

# New records of Aphyllophorales (Basidiomycota) in the Atlantic Rain Forest in Northeast Brazil<sup>1</sup>

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**RESUMO** – (Novos registros de Aphyllophorales (Basidiomycota) em Mata Atlântica no Nordeste brasileiro). Aphyllophorales (Basidiomycota) não poróides foram registrados em áreas de Mata Atlântica do Nordeste brasileiro. *Auriscalpium villipes* (Lloyd) Snell & E.A. Dick, *Climacodon pulcherrimus* (Berk. & M.A. Curtis) Nikol., *Gloeodontia discolor* (Berk. & M.A. Curtis) Boidin, *Irpex lacteus* (Fr.: Fr.) Fr. e *Scytinostroma duriusculum* (Berk. & Broome) Donk são novas ocorrências para o Nordeste do Brasil.

**Palavras-chave:** Hydnaceae, Lachnocladiaceae, Schizophyllaceae, Mata Atlântica, Brasil

**ABSTRACT** – (New records of Aphyllophorales (Basidiomycota) in the Atlantic Rain Forest in Northeast Brazil). Non-poroid Aphyllophorales (Basidiomycota) in areas of the Atlantic Rain Forest in Northeast Brazil are reported. *Auriscalpium villipes* (Lloyd) Snell & E.A. Dick, *Climacodon pulcherrimus* (Berk. & M.A. Curtis) Nikol., *Gloeodontia discolor* (Berk. & M.A. Curtis) Boidin, *Irpex lacteus* (Fr.: Fr.) Fr. and *Scytinostroma duriusculum* (Berk. & Broome) Donk are new records to Northeast Brazil.

**Key words:** Hydnaceae, Lachnocladiaceae, Schizophyllaceae, Atlantic Rain Forest, Brazil

## Introduction

The Atlantic Rain Forest is a coastal ecosystem characterised by high biological diversity. Over time, it has been diminished significantly by human activities that have nearly caused its complete destruction (Ministério do Meio Ambiente, dos Recursos Hídricos e da Amazônia Legal 1998; Ranta *et al.* 1998).

Few mycological studies have been undertaken in the Atlantic Rain Forest in Brazil (Loguércio-Leite & Gerber 1997; Soares & Gugliotta 1998; Gugliotta & Bononi 1999; Gerber & Loguércio-Leite 2000; Góes-Neto *et al.* 2000; Gibertoni & Cavalcanti 2000; 2003). The hydroid fungi were studied by Bononi (1979), and species of Lachnocladiaceae and Schizophyllaceae were reported by Burt (1919), Corner (1950), Talbot (1951), Bononi *et al.* (1981), Bononi (1984), and Hjortstam & Bononi (1986), Capelari & Maziero (1988), Sotão *et al.* (1991), Jesus (1993; 1996), Silva & Minter (1995), Gugliotta (1997) and Gibertoni & Cavalcanti (2003).

This work aims to contribute to our knowledge of Aphyllophorales in the Atlantic Rain Forest in Northeast Brazil.

## Materials and methods

Collections of Aphyllophorales were made from September/2000 to June/2002 in 13 reserves of the Atlantic Rain Forest in the States of Sergipe, Alagoas, Pernambuco, Paraíba and Rio Grande do Norte.

Collections, preparation of the material and micro- and macroscopic analyses were made following the usual methods for these fungi (Maerz & Paul 1950; Fidalgo & Bononi 1989; Martin 1934; Kotlaba & Pouzar 1964; Singer 1951; Teixeira 1995).

For identification the following literature was used: Cooke (1961), Harrison (1973), Rattan (1974), Maas Geesteranus (1978), Gilbertson & Ryvarden (1986), Stalpers (1996) and Ryvarden (2001).

## Results and discussion

Four species of Hydnaceae, two of Lachnocladiaceae and one of Schizophyllaceae were recorded in the surveyed areas. *Auriscalpium villipes*, *Climacodon pulcherrimus*, *Gloeodontia discolor*, *Irpex lacteus* and *Scytinostroma duriusculum* are new records to Northeast Brazil.

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## Hydnaceae

1. Basidioma resupinate, incrustated cystidia present
  2. Basidiospores amyloid, ornamented ..... 3. *Gloeodontia discolor*
  2. Basidiospores inamyloid, smooth ..... 4. *Irpex lacteus*
1. Basidioma sessile to stipitate, incrustated cystidia absent
  3. Basidioma stipitate, basidiospores amyloid, 4,5-5,5×3,5-4,5µm ..... 1. *Auriscalpium villipes*
  3. Basidioma sessile, basidiospores inamyloid, 2,0-4,5×1,5-2,0µm ..... 2. *Climacodon pulcherrimus*

1. *Auriscalpium villipes* (Lloyd) Snell & E. A. Dick, *Lloydia* 21: 35, 1958.

*Hydnum villipes* Lloyd, *Mycol. Writ.* 5: 801, 1918.

Basidioma stipitate, reniform, 3,0×2,5cm. Abhymenial surface velutine, MP15L12 (Raw UMBER, Partridge). Margin entire, concolorous to the abhymenial surface. Context thin. Hymenial surface hydroid, MP8L12 (Mandalay, Friar), spines 1mm long. Hyphal structure dimitic; generative hyphae clamped, hyaline, thin to slightly thick-walled, 2,0-4,5µm; skeletal hyphae hyaline to brown, thick-walled to solid, sometimes branched, 3,5-4,5µm; gloeopleurous hyphae not observed, "yellowish, 2,0-5,0µm wide" (Ryvarden 2001). Gloecystidia not observed, "up to 8,0µm wide, hyaline to pale yellow" (Ryvarden 2001). Basidia clavate, 16,0-20,0×4,5-6,5µm. Basidiospores hyaline, subglobose to ellipsoid, echinulate, amyloid, 4,5-5,5×3,5-4,5µm.

Material examined: **BRAZIL. Pernambuco:** Igarassu, Refúgio Ecológico Charles Darwin, IX/2000, *Gibertoni 77411* (URM).

Distribution: Neotropical (Ryvarden 2001).

Remarks: *A. villipes* shows high macromorphological variation: the basidioma can be sessile to long-stipitate, and the abhymenial surface can be glabrous to hirsute (Ryvarden 2001). In Brazil, it was recorded in Goiás, São Paulo (Bononi-Penteado 1976) and Rio Grande do Sul (Ryvarden 2001), and for the first time in Northeast Brazil.

2. *Climacodon pulcherrimus* (Berk. & M. A. Curtis) Nikol., *Fl. Sporov. Rast. URSS* 6(2): 194, 1961.

*Hydnum pulcherrimum*, Berk. & M. A. Curtis, *J. Bot. & Kew Gard. Misc.* 1: 235, 1849.

Basidioma sessile, applanate, dimidiate, fleshy when fresh, leathery when dry, 4,5-9,0 x 2,5-4,5cm. Abhymenial surface glabrous, MP16A1, when fresh, MP6A12 (Rust Sorolla Br+), when dry. Margin entire, concolorous to the abhymenial surface. Context thin, 0,1cm, MP11B6 (Peachbeige-). Hymenial surface hydroid, MP2A1, when fresh, MP3A11 (Wren), MP8L10 (Java+, Nomad Br-), MP11C3 (Sheepskin, Moth+), when dry, spines up to 4mm long, 2-4/mm. Hyphal structure dimitic; generative hyphae hyaline, clamped, thin-walled, 3,0-10,0µm; skeletal hyphae hyaline, thin-walled, sometimes branched, 3,0-6,0µm. Gloecystidia clavate, 30,0-60,0×5,0-7,0µm. Basidia clavate, 17,0-22,0×3,0-5,0µm. Basidiospores hyaline, ellipsoid, smooth, inamyloid, 2,0-4,5×1,5-2,0µm.

Material examined: **BRAZIL. Paraíba:** Santa Rita, RPPN Engenho Gargaú, XI/2001, III/2002, V/2002, *Gibertoni 77371* (URM), *77372* (URM), *77373* (URM), *77374* (URM); Mamanguape, Reserva Biológica Guaribas, III/2002, V/2002, *Gibertoni 77375* (URM), *77376* (URM); **Pernambuco:** Recife, Reserva Ecológica Dois Irmãos, III/2001, *Gibertoni 77367* (URM); Cabo, Mata de Gurjaú, XI/2001, III/2002, *Gibertoni 77369* (URM), *77370* (URM).

Distribution: Cosmopolitan (Bononi 1979).

Remarks: *C. pulcherrimus* is characterised by the dimidiate, white and fleshy basidioma. In Brazil, it was recorded in the States of Rio de Janeiro, Rio Grande do Sul, São Paulo (Bononi 1979), Pará and Rondônia (Bononi 1981). The collections given above are the first ones from Northeast Brazil.

3. *Gloeodontia discolor* (Berk. & M. A. Curtis) Boidin, *Cah. Maboké* 4: 22, 1966.

*Irpex discolor* Berk & M. A. Curtis, *Grevillea* 1: 145, 1873.

Basidioma resupinate. Margin concolorous to the hymenial surface. Context thin. Hymenial surface hydroid to irpicoid, MP12F7, teeth 2-3/mm. Hyphal structure dimitic; generative hyphae hyaline, clamped, thin-walled, 1,0-4,0µm; skeletal hyphae hyaline, thick-walled to solid, sometimes branched, 1,8-4,0µm. Gloecystidia cylindrical to clavate, 25,0-75,0×5,0-10,0µm. Cystidia apically incrustated, 6,0-9,0µm wide. Basidia subclavate, 12,0-20,0×3,5-4,0µm. Basidiospores hyaline, ovoid to elliptical, verruculose, amyloid, 3,0-5,5×2,5-3,5µm.

Material examined: **BRAZIL. Pernambuco:** Igarassu, Refúgio Ecológico Charles Darwin, IX/2000, *Gibertoni 77368* (URM).

Distribution: Tropical parts of America and Africa (Bononi 1979).

Discussion: *G. discolor* is characterised by ornamented, amyloid basidiospores. In Brazil, it was found in São Paulo (Bononi 1979; 1984; Bononi *et al.* 1981; Jesus 1993), and is recorded for the first time in Northeast Brazil.

4. *Irpex lacteus* (Fr.: Fr.) Fr., Elench. Fung. p. 145, 1828.

*Hydnum lacteum* Fr.: Fr., Syst. Mycol. 1: 412, 1821.

Basidioma resupinate. Margin concolorous to the hymenial surface. Context thin. Hymenial surface poroid to irpicoid, MP13F8 (Toast), pores 2-3/mm. Hyphal structure dimitic; generative hyphae hyaline, simple-septate, thin-walled to thick-walled, 2,0-4,0µm; skeletal hyphae hyaline, thick-walled, sometimes branched, 2,5-6,0µm. Cystidia apically incrustated, 50,0-110,0×5,0-10,0µm. Basidia clavate, 20,0-25,0×4,0-6,0µm. Basidiospores hyaline, oblong to cylindrical, smooth, inamyloid, 5,0-7,0×2,0-3,0µm.

Material examined: **BRAZIL. Pernambuco:** Recife, Reserva Ecológica Dois Irmãos, V/2001, *Gibbertoni 77378* (URM).

Distribution: Cosmopolitan (Gilbertson & Ryvardeen 1986).

Remarks: both *I. lacteus* and *G. discolor* have incrustated cystidia. However, basidiospores in *I. lacteus* are inamyloid and smooth. In Brazil, it was found in São Paulo and Paraná (Bononi *et al.* 1981; Bononi 1984; Gugliotta & Capelari 1995; Gugliotta & Bononi 1999; Ryvardeen & Meijer 2002), and represents the first record to Northeast Brazil.

#### Lachnocladiaceae

1. Basidioma clavarioid, dichohyphidia stellate, basidiospores inamyloid
  1. .... *Lachnocladium schweinfurthianum*
1. Basidioma resupinate, dichohyphidia dichotomously branched, basidiospores amyloid ..... 2. *Scytinostroma duriusculum*

1. *Lachnocladium schweinfurthianum* P. Henn., Bot. Jb. 17: 21, 1893.

Basidioma solitary to caespitose, clavarioid, 2,0-4,2cm, shrubby, leathery, MP10G4, branched into 2-5 main flattened, upright branches, 1,0-2,5cm long, MP10G5 (Maise), these branching 2-4 times. Stipe cylindrical, 0,5-2,0×0,2cm. Hymenial surface smooth.

Hyphal structure dimitic; generative hyphae hyaline, simple-septate, thin-walled, 2,5-3,0µm; skeletal hyphae modified into pale brown dichohyphidia, without septa, rays 45,0×2,0-3,0µm. Basidia clavate, 11,0-15,0×2,5-3,0µm. Gloeocystidia hyaline to pale green, fusiform to clavate, 40,0×9,0-14,0µm. Basidiospores hyaline, ovoid, with apiculus, 1-guttulate, smooth, inamyloid, 5,5×3,0µm.

Material examined: **BRAZIL. Alagoas:** Pilar, RPPN Fazenda São Pedro, V/2002, *Gibbertoni 77342* (URM); **Pernambuco:** Recife, Reserva Ecológica Dois Irmãos, V/2002, *Gibbertoni 77338* (URM); **Sergipe:** Itabaiana, Estação Ecológica Serra de Itabaiana, VII/2001, *Gibbertoni 77339* (URM).

Distribution: Cuba to Brazil (Burt 1919), Brazil and USA (Corner 1950).

Remarks: many specimens identified as *L. brasiliense* (Lév.) Pat. are *L. schweinfurthianum*, which would be the correct name for the taxon (Stalpers 1996). In Brazil, *L. brasiliense* was recorded in Bahia (Burt 1919; Corner 1950) and Acre (Silva & Minter 1995), while *L. schweinfurthianum* was recorded in Pernambuco (Gibbertoni & Cavalcanti 2003). It is a new record from Sergipe.

2. *Scytinostroma duriusculum* (Berk. & Broome) Donk, Fungus 26: 20, 1956.

*Stereum duriusculum* Berk. & Broome, Journal Linn. Soc. Bot. 14: 66, 1873.

Basidioma resupinate, 500µm thick. Context 300-375µm, MP9B2 (Polar Bear), MP10D4. Hymenial surface smooth, MP12B2 (Flax Pebble-, Peanut+), MP13A2 (Diping Rock), MP14A3 (Beige). Hyphal structure dimitic; generative hyphae hyaline, simple-septate, thin-walled, 1,0-2,5µm, not dextrinoid or cyanophilous; skeletal hyphae hyaline to pale yellow, thick-walled, sometimes branched, 1,0-2,0µm, dextrinoid and cyanophilous. Gloeocystidia clavate, cylindrical to subfusiform, hyaline with granular content, 50,0-100,0×6,0-9,0µm. Basidia utriform, 25,0-40,0×4,0-5,5µm. Basidiospores hyaline, smooth, globose, with apiculus, amyloid, 4,6-6,0µm.

Material examined: **BRAZIL. Alagoas:** Barra de São Miguel, RPPN Rosa do Sol, X/2000, III/2001, V/2001, XI/2001, III/2002, *Gibbertoni 77360* (URM), 77470 (URM), 77361 (URM), 77362 (URM), 77363 (URM); Pilar, RPPN Fazenda São Pedro, VII/2001, I/2002, *Gibbertoni 77366* (URM), 77341 (URM); **Paraíba:** João Pessoa, Mata do Buraquinho, I/2002, *Gibbertoni 77352* (URM); Mamanguape, Reserva Biológica Guaribas, VII/2001, XI/2001, I/2002, III/2002,

*Gibertoni* 77466 (URM), 77347 (URM), 77467 (URM), 77348 (URM), 77468 (URM); Santa Rita, RPPN Engenho Gargaú, III/2001, XI/2001, *Gibertoni* 77346 (URM), 77465 (URM); Sapé, RPPN Fazenda Pacatuba, XI/2001, III/2001, *Gibertoni* 77471 (URM), 77471 (URM); **Pernambuco**: Recife, Reserva Ecológica Dois Irmãos, IX/2001, I/2002, V/2002, *Gibertoni* 77343 (URM), 77344 (URM), 77345 (URM); Cabo, Mata de Gurjaú, V/2001, *Gibertoni* 77349 (URM); Tamandaré, Reserva Biológica Saltinho, IX/2001, XI/2001, *Gibertoni* 77364 (URM), 77365 (URM); **Rio Grande do Norte**: Baía Formosa, RPPN Senador Antônio Farias - Mata Estrela, XI/2000, VII/2001, III/2002, V/2002, *Gibertoni* 77353 (URM), 77469 (URM), 77354 (URM), 77355 (URM), 77356 (URM), 77357 (URM); Nísia Floresta, Floresta Nacional de Nísia Floresta, XI/2001, I/2002, *Gibertoni* 77358 (URM), 77359 (URM); **Sergipe**: Itabaiana, Estação Ecológica Serra de Itabaiana, III/2002, V/2002, *Gibertoni* 77351 (URM), 77340 (URM).

Distribution: Pantropical (Talbot 1951).

Remarks: according to Rattan (1974), *S. duriusculum* differs from the other species of the genus by the smooth, amyloid basidiospores, by the presence of gloeocystidia, and absence of incrustated cystidia. It was recorded in the States of Roraima (Jesus 1996) and Rio de Janeiro (Talbot 1951), and for the first time in Northeast Brazil.

#### Schizophyllaceae

1. *Schizophyllum commune* (Fr.) Fr., Syst. Mycol. 1: 330, 1921.

Basidioma solitary to caespitose, flabellate, sessile, 0,8-2,0×1,1-1,7cm. Abhymenial surface velutinate, zoned or not, MP1A7, MP2B2, MP43A1 (Agate Gy+). Margin entire, concolorous to the abhymenial surface. Context thin, MP2C1. Hymenial surface lamellate, MP12A2 (Flax), MP 26A1, MP42A1 (Agate Gy+). Hyphal structure monomitic; generative hyphae clamped, thick-walled, hyaline, 2,7-6,3µm. Basidia clavate, 9,0-13,6×2,7µm. Basidiospores hyaline, smooth, oblong to cylindrical, 3,6-7,5×1,8-2,7µm.

Material examined: **BRAZIL. Alagoas**: Barra de São Miguel, RPPN Rosa do Sol, V/2001, I/2002, III/2002, V/2002, *Gibertoni* 77325 (URM), 77326 (URM), 77327 (URM), 77328 (URM); Pilar, RPPN Fazenda São Pedro, X/2000, III/2001, V/2001, VII/2001, XI/2001, I/2002, V/2002, *Gibertoni* 77329 (URM), 77330 (URM), 77331 (URM), 77332 (URM), 77333 (URM), 77334 (URM), 77335

(URM); **Paraíba**: Santa Rita, RPPN Engenho Gargaú, VII/2001, I/2001, I/2002, III/2002, *Gibertoni* 77307 (URM), 77308 (URM), 77309 (URM), 77310 (URM); João Pessoa, Mata do Buraquinho, I/2002, III/2002, *Gibertoni* 77316 (URM), 77317 (URM); Sapé, RPPN Fazenda Pacatuba, XI/2000, *Gibertoni* 77324 (URM); **Pernambuco**: Cabo, Mata de Gurjaú, X/2000, V/2001, VII/2001, I/2002, V/2002, *Gibertoni* 77311 (URM), 77312 (URM), 77313 (URM), 77314 (URM), 77315 (URM); Tamandaré, Reserva Biológica Saltinho, VII/2001, IX/2001, XI/2001, *Gibertoni* 77336 (URM), 77337 (URM); **Rio Grande do Norte**: Baía Formosa, RPPN Senador Antônio Farias - Mata Estrela, V/2001, VII/2001, *Gibertoni* 77318 (URM), 77319 (URM), 77320 (URM); Nísia Floresta, Floresta Nacional de Nísia Floresta, I/2002, III/2002, *Gibertoni* 77321 (URM), 77322 (URM), 77323 (URM).

Distribution: Cosmopolitan (Cooke 1961).

Remarks: *S. commune* can be characterised by the small, whitish grey, flabellate and lamellate basidioma. In Brazil, it was studied *in vitro* by Cavalcanti (1972) and recorded in the States of Amapá (Sotão et al. 1991), Pará (Silva & Minter 1995), Pernambuco (Gibertoni & Cavalcanti 2003), Rondônia (Capelari & Maziero 1988) and São Paulo (Bononi et al. 1981; Bononi 1984; Gugliotta 1997). It is a new record for Alagoas, Paraíba, and Rio Grande do Norte.

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