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Polyporales and similar poroid genera (Basidiomycota) from Parque Estadual da Serra do Mar, São Paulo State, Brazil[1]

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ABSTRACT - (Polyporales and similar poroid genera (Basidiomycota) from Parque Estadual da Serra do Mar, São Paulo State, Brazil). This survey presents the first species list of the poroid fungi (Polyporales and related genera) from Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, the largest area of the Atlantic forest in Brazil. A total of 68 species, 38 genera and ten families were found in the studied area. *Antrodiella luteocontexta*, *Ceriporiopsis flavilutea*, *Diplomitoporus navisporus*, *Flaviporus venustus*, *Grammothele fuligo*, *Oxyporus latemarginatus*, *Perenniporia cremeopora*, *Postia subcaesia* and *Postia tephroleuca* are recorded for the first time to São Paulo State and *Dichomitus campestris* and *Postia undosa* represent the first records in Brazil. Full description of the new records in Brazil, comments about the new records in São Paulo State, as well as pictures and an identification key are provided.
Keywords: Brazilian Atlantic forest, Fungal diversity, Neotropics, Taxonomy

RESUMO - (Polyporales e gêneros poroides semelhantes (Basidiomycota) do Parque Estadual da Serra do Mar, Estado de São Paulo, Brasil). Esta pesquisa apresenta a primeira lista de espécies dos fungos poroides (Polyporales e gêneros relacionados) do Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, a maior área de Mata Atlântica no Brasil. Um total de 68 espécies, 38 gêneros e dez famílias foram encontradas na área estudada. *Antrodiella luteocontexta*, *Ceriporiopsis flavilutea*, *Diplomitoporus navisporus*, *Flaviporus venustus*, *Grammothele fuligo*, *Oxyporus latemarginatus*, *Perenniporia cremeopora*, *Postia subcaesia* e *Postia tephroleuca* são registradas pela primeira vez para o Estado de São Paulo e *Dichomitus campestris* e *Postia undosa* representam o primeiro registro no Brasil. A descrição completa dos novos registros no Brasil, comentários sobre os novos registros no estado de São Paulo, fotos e uma chave de identificação são fornecidos.
Palavras-chave: Mata Atlântica brasileira, diversidade fúngica, neotrópico, taxonomia

Introduction

Polypores belong to class *Agaricomycetes* Doweld in the Basidiomycota; they grow mostly lignicolous and are characterized by the presence of a hymenophore formed by parallel tubes that lead into a surface composed by pores, which are inseparable from the context, a feature that makes them different from *Boletales* E.J. Gilbert (Ryvarden 1991). These fungi are extremely important for nutrient cycling and play a fundamental role in wood decay due to their system of lignocellulolytic enzymes (Ryvarden 1991, Begon *et al*. 2006).

Polyporales Gäum. is considered one of the most problematic groups of fungi from a taxonomic and systematic viewpoint. Based on molecular phylogenetic results, the order has been divided into four lineages, the 'antrodia clade', the 'polyporoid clade', the 'phlebioid clade', and a 'residual polyporoid clade', which often unite genera previously considered unrelated (Hibbett & Donoghue 1995, Larsson *et al*. 2004, Binder *et al*. 2005; 2013, Garcia-Sandoval *et al*. 2011, Miettinen *et al*. 2011). The position of the 'residual polyporoid clade' remains uncertain and some taxa (*e.g*. *Gelatoporia* Niemelä, *Grifola* Gray and *Tyromyces* P. Karst) apparently do not belong to any of these main lineages. Families such as *Hydnodontaceae* Jülich and *Schizoporaceae* Jülich and many polyporoid genera as *Trichaptum* Murrill (*Incertae sedis*) are included in the order Hymenochaetales. However, poroid taxa are morphologically and ecologically related and have

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been historically studied together; for this reason, also poroid genera not belonging to *Polyporales* were included in this study.

Many studies on polypores have been carried out in Brazil, and many of them in areas of the Atlantic forest (Bononi *et al*. 1981, Jesus 1993, Gugliotta & Bononi 1999, Xavier-Santos *et al*. 2004, Louza & Gugliotta 2007, Leal & Gugliotta 2008, Abrahão *et al*. 2009, Baltazar & Gibertoni 2009, Gugliotta *et al*. 2010, 2011, 2015, Westphalen & Silveira 2008, 2013, Westphalen &. 2010, Motato-Vásquez & Gugliotta 2014, Motato-Vásquez *et al*. 2015, Pires & Gugliotta 2016). The Atlantic forest, which originally occupied 1,315,460 km² of Brazilian territory, presently only covers about 8% of its original area (Fundação SOS Mata Atlântica and INPE 2009, 2011), being placed in the top five list of the biologically richest and most threatened regions (biodiversity hotspots) on the planet (Mittermeier *et al*. 2004). In Brazil, the Atlantic forest includes the second largest area of tropical forest ecosystem, including different types of vegetation as ombrophilous, mountain, inland and *Araucaria* forest (Secretaria de Estado de Meio Ambiente 1996). São Paulo State contains a significant portion of this important phytogeographic domain, with 26,703.24 km², which occurs mainly along the coast and on the slopes of Serra do Mar, corresponding to 15.78% of the state's territory (Fundação SOS Mata Atlântica and INPE 2011).

Parque Estadual da Serra do Mar represents the largest continuous area of preserved Atlantic forest in Brazil (Secretaria de Estado de Meio Ambiente 2008); however, so far little is known about the community of poroid fungi. This study was aimed to survey species included in *Polyporales* and similar genera of poroid fungi present in the park. A list of recorded species, descriptions of the new records in Brazil, comments on the new records in São Paulo State, and an identification key are provided.

Materials and methods

Parque Estadual da Serra do Mar (PESM), managed by Instituto Florestal, is a protected area that hosts the largest area of Atlantic forest in Brazil. With 3,153.9 km², it encompasses 11 coastal municipalities and 15 municipalities located on the Atlantic Plateau in São Paulo state (Secretaria de Estado de Meio Ambiente 2000). Due to the extent of the park and the heterogeneity of its socio-cultural, historical and environmental features, it is managed in eight units. Among these, the Núcleo Santa Virgínia (45°03' to 45°11' W and 23°24' to 23°17' S) is located in the municipality of São Luiz do Paraitinga and Natividade da Serra. The unit covers a total area of 170 km², with altitudinal range of 860 m to 1650 m, and maximum temperature of 35 °C, medium 21 °C, and minimum -3°C (Secretaria de Estado de Meio Ambiente 2008).

A permit for sampling in the park was issued by the Instituto Florestal (Carta COTEC nº. 155/2013 D201/2011 PGH). Collections in the study area were carried out bimonthly from April 2013 to February 2015 and all studied materials were collected by Ricardo M. Pires. The basidiomata were photographed, georeferenced, collected with a knife, and individually packed in paper bags. Data such as date of collection, collector number, substrate, color and other macroscopic features were noted (Fidalgo & Bononi 1984). Macroscopic analysis included description of features such as: habit and habitat of the basidiomata; shape, surface, margin and size of the pileus, color, shape and number of pores per millimeter; shape, color, consistency, surface, apex, base and size of the stipe (when present). The color was described according to Küppers (2002).

For microscopic analysis, freehand cuts were performed in cross sections of the tubes to observe the hymenium and trama structures. The sections were treated with KOH 5% solution and stained with 1% Phloxine. Melzer's reagent was used for evidence of amyloid and dextrinoid reactions. The sections were observed under a Leica DM1000 optical microscope. The structures were analyzed and described based on color, cell walls, reactions and size of the basidiospores; shape, color, wall, sterigmate number and size of basidia; shape, color and size of sterile elements; and color and type of hyphae. Twenty to 30 measurements were taken from each structure present. Measurements of the length and width of basidiospores, basidia (without sterigmata), and cystidia were also taken. For basidiospores, the measurement of Q represents the variation of the ratio between the length and the width of approximately 100 basidiospores of each species, and Qm that represents the average value of Q (Coelho 2005). The specimens were deposited at the Herbarium Maria Eneyda P. K. Fidalgo (SP) of the Instituto de Botânica. The literature consulted for identification were mainly Lowe (1966), Ryvarden & Johansen (1980), Ryvarden (1991) and Ryvarden & Gilbertson (1993, 1994), as well as all the specialized literature from which the distribution data of the species was extracted (see below the entries for new records).

Results and Discussion

A total of 68 species, 38 genera and ten families were found in the study area. *Dichomitus campestris* (Quél.) Domanski & Orlicz and *Postia undosa* (Peck) Jülich are recorded for the first time for Brazil. Furthermore, *Antrodiella luteocontexta* Ryvarden & de Meijer, *Ceriporiopsis flavilutea* (Murrill) Ryvarden, *Diplomitoporus navisporus* Gibertoni & Ryvarden, *Flaviporus venustus* A. David & Rajchenb., *Grammothele fuligo* (Berk. & Broome) Ryvarden, *Oxyporus latemarginatus* (Durieu & Mont.) Donk, *Postia subcaesia* (A. David) Jülich and *Postia tephroleuca* (Fr.) Jülich are recorded for São Paulo state for the first time.

Antrodiella luteocontexta Ryvarden & de Meijer
Figures 1-3

Polyporales, *Phanerochaetaceae*

Description: Ryvarden & de Meijer (2002).

Remarks: the species is characterized by the pileate and annual basidioma with imbricate, broadly sessile and gregarious pilei, yellow context (Küppers color chart: $N_{00}A_{60}M_{30}$), with large, round to angular pores (1-2 per mm), and small, cylindrical basidiospores (3.0-3.5 × 1.4-2.0 µm).

Distribution in Brazil: previously only recorded for the Atlantic forest in Brazil in the State of Paraná (Ryvarden & de Meijer 2002) and now also for São Paulo.

Specimens examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 25-IV-2014, *R.M. Pires 299* (SP-466227); 26-IV-2014, *R.M. Pires 318* (SP-446275).

Ceriporiopsis flavilutea (Murrill) Ryvarden ≡ ***Poria flavilutea*** Murrill, Mycologia 13(3): 176 (1921)
Figure 4

Polyporales, *Phanerochaetaceae*

Description: Lowe (1966).

Remarks: *Ceriporiopsis flavilutea* is recognized by its annual and small basidiomata up to 1 mm thick, with white and cottony margins, small angular pores (6-8 per mm) and small basidiospores (2.5-3.5 × 1.5-2.0 µm).

Distribution in Brazil: previously only recorded in the Atlantic forest in Brazil in the State of Rio Grande do Norte (Gibertoni *et al*. 2004) and now in São Paulo.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 13-VI-2013, *R.M. Pires et al. 87* (SP-466094).

Dichomitus campestris (Quél.) Domanski & Orlicz ≡ ***Trametes campestris*** Quél., Mémoires de la Société d'Émulation de Montbéliard 5:286 (1872)
Figure 5

Polyporales, *Polyporaceae*

Description: Basidiomata annual to perennial, resupinate, typically cushion-shaped, distinctly thickened in the center, oblong to oval, up to 15 mm thick in center and up to 10 cm long. Margin narrow, dirty ochraceous to blackish (Küppers color chart: $N_{99}A_{70}M_{70}$). Pore surface tan to straw (Küppers color chart: $N_{20}A_{60}M_{30}$) with angular pores (1-2 per mm). Hyphal system dimitic; generative hyphae clamped, hyaline, thin-walled, 2.5-4.0 µm wide; binding hyphae hyaline, thick-walled, straight to slightly sinuous, dichotomous branching, dextrinoid, (3.5-)4.0-8.0 µm wide. Basidiospores cylindrical, hyaline and thin-walled, negative in Melzer's reagent, 10-13 × 4.5-5.5 µm, Q = 2.0–2.7 and Q_m = 2.4.

Remarks: the cushion-shaped basidiomata with blackish margins are diagnostic for this species. The basidiospores of our material are slightly shorter than described by Ryvarden & Gilbertson (1993), (13-19 × 4.0-5.5 µm), but similar to those materials described in Domansky & Orlikz (1966), (9.0-12.5 × 3.5-4.5 µm) and this may be considered a normal variation within the species. This species is common in Europe and considered rare in America, recorded from United Stated and Mexico by Ryvarden & Gilbertson (1993).

Distribution in Brazil: this is the first record of the species in Brazil, and as far as we known it is the first record of the species in South America and in the phytogeographic domain of the Atlantic Forest.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 13-VI-2013, *R.M. Pires et al. 51* (SP-466079).

Diplomitoporus navisporus Gibertoni & Ryvarden
Figure 6

Polyporales, *Polyporaceae*

Description: Gibertoni *et al.* (2004).

Remarks: the species presents perennial and resupinate basidiomata, a trimitic hyphal system and fusoid cystidioles. The navicular basidiospores, 4.1-5.0 × 2.0-2.7 μm in size, and the small regular pores (7-9 per mm) are diagnostic.

Distribution in Brazil: this species was only known from the type locality in Pernambuco state (Gibertoni *et al*. 2014). This study represents the first record of the species in São Paulo State.

Specimens examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 31-X-2013, *R.M. Pires et al. 180* (SP-466153).

Flaviporus venustus A. David & Rajchenb.
Figure 7

Polyporales, *Meruliaceae*

Description: David & Rajchenberg (1985).

Remarks: this species is very easy to recognize in field due to its fleshy and large basidiomata, whitish pink (Küppers color chart: $A_{10}M_{40}C_{00}$), translucid and brittle. The species shrinks when dried, becoming rigid and hard. Microscopically, it is characterized by the small, ovoid basidiospores (3.5-4.5 × 2.5-3.2 μm) and the monomitic hyphal system with hyphae deeply immersed in a resinous substance, which makes them difficult to be observed in dried specimens.

Distribution in Brazil: previously only known from the southern region of Brazil in Paraná, Santa Catarina and Rio Grande do Sul States (Ryvarden & de Meijer 2002, Silveira & Guerrero 1991). This study represents the first record of the species in the southeast region of Brazil, in São Paulo State.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 12-II-2014, *R.M. Pires et al. 262* (SP-466208).

Grammothele fuligo (Berk. & Broome) Ryvarden ≡ *Polyporus fuligo* Berk. & Broome, Botanical Journal of the Linnean Society 14: 53 (1875)
Figure 8

Polyporales, *Polyporaceae*

Description: Reck & Silveira (2009).

Remarks: the species can be recognized by its association with monocotyledons, and macroscopically by the annual, resupinate, widely effused and strongly adnate basidiomata and by the bluish gray pore surface (Küppers color chart: $N_{40}M_{00}C_{00}$). *Grammothele fuligo* is separated from other species of the genus by the smaller pores (7-10 per mm).

Distribution in Brazil: the species was previously known from the Amazonas, Roraima and Santa Catarina states (Loguercio-Leite 1990, Reck & Silveira 2009). This study represents the first record of the species in São Paulo State and Southeast region.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 19-XII-2013, *R.M. Pires et al. 211* (SP-466176).

Oxyporus latemarginatus (Durieu & Mont.) Donk ≡ *Polyporus latemarginatus* Durieu & Mont., Sylloge generum specierumque plantarum cryptogamarum: 163 (1856)
Figure 9

Hymenochaetales, *Schizoporaceae*

Description: Ryvarden & Gilbertson (1994)

Remarks: *Oxyporus latemarginatus* is recognized by the resupinate white to straw (Küppers color chart: $N_{00}A_{50}M_{10}$) basidiomata. Microscopically, it is characterized by the monomitic hyphal system, generative hyphae with simple septa, rather small, apically encrusted cystidia (13-30 × 4.0-7.0 μm) and ellipsoid basidiospores (3.8-4.8 × 2.6-3.2 μm).

Distribution in Brazil: the species was previously known from the Paraná, Santa Catarina and Rio Grande do Sul states (Ryvarden & de Meijer 2002, Loguercio-Leite *et al*. 2008, Baltazar & Gibertoni 2009). This study represents the first record of the species in the southeast region of Brazil, in São Paulo State.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 12-II-2014, *R.M. Pires et al. 260* (SP-466206).

Postia subcaesia (A. David) Jülich ≡ *Tyromyces subcaesius* A. David, Bulletin Mensuel de la Société Linnéenne de Lyon 43: 120 (1974)
Figure 11

Polyporales, *Fomitopsidaceae*

Description: Ryvarden & Gilbertson (1994).

Remarks: macroscopically, *P. subcaesia* has soft and watery basidiomata when fresh, white to ochraceous pileus (Küppers color chart: $N_{30}C_{10}A_{00}$), with slightly grayish to bluish tints in spots and pubescent pileus surface. Microscopically, the allantoid and slightly amyloid basidiospores (4.0-5.0 × 1.0-1.2) and metachromatic generative hyphae are helpful in the identification.

Distribution in Brazil: previously only known from the southern region of Brazil in Paraná, Santa Catarina and Rio Grande do Sul states (Ryvarden & de Meijer 2002, Loguercio-Leite *et al*. 2008). This study represents the first record of the species in the southeast region of Brazil in São Paulo State.

Specimens examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 12-VI-2013, *R.M. Pires et al. 75* (SP-466088); *R.M. Pires et al. 78* (SP-466089); 29-X-2013, *R.M. Pires et al. 139* (SP-466124).

Postia tephroleuca (Fr.) Jülich ≡ *Polyporus tephroleucus* Fr., Systema Mycologicum 1: 360 (1821)
Figure 12

Polyporales, *Fomitopsidaceae*

Description: Ryvarden & Gilbertson (1994).

Remarks: *Postia tephroleuca* is distinguished by the velvety to tomentose pileus, pores (3-4 per mm), monomitic hyphal system, clamped and metachromatic generative hyphae and by the cylindrical to allantoid basidiospores (4.5-6.0 × 1.0-1.5 µm). *Postia tephroleuca* is reported in the literature as a species that produces brown rot and is similar to *Tyromyces leucomallus* (Berk. & Curt.) Murril. However, *T. leucomallus* has smaller pores (5-7 per mm) and smaller basidiospores (3.5-4.5 × 1.0 µm).

Distribution in Brazil: previously only known from the southern region of Brazil in Paraná and Rio Grande do Sul states (Ryvarden & de Meijer 2002, Baltazar & Gibertoni 2009). This study represents the first record of the species in the southeast region of Brazil, in São Paulo State.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 27-IV-2014, *R.M. Pires 331* (SP-466249).

Postia undosa (Peck) Jülich ≡ ***Polyporus undosus*** Peck, Annual Report on the New York State Museum of Natural History 34: 42 (1881)
Figure 13

Polyporales, *Fomitopsidaceae*

Description: Basidiomata annual, effused-reflexed to resupinate, with a narrow and elongated pileus, single or imbricate with numerous small pilei and pore surface decurrent. Margin characteristically undulate; upper surface white to light cream (Küppers color chart: $N_{10}A_{40}M_{30}$), finely adpressed velutinate, becoming glabrous and smooth with age, pore surface cream, pores angular to irregular, 2-3 per mm. Hyphal system monomitic, generative hyphae clamped and metachromatic, contextual hyphae rarely to frequently branched, with abundant clamps, thick-walled, 3.5-7.0 µm and generative hyphae in the subhymenium rather thin-walled, 2.0-4.0 µm. Basidiospores cylindrical to allantoid, hyaline and smooth, negative in Melzer's reagent, 4.0-5.0 × 1.5-2.1 µm, Q = 2.2-2.9 and Q_m = 2.5.

Remarks: the undulate margin and the large pores are good field characters (Ryvarden & Gilbertson 1994). Furthermore, the cylindrical to allantoid basidiospores and metachromatic generative hyphae are important to distinguish this species. *Postia undosa* is widely distributed in the Northern Hemisphere, found on gymnosperms or rarely on angiosperms in southern Canada, the northern half of the United States and in Europe; associated with brown rot (Lowe 1966). In Africa, is was only observed on angiosperms (Ryvarden & Johansen 1980). Our specimen was found growing on a dead log, preventing the identification of the plant.

Distribution in Brazil: This is the first record of the species in Brazil, and as far as we known it is the first record of the species in South America.

Specimen examined: BRAZIL. São Paulo: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 31-X-2013, *R.M. Pires 189* (SP-466161).

Identification key to species of *Polyporales* and similar genera (Basidiomycota) from Parque Estadual da Serra do Mar

1. Basidiomata stipitate to pseudo-stipitate
   2. Basidiospores double-walled, endospore ornamented ..... *Amauroderma sprucei*
   2. Basidiospores simple-walled
      3. Stipe dark-brown to black, not concolorous with the pileus

4. Pileus surface tan to beige; pores 1-2 per mm ..... *Polyporus guianensis*
4. Pileus surface dark brown to black; pores 5-7(-10) per mm ..... *Polyporus dictyopus*
3. Stipe cream to brown, concolorous with the pileus
5. Pileus margin usually ciliate; pores (4-)5-7 per mm ..... *Polyporus ciliatus*
5. Pileus margin non-ciliate, pores 1-5 per mm
6. Pileus surface white to pale brown; pores 1-2 per mm ..... *Polyporus tenuiculus*
6. Pileus surface ochraceous to tan; pores 3-5 per mm ..... *Polyporus grammocephalus*
1. Basidiomata resupinate to pileate sessile
7. Basidiomata strictly resupinate
8. Generative hyphae with simple septa
9. Hyphal system dimitic ..... *Flaviporus subundatus*
9. Hyphal system monomitic
10. Basidiomata in shades of orange
11. Cystidia absent in the trama or hymenium ..... *Rigidoporus crocatus*
11. Cystidia present in the trama or hymenium
12. Pore surface pinkish to brown-orange when fresh, becoming brownish to blackish in dried specimens; basidiospores subglobose 4.0-5.0 × 3.0-4.0 µm ..... *Rigidoporus vinctus*
12. Pores surface isabelline to ochraceous, almost unchanging when dry; basidiospores globose, (4.0-)5.5-6.0 µm diam. ..... *Rigidoporus undatus*
10. Basidiomata in a different color, never in shades of orange
13. Cystidia present in the trama or hymenium ..... *Oxyporus latemarginatus*
13. Cystidia absent in the trama or hymenium
14. Pore surface white; pores 1-3 per mm; basidiospores 4.0-5.0(-6.0) × 3.5-4.5(-5.0) µm ..... *Ceriporia xylostromatoides*
14. Pore surface yellow; pores 7–8 per mm; basidiospores 2.5-3.5 × 1.5-2.0 µm ..... *Ceriporiopsis flavilutea*
8. Generative hyphae with clamps
15. Skeletal hyphae dextrinoid
16. Basidiospores dextrinoid ..... *Grammothelopsis puiggarii*
16. Basidiospores non-dextrinoid
17. Basidiospores ornamented ..... *Pachykytospora alabamae*
17. Basidiospores smooth
18. Basidiomata white to cream
19. Pores 1-3 per mm; hyphal pegs present ..... *Dichomitus setulosus*
19. Pores (2-)4-5 per mm; hyphal pegs absent ..... *Dichomitus cavernulosus*
18. Basidiomata ochraceous to blackish
20. Basidiomata with a distinct blackish margin; pores 1-2(-3) per mm; basidiospores 10-13 × 4.5-5.5 µm ..... *Dichomitus campestris*
20. Basidiomata with an ochraceous margin; pores 3-4 per mm; basidiospores 8.0-10 × 2.5-3.0 µm ..... *Dichomitus cylindrosporus*
15. Skeletal hyphae non-dextrinoid
21. Basidiospores ornamented ..... *Trechispora regularis*
21. Basidiospores smooth
22. Cystidia present in the trama or hymenium
23. Basidiomata white to cream; capitate cystidioles present
24. Pores 2-3 per mm; basidiospores (4.5-)5.0-6.5 × 3.0-4.0(-5.0) µm .... *Schizopora paradoxa*
24. Pores 5-6(-7) per mm; basidiospores 3.0-4.5(-5.0) × (2.0-)2.5-3.0 µm ..... *Schizopora flavipora*
23. Basidiomata in a different color; capitate cystidioles absent
25. Basidiomata yellowish, becoming red when bruised; pores 3-6 per mm .... *Junghuhnia carneola*
25. Basidiomata pinkish, not becoming red when bruised; pores 6-10 per mm ..... *Junghuhnia nitida*

22. Cystidia absent in the trama or hymenium
    26. Pore surface reddish-violet to lilac grey
        27. Basidiospores ellipsoid to subglobose, 4.0-5.0(-5.5) × 2.5-3.0 µm; dendrohyphidia absent; red staining the substrate; usually on dicotyledons ..... *Tinctoporellus epimiltinus*
        27. Basidiospores cylindrical, (5.5-)6.0-8.0 × 3.0-3.5 µm; dendrohyphidia present; no red staining the substrate; on monocotyledons ..... *Grammothele fuligo*
    26. Pore surface white to pale brown
        28. Hyphal system dimitic; basidiospores lunate, 0.5-1.0 µm wide; hyphal top with rosette-shaped crystals ..... *Sidera lenis*
        28. Hyphal system trimitic; basidiospores in a different form; without rosette-shaped crystals
            29. Pores 4-6 per mm; basidiospores cylindrical to slightly allantoid 4.5-5.5 × 2.5-3.0 µm ..... *Cinereomyces dilutabilis*
            29. Pores 7-9 per mm; basidiospores navicular, 4.5-5.4 × 2.0-2.7 µm ..... *Diplomitoporus navisporus*

7. Basidiomata effused-reflexed to pileate
    30. Hyphal system monomitic
        31. Generative hyphae with simple septa
            32. Gloeopleurous hyphae present ..... *Henninsia brasiliensis*
            32. Gloeopleurous hyphae absent
                33. Cystidia present in the trama or hymenium ..... *Rigidoporus lineatus*
                33. Cystidia absent in the trama or hymenium ..... *Rigidoporus microporus*
        31. Generative hyphae with clamps
            34. Basidiospores allantoid; generative hyphae with metachromatic reaction
                35. Pileus margin undulate; pores 2-3 per mm ..... *Postia undosa*
                35. Pileus margin indistinct; pores smaller
                    36. Basidiospores slightly amyloid in Melzer's reagent; hyphal pegs absent; upper surface white to ochraceous with slight grayish to bluish tints in spots and streaks, pubescent ..... *Postia subcaesia*
                    36. Basidiospores non-amyloid in Melzer's reagent; hyphal pegs presents; upper surface cream-coloured to mouse-grey, coarsely strigose ..... *Postia tephroleuca*
            34. Basidiospores in other form; generative hyphae without metachromatic reaction
                37. Basidiomata white to pinkish-red
                    38. Pores 6-10 per mm; basidiospores subglobose, 3.5-4.5 × 2.5-3.2 µm ... *Flaviporus venustus*
                    38. Pores 1-3 per mm; basidiospores ellipsoid to broadly ellipsoid, 4.6-6.0 × 3.3-4.3 µm ..... *Spongipellis caseosus*
                37. Basidiomata ochraceous to brownish
                    39. Pores 4–6 per mm; basidiospores broadly ellipsoid to ovoid, 4.50-6.0 ×4.0-5.0 µm ..... *Loweomyces fractipes*
                    39. Pores 2–4 per mm; basidiospores short-cylindrical, 5.5-7.0 × 2.5-3.5 µm ..... *Bjerkandera fumosa*
    30. Hyphal system di-trimitic
        40. Generative hyphae with simple septa ..... *Laetiporus gilbertsonii*
        40. Generative hyphae with clamps
            41. Basidiomata perennial, ungulate to applanate, up to 10 × 18 × 10 cm, gray, dark-brown to black; pores 7-10 per mm; basidiospores yellow to rusty brown ..... *Fomes fasciatus*
            41. Basidiomata different shaped
                42. Skeletal hyphae dextrinoid

43. Basidiospores non-dextrinoid to slightly-dextrinoid, yellowish-brown with slightly thickened walls and non-truncate, (3.6-)3.8-5.0 × 2.2-3.2(-3.4) µm ..... *Abundisporus subflexibilis*
43. Basidiospores strongly dextrinoid, hyaline and truncate, 12-17(-20) × 7.0-10(-11) µm ..... *Truncospora ochroleuca*

42. Skeletal hyphae non-dextrinoid
44. Basidiospores thick-walled and dextrinoid in mass ..... *Perenniporiella neofulva*
44. Basidiospores thin-walled and non-dextrinoid
45. Cystidia present in the trama or hymenium
46. Pileus surface grayish-brown to dark-brown; cystidia cylindrical, embedded apically, up to 15 µm length ..... *Trichaptum sector*
46. Pileus surface in a different color; cystidia larger, up to 100 µm length
47. Pore surface white to ochraceous
48. Pores 5-6 per mm; basidiospores subglobose, 4.0-5.0 × 3.5-4.0 µm ..... *Junghuhnia undigera*
48. Pores 6-7 per mm; basidiospores broadly ellipsoid, 3.6-4.2 × 2.5-3.2 µm ..... *Junghuhnia semisupiniformis*
47. Pore surface pale straw to sulphurous yellow
49. Pore surface sulphurous yellow when fresh, paler when dry; basidiospores 2.6−2.8 × 1.8−2.0 µm ..... *Flaviporus brownii*
49. Pore surface pale tan to pale straw, often darker in older specimens, brown to deep bay when dry; basidiospores 2.5-3.5 × 1.5-2.5 µm ..... *Flaviporus liebmannii*
45. Cystidia absent in the trama or hymenium
50. Context white to cream to golden yellow
51. Chlamydospores presents in the dissepiment edges and cystidia ventricose 9.0-30 × 4.5-7.0 µm ..... *Echinoporia inermis*
51. Chlamydospores absent and cystidia different shaped
52. Hyphal system dimitic
53. Basidiomata yellow to brownish yellow
54. Pores 7-8 per mm ..... *Flaviporus subhydrophilus*
54. Pores 1-2 per mm ..... *Antrodiella luteocontexta*
53. Basidiomata white to pale brown
55. Basidiospores globose to broadly ellipsoid
56. Pores 7-10 per mm; skeletal hyphae densely agglutinated and difficult to separate in the dense context and the trama ..... *Flaviporus hydrophilus*
56. Pores 2-6 per mm; skeletal hyphae non-agglutinated
57. Irregular pores 2-4 per mm ..... *Antrodiella angulatopora*
57. Regular pores 4-6(-7) per mm ..... *Antrodiella semisupina*
55. Basidiospores allantoid to cylindrical
58. Pores 5-8 per mm; basidiospores allantoid, 4.0-6.0(-6.5) × 1.5-2.0 µm ..... *Antrodiella duracina*
58. Pores 1-3 per mm; basidiospores cylindrical, (8.0-)9.5-14 × 3.5-5.0(-6.0) µm ..... *Antrodia albida*
52. Hyphal system trimitic
59. Skeletal hyphae golden yellow ..... *Coriolopsis rigida*
59. Skeletal hyphae hyaline

60. Pores angular, 2-4 per mm; basidiospores 6.5-8.0 × 2.0-3.0(-3.5) µm .... *Trametes villosa*
60. Pores circular, above 4 per mm; basidiospores smaller
61. Pores 4-5 per mm; basidiospores cylindrical, 5.0-6.0 × 1.5-2.0 µm .... *Trametes versicolor*
61. Pores 5–8 per mm; basidiospores ellipsoid, (3.0-)3.5-4.5(-5.0) × 2.5-3.0(-3.5) µm .... *Trametes membranacea*

50. Context brown to reddish-orange
62. Basidiomata orange to reddish-orange ..... *Pycnoporus sanguineus*
62. Basidiomata of a different color, never orange
63. Crust dark-reddish to black on the pileus surface ..... *Fomitella supina*
63. Crust absent on the pileus surface
64. Skeletal hyphae dark fuliginous-brown to dark golden
65. Basidiospores ornamented, double walled ..... *Ganoderma australe*
65. Basidiospores smooth, simple walled ..... *Coriolopsis caperata*
64. Skeletal hyphae hyaline to yellowish
66. Pores irregular, sinuous to daedaleoid, pores 1-2 per mm; dendrohyphidia present; basidiospores 5.0-7.0 × 2.0-2.5 µm ..... *Fuscocerrena portoricensis*
66. Pores regular, pores above 2 per mm; dendrohyphidia absent
67. Pores 2–3 per mm; hyphal pegs absent; basidiospores cylindrical, 7.0-10 × 2.5-4.0 µm ..... *Antrodia malicola*
67. Pores 8-10 per mm; hyphal pegs present; basidiospores allantoid, 4.0-5.0 × 0.5-1.0 µm ... *Skeletocutis nivea*

Table 1. Polypores and similar poroid genera recorded for the first time from Parque Estadual da Serra do Mar – Núcleo Santa Virgínia, São Paulo State, Brazil.

Order/Family/ species	Voucher
Polyporales	
Fomitopsidaceae Jülich	
Antrodia aff. *albida* (Fr.) Donk	SP466098, SP466123, SP466150, SP466159, SP466220, SP466237
Antrodia malicola (Berk. & M.A. Curtis) Donk	SP466077
Laetiporus gilbertsonii Burds.	SP466044, SP466045, SP466046
Ganodermataceae (Donk) Donk	
Amauroderma sprucei (Pat.) Torrend	SP466165
Ganoderma australe (Fr.) Pat.	SP445969, SP466059, SP466071, SP466137, SP466139, SP466199
Meripilaceae Jülich	
Henningsia brasiliensis (Speg.) Speg.	SP466163, SP466170, SP466177, SP466179
Rigidoporus crocatus (Pat.) Ryvarden	SP446270
Rigidoporus lineatus (Pers.) Ryvarden	SP466064, SP466148, SP466154, SP466166, SP466175, SP466185, SP466196
Rigidoporus microporus (Sw.) Overeem	SP466114, SP466138
Rigidoporus undatus (Pers.) Donk	SP466099
Rigidoporus vinctus (Berk.) Ryvarden	SP466155, SP466157, SP466198, SP466202, SP466211
Meruliaceae Rea	
Bjerkandera fumosa (Pers.) P. Karst.	SP466241
Ceriporia xylostromatoides (Berk.) Ryvarden	SP466142
Flaviporus brownii (Humb.) Donk	SP446265
Flaviporus hydrophilus (Berk. & M.A.Curtis) Ginns	SP466134

continue

Table 1 (continuation)

Order/Family/ species	Voucher
Flaviporus liebmannii (Fr.) Ginns	SP466065, SP466072, SP466074, SP466132, SP466171, SP466172
Flaviporus subhydrophilus (Speg.) Rajchenb. & J.E. Wright	SP446262, SP446274, SP466129
Flaviporus subundatus (Murrill) Ginns	SP446276
Loweomyces fractipes (Berk. & M.A. Curtis) Jülich	SP466167
Phanerochaetaceae Jülich	
Antrodiella angulatopora Ryvarden	SP445968, SP445970, SP446269, SP466230, SP466236
Antrodiella duracina (Pat.) I. Lindblad & Ryvarden	SP445966, SP446268, SP466086, SP466093, SP466149, SP466162
Antrodiella semisupina (Berk. & M.A. Curtis) Ryvarden	SP466076
Junghuhnia carneola (Bres.) Rajchenb.	SP446259
Junghuhnia nitida (Pers.) Ryvarden	SP445975
Junghuhnia semisupiniformis (Murrill) Ryvarden	SP446264
Junghuhnia undigera (Berk. & M.A. Curtis) Ryvarden	SP466118, SP466223, SP466228, SP466235, SP466247
Polyporaceae Corda	
Abundisporus subflexibilis (Berk. & M.A. Curtis) Parmasto	SP466116
Cinereomyces dilutabilis (Log.-Leite & J. E. Wright) Miettinen	SP446258, SP466181
Coriolopsis caperata (Berk.) Murrill	SP466169
Coriolopsis rigida (Berk. & Mont.) Murrill	SP466087, SP466103, SP466126, SP466130, SP466147, SP466160, SP466194
Dichomitus cavernulosus (Berk.) Masuka & Ryvarden	SP466188, SP466238
Dichomitus cylindrosporus Ryvarden	SP466096, SP446261
Dichomitus setulosus (Henn.) Masuka & Ryvarden	SP466242
Fomes fasciatus (Sw.) Cooke	SP445965, SP466083, SP466173
Fomitella supina (Sw.) Ryvarden	SP445964, SP445967, SP466067, SP466082, SP466174, SP466195, SP466251
Fuscocerrena portoricensis (Fr.) Ryvarden	SP466107, SP466115
Grammothelopsis puiggarii (Speg.) Rajchenb. & J.E. Wrigh	SP466120
Pachykytospora alabamae (Berk. & Cooke) Ryvarden	SP466128
Perenniporiella neofulva (Lloyd) Decock & Ryvarden	SP466219
Polyporus ciliatus Fr.	SP466119, SP466122, SP466135, SP466141
Polyporus dictyopus Mont.	SP466145, SP466190, SP466209, SP466229, SP466250
Polyporus grammocephalus Berk.	SP466187
Polyporus guianensis Mont.	SP466207
Polyporus tenuiculus (P. Beauv.) Fr.	SP466060, SP466151, SP466183, SP466197, SP466201
Pycnoporus sanguineus (L.) Murrill	SP445972, SP445973
Skeletocutis nivea (Jungh.) Jean Keller	SP446267
Spongipellis caseosus (Pat.) Ryvarden	SP466117
Tinctoporellus epimiltinus (Berk. & Broome) Ryvarden	SP445977, SP466068, SP466178
Trametes membranacea (Sw.) Kreisel	SP466127
Trametes versicolor (L.) Lloyd	SP466225
Trametes villosa (Sw.) Kreisel	SP445974, SP445976, SP466111
Truncospora ochroleuca (Berk.) Ryvarden	SP466218, SP466245

continue

Table 1 (continuation)

Order/Family/ species	Voucher
Rickenellaceae Vizzini	
Sidera lenis (P. Karst.) Miettinen	SP466075, SP466095, SP466097, SP466101, SP466105, SP466109, SP466110, SP466158, SP466182, SP466186, SP466191, SP466203, SP466215, SP466221, SP466243
Hymenochaetales	
Schizoporaceae Jülich	
Echinoporia inermis G. Coelho	SP466090, SP466152, SP466232
Schizopora flavipora (Berk. & M.A. Curtis *ex* Cooke) Ryvarden	SP466062, SP466063, SP466091, SP466140, SP466143, SP466146, SP466156, SP466168, SP466184, SP466222, SP466231
Schizopora paradoxa (Schrad.) Donk	SP466125, SP466212, SP466213, SP466234
Incertae sedis	
Trichaptum sector (Ehrenb.) Kreisel	SP445971, SP466084
Trechisporales	
Hydnodontaceae Jülich	
Trechispora regularis (Murrill) Liberta	SP466193, SP466224, SP466226

Figure 1-13. Fresh basidiomata. 1-3. *Antrodiella luteocontexta*. 4. *Ceriporiopsis flavilutea*. 5. *Dichomitus campestris*. 6. *Diplomitoporus navisporus*. 7-8. *Flaviporus venustus*. 9. *Grammothele fuligo*. 10. *Oxyporus latemarginatus*. 11. *Postia subcaesia*. 12. *Postia tephroleuca*. 13. *Postia undosa*. Scale bar = 1 cm.

All the 68 collections represent the first record to the PESM. An identification key and a table including the other specimens recorded for the first time in the locality are presented (table 1).

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