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Morphology and phylogeny of *Neokamalomyces indicus*—an addition of *Septoria*-like new genus and species to *Mycosphaerellaceae* from India

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Abstract

A new hyaline coelomycetous fungus was discovered on living leaves of *Ficus benghalensis* (*Moraceae*) is described and illustrated. Morphologically, it is similar to *Septoria* or *Septoria*-like genus, but based on cultural characteristics and multigene (LSU-*RPB2*-ITS) phylogenetic analysis, this strain represents an additional lineage in *Mycosphaerellaceae*. Hence, a new genus and species as *Neokamalomyces indicus* is proposed.

Introduction

Fungal species belonging to *Septoria* Sacc., are among the most common and widespread leaf-spotting coelomycetous fungi worldwide. The type species *S. cytisi*, Sutton (1980) circumscribed *Septoria* as follows: Mycelium immersed. Conidiomata pycnidial, immersed, globose. Conidiophores reduced to conidiogenous cells. Conidiogenous cells holoblastic. Each locus has a broad, flat, unthickened scar, discrete, hyaline, smooth, ampulliform. Conidia hyaline and multi-septate.

This genus *Septoria* is enormously large, and during the past 150 years more than 2000 taxa have been recognized to this asexual genus (Verkley and Priest 2000; Verkley et al. 2004b). Presently, *Septoria s.lat.* represents a polyphyletic assemblage of genera that cluster mostly in the *Mycosphaerellaceae* have mycosphaerella-like sexual states, although fungi with septoria-like morphology have also evolved outside this family (Crous et al. 2009a, b).

Morphological characters in *Septoria* and septoria-like species are generally conserved, and limited. Due lack of specific morphological characters, the taxonomy of *Septoria* is largely dependent on associated host, leading to big number of species identifiable by host plant, and by variation in some supplementary characters like conidial length, width and septation (Jørstad 1965, 1967; Sutton 1980; Priest 2006). Extensive host inoculation experiments by Beach (1919) and Teterevnikova-Babayan (1987) have proven that identification of *Septoria* spp. are not restricted to a single specific host (i.e., several taxa have broader host ranges).

Based on multi-locus phylogeny, it has been proven that *Septoria* show both poly- and paraphyletic nature and showed that some septoria-like species are more closely related to *Ramularia* than to the majority of the other *Septoria* species (Verkley et al. 2004b, 2013, 2016; Feau et al. 2006; Quaedvlieg et al. 2011, 2013; Groenewald et al. 2013).

To date, there have been several studies focused on diversity of phytopathogenic fungi in India, related to the genera of *Mycosphaerellaceae* (Singh et al. 2007, 2008, 2011, 2012, 2013, 2014a, b, 2020a, 2022; Kumar et al. 2013, 2014; Awasthi et al. 2015, 2016; Kharwar et al. 2015; Kumar and Singh 2015, 2016; Singh and Kumar 2017; Kushwaha et al. 2020). However, all previous studies have relied exclusively on morphological data, and very few records are supported by cultures and DNA sequence data (Singh et al. 2020b; Verma et al. 2021a, b; Yadav et al. 2021).

In this regard, the objective of the present study was to characterize septoria-like species obtained from infected leaves of *Ficus benghalensis* collected from north India, based on morphology, cultural characteristics, and phylogenetic analyses. Molecular phylogenetic analyses showed that this species could not be placed in any of the allied genera described in *Mycosphaerellaceae*. Thus, the aim of this paper is to describe a new genus for this new strain.

Materials And Methods

Collection, isolation and morphological characterization

Living leaves with distinct symptoms were collected during a field survey during July 2019, from Har Ki Pauri region of Haridwar, Uttarakhand, India. The collected samples were placed in separate paper bags and brought to the laboratory for detailed study. The sun dried and pressed leaf specimens were placed in air tight polyethylene bags and then kept in a paper envelop along with collection details. The holotype material is deposited in the Ajrekar Mycological Herbarium (AMH), Agharkar Research Institute (ARI), Pune, India and isotype is retained in the Mycological Herbarium of the Department of Botany of Banaras Hindu University, Varanasi, U.P., India (MH-BHU).

Using a flame-sterilized inoculation needle, conidia were collected from the infected leaf and suspended in sterile water on sterile microscopic slides. The conidial suspension was checked in the microscope for the presence of conidia. The conidial suspension was further diluted in sterile water and pipetted onto Water Agar medium (WA), and spread uniformly over the surface. Inoculated plates were incubated at 25 °C in the dark for 24 h. The germinating conidia were individually transferred onto fresh Potato Dextrose Agar (PDA) plates and incubate at 25 °C in the dark for the growth. Purified ex-type culture is deposited in National Fungal Culture Collection of India (NFCCI), Pune, India. The growth rates and colony characters were recorded on PDA after 28-days at 25 °C.

Specimen's slides for microscopic examination were prepared by free hand sections using razor blade passing through fruiting bodies from freshly collected materials. Fungal propagules were mounted on slides in clear lacto-phenol cotton blue mixture as well as clear glycerine and observed under an Olympus Compound Microscope (CH20i). The measurements were done by Magnus Camera (MIPS CMOS) and software at magnifications 450× and 1000×. Measurements were made of 30 of each morphological feature. The photo plates were prepared by using Adobe Photoshop v.7.0.

DNA extraction, PCR amplification, and sequencing

The mycelium of actively growing fungal cultures was scraped from the surface of PDA plates using a sterile scalpel blade. Harvested mycelium approximately 150–200 mg of wet-weight was transferred to 2 ml microcentrifuge tubes kept in liquid nitrogen for one minute and then grinded to a fine powder using micropestle. From powdered form, DNA was extracted using HiPurA™ Fungal DNA Purification Kit (Himedia) following the manufacturers' protocol. Isolated DNA was visualized by electrophoresis in 1% agarose gel (w/v) stained with Ethidium bromide and viewed under Gel Documentation System (BIO-RAD: Universal Hood II). DNA concentration was quantified by using NanoDrop Microvolume Spectrophotometers (Thermo Scientific^{TM} NanoDrop^{TM} One/One^{C} Microvolume UV-Vis Spectrophotometer with Wi-Fi).

Fragments containing the region encoding the ITS1-5.8S nrDNA-ITS2 (ITS) region, 28S nrDNA (LSU) and DNA-directed RNA polymerase II subunit (*RPB2*) were amplified using primers ITS1/ITS4 (White et al. 1990), LROR/LR7 (Vilgalys and Hester 1990; Rehner and Samuels 1994) and RBP2-5f2/fRBP2-7cR (Liu et al.1999; Sung et al. 2007) respectively. PCRs mixtures included the following ingredients for each 50 µL reaction: 5 µL PCR buffer containing $MgCl_2$, 1 µL each forward and reverse primer (10 pmol), 1 µl dNTPs (10 mM), 0.25 µL Taq DNA polymerase (5 Unit/µL) and 5 µL of DNA template (20.00 ng/µL). The PCRs were carried out in Thermal Cycler (BIO-RAD: T100^{TM} Thermal Cycler). Conditions for the PCR amplification consisted of an initial denaturation at 95 °C for 5 min; followed by 35 cycles of denaturation at 94 °C for 1 min; annealing at 52 °C for ITS, 48 °C for LSU and 55 °C for *RPB2* for 1 min and extension at 72 °C for 1 min. The final extension step was done at 72 °C for 8 min. The amplified amplicons were run in 1.2% agarose gel and visualised in Gel Documentation system (BIO-RAD: Universal Hood II) for the product size and purity. Sequencing was done at SciGenom Labs Private Ltd., Kerala by the Sanger sequencing method using BigDye® Terminator v3.1 Cycle sequencing Kit and ABI 3100 DNA analyzer.

Sequence alignment and phylogenetic analysis

The obtained ITS, LSU and *RPB2* sequences from the present collection (*N. indicus*) were assembled and edited with Chromas v.2.6.6. The manually edited sequences were submitted in NCBI GenBank (MT731962, MT731328 and OL773682 for ITS, LSU and *RPB2* respectively) and was subjected to a megablast search of the NCBI GenBank nucleotide database and sequences of related strains were retrieved (Table 1). Sequence alignments were generated using MAFFT v.6.864b (Katoh and Toh 2010) whereas BioEdit v.7.0.9 (Hall 2007) and MEGA-X v.10.1.8 (Kumar et al. 2018) were used to manually check and edit the aligned sequences.

The phylogenetic methods used in this study included a Bayesian inference (BI) analysis performed with MrBayes 3.2.6 (Ronquist et al. 2012), maximum likelihood (ML) analysis performed with RAxML v.8.2.10 (Stamatakis 2014) and a maximum parsimony (MP) analysis performed with PAUP 4.0b10 (Swofford 2003). A phylogeny using *N. indicus* sequences from the current study and other reference sequences in GenBank was generated based on the multilocus alignment (ITS, LSU and *RPB2*). The tree was rooted with *Cylindroseptoria ceratoniae* (CBS 477.69). Presented tree was obtained with the ML approach. Tree reconstruction, visualization and editing were done using FigTree v.1.4.4 and TreeGraph_2.15.0.

Bayesian inference was also implemented with the GTR+I+G model. Bayesian inference was calculated using a Markov chain Monte Carlo (MCMC) algorithm with Bayesian posterior probabilities (Rannala and Yang 1996). The analysis lasted 3600000 generations till the standard deviation of split frequency was below 0.01. The first 25% of generated trees representing the burn-in phase were discarded, and the remaining trees were used to calculate posterior probabilities of the majority rule consensus tree. ML analysis was performed using a GTR model of site substitution, including GAMMA+P-Invar model of rate heterogeneity and a proportion of invariant sites (Stamatakis 2014). The ML support values were evaluated with a bootstrapping method of 1000 replicates. For the maximum parsimony analysis, a heuristic search option with 100 random sequence additions and tree bisection and reconnection (TBR) as the branch-swapping algorithm was used. Alignment gaps were treated as fifth character states, and all characters were unordered and of equal weight. Maxtrees were set up to 5000, branches of zero length were collapsed, and all multiple, equally most parsimonious trees were saved. The robustness of the most parsimonious trees obtained was evaluated by 1000 bootstrap replications (Hillis and Bull 1993). Other measures calculated included tree length (TL), consistency index (CI), retention index (RI), rescaled consistency index (RC), homoplasy index (HI) and G-fit.

There were a total of 2101 positions in the final dataset in LSU, *RPB2* and ITS concatenated sequence including gaps to resolved phylogenetic position of species belonging to the *Septoria* (-like) complex along with new collection. A total of 133 isolates representing 130 species were subjected to DNA analysis belongs to 104 genera of *Mycosphaerellaceae* including out groups. The gene boundaries were: 1–744 bp for LSU, 745–1393 bp for *RPB2* and 1394–2101 for ITS.

Results

Phylogeny

Comparing BLAST search results among sequences from the three loci (ITS, LSU, *RPB2*), the highest matches were all sequences of *Parapallidocercospora*. Phylogenetic analysis was based on LSU-*RPB2*-ITS concatenated sequences, our new collection *Neokamalomyces indicus* clustered closer (BI-PP/ML-BS/MP-BS: 1/100/100) to *Parapallidocercospora colombiensis* (Crous & M.J. Wingf.) Videira & Crous and *Parapallidocercospora thailandica* (Crous, Himaman & M.J. Wingf.) Videira & Crous (Videira et al. 2017) and separated as sister lineage to the

Parapallidocercospora clade (Fig. 5). Since the differences in morphology are significant enough for retaining our new collection (a coelomycete) as distinct from *Parapallidocercospora* (a hyphomycete) and represent a new lineage within the *Mycosphaerellaceae*. Hence a new genus and a new species are proposed. Phylogenetic trees generated from Bayesian analyses, ML, and MP produced trees with similar overall topology. A best scoring RAxML tree is presented in Fig. 5, with the Likelihood value of −57161.450108. The most parsimonious tree showed length = 16941 steps, consistency index = 0.165516, retention index = 0.477472, rescaled consistency index = 0.079029, homoplasy index = 0.834484 and G-fit is 384.467564. From the analyzed characters, 727 were constant, 342 were variable and parsimony-uninformative, and 1032 were parsimony-informative. The overall parsimony phylogeny confirmed the same species clades as those obtained in the Bayesian phylogeny.

Taxonomy

Neokamalomyces Sanjay & Raghv. Singh, ***gen. nov.***Figs. 1–4

MycoBank: MB 843,767.

Etymology: Prefix '*Neo*' means new and genus suffix '*kamalomyces*' based on the living legends Professor Kamal (DDU Gorakhpur University, Gorakhpur, India), a renowned mycologist and monographer of Cercosporoid Fungi of India.

Diagnosis: Differs from *Parapallidocercospora* by its very well developed pycnidial conidiomata with a central ostiolum; conidiophores hyaline, reduced to conidiogenous cells, lining the inner cavity; conidiogenous cells compactly aggregated; conidia hyaline to light olivaceous.

Description: Conidiomata pycnidial, brown to darkish brown, subepidermal, epigenous, numerous in each lesion, immersed to erumpent, subglobose to globose, with a central ostiolum, releasing a hyaline conidial mass; the outer cells with brown, somewhat thickened walls, the inner cells hyaline, thin-walled. Ostiole single, circular, central. Conidiophores hyaline, reduced to conidiogenous cells, lining the inner cavity. Conidiogenous cells hyaline, tightly aggregated, cylindrical and tapering gradually toward the apex, ampulliform or lageniform with a relatively long neck, holoblastic, proliferating sympodially, smooth; scars unthickened. Conidia cylindrical, weakly to strongly curved, or flexuous, gradually attenuated to a rounded apex, gradually or more abruptly attenuated into a broadly truncate base, septate, not or indistinctly constricted around the septa, hyaline to light olivaceous, hila unthickened to slightly thickened. Sexual morph not seen.

Type species: *Neokamalomyces indicus* Sanjay & Raghv. Singh

Neokamalomyces indicusSanjay & Raghv. Singh, ***sp. nov.*** Figs. 1–4

MycoBank number: MB 843,768.

Etymology: *indicus*, referring to India, the country where the fungus was discovered.

Type: India, Uttarakhand, Haridwar, Har Ki Pauri, 29.9567°N 78.1710°E, on living leaves of *Ficus benghalensis* L. (*Moraceae*), July 2019, coll. Sanjay Yadav, holotype (AMH 10233), isotype (MH-BHU 13), ex-type living culture (NFCCI 4870).

Diagnosis: Differs from *Parapallidocercospora colombiensis* by its presence of only internal mycelium, colonies epigenous, conidiomata pycnidial type, conidiophores develop from the inner lining of conidiomatal wall, hyaline, shorter and reduced to conidiogenous cells, conidia hyaline to light olivaceous and always smooth.

Description: Leaf spots numerous, amphigenous, circular to subcircular, brown, with dark brown border with greyish white centre (with many blackish dots represent conidioma), 5–10 mm diam, later on became irregular and covers entire leaf surface (Fig. 1a–e). Conidiomata pycnidial, brown to darkish brown, subepidermal, epigenous, visible on upper sides of the leaf, several in each lesion, immersed to erumpent, subglobose to globose, 49–180 µm diam., with a central ostiolum, releasing a hyaline conidial mass; conidiomatal wall without distinctly differentiated layers of textura angularis, the outer cells with brown, somewhat thickened walls, the inner cells hyaline, thin-walled (Fig. 3a–d). Ostiole single, circular, central (Fig. 3a–d). Conidiophores hyaline, reduced to conidiogenous cells, lining the inner cavity (Fig. 3a–e). Conidiogenous cells hyaline, tightly aggregated, cylindrical and tapering gradually toward the apex, ampulliform or lageniform with a relatively long neck, holoblastic, proliferating sympodially, smooth, percurrent proliferations not observed, 8–12(–16) × 3–7 µm, scars unthickened (Fig. 3e–g). Conidia cylindrical, weakly to strongly curved, or flexuous, gradually attenuated to a rounded apex, gradually or more abruptly attenuated into a broadly truncate base, 0–4-septate, not or indistinctly constricted around the septa, hyaline to light olivaceous, (10–)23–36(–50) × (1.5–)2-4(–5) µm, hila unthickened to slightly thickened (Fig. 4a–m). Sexual morph not seen.

Description in vitro: Only sterile mycelium was found without development of any kind of fruiting body or spores (Fig. 2k).

Culture characteristics: Colonies on PDA restricted and erumpent, surface folded, cerebriform to irregularly pustulate, mostly covered by a dense woolly floccose mat of smoke grey aerial mycelium, dark blackish green, reverse fuscous-black, with an irregular margin, reaches 8-mm diam in 28 days at 25 °C with an even to slightly ruffled and glabrous margin (Fig. 2a–j).

Discussion

Present collectionshares a superficial morphological resemblance with *Septoria* and septoria-like fungi (Crous et al. 2009a, b) due to the presence of pycnidial type conidiomata that is internally lined by conidiophores. But on the basis of multi-gene analyses, it is quite distant from the *Septoria* and septoria-like clade. Phylogenetic analyses based on the LSU, *RPB2* and ITS sequence data retrieved from the ex-epitype culture of different genera of *Mycosphaerellaceae* along with *Septoria* and septoria-like fungi were chosen to establish exact phylogenetical position of present collection. *Neokamalomyces indicus* is morphologically indistinguishable from previous broad concepts of *Septoria s. lat*., just based on morphology. However, the phylogenetic position of *N. indicus*, quite distant from the *Septoria s. lat*. clade, does now allow to retain this species in the latter genus. These results justify the introduction of a new genus for this lineage, viz., *Neokamalomyces*.

Based on both LSU and *RPB2* as well as LSU, *RPB2* and ITS sequences, the phylogenetic position has been shown to be closely related to *Parapallidocercospora* with high bootstrap support (BI-PP/ML-BS/MP-BS: 1/100/100). The phylogenetic results in this study, agreed with the previous placement of *Pallidocercospora* and *Parapallidocercospora* along with *Nothophaeocryptopus, Pseudophaeophleospora, Scolecostigmina* and *Trochophora* (Videira et al. 2017)(Fig. 5).

Based on multi-gene analyses, *Pallidocercospora* was established by Crous et al. (2013a) to accommodate cercospora-like species, but not congeneric with *Cercospora* and is typified by *P. heimii* (Crous) Crous (Crous et al. 2013a) and designated this genus based on its pale brown cercosporoid like conidia, which are generally referred to as the *Mycosphaerella heimii* complex (Crous et al. 2004a, 2013a). However, they did not synonymise *Pseudocercospora colombiensis* and *Pseudocercospora thailandica* under *Pallidocercospora*, even though these two species clustered with other *Pallidocercospora* species (Crous et al. 2013a). Subsequently, these two species have been stated as *Pallidocercospora colombiensis* and *P. thailandica* (Crous et al. 2013a; Pérez et al. 2013; Quaedvlieg et al. 2014), although the species combinations have not been formally established and thus, this name was invalid.

Later on, based on LSU, *RPB2* and ITS sequence data, *Parapallidocercospora* was established with a type species *Parapallidocercospora colombiensis* as a separated genus by Videira et al. (2017) in order to accommodate two species, *Pseudocercospora colombiensis* (foliar pathogen of *Eucalyptus*; Crous 1998), and *Pseudocercospora thailandica* (foliar pathogen of *Acacia*; Crous et al. 2004b). Morphologically, these taxa appear as a typical member of *Pseudocercospora s. str.* and are very difficult to identify without the use of molecular sequence data. *Mycosphaerella colombiensis* Crous & M.J. Wingf. and *Pseudocercospora colombiensis* Crous & M.J. Wingf. stand for sexual and asexual morphs of *P. colombiensis* (Crous 1998). In this study, both these species are clustered together in a very well-supported clade in the phylogenetic analyses (Fig. 5) and are closely related to *Nothophaeocryptopus, Pallidocercospora*, *Scolecostigmina* and *Trochophora.* Currently, only 2 species names are validly accepted to *Parapallidocercospora* (https://www.mycobank.org, queried 8 March 2022).

Parapallidocercospora, however, is easily distinguished from *Neokamalomyces* by its lack of pycnidial type conidiomata; mycelium internal as well as external; conidiophores brown, septate and arises singly from superficial mycelium or aggregated in loose to dense fascicles arises from the upper cells of a brown stromata like structure and conidia that are brown and smooth to finely verruculose. *Parapallidocercospora* also shows formation of ascomata and spermogonia intermixed with the ascomata or with the asexual morph that is totally lacking in *Neokamalomyces*. Therefore, despite the very high bootstrap support, the distinctive morphology justifies the introduction of a new genus for this lineage, viz., *Neokamalomyces*. The genus *Neokamalomyces* is currently monotypic based on *Neokamalomyces indicus*, a pathogen of *Ficus benghalensis*. Similarly, despite the low bootstrap support, the distinctive morphology observed in *Trochophora* justifies that it is retained as a separate clade.

Presently, there are five species of *Septoria* that have been described from *Ficus,* namely, *Septoria arcuata* Cooke*, S. brachyspora* Sacc.*, S. elasticae* Koord.*, S. pipulae* Cookeand *S. pirottae* Tassi. The comparative morphology of these species is provided in table 2 indicates that they are clearly different from novel strain *N. indicus* by either having narrower conidia or shape of conidia.

Declarations

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Author's contribution All authors contributed to the conception and design of the study. SY collected sample, cultivated pure culture, isolated DNA and prepared samples for sequencing. SKV and VKS developed morphological features and surveyed concerned literatures. RS developed photo plates, performed phylogenetic analyses and developed discussion part of the manuscript. BC, PNS and SK wrote the first draft of the manuscript. All authors contributed to previous drafts of the manuscript and read and approved the final draft of the manuscript.

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Data availability The sequences generated in this study have been submitted in GenBank with the accession numbers listed in table 1. The specimen studied in this work was deposited in the Ajrekar Mycological Herbarium (AMH), Agharkar Research Institute (ARI), Pune, India, and the purified ex-type culture is deposited in National Fungal Culture Collection of India (NFCCI), Agharkar Research Institute (ARI), Pune, India.

Code availability Not applicable

Ethics approval Not applicable

Consent to participate Not applicable

Consent for publication Not applicable

Conflict of interest The authors declare that they have no conflict of interest in the develop of this research work.

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Tables

Table 1 Taxa included in molecular phylogenetic analyses and their GenBank accession numbers. The sequences in bold were generated in this study

Taxon	Voucher ID	GenBank accession no.			Host	Location	References
		LSU	*RPB2*	ITS			
Acervuloseptoria ziziphicola	CBS 138009	NG_057048	MF951425	NR_156287	*Ziziphus mucronata*	South Africa	Crous et al. 2014a, Videira et al. 2017
Amycosphaerella africana	CBS 110500	DQ246256	MF951427	AY725531	*Eucalyptus globulus*	Australia	Crous et al. 2004a, Hunter et al. 2006, Videira et al. 2017
Amycosphaerella keniensis	CBS 111001/ CPC 1084/ CMW 5147	GQ852610	MF951433	MF951290	*Eucalyptus grandis*	Kenya	Crous et al. 2009b, Videira et al. 2017
Annellosympodiella juniperi	CBS 137992	NG_057047	MF951436	NR_156284	*Juniperus procera*	Ethiopia	Crous et al. 2014a, Videira et al. 2017
Apseudocercosporella trigonotidis	CBS 131890	JQ324972	KX288414	NR_153512	*Trigonotis peduncularis*	South Korea	Crous et al. 2013a, Videira et al. 2017
Asperisporium caricae	CBS 130298	MH877228	MF951437	NR_119970	*Caricae papaya*	Brazil	Schoch et al. 2014, Videira et al. 2017, Vu et al. 2019
Australosphaerella nootherensis	CBS 130522	NG_057034	MF951440	NR_156365	*Corymbia intermedia*	Australia	Quaedvlieg et al. 2014, Videira et al. 2017
Brunneosphaerella jonkershoekensis	CPC 13902	NG_058654	MF951441	NR_156244	*Protea repens*	South Africa	Crous et al. 2011a, Videira et al. 2017
Brunneosphaerella nitidae	CBS 130595/ CPC 15231	GU214396	MF951442	GU214625	*Protea nitida*	South Africa	Crous et al. 2009a, Videira et al. 2017
Brunneosphaerella protearum	CBS 130597/ CPC 16338	GU214397	MF951443	GU214626	*Protea* sp.	South Africa	Crous et al. 2009a, Videira et al. 2017
Brunswickiella parsonsiae	CBS 137979	NG_058666	MF951593	NR_156281	*Parsonsia straminea*	Australia	Crous et al. 2014a, Videira et al. 2017
Caryophylloseptoria lychnidis	CBS 109099	KF251791	MF951444	KF251287	*Silene pratensis*	Austria	Verkley et al. 2013, Videira et al. 2017
Catenulocercospora fusimaculans	CPC 17277	KF251817	MF951450	KF251313	*Agrostis* sp.	Thailand	Verkley et al. 2013,

							Videira et al. 2017
Cercoramularia koreana	CBS 142175	NG_059050	MF951453	NR_156366	*Styrax japonicus*	South Korea	Videira et al. 2017
Cercoramularia koreana	CPC 10639	MF951130	MF951451	MF951294	*Styrax japonicus*	South Korea	Videira et al. 2017
Cercospora apii	CBS 118712	GQ852583	KT216554	GU214653	*Capsicum annuum*	Fiji	Crous et al. 2009a, Crous et al. 2009b, Ismail et al. 2016
Cercospora beticola	CPC 18813	MF951135	MF951455	JX143556	*Beta vulgaris*	USA	Groenewald et al. 2013, Videira et al. 2017
Cercospora capsici	CBS 132622/ CPC 14520	MF951136	MF951456	JX143568	*Capsicum annuum*	South Korea	Groenewald et al. 2013, Videira et al. 2017
Cercospora fagopyri	CBS 132623/ CPC 14541	MF951143	MF951463	JX143594	*Fagopyrum esculentum*	South Korea	Groenewald et al. 2013, Videira et al. 2017
Cercosporella virgaureae	CBS 113304	GU214658	KX348051	GU214658	*Erigeron annuus*	South Korea	Crous et al. 2009a, Videira et al. 2016
Cercosporidium californicum	CBS 128857	MH876560	MF951470	MH865121	*Asclepias fascicularis*	USA	Videira et al. 2017, Vu et al. 2019
Chuppomyces handelii	CBS 113302	GU214437	MF951475	EU167581	*Rhododendron* sp.	Netherlands	Crous et al. 2009a, Simon et al. 2009, Videira et al. 2017
Clarohilum henningsii	CPC 17314	MF951152	MF951476	MF951307	*Manihot esculenta*	Laos	Videira et al. 2017
Clypeosphaerella quasiparkii	CBS 123243	MH874811	MF951478	MH863287	*Eucalyptus* sp.	Thailand	Videira et al. 2017, Vu et al. 2019
Collarispora valgourgensis	CBS 129531/ CPC 18385	JF951175	MF951479	NR_169649	*Yucca* sp.	France	Crous et al. 2011c, Videira et al. 2017
Coremiopassalora eucalypti	CBS 111306	NG_058736	MF951481	NR_165597	*Eucalyptus saligna*	Brazil	Hunter et al. 2006, Videira et al. 2017, Crous et al. 2019a
Cytostagonospora martiniana	CBS 135102	KF251657	MF951484	KF251153	*Acacia* sp.	Australia	Quaedvlieg et al. 2013, Videira et al. 2017

Deightonomyces daleae	CBS 113031	EU040236	MF951485	EU040236	*Psorothamnus spinosus*	Mexico	Crous et al. 2007c, Videira et al. 2017
Devonomyces endophyticus	CBS 114662	GQ852603	MF951590	NR_164212	*Eucalyptus* sp.	South Africa	Crous et al. 2006, Crous et al. 2009b, Videira et al. 2017
Distocercospora pachyderma	CBS 138247	MH877655	MF951486	NR_156369	*Dioscorea* sp.	Japan	Videira et al. 2017, Vu et al. 2019
Distocercosporaster dioscoriae	CBS 135460/ CPC 10855	GU214665	MF951488	GU214665	*Dioscorea tokoro*	South Korea	Crous et al. 2009a, Videira et al. 2017
Distomycovellosiella brachycarpa	CBS 142178	NG_069528	MF951490	NR_156370	*Solanum mauritianum*	South Africa	Videira et al. 2017
Dothistroma pini	CBS 116486	JX901823	KX348053	JX901735	*Pinus nigra*	USA	Quaedvlieg et al. 2012, Videira et al. 2016
Epicoleosporium ramularioides	CPC 10672	GU214688	KX288433	GU214688	*Phellodendron amurense*	South Korea	Crous et al. 2009a, Videira et al. 2016
Exosporium livistonae	CBS 131313/ CPC 19357	JQ044446	MF951494	JQ044427	*Livistona benthamii*	Australia	Crous et al. 2011b, Videira et al. 2017
Exutisphaerella laricina	CBS 326.52	NG_059205	MF951496	NR_156209	*Larix decidua*	Switzerland	Simon et al. 2009, Crous et al. 2013a, Videira et al. 2017
Filiella pastinacae	CBS 114116	NG_058008	KX348056	KF251328	*Laserpitium latifolium*	Sweden	Verkley et al. 2013, Videira et al. 2016
Fulvia fulva	CBS 120.46	MH867656	MF951497	MH856140	*Lycopersicon esculentum*	Switzerland	Videira et al. 2017, Vu et al. 2019
Fusoidiella depressa	CPC 14915	KF251813	KX348055	KF251309	*Angelica gigas*	Republic of Korea	Verkley et al. 2013, Videira et al. 2016
Graminopassalora graminis	CBS 113303	GU214666	MF951502	GU214666	*Alopecurus aequalis* var. *amurensis*	South Korea	Crous et al. 2009a, Videira et al. 2017
Graminopassalora geissorhizae	CPC 38623	MW175376	MW173111	MW175336	*Geissorhiza splendidissima*	South Africa	Crous et al. 2020
Hyalozasmidium	CBS 125011/	NG_059440	MF951504	NR_156220	*Eucalyptus*	Australia	Crous et al.

aerohyalinosporum	CPC 14636				*tectifica*		2009b, Crous et al. 2009e, Videira et al. 2017
Hyalocercosporidium desmodii	CBS 142179	NG_058488	MF951503	NR_156371	*Desmodium tortuosum*	Brazil	Videira et al. 2017
Lecanosticta acicola	CBS 871.95	GU214663	MF951506	GU214663	*Pinus radiate*	France	Crous et al. 2009a, Videira et al. 2017
Madagascaromyces intermedius	CBS 124154/ CPC 15745	FJ790297	MF951511	FJ790267	*Eucalyptus camaldulensis*	Madagascar	Crous et al. 2009c, Videira et al. 2017
Microcyclosporella mali	CBS 126136/ CPC 16184	GU570547	KX288436	GU570535	*Malus domestica*	Slovenia	Frank et al. 2010, Videira et al. 2016
Micronematomyces caribensis	CBS 113380	NG_058490	MF951517	NR_160215	*Chromolaena odorata*	Jamaica	Videira et al. 2017, Vu et al. 2019
Miuraea degenerans	MAFF 239265	MF951181	MF951523	NR_156373	*Prunus mume*	Japan	Videira et al. 2017
Miuraea persica	CBS131935/ CPC 10828	JQ324939	MF951524	GU269844	*Prunus armeniaca*	South Korea	Crous et al. 2013a, Videira et al. 2017
Mycodiella sumatrensis	CBS 118501/ CPC 11175	JX901872	MF951525	DQ303049	*Eucalyptus* sp.	Indonesia	Crous et al. 2006, Quaedvlieg et al. 2012, Videira et al. 2017
Mycosphaerelloides madeirae	CBS 112895	DQ204756	KX348057	NR_154213	*Eucalyptus globulus*	Portugal	Hunter et al. 2006, Videira et al. 2017
Mycosphaerelloides madeirae	CBS 116066	KX286989	KX288444	AY853188	*Quercus robur*	Netherlands	Videira et al. 2016
Neoceratosperma cyatheae	CPC 18580	KT037580	MF951530	KT037539	*Cyathea delgadii*	Brazil	Guatimosim et al 2016, Videira et al. 2017
Neoceratosperma eucalypti	CBS 137998	NG_058084	MF951531	NR_156285	*Eucalyptus* sp.	Thailand	Crous et al. 2014a, Videira et al. 2017
Neocercospora ammicola	CBS 136450	NG_058158	KX288446	NR_154229	*Ammi majus*	Iran	Bakhshi et al. 2015, Videira et al. 2016
Neocercosporidium smilacis	CBS 556.71	KJ633269	MF951535	KJ633265	*Smilax aspera*	Italy	Collemare et al. 2015, Videira et al. 2017

Neodeightoniella phragmiticola	CPC 22057	KF777223	MF951542	KF777170	*Phragmites australis*	South Africa	Crous et al. 2013c, Videira et al. 2017
Neokamalomyces indicus	**NFCCI 4870**	**MT731328**	**OL773682**	**MT731962**	***Ficus benghalensis***	**India**	**This study**
Neomycosphaerella pseudopentameridis	CBS 136407/ CPC 21126	NG_058044	MF951545	KF777173	*Pseudopentameris macrantha*	South Africa	Crous et al. 2013c, Videira et al. 2017
Neopenidiella nectandrae	CBS 734.87/ ATCC 200932	MH873803	MF951546	MH862115	*Nectandrea coriacea*	Cuba	Videira et al. 2017, Vu et al. 2019
Neophloeospora maculans	CBS 115123	GU214670	MF951547	GU214670	*Morus alba*	New Zealand	Crous et al. 2009a, Videira et al. 2017
Neopseudocercosporella brassicae	CBS 228.32	MH866752	KX348058	MH855297	*Brassica oleracea*	Denmark	Videira et al. 2016, Vu et al. 2019
Neopseudocercosporella capsellae	CBS 118412	MF951193	MF951549	MF951338	*Brassica* sp.	New Zealand	Videira et al. 2017
Neoseptoria caricis	CBS 135097	KF251663	MF951551	KF251159	*Carex acutiformis*	Netherlands	Quaedvlieg et al. 2013, Videira et al. 2017
Nothopassalora personata	CBS 142236	MF951235	MF951632	MF951374	*Arachis hypogaea*	Australia	Videira et al. 2017
Nothophaeocryptopus gaeumannii	CBS 244.38	MF951191	GU371740	MF951336	NA	Austria	Schoch et al. 2009, Videira et al. 2017
Pachyramichloridium pini	CBS 461.82/ MUCL 28942	MH873262	MF951552	EU041802	*Pinus contorta*	United Kingdom	Arzanlou et al. 2007, Vu et al. 2019
Pallidocercospora acaciigena	CBS 112515	GQ852599	KX348062	MH862893	*Acacia mangium*	Venezuela	Crous et al. 2009a, Videira et al. 2016, Vu et al. 2019
Pallidocercospora crystallina	CBS 111045/ CPC 1179	KF442659	KX348063	KF901704	*Eucalyptus grandis*	South Africa	Crous et al. 2013b, Quaedvlieg et al. 2014, Videira et al. 2016
Pallidocercospora heimii	CBS 110682/ CPC 760	GQ852604	MF951554	KF901671	*Eucalyptus* sp.	Madagascar	Crous et al. 2009b Quaedvlieg et al. 2014, Videira et al. 2017
Pallidocercospora heimioides	CBS 111190/	GQ852607	MF951555	KF901659	*Eucalyptus* sp.	Indonesia	Crous et al. 2009b,

	CMW 3046/ CPC 1312						Quaedvlieg et al. 2014, Videira et al. 2017
Pallidocercospora irregulariramosa	CBS 111211	GQ852609	KX348065	KX287297	*Eucalyptus saligna*	South Africa	Crous et al. 2009b, Videira et al. 2016
Pallidocercospora konae	CBS 111028/ CPC 2125	KF902158	KX348066	KF901798	*Leucadendron* sp.	USA	Quaedvlieg et al. 2014, Videira et al. 2016
Pantospora chromolaenae	CBS 145563	MK876442	MK876488	NR_165571	*Chromolaena odorata*	Thailand	Crous et al. 2019b
Paracercospora egenula	CBS 132030/ CPC 12537	GU253738	MF951557	GU269698	*Solanum melongena*	Republic of Korea	Crous et al. 2013a, Videira et al. 2017
Paracercosporidium microsorum	CBS 123735	KJ633266	MF951563	KJ633262	*Tilia* sp.	Czech Republic	Collemare et al. 2015, Videira et al. 2017
Paracercosporidium tiliae	CBS 112734	MF951202	MF951565	MF951345	*Tilia Americana*	Canada	Videira et al. 2017
Paramycosphaerella marksii	CBS 110920	GU253694	MF951572	GU269644	*Eucalyptus botryoides*	Australia	Crous et al. 2013a, Videira et al. 2017
Paramycovellosiella passaloroides	CPC 14694	MF951208	MF951579	MF951351	*Amorpha fruticosa*	South Korea	Videira et al. 2017
Parapallidocercospora colombiensis	CBS 110968/ CPC 1105	KF901969	MF951581	AY752148	*Eucalyptus urophylla*	Colombia	Crous et al. 2004b, Quaedvlieg et al. 2014, Videira et al. 2017
Parapallidocercospora thailandica	CBS 120723/ CPC 13478	KF442667	MF951582	EF394848	*Eucalyptus camaldulensis*	Thailand	Crous et al. 2007b, Crous et al. 2013b, Videira et al. 2017
Phaeocercospora colophospermi	CBS 132687/ CPC 19812	JX069854	MF951586	JX069870	*Colophospermum mopane*	South Africa	Crous et al. 2012, Videira et al. 2017
Phaeophleospora eugeniae	CBS 142184/ CPC 15143	FJ493206	MF951594	FJ493188	*Eugenia uniflora*	Brazil	Crous et al. 2009d, Videira et al. 2017
Phaeoramularia capsicicola	CBS 113382/ C460	MF951213	MF951596	DQ676522	*Chromolaena odorata*	USA	Den Breeÿen et al. 2006, Videira et al. 2017
Phloeospora ulmi	CBS 613.81	GU253842	MF951601	GU269825	*Ulmus* sp.	Austria	Crous et al. 2013a,

							Videira et al. 2017
Pleopassalora perplexa	CPC 12170	MF951219	MF951605	MF951362	*Acacia* sp.	Indonesia	Videira et al. 2017
Pleuropassalora armatae	CBS 125420/ CPC 15419	MH875073	MF951609	MH863597	*Dalbergia armata*	South Africa	Crous et al. 2009a, Videira et al. 2017, Vu et al. 2019
Pluripassalora bougainvilleae	CBS 142237	MF951224	MF951612	MF951365	*Bougainvillea* sp.	Australia	Videira et al. 2017
Polyphialoseptoria tabebuiae-serratifoliae	CBS 112650/ CPC 3944	KF251716	MF951613	KF251213	*Tabebuia serratifolia*	Brazil	Quaedvlieg et al. 2013, Videira et al. 2017
Polyphialoseptoria terminaliae	CBS 135106	MH878128	MF951615	KF251214	*Terminalia catappa*	Brazil	Quaedvlieg et al. 2013, Videira et al. 2017, Vu et al. 2019
Pseudocercospora catappae	MAFF 238312/ /MUCC 1109	MF951225 -	MF951616	MF951366	*Terminalia catappa*	Japan	Videira et al. 2017
Pseudocercospora vitis	CBS 132012/ CPC 11595	GU214483	KX348076	DQ073923	*Vitis vinifera*	Republic of Korea	Ayala et al. 2006, Crous et al. 2009a, Videira et al. 2017
Pseudocercosporella bakeri	CBS 119488	KX287005	KX288462	KX287306	*Ipomoea indica*	New Zealand	Videira et al. 2016
Pseudopericoniella levispora	CBS 873.73	MH872550	MF951633	EU041780	*Turpinia pomifera*	Sri Lanka	Arzanlou et al. 2007, Videira et al. 2017, Vu et al. 2019
Pseudophaeophleospora atkinsonii	CBS 124565/ ICMP 17860	MF951236	MF951635	GU214643	*Hebe* sp.	New Zealand	Crous et al. 2009a, Videira et al. 2017
Pseudozasmidium nabiacense	CBS 125010/ CPC 12748	MH874956	MF951638	MH863455	*Eucalyptus* sp.	Australia	Videira et al. 2017, Vu et al. 2019
Ragnhildiana pseudotithoniae	CBS 136442/ CPC 21688	KF777231	MF951652	KF777179	*Tithonia diversifolia*	Thailand	Crous et al. 2013c, Videira et al. 2017
Ramularia carneola	CBS 108975	KX287048	KX288507	KX287348	Scrophularia nodosa	Netherlands	Videira et al. 2016
Ramularia endophylla	CBS 113265	AY490776	KP894673	EU167569	*Quercus robur*	Netherlands	Verkley et al. 2004a, Simon et al. 2009, Videira et al. 2015

Ramularia pusilla	CBS 124973/ RoKi 3143	KP894141	KP894687	KP894248	*Poa annua*	Germany	Videira et al. 2015
Ramulariopsis gossypii	CPC 25909	KX287243	KX288702	KX287540	*Gossypium* sp.	Brazil	Videira et al. 2016
Ramulispora sorghi	CBS 478.92	KX286970	KX288420	KX287278	*Sorghum halepense*	Alabama	Videira et al. 2016
Rhachisphaerella mozambica	CBS 122464/ X34	NG_064205	MF951640	NR_164290	*Musa acuminata*	Mozambique	Vu et al. 2019
Rosisphaerella rosicola	CBS 142183/ CPC 12548	MF951251	MF951657	MF951387	*Rosa hybrid*	USA	Videira et al. 2017
Ruptoseptoria unedonis	CBS 755.70	KF251732	MF951659	KF251229	*Arbutus unedo*	Croatia	Quaedvlieg et al. 2013, Videira et al. 2017
Scolecostigmina mangiferae	CBS 125467	GU253877	MF951660	MH863595	*Mangifera indica*	Australia	Crous et al. 2013a, Videira et al. 2017, Vu et al. 2019
Septoria dysentericae	CBS:131892/ CPC 12328	GU214699	KX348088	GU214699	*Inula britannica*	South Korea	Crous et al. 2009a, Videira et al. 2016
Septoria protearum	CBS 135477/ CPC 19675	KF252029	MF951663	KF251524	*Zantedeschia aethiopica*	South Africa	Verkley et al. 2013, Videira et al. 2017
Sirosporium celtidis	CBS 289.50	MH868136	MF951671	MH856627	*Celtis australis*	Italy	Videira et al. 2017, Vu et al. 2019
Sonderhenia eucalypticola	CBS 112502/ CPC 3749	KF902019	MF951672	KF901677	*Eucalyptus* sp.	Spain	Quaedvlieg et al. 2014, Videira et al. 2017
Sonderhenia eucalyptorum	CBS 120220	DQ923536	MF951673	DQ923536	*Eucalyptus* coccifera	Australia	Summerbell et al. 2006, Videira et al. 2017
Sphaerulina gei	CBS 128632	MH876498	KX348095	MH865060	*Gei urbani*	Korea	Videira et al. 2016, Vu et al. 2019
Stromatoseptoria castaneicola	CBS 102322	KF251774	MF951681	MH862786	*Castanea sativa*	France	Quaedvlieg et al. 2013, Videira et al. 2017, Vu et al. 2019
Sultanimyces vitiphyllus	CBS 206.48	MH867863	MF951683	MH856310	*Vitis* sp.	South Africa	Videira et al. 2017, Vu et al. 2019
Trochophora fasciculata	CBS 124744/ SMKC 21713	GU253880	MF951684	GU269872	*Daphniphyllum macropodum*	South Korea	Crous et al. 2013a, Videira et al. 2017

Virosphaerella irregularis	CBS 123242	MH874810	MF951685	MH863286	*Eucalyptus* sp.	Thailand	Videira et al. 2017, Vu et al. 2019
Virosphaerella pseudomarksii	CBS 123241	EU882137	MF951686	MH863285	*Eucalyptus* sp.	Thailand	Cheewangkoon et al. 2008, Videira et al. 2017, Vu et al. 2019
Xenomycosphaerella elongata	CBS 120735/ CPC 13378	KF902170	MF951687	EF394833	*Eucalyptus camaldulensis*	Venezuela	Crous et al. 2007b, Quaedvlieg et al. 2014, Videira et al. 2017
Xenoramularia neerlandica	CPC 18377	KX287260	KX288722	KX287554	*Iris pseudacorus*	Netherlands	Videira et al. 2016
Xenoramularia polygonicola	CPC 10852	GU214695	KX288723	GU214695	*Polygonum* sp.	Republic of Korea	Crous et al. 2009a, Videira et al. 2016
Xenosonderhenia eucalypti	CBS 138858	KP004485	MF951688	KP004457	*Eucalyptus urophylla*	Mozambique	Crous et al. 2014b, Videira et al. 2017
Xenosonderhenioides indonesiana	CBS 142239	MF951261	MF951689	MF951396	*Eucalyptus* sp.	Indonesia	Videira et al. 2017
Zasmidium arcuatum	CBS 113477	MH874499	MF951692	EU041779	*Zasmidium arcuatum*	South Africa	Arzanlou et al. 2007, Videira et al. 2017, Vu et al. 2019
Zasmidium cerophillum	CBS 103.59	GU214485	MF951694	EU041798	*Sasa* sp.	Japan	Arzanlou et al. 2007, Crous et al. 2009a, Videira et al. 2017
Zasmidium grevilleae	CBS 124107/ CPC 14761	FJ839670	MF951705	MH863352	*Grevillea decurrens*	Australia	Crous et al. 2009f, Videira et al. 2017, Vu et al. 2019
Out groups							
Cladosporium ramotenellum	CBS 133.29/ ATCC 36970	MF951116	MF951413	MF951281	*Populus tremuloides*	NA	Videira et al. 2017
Cylindroseptoria ceratoniae	CBS 477.69/ H.A 1731	KF251655	MF951419	KF251151	*Ceratonia siliqua*	Spain	Quaedvlieg et al. 2013, Videira et al. 2017
Exopassalora zambiae	CBS 112971/ CMW 14782 CPC 1227	EU019273	MF951421	AY725523	*Eucalyptus globulus*	Zambia	Crous et al. 2004a, Crous et al. 2007a,

							Videira et al. 2017
Ramichloridium apiculatum	CBS 156.59/ ATCC 13211/ IMI 100716/ JCM 6972/ MUCL 15753/ MUCL 7991/ QM 7716	EU041848	MF951416	EU041791	Forest soil	USA	Arzanlou et al. 2007, Videira et al. 2017
Schizothyrium pomi	CBS 228.57	EF134947	MF951734	EF134947	NA	Italy	Batzer et al. 2008, Videira et al. 2017
Stenella araguata	CBS 105.75	EU019250	MF951742	EU019250	*Homo sapiens*	Venezuela	Crous et al. 2007a, Videira et al. 2017
Teratosphaeria stellenboschiana	CBS 125215/ CPC 13764	KF937247	MF951743	KF901733	*Eucalyptus punctata*	South Africa	Quaedvlieg et al. 2014, Videira et al. 2017
Uwebraunia musae	CBS 122453/ X1021	JQ739816	KX348107	EU514225	*Musa acuminata*	India	Arzanlou et al. 2008, Stukenbrock et al. 2012, Videira et al. 2016

Table 2 Comparative morphology of *Septoria* spp. reported on *Ficus* spp.

Taxa	Host	Conidia			References
		Dimension	Septation	Shape	
Septoria arcuata	*Ficus* sp.	40–50 µm long	–	Linear	Cooke 1880
Septoria brachyspora	*Ficus elastica*	12–15 × 1 µm	–	Curved	Saccardo 1879
Septoria elasticae	*Ficus elastica*	15–28 × 1–1.5 µm	Indistinctly 1–3-septate or guttulate	Filiform to bacillar, curvules to curve winding	Koorders 1907
Septoria pipulae	*Ficus religiosa*	50–60 µm long	–	Filiform	Cooke 1879
Septoria pirottae	*Ficus repens*	24–30 × 2–3 µm	–	Filiform, subcylindrical, curved	Tassi 1896

Figures

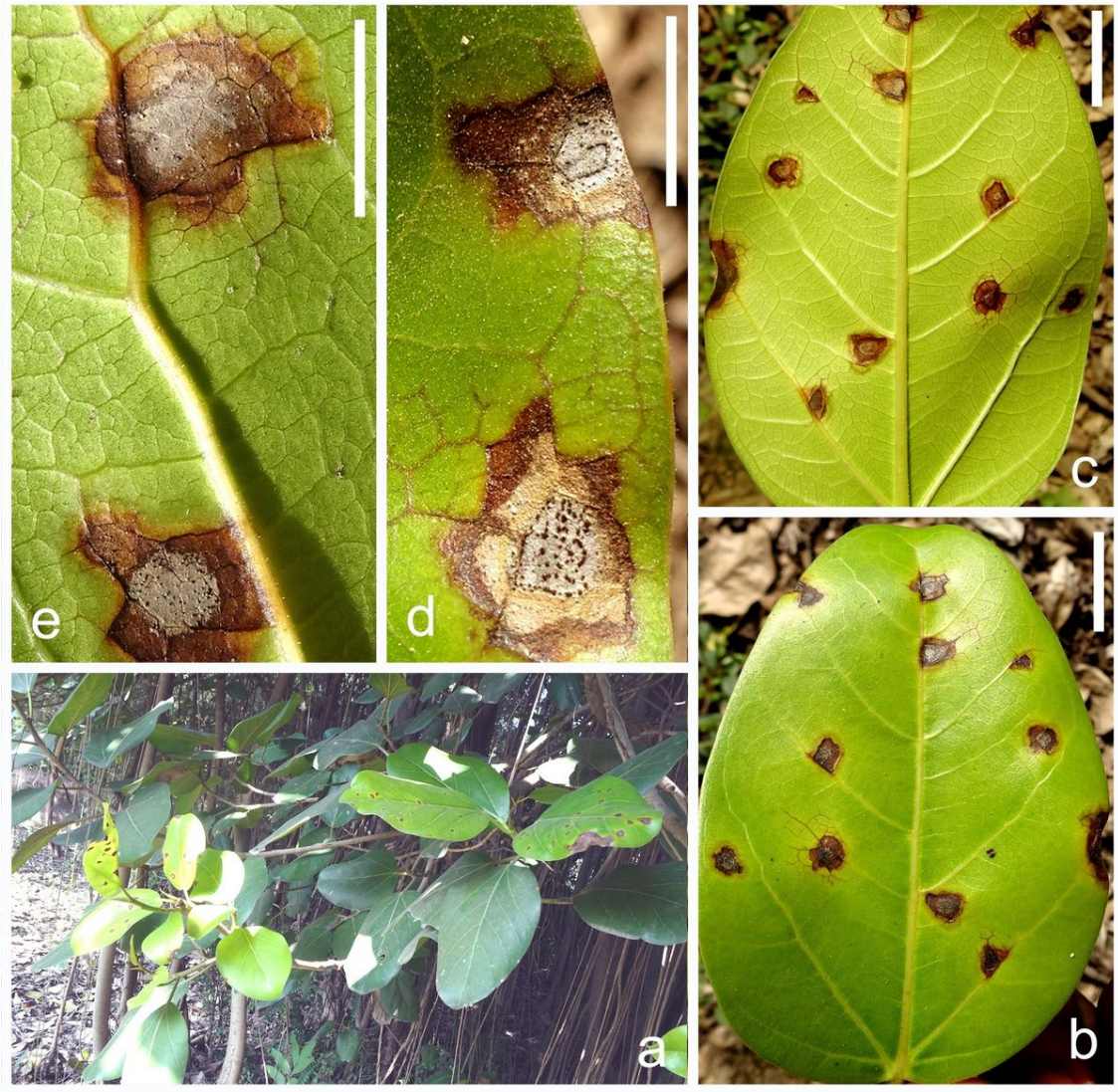


Figure 1

Neokamalomyces indicus on *Ficus benghalensis*. **a** Host plant in natural habitat, **b** Initial stage of symptom on upper surface of leaf, **c** Initial stage of symptom on lower surface of leaf, **d, e** Conidiomata on host tissue. Bars: **b, c** = 20 mm, **d, e** = 10 mm

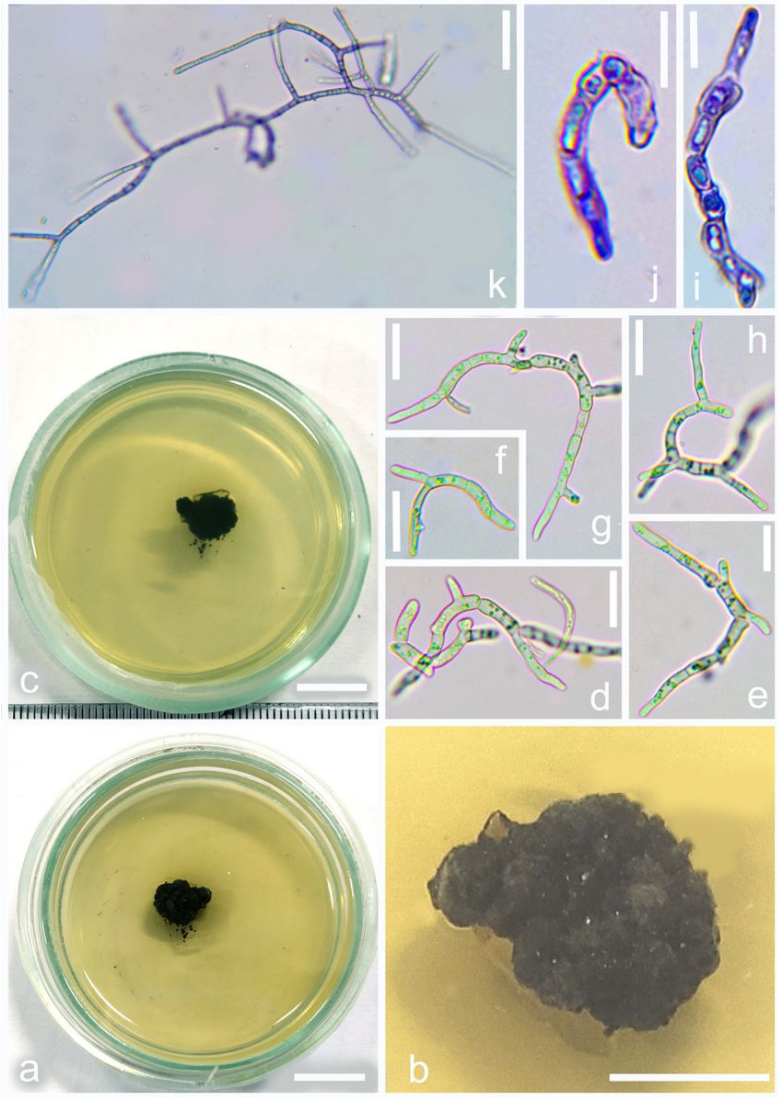


Figure 2

Neokamalomyces indicus on PDA (NFCCI 4870, ex-type culture). **a, b** Colony on PDA front view, **c** Colony on PDA reverse view, **d–h** Germinated conidia in water droplet in cavity slide after 12-15 hours, **i, j** Germinated conidia on PDA (stained with cotton-blue), **k** Development of mycelia on PDA. Bars: **a** = 10 mm, **b** = 5 mm, **c** = 10 mm, **d–h** = 20 µm, **i–k** = 10 µm

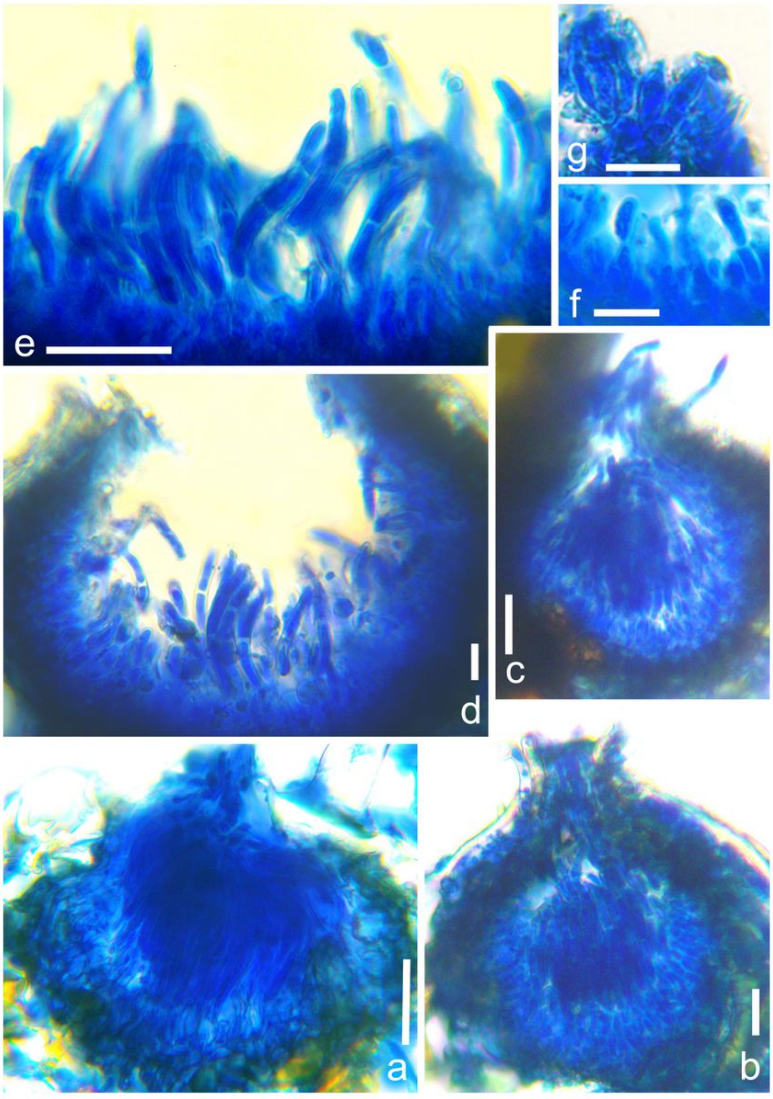


Figure 3

Fruiting body of *Neokamalomyces indicus* (holotype, AMH 10233). **a–d** Vertical section through conidioma, **e, f** Conidia with conidiophores, **g** Conidiogenous cells. Bars: **a–e** = 20 µm, **f, g** = 10 µm

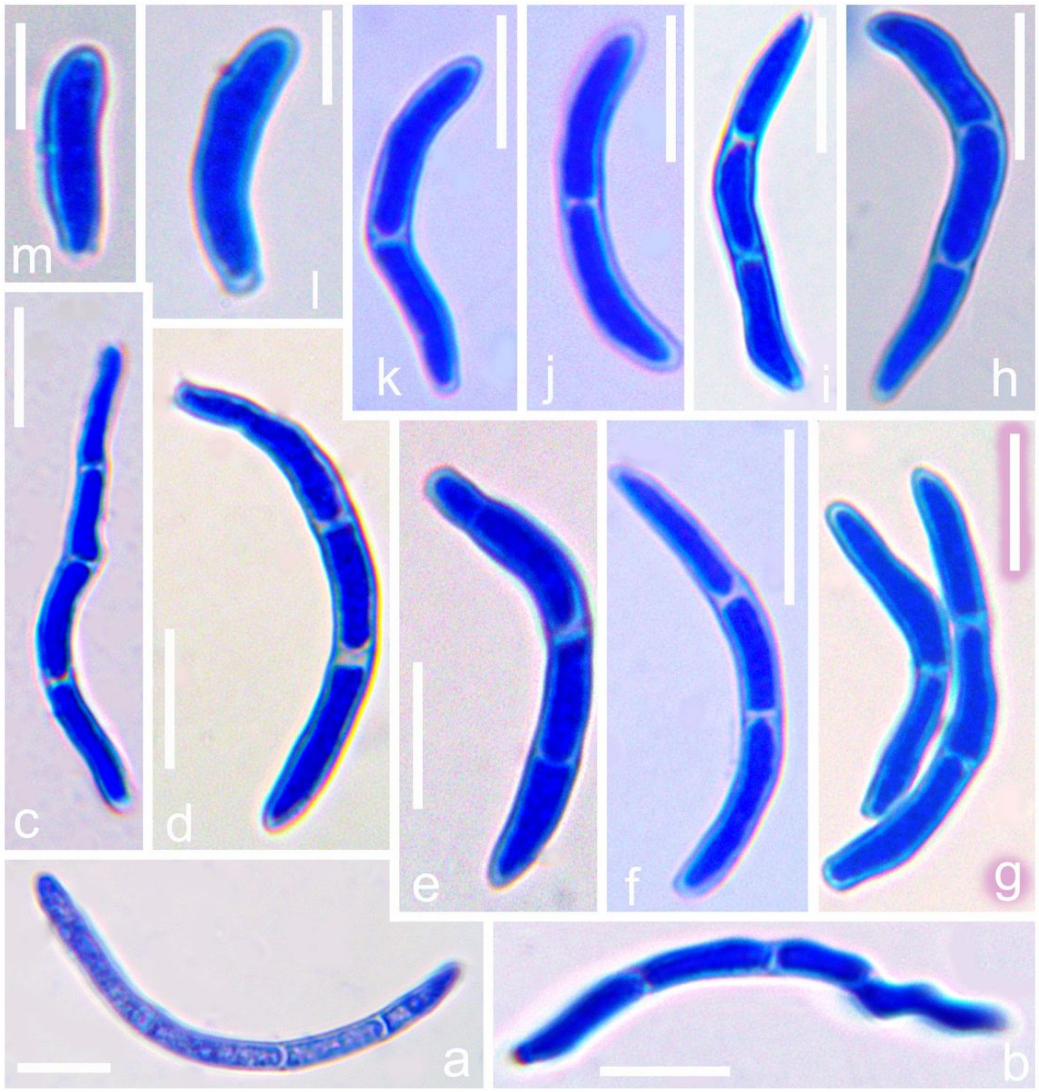


Figure 4

Conidia of *Neokamalomyces indicus* (holotype, AMH 10233). Bars: **a–k** = 10 µm, **l, m** = 5 µm

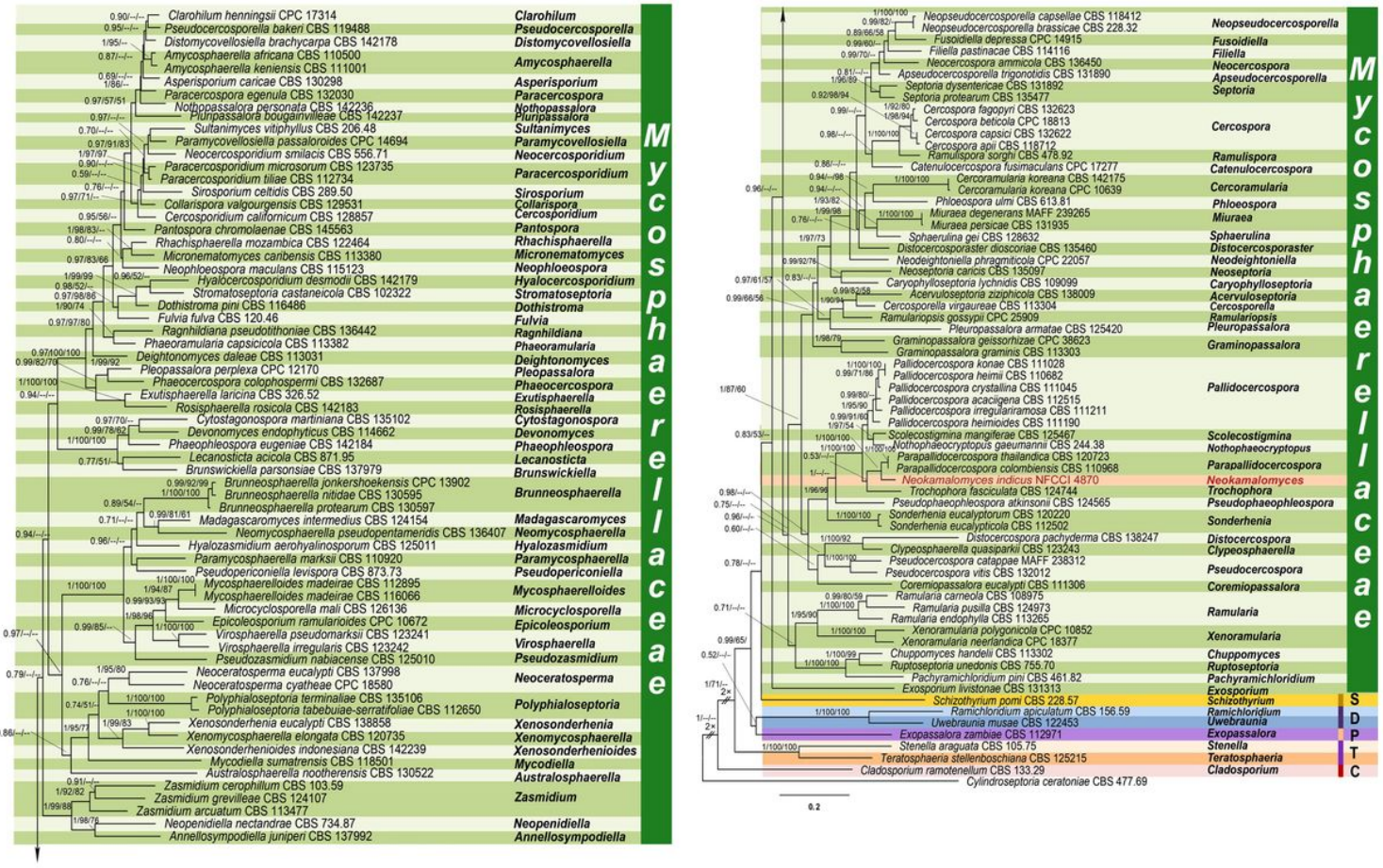


Figure 5

Consensus phylogram (50% majority rule) resulting from a maximum likelihood of the combined three-genes (LSU, *RPB2* and ITS) sequence alignment. The Bayesian posterior probabilities (≥ 0.50; BI-PP), maximum likelihood bootstrap support values (≥ 50%; ML-BS) and maximum parsimony bootstrap support values (≥ 50%; MP-BS) are given at the nodes (BI-PP/ML-BS/MP-BS). Red names indicate *Neokamalomyces indicus*. A vertical bar is used to the right of the coloured boxes and encompasses all genera within their respective families. The family name *Mycosphaerellaceae* is unabbreviated while the rest are abbreviated as follows: D = *Dissoconiaceae*, P = *Phaeothecoidiellaceae*, S = *Schizothyriaceae*, T = *Teratosphaeriaceae*, C = *Cladosporiaceae*. The tree was rooted to *Cylindroseptoria ceratoniae* (CBS 477.69)