菌物学报

jwxt@im.ac.cn | 22 July 2017, 36(7): 820-850
Http://journals.im.ac.cn | Mycosystema ISSN1672-6472 CN11-5180/Q
Tel: +86-10-64807521 |
研究论文 Research paper Doi: 10.13346/j.mycosystema.170078

球囊菌门丛枝菌根真菌最新分类系统菌种名录

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摘 要：球囊菌门 Glomeromycota 是菌物界（Kingdom of Fungi）晚近新增加的一个门，下设 1 纲 4 目 11 科 27 属约 300 种丛枝菌根（AM）真菌，均是植物根系重要的共生真菌。同其他真菌分类研究过程相似，随着新种的不断发现、分类技术的进步与研究的深入，AM 真菌分类系统及其菌种学名经历着持续不断的变更。然而，这些变动给 AM 真菌研究者造成了一定的困扰和混乱。本文在 AM 真菌系统发育分类重建的基础上，结合当前国际上 AM 真菌分类的最新进展，规范、正确并一致描述全球已知的 AM 真菌菌种拉丁文和中文学名，以纠正错误和统一 AM 真菌中文学名；同时标注了中国新记录种、新种和种质资源保藏种名录，以期促进中国 AM 真菌分类、资源多样性、群落结构及其相关研究。
关键词：丛枝菌根真菌，球囊菌门，分类系统，菌种，物种多样性

A checklist of arbuscular mycorrhizal fungi in the recent taxonomic system of Glomeromycota

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Abstract: Glomeromycota is a new phylum which was added in Kingdom of Fungi in 2008. This phylum includes one class, four orders, 11 families, 27 genera, 300 species of arbuscular mycorrhzial (AM) fungi. The species name and classification systems were always under changes with the advances of taxonomic researches, bringing about disorder and trouble in the study of AM fungi. On the basis of latest progress of taxonomy of AM fungi, correct names of AM fungal species are listed, and species recorded in China are noted according to literatures and germplasm resources preserved in the Bank of Glomeromycota in China (BGC). Standardized Chinese names are given for each species.
Key words: arbuscular mycorrhizal fungi, Glomeromycota, taxonomic system, species, species diversity

基金项目：北京市农林科学院科技创新能力建设专项（KJCX20170103）；国家自然科学基金（31470101）
Supported by Special Fund for Science and Technology Innovation Ability of Beijing Academy of Agriculture and Forestry Sciences (KJCX20170103), the National Natural Science Foundation of China (31470101).
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Received: 2017-04-25, accepted: 2017-06-09

丛枝菌根（AM）真菌属于专性活体营养的植物共生真菌。AM 真菌的分类地位和分类系统从 Link 1809 年建立的内囊霉属 *Endogone* 至今经历了复杂多变的过程。现代分子生物学和生化技术在分类学中的广泛应用，使得 AM 真菌分类概念、分类方法和分类系统均有了长足的发展。特别是最近 10 年来，球囊菌门 Glomeromycota AM 真菌分类学进展迅速，其分类系统持续较大变动。这些变动给 AM 真菌研究者造成了一定程度的困扰和混乱，尤其是对于母语为汉语的学者针对菌种学名还存在中文学名的正确、规范和一致的表达问题。球囊菌门分类学领域资深科学家 Redecker *et al.*（2013）在系统发生假说框架范围内验证所有可用的分子系统发育证据，并当证据和框架相一致时，再整理结合这些菌种的形态特征，就 AM 真菌新的分类单元与命名达成共识，并权威发布了全球所有公开发表的 AM 真菌菌种名称。虽然我国发表的 AM 真菌分类进展文献很多（王宇涛等 2013；蒋胜竞等 2014），但是至今尚无公开发表全世界已知的 AM 真菌详细种名及其规范的中文学名。本文在简要介绍目前球囊菌门最新分类系统的基础上，全面、系统和规范地给出全球范围内全部已知和公认的 AM 真菌的拉丁文和中文学名，以期规范 AM 真菌的中文命名，方便和促进中国学者的研究与学术交流。

1 球囊菌门 Glomeromycota AM 真菌最新分类系统

在 AM 真菌系统发育分类重建的基础上，结合当前国际上 AM 真菌分类的权威科学家及相关网站（国际 AM 真菌保藏中心 INVAM，http://invam.caf.wvu.edu/，2017.3；Arthur Schüßler 教授 http://www.amf-phylogeny.com/，2017.3；波兰农业大学 Janusz Blaszkowski 教授 http://www.zor.zut.edu.pl/Glomeromycota，2017.3）上公布的详细 AM 真菌分类列表的情况，笔者对 Redecker *et al.*（2013）的分类系统做了补充，至此球囊菌门 AM 真菌 1 纲 4 目 11 科 27 属列入表 1。

与 Redecker *et al.*（2013）发表的分类系统比较，当前 Arthur Schüßler 网站公布的分类系统（表 1）中增加了多氏囊霉属 *Dominikia* 和卡氏囊霉属 *Kamienskia* 2 个有明确分类地位的属，都归于球囊霉科 Glomeraceae；葱状囊霉属 *Bulbospora* 为证据不足的属，归于巨孢囊霉科 Gigasporaceae。同时说明伞房球囊霉属 *Corymbiglomus*、内饰孢囊霉属 *Intraornatospora*、耳孢囊霉属 *Otospora*、类齿盾囊霉属 *Paradentiscutata*、囊孢囊霉属 *Sacculospora* 和三孢囊霉属 *Tricispora* 为证据不足且无正式认可的属。此网站公布的种的列表中，无梗囊霉属 *Acaulospora* 48 种，其中 19 种系统发育位置不明确；巨孢囊霉属 *Gigaspora* 8 种，其中 1 种的系统发育位置不明确；裂盾囊霉属 *Racocetra* 13 种，其中 5 种的分类地位不明确；硬囊霉属 *Sclerocystis* 10 种，其中 8 种分类地位不明确；盾巨孢囊霉属 *Scutellospora* 24 种，其中 18 种的分类地位不明确；球囊霉属 *Glomus* 68 种，其中 66 种因系统发育位置不明确被定义为广义（*sensu lato*）种，2 种是狭义（*sensu stricto*）种，即严格意义上的种；伞房球囊霉属、葱状囊霉属、耳孢囊霉属和囊孢囊霉属 4 个证据不足的属，共有 7 个种。另外，网站所列的 295 种中有 6 种不能确定其在球囊菌门内的分类地位，这些种仅依据其形态特征，没有分子数据，故将这些种归在分类地位不确定的种类。

2 球囊菌门 AM 真菌学名及中文学名

现已发现的 AM 真菌接近 300 种，其中约 190 种已有中文学名，本文则采用已有的这些中文学名。对于 AM 真菌新分类系统增加的新属、系统发育位置发生变化的很多种和新发表的尚无中文学名的 AM 真菌，按照当前 Arthur Schüßler 网站（http://www.amf-phylogeny.com）权威发布的属和种，表 2 列出了 AM 真菌全部的名录。

表 1 菌物界球囊菌门 Glomeromycota 丛枝菌根真菌最新分类系统

Table 1 The recent taxonomic system of arbuscular mycorrhizal fungi in Glomeromycota

门 Phylum 球囊菌门 Glomeromycota 纲 Class 球囊菌纲 Glomeromycetes 目 Orders (4)	科 Families (11)	属 Genera (27)
球囊霉目 Glomerales	球囊霉科 Glomeraceae	多氏囊霉属 *Dominikia*
		斗管囊霉属 *Funneliformis*
		球囊霉属 *Glomus*
		卡氏囊霉属 *Kamienskia*
		根孢囊霉属 *Rhizophagus*
		硬囊霉属 *Sclerocystis*
		隔球囊霉属 *Septoglomus*
	近明球囊霉科 Claroideoglomeraceae	近明球囊霉属 *Claroideoglomus*
多样孢囊霉目 Diversisporales	巨孢囊霉科 Gigasporaceae	葱状囊霉属 *Bulbospora**
		盾孢囊霉属 *Cetraspora*
		齿盾囊霉属 *Dentiscutata*
		巨孢囊霉属 *Gigaspora*
		内饰孢囊霉属 *Intraornatospora***
		类齿盾囊霉属 *Paradentiscutata***
		裂盾囊霉属 *Racocetra*
		盾巨孢囊霉属 *Scutellospora*
	无梗囊霉科 Acaulosporaceae	无梗囊霉属 *Acaulospora*
	和平囊霉科 Pacisporaceae	和平囊霉属 *Pacispora*
	多样孢囊霉科 Diversisporaceae	伞房球囊霉属 *Corymbiglomus***
		多样孢囊霉属 *Diversispora*
		耳孢囊霉属 *Otospora***
		雷德克囊霉属 *Redeckera*
		三孢囊霉属 *Tricispora***
	囊孢囊霉科 Sacculosporaceae	囊孢囊霉属 *Sacculospora***
类球囊霉目 Paraglomerales	类球囊霉科 Paraglomeraceae	类球囊霉属 *Paraglomus*
原囊霉目 Archaeosporales	地管囊霉科 Geosiphonaceae	地管囊霉属 *Geosiphon*
	双型囊霉科 Ambisporaceae	双型囊霉属 *Ambispora*
	原囊霉科 Archaeosporaceae	原囊霉属 *Archaeospora*
未确定分类地位 Unknown taxonomic affiliation		内养囊霉属 *Entrophospora*

注：带*者为证据不足；带**者为证据不足且无正式认可的属

Notes: * insufficient evidence; ** insufficient evidence, and no formal action was taken.

表 2 菌物界球囊菌门 Glomeromycota 丛枝菌根真菌名录及中文学名

Table 2 Species list of arbuscular mycorrhizal fungi in Glomeromycota

种名 Current names of species	基原异名/同种异名 Basionyms, synonyms & additional comments	权威认证 Authorities	中国新记录种、新种和种质资源保藏种 Species hitherto recorded in China according to literature and germplasm resources preserved in the Bank of Glomeromycota in China
Acaulospora 无梗囊霉属		Trappe & Gerd. (1974)	
Acaulospora alpina 高山无梗囊霉		Oehl, Sýkorová & Sieverd. (2006)	
Acaulospora baetica 伯蒂卡无梗囊霉		Palenz., Oehl, Azcón-Aguilar & G.A. Silva (2015)	
Acaulospora brasiliensis 巴西无梗囊霉	≡ *Ambispora brasiliensis* B.T. Goto, L.C. Maia & Oehl (2008)	(B.T. Goto, L.C. Maia & Oehl) C. Walker, M. Krüger & A. Schüßler (2011)	
Acaulospora cavernata 空洞无梗囊霉		Błaszk. (1989)	Xing *et al.* 2000
Acaulospora colliculosa 小丘无梗囊霉		Kaonongbua, J.B. Morton & Bever (2010)	
Acaulospora colombiana 哥伦比亚无梗囊霉	≡ *Entrophospora colombiana* Spain & N.C. Schenck (1984) = *Kuklospora colombiana* Oehl & Sieverd. (2006)	(Spain & N.C. Schenck) Kaonongbua, J.B. Morton & Bever (2010)	Zhang *et al.* 2003
Acaulospora delicata 脆无梗囊霉		C. Walker, C.M. Pfeiff. & Bloss (1986)	Qiao *et al.* 2005 Wang *et al.* 2016**
Acaulospora dilatata 膨胀无梗囊霉		J.B. Morton (1986)	Zhang *et al.* 1998
Acaulospora entreriana 恩特雷无梗囊霉		M.S. Velázquez & Cabello (2008)	
Acaulospora foveata 孔窝无梗囊霉		Trappe & Janos (1982)	Wu & Chen 1986
Acaulospora ignota 隐纹无梗囊霉		Błaszk., Góralska, Chwat & Goto (2015)	

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Acaulospora kentinensis 屏东无梗囊霉	≡ *Entrophospora kentinensis* C.G. Wu & Y.S. Liu (1995) = *Kuklospora kentinensis* Oehl & Sieverd. (2006)	(C.G. Wu & Y.S. Liu) Kaonongbua, J.B. Morton & Bever (2010)	Wu *et al.* 1995*
Acaulospora koskei 柯氏无梗囊霉		Błaszk. (1995)	Zhang & Guo 2005
Acaulospora lacunosa 浅窝无梗囊霉		J.B. Morton (1986)	Gai & Liu 2000
Acaulospora laevis 光壁无梗囊霉		Gerd. & Trappe (1974)	Wu & Chen 1986
Acaulospora longula 稍长无梗囊霉		Spain & N.C. Schenck (1984)	Zhang *et al.* 1992
Acaulospora mellea 蜜色无梗囊霉		Spain & N.C. Schenck (1984)	Hu 1988 Wang *et al.* 2016**
Acaulospora minuta 细小无梗囊霉		Oehl, Tchabi, Hountondji, Palenz., I.C. Sánchez & G.A. Silva (2011)	
Acaulospora morrowiae 毛氏无梗囊霉		Spain & N.C. Schenck (1984)	Hu 1988
Acaulospora nivalis 雪白无梗囊霉		Oehl, Palenz., I.C. Sánchez, G.A. Silva & Sieverd. (2012)	
Acaulospora paulinae 疏线无梗囊霉		Błaszk. (1988)	Cai *et al.* 2008
Acaulospora pustulata 泡状无梗囊霉		Palenz., Oehl, Azcón-Aguilar & G.A. Silva (2013)	
Acaulospora scrobiculata 细凹无梗囊霉		Trappe (1977)	Wu & Chen 1986 Wang *et al.* 2016**
Acaulospora sieverdingii 西维丁无梗囊霉		Oehl, Sýkorová & Błaszk. (2011)	
Acaulospora spinosa 刺无梗囊霉		C. Walker & Trappe (1981)	Hu 1988
Acaulospora spinosissima 密刺无梗囊霉		Oehl, Palenz., I.C. Sánchez, Tchabi, Hount. & G.A. Silva (2014)	

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Acaulospora tortuosa 扭形无梗囊霉		Palenz., Oehl, Azcón-Aguilar & G.A. Silva (2013)	
Acaulospora tuberculata 疣状无梗囊霉		Janos & Trappe (1982)	Zhao & Du 1997
Acaulospora viridis 绿色无梗囊霉		Palenz., Oehl, Azcón-Aguilar & G.A. Silva (2014)	
Acaulospora 无梗囊霉属	未确定系统发育地位种 Species of uncertain phylogenetic position		
Acaulospora bireticulata 双网无梗囊霉		F.M. Rothwell & Trappe (1979)	Peng *et al*. 1990
Acaulospora capsicula 椒红无梗囊霉		Błaszk. (1990)	Cai *et al*. 2007
Acaulospora colossica 大型无梗囊霉		P.A. Schultz, Bever & J.B. Morton (1999)	Cai *et al*. 2009
Acaulospora denticulata 细齿无梗囊霉		Sieverd. & S. Toro (1987)	Wu *et al.* 1995
Acaulospora elegans 丽孢无梗囊霉		Trappe & Gerd. (1974)	Hu 1988
Acaulospora excavata 凹坑无梗囊霉		Ingleby & C. Walker (1994)	Zhang *et al.* 2001
Acaulospora gedanensis 格但无梗囊霉		Błaszk. (1988)	Gao *et al*. 2006
Acaulospora myriocarpa 多果无梗囊霉		Spain, Sieverd. & N.C. Schenck (1986)	Hu 1988
Acaulospora nicolsonii 尼氏无梗囊霉		C. Walker, L.E. Reed & F.E. Sanders (1984)	Fang *et al.* 2000
Acaulospora polonica 波兰无梗囊霉		Błaszk. (1988)	Zhang *et al.* 2001
Acaulospora punctata 细点无梗囊霉		Oehl, Palenz., I.C. Sánchez, G.A. Silva, C. Castillo & Sieverd. (2012)	

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Acaulospora rehmii 瑞氏无梗囊霉		Sieverd. & S. Toro (1987)	Shi *et al.* 2003
Acaulospora rugosa 皱壁无梗囊霉		J.B. Morton (1986)	Zhang *et al.* 1998
Acaulospora splendida 华彩无梗囊霉		Sieverd., Chaverri & I. Rojas (1988)	
Acaulospora sporocarpia 孢果无梗囊霉		S.M. Berch (1985)	
Acaulospora taiwania 台湾无梗囊霉		H.T. Hu (1988)	Hu 1988*
Acaulospora thomii 汤姆无梗囊霉		Błaszk. (1988)	
Acaulospora undulata 波状无梗囊霉		Sieverd. (1988)	Zhang *et al.* 2001
Acaulospora walkeri 沃氏无梗囊霉		Kramad. & Hedger (1990)	
Ambispora 双型囊霉属		C. Walker, Vestberg & Schuessler (2007)	
Ambispora appendicula 附柄双型囊霉	≡ *Acaulospora appendicula* Spain, Sieverd. & N.C. Schenck (1984) = *Appendicispora appendicula* Spain, Oehl & Sieverd. (2006), *Paracaulospora appendicula* S.P. Gautam & U.S. Patel (2007)	C. Walker (2008)	Zhang *et al.* 1998
Ambispora callosa 厚皮双型囊霉	≡ *Glomus callosum* Sieverd. (1988) = *Appendicispora callosa* C. Walker, Vestberg & Schuessler (2007)	C. Walker, Vestberg & Schuessler (2007)	Jiang *et al.* 2012
Ambispora fecundispora 多产双型囊霉	≡ *Glomus fecundisporum* N.C. Schenck & G.S. Sm. (1982) = *Appendicispora fecundispora* C. Walker, Vestberg & Schuessler (2007)	C. Walker (2008)	Wang *et al.* 1998
Ambispora fennica 芬兰双型囊霉	=*Appendicispora fennica* C. Walker, Vestberg & Schuessler (2007)	C. Walker, Vestberg & Schuessler (2007)	
Ambispora gerdemannii 格氏双型囊霉	≡ *Glomus gerdemannii* S.L. Rose, B.A. Daniels & Trappe (1979) = *Appendicispora gerdemannii* Spain, Oehl & Sieverd. (2006), *Archaeospora gerdemannii* J.B. Morton & D. Redecker (2001)	C. Walker, Vestberg & Schuessler (2007)	Fang *et al.* 2000

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Ambispora granatensis 格拉纳达双型囊霉		J. Palenzuela, N. Ferrol & Oehl (2011)	
Ambispora jimgerdemannii 詹氏双型囊霉	≡ *Acaulospora gerdemannii* N.C. Schenck & T.H. Nicolson (1979) =*Appendicispora jimgerdemannii* Spain, Oehl & Sieverd. (2006)	C. Walker (2008)	Liu *et al.* 2001
Ambispora leptoticha 薄壁双型囊霉	≡ *Glomus leptotichum* N.C. Schenck & G.S. Sm. (1982) = *Appendicispora leptoticha* C. Walker, Vestberg & Schuessler (2007), *Archaeospora leptoticha* J.B. Morton & D. Redecker (2001), *Pseudoglomus leptotichum* S.P. Gautam & U.S. Patel (2007)	C. Walker, Vestberg & Schuessler (2007)	Hu 1988
Ambispora reticulata 网纹双型囊霉		Oehl & Sieverd (2012)	
Archaeospora 原囊霉属		J.B. Morton & D. Redecker (2001)	
Archaeospora schenckii 申克原囊霉	≡ *Entrophospora schenckii* Sieverd. & S. Toro (1987) = *Intraspora schenckii* Oehl & Sieverd. (2006)	Walker & Schuessler (2010)	Cai *et al*. 2009
Archaeospora trappei 崔氏原囊霉	≡ *Acaulospora trappei* R.N. Ames & Linderman (1976)	J.B. Morton & D. Redecker (2001)	Wu & Chen 1986
Bulbospora 葱状囊霉属		Oehl & G.A. Silva 2014	
Bulbospora minima 极小葱状囊霉		Oehl, Marinho, B.T. Goto & G.A. Silva (2014)	
Cetraspora 盾孢囊霉属		Oehl, F.A. Souza & Sieverd. 2009	
Cetraspora auronigra 金黑盾孢囊霉		Oehl, L.L. Lima, Kozovits, Magna & G.A. Silva 2014	
Claroideoglomus 近明球囊霉属		C. Walker & Schuessler (2010)	
Claroideoglomus candidum 白色近明球囊霉	≡ *Glomus candidum* Furrazola, Kaonongbua & Bever (2010)	Oehl, G.A. Silva & Sieverd. (2011)	

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Claroideoglomus claroideum 近明球囊霉	≡ *Glomus claroideum* N.C. Schenck & G.S. Sm. (1982) (emendation by Walker & Vestberg 1998) = *Glomus maculosum* D.D. Mill. & C. Walker (1986), *G. fistulosum* Skou & I. Jakobsen (1989)	C. Walker & Schuessler (2010)	Peng *et al*. 1990 Wang *et al.* 2016**
Claroideoglomus drummondii 待霄草近明球囊霉	≡ *Glomus drummondii* Blaszk. & C. Renker (2006) = *Albahypha drummondii* Sieverd., Oehl, B.T. Goto & G.A. Silva (2011)	C. Walker & Schuessler (2010)	
Claroideoglomus etunicatum 幼套近明球囊霉	≡ *Glomus etunicatum* W.N. Becker & Gerd. (1977)	C. Walker & Schuessler (2010)	Wu & Chen 1986 Wang *et al.* 2016**
Claroideoglomus hanlinii 汉林近明球囊霉		Błaszk., Chwat & Góralska (2015)	
Claroideoglomus lamellosum 层状近明球囊霉	≡ *Glomus lamellosum* Dalpé, Koske & Tews (1992)	C. Walker & Schuessler (2010)	Zhang *et al.* 2007 Wang *et al.* 2016**
Claroideoglomus luteum 纯黄近明球囊霉	≡ *Glomus luteum* L.J. Kenn., J.C. Stutz & J.B. Morton (1999)	C. Walker & Schuessler (2010)	Zhang & Guo 2005
Claroideoglomus walkeri 沃克近明球囊霉	≡ *Glomus walkeri* Blaszk. & C. Renker (2006) = *Albahypha walkeri* Sieverd., Oehl, B.T. Goto & G.A. Silva (2011)	C. Walker & Schuessler (2010)	Xiao *et al.* 2008
Corymbiglomus 伞房球囊霉属		Błaszk. & Chwat (2013)	
Corymbiglomus corymbiforme 簇孢伞房球囊霉	≡ *Glomus corymbiforme* Błaszk. (1995)	Błaszk. & Chwat (2013)	
Corymbiglomus globiferum 球孢伞房球囊霉	≡ *Glomus globiferum* Koske & C. Walker (1986)	Błaszk. & Chwat (2013)	Zhang *et al.* 2003
Corymbiglomus pacificum 太平洋伞房球囊霉		Oehl, Medina, P. Cornejo, Sánchez-Castro, G.A. Silva & Palenz. (2014)	

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Corymbiglomus tortuosum 扭形伞房球囊霉	≡ *Glomus tortuosum* N.C. Schenck & G.S. Sm. (1982) = *Parapseudoglomus tortuosum* S.P. Gautam & U.S. Patel (2007)	Błaszk. & Chwat (2013)	Wu *et al.* 2000 Wang *et al.* 2016**
Dentiscutata 齿盾囊霉属			
Dentiscutata heterogama 异配齿盾囊霉	≡*Endogone heterogama* T.H. Nicolson & Gerd. (1968) = *Gigaspora heterogama* Gerd. & Trappe (1974), *Scutellospora heterogama* Walker & F.E. Sanders (1986), *Fuscutata heterogama* Oehl, F.A. Souza, L.C. Maia & Sieverd. (2009)	Sieverd., F.A. Souza & Oehl (2008)	Wu *et al.* 1994
Dentiscutata erythropus 红色齿盾囊霉	≡ *Gigaspora erythropus* Koske & C. Walker (1984) = *Scutellospora erythropus* C. Walker & F.E. Sanders (1986), *Quatunica erythropus* F.A. Souza, Sieverd. & Oehl (2008)	C. Walker & D. Redecker (2013)	Pan *et al.* 1996
Diversispora 多样孢囊霉属		C. Walker & Schuessler (2004)	
Diversispora arenaria 沙生多样孢囊霉	≡ *Glomus arenarium* Błaszk., Tadych & Madej (2001)	Oehl, G.A. Silva & Sieverd. (2011)	Cai *et al*. 2012
Diversispora aurantia 橙黄多样孢囊霉	≡ *Glomus aurantium* Błaszk., Blanke, Renker & Buscot (2004)	C. Walker & Schuessler (2010)	Cui *et al.* 2016
Diversispora celata 隐多样孢囊霉		C. Walker, Gamper & Schuessler (2009)	Cui *et al.* 2016
Diversispora clara 光亮多样孢囊霉		Oehl, B. Estrada, G.A. Silva & Palenz. (2012)	
Diversispora eburnea 象牙白多样孢囊霉	≡ *Glomus eburneum* L.J. Kenn., J.C. Stutz & J.B. Morton (1999)	C. Walker & Schuessler (2010)	Wang *et al.* 2006 Wang *et al.* 2016**
Diversispora epigaea 地表多样孢囊霉	≡ *Glomus epigaeum* B.A. Daniels & Trappe (1979)	C. Walker & Schuessler (2010)	Luo *et al.* 2016
Diversispora gibbosa 肿胀多样孢囊霉	≡ *Glomus gibbosum* Błaszk. (1997)	Błaszk. & Kovács (2011)	Zhang *et al.* 2003
Diversispora insculpta 雕蚀多样孢囊霉	≡ *Glomus insculptum* Błaszk. (2004)	Oehl, G.A. Silva & Sieverd. (2011)	

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Diversispora jakucsiae 雅氏多样孢囊霉		Błaszk., Balázs & Kovács (2015)	
Diversispora omaniana 阿曼多样孢囊霉		Symanczik, Błaszk. & Al-Yahya'ei (2014)	
Diversispora peridiata 包被多样孢囊霉		Błaszk., Chwat, Kovács & Góralska (2015)	
Diversispora trimurales 三壁多样孢囊霉	≡ *Glomus trimurales* Koske & Halvorson (1989)	C. Walker & Schuessler (2010)	Cai *et al.* 2012
Diversispora slowinskiensis 斯洛文多样孢囊霉		Błaszk., Chwat, Kovács & Góralska (2015)	
Diversispora spurca 黏屑多样孢囊霉	≡ *Glomus spurcum* C.M. Pfeiff., C. Walker & Bloss (1996)	C. Walker & A. Schuessler (2004)	Gai *et al.* 2004 Wang *et al.* 2016**
Diversispora varaderana 巴拉德罗多样孢囊霉		Błaszk., Chwat, Kovács & Góralska (2015)	
Dominikia 多氏囊霉属		Błaszk., Chwat & Kovács (2014)	
Dominikia achra 无色多氏囊霉	≡ *Glomus achrum* Błaszk., D. Redecker, Koegel, Schützek, Oehl & Kovács (2009)	Błaszk., Chwat & Kovács (2014)	
Dominikia aurea 黄金多氏囊霉	≡ *Glomus aureum* Oehl & Sieverd (2003)	Błaszk., Chwat, G.A. Silva & Oehl (2015)	Cai *et al.* 2008
Dominikia bernensis 伯尔尼多氏囊霉		Oehl, Palenz., Sánchez-Castro, N.M.F. Sousa & G.A. Silva (2015)	
Dominikia compressa 扁柄多氏囊霉	≡ *Glomus compressum* Sieverd., Oehl, Palenz., Sánchez-Castro & G.A. Silva	Oehl, Palenz., Sánchez-Castro & G.A. Silva (2015)	
Dominikia difficilevidera 难辨多氏囊霉		Błaszk., Góralska & Chwat (2015)	
Dominikia disticha 两列多氏囊霉		Błaszk., Chwat & Kovács (2014)	
Dominikia duoreactiva 双变多氏囊霉		Błaszk., Góralska & Chwat (2015)	

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Dominikia indica 印度多氏囊霉	≡ *Glomus indicum* Błaszk., Wubet, Harikumar (2010)	Błaszk., Chwat & Kovács (2015)	
Dominikia iranica 伊朗多氏囊霉	≡ *Glomus iranicum* Błaszk., Kovács & Balázs (2010) = *Rhizophagus iranicus* C. Walker & Schuessler (2010)	Błaszk., Chwat & Kovács (2014)	
Dominikia minuta 极小多氏囊霉	≡ *Glomus minutum* Błaszk., Tadych & Madej (2000)	Błaszk., Chwat & Kovács (2014)	
Entrophospora 内养囊霉属	未确定分类地位的种 Species of uncertain position		
Entrophospora baltica 波罗的海内养囊霉	= *Sacculospora baltica* Oehl, Palenz., Sánchez-Castro, B.T. Goto, G.A. Silva & Sieverd. (2011)	Błaszk., Madej & Tadych (1998)	Cai *et al.* 2007
Entrophospora nevadensis 内瓦达内养囊霉		J. Palenzuela, N. Ferrol, Azcón-Aguilar & Oehl (2010)	
Entrophospora 内养囊霉属	未确定系统发育地位的种 Uncertain phylogenetic position	R.N. Ames & R.W. Schneid. (1979)	
Entrophospora infrequens 稀有内养囊霉	≡ *Glomus infrequens* I.R. Hall (1977)	R.N. Ames & R.W. Schneid. (1979)	Wu & Chen 1986
Funneliformis 斗管囊霉属		C. Walker & Schuessler (2010)	
Funneliformis africanum 非洲斗管囊霉	≡ *Glomus africanum* Błaszk. & Kovács (2010)	C. Walker & Schuessler (2010)	
Funneliformis badium 褐色斗管囊霉	≡ *Glomus badium* Oehl, Redecker & Sieverd. (2005)	C. Walker & Schuessler (2010)	Zhang *et al.* 2007
Funneliformis caledonium 苏格兰斗管囊霉	≡ *Endogone macrocarpa* var. *Caledonia* T.H. Nicolson & Gerd. (1968) = *Glomus caledonium* Trappe & Gerd. (1974)	C. Walker & Schuessler (2010)	Wu & Chen 1986 Wang *et al.* 2016**
Funneliformis coronatum 副冠斗管囊霉	≡ *Glomus coronatum* Giovann. (1991)	C. Walker & Schuessler (2010)	Zhang *et al.* 2007 Wang *et al.* 2016**
Funneliformis mosseae 摩西斗管囊霉	≡ *Endogone mosseae* T.H. Nicolson & Gerd. (1968) = *Glomus mosseae* Gerd. & Trappe (1974)	C. Walker & Schuessler 2010	Fang *et al.* 1986 Wang *et al.* 2016**
Funneliformis fragilistratum 脆层斗管囊霉	≡ *Glomus fragilistratum* Skou & I. Jakobsen (1989)	C. Walker & Schuessler (2010)	

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Funneliformis geosporum 地斗管囊霉	≡*Endogone macrocarpa* var. *Geospora* T.H. Nicolson & Gerd. (1968) = *Glomus macrocarpum* var. *geosporum* Gerd. & Trappe (1974), *Glomus geosporum* C. Walker (1982)	C. Walker & Schuessler (2010)	Hu 1988 Wang *et al.* 2016**
Funneliformis verruculosum 疣突斗管囊霉	≡ *Glomus verruculosum* Błaszk. (1997)	C. Walker & Schuessler (2010)	Li *et al.* 2004
Funneliformis xanthium 苍耳斗管囊霉	≡ *Glomus xanthium* Błaszk., Blanke, Renker & Buscot (2004)	C. Walker & Schuessler (2010)	Cai *et al.* 2012
Geosiphon 地管囊霉属		F. v. Wettstein (1915)	
Geosiphon pyriformis 梨形地管囊霉	≡ *Botrydium pyriforme* Kützing (1849) = *Geosiphonomyces pyriformis* Cif. & Tomas (1957)	F. v. Wettstein (1915)	
Gigaspora 巨孢囊霉属		Gerd. & Trappe (1974)	
Gigaspora albida 微白巨孢囊霉		N.C. Schenck & G.S. Sm. (1982)	Fang *et al.* 2000
Gigaspora candida 纯白巨孢囊霉	= *Gigaspora alboaurantiaca* W.N. Chou (1991)	Bhattacharjee, Mukerji, J.P. Tewari & Skoropad (1982)	Zhou *et al.* 1991*
Gigaspora decipiens 易误巨孢囊霉		I.R. Hall & L.K. Abbott (1984)	Liu *et al.* 2002
Gigaspora gigantea 极大巨孢囊霉	≡ *Endogone gigantea* T.H. Nicolson & Gerd. (1968)	Gerd. & Trappe (1974)	Wu & Chen 1986
Gigaspora margarita 球状巨孢囊霉		W.N. Becker & I.R. Hall (1976)	Peng *et al*. 1990
Gigaspora ramisporophora 分支巨孢囊霉		Spain, Sieverd. & N.C. Schenck (1989)	Cai *et al.* 2007
Gigaspora rosea 玫瑰红巨孢囊霉		T.H. Nicolson & N.C. Schenck (1979)	
Glomus（狭义的 *sensu stricto*） 球囊霉属	= *Parapseudoglomus* S.P. Gautam & U.S. Patel (2007)	Tul. & C. Tul. (1845)	
Glomus macrocarpum 大果球囊霉	= *Endogone macrocarpa* Tul. & C. Tul. (1851), *Glomus macrocarpum* var. *macrocarpum*	Tul. & C. Tul. (1845)	Hu 1988 Wang *et al.* 2016**

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Glomus tetrastratosum 四层球囊霉		Błaszk., Chwat & Góralska (2015)	
Glomus（广义的 *sensu lato*）球囊霉属	未确定系统发育地位的种 Species of uncertain phylogenetic position		
Glomus albidum 白色球囊霉		C. Walker & L.H. Rhodes (1981)	Wang & Hu 1989
Glomus ambisporum 双型球囊霉		G.S. Sm. & N.C. Schenck (1985)	Wang & Hu 1989
Glomus antarcticum 南极球囊霉		Cabello (1994)	
Glomus arborense 树状球囊霉		McGee (1986)	
Glomus atrouva 黑葡萄球囊霉		McGee & Pattinson (2002)	
Glomus australe 澳洲球囊霉	≡ *Endogone australis* Berk. (1859)	S.M. Berch (1983)	Zhang *et al.* 2003
Glomus avelingiae 艾夫林球囊霉		R.C. Sinclair (2000)	
Glomus bagyarajii 巴氏球囊霉		V.S. Mehrotra (1997)	
Glomus boreale 北方球囊霉	≡ *Endogone borealis* Thaxt. (1922)	Trappe & Gerd. (1974)	
Glomus botryoides 总序球囊霉		F.M. Rothwell & Victor (1984)	
Glomus brohultii 布氏球囊霉		R.A. Herrera, Ferrer & Sieverd. (2003)	Yang *et al.* 2008
Glomus caesaris 恺撒球囊霉		Sieverd. & Oehl (2002)	
Glomus canadense 加拿大球囊霉	≡ *Endogone canadensis* Thaxt. (1922)	Trappe & Gerd. (1974)	Shi *et al*. 2004
Glomus canum 白发球囊霉		McGee (2002)	
Glomus cerebriforme 脑状球囊霉		McGee (1986)	
Glomus citricola 柑橘球囊霉		D.Z. Tang & M. Zang (1984)	Tang & Zang 1984*

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Glomus convolutum 卷曲球囊霉		Gerd. & Trappe (1974)	Zhang *et al.* 2003
Glomus crenatum 圆齿球囊霉		Furrazola, Ferrer, R.A. Herrera & B.T. Goto (2011)	
Glomus cubense 古巴球囊霉		Y. Rodr. & Dalpé (2012)	
Glomus cuneatum 楔形球囊霉		McGee & Cooper (2002)	
Glomus delhiense 德里球囊霉		Mukerji, Bhattacharjee & J.P. Tewari (1983)	Liu *et al.* 2001
Glomus dimorphicum 两型球囊霉		Boyetchko & J.P. Tewari (1986)	Wang *et al.* 1998
Glomus dolichosporum 长孢球囊霉		M.Q. Zhang & You S. Wang (1997)	Zhang *et al.* 1997*
Glomus flavisporum 黄孢球囊霉	≡ *Endogone flavispora* M. Lange & E.M. Lund (1955)	Trappe & Gerd. (1974)	Gao *et al*. 2006
Glomus formosanum 台湾球囊霉		C.G. Wu & Z.C. Chen (1986)	Wu & Chen 1986*
Glomus fragile 脆球囊霉	≡ *Paurocotylis fragilis* Berk. & Broome (1875)	(Berk. & Broome) Trappe & Gerd. (1974)	
Glomus fuegianum 富氏球囊霉	≡ *Endogone fuegiana* Speg. (1887)	Trappe & Gerd. (1974)	
Glomus glomerulatum 团集球囊霉		Sieverd. (1987)	Fang *et al.* 2000
Glomus goaensis 果阿球囊霉		Khade (2009)	
Glomus halonatum 晕环球囊霉		S.L. Rose & Trappe (1980)	
Glomus heterosporum 异形球囊霉		G.S. Sm. & N.C. Schenck (1985)	Zhang *et al.* 2003
Glomus hoi 何氏球囊霉	= *Simiglomus hoi* G.A. Silva, Oehl & Sieverd. (2011)	S.M. Berch & Trappe (1985)	Wang & Hu 1989 Wang *et al.* 2016**
Glomus hyderabadensis 海得拉巴球囊霉		Swarapu, Kunwar, Prasad & Manohar (2004)	Wang *et al.* 2006
Glomus kerguelense 克尔盖伦球囊霉		Dalpé & Strullu (2002)	

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Glomus lacteum 乳白球囊霉		S.L. Rose & Trappe (1980)	Fang *et al.* 2000
Glomus magnicaule 宽柄球囊霉		I.R. Hall (1977)	Fang *et al.* 2000
Glomus melanosporum 黑孢球囊霉		Gerd. & Trappe (1974)	Wang & Liu 2002a
Glomus microaggregatum 微丛球囊霉	= *Rhizoglomus microaggregatum* Sieverd., G.A. Silva & Oehl (2014)	Koske, Gemma & P.D. Olexia (1986)	Zhang *et al.* 1996 Wang *et al.* 2016**
Glomus microcarpum 小果球囊霉	= *Endogone microcarpus* Tul. & C. Tul. (1851), *E. neglecta*	Tul. & C. Tul. (1845)	Hu 1988
Glomus monosporum 单孢球囊霉		Gerd. & Trappe (1974)	Zhao 1998
Glomus mortonii 莫顿球囊霉		Bentiv. & Hetrick (1991)	Cai *et al.* 2012
Glomus multicaule 多梗球囊霉		Gerd. & B.K. Bakshi (1976)	Zhao & Du 1997
Glomus multiforum 凹坑球囊霉		Tadych & Błaszk. (1997)	Zhao *et al.* 2006
Glomus multisubstensum 多丝球囊霉		Mukerji, Bhattacharjee & J.P. Tewari (1983)	
Glomus nanolumen 微腔球囊霉		Koske & Gemma (1990)	
Glomus pallidum 淡色球囊霉		I.R. Hall (1977)	Peng *et al*. 1990
Glomus pansihalos 膨果球囊霉		S.M. Berch & Koske (1986)	Wang & Liu 2002a
Glomus pellucidum 半透明球囊霉		McGee & Pattinson (2002)	
Glomus pustulatum 具疱球囊霉		Koske, Friese, C. Walker & Dalpé (1986)	Wang & Liu 2002a
Glomus radiatum 放射球囊霉	≡ *Endogone radiata* Thaxt. (1922)	Trappe & Gerd. (1974)	
Glomus reticulatum 网状球囊霉		Bhattacharjee & Mukerji (1980)	Gai *et al.* 2000
Glomus segmentatum 裂纹球囊霉		Trappe, Spooner & Ivory (1979)	
Glomus spinosum 刺球囊霉		H.T. Hu (2002)	Hu 2002*

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Glomus spinuliferum 微刺球囊霉		Sieverd. & Oehl (2003)	Cai *et al*. 2009
Glomus sterilum 不育球囊霉		V.S. Mehrotra & Baijal (1992)	
Glomus tenebrosum 萌性球囊霉	≡ *Endogone tenebrosa* Thaxt. (1922)	S.M. Berch (1983)	Wang & Liu 2002a
Glomus tenerum 柔球囊霉		P.A. Tandy (1975)	
Glomus tenue 细球囊霉	≡ *Rhizophagus tenuis* Greenall (1963)	I.R. Hall (1977)	
Glomus trufemii 特氏球囊霉		B.T. Goto, G.A. Silva & Oehl (2012)	
Glomus versiforme 变形球囊霉	≡ *Endogone versiformis* P. Karst (1884), non sensu Berch & Fortin, Can. J. Bot. 61: 2614 (1983)	S.M. Berch (1983)	Zhang & Wang 1991 Wang *et al.* 2016**
Glomus warcupii 沃氏球囊霉		McGee (1986)	
Glomus zaozhuangianus 枣庄球囊霉		F.Y. Wang & R.J. Liu (2002)	Wang & Liu 2002b*
Kamienskia 卡氏囊霉属		Błaszk., Chwat & Kovács (2014)	
Kamienskia bistrata 双层卡氏囊霉	≡ *Glomus bistratum* Błaszk., D. Redecker, Koegel, Symanczik, Oehl & Kovács (2009)	Błaszk., Chwat & Kovács (2014)	
Kamienskia perpusilla 微细卡氏囊霉	≡ *Glomus perpusillum* Błaszk. & Kovács (2009)	Błaszk., Chwat & Kovács (2014)	
Otospora 耳孢囊霉属		J. Palenzuela, N. Ferrol & Oehl (2008)	
Otospora bareae 巴里亚耳孢囊霉		J. Palenzuela, N. Ferrol & Oehl (2008)	
Pacispora 和平囊霉属		Oehl & Sieverd. (2004)	
Pacispora chimonobambusae 方竹和平囊霉	≡ *Glomus chimonobambusae* C.G. Wu & Y.S. Liu (1995) =*Gerdemannia chimonobambusae* C. Walker, Blaszk., Schuessler & Schwarzott (2004)	C. Walker, Vestberg & Schuessler (2007)	Wu *et al*. 1995*
Pacispora boliviana 玻利维亚和平囊霉		Oehl & Sieverd. (2004)	Gao *et al*. 2006

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Pacispora coralloidae 珊瑚状和平囊霉		Oehl & Sieverd. (2004)	
Pacispora franciscana 弗朗西斯和平囊霉		Oehl & Sieverd. (2004)	
Pacispora patagonica 巴塔哥尼亚和平囊霉	≡ *Glomus patagonicum* Novas & Fracchia (2005)	C. Walker, Vestberg & Schuessler (2007)	
Pacispora robigina 锈色和平囊霉		Oehl & Sieverd. (2004)	Cai *et al.* 2008
Pacispora scintillans 闪亮和平囊霉	≡ *Glomus scintillans* S.L. Rose & Trappe (1980) = *P. dominikii* Oehl & Sieverd. (2004), *Gerdemannia scintillans* Walker, Błaszk., Schuessler & Schwarzott (2004), *Glomus dominikii* Błaszk. (1988)	C. Walker, Vestberg & Schuessler (2007)	Hu 1988
Paraglomus 类球囊霉属		J.B. Morton & D. Redecker (2001)	
Paraglomus brasilianum 巴西类球囊霉	≡ *Glomus brasilianum* Spain & J. Miranda (1996)	J.B. Morton & D. Redecker (2001)	Cai *et al.* 2009
Paraglomus majewskii 马耶夫斯基类球囊霉		Błaszk. & Kovács (2012)	Cui *et al.* 2016
Paraglomus occultum 隐类球囊霉	≡ *Glomus occultum* C. Walker (1982)	J.B. Morton & D. Redecker (2001)	Peng *et al*. 1990 Wang *et al.* 2016**
Paraglomus laccatum 漆亮类球囊霉	≡ *Glomus laccatum* Błaszk. (1988)	C. Renker, Błaszk. & F. Buscot (2007)	
Paraglomus pernambucanum 伯南布哥类球囊霉		Oehl, C.M. Mello, Magna & G.A. Silva sp. nov.（2013）	Luo *et al.* 2016
Racocetra 裂盾囊霉属		Oehl, F.A. Souza & Sieverd. (2008)	
Racocetra castanea 栗色裂盾囊霉	≡ *Scutellospora castanea* C. Walker (1993)	Oehl, F.A. Souza & Sieverd. (2008)	
Racocetra coralloidea 珊瑚状裂盾囊霉	≡ *Gigaspora coralloidea* Trappe, Gerd. & I. Ho (1974) = *Scutellospora coralloidea* C. Walker & F.E. Sanders (1986)	Oehl, F.A. Souza & Sieverd. (2008)	Pan *et al.* 1997b

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Racocetra fulgida 亮色裂盾囊霉	≡ *Scutellospora* fulgida Koske & C. Walker (1986)	Oehl, F.A. Souza & Sieverd. (2008)	Wang *et al.* 1998
Racocetra gregaria 群生裂盾囊霉	≡ *Gigaspora gregaria* N.C. Schenck & T.H. Nicolson (1979) = *Scutellospora gregaria* C. Walker & F.E. Sanders (1986)	Oehl, F.A. Souza & Sieverd. (2008)	Zhao 1998
Racocetra persica 桃形裂盾囊霉	≡ *Gigaspora persica* Koske & C. Walker (1985) = *Scutellospora persica* C. Walker & F.E. Sanders (1986)	Oehl, F.A. Souza & Sieverd. (2008)	Zhao 1998
Racocetra tropicana 热带裂盾囊霉		Oehl, B.T. Goto & G.A. Silva (2011)	
Racocetra verrucosa 疣壁裂盾囊霉	≡ *Gigaspora verrucosa* Koske & C. Walker (1985) = *Scutellospora verrucosa* C. Walker & F.E. Sanders (1986)	Oehl, F.A. Souza & Sieverd. (2008)	Yang *et al.* 2004
Racocetra weresubiae 卫氏裂盾囊霉	≡ *Scutellospora weresubiae* Koske & C. Walker (1986)	Oehl, F.A. Souza & Sieverd. (2008)	
Racocetra 裂盾囊霉属	未确定分类地位的种 Species of uncertain position		
Racocetra alborosea 白粉红裂盾囊霉	≡ *Gigaspora alborosea* Ferrer & R.A. Herrera (1981) =*Scutellospora alborosea* C. Walker & F.E. Sanders (1986)	Oehl, F.A. Souza & Sieverd. (2008)	
Racocetra beninensis 贝宁裂盾囊霉		Oehl, Tchabi & Lawouin (2009)	
Racocetra intraornata 内饰裂盾囊霉		B.T. Goto & Oehl (2009)	
Racocetra minuta 微小裂盾囊霉	≡ *Gigaspora minuta* Ferrer & R.A. Herrera (1981) =*Scutellospora minuta* C. Walker & F.E. Sanders (1986)	Oehl, F.A. Souza & Sieverd. (2008)	
Racocetra undulata 波状裂盾囊霉		T.C. Lin & C.H. Yen (2011)	
Redeckera 雷德克囊霉属		C. Walker & Schuessler (2010)	
Redeckera fulvum 黄雷德克囊霉	≡ *Paurocotylis fulvum* Berk. & Broome (1875) Synonyms: *Endogone fulva* (Berk. & Broome) Pat. (1903), *Glomus fulvum* Trappe & Gerd. (1974)	C. Walker & Schuessler (2010)	Wu *et al.* 2001

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Redeckera megalocarpum 大果雷德克囊霉	≡ *Glomus megalocarpum* D. Redecker (2007)	C. Walker & Schuessler (2010)	
Redeckera pulvinatum 垫状雷德克囊霉	≡ *Endogone pulvinata* Henn. (1897) = *Glomus pulvinatum* Trappe & Gerd. (1974)	C. Walker & Schuessler (2010)	
Rhizophagus 根孢囊霉属			
Rhizophagus aggregatus 聚丛根孢囊霉	= *Glomus aggregatum* N.C. Schenck & G.S. Sm. (1982) *Rhizoglomus aggregatum* (N.C. Schenck & G.S. Sm.) Sieverd., G.A. Silva & Oehl	C. Walker (2016)	Hu 1988 Wang *et al.* 2016**
Rhizophagus arabicus 阿拉伯根孢囊霉		Błaszk., Symanczik & Al-Yahya'ei (2014)	
Rhizophagus clarus 明根孢囊霉	≡ *Glomus clarum* T.H. Nicolson & N.C. Schenck (1979)	C. Walker & Schuessler (2010)	Hu 1988
Rhizophagus diaphanus 透光根孢囊霉	≡ *Glomus diaphanum* J.B. Morton & C. Walker (1984)	C. Walker & Schuessler (2010)	Peng *et al*. 1990 Wang *et al.* 2016**
Rhizophagus custos 护卫根孢囊霉	≡ *Glomus custos* C. Cano & Y. Dalpé (2009)	C. Walker & Schuessler (2010)	
Rhizophagus fasciculatus 聚生根孢囊霉	≡*Endogone fasciculata* Thaxt. (1922) = *Glomus fasciculatum* Gerd. & Trappe (1974)	C. Walker & Schuessler (2010)	Wu & Chen 1986
Rhizophagus intraradices 根内根孢囊霉	≡ *Glomus intraradices* N.C. Schenck & G.S. Sm. (1982)	C. Walker & Schuessler (2010)	Fang *et al.* 1986 Wang *et al.* 2016**
Rhizophagus invermaium 英弗梅根孢囊霉	≡ *Glomus invermaium* I.R. Hall (1977) =*Rhizoglomus invermaium* Sieverd., G.A. Silva & Oehl	C. Walker (2016)	Wu *et al.* 2001
Rhizophagus irregularis 异形根孢囊霉	≡ *Glomus irregulare* Błaszk., Wubet, Renker & Buscot (2008)	C. Walker & Schuessler (2010)	
Rhizophagus manihotis 木薯根孢囊霉	≡ *Glomus manihotis* R.H. Howeler, Sieverd. & N.C. Schenck (1984)	C. Walker & Schuessler (2010)	Wu *et al.* 1994
Rhizoglomus melanum 深棕根孢囊霉		Sudová R, Sýkorová Z, Rydlová J, Čtvrtlíková M, Oehl F (2015)	

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Rhizophagus natalensis 纳塔尔根孢囊霉		Błaszk., Chwat & B.T. Goto (2015)	
Rhizophagus populinus 杨根孢囊霉		P.A. Dang. (1896)	
Rhizophagus proliferus 多育根孢囊霉	≡ *Glomus proliferum* Dalpé & Declerck (2000) compare with *Glomus arborense*	C. Walker & Schuessler (2010)	
Rhizophagus vesiculiferus 泡囊根孢囊霉	≡ *Endogone vesiculifera* Thaxt. (1922) = *Glomus vesiculiferum* Gerd. & Trappe (1974)	C. Walker & Schuessler (2013)	
Sacculospora 囊孢囊霉属		Oehl, Sieverd., G.A. Silva, B.T. Goto, Sánchez-Castro & Palenz. 2011	
Sacculospora felinovii 费里诺囊孢囊霉		Błaszk., Góralska & Chwat (2016)	
Sclerocystis 硬囊霉属		Berk. & Broome (1873)	
Sclerocystis coremioides 帚状硬囊霉	= *Glomus coremioides* D. Redecker & J.B. Morton (2000)	Berk. & Broome (1873)	Wu & Chen 1986
Sclerocystis sinuosa 弯丝硬囊霉	= *Glomus sinuosum* R.T. Almeida & N.C. Schenck (1990), *S. pakistanica*	Gerd. & B.K. Bakshi (1976)	Wu & Chen 1986
Sclerocystis 硬囊霉属	未确定分类地位的种 Species of uncertain position		
Sclerocystis alba 白硬囊霉	= *Endogone alba* Gerd. & Trappe (1974)	Petch (1925)	
Sclerocystis dussi 杜斯硬囊霉	≡*Ackermannia dussii* Pat. (1902) = *Sphaerocreas dussii* Höhn. (1909)	Höhn. (1910)	
Sclerocystis clavispora 棒孢硬囊霉	= *Glomus clavisporum* R.T. Almeida & N.C. Schenck (1990)	Trappe (1977)	Wu & Chen 1986
Sclerocystis coccogenum 粒生硬囊霉	≡ *Ackermannia coccogena* Pat. (1902) =*Sphaerocreas coccogenum* (Pat.) Höhn. (1909), *Sclerocystis microcarpus* S.H. Iqbal & Perveen (1980)	Höhn. (1910)	

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Sclerocystis liquidambaris 枫香硬囊霉	= *Glomus liquidambaris* R.T. Almeida & N.C. Schenck (1990), *Glomus liquidambaris* R.T. Almeida & N.C. Schenck ex Y.J. Yao (1995), *Sclerocystis cunninghamia* H.T. Hu (1988)	C.G. Wu & Z.C. Chen (1987)	Wu & Chen 1987* Hu 1988*
Sclerocystis rubiformis 悬钩子硬囊霉	= *Glomus rubiforme* R.T. Almeida & N.C. Schenck (1990), *Sclerocystis indica* Bhattacharjee & Mukerji (1980), *Sclerocystis pachycaulis* C.G. Wu & Z.C. Chen (1986)	Gerd. & Trappe (1974)	Wu & Chen 1986
Sclerocystis pubescens 短毛硬囊霉	≡ *Sphaerocreas pubescens* Sacc. & Ellis (1882) = *Endogone pubescens* Zycha (1935), *Stigmatella pubescens* Sacc. (1886), *Glomus pubescens* Trappe & Gerd. (1974)	Höhn (1910)	
Sclerocystis taiwanensis 台湾硬囊霉	= *Glomus taiwanense* R.T. Almeida & N.C. Schenck (1990), *Glomus taiwanense* R.T. Almeida & N.C. Schenck ex Y.J. Yao (1995)	C.G. Wu & Z.C. Chen (1987)	Wu & Chen 1987*
Scutellospora 盾巨孢囊霉属		C. Walker & F.E. Sanders (1986)	
Scutellospora alterata 变异盾巨孢囊霉		Oehl, J.S. Pontes, Palenz., I.C. Sánchez & G.A. Silva (2013)	
Scutellospora aurigloba 金球盾巨孢囊霉	≡*Gigaspora aurigloba* I.R. Hall	C. Walker & F.E. Sanders (1986)	Peng *et al*. 1990
Scutellospora calospora 美丽盾巨孢囊霉	≡*Endogone calospora* T.H. Nicolson & Gerd. (1968) = *Gigaspora calospora*	C. Walker & F.E. Sanders (1986)	Hu 1988
Scutellospora nodosa 结节盾巨孢囊霉		Błaszk. (1991)	
Scutellospora projecturata 指状盾巨孢囊霉	= *Orbispora projecturata* Oehl, G.A. Silva & D.K. Silva (2011)	Kramad. & C. Walker (2000)	
Scutellospora dipurpurescens 双紫盾巨孢囊霉		J.B. Morton & Koske (1988)	Zhao *et al.* 2006

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Scutellospora 盾巨孢囊霉属	未确定分类地位的种 Species of uncertain position		
Scutellospora arenicola 沙生盾巨孢囊霉		Koske & Halvorson (1990)	
Scutellospora armeniaca 杏黄盾巨孢囊霉	≡ *Cetraspora armeniaca* Oehl, F.A. Souza & Sieverd. (2008)	Błaszk. (1993)	
Scutellospora biornata 双突盾巨孢囊霉	= *Dentiscutata biornata* Sieverd., F.A. Souza & Oehl (2008)	Spain, Sieverd. & S. Toro (1989)	
Scutellospora cerradensis 塞拉多盾巨孢囊霉	= *Dentiscutata cerradensis* Sieverd., F.A. Souza & Oehl (2008), *Scutellospora trirubiginopa* X.L. Pan & G.Yun Zhang (1997), *Fuscutata trirubiginopa* Oehl, F.A. Souza & Sieverd. (2008)	Spain & J. Miranda (1996)	Pan *et al.* 1997a* Wang *et al.* 2006
Scutellospora crenulata 圆齿盾巨孢囊霉		R.A. Herrera, Cuenca & C. Walker (2001)	
Scutellospora dipapillosa 双疣盾巨孢囊霉	≡ *Gigaspora dipapillosa* C. Walker & Koske (1985)	C. Walker & F.E. Sanders (1986)	Cai *et al.* 2009
Scutellospora gilmorei 吉尔莫盾巨孢囊霉	≡ *Gigaspora gilmorei* Trappe & Gerd. (1974) = *Cetraspora gilmorei* Oehl, F.A. Souza & Sieverd. (2008)	C. Walker & F.E. Sanders (1986)	Hu 1988
Scutellospora hawaiiensis 夏威夷盾巨孢囊霉	= *Dentiscutata hawaiiensis* Sieverd., F.A. Souza & Oehl (2008)	Koske & Gemma (1995)	
Scutellospora nigra 黑盾巨孢囊霉	≡ *Gigaspora nigra* J.F. Redhead (1979) = *Dentiscutata nigra* Sieverd., F.A. Souza & Oehl (2008)	C. Walker & F.E. Sanders (1986)	Hu 1988
Scutellospora pellucida 透明盾巨孢囊霉	≡ *Gigaspora pellucida* T.H. Nicolson & N.C. Schenck (1979) = *Cetraspora pellucida* Oehl, F.A. Souza & Sieverd. (2008)	C. Walker & F.E. Sanders (1986)	Hu 1988
Scutellospora pernambucana 伯南布哥盾巨孢囊霉	= *Orbispora pernambucana* Oehl, G.A. Silva & D.K. Silva (2011)	Oehl, D.K Silva, N. Freitas, L.C. Maia (2008)	

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Scutellospora reticulata 网纹盾巨孢囊霉	≡ *Gigaspora reticulata* Koske, D.D. Mill. & C. Walker (1983) = *Dentiscutata reticulata* Sieverd., F.A. Souza & Oehl (2008)	C. Walker & F.E. Sanders (1986)	Wang *et al.* 1998
Scutellospora rubra 红盾巨孢囊霉	= *Fuscutata rubra* Oehl, F.A. Souza & Sieverd. (2008)	Stürmer & J.B. Morton (1999)	
Scutellospora savannicola 草原盾巨孢囊霉	≡ *Gigaspora savannicola* R.A. Herrera & Ferrer (1981) = *Fuscutata savannicola* Oehl, F.A. Souza & Sieverd. (2008)	C. Walker & F.E. Sanders (1986)	
Scutellospora scutata 盾状盾巨孢囊霉	= *Dentiscutata scutata* Sieverd., F.A. Souza & Oehl (2008)	C. Walker & Dieder. (1989)	
Scutellospora spinosissima 多刺盾巨孢囊霉	= *Cetraspora spinosissima* Oehl, F.A. Souza & Sieverd. (2008)	C. Walker & Cuenca (1998)	
Scutellospora striata 条纹盾巨孢囊霉	= *Cetraspora striata* Oehl, F.A. Souza & Sieverd. (2008)	Cuenca & R.A. Herrera (2008)	
Scutellospora tricalypta 三盖盾巨孢囊霉	≡ *Gigaspora tricalypta* R.A. Herrera & Ferrer (1981)	C. Walker & F.E. Sanders (1986)	
Septoglomus 隔球囊霉属			
Septoglomus altomontanum 高山隔球囊霉		Palenz., Oehl, Azcón-Aguilar & G.A. Silva (2013)	
Septoglomus constrictum 缩隔球囊霉	≡ *Glomus constrictum* Trappe (1977) =*Funneliformis constrictus* C. Walker & A. Schüßler	Sieverd., G.A. Silva & Oehl (2011)	Fang *et al.* 1986 Wang *et al.* 2016**
Septoglomus deserticola 沙荒隔球囊霉	≡ *Glomus deserticola* Trappe, Bloss & J.A. Menge (1984)	G.A. Silva, Oehl & Sieverd. (2011)	Zhao 1998
Septoglomus fuscum 深棕隔球囊霉		Błaszk., Chwat, Kovács & Ryszka (2013)	
Septoglomus furcatum 叉状隔球囊霉		Błaszk., Chwat, Kovács & Ryszka (2013)	

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Septoglomus jasnowskae 雅氏隔球囊霉		Błaszk., Chwat & Ryszka (2015)	
Septoglomus nakheelum 枣椰隔球囊霉		Al-Yahya'ei, Symanczik & Błaszk. (2014)	
Septoglomus titan 大孢隔球囊霉		B.T. Goto & G.A. Silva (2013)	
Septoglomus turnauae 图尔瑙隔球囊霉		Błaszk., Chwat & Ryszka (2015)	
Septoglomus viscosum 黏质隔球囊霉	≡ *Glomus viscosum* T.H. Nicolson (1995) = *Viscospora viscosa* Sieverd., Oehl & G.A. Silva (2011)	C. Walker, D. Redecker, D. Stille & A. Schüßler (2013)	Li *et al.* 2004

注：带*者为中国学者描述的新种；带**者为中国已保藏种质资源的种

Notes: *species described in China; **species collected in China.

表 2 列举的球囊菌门 AM 真菌的每一个种都包括有拉丁文种名（current name）、基原异名/同种异名（basionyms/synonyms）及分子研究的权威认证信息。同时对能够查到模式种发表文献的种，根据命名人的命名释义进行翻译，给出了 275 个种的中文名称。在这些种中有 4 个我国菌根研究常用的种需要特别注意：*Rhizophagus intraradices* 本文译作根内根孢囊霉，在旧分类系统为 *Glomus intraradices*（Schenck & Smith 1982）；*Rhizophagus irregularis* 本文译作异形根孢囊霉，是 Błaszkowski *et al*.（2008）发表的新种 *Glomus irregulare*。由于这 2 个种形态相似，有一段时间被混淆，后因 *Rhizophagus irregularis* 是目前 AM 真菌唯一被全基因组测序的种（Tisserant *et al*. 2013），国内一些研究者在用新分类系统发表文章时直接将试验菌种为 *Glomus intraradices* 写成 *Rhizophagus irregularis*，这是完全错误的。*Rhizophagus intraradices* 和 *Rhizophagus irregularis* 已被 Schüßler & Walker（2010）证明为是两个不同的种。关于 *Diversispora epigaea*（≡*Glomus epigaeum* Daniels & Trappe 1979）和 *Glomus versiforme*（≡*Endogone versiformis* Karst 1884）的中文种名，张美庆和王幼珊（1991）发表中国新记录种时将 *Glomus versiforme* 中文种名译为地表球囊霉，因为 Berch & Fortin（1983）把 *Glomus epigaeum* 归为同一个种，所以按照 *Glomus epigaeum* 发表时的命名释义翻译为地表球囊霉。目前新的分类系统明确其为 2 个不同的种，本文根据模式种发表时的拉丁文释义将 *Diversispora epigaea* 中文种名译为地表多样孢囊霉，*Glomus versiforme* 中文种名译为变形球囊霉。此外，对于 *Paraglomus pernambucanum* Oehl, C.M. Mello, Magna & G.A. Silva sp. nov.（2013），罗协等（2016）发表中国新记录种时将其译作“伯氏类球囊霉”，而笔者根据 de Mello *et al*.（2013）发现该种的命名释义，“*pernambucanum*”的意思为该种第一次被发现的地方，所以该种译为“伯南布哥类球囊霉”

是确切的。

3 中国新记录种、新种和种质资源保藏种

迄今为止，中国已发现并报道的 AM 真菌有 147 种，其中包括 13 个新种（表 2），约占全球已报道球囊菌门 AM 真菌种数的一半，说明中国 AM 真菌物种资源十分丰富，具有生物多样性研究的巨大优势、资源收集与保藏的巨大潜力。近 10 多年来，中国 AM 真菌多样性、资源分布和群落结构等方面研究取得了丰硕结果（王发园等 2004；Gai *et al*. 2006；刘润进等 2009；何新华等 2012；王幼珊等 2012；王宇涛等 2013；蒋胜竞等 2014），这在全面了解我国 AM 真菌的属种分布特点、物种多样性状况及其促进相关研究等方面发挥了重要作用。然而，中国发表的有关论文中部分 AM 真菌学名因分类系统的变更而没有及时采用当时的新系统命名，特别是中文种名仍沿用旧的分类系统的中文种名，这是不科学的，甚至存在一定错误。为与国际 AM 真菌命名保持一致，笔者对照当前最新的分类系统特意在表 2 列出中国已报道的 145 个种首次报道者及其在最新分类系统中的中文学名，以期规范、正确和一致描述中国已报道的 AM 真菌菌种，以促进中国 AM 真菌分类、资源多样性和群落结构研究。

另外，表 2 中还标注了目前中国已保藏的 AM 真菌种质资源的 23 个种。这些种是从中国的 45 个地区 50 余种寄主植物根区土壤中获得，以高粱为寄主植物，采用诱集培养、单孢培养、扩繁培养和形态学鉴定到种，共分离得到 AM 真菌 135 株（王幼珊等 2012，2016），保藏在北京市农林科学院植物营养与资源研究所的“丛枝菌根真菌种质资源库（Bank of glomeromycota in China，BGC）”，并通过“国家微生物资源平台”实现共享服务，为中国丛枝菌根研究发挥着不可或缺的作用。

4 展望与结论

菌物界的真核生物至少 150 万种，是仅次于昆虫的第二大物种，在维持地球生态系统平衡与可持续生产力等方面发挥着不可替代的作用而倍受关注。进入 21 世纪以来，菌物分类学的发展可谓突飞猛进、日新月异和令人振奋。其中，该界增加的新门——球囊菌门 AM 真菌，尽管目前尚未获得纯培养，其分类系统不断更新，新种数量逐年增加，均表明该类真菌分类研究十分活跃。这与当今生物学迈入组学时代、现代分子生物学技术、其他学科的方法不断拓宽研究领域，以及新技术、新思路和新机制构建新的真菌分类学不无关系。可以预见，随着 AM 真菌分类学的不断进展，将有效促进 AM 真菌多样性特点与资源分布、群落结构特征与生理生态功能、生物共生机制与作用机制等方面的深入研究，以及 AM 真菌纯培养与应用技术的研发。

致谢：感谢庄剑云研究员在 AM 真菌拉丁文和中文学名修订过程中给予的指导，感谢陈应龙博士在查找疑难文献中给予的大力支持和帮助，以及研究生胡玉金、于小娟和尹永楠同学协助查找和整理文献。

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（本文责编：韩丽）