

Updates on the knowledge of arbuscular mycorrhizal fungi (*Glomeromycotina*) in the Atlantic Forest biome – an example of very high species richness in Brazilian biomes

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ABSTRACT — The Atlantic Forest has historically one of the most sampled biomes on Arbuscular Mycorrhizal Fungi (AMF) diversity in Brazil. Due to the high number of studies published in recent decades, the number of species records available in the literature, including new species for science, has increased substantially. In an effort to monitor recent advances, this paper cites additions to the AMF richness in the Atlantic Forest and provides an updated checklist. We highlight the Atlantic Forest as the most representative Brazilian biome, as is to be expected for a global diversity hotspot. Since the Atlantic Forest is the Brazilian area most threatened by human impact, most particularly forest fragmentation, this checklist underscores the importance of developing and maintaining conservation policies for the remainder of Brazil.

KEY WORDS — mycorrhizae, taxonomy, forest fragmentation, conservation

Introduction

Glomeromycotina subphylum (*Mucoromycota*) is a monophyletic clade currently represented by about 300 species distributed in three classes, five orders, 15 families and 38 genera (Oehl et al. 2011; Goto et al. 2012a; Błaszowski 2012; Błaszowski et al. 2014; Spatafora et al. 2016). This subphylum comprises the Arbuscular Mycorrhizal Fungi (AMF), symbiotic mutualistic organisms associated with about 80% terrestrial plants species and *Geosiphon pyriformis* (Kütz.) F. Wettst., a unique species that forms association with *Nostoc* (Wettstein 1915; Smith & Read 2008). The AMF are important biotic soil components since they provide increase in soil nutrient uptake, notably phosphorus, which is the most limiting nutrient for agricultural production in the tropics (Smith & Read 2008; Souza et al. 2007).

Brazil is one of the most biodiverse countries in the world (Maia et al. 2015), promising great biological potential (Mittermeier et al. 2005). The country comprises six biomes with two biodiversity hotspots: Cerrado (Brazilian savanna) and Atlantic Forest. Studies on AMF diversity have been carried out in different Brazilian biomes and the result reveals a high species richness (more than 50% of the species described for the subphylum) (Goto & Jobim 2017; Jobim & Goto 2016).

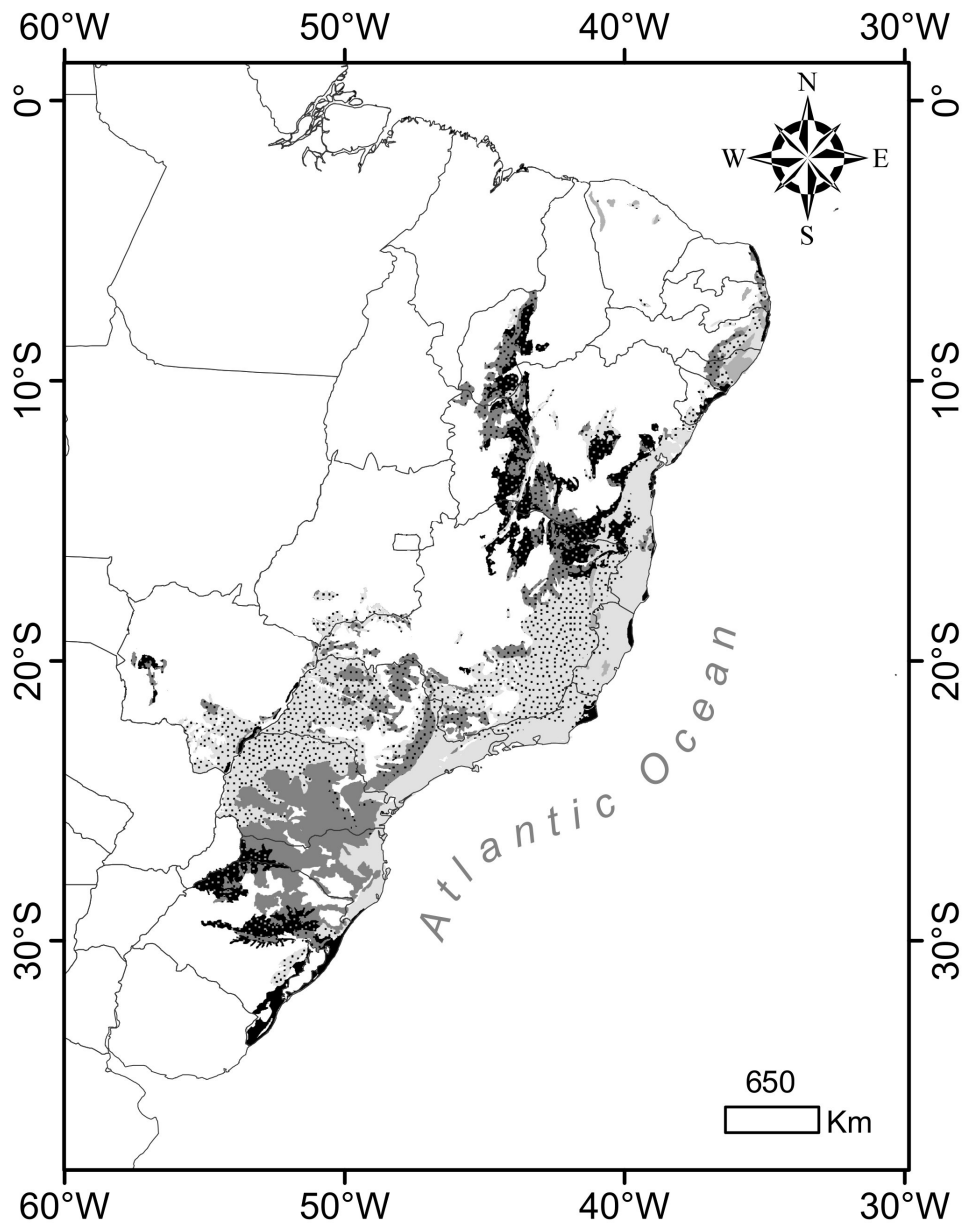
The Atlantic Forest was the first Brazilian biome studied for AMF diversity (Trufem, 1995). It consists of the second largest neotropical forest and develops on the mountains ranging along the entire Brazilian Atlantic coast (Zangaro & Moreira 2010). The biome encompasses many vegetation forms such as Altitude Vegetation, Seasonal and Ombrophilous Forests and Pioneer Formations (IBGE, 1997) (Fig. 1).

Zangaro & Moreira (2010) presented 78 AMF species records for the Atlantic Forest. However, since then the recorded number of species has increased as a result of diversity surveys and descriptions of new taxa to the subphylum. In order to outline the recent research advances made in this important Brazilian biome, we offer this updated checklist of AMF species recorded for the Atlantic Forest and highlight the new taxa to science.

Materials and methods

The bibliographies consulted to provide this checklist were Moreira et al. (2009), Oliveira et al. (2009), Souza et al. (2010), Zangaro & Moreira (2010), Goto et al. (2010a, 2011, 2012a,b, 2013), Santos & Carrenho (2011), Mello et al. (2012), Silva et al. (2012, 2014, 2015a,b), Bonfim et al. (2013), Souza et al. (2013), Stürmer et al. (2013), Błaszowski et al. (2014), Novais et al. (2014), Pereira et al. (2014, 2015, 2016), Bonfim et al. (2015), Błaszowski et al. (2015), Camara et al. (2016), Jobim & Goto (2016), Goto et al. (2016), Moreira et al. (2016), Assis et al. (2016) and Silva et al. (2017).

The biological classification system applied in this checklist was based on Oehl et al. (2011, 2015), Błaszowski (2012, 2014), Goto et al. (2012a) and Marinho et al. (2014).



Legend

-  Altitude Vegetation (Cerrado Enclaves and Zone of Ecological Tension)
-  Pioneer Formation (Restinga Forest, Mangrove, Saline Vegetation, Lacustrine–fluvial Vegetation)
-  Seasonal Semi–deciduous Forest
-  Seasonal Deciduous Forest
-  Mixed Ombrophilous Forest
-  Open Ombrophilous Forest
-  Dense Ombrophilous Forest

FIG. 1. Map of the phytophysiognomies of the Atlantic Forest Biome (IBGE 1997).

Results

A total of 128 species were recorded in the Atlantic Forest of Brazil of which 18 species were originally described for the biome (*Acaulospora spinulifera*, *A. reducta*, *A. endographis*, *A. herrerae*, *A. ignota*, *A. papillosa*, *Dentiscutata colliculosa*, *Fuscutata aurea*, *F. heterogama*, *F. rubra*, *Gigaspora ramisporophora*, *Glomus trufemii*, *Intraornatospora intraornata*, *Orbispora pernambucana*, *Paradentiscutata bahiana*, *P. maritima*, *Racocetra tropicana* and *Rhizoglomus natalense*). Moreover, a new family (*Intraornatosporaceae*) and three genera (*Intraornatospora*, *Orbispora*, and *Paradentiscutata*) were also described for the biome.

Acaulosporaceae

Acaulospora bireticulata F.M. Rothwell & Trappe, Mycotaxon 8: 472. 1979.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Seasonal Semi-deciduous Forest.

Acaulospora cavernata Błaszcz., Cryptogamic Botany 1: 204. 1989.

Habitat: Restinga.

Acaulospora colossica P.A. Schultz, Bever & J.B. Morton, Mycologia 91: 677. 1999.

Habitat: Seasonal Semi-deciduous Forest.

Acaulospora delicata C. Walker, C.M. Pfeiffer & Bloss, Mycotaxon 25: 622. 1986.

Habitat: uninformed.

Acaulospora denticulata Sieverd. & S. Toro, Angewandte Botanik 61: 217. 1987.

Habitat: Seasonal Semi-deciduous Forest and Restinga.

Acaulospora endographis B.T. Goto, Mycotaxon 123: 405. 2013.

Habitat: Dense Ombrophilous Forest

Acaulospora elegans Trappe & Gerd., Mycologia Memoirs 5: 34. 1974.

Habitat: Dense Ombrophilous Forest, Seasonal Semi-deciduous Forest and Restinga.

Acaulospora excavata Ingleby & C. Walker, Mycotaxon 50: 100. 1994.

Habitat: Dense Ombrophilous Forest.

Acaulospora foveata Trappe & Janos, Mycotaxon 15: 516. 1982.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Acaulospora herrerae Furrzola, B.T. Goto, G.A. Silva, Sieverd. & Oehl, Mycological Progress 97: 405. 2012.

Habitat: Restinga.

Acaulospora ignota Błaszcz., Góralska, Chwat & B.T. Goto, Mycological Progress 14: 4. 2015.

Habitat: Restinga.

Acaulospora koskei Błaszcz., Mycological Research 99: 237. 1995.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Semi-deciduous Seasonal Forest.

Acaulospora lacunosa J.B. Morton, Mycologia 78: 643. 1986.

Habitat: Restinga, Semi-deciduous Seasonal Forest, Dense Ombrophilous Forest, Mixed Ombrophilous Forest.

Acaulospora laevis Gerd. & Trappe, Mycologia Memoirs 5: 33. 1974.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Acaulospora longula Spain & N.C. Schenck, Mycologia 76: 689. 1984.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Acaulospora mellea Spain & N.C. Schenck, Mycologia 76: 689. 1984.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

- Acaulospora morrowiae* Spain & N.C. Schenck, Mycologia 76: 692. 1984.
Habitat: Mangrove, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.
- Acaulospora papillosa* C.M.R. Pereira & Oehl, Phytotaxa 260: 16. 2016.
Habitat: Dense Ombrophilous Forest.
- Acaulospora reducta* Oehl, B.T. Goto & C.M.R. Pereira, Mycotaxon 61: 219. 2015.
Habitat: Restinga.
- Acaulospora rehmi* Sieverd. & S. Toro, Angewandte Botanik 61: 219. 1987.
Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.
- Acaulospora rugosa* J.B. Morton, Mycologia 78: 645. 1986.
Habitat: Dense Ombrophilous Forest.
- Acaulospora scrobiculata* Trappe, Mycotaxon 6: 363. 1977.
Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.
- Acaulospora sieverdingii* Oehl, Sýkorová, Błaszczak & G.A. Silva, Journal of Applied Botany and Food Quality 84: 48. 2011.
Habitat: Restinga.
- Acaulospora spinosa* C. Walker & Trappe, Mycotaxon 12: 515. 1981.
Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.
- Acaulospora spinosissima* Oehl, Palenz., Sánchez-Castro, Tchabi, Hount. & G.A. Silva, Sydowia 66: 34. 2014.
Habitat: Restinga, Dense Ombrophilous Forest.
- Acaulospora spinulifera* Pontes, Santos, Pereira, Silva, Maia & Oehl, Nova Hedwigia 105: 221. 2017.
Habitat: Dense Ombrophilous Forest.
- Acaulospora splendida* Sieverd., Chaverri & I. Rojas, Mycotaxon 33: 252. 1988.
Habitat: uninformed.
- Acaulospora tuberculata* Janos & Trappe, Mycotaxon 15: 519. 1982.
Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.
- Kuklospora colombiana* (Spain & N.C. Schenck) Oehl & Sieverd., Journal of Applied Botany 80: 74. 2006.
≡ *Entrophospora colombiana* Spain & N.C. Schenck, Mycologia 76: 693. 1984.
≡ *Acaulospora colombiana* (Spain & N.C. Schenck) Kaonongbua, J.B. Morton & Bever, Mycologia 102: 1501. 2010.
Habitat: Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.
- Kuklospora kentinensis* (C.G. Wu & Y.S. Liu) Oehl & Sieverd., Journal of Applied Botany 80: 74. 2006.
≡ *Entrophospora kentinensis* C.G. Wu & Y.S. Liu, Mycotaxon 53: 287. 1995.
≡ *Acaulospora kentinensis* (C.G. Wu & Y.S. Liu) Kaonongbua, J.B. Morton & Bever, Mycologia 102: 1501. 2010.
Habitat: Mixed Ombrophilous Forest.
- Ambisporaceae**
- Ambispora appendicula* (Spain, Sieverd., N.C. Schenck) C. Walker, Mycological Research 112: 298. 2008.
≡ *Acaulospora appendicula* Spain, Sieverd. & N.C. Schenck, Mycologia 76: 686. 1984.
≡ *Appendicispora appendicula* (Spain, Sieverd. & N.C. Schenck) Spain, Oehl & Sieverd., Mycotaxon 97: 170. 2006.
≡ *Paracaulospora appendicula* (Spain, Sieverd. & N.C. Schenck) S.P. Gautam & U.S. Patel, The Mycorrhizae: Diversity, Ecology and Applications: 5. 2007.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Ambispora fecundispora (N.C. Schenck & G.S. Sm.) C. Walker, *Mycological Research* 112: 298. 2008.

≡ *Glomus fecundisporum* N.C. Schenck & G.S. Sm., *Mycologia* 74: 81. 1982.

≡ *Appendicispora fecundispora* (N.C. Schenck & G.S. Sm.) C. Walker, Vestberg & A. Schüßler, *Mycological Research* 111: 254. 2007.

Habitat: Restinga.

Ambispora gerdemannii (S.L. Rose, B.A. Daniels & Trappe) C. Walker, Vestberg & A. Schüßler, *Mycological Research* 111: 148. 2006.

≡ *Glomus gerdemannii* S.L. Rose, B.A. Daniels & Trappe, *Mycotaxon* 8: 297. 1979.

≡ *Archaeospora gerdemannii* (S.L. Rose, B.A. Daniels & Trappe) J.B. Morton & D. Redecker, *Mycologia* 93: 186. 2001.

≡ *Appendicispora gerdemannii* (S.L. Rose, B.A. Daniels & Trappe) Spain, Oehl & Sieverd., *Mycotaxon* 97: 174. 2006.

Habitat: Mixed Ombrophilous Forest and Restinga.

Ambispora jimgerdemannii (Spain, Oehl & Sieverd.) C. Walker, *Mycological Research* 112: 298. 2008.

≡ *Acaulospora gerdemannii* N.C. Schenck & T.H. Nicolson, *Mycologia* 71: 193. 1979.

≡ *Appendicispora jimgerdemannii* Spain, Oehl & Sieverd., *Mycotaxon* 97: 176. 2006.

Habitat: Dense Ombrophylus Forest, Mixed Ombrophilous Forest, Restinga and Seasonal Semi-deciduous Forest.

Ambispora leptoticha (N.C. Schenck & T.H. Nicolson) Walker, Vestberg & A. Schüßler, *Mycological Research* 111: 148. 2006.

≡ *Glomus leptotichum* N.C. Schenck & G.S. Sm., *Mycologia* 74: 82. 1982.

≡ *Archaeospora leptoticha* (N.C. Schenck & G.S. Sm.) J.B. Morton & D. Redecker, *Mycologia* 93: 184. 2001.

≡ *Pseudoglomus leptotichum* (N.C. Schenck & G.S. Sm.) S.P. Gautam & U.S. Patel, *The Mycorrhizae: Diversity, Ecology and Applications*: 10. 2007.

≡ *Appendicispora leptoticha* (N.C. Schenck & G.S. Sm.) C. Walker, Vestberg & A. Schüßler, *Mycological Research* 111: 255. 2007.

Habitat: Dense Ombrophylus Forest, Mixed Ombrophilous Forest, Restinga and Seasonal Semi-deciduous Forest.

Archaeosporaceae

Archaeospora trappei (R.N. Ames & Linderman) J.B. Morton & D. Redecker, *Mycologia* 93: 183. 2001.

≡ *Acaulospora trappei* R.N. Ames & Linderman, *Mycotaxon* 3: 566. 1976.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest.

Archaeospora myriocarpa (Spain, Sieverd. & N.C. Schenck) Oehl, G.A. Silva, B.T. Goto & Sieverd., *Mycotaxon* 117: 430. 2011.

≡ *Acaulospora myriocarpa* Spain, Sieverd. & N.C. Schenck, *Mycotaxon* 25: 112. 1986.

Habitat: uninformed.

Dentiscutataceae

Dentiscutata biornata (Spain, Sieverd. & S. Toro) Sieverd., F.A. Souza & Oehl, *Mycotaxon* 106: 342. 2009.

≡ *Scutellospora biornata* Spain, Sieverd. & S. Toro, *Mycotaxon* 35: 220. 1989.

Habitat: Restinga.

Dentiscutata cerradensis (Spain & J. Miranda) Sieverd., F.A. de Souza & Oehl, *Mycotaxon* 106: 342. 2009.

≡ *Scutellospora cerradensis* Spain & J. Miranda, *Mycotaxon* 60: 130. 1996.

Habitat: Mixed Ombrophilous Forest and Restinga.

Dentiscutata colliculosa B.T. Goto & Oehl, *Nova Hedwigia* 90: 385. 2010.

Habitat: Restinga.

Dentiscutata hawaiiensis (Koske & Gemma) Sieverd., F.A. de Souza & Oehl, *Mycotaxon* 106: 342. 2009.

≡ *Scutellospora hawaiiensis* Koske & Gemma, *Mycologia* 87: 678. 1995.

Habitat: Restinga.

Dentiscutata heterogama (T.H. Nicolson & Gerd.) Sieverd., F.A. de Souza & Oehl, Mycotaxon 106: 342. 2009.

≡ *Endogone heterogama* T.H. Nicolson & Gerd., Mycologia 60: 319. 1968.

≡ *Gigaspora heterogama* (T.H. Nicolson & Gerd.) Gerd. & Trappe, Mycologia Memoirs 5: 31. 1974.

≡ *Scutellospora heterogama* (T.H. Nicolson & Gerd.) C. Walker & F.E. Sanders, Mycotaxon 27: 180. 1986.

Habitat: Mixed Ombrophilous Forest and Semideciduos Seasonal Forest

Dentiscutata nigra (J.F. Redhead) Sieverd., F.A. de Souza & Oehl, Mycotaxon 106: 342. 2009.

≡ *Gigaspora nigra* J.F. Redhead, Mycologia 71: 187. 1979.

≡ *Scutellospora nigra* (J.F. Redhead) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Dentiscutata reticulata (Koske, D.D. Miller & C. Walker) Sieverd., F.A. de Souza & Oehl, Mycotaxon 106: 342. 2009.

≡ *Gigaspora reticulata* Koske, D.D. Mill. & C. Walker, Mycotaxon 16: 429. 1983.

≡ *Scutellospora reticulata* (Koske, D.D. Mill. & C. Walker) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: uninformed.

Dentiscutata scutata (C. Walker & Dieder.) Sieverd., F.A. de Souza & Oehl, Mycotaxon 106: 342. 2009.

≡ *Scutellospora scutata* C. Walker & Dieder., Mycotaxon 35: 357. 1989.

Habitat: Restinga.

Fuscutata aurea Oehl, C.M. Mello & G.A. Silva, Nova Hedwigia 95: 269. 2012.

Habitat: Dense Ombrophilous Forest.

Fuscutata heterogama Oehl, F.A. Souza. L.C. Maia & Sieverd., Mycotaxon 106: 344. 2009.

Habitat: Dense Ombrophilous Forest and Restinga.

Fuscutata rubra (Stürmer & J.B. Morton) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 347. 2009.

≡ *Scutellospora rubra* Stürmer & J.B. Morton, Mycological Research 103: 951. 1999.

Habitat: Restinga and Semi-deciduous Seasonal Forest.

Fuscutata savannicola (R.A. Herrera & Ferrer) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 347. 2009.

≡ *Gigaspora savannicola* R.A. Herrera & Ferrer, Revista del Jardín Botánico Nacional Habana 1: 57. 1981.

≡ *Scutellospora savannicola* (R.A. Herrera & Ferrer) C. Walker & F.E. Sanders, Mycotaxon 27: 180. 1986.

Habitat: Restinga.

Quatunica erythropus (Koske & C. Walker) F.A. Souza, Sieverd. & Oehl, Mycotaxon 106: 348. 2009.

≡ *Gigaspora erythropus* Koske & C. Walker, Mycologia 76: 250. 1984, as "erythropha".

≡ *Scutellospora erythropha* (Koske & C. Walker) C. Walker & F.E. Sanders, Mycotaxon 27: 181, 1986, as "erythropha".

Habitat: Dense Ombrophilous Forest and Restinga.

Diversisporaceae

Corymbiglomus globiferum (Koske & C. Walker) Błaszk. & Chwat, Acta Mycologica 48: 99. 2013.

Habitat: Restinga.

Corymbiglomus tortuosum (N.C. Schenck & G.S. Sm.) Błaszk. & Chwat, Acta Mycologica, 48: 99. 2013.

≡ *Glomus tortuosum* N.C. Schenck & G.S. Sm., Mycologia 74: 83. 1982.

Habitat: Restinga.

Diversispora eburnea (L.J. Kenn., J.C. Stutz & J.B. Morton) C. Walker & A. Schüßler, The *Glomeromycota*: a species list with new families and new genera: 43. 2010.

≡ *Glomus eburneum* L.J. Kenn., J.C. Stutz & J.B. Morton, Mycologia 91: 1084. 1999.

Habitat: Dense Ombrophilous Forest.

Diversispora spurca (C.M. Pfeifer, C. Walker & Bloss) C. Walker & Schüßler, Mycological Research 108: 982. 2004.

≡ *Glomus spurcum* C.M. Pfeiff., C. Walker & Bloss, *Mycotaxon* 59: 374. 1996.

Habitat: uninformed.

Diversispora trimurales (Koske & Halvorson) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 43. 2010.

≡ *Glomus trimurales* Koske & Halvorson, *Mycologia* 81: 930. 1990.

Habitat: Restinga.

Diversispora versiformis (P. Karst.) Oehl, G.A. Silva & Sieverd., *Mycotaxon* 116: 110. 2011.

≡ *Endogone versiformis* P. Karst.: 39. 1884.

≡ *Glomus versiforme* (P. Karst.) S.M. Berch, *Canadian Journal of Botany* 61: 2614. 1983.

Habitat: Semi-deciduous Seasonal Forest.

Redeckera fulva (Berk. & Broome) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 44. 2010.

≡ *Paurocotylis fulva* Berk. & Broome, *Botanical Journal of the Linnean Society* 14: 137. 1873.

≡ *Endogone fulva* (Berk. & Broome) Pat., *Bulletin de la Société Mycologique de France* 19: 341. 1903.

≡ *Glomus fulvum* (Berk. & Broome) Trappe & Gerd., *Mycologia Memoirs* 5: 59. 1974.

Habitat: Restinga.

Entrophosporaceae

Entrophospora infrequens (I.R. Hall) R.N. Ames & R.W. Schneid., *Mycotaxon* 8: 348. 1979.

≡ *Glomus infrequens* I.R. Hall, *Transactions of the British Mycological Society* 68: 345. 1977.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Claroideoglomus claroideum (N.C. Schenck & G.S. Sm.) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*

: 21. 2010.

≡ *Glomus claroideum* N.C. Schenck & G.S. Sm., *Mycologia* 74: 84. 1982.

Habitat: Dense Ombrophilous Forest and Semi-deciduous Seasonal Forest.

Claroideoglomus etunicatum (W.N. Becker & Gerd.) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 22. 2010.

≡ *Glomus etunicatum* W.N. Becker & Gerd., *Mycotaxon* 6: 29. 1977.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Viscospora viscosa (T.H. Nicolson) Sieverd., Oehl & F.A. Souza, *Mycotaxon* 116: 108. 2011.

≡ *Glomus viscosum* T.H. Nicolson, *Mycological Research* 99: 1502. 1995.

Habitat: Dense Ombrophilous Forest and Semi-deciduous Seasonal Forest.

Gigasporaceae

Gigaspora albida N.C. Schenck & G.S. Sm., *Mycologia* 74: 85. 1982.

Habitat: Semi-deciduous Seasonal Forest and Restinga.

Gigaspora decipiens I.R. Hall & L.K. Abbott, *Transactions of the British Mycological Society* 83: 204. 1984.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Gigaspora gigantea (T.H. Nicholson & Gerd.) Gerd. & Trappe, *Mycologia Memoirs* 5: 29. 1974.

≡ *Endogone gigantea* T.H. Nicholson & Gerd., *Mycologia* 60: 321. 1968.

Habitat: Mangrove, Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Gigaspora margarita W.N. Becker & I.R. Hall, *Mycotaxon* 4: 155. 1976.

Habitat: Mangrove, Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Gigaspora ramisporophora Spain, Sieverd. & N.C. Schenck, Mycotaxon 34: 668. 1989.

Habitat: Restinga.

Gigaspora rosea T.H. Nicolson & N.C. Schenck, Mycologia 71: 190. 1979.

Habitat: Restinga and Semi-deciduous Seasonal Forest.

Glomeraceae

Dominikia aurea (Oehl & Sieverd.) Błaszk., Chwat, G.A. Silva & Oehl, Nova Hedwigia 101: 71. 2015.

Habitat: Restinga.

Funneliformis geosporum (T.H. Nicolson & Gerd.) C. Walker & A. Schüßler, The *Glomeromycota*: a species list with new families and new genera: 14. 2010.

≡ *Endogone macrocarpa* var. *geospora* T.H. Nicolson & Gerd., Mycologia 60 (2): 318. 1968.

≡ *Glomus macrocarpum* var. *geosporum* (T.H. Nicolson & Gerd.) Gerd. & Trappe, Mycologia Memoirs 5: 55. 1974.

≡ *Glomus geosporum* (T.H. Nicolson & Gerd.) C. Walker, Mycotaxon 15: 56. 1982.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Funneliformis halonatus (S.L. Rose & Trappe) Oehl, G.A. Silva & Sieverd., Mycotaxon 116: 102. 2011.

≡ *Glomus halonatum* S.L. Rose & Trappe, Mycotaxon 10: 413. 1980.

Habitat: Mangrove and Restinga.

Funneliformis monosporus (Gerd. & Trappe) Oehl, G.A. Silva & Sieverd., Mycotaxon 116: 102. 2011.

≡ *Glomus monosporum* Gerd. & Trappe, Mycologia Memoirs 5: 41. 1974.

Habitat: Dense Ombrophilous Forest and Restinga.

Funneliformis mosseae (T.H. Nicolson & Gerd.) C. Walker & A. Schüssler, The *Glomeromycota*: a species list with new families and new genera: 13. 2010.

≡ *Endogone mosseae* T.H. Nicolson & Gerd., Mycologia 60: 314. 1968.

≡ *Glomus mosseae* (T.H. Nicolson & Gerd.) Gerd. & Trappe, Mycologia Memoirs 5: 40. 1974.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Funneliformis vesiculiferum (Thaxt.) C. Walker & A. Schüßler, The *Glomeromycota*: a species list with new families and new genera: 14. 2010.

≡ *Endogone vesiculifera* Thaxt., Proceedings of the American Academy of Arts and Sciences 57: 309. 1922.

≡ *Glomus vesiculiferum* (Thaxt.) Gerd. & Trappe, Mycologia Memoirs 5: 49. 1974.

Habitat: Restinga.

Glomus ambisporum G.S. Sm. & N.C. Schenck, Mycologia 77: 566. 1985.

Habitat: Mixed Ombrophilous Forest and Restinga.

Glomus arboreense McGee, Transactions of the British Mycological Society 87: 123. 1986.

Habitat: uninformed.

Glomus australe (Berk.) S.M. Berch, Canadian Journal of Botany 61: 2611. 1983.

≡ *Endogone australis* Berk., Botany of the Antarctic Voyage. III Flora Tasmaniae. 2: 282. 1859.

Habitat: uninformed.

Glomus botryoides F.M. Rothwell & Victor, Mycotaxon 20: 163. 1984.

Habitat: Semi-deciduous Seasonal Forest.

Glomus brohultii R.A. Herrera, Ferrer & Sieverd.: J. Appl. Bot. 77: 37. 2003.

Habitat: Mangrove, Dense Ombrophilous Forest and Restinga.

Glomus formosanum C.G. Wu & Z.C. Chen, Taiwania 31: 71. 1986.

Habitat: Semi-deciduous Seasonal Forest.

Glomus glomerulatum Sieverd., Mycotaxon 29: 74. 1987.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Glomus heterosporum G.S. Sm. & N.C. Schenck, Mycologia 77: 567. 1985.

Habitat: Dense Ombrophilous Forest.

Glomus maculosum D.D. Mill. & C. Walker, Mycotaxon 25: 218. 1986.

Habitat: Mixed Ombrophilous Forest.

Glomus macrocarpum Tul. & C. Tul., Giornale Botanico Italiano 2: 63. 1845.

≡ *Glomus macrocarpus* Tul. & C. Tul. 1845.

≡ *Endogone macrocarpa* (Tul. & C. Tul.) Tul. & C. Tul., Fungi Hypogaei: Histoire et Monographie des Champignons Hypogés: 182, t. 20:1. 1851, var. *macrocarpa*.

= *Paurocotylis fulva* var. *zealandica* Cooke, Grevillea 8: 59. 1879, as “*zealandica*”.

= *Endogone pampaloniana* Bacc., G. bot. ital.: 79. 1903.

= *Endogone guttulata* E. Fisch., Berichte Schweiz bot. Ges.: 13. 1923.

= *Endogone nuda* Petch, Annals of the Royal Botanic Gardens Peradeniya 9: 322. 1925.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Glomus microcarpum Tul. & C. Tul., Giornale Botanico Italiano 2: 63. 1845.

≡ *Glomus microcarpus* Tul. & C. Tul. 1845.

≡ *Endogone microcarpa* (Tul. & C. Tul.) Tul. & C. Tul., Fungi Hypogaei: Histoire et Monographie des Champignons Hypogés: 182, t. 20:2.1851.

= *Endogone neglecta* Rodway, Papers and Proceedings of the Royal Society of Tasmania 1917: 107. 1918.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Glomus multicaule Gerd. & B.K. Bakshi, Transactions of the British Mycological Society 66: 340. 1976.

Habitat: uninformed.

Glomus pallidum I.R. Hall, Transactions of the British Mycological Society 68: 343. 1977.

Habitat: Dense Ombrophilous Forest and Restinga.

Glomus pansihalos S.M. Berch & Koske, Mycologia 78: 832. 1986.

Habitat: Mixed Ombrophilous Forest.

Glomus pachycaule (C.G. Wu & Z.C. Chen) Sieverd. & Oehl, Mycotaxon 116: 99. 2011.

≡ *Sclerocystis pachycaulis* C.G. Wu & Z.C. Chen, Taiwania 31: 74. 1986.

Habitat: Restinga.

Glomus reticulatum Bhattacharjee & Mukerji, Sydowia 33: 14. 1980.

≡ *Glomus reticulatus* Bhattacharjee & Mukerji, 1980.

Habitat: Mixed Ombrophilous Forest.

Glomus rubiforme (Gerd. & Trappe) R.T. Almeida & N.C. Schenck, Mycologia 82: 709. 1990.

≡ *Sclerocystis rubiformis* Gerd. & Trappe, Mycologia Memoirs 5: 60. 1974.

= *Sclerocystis indica* Bhattacharjee & Mukerji, Acta Botanica Indica 8: 99. 1980.

Habitat: Mixed Ombrophilous Forest and Restinga.

Glomus spinuliferum Sieverd. & Oehl, Mycotaxon 86: 158. 2003.

Habitat: Restinga.

Glomus tenebrosum (Thaxt.) S.M. Berch, Canadian Journal of Botany 61: 2615. 1983.

≡ *Endogone tenebrosa* Thaxt., Proceedings of the American Academy of Arts and Sciences 57: 314. 1922.

Habitat: Seasonal Semi-deciduous Forest.

Glomus tenue (Greenall) I.R. Hall, Transactions of the British Mycological Society 68: 350. 1977.

≡ *Rhizophagus tenuis* Greenall, New Zealand Journal of Botany 1: 398. 1963.

≡ *Glomus tenuis* (Greenall) I.R. Hall, 1977.

Habitat: Restinga.

Glomus truffemii B.T. Goto, G.A. Silva & F. Oehl, Mycotaxon 120: 3. 2012.

Habitat: Dense Ombrophilous Forest and Restinga.

Rhizoglomus aggregatum (N.C. Schenck & G.S. Sm.) Sieverd., G.A. Silva & Oehl, Mycotaxon 129: 378. 2015.

≡ *Glomus aggregatum* N.C. Schenck & G.S. Sm., Mycologia 74: 80. 1982.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Rhizoglomus clarum (T.H. Nicolson & N.C. Schenck) Sieverd., G.A. Silva & Oehl, Mycotaxon 129: 380. 2015.

- ≡ *Glomus clarum* T.H. Nicolson & N.C. Schenck, *Mycologia* 71: 182. 1979.
- ≡ *Rhizophagus clarus* (T.H. Nicolson & N.C. Schenck) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 19. 2010.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Rhizoglomus diaphanum (J.B. Morton & C. Walker) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 19. 2010.

- ≡ *Glomus diaphanum* J.B. Morton & C. Walker, *Mycotaxon* 21: 433. 1984.

Habitat: Mixed Ombrophilous Forest, Restinga and Semideciduos Seasonal Forest.

Rhizoglomus fasciculatum (Thaxt.) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 380. 2015.

- ≡ *Endogone fasciculata* Thaxt., *Proceedings of the American Academy of Arts and Sciences* 57: 308. 1922.
- ≡ *Glomus fasciculatum* (Thaxt.) Gerd. & Trappe, *Mycologia Memoirs* 5: 51. 1974.
- ≡ *Rhizophagus fasciculatus* (Thaxt.) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 19. 2010.

Habitat: Dense Ombrophilous Forest, Restinga and Mixed Ombrophilous Forest.

Rhizoglomus intraradices (N.C. Schenck & G.S. Sm.) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 380. 2015.

- ≡ *Glomus intraradices* N.C. Schenck & G.S. Sm., *Mycologia* 74: 78.1982.
- ≡ *Rhizophagus intraradices* (N.C. Schenck & G.S. Sm.) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 19: 2010.

Habitat: Dense Ombrophilous Forest and Restinga.

Rhizoglomus irregularis (Błaszk., Wubet, Renker & Buscot) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 381. 2015.

- ≡ *Glomus irregulare* Błaszk., Wubet, Renker & Buscot, *Mycotaxon* 106: 252. 2009.
- ≡ *Rhizophagus irregularis* (Błaszk., Wubet, Renker & Buscot) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 19. 2010.

Habitat: Restinga.

Rhizoglomus invermaium (I.R. Hall) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 381. 2015.

- ≡ *Glomus invermaium* I.R. Hall, *Transactions of the British Mycological Society* 68: 345. 1977.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Rhizoglomus manihotis (R.H. Howeler, Sieverd. & N.C. Schenck) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 381. 2015.

- ≡ *Glomus manihotis* R.H. Howeler, Sieverd. & N.C. Schenck, *Mycologia* 76: 695. 1984.
- ≡ *Rhizophagus manihotis* (R.H. Howeler, Sieverd. & N.C. Schenck) C. Walker & A. Schüßler, *The Glomeromycota: a species list with new families and new genera*: 19. 2010.

Habitat: uninformed.

Rhizoglomus microaggregatum (Koske, Gemma & P.D. Olexia) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 381. 2015.

- ≡ *Glomus microaggregatum* Koske, Gemma & P.D. Olexia, *Mycotaxon* 26: 125. 1986.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Semi-deciduous Seasonal Forest.

Rhizoglomus natalense (Błaszk., Chwat & B.T. Goto) Sieverd., G.A. Silva & Oehl, *Mycotaxon* 129: 382. 2015.

- ≡ *Rhizophagus natalensis* Błaszk., Chwat & B.T. Goto, *Mycotaxon* 129: 100. 2014.

Habitat: Restinga.

Sclerocystis clavispora Trappe, *Mycotaxon* 6: 359. 1977.

- ≡ *Glomus clavisporum* (Trappe) R.T. Almeida & N.C. Schenck, *Mycologia* 82: 710. 1990.
- = *Sclerocystis microcarpus* S.H. Iqbal & Perveen, *Transactions of the Mycological Society of Japan* 21: 58. 1980.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Sclerocystis coremioides Berk. & Broome, *Botanical Journal of the Linnean Society* 14: 137. 1873.

- ≡ *Glomus coremioides* (Berk. & Broome) D. Redecker & J.B. Morton, *Mycologia* 92: 284. 2000.
- = *Xenomyces ochraeus* Cesati, *Atti della Reale Accademia delle Scienze Fisiche e Matematiche di Napoli* 8(4): 26. 1878. = *Ackermannia coccogena* Pat., *Bulletin de la Société Mycologique de France* 18: 183. 1902.
- ≡ *Sphaeroceas coccogena* (Pat.) von Höhn., *Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. I* 118: 401. 1909.

= *Sclerocystis coccogena* (Pat.) von Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. I. 119: 399. 1910.

= *Ackermannia dussii* Pat., Bulletin de la Société Mycologique de France 18: 180–181. 1902.

= *Sphaerocreas dussii* (Pat.) von Höhn, Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. I. 118: 401. 1909.

= *Sclerocystis dussii* (Pat.) von Höhn, Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. I. 118: 401. 1909.

= *Sphaerocreas javanicum* von Höhn, Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. I. 117: 1014–1015. 1908.

= *Endogone minutissima* Beeli, Bulletin de la Société Royale de Botanique de Belgique 56: 57. 1923.

= *Sclerocystis alba* Petch, Annals of the Royal Botanic Gardens, Peradenya 9: 322–383. 1925.

= *Endogone alba* (Petch) Gerd. & Trappe, Mycologia Memoir 5: 25. 1974.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Sclerocystis sinuosa Gerd. & B.K. Bakshi, Transactions of the British Mycological Society 66: 343. 1976.

= *Glomus sinuosum* (Gerd. & B.K. Bakshi) R.T. Almeida & N.C. Schenck, Mycologia 82: 710. 1990.

= *Sclerocystis pakistanica* S.H. Iqbal & Perveen, Transactions of the Mycological Society of Japan 21: 59. 1980.

Habitat: Mangrove, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Sclerocystis taiwanensis C.G. Wu & Z.C. Chen Transactions of the Mycological Society of the Republic of China 2: 78. 1987. Kew Bulletin 50: 306. 1995.

= *Glomus taiwanense* (C.G. Wu & Z.C. Chen) R.T. Almeida & N.C. Schenck, Mycologia 82: 711. 1990. [Validated: Kew Bulletin 50: 306. 1995.]

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Septoglomus constrictum (Trappe) Sieverd., G.A. Silva & Oehl, Mycotaxon 116: 105. 2011.

= *Glomus constrictum* Trappe, Mycotaxon 6: 361. 1977.

= *Funneliformis constrictum* (Trappe) C. Walker & A. Schüßler, The *Glomeromycota*: a species list with new families and new genera: 14. 2010.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Septoglomus deserticola (Trappe, Bloss & J.A. Menge) G.A. Silva, Oehl & Sieverd., Mycotaxon 116: 106. 2011.

= *Glomus deserticola* Trappe, Bloss & J.A. Menge, Mycotaxon 20: 123. 1984.

Habitat: Restinga and Semi-deciduous Seasonal Forest.

Septoglomus titan B.T. Goto & G.A. Silva, Mycotaxon 124: 105. 2013.

Habitat: Dense Ombrophilous Forest.

Simioglomus hoi (S.M. Berch & Trappe) G.A. Silva, Oehl & Sieverd., Mycotaxon 116: 104. 2011.

= *Glomus hoi* S.M. Berch & Trappe, Mycologia 77: 654. 1985.

Habitat: uninformed.

Intraornatosporaceae

Intraornatospora intraornata (B.T. Goto & Oehl) B.T. Goto, Oehl & G.A. Silva, Mycotaxon 119: 122. 2012.

= *Racocetra intraornata* B.T. Goto & Oehl, Mycotaxon 109: 485. 2009.

Habitat: Dense Ombrophilous forest and Restinga.

Paradentiscutata bahiana Oehl, Magna, B.T. Goto & G.A. Silva, Mycotaxon 119: 122. 2012.

Habitat: Tropical Rainforest Fragment.

Paradentiscutata maritima B.T. Goto, D.K. Silva, Oehl & G.A. Silva, Mycotaxon 119: 122. 2012.

Habitat: Mangrove and Restinga.

Pacisporaceae

Pacispora scintillans (S.L. Rose & Trappe) Sieverd. & Oehl ex C. Walker, Vestberg & A. Schüssler, Mycological Research 111: 254. 2007.

= *Glomus scintillans* S.L. Rose & Trappe, Mycotaxon 10: 417. 1980.

= *Pacispora scintillans* (S.L. Rose & Trappe) Sieverd. & Oehl, Journal of Applied Botany 78: 76. 2004.

= *Gerdemannia scintillans* (S.L. Rose & Trappe) C. Walker, Błaszcz., A. Schüßler & Schwarzott, Mycological Research 108: 716. 2004.

Habitat: uninformed.

Paraglomeraceae

Paraglomus albidum (C. Walker & L.H. Rhodes) Oehl, F.A. Souza, G.A. Silva & Sieverd., Mycotaxon 116: 112. 2011.

≡ *Glomus albidum* C. Walker & L.H. Rhodes, Mycotaxon 12: 509. 1981.

Habitat: uninformed.

Paraglomus bolivianum (Sieverd. & Oehl) Oehl & G.A. Silva, Journal of Applied Botany and Food Quality 86: 115. 2013.

≡ *Pacispora boliviana* Sieverd. & Oehl, Journal of Applied Botany 78: 79. 2004.

Habitat: Dense Ombrophilous Forest and Restinga.

Paraglomus occultum (C. Walker) J.B. Morton & D. Redecker, Mycologia 93: 190. 2001.

≡ *Glomus occultum* C. Walker, Mycotaxon 15: 50. 1982.

Habitat: Dense Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Racocetraceae

Cetraspora gilmorei (Trappe & Gerd.) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 338. 2009.

≡ *Gigaspora gilmorei* Trappe & Gerd., Mycologia Memoirs 5: 27. 1974.

≡ *Scutellospora gilmorei* (Trappe & Gerd.) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Cetraspora pellucida (T.H. Nicolson & N.C. Schenck) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 338. 2009.

≡ *Gigaspora pellucida* T.H. Nicolson & N.C. Schenck, Mycologia 71 (1): 189. 1979.

≡ *Scutellospora pellucida* (T.H. Nicolson & N.C. Schenck) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Mangrove, Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Racocetra castanea (C. Walker) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 336. 2009.

≡ *Scutellospora castanea* C. Walker, Cryptogamie Mycologie 14: 280. 1993.

Habitat: Restinga and Semi-deciduous Seasonal Forest.

Racocetra coralloidea (Trappe, Gerd. & I. Ho) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 336. 2009.

≡ *Gigaspora coralloidea* Trappe, Gerd. & I. Ho, Mycologia Memoirs 5: 30. 1974.

≡ *Scutellospora coralloidea* (Trappe, Gerd. & I. Ho) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Mangrove and Restinga.

Racocetra fulgida (Koske & C. Walker) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 336. 2009.

≡ *Scutellospora fulgida* Koske & C. Walker, Mycotaxon 27: 221. 1986.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Racocetra gregaria (N.C. Schenck & T.H. Nicolson) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 337. 2009.

≡ *Gigaspora gregaria* N.C. Schenck & T.H. Nicolson, Mycologia 71: 185. 1979.

≡ *Scutellospora gregaria* (N.C. Schenck & T.H. Nicolson) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Restinga.

Racocetra persica (Koske & C. Walker) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 337. 2009.

≡ *Gigaspora persica* Koske & C. Walker, Mycologia 77: 708. 1985.

≡ *Scutellospora persica* (Koske & C. Walker) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Restinga.

Racocetra tropicana Oehl, B.T. Goto & G.A. Silva, Nova Hedwigia 92: 72. 2011.

Habitat: Mangrove, Dense Ombrophilous Forest and Restinga.

Racocetra verrucosa (Koske & C. Walker) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 337. 2009.

≡ *Gigaspora verrucosa* Koske & C. Walker, Mycologia 77: 705. 1985.

≡ *Scutellospora verrucosa* (Koske & C. Walker) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest, Restinga and Semi-deciduous Seasonal Forest.

Racocetra weresubiae (Koske & C. Walker) Oehl, F.A. de Souza & Sieverd., Mycotaxon 106: 337. 2009.

≡ *Scutellospora weresubiae* Koske & C. Walker, Mycotaxon 27: 224. 1986.

Habitat: Restinga.

Sacculosporaceae

Sacculospora baltica (Błaszk., Madej & Tadych) Oehl, Palenz., Sánchez-Castro, B.T. Goto, G.A. Silva & Sieverd., Mycotaxon 117: 311. 2012.

≡ *Entrophospora baltica* Błaszk., Madej & Tadych, Mycotaxon 68: 167. 1998.

Habitat: Restinga.

Scutellosporaceae

Bulbospora minima Oehl, Marinho, B.T. Goto & G.A. Silva, Sydowia 66: 316. 2014.

Habitat: Restinga.

Orbispora pernambucana (Oehl, D.K. Silva, N. Freitas & L.C. Maia) Oehl, G.A. Silva & D.K. Silva, Mycotaxon 116: 166. 2011.

≡ *Scutellospora pernambucana* Oehl, D.K. Silva, N. Freitas & L.C. Maia, Mycotaxon 106: 363. 2009.

Habitat: Restinga, Dense Ombrophilous Forest.

Scutellospora aurigloba (I.R. Hall) C. Walker & F.E. Sanders, Mycotaxon 27: 180. 1986.

≡ *Gigaspora aurigloba* I.R. Hall, Transactions of the British Mycological Society 68: 351. 1977.

Habitat: Dense Ombrophilous Forest and Restinga.

Scutellospora calospora (T.H. Nicolson & Gerd.) C. Walker & F.E. Sanders, Mycotaxon 27: 180. 1986.

≡ *Endogone calospora* T.H. Nicolson & Gerd., Mycologia 60: 322. 1968.

≡ *Gigaspora calospora* (T.H. Nicolson & Gerd.) Gerd. & Trappe, Mycologia Memoirs 5: 28. 1974.

Habitat: Dense Ombrophilous Forest, Mixed Ombrophilous Forest and Restinga.

Scutellospora dipapillosa (C. Walker & Koske) C. Walker & F.E. Sanders, Mycotaxon 27: 181. 1986.

≡ *Gigaspora dipapillosa* C. Walker & Koske, Mycologia 77: 709. 1985.

Habitat: uninformed.

Scutellospora dipurpurescens J.B. Morton & Koske, Mycologia 80: 520. 1988.

Habitat: Restinga and Semi-deciduous Seasonal Forest.

Discussion

This checklist indicates a >50% increase in AMF species recorded for the Atlantic Forest since the last review (Zangaro & Moreira 2010), a number that reflects the inventory efforts expended in this biome. Thus, the Atlantic Forest is the most representative Brazilian biome in AMF species, with 83% of the species cataloged for the Brazilian territory, including new family, genera and species, a ranking previously published by Goto & Jobim (2017) and corroborated in this checklist. Furthermore, the biome has 42% representation of the species described for the subphylum *Glomeromycotina*.

With respect to representation per taxa, of the 15 families described for the subphylum, 14 are represented in the biome. *Glomeraceae* and *Acaulosporaceae* present high richness, a pattern noted for the Atlantic Forest over the last three decades (Trufem 1990, 1995, Silva et al. 2012, 2015a, 2015b).

Glomus tenue is recognized as "fine root endophyte", by intraradical hyphae development, which are thin with intracellularly branched structures and a distinctive fan-like pattern (Orchard et al. 2017a,b,c). However, sequence analysis suggests that this fungus is phylogenetically related to *Mucoromycotina* (Orchard et al. 2017b) and that *G. tenue*, considered as a single species, comprises more than one species, and the phylogenetic differences in relation to other AMFs could reflect on ecological differences (Orchard et al. 2017c). Due to the incipient nature of the studies and further additional taxonomic review, we opted to include *G. tenue* in this checklist.

The pioneer formations (Fig. 1) can be defined as pedologically unstable areas (Fig. 1), submitted to the processes of fluvial, lacustrine, marine and fluvial accumulation and covered by a vegetation of first occupation of edaphic character, including the vegetation of the restinga and mangrove vegetation (Ageitec 2017).

Restinga is located along the Brazilian Northeast and comprises a narrow sandy strip along the entire coast, including characteristic plant communities and different biological communities (Araujo & Lacerda 1987). The high representation of AMF species can be explained also by the variability of abiotic and biotic conditions and the high number of surveys conducted in this ecosystem (Silva et al. 2012, 2014, 2015a,b; Assis et al. 2016; Jobim & Goto 2016).

In contrast to the Restinga, mangroves express low representativeness. Mangroves are composed of trees that grow ubiquitously on a narrow margin between land and sea, are tolerant to saline fluctuation conditions and encompass great complexity in ecological dynamics (Valiela et al., 2001). Despite its complexity in terms of ecological dynamics, only one study was conducted in Brazil in this condition (Carrenho et al. 2001).

In addition to the scarcity of knowledge on mangrove areas, no studies were carried out taking into account the phytophysiognomies of the Deciduous Seasonal Forest and Altitude Vegetation, habitats in great need of AMF inventories, neglected in taxonomic and diversity studies (Carrenho et al. 2001).

Another important fact to highlight for the Atlantic Forest biome is the potential of tropical rainforest areas for the biological surveys of traditionally neglected groups in AMF diversity studies. This checklist includes 25 sporocarpic species, with macroscopic structures. Sporocarpic AMF species have been poorly investigated and accounted for in taxonomic inventories, mainly due to methodological difficulties. Such species require specific collection methods, including manually searching through other substrates in addition to soil (Furrázola et al. 2016). So, tropical rainforests are strategic habitats for conducting inventories that also incorporate the search for AMF sporocarpic species, since they offer high humidity, high organic matter content and a wide variety of available substrates, all favorable for development of these species. This fact was corroborated in studies carried out with a focus on the AMF sporocarpic species, which, although in an incipient state, contributed to the understanding of the taxonomic aspects of this group (Torre-Arias et al. 2017; Furrázola et al. 2016; Goto et al. 2016).

Thus, our checklist allows to conclude that studies of AMF diversity in the Atlantic Forest have revealed a biological potential to discovery of a substantial number of new taxa. Study initiatives focusing on the most different types of phytophysiognomies in the Atlantic Forest are essential for the expansion of the knowledge about this biologically valuable threatened biome.

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