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A multiple gene genealogy reveals the phylogenetic placement of *Iodosphaeria tongrenensis* sp. nov. in Iodosphaeriaceae (Xylariales)

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Abstract

During collections of Sordariomycetes in Guizhou Province, China, we collected *Iodosphaeria tongrenensis sp. nov.*. It is unique in the genus because of its ellipsoidal ascospores (18.5–22.5 × 6.5–8.5 µm) with a slimy sheath covering the whole spore, and J+, wedge-shaped, ascal apical apparatus. *Iodosphaeria* is a monotypic genus in *Iodosphaeriaceae* and phylogenetic analyses of combined LSU, ITS and SSU sequence data indicate that it is a distinct family in the order *Xylariales.*

Key words: phylogeny, Sordariomycetes, taxonomy

Introduction

Samuels *et al*. (1987) introduced the generic name *Iodosphaeria* in the family Amphisphaeriaceae with type species, *I. phyllophila* (Mouton) Samuels, E. Müll. & Petrini. *Iodosphaeria* species are characterised by their superficial, black, non-papillate ascomata, with unbranched, brown flexuous hairs radiating from the peridium surface. The peridium is composed of two distinct regions; an outer region of angular, pigmented cells, and an inner region of flattened hyaline cells. Asci are 8-spored, unitunicate, cylindrical to narrowly clavate, and usually have amyloid, discoid apical apparatuses staining in Melzer's reagent. Ascospores are allantoid to ellipsoidal, aseptate, hyaline, with or without sheaths (Samuels *et al*. 1987). Selenosporella -like and ceratosporium -like asexual morphs have been observed, both on the surface of host and in culture. There are eight records in the genus *Iodosphaeria* (Index Fungorum 2015), which have been reported worldwide, from Argentina, Europe, Hong Kong, New Zealand South America and USA (Samuels *et al.* 1987, Barr 1993, Hyde 1995, Candoussau *et al.* 1996, Hsieh *et al.* 1997, Taylor & Hyde 1999, Catania & Romero 2012).

Ellis & Ellis (1985) described *Lasiosphaeria phyllophila* Mouton from fallen dead twigs and debris of *Acer*, *Populus* and *Salix*. Because *Lasiosphaeria phyllophila* combined characters of selenosporella -like and ceratosporium -like asexual morphs and forming an amyloid apical apparatus in the sacus, Samuels *et al*. (1987) placed it in a new genus *Iodosphaeria. Iodosphaeria* was considered similar to *Phaeotrichosphaeria* Sivan. (Sivanesan 1983) and *Endophragmiella* B. Sutton (Hughes 1979). *Iodosphaeria* was included in *Amphisphaeriaceae* by Samuels *et al*. (1987). Barr (1993) transferred *Trichosphaeria arundinariae* Ellis and Everh. to *Iodosphaeria arundinariae* (Ellis and Everh.) M.E. Barr based on its peridium and centrum structure. Barr (1990, 1994) suggested that *Iodosphaeria* was better placed in the family *Lasiosphaeriaceae* (*Sordariales*). Hyde (1995) added a new species, *I. aquatica*, to the genus, and noted that *I. aquatica* is close to *Pseudohalonectria* Minoura & T. Muroi and some species in *Lasiosphaeriaceae*. Hsieh *et al*. (1997) excluded *I. aquatica* from *Iodosphaeria*, while describing another new species. *Iodosphaeria* was excluded from *Amphisphaeriaceae* by Kang *et al*. (1998, 1999). Réblová (1999) placed the genus in the family Trichosphaeriaceae and Eriksson *et al*. (2001) placed it in the Amphisphaeriaceae. *Iodosphaeriaceae* was introduced as a new family by Hilber & Hilber (2002) to accommodate *Iodosphaeria*. Based on phylogenetic analyses of 28S rDNA, *Iodosphaeria* was shown to be similar to *Phomatospora* Sacc., and excluded from the Amphisphaeriaceae by

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Jeewon *et al*. (2003). The taxonomic position of *Iodosphaeria* is unclear as it lacks molecular data (Senanayake *et al*. 2015).

An interesting species characteristic of *Iodosphaeria* was found in China. Sequence data showed that its phylogenetic placement is in the family *Iodosphaeriaceae* (*Xylariales*, *Sordariomycetes*).

Materials and Methods

Morphological studies

Samples were collected in Guizhou Province in China. Specimens were taken to the laboratory in plastic bags. Observations, photography and measurements of ascomata, asci and ascospores were made from squash-mounts in distilled water and Melzer´s reagent for optical microscopy (Kang *et al*. 1999). Asci and ascospores were examined by light microscopy (BX41, Olympus Optical Co. Ltd., Tokyo, Japan). Materials were deposited in the herbarium of Guizhou University (GZUH) and MFLU (Mae Fah Luang University). Facesof fungi numbers and Index Fungorum numbers are as explained in Jayasiri *et al*. (2015) and Index Fungorum (2015).

DNA extraction, PCR and sequencing

Three to five ascomata were collected to extract DNA from the host under the stereomicroscope. Genomic DNA was extracted from ascomata by using an OMEGA Micro Elute Genomic DNA Kit (D3096-01). The DNA preparations were stored at -20 °C until used for PCR.

Sequences alignment and phylogenetic analyses

The amplifications of rDNA regions of internal transcribed spacers (ITS) and large subunit ribosomal RNA gene (LSU) were carried out using ITS5 and ITS4 (White *et al*. 1990), LROR and LR5 (Vilgalys & Hester 1990) primers. Small subunit ribosomal RNA gene (SSU) was amplified with primer pairs NS1 and NS4 (Tanaka *et al.* 2009, Hsieh *et al.* 2010). The amplification conditions were carried out according to Liu *et al*. (2010). Amplified PCR fragments were then sent to SinoGenoMax, Beijing, China for DNA sequencing. The sequence data obtained were deposited in GenBank (Table 1). Combined sequence data were manually adjusted using BioEdit 7.0.1 (Hall 1999), and further implemented with Clustal X v1.83 (Thompson *et al.* 1997) to allow maximum alignment and maximum sequence similarity. Maximum parsimony (MP) analyses were performed using PAUP (Phylogenetic Analysis Using Parsimony) v. 4.0b10 (Swofford 2002). All characters were assessed to be unordered and equally weighed. Gaps were treated as missing data. Trees were inferred using the heuristic search option with TBR branch swapping and 1,000 random sequence additions. Maxtrees were set up to 5,000, branches of zero length were collapsed and all multiple parsimonious trees were saved. The robustness of the most parsimonious trees was evaluated by 1,000 bootstrap replications resulting from maximum parsimony analysis (Felsenstein 1985).

TABLE 1. Taxa included in the present study.

Species	Culture	GenBank accession numbers			Reference
		LSU	ITS	SSU	
Amphisphaeria umbrina	CBS 172.96	FJ176863	AF009805	FJ176809	McTaggart *et al*. 2013
Annulatascus triseptatus	SMH 2359, CBS 128831	AY346257		JQ429242	Miller & Huhndorf 2005
Annulatascus velatispora	HKUCC 3701	AF132320	AF177150		Miller & Huhndorf 2005
Anthostomella formosa	MFLUCC:14-0170	KP340544	KP297403		Kowalski & Andruch 2012
Apiosordaria backusii	ATCC 34568	AY780051	GQ922520		Miller & Huhndorf 2005
Apiosordaria verruculosa	F1 52, 365	AY346258			Cai *et al*. 2005
Apiospora bambusae	ICMP 6889	DQ368630		DQ368662	Tang *et al*. 2007
Apiospora montagnei	AFTOL-ID 951	DQ471018		FJ190614	Spatafora *et al*. 2006
Apiospora setosa	ICMP 4207	DQ368631		DQ368661	Tang *et al*. 2007
Arecophila bambusae	HKUCC 4794	AF452038		AY083802	Maharachchikumbura *et al*. 2015

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TABLE 1. (Continued)

Species	Culture	GenBank accession numbers			Reference
		LSU	ITS	SSU	
Arthrinium hydei	CBS 114990	KF144936	KF144890		Maharachchikumbura *et al*. 2015
Arthrinium phaeospermum	CBS: 114317	KF144953	KF144906	AY083816	Jaklitsch & Voglmayr 2012
Arthrobotrys foliicola	CBS 242.90	AY261182	U51954		Jaklitsch & Voglmayr 2012
Astrocystis cocoes	HKUCC 3441	AY083823			Maharachchikumbura *et al*. 2015
Barrina polyspora	AWR 9560A	AY346261			Miller & Huhndorf 2005
Beltrania pseudorhombica	CBS: 138003	KJ869215	KJ869158		Crous *et al*. 2012
Beltraniella endiandrae	CBS: 137976	KJ869185	KJ869128		Crous *et al*. 2012
Bertia moriformis	SMH 4320	AY695260			Miller & Huhndorf 2005
Bombardia bombarda	SMH 3391	NG_027572		NG_013187	Stchigel *et al*. 2006
Bombardioidea anartia	HHB 99-1	AY346264			Stchigel *et al*. 2006
Botryosphaeria ribis	CMW 7773, CBS 115475	DQ246263	AY236936	DQ678000	Barber *et al*. 2005
Cainia graminis	CBS 136.62	AF431949		AF431952	Lumbsch *et al*. 2005
Camarops amorpha	SMH 1450	AY780054			Tang *et al*. 2009
Camarops tubulina	SMH 4614	AY346266			Tang *et al*. 2009
Cercophora caudate	CBS 606.72	AY999113	AY999135	DQ368659	Cai *et al*. 2005
Cercophora newfieldiana	SMH 3303	AY780062			Miller & Huhndorf 2005
Chaetomium funicola	CBS 179.84	JX280679	JX280785		Miller & Huhndorf 2005
Chaetomium microascoides	F 153, 395	AY346273			Miller & Huhndorf 2005
Chaetosphaerella phaeostroma	SMH 4257	AY695264			Fan *et al*. 2012
Chaetosphaeria innumera	SMH 2748	AY017375	AY906956		Huhndorf & Fernández 2005
Chaetosphaeria ovoidea	SMH 2605	AF064641			Tang *et al*. 2007
Clypeosphaeria uniseptata	6349 (HKUCC)	DQ810219		DQ810255	Dai *et al*. 2014
Coniocessia anandra	Iran 1468C	GU553349			Maharachchikumbura *et al*. 2015
Coniocessia maxima	CBS 593.74	GU553344			Asgari & Zare 2011
Coniocessia nodulisporioides	CBS 281.77	GU553352	GU553333	AJ875185	Maharachchikumbura *et al*. 2015
Coniochaeta discoidea	CBS 158.80	AY346297		AJ875179	Tang *et al*. 2007
Coniochaeta ligniaria	C 8	AY198388	AY198390	AY198389	Hujslová *et al*. 2014
Coniochaetidium savoryi	TRTC 51980	AY346276			Tang *et al*. 2007
Creosphaeria sassafras	CM AT-018	DQ840056			Tang *et al*. 2009
Diamantinia citrina	Buck 26886	AY346278			Shenoy *et al*. 2006
Diaporthe eres	AR 3519	AF362565	KJ210523		Farr *et al*. 2002
Diatrype disciformis	CBS 197.49	DQ470964	AJ302423	DQ471012	Raja *et al*. 2010
Discostroma botan		DQ368629		DQ368660	Tang *et al*. 2009
Ellisembia calyptrata	HKUCC 10821	DQ408564			Jaklitsch & Voglmayr 2012
Eutypa lata	CBS 208.87	DQ836903	JQ041700	DQ836896	Raja *et al*. 2010
Graphostroma platystoma	AFTOL-ID 1249	DQ836906	JX658535	DQ836900	Zhang *et al*. 2006
Heleococcum japonense	CBS: 397.67	JX158442	JX158420	JX158485	Rehner & Samuels 1995

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TABLE 1. (Continued)

Species	Culture	GenBank accession numbers			Reference
		LSU	ITS	SSU	
Hypomyces luteovirens	Genbank	AF160237	EU652350		Miller *et al*. 2005
Hyponectria buxi	UME 31430	AY083834		AF130976	Tang *et al*. 2007
Iodosphaeria tongrenensis	GZUH 0109	KR095283	KR095282	KR095284	This study
Lepteutypa cupressi	IMI 052255	AF382379	AF009817	AY083813	Jaklitsch & Voglmayr 2012
Lopadostoma turgidum	LT 3	KC774618	KC774619		Maharachchikumbura *et al*. 2015
Magnaporthe oryzae	CBS: 659.66	KM485005	KM484895		Klaubauf *et al*. 2014
Melanochaeta hemipsila	SMH 2125	AF466083			Zelski *et al*. 2014
Melogramma campylosporum	MBU	JF440978	JF440978		Jaklitsch & Voglmayr 2012
Microdochium bolleyi	SRC1dJ1a	HM216199	HM216206	HM216190	Jaklitsch & Voglmayr 2012
Monographella nivalis	UPSC 3273, ATCC MYA-3967	AF452030		AF064049	Tang *et al*. 2007
Monosporascus cannonballus	FMR 6682			AF340016	Maharachchikumbura *et al*. 2015
Nectriopsis exigua	GJS 98-32	GQ505986	HM484865		Chaverri *et al*. 2011
Nectriopsis violacea	CBS: 424.64	AY489719		AY489687	Pinruan *et al*. 2010
Nitschkia grevillei	SMH 4663	AY346294			Tang *et al*. 2007
Ochronectria calami	CBS: 125.87	AY489717		AY489685	Pinruan *et al.* 2010
Phlogicylindrium eucalypti	CBS H-19749	DQ923534	DQ923534		Jaklitsch & Voglmayr 2012
Phlogicylindrium eucalyptorum	CBS: 111680	KF251707	KF251204		Quaedvlieg *et al*. 2013
Phomatospora bellaminuta	AFTOL-ID 766	FJ176857		FJ176803	Hujslová *et al*. 2014
Podospora fimiseda	CBS 990.96	AY346296	AY515361		Cai *et al*. 2005
Pseudohalonectria lignicola	M95, SMH 2440	JX134691	JX134679	JX134665	Luo *et al*. 2004
Pseudomassaria carolinensis	9502 (IFO)	DQ810233		DQ810262	Jaklitsch & Voglmayr 2012
Pseudonectria rousseliana	CBS 114049, AR 2716	JF937575	JF937565	AF543767	Zeng & Zhuang 2014
Robillarda sessilis	BCC 13393	FJ825378	FJ825373	FJ825368	Jaklitsch & Voglmayr 2012
Rosellinia necatrix	HKUCC 9037	AY083824			Maharachchikumbura *et al*. 2015
Roumegueriella rufula	CBS 346.85	DQ518776		DQ52256	Spatafora *et al*. 2007
Seimatosporium eucalypti	CBS: 114876	JN871212	JN871202		Jaklitsch & Voglmayr 2012
Seimatosporium grevilleae	ICMP 10981	AF382372	AF405304		Jaklitsch & Voglmayr 2012
Seimatosporium vaccinii	ICMP 7003	AF382374			Jaklitsch & Voglmayr 2012
Seiridium cardinale	ICMP 7323, CMW 18607, ATCC52521	AF382377	AF405305	AF346556	Tang *et al*. 2009
Seiridium phylicae	CPC: 19962	KC005807	KC005785		Crous *et al*. 2012
Selinia pulchra	AR 2812	GQ505992	HM484859		Chaverri *et al*. 2011
Seynesia erumpensnew	SMH 1291	AF279410		AF279409	Maharachchikumbura *et al*. 2015
Sinosphaeria bambusicola	SMH 1999	AY780077			Miller & Huhndorf 2005
Sordaria fimicola	HKUCC 3714	AF132330	AY681188	AY545724	Checa *et al*. 2008
Sordaria macrospora	Buck s.n	AY346301	AF246293		Zare *et al*. 2004

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TABLE 1. (Continued)

Species	Culture	GenBank accession numbers			Reference
		LSU	ITS	SSU	
Sporidesmina malabarica	NN 43118	DQ408580			Shenoy *et al*. 2006
Sporidesmium knawiae	CBS: 123529	FJ349610	FJ349609		Santa *et al*. 2013
Stanjehughesia polypora	NN 47796	DQ408569			Shenoy *et al*. 2006
Stephanonectria keithii	GJS 92-133	AY489727		AY489695	Doveri *et al*. 2010
Stilbocrea macrostoma	GJS 73-26	AY489725		AY489693	Doveri *et al*. 2010
Striatosphaeria codinaeaphora	SMH 1524	AF466088	AF178546		Miller & Huhndorf 2005
Triangularia tanzaniensisi	TRTC 51981	AY780081			Miller & Huhndorf 2005
Truncatella angustata	ICMP 7062	AF382383	AF405306		Jeewon *et al*. 2003
Valsa nivea	CBS: 109489	NG_027590	JX438624	NG_013203	Fan *et al*. 2015
Valsa sordida	HMBF 15	KF225627	KF225613		Fan *et al*. 2015
Valsonectria pulchella	SMH 1193	AY346304			Tang *et al*. 2007
Vialaea mangifia	MFLUCC 12-0808	KF724975	KF724974		Maharachchikumbura *et al*. 2015
Vialaea minutella	BRIP 56959	KC181924	KC181926		Maharachchikumbura *et al*. 2015
Xylaria curta	BCC 1007	AB376681	GU322444	U32417	Ramesh *et al*. 2012
Xylaria hypoxylon	ATCC 42768, CBS 122620	AY327480	AY327477		Nonaka *et al*. 2013

Note: AFTOL: Assembling the Fungal Tree of Life; **ATCC:** American Type Culture Collection; **BCC:** Universitat de Barcelona; **CBS:** Centraalbureau voor Schimmelcultures; **GZUH:** Herbarium of Guizhou University; **HKUCC:** Hong Kong University Culture Collection; **ICMP:** International Collection of Microorganisms from Plants; **IFO:** Institute for Fermentation; **IMI:** CABI Bioscience UK Centre; **MFLUCC:** Mae Fah Luang University Culture Collection; **MRC:** Rocky Mountain Research Station; **MUCL:** University Catholique de Louvain; **SMH:** Sabine M. Huhndorf; **TRTC:** Royal Ontario Museum; **Others:** information not available.

Results

Combined analysis of LSU, ITS and SSU sequence data

The combined LSU, ITS and SSU dataset comprised 90 sequences from 89 taxa with *Botryosphaeria ribis* Grossenb. & Duggar (Huhndorf *et al*. 2004) as the outgroup taxon. The dataset comprised 2,858 characters (LSU 934 characters, ITS 577 characters, SSU 1347 characters) after alignment, of which 1,793 are conserved, 360 are variable and 705 are parsimony informative. A best scoring MP tree is shown (Fig. 1) and bootstrap support (BS) values of MP (equal to or above 50% based on 1,000 replicates) are shown on the upper branches (TL= 4,741, CI= 0.367, RI= 0.629, RC= 0.231, HI= 0.633). Xylariales grouped a single clade. Sordariales, Coniochaetales, Chaetospaeriales, Boliniales, Annulatascaceae, Magnaporthales and Diaporthales clustered together and showed a far phylogenetic distance from Xylariales. *Iodosphaeria tongrenensis* clustered with families in Xylariales with high bootstrap support (88%).

Taxonomy

Iodosphaeria tongrenensis Q.R. Li, J.C. Kang & K.D. Hyde, *sp. nov.* (Fig. 2) MycoBank no.: MB 812255; FoF 00642.

Differs from other species in the genus by its ellipsoidal ascospores (18.5–22.5 × 6.5–8.5 μm) with a slimy sheath covering the entire spore, and a J+, wedge-shaped ascal apical apparatus.

Type—CHINA. Guizhou Province: Guiyang, saprobic on dead twigs of unidentified host, March 2014, Q.R. Li (GZUH0109, holotype!)

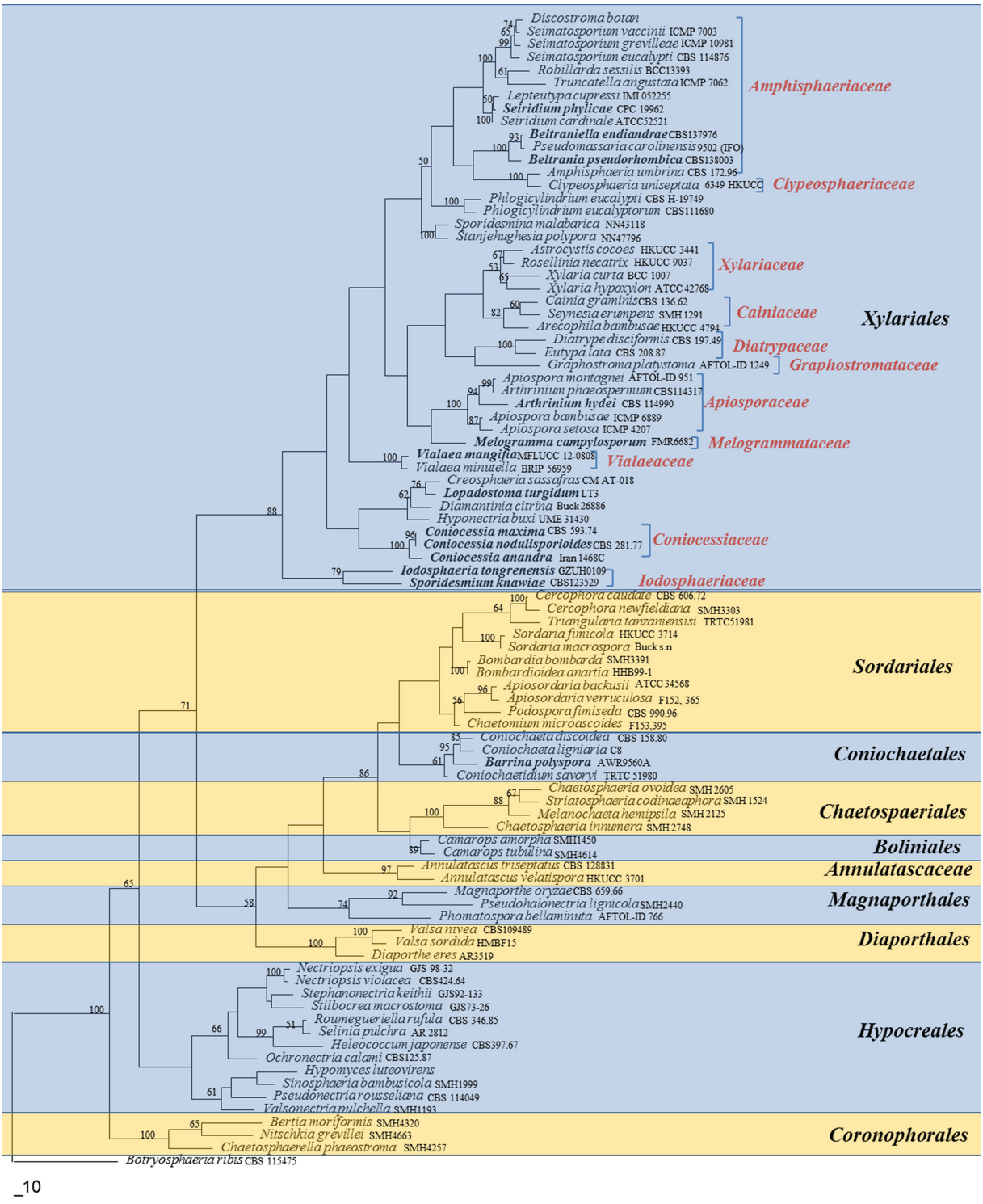

FIGURE 1. MP tree based on dataset of LSU, ITS and SSU sequences. Bootstrap support values for maximum parsimony (MP) greater than 50% are given above the nodes. The strains numbers are given after the species names. The tree is rooted to *Botryosphaeria ribis*. All sequences from type strains are shown in bold face.

Saprobic on dead twigs of unidentified host. Sexual morph: *Ascomata* 250–350 µm high × 260–370 µm diam., globose to subglobose, superficial, black, solitary to gregarious, with numerous long, flexuous, unbranched brown hairs, arising from cells at the peridium surface, apex flattened, non-papillate, ostiole pore-like, periphysate. *Peridium* up to 50 µm wide, comprising two strata, an outer layer of angular, dark brown to black thick-walled cells, and an inner layer of flattened, hyaline cells. *Paraphyses* 3–4 um wide, hypha-like, septate, tips rounded, not tapering, of the same

length as the asci. *Asci* 150–210 × 12–16 µm (mean 165.8 × 14.3 µm, n = 30), 8-spored, unitunicate, cylindrical, short-pedicellate, apex rounded, with a J+, wedge-shaped apical apparatus, 1 µm high × 1.5 µm wide. *Ascospores* 18.5–22.5 × 6.5–8.5 µm (mean 21.2 × 7.2 µm, n = 30), overlapping uniseriate, ellipsoidal to fusiform, unicellular, hyaline, smooth, slightly narrower at the center, with slimy sheath covering entire spore. Asexual morph: ceratosporium-like conidia were observed on the surface of ascomata but may not be related.

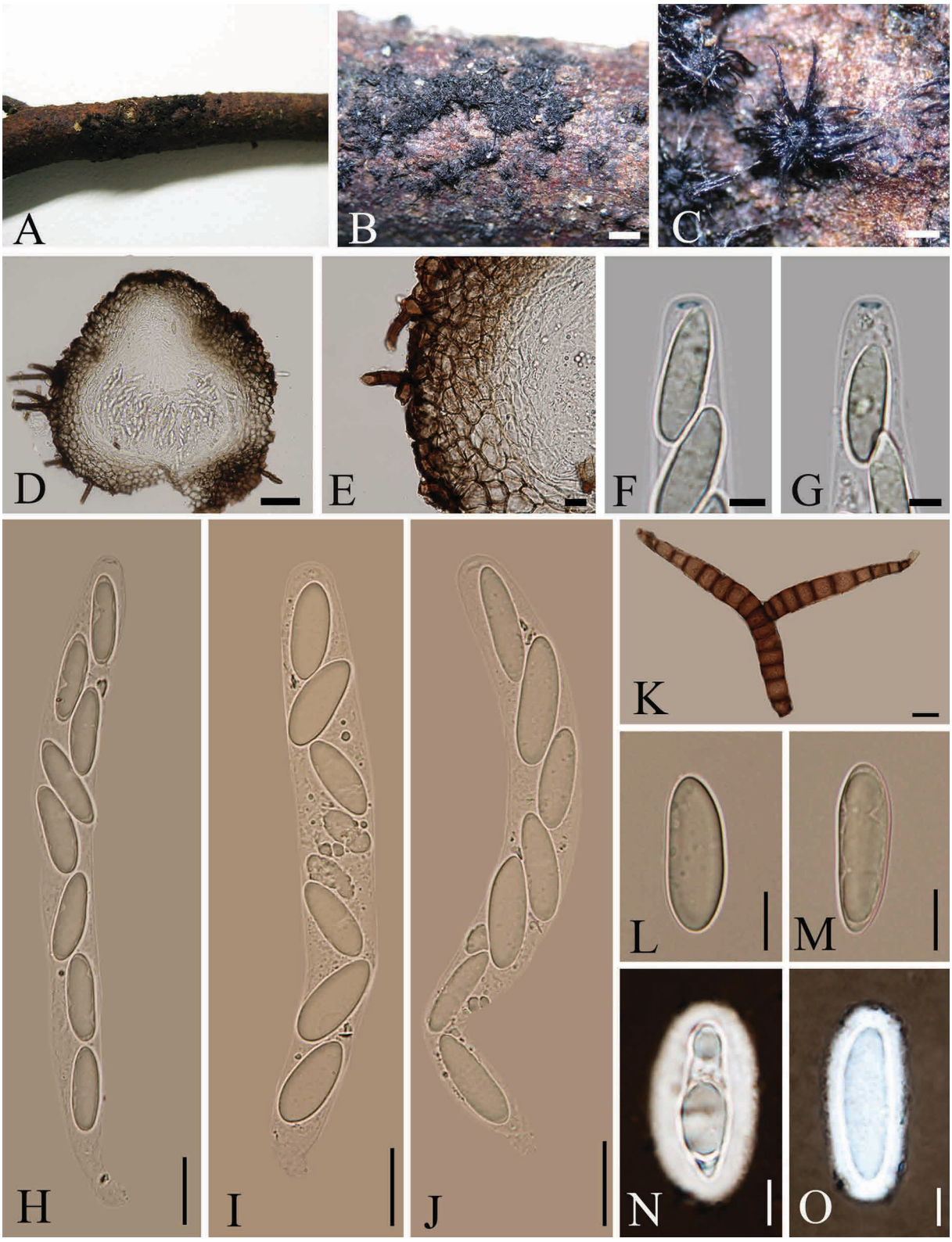

FIGURE 2. *Iodosphaeria tongrenensis* (holotype). A. Herbarium material. B, C. Ascomata on the surface of host. D. Section of ascoma. E. Peridium. F,G. Ascus apical apparatus (stained in Melzer´s reagent). H–J. Mature asci with ascospores. K. Ceratosporium -like conidia. L–O. Ascospores (N, O stained in India ink). Scale bars: B=1 mm, C=300 µm, D=50 µm, E=10 µm, F, G=5 µm, H–K=10 µm, L–O=5 µm.

Habitat/Distribution:—Known to inhabit dead twigs of unknown plant, Guizhou Province, China.

Etymology:—In reference to collection location (Tongren city).

Material examined: China, Guizhou Province, Tongren City, Fanjingshan Nature Reserve, on dead twigs of unidentified host, March 2014, Qirui Li (GZUH0109, holotype!; *Ibid.,* MFLU 15-0393, Isotype!).

Discussion

In this paper we use morphology and sequence data to describe one new species of *Iodosphaeria* from China and introduce the placement of *Iodosphaeria*.

Iodosphaeria tongrenensis is most similar to *I. polygoni* W.H. Hsieh, Chi Y. Chen & Sivan, but differs in having sheathed ascospores (Hsieh *et al*. 1997).

Key to *Iodosphaeria* species

1. Asci with a distinct apical apparatus 2
1. Asci lacking a distinct apical apparatus..... 6
2. Apical apparatus staining blue in Melzer´s reagent 3
2. Apical apparatus not staining blue in Melzer´s reagent 5
3. Asci longer than 150 µm 4
3. Asci shorter than 150 µm long 5
4. Ascospores ellipsoidal, with a mucilaginous sheath .....*I. tongrenensis*
4. Ascospores ellipsoidal, lacking a mucilaginous sheath.....*I. polygoni*
5. Ascospores allantoid.....*I. phyllophila*
5. Ascospores inequilaterally ellipsoid to navicular.....*I. podocarpi*
6. Ascospore wall verruculose.....*I. arundinariae*
6. Ascospore wall smooth.....*I. tarda*
7. Ascospores ellipsoidal, with a mucilaginous sheath .....*I. ripogoni*
7. Ascospores ellipsoidal to fusiform, lacking a mucilaginous sheath.....*I. hongkongensis*

The taxonomic position of *Iodosphaeria* is still unclear and it has been placed in various families by different authors. In our study, phylogenetic analyses of LSU-ITS-SSU sequence data showed that *Iodosphaeria tongrenensis* clustered in Xylariales, forming a distinct branch close to the genera *Sporidesmium*. *Iodosphaeria tongrenensis* has unitunicate asci, with a J+, apical apparatus which is similar to species of *Amphisphaeriaceae*. However, phylogenetic analyses indicated *Iodosphaeria tongrenensis* differs from the genera of *Amphisphaeriaceae* and that *Iodosphaeria* belongs in Iodosphaeriaceae in Xylariales, agreeing with Hilber & Hilber (2002) and Senanayake *et al*. (2015). Based on ribosomal and RPB2 DNA sequence data, the phylogenies showed that *Sporidesmium* is not monophyletic, and species are phylogenetically distributed in Dothideomycetes and Sordariomycetes (Shenoy *et al*. 2006). *Sporidesmium macrurum* within the Apiosporaceae/Amphisphaeriaceae clustered in the Xylariales clade (Shenoy *et al*. 2006). *Sporidesmium* has conidia with 3–5-transverse septa borne singly at the ends of short conidiophores (Ellis 1958). Phylogenetic analysis showed that *Iodosphaeria tongrenensis* is related to *Sporidesmium knawiae* Crous. *Sporidesmium knawiae* groups in the *Iodosphaeriaceae* with 79 % bootstrap value. However, no conidia of *Sporidesmium* were observed around the ascomata.

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