

## NOTES ON PHALLALES IN THE NEOTROPICS

by

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**Summary.** BASEIA, I.G., L.C. MAIA & F.D. CALONGE (2006). Notes on *Phallales* in the neotropics. *Bol. Soc. Micol. Madrid* 30: 87-93.

Some interesting species of *Phallales* are reported from Atlantic rainforest areas in Northeast Brazil. Eight species are described: *Aseroë floriformis*, *Geastrum setiferum*, *Ileodictyon cibarium*, *Laternea triscapa*, *Mutinus caninus*, *Phallus indusiatus*, *P. pygmaeus* and *Staheliomyces cinctus*. Original colour photos and comments on the taxonomy and ecology of these species are also given.

**Key words:** *Agaricomycetidae*, *Phallales*, *Gasteromycetes*, taxonomy, Brazil.

**Resumen.** BASEIA, I.G., L.C. MAIA & F.D. CALONGE (2006). Notas sobre *Phallales* en los neotrópicos. *Bol. Soc. Micol. Madrid* 30: 87-93.

En este trabajo se describen y comentan ocho especies raras o interesantes de *Phallales*, procedentes de bosques lluviosos de influencia atlántica del NE de Brasil: *Aseroë floriformis*, *Geastrum setiferum*, *Ileodictyon cibarium*, *Laternea triscapa*, *Mutinus caninus*, *Phallus indusiatus*, *P. pygmaeus* y *Staheliomyces cinctus*. Se añaden ilustraciones en color y comentarios sobre la taxonomía y ecología de las especies estudiadas.

**Palabras clave:** *Agaricomycetidae*, *Phallales*, *Gasteromycetes*, taxonomía, Brasil.

### INTRODUCTION

The *Phallales* have five families, totaling about 60 genera and 331 species (KIRK & *al.*, 2001). Their members have a broad geographic distribution, however many meet in the tropical forests (HAWKSWORTH, 2001), where they are important components in the forest scope, acting on the recycling of the vegetal substrate compo-

sition. They still possess interesting strategies in the dispersion of the spores, where in the majority of the cases insects are their dispersal agents.

Due to the lack of information on these taxa in Brazil we considered important to give some notes on their distribution, taxonomy and ecology in some places from the NE of the country. New discoveries within this subject have been carried



out in the last years (BASEIA & MILANEZ, 2002; BASEIA & *al.*, 2003; BASEIA & CALONGE, 2005; BASEIA & *al.*, 2006; CALONGE & MATA 2004, 2005; CALONGE & *al.*, 2003, 2004; CALONGE & *al.*, 2005a; 2005b).

## MATERIAL AND METHODS

Mycological forays were conducted from January 2003 to July 2004, to the biological reserves of Serra Negra (8°38'-8°35'S and 38°02'-38°04'W) and Gurjaú (8°21'30"-8°12'S and 31°56'30"-35°45'W), both within the State of Pernambuco; plus Parque Estadual Dunas do Natal (05°46' S and 35°12' W) and Reserva Particular do Patrimônio Natural Mata Estrela (06°22'10" S and 35°00'28" W), both are located in the State of Rio Grande do Norte; plus Jardim Botânico de João Pessoa (7° 6' S and 34°52' W) within the State of Paraíba. All these places are remnants of the Atlantic rainforest.

Fruit-bodies were examined and photographed in the field. Colours were coded according to KORNERUP & WANSCHER (1978), with the indication "KW", bracketed in the text, and simultaneously described. They were dried up slowly and placed in containers with naphthalene to prevent destruction by insects. In addition, some basidiomata were stored fresh in FAA. The specimens studied were preserved in UFRN-Fungos, URM and MA-Fungi.

## RESULTS

*Ileodictyon cibarium* Tul. ex Raoul, Ann. Sci Nat. Bot. Ser. 3, 2: 114 (1844). (Fig. 1)

Egg subglobose, 20-25 mm diam., yellowish white (KW 4A2) to white (KW 4A1), dehiscing irregularly; rhizomorph present; expanded receptacle up to 70-80 mm diam., occasionally larger, white (KW 4A1), latticed, composed of gelatinous arms, with cellular structure forming pentagonal to hexagonal meshes; gleba mucilaginous, foetid; spores 3.5-4 x 1.5-2 µm, elliptical, smooth.

*Material examined.*- Brazil, Rio Grande do Norte, Natal, Parque Estadual Dunas, 25/V/2005 (UFRN-Fungos 196).



Fig. 1.- *Ileodictyon cibarium*. Receptacle after its liberation from the volva, showing a typical spherical cage-shaped body, made of pentagonal to hexagonal meshes. UFRN-FUNGOS 196.

*Observ.*- This species has a peculiar morphology and for this reason it is called "basket fungus". According to GOODAY & ZERNING (1997) the geometry of the polyhedral structure of basidioma has a marked resemblance to buckyballs. There is a very similar species, *I. gracile* Berk., which differs by showing a smaller size, with receptacle up to 40 mm diam. and the arms having tubular structure. Regarding its distribution, it has been recorded in Australia, New Zealand, Tasmania, Chile, East Africa and England (DRING, 1980).

*Mutinus caninus* (Huds. : Pers.) Fr., Summa Veg. Scand. 2: 434 (1849) (Fig. 2)

Egg elliptical, 4-7 mm broad to 15-22 mm long, white (KW 4A1) to yellowish white (KW 4A3), dehiscing irregularly; pseudostipe 25-40 mm high, cylindrical, hollow, white pinkish at the top (KW 10A2 to 10A3), fertile part conical; gleba covering the fertile region, violet brown (KW 10E4), mucilaginous, foetid; spores elliptical, 3.5-5.5 x 1.5-2 µm, smooth, hyaline.

*Material examined.*- Brazil, Rio Grande do Norte, Natal, Parque Estadual Dunas, 16/VII/2004 (UFRN-Fungos 197, MA-Fungi 63387).

*Observ.*- Fungus with a worldwide distribution but rare in the neotropics. It was collected gro-





Fig. 2.- *Mutinus caninus*. Basidioma composed of a volva and pseudostipe. UFRN-Fungos 197.

wing on the ground, on litter or on sandy soil, solitary.

*Phallus indusiatus* Vent.: Pers., Syn. Meth. Fung. 244 (1801) (Fig. 3)

Egg globose to obovoid, 15-17 mm diam., pale yellowish (KW 4A3), pseudostipe cylindrical, spongy, not pigmented, 100-150 mm high, 10-30 mm wide; indusium well-developed, white to pale yellow (KW 4A2), pendulous, up to three-quarters of the length of the pseudostipe; pileus widely campanulate, with superficial folds which form a network, apex perforate; gleba brown (KW 5F6), foetid, mucid; spores ovoid 2.5-3.5 x 1-1.5  $\mu$ m, smooth, hyaline.

*Material examined.*- Brazil, Rio Grande do Norte, Natal, Parque Estadual Dunas, 10IV/2005 (UFRN-Fungos 197, MA-Fungi 53367); Mata Estrela 21/V/2004 (UFRN-Fungos 198).

*Observ.*- Easy to identify due to the presence of a well-developed indusium, white pseudostipe and



Fig. 3.- *Phallus indusiatus*. Typical basidioma showing a well-developed indusium, pale yellowish volva, cylindrical pseudostipe and receptacle with reticulate surface. MA-Fungi 53367.

volva. This species is very common in the neotropics, occurring on sandy soil, plant debris and rich substrates in general.

*Aseroë floriformis* Baseia & Calonge, Mycotaxon 92 (2005) (Fig. 4)

Egg subglobose, 15-20 mm diam, white yellowish (4A3), dehiscing irregularly; pseudostipe cylindrical, spongy, reddish (KW 11A6) to pink (KW 11A4), 30-40 mm high, 5-8 mm wide, with a pseudoparenchymatous structure made of globose elements, 12-45  $\mu$ m diam, with intracellular pigment; receptacle sunflower-shaped, 15-35 mm diam, without branches, pinkish (KW 11A4), central disc perforate, showing a reddish edge (KW 11A8), covered by the gelatinous gleba, of a grey brownish colour (KW 11F1); spores cylindrical to bacilloid, 4-6 x 1.5-2  $\mu$ m, smooth, hyaline.

*Material examined.*- Brazil, Rio Grande do





Fig. 4.- *Aseroë floriformis*. Mature fruit body with the typical sunflower-shaped receptacle, without branches, pinkish, with a perforate disc showing a reddish edge, covered by the gelatinous gleba of a grey brownish colour; pseudostipe cylindrical, spongy, pink reddish; volva whitish. MA-Fungi 59460.



Fig. 5.- *Laternea triscapa*. Basidioma composed of a receptacle with three orange columns fused at the apex; gleba attached to the internal side of the arch and whitish volva. UFRN-Fungos 194.

Norte, Natal, Parque Estadual Dunas, 25/VI/2005 (UFRN-Fungos 193, URM 77091, MA-Fungi 59460).

*Observ.*- When fresh it produces a repellent smell which attracts insects. This species has recently

been published by BASEIA & CALONGE (2005), giving enough information on its taxonomy within the genus *Aseroë*.

*Laternea triscapa* Turpin ex Turpin, Dict. Sc. Nat. 25: 248 (1822) (Fig. 5)

Egg subglobose, 20-25 mm diam., yellowish white (KW4A2), dehiscing irregularly; receptacle obovoid, up to 60 x 20 mm, orange (KW 5A6), consisting of three columns free at the base and united in the apex; gleba mucilagenous attached to the arch of the receptacle and spreading down the columns, yellowish brown (KW 5F6), foetid; spores cylindrical to elliptical, 3.5-4 x 2-2.5  $\mu$ m, smooth, hyaline.

*Material examined.*- Brazil, Rio Grande do Norte, Natal, Parque Estadual Dunas, 12/VII/2004 (UFRN-Fungos 194).

*Observ.*- Taxon close to *L. pusilla* Berk. & M.A. Curtis, which shows a bigger basidioma (70 x 30 mm) with 3-4 crestate columns, while in *L. triscapa* the basidiomata are smaller and lack of any kind of ornamentation. Both species are common in the neotropics (CALONGE & *al.*, 2004; CALONGE & *al.*, 2005a).

*Staheliomyces cinctus* E. Fischer, Mitth. Naturf. Ges. Bern 35: 142 (1920-1921). (Fig. 6)

Egg oval, 15-20 x 12-16 mm, olive brown (KW 4F6), dehiscing irregularly; pseudostipe cylindrical and perforate, yellowish white (KW 5A1), 100-140 mm high; gleba yellowish brown (KW 5E6) forming a constricted band around the upper portion of the pseudostipe, with orquid smell; spores ellipsoid, 2.5-3 x 1.2 x 1.5  $\mu$ m, smooth, hyaline.

*Material examined.*- Brazil, Rio Grande do Norte, Natal, Parque Estadual Dunas, 16/IV/2004 (UFRN-Fungos 123, MA-Fungi 63388).

*Observ.*- Neotropical species, easy to be identified by its typical morphology, which reminds a *Phallus*, but differing by the presence of a strong constriction on the middle upper part of the pseudostipe, resembling a belt, where the gleba is located. It has been recorded in Surinam, British Guyana, Bolivia, Costa Rica, Ecuador, Panama and Peru (DENNIS, 1970; CALONGE & *al.*, 2005a).





Fig. 6.- *Staheliomyces cinctus*. Cylindrical fruit body, attenuate at the apex, showing a typical perforate pseudostipe, with a constricted zone where the brownish gleba is located; volva olive brown. UFRN-Fungos 123.

***Phallus pygmaeus*** Baseia, Mycotaxon 85: 77-79 (2003).(Fig. 7)

Egg subglobose, 20-30 mm diam., olive brown (KW 4F4) at the apex, yellowish white (KW 4A2) at the lower part, dehiscing irregularly; pseudostipe cylindrical, reticulate, white, 5-10 mm high, 1-2 mm wide; pileus campanulate, with smooth surface, apex perforate; gleba olivaceous (KW 1F5), foetid, mucid, spores ellipsoid, 3-4 x 1-1.5 µm, smooth, hyaline.

*Material examined*.- Brazil, Pernambuco, Cabo de Santo Agostinho, Reserva Ecológica de Gurjaú, 09/IV/2003 (UFRN-Fungos 199, MA-



Fig. 7.- *Phallus pygmaeus*. A mature basidioma showing its typical reticulate pseudostipe and smooth pileus. UFRN-Fungos 199.

Fungi 56969).

*Observ.*- This species is characterized by its diminutive size, not exceeding 10 mm high, as well as by the smooth surface of the pileus and reticulate pseudostipe. It was found growing in colonies on dead wood in Atlantic rainforest. It is an unusual species occurring only in the Pernambuco State. For a complete description see BASEIA & al. (2003).

***Geastrum setiferum*** Baseia, Mycotaxon 84: 135-139 (2002).(Fig. 8)

Egg globose to depressed-globose, 15-23 mm diam., dark brown (KW 7F5), dehiscing by an ostiole; exoperidium, when open 30-50 mm broad, split into 5-8 acute, recurving rays; mycelial layer squamose, tending to peel off in flakes; endoperidium surface setose, greyish-orange (KW 5B3), sessile, globose, 10-15 mm diam.,





Fig. 8.- *Geastrum setiferum*. Mature basidiomata showing their typical morphology. UFRN-Fungos 195.

setae cymbiform (90-120 x 20-30  $\mu\text{m}$ ), brown; peristome definite, fimbriate; columella distinct; spores globose, 2.5-3  $\mu\text{m}$ , brown, with regular short warts; capillitium 3-4  $\mu\text{m}$  diam., brown, slightly incrustated with debris, not branching.

*Material examined.*- Brazil, Pernambuco, Serra Negra, Reserva Biológica de Serra Negra 23/V/2003 (UFRN-Fungos 195, MA-Fungi 56968).

*Observ.*- *Geastrum setiferum* is fundamentally recognized by the following characters: setose endoperidium with a fimbriate peristome; small spores 2.5-3  $\mu\text{m}$  diam., ornamentation included, which appears as densely arranged, column-like warts and among them, other smaller ones. For a complete description see BASEIA & MILANEZ (2002). It was found growing on soil in Atlantic rainforest.

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