

A checklist of Jelly Fungi (*Agaricomycotina: Basidiomycota*) recorded in Brazil

RENATO LÚCIO MENDES ALVARENGA* & SOLANGE XAVIER-SANTOS

Universidade Estadual de Goiás - Campus de Ciências Exatas e Tecnológicas -

BR 153 nº 3.105, Fazenda Barreiro do Meio 75132 903, Anápolis, Goiás, Brazil.

*CORRESPONDENCE TO: renatolma@gmail.com

ABSTRACT — Based on an intensive search of literature records on jelly fungi (*Agaricomycotina: Basidiomycota*) in Brazil, a list of 88 species was compiled. These are distributed into four orders (*Auriculariales*, *Dacrymycetales*, *Sebacinales*, and *Tremellales*) and seven families (*Auriculariaceae*, *Dacrymycetaceae*, *Hyaloriaceae*, *Phragmoxenidiaceae*, *Sebacinaceae*, *Sirobasidiaceae*, and *Tremellaceae*), with the most frequent taxa being *Auricularia nigricans*, *A. fuscusuccinea*, and *A. delicata* sensu lato. Among the 16 Brazilian states with occurrence records, the most frequent are Rio Grande do Sul, São Paulo and Paraná. The fact that in 40% of the states there is no occurrence and that most species are represented by a single record reinforce the need for taxonomic studies about the group.

KEY WORDS — biodiversity, neotropical, macrofungi, geographic distribution

Introduction

Jelly fungi are a paraphyletic group of fungi, so named because of the gelatinous or cartilaginous consistency of their fruiting body. However, when dry their texture is hard, wilted or brittle, returning to their original consistency when exposed to water. The particular gelatinous texture is a product of convergent evolution as an adaptation to certain environmental pressures and is therefore found in a number of *Ascomycota* and *Basidiomycota*, including large, striking species and even some small, inconspicuous members of *Pucciniomycotina* (Moore 1965; Lowy 1971; Wells 1994; Hibbett 2006; Hibbett et al. 2007).

Jelly fungi, however, are traditionally classified as gelatinous members of 4 orders of macroscopic *Basidiomycetes*: *Auriculariales*, *Dacrymycetales*, *Sebacinales* and *Tremellales*, which, in addition to exhibiting almost exclusively gelatinous basidiomata, are microscopically characterized by their heterobasidia, that are either septate [*Auriculariales* J. Schröt., *Sebacinales* M. Weiss, Seloise, Rexer, A. Urb. & Oberw. and *Tremellales* Fr.] or forked holobasidia [*Dacrymycetales* Henn.] (Hibbett et al. 2007). Basidiomata morphology can be quite varied, from foliose to irregularly branched, shapeless or shaped like cups, railroad spikes or branched like coral, with color ranging from white, orange, pink, rose, brown to black. The spores have no ornamentation and, in general, are cylindrical to allantoid or ovoid to subglobose (Lowy 1952; Lowy 1971; Alexopoulos et al. 1996; Wells 1994; Kendrick 2001; Musngi et al. 2005; Sierra et al. 2012; Looney et al. 2013).

Jelly fungi can be found on logs, twigs and tree stumps. Some grow on certain plants, moss, and even on other types of fungi. Some species are edible, while others have an unpalatable texture or taste, some are medicinal. Medicinal and dietary use has been reported in different traditional neotropical communities in Brazil, including *Auricularia fuscusuccinea* (Mont.) Henn. used by the Txíção and Tucarramãe tribes (Fidalgo & Hirata 1979). The Uitoto, Muinane and Andoke communities in Colombia use *A. delicata* (Mont.) Henn. (Vasco-Palacios et al. 2008), and in Peru the rural population commonly uses *A. nigricans* (Fr.) Birkebak, Looney & Sánchez-García (Bardales 1997). The genus *Auricularia* Mont. has been used in Chinese medicine for many years to improve blood circulation and more recently the production of β -glucan polysaccharide has been reported in *A. nigricans*, which displays antitumor activity (Chang 1999; Kho et al. 2009; Song & Du 2011; Yu et al. 2014).

Lowy (1971) presented an extensive study of jelly fungi of the Neotropics, including species collected in different regions of Brazil, where he identified collections and deposited them in the most important herbaria up through the 1970s. This study circumscribed jelly fungi into two new subclasses of *Tremellales*: *Heterobasidiomycetidae* Alexop., characterized by septate basidia and *Metatremellales* *Metabasidiomycetidae* (Lowy) with subclavate or forked basidia. Analyzing septal pore morphology, Wells (1994) redistributed the group into 5 orders: *Ceratobasidiales* Jülich, *Tulasnellales* Rea, *Dacrymycetales*, *Auriculariales*, and *Tremellales*. At the end of the 20th century, with the development of molecular biology techniques Hibbett et al. (2007) organized the phylogenetic classification of the group using rRNA genes, thereby establishing 4 orders in the *Agaricomycotina* clade: *Tremellales*, *Dacrymycetales*, *Auriculariales* and *Sebacinales*. This the system adopted for the present checklist.

Among the studies on this group in Brazil is that conducted by Viégas (1945), with reports of one species of the family *Dacrymycetaceae*, one of *Sebacinaceae* and six species of *Auriculariaceae*, Teixeira (1945), who registered the occurrence of six species of *Auriculariales* and two of *Dacrymycetales*, and Lowy (1971), presenting 62 species distributed in the orders *Auriculariales*, *Dacrymycetales*, *Sebacinales* and *Tremellales*. Since then, the studies describing jelly fungi in the country have registered the occurrence of species collected sporadically with other groups of macrofungi, mainly the most easily recognized species (e.g. Roberts & Meijer 1997; Meijer 2006; Drechsler-Santos et al. 2008a-b; Trierveiler-Pereira et al. 2009; Gibertoni & Drechsler-Santos 2010, Dreschsler-Santos et al. 2013). This study is aimed at organizing the occurrence records and presenting a checklist of the diversity and distribution of jelly fungi in Brazil.

Materials & Methods

The occurrences of jelly fungi in Brazil were listed after an extensive literature review, considering only records found in published articles and/or books, and the nomenclature updated (when necessary) using the Index Fungorum Partnership (<http://www.indexfungorum.org>) and MycoBank (<http://www.mycobank.org/>) as reference.

Species occurrence is distributed by Brazilian states, which are represented by acronyms: Acre (AC); Alagoas (AL); Amazonas (AM); Amapá (AP); Bahia (BA); Ceará (CE); Federal District (DF); Espírito Santo (ES); Goiás (GO); Maranhão (MA); Minas Gerais (MG); Mato Grosso (MT); Mato Grosso do Sul (MS); Pará (PA); Paraíba (PB); Pernambuco (PE); Piauí (PI); Paraná (PR); Rio de Janeiro (RJ); Rio Grande do Norte (RN); Rondonia (RO); Rio Grande do Sul (RS); Roraima (RR); Santa Catarina (SC); Sergipe (SE); São Paulo (SP) and Tocantins (TO).

The records are organized in alphabetical order by family, genus and species. When a taxon is not clearly established in terms of its taxonomic position, it is identified as *Incertae sedis*.

The georeference points (longitude and latitude) of each record were obtained from the publications; when not available, the georeferences of the municipality were considered and plotted using DIVA-Gis software (Hijmans et al. 2001).

Results and Discussion

Records of 88 species were found distributed into four orders (*Auriculariales*, *Dacrymycetales*, *Sebacinales* and *Tremellales*) and seven families (*Auriculariaceae*, *Dacrymycetaceae*, *Hyaloriaceae*, *Phragmoxenidiaceae*, *Sebacinaceae*, *Sirobasidiaceae* and *Tremellaceae*). The highest number of species was found in Rio Grande do Sul state (50), followed by São Paulo and Paraná (30 and 27 respectively),

with São Paulo containing the largest number of records and the most sites sampled; 40% of the states showed no occurrence records (Figure 1).

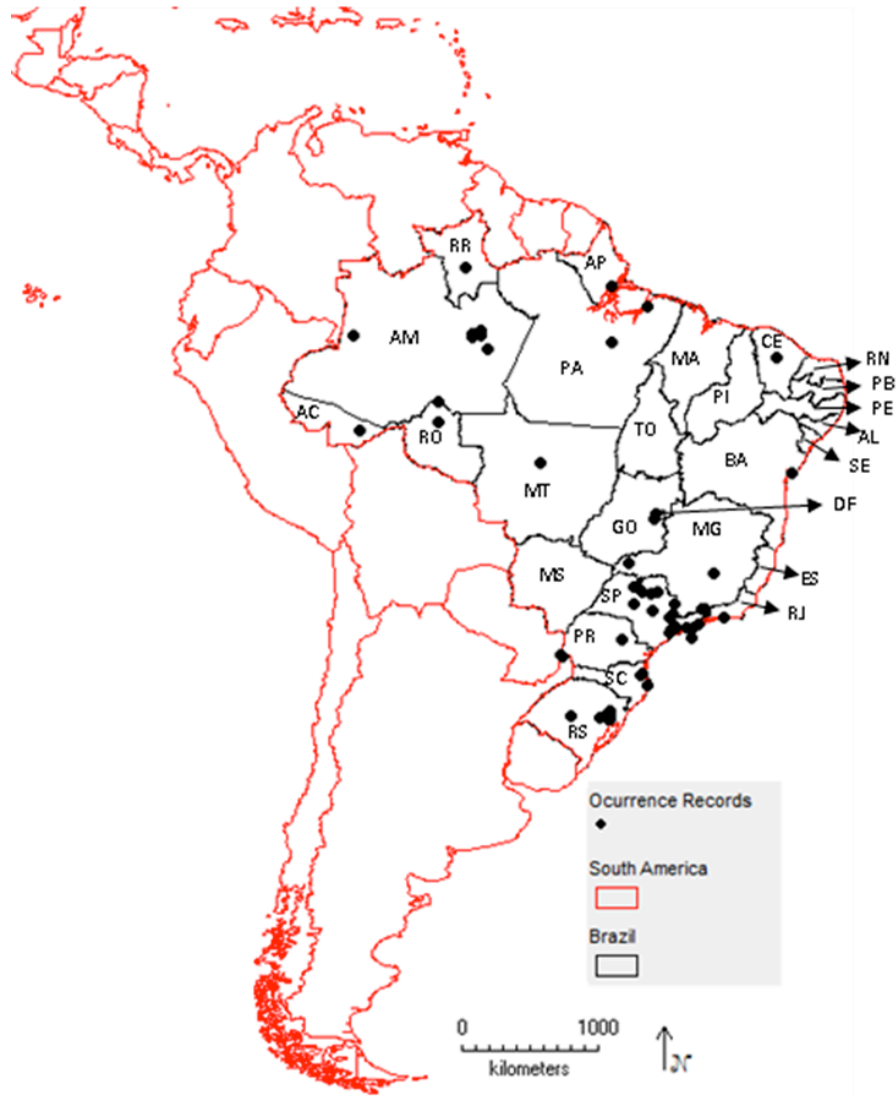


Figure 1. Distribution of the records of jelly fungi in Brazil.

Auricularia nigricans, *A. fuscosuccinea* and *A. delicata* sensu lato were the most abundantly represented taxa, occurring in 56%, 33%, and 30% of Brazilian states, respectively. This may be due to their more easily recognizable morphology. Around 60% of the species exhibited only one occurrence record. The data obtained reflect the lack of specialists in this fungal group in the country, limiting not only knowledge on taxonomic diversity, but also on the ecology and distribution of this economically important group.

Following is the list of species recorded in Brazil according to locality, accompanied by references in parentheses.

Jelly fungi cited for Brazil – a checklist

Fungi

Basidiomycota

Auriculariales

Auriculariaceae Fr.

Auricularia auricula-judae (Bull.) Quél.

Basionym: *Tremella auricula-judae* Bull.

Locality: MT, PA, RJ, SP [Hennings 1902, 1908; Sampaio 1916; Teixeira 1945; Batista et al. 1966; Sotão et al. 2003; Campos et al. 2005 (all as *Auricularia auricularis* (Gray) G.W. Martin)].

Auricularia cornea Ehrenb.

Locality: RS (Sobestiansky 2005; Meijer 2006).

Auricularia delicata (Mont.) Henn. sensu lato

Basionym: *Laschia delicata* Fr.

Locality: AM, BA, MT, PA, PR RO, SC, SP (Hennings 1900; Batista et al. 1966; Fidalgo 1968; Lowy 1971; Capelari & Maziero 1988; Góes-Neto 1996; Drechsler-Santos et al. 2008a).

Auricularia fuscosuccinea (Mont.) Henn.

Basionym: *Exidia fuscosuccinea* Mont.

Locality: AM, MT, PA, PR, RJ, RO, RS, SC, SP (Teixeira 1945 as *Auricularia rosea* Burt. and *Auricularia fusco-succinea*; Lowy 1952, 1971; Dennis 1970; Fidalgo & Hirata 1979; Bononi 1984; Capelari & Maziero 1988; Sotão et al. 2003; Campos et al. 2005; Sobestiansky 2005; Meijer 2006; Drechsler-Santos et al. 2008b; Abrahão et al. 2012).

Auricularia mesenterica (Dicks.) Pers.

Basionym: *Helvella mesenterica* Dicks.

Locality: AM, MT, PA, RS, SP (Rick 1903; Hennings 1904; Rada & Stevenson 1942; Teixeira 1945; Batista et al. 1966; Lowy 1971).

Auricularia nigricans (Fr.) Birkebak, Looney & Sánchez-García

Basionym: *Peziza nigricans* Fr.

Locality: AM, AP, BA, CE, DF, GO, MG, MT, PA, RJ, RO, RR, RS, SC, SP (Hennings 1902, 1904; Lloyd 1920; Teixeira 1945; Fidalgo 1968; Lowy 1971; Bononi 1984; Capelari & Maziero 1988; Jesus 1996; Sotão et al. 1991, 2002, 2003; Drechsler-Santos et al. 2008a; Gibertoni & Drechsler-Santos 2010; Abrahão et al. 2012; Drechsler-Santos et al. 2013) as *Auricularia polytricha* (Mont.) Sacc.; (Teixeira 1945) as *Auricularia porphyrea* (Lév.) Ribeiro Teixeira

Bourdotia galzinii (Bres.) Trotter

Basionym: *Sebacina galzinii* Bres.

Locality: RS, SC (Lowy 1971) as *Bourdotia galzinii* and *Sebacina petiolata* D.P. Rogers

Eichleriella alliciens (Berk. & Cooke) Burt

Basionym: *Stereum alliciens* Berk. & Cooke

Locality: PR, RS, SP (Viégas 1945; Lowy 1971) all as *Hirneolina ubatubensis* Viégas

Eichleriella leveilleana (Berk. & M.A. Curtis) Burt

Basionym: *Corticium leveilleanum* Berk. & M.A. Curtis

Locality: PR, RS, SP (Lowy 1971).

Exidia glandulosa (Bull.) Fr.

Basionym: *Tremella glandulosa* Bull.

Locality: SP (Lowy 1971).

Exidiopsis mucedinea (Pat.) K. Wells

Basionym: *Sebacina mucedinea* Pat.

Locality: SP (Lowy 1971).

Exidiopsis manihoticola Viégas

Locality: SP (Lowy 1971).

Exidiopsis opalea (Bourdot & Galzin) D.A. Reid

Basionym: *Sebacina opalea* Bourdot & Galzin

Locality: SP (Lowy 1971).

Exidiopsis sublivida (Pat.) K. Wells

Basionym: *Heterochaete sublivida* Pat.

Locality: RS (Lowy 1971).

Heterochaete albida Pat.

Locality: RS (Lowy 1971).

Heterochaete brasiliensis Bodman

Locality: RS (Lowy 1971).

Heterochaete crassa Bodman

Locality: RS (Lowy 1971).

Heterochaete cystidiophora (Lowy) Oberw., Kisim.-Hor. & L.D. Gómez

Basionym: *Heterochaetella cystidiophora* Lowy

Locality: RJ, SC (Lowy 1971) as *Heterochaetella cystidiophora*.

Heterochaete gelatinosa (Berk. & M.A. Curtis) Pat.

Basionym: *Kneiffia gelatinosa* Berk. & M.A. Curtis

Locality: RS (Lowy 1971).

Heterochaete hirneoloides (Pat.) K. Wells

Basionym: *Sebacina hirneoloides* Pat.

Locality: RS (Lowy 1971).

Heterochaete livida Pat.

Locality: RS (Lowy 1971).

Heterochaete lividofusca Pat.

Locality: RS (Lowy 1971).

Heterochaete nigerrima Viégas

Locality: SP (Viégas 1945).

Heterochaete ochracea Pat.

Locality: RS (Lowy 1971).

Heterochaete sanctae-catharinae Möller

Locality: RS, SC (Lowy 1971).

Heterochaete shearii (Burt) Burt

Basionym: *Sebacina shearii* Burt

Locality: RS (Lowy 1971).

***Hyaloriaceae* Lindau**

Hyaloria pilacre Möller

Locality: RS, SP (Lowy 1971).

Hyaloria traillii (Berk. & Cooke) G.W. Martin

Basionym: *Typhula traillii* Berk. & Cooke

Locality: AM (Lowy 1971).

Myxarium hyalinum (Pers.) Donk

Basionym: *Tremella hyalina* Pers.

Locality: AM, RS, SP (Lowy 1971) as *Exidia nucleata* (Schwein.) Burt.

Incertae Sedis

Aporpium dimidiatum A. David

Locality: PR, SC (Gerber & Loguercio-Leite 2000; Meijer 2006).

Basidi dendron burtii (Bres.) Wojewoda

Basionym: *Heterochaete burtii* Bres.

Locality: RS (Lowy 1971) as *Bourdotia burtii* (Bres.) K. Wells.

Basidiodendron cinereum (Bres.) Luck-Allen

Basionym: *Sebacina cinerea* Bres.

Locality: BA, RS, SP (Lowy 1971) as *Bourdotia cinerea* Bourdot & Galzin.

Basidiodendron eyrei (Wakef.) Luck-Allen

Basionym: *Sebacina eyrei* Wakef.

Locality: RS (Lowy 1971) as *Bourdotia eyrei* (Wakef.) Bourdot & Galzin.

Exidia richenii (Rick) Lloyd

Basionym: *Protomerulius richenii* Rick

Locality: RS (Lowy 1971).

Ductifera sucina (Möller) K. Wells

Basionym: *Exidia sucina* Möller

Locality: RS (Lowy 1971).

Guepinia dacrymycetospora (Speg.) Bres.

Basionym: *Hirneola dacrymycetospora* Speg.

Locality: RS (Bresadola 1920).

Heterochaetella chorisae Viégas

Locality: SP (Viégas 1945).

Heterochaetella ochracea Viégas

Locality: SP (Viégas 1945).

Patouillardina cinerea Bres.

Locality: PR, RS (Lowy 1971).

Protomerulius caryae (Schwein.) Ryvarden

Basionym: *Polyporus caryae* Schwein.

Locality: SC (Loguercio-Leite & Gerber 1997).

Protomerulius brasiliensis Möller

Locality: RS (Lowy 1971).

Protomerulius substuppeus (Berk. & Cooke) Ryvarden

Basionym: *Polyporus substuppeus* Berk. & Cooke

Locality: SC (Gerber & Loguercio-Leite 2000).

Pseudohydnum gelatinosum (Scop.) P. Karst.

Basionym: *Hydnum gelatinosum* Scop.

Locality: PA (Bononi 1981).

Stypella dubia (Bourdot & Galzin) P. Roberts

Basionym: *Heterochaete dubia* Bourdot & Galzin

Locality: SC, SP (Lowy 1971) as *Heterochaetella dubia*.

Stypella minor Möller

Locality: RS (Lowy 1971)

Stypella vermiformis (Berk. & Broome) D.A. Reid

Basionym: *Dacrymyces vermiformis* Berk. & Broome

Locality: SC (Lowy 1971) as *Stypella papillata* Möller.

Tremellodon cartilagineus (Möller) Rick

Basionym: *Protohydnum cartilagineum* Möller

Locality: RS (Lowy 1971).

Tremiscus helvelloides (DC.) Donk.

Basionym: *Tremella helvelloides* DC.

Locality: SP (Lowy 1971) as *Phlogiotis helvelloides* (DC.) G.W. Martin.

Dacrymycetales

***Dacrymycetaceae* J. Schröt.**

Arrhytidia involuta (Schwein.) Coker.

Basionym: *Dacrymyces involutus* Schwein.

Locality: RS (Lowy 1971).

Calocera arborea Shirouzu

Locality: AM (Shirouzu et al. 2013).

Calocera cornea (Batsch) Fr.

Basionym: *Clavaria cornea* Batsch

Locality: AM, DF, PA, PR, RS, SC, SP (Lowy 1971; Sotão et al. 2003; Campos et al. 2005; Sobestiansky 2005; Trierweiler-Pereira et al. 2009).

Cerinomyces lagerheimii (Pat.) McNabb

Basionym: *Ceracea lagerheimii* Pat.

Locality: PR, RS (Lowy 1971; Meijer 2006).

Dacrymyces chrysospermus Berk. & M.A. Curtis

Locality: PR (Meijer 2006)

Dacrymyces deliquescens var. *ellisii* (Coker) L.L. Kenn.

Basionym: *Dacrymyces ellisii* Coker

Locality: AM, RS (Lowy 1971)

Dacrymyces enatus var. *macrosporus* L.L. Kenn.

Locality: PR, RS (Sobestiansky 2005; Meijer 2006)

Dacrymyces stillatus Nees

Locality: PR (Meijer 2006)

Dacryopinax elegans (Berk. & M.A. Curtis) G.W. Martin

Basionym: *Guepinia elegans* Berk. & M.A. Curtis

Locality: AM, PR, RJ, RS, SP (Lowy 1971; Sobestiansky 2005; Meijer 2006).

Dacryopinax indacocheae Lowy

Locality: AM (Lowy 1971).

Dacryopinax martinii Lowy

Locality: PR (Meijer 2006).

Dacryopinax maxidorii Lowy

Locality: AM, PA (Lowy 1981; Sotão et al. 2003; Campos et al. 2005).

Dacryopinax spathularia (Schwein.) G.W. Martin

Basionym: *Merulius spathularius* Schwein.

Locality: AM, PR, RJ, RS, SP (Teixeira 1945; Viégas 1945; Lowy 1971; Sobestiansky 2005; Meijer 2006).

Ditiola radicata (Alb. & Schwein.) Fr.

Basionym: *Helotium radicatum* Alb. & Schwein.

Locality: SC (Lowy 1971).

Guepiniopsis buccina (Pers.) L.L. Kenn.

Basionym: *Peziza buccina* Pers.

Locality: PR (Meijer 2006).

Sebacinales

***Sebacinaceae* K. Wells & Oberw.**

Helvellosebacina conrescens (Schwein.) Oberw., Garnica & K. Riess

Basionym: *Peziza conrescens* Schwein.

Locality: SP (Lowy 1971) as *Tremella conrescens* (Schwein.) Burt.

Basidiodendron grandinioides (Bourdot & Galzin) Luck-Allen

Basionym: *Bourdotia grandinioides* Bourdot & Galzin

Locality: AM (Lowy 1971) as *Bourdotia grandinioides*.

Ductifera pululahuana (Pat.) Donk

Basionym: *Tremella pululahuana* Pat.

Locality: RS (Lowy 1971).

Sebacina fuliginea (Rick) L.S. Olive

Basionym: *Exidiopsis fuliginea* Rick

Locality: RS, SC (Lowy 1971; Sobestiansky 2005) as *Exidiopsis fuliginea*.

Sebacina stratosa (Viégas) L.S. Olive

Basionym: *Seismosarca stratosa* Viégas

Locality: SP (Viégas 1945) as *Seismosarca stratosa*.

Tremellodendron schweinitzii (Peck) G.F. Atk.

Basionym: *Thelephora schweinitzii* Peck

Locality: AM (Lowy 1971).

Tremellales

***Phragmoxenidiaceae* Oberw. & R. Bauer**

Phyllogloea tremelloidea Lowy

Locality: RS (Lowy 1971).

***Sirobasidiaceae* Lindau**

Sirobasidium brefeldianum Möller

Locality: RS, SP (Lowy 1971).

Sirobasidium rubrofusum (Berk.) P. Roberts

Basionym: *Dacrymyces rubrofusus* Berk.

Locality: BA, PR (Roberts & Meijer 1997; Meijer 2006).

Sirobasidium sanguineum Lagerh. & Pat.

Locality: BA, MG, RS (Lowy 1971).

***Tremellaceae* Fr.**

Holtermannia damicornis (Möller) Kobayasi

Basionym: *Tremella damicornis* Möller

Locality: RS (Lowy 1971).

Tremella aurantia Schwein.

Locality: PR, SP (Roberts & Meijer 1997).

Tremella auricularia Möller

Locality: PR (Roberts & Meijer 1997).

Tremella brasiliensis (Möller) Lloyd

Basionym: *Tremella lutescens* var. *brasiliensis* Möller.

Locality: RS, PR (Lowy 1971; Roberts & Meijer 1997)

Tremella compacta Möller

Locality: RS (Lowy 1971).

Tremella dysenterica Möller

Locality: PR (Roberts & Meijer 1997).

Tremella fibulifera Möller

Locality: BA, MG, PR, RS, SP (Lowy 1971; Roberts & Meijer 1997; Sobestiansky 2005).

Tremella foliacea Pers.

Locality: PR (Roberts & Meijer 1997).

Tremella fuciformis Berk.

Locality: BA, PR, RS, SP (Roberts & Meijer 1997; Sobestiansky 2005; Meijer 2006).

Tremella mesenterica (Schaeff.) Retz.

Basionym: *Helvella mesenterica* Schaeff.

Locality: RS, SP (Lowy 1971) as *Tremella lutescens* Pers.

Tremella moriformis Sowerby

Locality: RS (Lowy 1971).

Tremella philippinensis Lloyd

Locality: RS (Sobestiansky 2005).

Tremella riobrancensis Lowy

Locality: AC (Lowy 1981).

Tremella rubromaculata Lowy

Locality: SP (Lowy 1971).

Tremella wrightii Berk. & M.A. Curtis

Locality: PR, SC (Lowy 1971; Roberts & Meijer 1997; Meijer 2006).

Acknowledgments

We would like to thank Fundação de Amparo à Pesquisa do Estado de Goiás (FAPEG) for the Masters scholarship awarded to the first author and for the financial support (AUXPE no. 2036/2013), to

Universidade Estadual de Goiás, Laboratório de Biodiversidade do Cerrado, for the support that enabled us to carry out this study. We also thank the reviewers Sigfrido Sierra Galván, Brian P. Looney and Adriana de Mello Gugliotta, for their contribution in reviewing and revising the manuscript.

Literature cited

- Abrahão MC, Gugliotta AM, Bononi VLR. 2012. Xylophilous Agaricomycetes (Basidiomycota) of the Brazilian Cerrado. *CheckList*, 8(5): 1102-1116.
- Alexopoulos CJ, Mims, CW, Blackwell, M. 1996. *Introductory Mycology* 4 ed., Wiley, USA, 869p.
- Bardales LM. 1997. Los Hongos o setas: alternativas de suplemento alimentício em la Región Loreto. *Bosques Amazónicos*, 3: 8.
- Batista AC, Falção, RGS, Peres, GEP, Moura, NR. 1966. *Fungi Paraenses (Revisão da Coleção de Paul C. Hennings, do Museu Paraense Emílio Goeldi)*. Publicação do Instituto de Micologia, 506: 10-290.
- Bononi VLR. 1981. Alguns Basidiomicetos hidnóides da região amazônica. *Rickia*, 9: 17-30.
- Bononi VLR. 1984. Basidiomicetos do Cerrado da Reserva Biológica de Moji-Guaçu, SP. *Rickia*, 11: 1-25.
- Bresadola G. 1920. *Selecta mycologica*. *Annales Mycologici*, 18: 26-70.
- Campos EL, Sotão, HMP, Cavalcante, MAQ, Luz, AB. 2005. Basidiomycetes de Manguezais da APA de Algodão-Maiandeuá, Pará, Brasil. *Boletim do Museu Paraense Emílio Goeldi, sér. Ciências Naturais*, 1: 141-146.
- Capelari M, Maziero, R. 1988. Fungos macroscópicos do estado de Rondônia, região dos rios Jaru e Ji-Paraná. *Hoehnea*, 15: 28-36.
- Chang ST. 1999. Global impact of edible and medicinal mushrooms on human welfare in the 21st century: nongreen revolution. *International Journal of Medicinal Mushrooms*, 1:1-7. <http://dx.doi.org/10.1615/IntJMedMushrooms.v1.i1.10>
- Dennis RWG. 1970. Fungus flora of Venezuela and adjacent countries. *Kew Bulletin Additional Series*, 3: 1-530.
- Drechesler-Santos ER, Groposo C, Loguercio-Leite C. 2008a. New records of lignocellulolytic fungi (Basidiomycetes) from the Atlantic Rain Forest in State of Santa Catarina, Brazil. *Hoehnea*, 35(1): 57-61. <http://dx.doi.org/10.1590/S2236-89062008000100002>
- Drechesler-Santos ER, Groposo C, Loguercio-Leite C. 2008b. Additions to the knowledge of lignocellulolytic Basidiomycetes (Fungi) in forests from Santa Catarina State, Brazil. *Mycotaxon*, 103: 197-200.
- Drechesler-Santos ER, Ryvardeen L, Bezerra JL, Gibertoni TB, Salvador-Montoya CA, Cavalcanti MAQ. 2013. New records of Auriculariales, Hymenochaetales and Polyporales (Fungi: Agaricomycetes) for Caatinga Biome. *CheckList*, 9(4): 800-805.
- Fidalgo MEPK, Hirata JM. 1979. *Etnomicologia Caiabi, Txicão e Txucarramãe*. *Rickia*, 9: 1-5.
- Fidalgo MEPK. 1968. Contribution to the fungi of Mato Grosso, Brazil. *Rickia*, 3: 171-219.
- Gerber AL, Loguercio-Leite C. 2000. Polyporoid wood-rotting fungi (Basidiomycetes) II – New records from southern Brazil. *Mycotaxon*, 76: 175-185.
- Gibertoni TB, Drechesler-Santos ER. 2010. Lignocellulolytic Agaricomycetes from the Brazilian Cerrado biome. *Mycotaxon*, 111: 87-90. <http://dx.doi.org/10.5248/111.87>
- Góes-Neto A. 1996. Biodiversidade de Mixomicetos e Fungos Macroscópicos da Reserva Biológica de UNA e Áreas Adjacentes (Bahia, Brasil). *Sitentibus*, 15: 91-108.
- Hennings P. 1900. *Fungi Mattogrossenses a Dr. R. Pilger Collecti*. *Hedwigia* 39: 134-139.
- Hennings P. 1902. *Fungi Paraensis II. a cl. E. Ule collecti*. *Hedwigia* 41: 15-18.
- Hennings P. 1904. *Fungi Amazonici I. a cl. E. Ule collecti* *Hedwigia*. 43: 154-186.
- Hennings P. 1908. *Fungi Paraensis III*. *Hedwigia* 48(1): 101-117.
- Hibbett DS, Binder M, Bischoff JF, Blackwell M, Cannon PF, Eriksson OE, Huhndorf S, James T, Kirk PM, Lücking R, Lumbsch T, Lutzoni F, Matheny PB, McLaughlin DJ, Powell MJ, Redhead S, Schoch CL, Spatafora JW, Stalpers JA, Vilgalys R, Aime MC, Aptroot A, Bauer R, Begerow D, Benny GL, Castlebury LA, Crous PW, Dai Y-C, Gams W, Geiser DM, Griffith GW, Gueidan C, Hawksworth DL, Hestmark G, Hosaka K, Humber RA, Hyde K, Ironside JE, Kõljalg U, Kurtzman CP, Larsson K-H, Lichtwardt R, Longcore J, Miądlikowska J, Miller A, Moncalvo J-M, Mozley-Standridge S, Oberwinkler F, Parmasto E, Reeb V, Rogers JD, Roux C, Ryvardeen L, Sampaio JP, Schüßler A, Sugiyama J, Thorn RG, Tibell L, Untereiner WA, Walker C, Wang Z, Weir A, Weiß M, White MM, Winka K, Yao Y-J, Zhang N. 2007. A higher-level phylogenetic classification of the Fungi. *Mycological Research*, 111: 509-547. <http://dx.doi.org/10.1016/j.mycres.2007.03.004>

- Hibbett DS. 2006. A phylogenetic overview of the Agaricomycotina. *Mycologia*, 98: 917-925. <http://dx.doi.org/10.3852/mycologia.98.6.917>
- Hijmans RJ, Cruz M, Rojas E, Guarino L. 2001. DIVA-GIS, Version 1.4. A geographic information system for the management and analysis of genetic resources data. Manual International Potato Center, Lima, Peru
- IFP: Index Fungorum Partnership. 2015 – www.indexfungorum.org.
- Jesus MA. 1996. Contribution to the knowledge of wood-rotting fungi in Brazil. II. Checklist of fungi from Maracá Island, Roraima State. *Mycotaxon*, 57: 323-328.
- Kendrick B. 2001. *The Fifth Kingdom*. 3 ed., Focus Publishing / R. Pullins Co. 400p.
- Kho YS, Vikineswary S, Noorlidah A, Kuppusamy UR, Oh HI. 2009. Antioxidant capacity of fresh and processed fruit bodies and mycelium of *Auricularia auricula-judae* (Fr.). *Journal of Medicinal Food*, 12:167-174. <http://dx.doi.org/10.1089/jmf.2007.0568>
- Lloyd CG. 1920. *Auricularia polytricha*. *Mycological Writings* 63(6): 972.
- Loguercio-Leite C, Gerber AL. 1997. Non-pileate polypores on Santa Catarina Island, SC, Brazil. *Mycotaxon*, 64: 285-301.
- Looney BP, Birkebak JM, Matheny B. 2013. Systematics of the genus *Auricularia* with an emphasis on species from the southeastern United States. *North American Fungi*, 8(6): 1-25. <http://dx.doi.org/10.2509/naf2013.008.006>
- Lowy B. 1952. The genus *Auricularia*. *Mycologia*, 44: 656-692
- Lowy B. 1971. *Flora neotropica*. Monograph no. 6. Tremellales. New York: Hafner Publishing Company. 153p.
- Lowy B. 1981. A new species of *Dacryopinax* from Brazil. *Mycotaxon*, 13(2):428-430
- Lowy B. 1982. New Tremellales from West Brazilian Amazon. *Mycotaxon*, 15: 95-102.
- Meijer AAR. 2006. Preliminary list of the macromycetes from Brazilian state of Paraná. *Boletim do Museu Botânico Municipal*, 68: 1-55.
- Moore EJ. 1965. Ontogeny of Gelationous Fungi. *Mycologia*, 57: 114-130. <http://dx.doi.org/10.2307/3756714>
- Musngi RB, Abella EA, Lalap AL, Reyes RG. 2005. Four species of wild *Auricularia* in Central Luzon, Philippines as sources of cell lines for researchers and mushroom growers. *Journal of Agricultural Technology*, 1(2): 279-299.
- Rada JC, Stevenson JA. 1942. La flora fungosa peruana. *Publ. Est. Exp. De La Molina (Peru)*: 1-112.
- Rick J. 1903. *Fungos do Rio Grande do Sul (Brasil)*. *Broteria Serie Botanica*, 2: 276-293.
- Roberts P, Meijer AAR. 1997. Macromycetes from the state of Paraná, Brazil. 6. Sirobasidiaceae & Tremellaceae. *Mycotaxon*, 64: 261-283.
- Sampaio, VD. 1916. A flora de Mato Grosso. *Archivos do Museu. Nacional do Rio de Janeiro*, 19: 1-126
- Shirouzu T, Ishikawa NK, Hirose D, Maekawa N. 2013. A new Amazonian species of *Calocera* with dendroid and multi-headed basidiocarp. *Mycoscience*, 54: 252-256. <http://dx.doi.org/10.1016/j.myc.2012.09.018>
- Sierra S, Rodríguez-Gutiérrez I, Izquierdo-SanAgustín LA, Castro-Santiuste S, Cifuentes J, Pérez-Ramírez L. 2012. Hongos tremeloides (Heterobasidiomycetes de la Reserva de la Biosfera de Calakmul, Campeche, México. *Revista Mexicana de Biodiversidad* 83: 23-30.
- Sobestiansky G. 2005. Contribution to a Macromycete Survey of the States of Rio Grande do Sul and Santa Catarina in Brazil. *Brazilian Archives of Biology and Technology*, 48(3): 437-457. <http://dx.doi.org/10.1590/S1516-89132005000300015>
- Song G, Du Q. 2011. Structure characterization and antitumor activity of an $\alpha\beta$ -glucan polysaccharide from *Auricularia polytricha*. *Food Research International*, 45: 381-387. <http://dx.doi.org/10.1016/j.foodres.2011.10.035>
- Sotão HMP, Bononi VLR, Figueiredo TS. 1991. Basidiomycetes de manguezais da Ilha de Maracá, Amapá, Brasil. *Boletim do Museu Paraense Emílio Goeldi, série Botânica*, 7(1): 109-114.
- Sotão HMP, Campos EL, Costa SPSE, Melo OA, Azevedo JC. 2002. Basidiomycetes macroscópicos de manguezais de Bragança, Pará, Brasil. *Hoehnea*, 29 (3): 215-224.
- Sotão HMP, Campos EL, Gugliotta AM, Costa, SPSE. 2003. Fungos macroscópicos: Basidiomycetes. In: FERNANDES, M.E.B. (org.). *Os manguezais da costa norte brasileira*. Maranhão: Fundação Rio Bragança.
- Teixeira AR. 1945. Himenomicetos Brasileiros: Auriculariales e Dacrymycetales. *Bragantia*, 5: 153-180.
- Trierveiler-Pereira L, Baltazar JM, Loguercio-Leite C. 2009. Santa Catarina Island mangroves 4 – Xylophilous basidiomycetes. *Mycotaxon*, 109: 107-110. <http://dx.doi.org/10.5248/109.107>
- Vasco-Palacios AM, Suaza SC, Castaño-Betancur M, Franco-Molano AE. 2008. Conocimiento etnoecológico de los hongos entre los indígenas Uitoto, Muinane y Andoke de la Amazonía Colombiana. *Acta Amazonica*, 38(1): 17-30. <http://dx.doi.org/10.1590/S0006-87051945000400002>

- Viégas AP. 1945. Alguns Fungos do Brasil VI: Dacrymycetaceae – Tremellaceae. *Bragantia*, V: 239-251.
- Wells K. 1994. Jelly fungi, then and now! *Mycologia*, 86: 18-48. <http://dx.doi.org/10.2307/3760717>
- Yu J, Sun R, Zhao Z, Wang Y. 2014. *Auricularia polytricha* polysaccharides induce cell cycle arrest and apoptosis in human lung cancer A549. *International Journal of Biological Macromolecules*, 68: 67-71. <http://dx.doi.org/10.1016/j.ijbiomac.2014.04.018>