional difference is the presence of sphaerocysts in *M. rimosa*, absent in *L. solmsii*. According to Dring (1964) and Reid (1977) dehiscence in *L. solmsii* occurs through irregular dehiscence of the upper portion of the basidioma, which acquires the shape of a concave disk. This is not observed in *M. rimosa*, where dehiscence takes place through a well defined ostiole at the apex of basidiomata.

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### References

- Bates ST. 2004 – Arizona members of the *Geastraceae* and *Lycoperdaceae* (*Basidiomycota*, *Fungi*). M.Sc. Thesis, Arizona State University, Tempe.
- Calonge FD, Mata M, Carranza J. 2005 – Contribución al catálogo de los *Gasteromycetes* (*Basidiomycotina*, *Fungi*) de Costa Rica. *Anales del Jardín Botánico de Madrid* 62(1), 23–45.
- Dring DM. 1964 – *Gasteromycetes* of West Tropical Africa. *Mycological Papers* 98.
- Hopkins MJG. 2005 – Flora da Reserva Ducke, Amazonas, Brasil. *Rodriguésia* 56(86), 9–25.
- Kirk PM, Cannon PF, Minter DW, Stalpers JA. 2008 – Dictionary of the fungi. 10<sup>th</sup> Edition. CAB International, Wallingford. 771pp.
- Kornerup A, Wanscher JH. 1978 – Methuen handbook of colours. Third edition. Eyre Methuen. London. 252 pp.
- Kreisel H, Dring DM. 1967 – An emendation of the genus *Morganella* Zeller (*Lycoperdaceae*). *Feddes Repertorium* 74, 109–122.
- Krüger D, Kreisel H. 2003 – Proposing *Morganella* subgen. *Apioperdon* subgen. nov. for the puffball *Lycoperdon pyriforme*. *Mycotaxon* 86, 169–177.
- Mueller GM, Bills GF, Foster MS. 2004 – Biodiversity of fungi: inventory and monitoring methods. Elsevier Academic Press, London. 777 pp.
- Ponce de Leon P. 1969 – A new member of *Morganella*. *Fieldiana Botany* 32(6), 69–71.
- Ponce de Leon P. 1971 – Revision of the genus *Morganella* (*Lycoperdaceae*). *Fieldiana Botany* 34 (3), 27–44.
- Reid DA. 1977 – Some *Gasteromycetes* from Trinidad and Tobago. *Kew Bulletin* 31, 657–690.
- Silva BDB, Souza JO, Baseia IG. 2011 – Discovery of *Geastrum xerophilum* from the Neotropics. *Mycotaxon* 118, 355–359.
- Suárez VL, Wright JE. 1996 – South American *Gasteromycetes* V: The genus *Morganella*. *Mycologia* 88, 655–661.
- Trierveiler-Pereira L, Kreisel H, Baseia IG. 2010 – New data on puffballs (*Agaricomycetes*, *Basidiomycota*) from the northeast region Brazil. *Mycotaxon* 111, 411–421.
- Zeller SM. 1948. Notes on certain gasteromycetes, including two new orders. *Mycologia* 40, 639–668.