**Didymellaceae revisited**

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Abstract: The Didymellaceae is one of the most species-rich families in the fungal kingdom, and includes species that inhabit a wide range of ecosystems. The taxonomy of Didymellaceae has recently been revised on the basis of multi-locus DNA sequence data. In the present study, we investigated 108 Didymellaceae isolates newly obtained from 40 host plant species in 27 plant families, and various substrates from caves, including air, water and carbonatite, originating from Argentina, Australia, Canada, China, Hungary, Italy, Japan, South Africa, the Netherlands, the USA and former Yugoslavia. Among these, 68 isolates representing 32 new taxa are recognised based on the multi-locus phylogeny using sequences of LSU, ITS, rpb2 and tub2, and morphological differences. Within the Didymellaceae, five genera appeared to be limited to specific host families, with other genera having broader host ranges. In total 19 genera are recognised in the family, with Hareleciola being reduced to synonymy under Ascochyta. This study has significantly improved our understanding on the distribution and biodiversity of Didymellaceae, although the placement of several genera still need to be clarified.

Key words: Host-associated, Karst caves, Multi-locus phylogeny, Phoma, Taxonomy.

**Taxonomic novelties: New species: Allopoma oltogonotricha Q. Chen, Crous & L. Cai, **Ascochyta** boeremae L.W. Hou, Crous & L. Cai, **Calophoma** rosea Q. Chen, Crous & L. Cai, **Didymella** aeria Q. Chen, Crous & L. Cai, **D. aquatica** Q. Chen, Crous & L. Cai, **D. chloroguttulata** Q. Chen, Crous & L. Cai, **D. eilisoides** Q. Chen, Crous & L. Cai, **D. ilicicola** Q. Chen, Crous & L. Cai, **D. macrophylla** Q. Chen, Crous & L. Cai, **D. aerea** Q. Chen, Crous & L. Cai, **D. denticulata** L.W. Hou, Crous & L. Cai, **D. sinensis** Q. Chen, Crous & L. Cai, **D. suyangensis** Q. Chen, Crous & L. Cai, **Epicoccum** camelliae Q. Chen, Crous & L. Cai, **E. dundrobi** Q. Chen, Crous & L. Cai, **E. duchesneae** Q. Chen, Crous & L. Cai, **E. hordei** Q. Chen, Crous & L. Cai, **E. italicum** Q. Chen, Crous & L. Cai, **E. latusciulluum** Q. Chen, Crous & L. Cai, **E. layنفسه Q. Chen, Crous & L. Cai, **E. poae** Q. Chen, Crous & L. Cai, **E. ritcis** Q. Chen, Crous & L. Cai, **E. argentina** L.W. Hou, Crous & L. Cai, **E. exigua** Q. Chen, Crous & L. Cai, **E. orientalis** L.W. Hou, Crous & L. Cai, **E. sp.** Q. Chen, Crous & L. Cai, **E. suiyangensis** Q. Chen, Crous & L. Cai, **E. viticis** Q. Chen, Crous & L. Cai, **E. argentina** L.W. Hou, Crous & L. Cai, **E. exigua** var. **sp.** Q. Chen, Crous & L. Cai, **E. sp.** Q. Chen, Crous & L. Cai, **Heterophoma** verbascioloa Q. Chen, Crous & L. Cai, **Neoscochyta** argentina L.W. Hou, Crous & L. Cai, **Neoscochyta** sp. Q. Chen, Crous & L. Cai, **New variety: Boeremia** exigua var. **sp.** Q. Chen, Crous & L. Cai, **New combinations: **Ascochyta** premicicrescens** (Tiplromma et al.) Q. Chen, Crous & L. Cai, **Didymella** segeticola (Q. Chen) Q. Chen, Crous & L. Cai.

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**INTRODUCTION**

The Didymellaceae is the largest family in the Pleosporales (Ascomycota, Pezizomycotina, Dothideomycetes), with more than 5,400 taxon names listed in MycoBank (Crous et al. 2004). The family Didymellaceae was established by de Gruyter et al. (2009) to encompass three main genera, viz. *Ascochyta*, *Didymella* and *Phoma*, and other allied phoma-like genera which grouped in the *Didymellaceae*. Aveskamp et al. (2010) circumscribed the boundaries of the family *Didymellaceae*, redefined the genera *Epicoccum*, *Peyronellaea* and *Stagonosporopsis*, and established the genus *Boeremia*. He also acknowledged two sexual genera in the family, namely *Leptosphaerulina* and *Macroventuria*. In spite of these studies, the polyphyly of *Ascochyta*, *Didymella* and *Phoma* remained unresolved. A revision of the *Didymellaceae* has recently been published, comprising 17 well-supported monophyletic clades which were treated as individual genera (Chen et al. 2015a). Moreover, the generic delimitations of *Ascochyta*, *Didymella*, *Epicoccum* and *Phoma* were further emended to reveal more natural evolutionary relationships (Chen et al. 2015a). Subsequent to this revision, several additional genera were added, namely *Briansuotumomyces* (Crous & Groenewald 2016), *Neomicrosphaeropsis* (Thambugala et al. 2017), *Didymellocomarosporium* (Wijayawardene et al. 2016), *Hareleciola* and *Neodidymella* (Ariyawansa et al. 2015).

Species of *Didymellaceae* are cosmopolitan and distributed throughout a broad range of environments. Most of the members in this family are plant pathogens of a wide range of hosts, mainly causing leaf and stem lesions; some are of quarantine significance (Aveskamp et al. 2008, 2010, Chen et al. 2015a, b). Several species belonging to *Ascochyta* and *Nothophoma* have been reported to be host-specific to a single plant genus or family (Aveskamp et al. 2010, Chen et al. 2015a). Nevertheless, host specificity in genera of *Didymellaceae* has not been specifically addressed.

Correct species identification in this family has always proven difficult, chiefly relying on morphology and plant host association (Aveskamp et al. 2010, Chen et al. 2015a). However, a robust backbone tree based on internal transcribed spacer regions and intervening 5.8S rDNA (ITS), partial 28S large subunit rDNA (LSU) sequences, and partial regions of RNA polymerase II second largest subunit (rpb2) and β-tubulin (tub2) genes provides a relatively robust phylogenetic backbone for taxon determination (Chen et al. 2015a).

The present study reports on a collection of 108 *Didymella* isolates obtained from 40 host plant species in 27 plant families in China, as well as several other countries. Of these, 68
isolates representing 32 new taxa are described by employing a polyphasic approach using morphological characteristics and multi-locus phylogenetics.

MATERIALS AND METHODS

Sampling and isolation

The majority of Didymellaceae strains were isolated from diseased plants in seven provinces of China (Gansu, Guizhou, Inner Mongolia, Jiangxi, Qinghai, Shandong and Tibet), as well as Australia, Italy, Japan and the USA. Some strains isolated from air, soil, water and faeces were collected from the Mingyong Glacier in Yunnan Province and inside the Karst caves in Guizhou Province in China. The air, soil and water samples were collected from inside the cave following the methods used by Zhang et al. (2017). Several strains were obtained from the Herbarium BRIP (Dutton Park, Queensland, Australia), the International Collection of Microorganisms from Plants (ICMP, Landcare Research, Auckland, New Zealand), and the Westerdijk Fungal Biodiversity Institute (CBS, Utrecht, the Netherlands), as listed in Table 1.

Plant-associated isolates were obtained from symptomatic tissue with sporocarps using the single spore isolation protocols of Choi et al. (1999) and Zhang et al. (2013), and from tissue according to the techniques outlined by Cai et al. (2009). Isolates from other substrates were obtained following the methods described by Zhang et al. (2017) and further screened with carbon-free silica gel medium to select the oligotrophic strains (Wainwright & Al-Talhi 1999). All the Didymellaceae isolates were primarily identified based on morphology and ITS sequence data, which distinguished them from other groups of fungi. Type specimens of new species in this study were deposited in the Mycological Herbarium of Institute of Microbiology, Chinese Academy of Sciences, Beijing, China (HAMAS), with the ex-type living cultures deposited in China General Microbiological Culture Collection Center (CGMCC), or the other Biological Resource Centres cited above.

Morphology

Isolates were incubated on oatmeal agar (OA), malt extract agar (MEA) and potato dextrose agar (PDA) (Crous et al. 2009) at 25 °C, and under near-ultraviolet (UV) light (12 h light/12 h dark) or on pine needle agar (PNA) (Smith et al. 1996) to induce sporulation. Colony diameters were measured after 7 d of incubation, and the culture characters were determined after 14 d (Boerema et al. 2004). Colony colours were rated according to the colour charts of Rayner (1970). Preparations were mounted in distilled water to study the micromorphological structures of mature ascospore/conidia, ascospores/conidia and conidiogenous cells from OA cultures (Aveskamp et al. 2010, Chen et al. 2015a, b). Observations were conducted with a Leica M125 dissecting microscope and a Nikon Eclipse 80i compound microscope under differential interference contrast (DIC) illumination. To study the pseudohyphae/pycnidial wall, sections of mature pseudohypha/pycnidia were made by a Leica CM1950 freezing microtome (Aveskamp et al. 2010, Chen et al. 2015a, b). The NaOH spot test was carried out by a drop of 1N NaOH to determine the secretion of metabolite E on MEA cultures (Boerema et al. 2004).

DNA isolation, amplification and phylogenetic analyses

Total genomic DNA was extracted from fresh mycelia using the MP Fastprep-24 sample preparation system, according to the protocol described by Cubero et al. (1999). The primers V9G (de Hoog & Gerrits van den Ende 1998) and ITS4 (White et al. 1990) were used to amplify part of the nuclear rDNA operon (ITS) spanning the 3′ end of the 18S rRNA gene, the first internal transcribed spacer (ITS1), the 5.8S rRNA gene, the second ITS region (ITS2), and the first 100 bp of the 5′ end of the 28S rRNA gene (LSU); the primers LROR (Rehner & Samuels 1994), LR7 and LR5 (Vilgalys & Hester 1990) were used for LSU amplification; Btub2Fd and Btub4Rd (Woudenberg et al. 2009) for the partial β-tubulin (tub2) gene region, and RPB2-5F2 (Sung et al. 2007) and rRPB2-7cR (Liu et al. 1999) for the RNA polymerase II second largest subunit (rpb2). Amplicons for each locus were generated following the protocols listed in Chen et al. (2015a).

Sequencing was conducted in both directions with the same primer pair used for amplification at the Omega Genetics Company (Beijing, China). Consensus sequences were assembled in MEGA v. 6.0 (Tamura et al. 2013) and additional reference sequences were obtained from GenBank (Table 1). Subsequent alignments for each locus were generated with MAFFT v. 7 (http://mafft.cbrc.jp/alignment/server/index.html; Katoh & Standley 2013), and manually corrected when necessary. The concatenated aligned dataset and each locus were analysed separately using Maximum Likelihood (ML) and Bayesian Inference (BI). The best-fit models of evolution for the four loci tested (SYM+I+G for ITS and GTR+I+G for LSU, rpb2 and tub2) were estimated by MrModeltest v. 2.3 (Nylander 2004).

The ML analyses were conducted with RAXML v. 7.2.6 ( Stamatakis & Alachiotis 2010) using a GTRGAMMA substitution model with 1 000 bootstrap replicates. The robustness of the analyses was evaluated by bootstrap support (MLBS). Bayesian (BI) analyses were performed on MrBayes v. 3.2.1 (Ronquist et al. 2012) based on the models selected by the MrModelfest. The Markov Chain Monte Carlo (MCMC) algorithm of four chains was initiated in parallel from a random tree topology. The analyses lasted until the average standard deviation of split frequencies was below 0.01 with trees saved each 1 000 generations. The first 25 % of trees were removed as burn-in phase and the remaining trees were used to calculate posterior probabilities. Posterior probabilities values of the BI analyses (BPP) over 0.95 were considered significant. Leptosphaeria conoida (CBS 616.75) and L. doliforma (CBS 505.75) were selected as outgroup. Sequences generated in this study were deposited in GenBank (Table 1), the final matrices and trees in TreeBASE (www.treebase.org; accession number: S20724), and novel taxonomic descriptions and nomenclature in MycoBank (www.MycoBank.org; Crous et al. 2004).

Unique fixed nucleotide positions are used to describe a sterile species (see Taxonomy below), and the closest phylogenetic neighbour was selected and subjected to single nucleotide polymorphism (SNP) analyses using MEGA v. 6.0 (Tamura et al. 2013).

Statistical analysis

A heatmap showing the host distribution of each genus of Didymellaceae was generated with R v. 3.3.1 heatmap.2 (https://www.r-project.org/).
Table 1. Isolates used in this study and their GenBank accession numbers. New taxa and new combinations introduced in the present study and newly generated sequences are indicated in **bold**.

| Species                        | Strain number | Status | Host, substrate   | Host family   | Country          | GenBank accession numbers |
|-------------------------------|---------------|--------|-------------------|---------------|-------------------|---------------------------|
| *Allophoma labilis*           | CBS 124.93; PD 87/269 |        | Lycopersicon esculentum | Solanaceae     | Netherlands       | GU238091 GU237765 KT389552 GU237619 |
| *Al. minor*                  | CBS 325.82           | T      | Syzygium aromaticum | Myrtaceae      | Indonesia         | GU238107 GU237831 KT389553 GU237632 |
| *Al. nicaraguensis*          | CBS 506.91; PD 91/876; IMI 215229 | T    | Coffea arabica     | Rubiaceae      | Nicaragua         | GU238058 GU237876 KT389551 GU237956 |
| *Al. oligotrophica*          | CGMCC 3.18114; LC 6245 | T      | Air               |              | China             | KYZ42194 KYZ42040 KYZ42128 KYZ42282 |
| *Al. minor*                  | CBS 325.82           | T      | Syzygium aromaticum | Myrtaceae      | Indonesia         | GU238107 GU237831 KT389553 GU237632 |
| *Al. nicaraguensis*          | CBS 506.91; PD 91/876; IMI 215229 | T    | Coffea arabica     | Rubiaceae      | Nicaragua         | GU238058 GU237876 KT389551 GU237956 |
| *Al. oligotrophica*          | CGMCC 3.18114; LC 6245 | T      | Air               |              | China             | KYZ42194 KYZ42040 KYZ42128 KYZ42282 |
| *Al. piperis*                | CBS 268.93; CBS 108.93; PD 88/720 | T    | Peperomia sp.     | Piperaceae     | Netherlands       | GU238129 GU237816 KT389554 GU237644 |
| *Al. minor*                  | CBS 108.93           | T      | Peperomia perekiifolia | Piperaceae     | Netherlands       | GU238130 GU237921 KT389555 GU237645 |
| *Al. tropica*                | CBS 436.75; DSM 63365 | T      | Saintpaulia ionantha | Gesneriaceae   | Germany           | GU238149 GU237864 KT389556 GU237663 |
| *Al. zantedeschiae*          | CBS 131.93; PD 69/140 | T      | Cicer arietinum    | Fabaceae       | Romania           | KT389690 KT389473 KT389558 KT389767 |
| *Ascochyta boeremae*         | ICMP 16850          |        | Lycopersicon esculentum | Solanaceae     | Hungary           | KYZ42197 KYZ42043 KYZ42131 KYZ42285 |
| *As. boeremae*               | CBS 372.84; PD 80/1246 | T    | Pisum sativum     | Fabaceae       | Australia         | KT389697 KT389480 — KT389774 |
| *As. fabae*                  | CBS 524.77           | T      | Phaseolus vulgaris | Fabaceae       | Belgium           | GU237963 GU237880 — GU237526 |
| *As. herbicola*              | CBS 629.97; PD 76/1017 | R    | Water             |              | USA               | GU238083 GU237988 KP330421 GU237614 |
| *As. lentis*                 | CBS 370.84; PD 817833 |        | Lens culinaris    | Fabaceae       | —                 | KT389691 KT389474 — KT389768 |
| *As. medicaginicola var. macrosepora* | BRIP 45051; LC 5258 | T      | Medicago sativa   | Fabaceae       | Australia         | KYZ42198 KYZ42044 KYZ42132 KYZ42286 |
| *As. medicaginicola*         | CBS 112.53           | T      | Medicago sativa   | Fabaceae       | USA               | GU238101 GU237749 — GU237628 |
| *As. medicaginicola var. medicaginicola* | CBS 404.65; IMI 116999 | R    | Medicago sativa   | Fabaceae       | Canada            | GU238102 GU237859 KP330423 GU237629 |
| *As. nigripuncta*            | CBS 116.96; PD 95/7930 | T      | Vicia cracca      | Fabaceae       | Russia            | GU238118 GU237756 — GU237637 |
| *As. pisi*                   | CBS 128.54           | T      | Phacca alpina     | Fabaceae       | Switzerland       | KT389692 KT389475 — KT389769 |
| *As. phacae*                 | CBS 184.55           | T      | Pismum sativum    | Fabaceae       | USA               | KT389694 KT389477 — KT389771 |
| *As. pisi*                   | CBS 122750; ATCC 201619 | T    | Pismum sativum    | Fabaceae       | Canada            | KP330444 KP330432 EU874867 KP330388 |
| *As. phacae*                 | CBS 122751; ATCC 201620 | T    | Pismum sativum    | Fabaceae       | Netherlands       | GU237969 — GU237973 |
| *As. phacae*                 | CBS 122785; PD 78/517 | T      | Pismum sativum    | Fabaceae       | Netherlands       | GU237969 — GU237973 |
| *As. pisi*                   | CBS 126.54           | T      | Pismum sativum    | Fabaceae       | Netherlands       | GU237969 — GU237973 |
| *As. pisi*                   | CBS 108.49           | T      | Pismum sativum    | Fabaceae       | Netherlands       | GU237969 — GU237973 |
| *As. pisi*                   | MFLUCC 14-0518       | T      | Heracleum sphondylum | Apiaceae      | Italy             | KT326695 KT326694 — |
| Species              | Strain number¹ | Status² | Host, substrate          | Host family | Country           | GenBank accession numbers³ |
|----------------------|----------------|---------|--------------------------|-------------|-------------------|---------------------------|
| As. rabiei           | CBS 206.30     | —       | —                        | —           | —                 | KT389695 KT389772         |
|                      | CBS 237.37     | T       | Cicer arrietinum         | Fabaceae    | Bulgaria          | KT389696 KT389479         |
|                      | CBS 534.65     | —       | —                        | —           | —                 | KT389773                  |
| As. syringae         | CBS 545.72     | —       | Syringa vulgaris         | Oleaceae    | Netherlands       | KT389700 KT389843         |
| As. versabilis       | CBS 876.97; PD 82/1008 | R | Silene sp.                | Caryophyllaceae | Netherlands | GU238152 GU237909 KT389561 GU237664 |
| As. vicieae          | CBS 451.68     | —       | Vicia sepium             | Fabaceae    | Netherlands       | KT389701 KT389844 KT389562 KT389778 |
| As. vicieae-pannonica| CBS 254.92     | —       | Vicia pannonica          | Fabaceae    | Czech Republic    | KT389702 KT389845         |
| Boeremia crinicola   | CBS 109.79; PD 77/74 | R | Crinium powelli          | Amaranthaceae | Netherlands       | GU237927 GU237737 KT389563 GU237489 |
| B. diversispora      | CBS 102.80; IMI 331907; PD 79/61 | R | Phaseolus vulgaris       | Fabaceae    | Kenya             | KT389700 KT389725 KT389565 GU237492 |
| B. exigua var. coffeae| CBS 101194; PD 79/687; IMI 373349 | R | Coffea arabica           | Rubiaceae   | Brazil            | KT389729 GU237716 KT389564 GU237491 |
| B. exigua var. forsythiae | CBS 101197; PD 95/721 | R | Forsythia sp.             | Oleaceae    | Netherlands       | KT389731 GU237718 KT389570 GU237493 |
| B. exigua var. gilvescens | CBS 101213; PD 92/959 | R | Forsythia sp.             | Oleaceae    | Netherlands       | KT389732 GU237723 KT389571 GU237494 |
| B. exigua var. heteromorpha | CBS 443.94 | T | Nerium oleander           | Apocynaceae | Italy             | GU237935 GU237866 KT389573 GU237497 |
| B. exigua var. ilincolia | CBS 111096; PD 79/176 | T | Nerium oleander           | Apocynaceae | France            | GU237934 GU237717 KT389572 GU237496 |
| B. exigua var. opulii | CBS 114.28     | R       | Linum usitatissimum       | Linaceae    | Netherlands       | GU237937 GU237752         |
|                      | CBS 116.76; ATCC 32332; IMI 197074; PD 75/544 | R | Linum usitatissimum       | Linaceae    | Netherlands       | KT389738 GU237754 KT389574 KT387500 |
|                      | CBS 248.38     | R       | Nemophila insignis        | Hydrophyllaceae | Netherlands | KT389703 KT389486 KT389575 KT387501 |
| B. exigua var. populi | CGMCC 3.18354; LC 8117 | T | Viburnum opulus           | Caprifoliaceae | USA             | KY742199 KY742045 KY742133 KY742287 |
|                      | LC 8118        | R       | Viburnum opulus           | Caprifoliaceae | USA             | KY742200 KY742046 KY742134 KY742288 |
| B. exigua var. populi | CBS 100167; PD 93/217 | T | Populus (+) euramericanus | Salicaceae | Netherlands       | GU237939 GU237707         |
| B. exigua var. pseudollacicis | CBS 423.67 | T | Lathynus sp.               | Fabaceae    | Netherlands       | KT389704 KT389487 KT389576 KT389781 |
|                      | CBS 462.67     | T       | Laminum maculatum         | Lamiaceae   | Netherlands       | KT389705 KT389488         |
| B. exigua var. viburni | CBS 101207; PD 94/614 | T | Syringa vulgaris          | Oleaceae    | Netherlands       | GU237941 GU237721         |
| B. foetata           | CBS 100354; PD 83/448 | R | Viburnum opulus           | Caprifoliaceae | Netherlands | GU237944 GU237711 KT389577 GU237506 |
| B. hedericola        | CBS 109176; PD 94/1394 | R | Viburnum opulus           | Caprifoliaceae | Netherlands | GU237946 GU237742 KT389578 GU237508 |
|                      | CBS 367.91; PD 67/229 | R | Hedera helix              | Araliaceae   | Netherlands       | GU237949 GU237842 KT389579 GU237511 |
| B. ilicis            | CBS 569.79; PD 72/741; IMI 331909 | R | Syringa vulgaris          | Oleaceae    | Netherlands       | GU237936 GU237892         |
| B. lilacis           | CBS 588.67     | R       | Philadelphus sp.          | Saxifragaceae | Netherlands      | KT389709 KT389492         |
| Species                          | Strain number¹ | Status² | Host, substrate            | Host family          | Country   | GenBank accession numbers³ |
|---------------------------------|----------------|---------|---------------------------|----------------------|-----------|---------------------------|
|                                 |                |         |                           |                      |           | LSU | ITS | RPB2 | TUB   |
| **LC 5178**                     |                |         | Lonicera japonica         | Caprifoliaceae       | China     |     |     |      |      |
| **LC 8116**                     |                |         | Ocimum sp.                | Lamiaceae            | China     |     |     |      |      |
| B. lycopersici                  | CBS 378.67; PD 67/276 | R       | Lycopersicon esculentum   | Solanaceae           | Netherlands |     |     |      |      |
|                                 |                |         | Phaseolus vulgaris        | Fabecceae            | Guatemala  |     |     |      |      |
| B. noackiana                    | CBS 100353; PD 87/718 | R       | Phaseolus vulgaris        | Fabecceae            | Colombia   |     |     |      |      |
| B. sambuci-nigrae               | CBS 629.68; CECT 20048; IMI 331913; PD 67/735 | T       | Sambucus nigra            | Caprifoliaceae       | Netherlands |     |     |      |      |
| B. strasserii                   | CBS 126.93; PD 73/842 |         | Mentha sp.                | Lamiaceae            | Netherlands |     |     |      |      |
| B. telephii                     | CBS 760.73; PD 71/1616 | R       | Schedum telephium         | Crassulaceae         | Netherlands |     |     |      |      |
| B. trachelospermi               | CGMCC 3.18222; LC 3105 | T       | Trachelospermum jasminoides | Apocynaceae         | USA        |     |     |      |      |
| Brianssutoromyces eucalypti     | CBS 114879; CPC 362 | T       | Eucalyptus sp.            | Myrtaceae            | South Africa |     |     |      |      |
|                                 | CBS 114887; CPC 363 |         | Eucalyptus sp.            | Myrtaceae            | South Africa |     |     |      |      |
| Calophoma aquilegiicola         | CBS 107.31     |         | Aquilegia sp.             | Ranunculaceae        | —          |     |     |      |      |
| C. aquilegiicola                | CBS 107.96; PD 73/586 | R       | Aconitum pyramidal        | Ranunculaceae        | Netherlands |     |     |      |      |
| C. clematidis-rectae            | CBS 507.63; PD 07/03486747; MUCL 9574 | T       | Clematis sp.              | Ranunculaceae        | Netherlands |     |     |      |      |
| C. complanata                   | CBS 268.92; PD 75/3 |         | Angelica sylvestris       | Umbelliferae         | Netherlands |     |     |      |      |
|                                 | CBS 100311     |         | Heracleum sphondylum      | Umbelliferae         | Netherlands |     |     |      |      |
| C. glauci                       | CBS 112.96; PD 79/765 |         | Dicentra sp.              | Papaveraceae         | Netherlands |     |     |      |      |
|                                 | CBS 114.96; PD 94/888 |         | Chaetinomium majus        | Papaveraceae         | Netherlands |     |     |      |      |
| C. rosae                        | CGMCC 3.18347; LC 5169 | T       | Rosa sp.                  | Rosaceae             | China       |     |     |      |      |
|                                 | LC 8119        |         | Rosa sp.                  | Rosaceae             | China       |     |     |      |      |
| C. vodaki                       | CBS 173.53     | T       | Hepatica trioba           | Ranunculaceae        | Switzerland |     |     |      |      |
| Didymella acetosellae           | CBS 179.97     |         | Rumex hydrolapathum       | Polygonaceae         | Netherlands |     |     |      |      |
| D. aeria                        | CGMCC 3.18353; LC 7441 | T       | Air                       | China                | China       |     |     |      |      |
|                                 | LC 8120        |         | Air                       | China                | China       |     |     |      |      |
| D. aliena                       | CBS 379.93; PD 82/945 |         | Berberis sp.              | Berberidaceae        | Netherlands |     |     |      |      |

(continued on next page)
| Species        | Strain number | Status | Host, substrate | Host family | Country          | GenBank accession numbers |
|---------------|---------------|--------|-----------------|-------------|------------------|--------------------------|
| D. americana  | CBS 185.85; PD 80/1191 | R      | Zea mays        | Poaceae     | USA              | GU237990 FJ426972 KT389594 FJ427038 |
|               | CBS 568.97; ATCC 44494; PD 94/1544 |        | Glycine max     | Fabaceae    | USA              | GU237991 FJ426974 FJ427090 |
| LC 5157       |               |        | Sorghum bicolor | Poaceae     | China            | KY742608 KY742054 KY742139 KY742296 |
| D. anserina   | CBS 253.80    |        | —               | —           | Germany          | KT389715 KT389498 KT389595 KT389795 |
|               | CBS 285.29    |        | Calluna sp.     | Ericaceae   | UK               | KT389716 KT389499 KT389596 KT389796 |
|               | CBS 360.84    | R      | Potato flour    | —           | Netherlands      | GU237993 GU237839 GU238796 GU237551 |
|               | CBS 397.65    |        | Plastic         | —           | Germany          | KT389717 KT389500 KT389597 KT389797 |
| D. aquatica   | CGMCC 3.18349; LC 5555 | T      | Water           | —           | China            | KY742209 KY742055 KY742140 KY742297 |
|               | LC 5555       |        | Water           | —           | China            | KY742210 KY742056 KY742141 KY742298 |
| D. arachidicola | CBS 333.75; ATCC 28333; IMI 386092; PREM 44889 | T      | Arachis hypogaea | Fabaceae    | South Africa     | GU237996 GU237833 KT389598 GU237554 |
| D. aurea      | CBS 269.93; PD 78/1087 | T      | Medicago polymorpha | Fabaceae | New Zealand      | GU237999 GU237818 KT389599 GU237557 |
| D. bellidis   | CBS 714.85; PD 74/265 | R      | Bellis perennis | Asteraceae  | Netherlands      | GU238046 GU237904 KP330417 GU237586 |
|               | PD 94/886     |        | Bellis sp.      | Asteraceae  | Netherlands      | GU238047 GU237923 GU237587 GU237587 |
| D. boeremae   | CBS 109942; PD 84/402 | T      | Medicago liltorals cv. Harbinger | Fabaceae | Australia         | GU238048 FJ426982 KT389600 FJ427097 |
| D. calidophila | CBS 448.83    | T      | Soil            | Egypt       | Egypt            | GU238052 FJ427059 FJ427168 FJ427168 |
|               | PD 84/109     |        | Cucumis sativus | Cucurbitaceae | Netherlands | GU238053 FJ427060 FJ427169 FJ427169 |
| D. chenopodi  | CBS 128.93; PD 79/140 | R      | Chenopodium quinoa cv. Sajana | Chenopodiaceae | Peru          | GU238055 GU237775 KT389602 GU237591 |
| D. chloroguttulata | CGMCC 3.18351; LC 7435 | T      | Air             | —           | China            | KY742211 KY742057 KY742142 KY742299 |
|               | LC 8122       |        | Air             | —           | China            | KY742212 KY742058 KY742143 KY742300 |
| D. coffeae-arabicae | CBS 123380; PD 84/1013 | T      | Coffea arabica  | Rubiaceae   | Ethiopia         | GU238005 FJ426993 KT389603 FJ427104 |
|               | LC 8975       |        | Lagerstroemia indica | Lythraceae | Italy            | GU238213 KY742059 KY742144 KY742301 |
| D. curtisi    | CBS 251.92; PD 86/1145 | R      | Nerine sp.      | Amaryllidaceae | Netherlands | GU238013 FJ427038 — FJ427148 |
|               | PD 92/1140    |        | Sprekelia sp.   | Amaryllidaceae | Netherlands | GU238012 FJ427041 KT389604 FJ427151 |
| D. dactylidis | CBS 124513; PD 73/1414 | T      | Dactylis glomerata | Poaceae | USA             | GU238061 GU237786 — GU237599 |
| D. dimorpha   | CBS 346.82    | T      | Opuntia sp.     | Cactaceae   | Spain            | GU238068 GU237835 — GU237606 |
| D. ellipsosidea | CGMCC 3.18350; LC 7434 | T      | Air             | —           | China            | KY742214 KY742060 KY742145 KY742302 |
|               | LC 8123       |        | Air             | —           | China            | KY742215 KY742061 KY742146 KY742303 |
| D. eucalyptica | CBS 377.91; PD 79/210 | R      | Eucalyptus sp.  | Myrtaceae   | Australia        | GU238007 GU237846 KT389605 GU237562 |
| D. exigua     | CBS 183.55    | T      | Rumex anthurus  | Polygonaceae | France           | EUT54155 GU237794 EUT4850 GU237525 |
| D. gardeniae | CBS 626.68; IMI 108771 | T      | Gardenia jasminoides | Rubiaceae | India            | GU2387595 FJ427003 KT389606 FJ427114 |
| D. glomerata  | CBS 133.72    |        | Fresco in church| —           | Romania          | KT389718 FJ427004 — FJ427115 |
| Species                  | Strain number\(^1\) | Status\(^2\) | Host, substrate          | Host family     | Country          | GenBank accession numbers\(^3\) |
|-------------------------|----------------------|-------------|--------------------------|-----------------|------------------|---------------------------------|
| CBS 528.66; PD 63/590    | R                    | Chrysanthemum sp. | Asteraceae               | Netherlands     | EU754184 FJ427013 GU371781 FJ427124 |
| LC 4963                 |                      | Leymus chinensis | Poaceae                  | China           | KY744216 KY7442062 KY7442147 KY7442304 |
| LC 8124                 |                      | Faeces        |-host family              | China           | KY744217 KY7442063 KY7442148 KY7442305 |
| D. heteroderae          | CBS 109.92; PD 73/1405| T            | Unde fined food material | Netherlands     | Gu238002 FJ426983 KT389601 FJ427098 |
| LC 8125                 |                      | Hydrangea macrophylla | Saxifragaceae        | China           | KY744228 KY7442064 KY7442149 KY7442306 |
| D. ilicicola            | CGMCC 3.18355; LC 8126; LC 8127 | T            | Ilex chinensis | Aquifoliaceae   | KY744229 KY7442065 KY7442150 KY7442307 |
| LC 8127                 |                      | Ilex chinensis | Aquifoliaceae   | Italy           | KY744222 KY7442066 KY7442151 KY7442308 |
| D. infuscatispora       | CGMCC 3.18356; LC 8128 | T            | Chrysanthemum indicum   | Asteraceae      | KY744222 KY7442067 KY7442152 KY7442309 |
| LC 8129                 |                      | Chrysanthemum indicum | Asteraceae | China           | KY744222 KY7442068 — KY7442310 |
| D. tethalis             | CBS 103.25           | —            | —                        | —               | Gu238010 Gu237729 KT389607 Gu237564 |
| LC 8130                 |                      | Liquidambar styraciflu | Hamamelidaceae | Italy           | KY744223 KY7442069 KY7442153 KY7442311 |
| D. longicola            | CBS 124514; PD 80/1189 | T            | Opuntia sp.              | Cactaceae       | Gu238095 Gu237767 — KY742322 |
| D. macrophylla          | CGMCC 3.18357; LC 8131 | T            | Hydrangea macrophylla    | Saxifragaceae   | KY744224 KY7442070 KY7442154 KY7442312 |
| LC 8132                 |                      | Hydrangea macrophylla | Saxifragaceae   | Italy           | KY744225 KY7442071 KY7442155 KY7442313 |
| D. macrostoma           | CBS 223.69           | R            | Acer pseudoplatanus      | Aceraceae       | Gu238096 Gu237801 KT389608 Gu237623 |
| LC 247.38               |                      | Pinus nigra var. asiatica | Pinaceae | —               | KT389719 KT389501 — KT389798 |
| D. makrocephala         | CBS 482.95           | T            | Larix decidua            | Pinaceae        | Gu238099 Gu237869 KT389609 Gu237626 |
| CBS 529.66; PD 66/521    | R                    | Malus sylvestris | Rosaceae                | Netherlands     | Gu238098 Gu237885 — Gu237625 |
| LC 5203                 |                      | Soil          |-                        | —               | KY744226 KY7442072 KY7442156 KY7442314 |
| D. maydis               | CBS 588.69           | T            | Zea mays                  | Poaceae         | EU754192 FJ427086 Gu371782 FJ427190 |
| D. microchlamydiospora  | CBS 105.95           | T            | Eucalyptus sp.            | Myrtaceae       | Gu238104 FJ427028 KP330424 FJ427138 |
| D. molleriana           | CBS 229.79; LEV 7660  | R            | Digitalis purpurea       | Scrophulariaceae | Gu238067 Gu237802 KP330418 Gu237605 |
| CBS 100719; PD 90/835-1  |                      | Digitalis sp. | Scrophulariaceae         | Netherlands     | Gu238066 Gu237744 — Gu237604 |
| D. musae                | CBS 463.69           | R            | Mangifera indica         | Anacardiaceae   | Gu238011 FJ427026 — FJ427136 |
| D. negriana             | CBS 358.71           | R            | Vitis vinifera           | Vitaceae        | Gu238116 Gu237838 KT389601 Gu237635 |
| ICMP 10845; LC 5249     |                      | Vitis vinifera | Vitaceae                | —               | KY744227 KY7442073 — KY7442315 |
| D. nigricans            | CBS 444.81; PDDCC 6546 | T            | Actinidia chinsensis     | Actinidiaceae   | Gu238000 Gu237887 — Gu237558 |
| LC 8133                 |                      | Robinia pseudoacacia f. decaisneana | Fabaceae | Italy           | KY744228 KY7442074 KY7442157 KY7442316 |
| LC 8134                 |                      | Acer palmatum | Aceraceae                | Japan           | KY744229 KY7442075 KY7442158 KY7442317 |
| LC 8135                 |                      | Acer palmatum | Aceraceae                | Japan           | KY744230 KY7442076 KY7442159 KY7442318 |
| LC 8136                 |                      | Acer palmatum | Aceraceae                | Japan           | KY744231 KY7442077 KY7442160 KY7442319 |

(continued on next page)
| Species          | Strain number¹ | Status² | Host, substrate | Host family | Country        | GenBank accession numbers³ |
|------------------|----------------|---------|----------------|-------------|----------------|---------------------------|
| PD 77/919        |                |         |                |             |                |                           |
| Actinidia chinensis | Actinidiaceae | New Zealand | GU238001         | GU237915   | KT389611       | GU237559                 |
| D. ocimicola     | CGMCC 3.18358; LC 8137 | T       | Ocimum sp.     | Lamiaceae   | China          | KY742232                 |
|                  | LC 8138        |         | Ocimum sp.     | Lamiaceae   | China          | KY742233                 |
| D. pedeiae       | CBS 124517; PD 92612A | T       | Schefflera elegantissima | Araliaceae | Netherlands    | GU238127                 |
|                  |                |         |                |             |                | KY742078                 |
| D. pinodella     | CBS 318.90; PD 81/729 |         | Pisum sativum  | Fabaceae    | Netherlands    | GU238016                 |
|                  | CBS 531.66     |         | Trifolium pretense | Fabaceae    | USA            | FJ427051                 |
|                  | LC 8139        |         |                |             |                | FJ427161                 |
| D. pinodes       | CBS 525.77     | T       | Pisum sativum  | Fabaceae    | Belgium        | GU238023                 |
| D. pomorum       | CBS 285.76; ATCC 28241; IMI 176742; VKM F-1843 |         | Heracleum dissectum | Umbelliferae | Russia         | GU238025                 |
|                  | CBS 354.52     |         | Triticum spelta | Poaceae     | Switzerland    | KT389720                 |
|                  | CBS 388.80     |         | Triticum spelta | Poaceae     | South Africa   | KT389617                 |
|                  | CBS 539.66; ATCC 16791; IMI 122286; PD 64/914 | R       | Polygonatum tataricum | Polygonaceae | Netherlands    | GU238028                 |
|                  | LC 5185        |         | Gentiana straminea | Gentianaceae | China          | KY742235                 |
|                  | LC 6140        |         | Dendrobium fimbriatum | Orchidaceae | China          | KY742236                 |
| D. protuberans   | CBS 132.96; PD 93/853 |         | Rhinanthus major | Scrophulariaceae | Netherlands | GU237989                 |
|                  | CBS 377.93; PD 80/976 |         | Daucus carota  | Umbelliferae | Netherlands    | GU238014                 |
|                  | CBS 381.96; PD 71/706 | T       | Lycium halifolium | Solanaceae | Netherlands    | GU238029                 |
|                  | CBS 391.93; PD 80/87 |         | Spinacia oleracea | Chenopodiaceae | Netherlands | GU238015                 |
| D. pteridis      | CBS 379.96     | T       | Pteris sp.     | Pteridaceae  | Netherlands    | KT389722                 |
| D. rhei          | BRIP 5862; LC 5251 |         | Rheum rhaponticum | Polygonaceae | Australia      | KY742237                 |
|                  | CBS 109177; LEV 15165; PD 2000/9941 | R       | Rheum rhaponticum | Polygonaceae | New Zealand    | GU238139                 |
| D. rumicicola    | CBS 683.79; LEV 15094 | T       | Rumex obtusifolius | Polygonaceae | New Zealand    | KT389721                 |
| D. sanca         | CBS 281.83     | T       | Allianthus altissima | Simaroubaceae | South Africa   | GU238030                 |
| D. segeticina    | CGMCC 3.17498; LC 1636 | T       | Cirsium segetum | Asteraceae  | China          | KP330455                 |
|                  | CGMCC 3.17498; LC 1635 |         | Cirsium segetum | Asteraceae  | China          | KP330454                 |
|                  | LC 1633        |         | Cirsium segetum | Asteraceae  | China          | KP330453                 |
|                  | LC 1634        |         | Cirsium segetum | Asteraceae  | China          | KP330452                 |
|                  | LC 8141        |         | Camellia sasanqua | Theaceae    | Japan          | KY742238                 |
| D. senecionicola | CBS 160.78; LEV 11451 | R       | Senecio jacobaea | Asteraceae  | New Zealand    | GU238143                 |
| D. sinensis      | CGMCC 3.18348; LC 5210 | T       | Cerasus pseudocerasus | Rosaceae    | China          | KY742239                 |
|                  | LC 5246        |         | Urticaceae     | Urticaceae  | China          | KY742420                 |
|                  | LC 8142        |         | Dendrobium officinale | Orchidaceae | China          | KY742421                 |
| Species                  | Strain number | Status | Host, substrate | Host family | Country | GenBank accession numbers |
|-------------------------|---------------|--------|-----------------|-------------|---------|--------------------------|
| **D. subglomerata**     | CBS 110.92; PD 76/1010 | R      | Triticum sp.    | Poaceae     | USA     | KY742302 FY427080 KT389626 FY427186 |
| **D. subherbarum**      | CBS 249.92; PD 79/1088 | T      | Zea mays       | Poaceae     | Canada   | KY742314 KY237808 — KY237659 |
| **D. suiyangensis**     | LC 8143       | D. subherbarum | CBS 250.92; DAOM 171914; PD 92/371 | Solanaceae | Peru     | GU238145 GU237809 — GU237659 |
|                         | D. subherbarum |       | Solanum sp. | Solanaceae | Peru     | KY742318 |
| **D. viburnicola**      | CBS 523.73; PD 69/800 | R      | Viburnum cassioide | Caprifoliaceae | Netherlands | GU238155 GU237879 KP303040 GU237667 |
| **Endocoryneum festucae** | MFLUCC 14-0241 | T      | Festuca sp. | Poaceae | Italy     | KU848183 — — — |
|                         | MFLUCC 14-0461 | T      | Tamarix sp. | Tamaricinaceae | Italy     | KU848203 — — — |
| **Epicoccum brasiliense** | CBS 120105 | T      | Amaranthus sp. | Amaranthaceae | Brazil     | GU238049 GU237780 KT389627 GU237588 |
| **E. camelliae**        | CGMCC 3.18343; LC 4858 | T      | Camellia sinensis | Theaceae | China     | KY742246 KY742092 KY42171 KY742334 |
|                         | LC 4862       | T      | Camellia sinensis | Theaceae | China     | KY742246 KY742092 KY42171 KY742334 |
| **E. dactyli**          | CGMCC 3.18359; LC 8145 | T      | Dendrobium fimbriatum | Orchidaceae | China     | KY742246 KY742092 KY42171 KY742334 |
| **E. draconic**         | CBS 186.83; PD 82/47 | R      | Dracaena sp.   | Agavaceae | Rwanda    | GU238070 GU237795 KT389628 GU237607 |
| **E. duchesneae**       | CGMCC 3.18345; LC 5139 | T      | Duchesnea indica | Rosaceae | China     | KY742249 KY742095 — KY742337 |
|                         | LC 8147       | T      | Duchesnea indica | Rosaceae | China     | KY742250 KY742096 — KY742338 |
| **E. henningsii**       | CBS 104.80; PD 74/1017 | R      | Acacia mearnsii | Fabaceae | Kenya     | GU238081 GU237731 KT389629 GU237612 |
| **E. hordei**           | CGMCC 3.18360; LC 8148 | T      | Hordeum vulgare | Poaceae | Australia | KY742251 KY742097 — KY742339 |
|                         | LC 8149       | T      | Hordeum vulgare | Poaceae | Australia | KY742252 KY742098 — KY742340 |
| **E. ilicatum**         | CBS 105.80; PD 75/908 | T      | Solanum sp. | Solanaceae | Peru     | GU238084 GU237732 KT389630 GU237615 |
| **E. italicum**         | CGMCC 3.18361; LC 8150 | T      | Acca sellowiana | Myricaceae | Italy     | KY742253 KY742099 KY42172 KY742341 |
|                         | LC 8151       | T      | Acca sellowiana | Myricaceae | Italy     | KY742255 KY42170 KY42173 KY742342 |
| **E. latisaccum**       | CGMCC 3.18346; LC 5158 | T      | Sorghum bicolor | Poaceae | China     | KY742255 KY742101 KY42174 KY742343 |
|                         | LC 4859       | T      | Camellia sinensis | Theaceae | China     | KY742256 KY742102 KY42175 KY742344 |
| **E. layuense**         | CGMCC 3.18362; LC 8155 | T      | Perilla sp. | Lamiaceae | China     | KY742261 KY742107 — KY742349 |
| **E. layuense**         | LC 8156       | T      | Perilla sp. | Lamiaceae | China     | KY742262 KY742108 — KY742350 |

**Continued on next page**
| Species            | Strain number | Status | Host, substrate | Host family | Country | GenBank accession numbers |
|--------------------|---------------|--------|----------------|-------------|---------|--------------------------|
| *E. nigrum*        | CBS 125.82; IMI 331914; CECT 20044 | T      | Human toenail | Poaceae     | Netherlands | GU237974 FJ426995 KT389631 FJ427106 |
| E. nigrum          | CBS 173.73; ATCC 24428; IMI 164070   | T      | Dactylis glomerata | Poaceae | USA | GU237975 FJ426996 KT389632 FJ427107 |
| LC 5180            |              |        | Lonicerajaponica | Caprifoliaceae | China | KY744263 KY742109 KY742178 KY742351 |
| LC 8157            |              |        | Ocimusp | Lamiaceae | China | KY742264 KY742110 KY742179 KY742352 |
| LC 8158            |              |        | Poa annua | Poaceae | USA | KY742265 KY742111 KY742180 KY742353 |
| LC 8159            |              |        | Poa annua | Poaceae | USA | KY742266 KY742112 KY742181 KY742354 |
| *E. pimprinum*     | CBS 246.60; ATCC 22237; ATCC 16652; IMI 81601 | T      | Soil | Poaceae | India | GU237976 FJ427049 — FJ427159 |
| E. pimprinum       | PD 77/1028   |        | Soil | Poaceae | New Zealand | GU238132 GU378888 KT389634 GU237647 |
| *E. plurivorum*    | CBS 558.81; PDDCC 6873 | T      | Setaria sp. | Poaceae | New Zealand | GU238132 GU378888 KT389634 GU237647 |
| *E. poae*          | CGMCC 3.18363; LC 8160 | T      | Poa annua | Poaceae | USA | KY742267 KY742113 KY742182 KY742355 |
| LC 8161            |              |        | Poa annua | Poaceae | USA | KY742268 KY742114 KY742183 KY742356 |
| LC 8162            |              |        | Poa annua | Poaceae | USA | KY742269 KY742115 KY742184 KY742357 |
| *E. sorghinum*     | CBS 179.80; PD 76/1018 | T      | Sorghum vulgare | Poaceae | Puerto Rico | GU237979 FJ427067 KT389635 FJ427173 |
| E. sorghinum       | CBS 627.68; PD 66/926 | T      | Citrus sp. | Rutaceae | France | GU237979 FJ427072 KT389636 FJ427178 |
| LC 4860            |              |        | Camellia sinensis | Theaceae | China | KY742270 KY742116 KY742185 KY742358 |
| *E. viticis*       | BRIP 29294; LC 5257 | T      | Andropogon gayanus | Poaceae | Australia | KY742271 KY742117 — KY742359 |
|                   | CGMCC 3.18344; LC 5126 | T      | Vex negundo | Verbenaceae | China | KY742272 KY742118 KY742186 KY742360 |
| Heterophoma adonis | CBS 114309; UPSC 2982 | T      | Adonis vernalis | Ranunculaceae | Sweden | KT389724 KT389506 KT389637 KT389803 |
| H. dictamnicola    | CBS 507.91; PD 74/148 | T      | Dictamnus albus | Rutaceae | Netherlands | GU238065 GU378777 KT389638 GU237603 |
| H. novae-verbaciscola | CBS 127.93; PD 92/347 | T      | Verbascum densiflorum | Scrophulariaceae | Netherlands | GU238120 GU237774 — — |
| H. poolensis       | CBS 113.20; PD 92/774 | T      | — | — | — |
| H. poolensis       | CBS 116.93; PD 71/884 | T      | Antirhumin majus | Scrophulariaceae | Netherlands | GU238134 GU237755 — — |
| H. sylvatica       | CBS 874.97; PD 93/764 | T      | Melampyrum pratense | Scrophulariaceae | Netherlands | GU238146 GU237907 — — |
| *H. verbascical*   | CGMCC 3.18364; LC 8163 | T      | Verbascum thapsus | Scrophulariaceae | China | KY744227 KY742119 KY742187 KY742361 |
| H. verbascical      | LC 8164 | T      | Verbascum thapsus | Scrophulariaceae | China | KY744227 KY742120 KY742188 KY742362 |
| Leptosphaeria concidea | CBS 616.75; ATCC 32813; IMI 199777; PD 74/56 | T      | Lunaria annua | Cruciferae | Netherlands | JF740279 JF740201 KT389639 KT389804 |
| Leptosphaeria dolotum | CBS 505.75 | T      | Urtica dioica | Urticaceae | Netherlands | GQ387576 JF740205 KT389640 JF740144 |
| Leptosphaerulina americana | CBS 213.55 | T      | Trifolium pratense | Fabaceae | USA | GU237981 GU237799 KT389641 GU237539 |
| L. arachidicola    | CBS 275.59; ATCC 13446 | T      | Arachis hypogaea | Fabaceae | Taiwan, China | GU237983 GU237820 — GU237543 |
| L. australis       | CBS 317.83 | T      | Eugenia aromatica | Myrtaceae | Indonesia | EU754166 GU237829 GU371790 GU237540 |
| L. trifoli         | CBS 235.58 | T      | Trifolium sp. | Fabaceae | Netherlands | GU237982 GU237806 — GU237542 |
| Macroventuria anomochaeta | CBS 502.72 | T      | Medicago sativa | Fabaceae | South Africa | GU237985 GU237873 — GU237545 |
| Species             | Strain number | Status | Host, substrate       | Host family | Country         | GenBank accession numbers |
|---------------------|---------------|--------|-----------------------|-------------|-----------------|--------------------------|
|                     |               |        |                       |             |                 | LSU | ITS | RPB2 | TUB |
| M. wentii           | CBS 525.71    | T  Decayed canvas | South Africa | GU237884 | GU237881 | GU456346 | GU237544 |
| Neoascocytta argentina | CBS 526.71  | T  Plant litter | USA | GU237896 | GU237884 | KT389642 | KT237546 |
|                     | CBS 112524    | T  Triticum aestivum | Poaceae | Argentina | KT389742 | KT389524 | — | KT389622 |
|                     | CBS 247.79    |        | Poaceae | Austria | KT389725 | KT389507 | — | KT389505 |
|                     | CBS 297.89    | T  Lollum perenne | Poaceae | Germany | KT389726 | KT389508 | KT389644 | KT389806 |
|                     | CBS 758.97    |        | Hay | Norway | KT389727 | KT389509 | — | KT389807 |
| Neoas. europaea      | CBS 819.84    |        | Hordeum vulgare | Poaceae | Germany | KT389728 | KT389510 | KT389845 | KT389808 |
|                     | CBS 820.84    | T  Hordeum vulgare | Poaceae | Germany | KT389729 | KT389511 | KT389646 | KT389809 |
| Neoas. exitialis     | CBS 118.40    |        | — | — | KT389732 | KT389514 | KT389647 | KT389812 |
|                     | CBS 389.86    |        | Triticum aestivum | Poaceae | Switzerland | KT389733 | KT389515 | KT389648 | KT389813 |
|                     | CBS 811.84    |        | Secale cereale | Poaceae | Germany | KT389734 | KT389516 | — | KT389814 |
|                     | CBS 812.84    |        | Hordeum vulgare | Poaceae | Germany | KT389735 | KT389517 | — | KT389815 |
|                     | CBS 110124    |        | Triticum sp. | Poaceae | Netherlands | KT389730 | KT389512 | — | KT389810 |
|                     | CBS 113693;  |        | Allium sp. | Liliaceae | Sweden | KT389731 | KT389513 | — | KT389811 |
|                     | UPSC 1929     |        | — | — | KT389732 | KT389514 | KT389647 | KT389812 |
| Neoas. graminicola   | CBS 301.69    |        | Lolium multiflorum | Poaceae | Germany | KT389737 | KT389519 | KT389650 | KT389817 |
|                     | CBS 447.82    |        | Triticum aestivum | Poaceae | Germany | KT389738 | KT389520 | — | KT389818 |
|                     | CBS 586.79    |        | Hordeum vulgare | Poaceae | Belgium | KT389739 | KT389521 | — | KT389819 |
|                     | CBS 815.84    |        | Hordeum vulgare | Poaceae | Germany | KT389740 | KT389522 | — | KT389820 |
|                     | CBS 816.84    |        | Hordeum vulgare | Poaceae | Germany | KT389741 | KT389523 | KT389651 | KT389821 |
|                     | CBS 102789    | R  Lollum perenne | Poaceae | New Zealand | KT389736 | KT389518 | KT389649 | KT389816 |
| Neoas. paspali       | CBS 560.81;  |        | Paspalum dilatatum | Poaceae | New Zealand | GU238124 | FJ427048 | KP330426 | FJ427158 |
|                     | PD 92/1569    |        | — | — | KT389732 | KT389514 | KT389647 | KT389812 |
| Neoas. soli          | CGMCC 3.18365; LC 8165 | T  Soil | China | KI742275 | KI742121 | — | KI742363 |
|                     | LC 8166       |        | Soil | China | KI742276 | KI742122 | — | KI742364 |
| Neoas. triticicola   | CBS 544.74    | T  Triticum aestivum | Poaceae | South Africa | EUI754134 | GU237887 | KT3898652 | GU237548 |
| Neodidymellopsis achlydis | CBS 256.77 | T  Achlys triphylla | Berberidaceae | Canada | KT389749 | KT389531 | — | KT389829 |
| Neod. cannabis       | CBS 121.75;  | T  Urtica dioica | Urticaceae | Netherlands | GU237972 | GU237761 | — | GU237535 |
|                     | ATCC 32164; IMI 194767; PD 73/584 |        | — | — | GU237961 | GU237804 | KP330403 | GU237523 |
|                     | CBS 234.37    |        | Urtica dioica | Urticaceae | Netherlands | KT389746 | KT389528 | — | KT389826 |
|                     | CBS 591.67    |        | Moraceae | — | KT389747 | KT389529 | — | KT389827 |
|                     | CBS 629.76    |        | Packing material | Urticaceae | Netherlands | KT389747 | KT389529 | — | KT389827 |
| Neod. longicolla     | CBS 382.96    | T  Soil in desert | Israel | KT389750 | KT389532 | — | KT389830 |
| Neod. polemonii      | CBS 375.67    |        | Polemonium caeruleum | Polemoniaceae | Netherlands | KT389748 | KT389530 | — | KT389828 |

(continued on next page)
| Species               | Strain number | Status | Host, substrate | Host family | Country | GenBank accession numbers |
|----------------------|---------------|--------|----------------|-------------|---------|--------------------------|
|                      |               |        |                |             |         | LSU          | ITS | RPB | TUB |
| Neod. xanthina       | CBS 168.70    |        | Delphinium sp. | Ranunculaceae | Netherlands | KT389751 | KT389533 | —    | KT389831 |
|                      | CBS 383.68    | T      | Delphinium sp. | Ranunculaceae | Netherlands | GU238157 | GU237855 | KP330431 | GU237668 |
| Neomicrosphaeropsis italica | MFLUCC 15-0485; ICMP 21253 | T | Tamarix sp. | Tamaricaceae | Italy | KT729864 | KT900318 | KT64820 | —    |
|                      | MFLUCC 15-0484 | T      | Tamarix sp. | Tamaricaceae | Italy | KT729865 | KT900319 | KJ695539 | KX453298 |
| Neom. novorossica    | MFLUCC 14-0578; ICMP 20751 | T | Tamarix ramosissima | Tamaricaceae | Russia | KX196710 | KX198709 | —    | —    |
| Neom. rossica        | MFLUCC 14-0586; ICMP 20753 | T | Tamarix ramosissima | Tamaricaceae | Russia | KUT729655 | KUT52192 | —    | —    |
| Neom. tamaricola     | MFLUCC 14-0443; ICMP 20708 | T | Tamarix gallica | Tamaricaceae | Italy | KT729651 | KT900322 | —    | —    |
|                      | MFLUCC 14-0439; ICMP 20743 | T | Tamarix gallica | Tamaricaceae | Italy | KJ729658 | KJ900323 | —    | —    |
| Nothophoma anigozanthi | CBS 381.91; PD 79/1110 | T | Anigozanthus maugleisi | Haemodoraceae | Netherlands | GU238039 | GU237852 | KT389655 | GU237580 |
| No. arachidis-hypogaeeae | CBS 125.93; PD 77/1029 | R | Arachis hypogaea | Fabaceae | India | GU238043 | GU237771 | KT389656 | GU237583 |
| No. gossypicola      | CBS 377.67    |        | Gossypium sp. | Malvaceae | USA | GU238079 | GU237845 | KT389658 | GU237661 |
| No. infossa          | CBS 123395    | T      | Fraxinus pennsylvanica | Oleaceae | Argentina | GU238089 | FJ427025 | KT389659 | FJ427135 |
| No. quercina         | CBS 633.92; ATCC 36786; VKM MF-325 |        | Microsphaera albolitidis from Quercus sp. | — | Ukraine | EU754127 | GU379900 | KT389657 | GU237609 |
| Paraboeremia adianticola | CBS 187.83; PD 62/128 |        | Polystichum adiantiforme | Dryopteridaceae | USA | GU238035 | GU237796 | KP330401 | GU237576 |
| Pa. camellae         | CGMCC 3.18106; LC 4852 | T | Camellia sp. | Theaceae | China | KX829042 | KX829034 | KX829050 | KX829058 |
|                      | CGMCC 3.18107; LC 6253 | T | Camellia sp. | Theaceae | China | KX829043 | KX829035 | KX829051 | KX829059 |
| Pa. itiseae          | CGMCC 3.18108; LC 6254 | T | Camellia sp. | Theaceae | China | KX829044 | KX829036 | KX829052 | KX829060 |
|                      | CGMCC 3.18109; LC 5028 | T | Litsea sp. | Lauraceae | China | KX829037 | KX829029 | KX829045 | KX829053 |
| Pa. oligotrophica    | CGMCC 3.18110; LC 5030 | T | Litsea sp. | Lauraceae | China | KX829038 | KX829030 | KX829046 | KX829054 |
|                      | CGMCC 3.18111; LC 6250 | T | Carbonatite | Carbonatitae | China | KX829039 | KX829031 | KX829047 | KX829055 |
| Pa. putaminum        | CBS 130.69; CECT 20054; IMI 331916 | R | Malus sylvestris | Rosaceae | Denmark | GU238138 | GU237777 | — | GU237652 |
|                      | CBS 372.91; PD 73/960 | R | Ulmus sp. | Ulmaceae | Netherlands | GU238137 | GU237843 | — | GU237651 |
| Pa. selaginellae     | CBS 122.93; PD 77/1049 | T | Selaginella sp. | Selaginellaceae | Netherlands | GU238142 | GU237762 | — | GU237656 |
| Phoma herbarum       | CBS 134.96; PD 64/676 | T | Delphinium sp. | Ranunculaceae | Netherlands | KT389753 | KT389535 | KT389661 | KT389834 |
|                      | CBS 274.37    | R      | Picea excelsa | Pinaceae | UK | KT389754 | KT389537 | KT389662 | KT389835 |
|                      | CBS 304.51    |        | Achillea millefolium | Asteraceae | Switzerland | KT389755 | KT389538 | KT389658 | KT389836 |
| CBS 377.92; IMI 213845 |        |        | Human leg | — | Netherlands | KT389756 | KT389536 | KT389663 | KT389837 |
| Species                  | Strain number | Status | Host, substrate       | Host family | Country    | GenBank accession numbers |
|-------------------------|---------------|--------|-----------------------|-------------|------------|--------------------------|
| **Phomatomides aubrietiae** | CBS 383.67; PD 65/223 | R      | *Rosa multiflora cv. Cathayensis* | Rosaceae    | Netherlands | EU754186 FJ427022 FK427133 |
| CBS 627.97; PD 70/714    | T              |        | *Aubrietia sp.*         |             |            |                          |
| **Phomatom. nebulosa**   | CBS 117.93; PD 83/90 |        | *Mercurialis perennis*   | Euphorbiaceae | Netherlands | GU238114 UMM7757 PK330425 |
| CBS 740.96              |                |        | *Armoracia rusticana*    |             |            |                          |
| CBS 100191              |                |        | *Thlaspi arvense*        |             |            |                          |
| **S. ajacis**           | CBS 177.93; PD 90/115 | T      | *Delphinium sp.*         |             | Nepal       | GU238168 UMM7791 CK330476 |
| **S. andigena**         | CBS 101.80; PD 75/909; IMI 386090 | R      | *Solunam sp.*            |             | China       | GU238169 UMM7714 GU237674 |
| CBS 269.80; PD 75/914    | T              |        | *Solunam sp.*            |             |            |                          |
| **S. artemisiicola**    | CBS 102636; PD 73/1409 | R      | *Artemis dracunculus*    | Asteraceae  | France      | GU238172 UMM7728 CK330476 |
| S. astragal           | CBS 178.25; MUC 9915 | R      | *Astragulas sp.*         | Fabaceae    |            |                          |
| **S. bomiensis**        | CGMCC 3.18366; LC 8167 | T      | *Boraginaceae*           | Boraginaceae | China       | KY742277 KY742123 KY742189 |
| LC 8168                 |                |        | *Boraginaceae*           | Boraginaceae | China       | KY742278 KY742124 KY742190 |
| **S. caricae**          | CBS 248.90     |        | *Carica papaya*          | Caricaceae   | Chile       | GU238175 GU237807 GU237680 |
| CBS 282.76              |                |        | *Brassica sp.*           |             |            |                          |
| **S. chrysanthemi**     | CBS 500.63; MUC 8090 | R      | *Chrysanthemum indicum*  | Asteraceae   | Germany     | GU238190 UMM7787 GU237695 |
| CBS 137.96; PD 84/75     |                |        | *Chrysanthemum indicum*  | Asteraceae   |            |                          |
| **S. crystalliniformis**| CBS 713.85; ATCC 76207; PD 83/826 | T      | *Lycopersicon esculentum* | Solanaceae   | Colombia    | GU238187 UMM7703 KT330476 |
| CBS 133.96; PD 79/127    | T              |        | *Cucumis sp.*            | Cucurbitaceae | New Zealand | GU238181 UMM7780 KT330476 |
| **S. dennisi**          | CBS 631.68; PD 68/147 | T      | *Solidago floribunda*    | Asteraceae   | Netherlands | GU238182 UMM7789 KT330476 |
| **S. dorenboschi**      | CBS 426.90; IMI 386093; PD 86/551 | T      | *Physogetia virginiana*  | Lamiaeaceae  | Netherlands | GU238185 UMM7782 KT330476 |
| **S. helianthi**        | CBS 200.87     | T      | *Helianthus annuus*      | Asteraceae   | Italy       | KT330476 KT330475 KT330476 |
| **S. heliospids**       | CBS 109182; PD 74/231 | R      | *Heliospsis patula*      | Asteraceae   | Netherlands | GU238186 UMM7747 KT330476 |
| **S. hortensis**        | CBS 104.42     | R      | —                       | Asteraceae   | Netherlands | GU238198 UMM7730 KT330476 |
| **S. inoxydabilis**     | CBS 572.85; PD 79/259 | R      | *Phaseolus vulgaris*     | Fabaceae     | Netherlands | GU238199 UMM7732 KT330476 |
| CBS 425.90; PD 81/520    | T              |        | *Chrysanthemum partheni* | Asteraceae   | Netherlands | GU238188 UMM7781 KT330476 |

(continued on next page)
| Species                  | Strain number1 | Status 2 | Host, substrate               | Host family    | Country | GenBank accession numbers 3 |
|--------------------------|----------------|----------|-------------------------------|----------------|---------|----------------------------|
| S. loticola              | CBS 562.81; PDDCC 6884 | T        | *Lotus pedunculatus*          | Fabaceae       | New Zealand | GU238192 GU237890 KT389684 GU237697 |
| S. lupini                | CBS 101494; PD 98/5247 | T        | *Lupinus albus*               | Fabaceae       | UK       | GU238194 GU237724 KT389685 GU237699 |
| S. oculo-hominis         | CBS 634.92; IMI 193307 | T        | Human corneal ulcer           |                | USA      | GU238196 GU237901 KT389686 GU237701 |
| S. papillatus            | CGMCC 3.18367; LC 8169 | T        | *Rumex nepalensis*            | Polygonaceae   | China     | KY742279 KY742125 KY742191 KY742367 |
|                          | LC 8170           |          | *Rumex nepalensis*            | Polygonaceae   | China     | KY742280 KY742126 KY742192 KY742368 |
|                          | LC 8171           |          | *Boraginaceae*                |                |          | KY742281 KY742127 KY742193 KY742369 |
| S. rudbeckiae            | CBS 109180; PD 79/175 | R        | *Rudbeckia bicolor*           | Asteraceae     | Netherlands | GU238197 GU237745 — GU237702 |
| S. tanaceti              | CBS 131484        | T        | *Tanacetum cinerariifolium*    | Asteraceae     | Australia | JQ897461 NR_111724 — JQ897496 |
| S. trachelii             | CBS 379.91; PD 77/875 | R        | *Campanula isophylla*         | Campanulaceae  | Netherlands | GU238173 GU237850 KT389687 GU237678 |
|                          | CBS 384.68        | R        | *Campanula isophylla*         | Campanulaceae  | Sweden    | GU238174 GU237856 — GU237679 |
| S. valerianellae         | CBS 273.92; PD 82/43 | T        | *Valerianella locusta*         | Caprifoliaceae | Netherlands | GU238200 GU237819 — GU237705 |
|                          | CBS 329.67; PD 66/302 | T        | *Valerianella locusta var. oleracea* | Caprifoliaceae | Netherlands | GU238201 GU237832 — GU237706 |
| Xenodidymella applanata  | CBS 195.36       | T        | *Rubus idaeus*                | Rosaceae       | Netherlands | KT389764 KT389548 — KT389852 |
| X. asphodeli             | CBS 205.63       | T        | *Rubus idaeus*                | Rosaceae       | Netherlands | GU237998 GU237798 KP330402 GU237556 |
|                          | CBS 115577       | T        | *Rubus idaeus*                | Rosaceae       | Sweden    | KT389762 KT389546 KT389688 KT389650 |
| X. catariae              | CBS 375.62       | T        | *Asphodelus albus*            | Asphodelaceae  | France     | KT389765 KT389549 KT389689 — |
|                          | CBS 499.72       | T        | *Asphodelus ramosus*          | Asphodelaceae  | Italy      | KT389766 KT389550 — KT389653 |
|                          | CBS 102635; PD 77/1131 | R       | *Nepeta cataria*              | Lamiaceae      | Netherlands | GU237962 GU237727 KP330404 GU237524 |
|                          | CBS 220.86; PD 71/1030 | R       | *Franseria sp.*               | Asteraceae     | USA        | GU237086 GU237800 KP330422 GU237617 |

1 ATCC: American Type Culture Collection, Virginia, U.S.A.; BRIP: Plant Pathology Herbarium, Department of Employment, Economic, Development and Innovation, Queensland, Australia; CBS: Westerdijk Fungal Biodiversity Institute (formerly CBS-KNAW), Utrecht, The Netherlands; CECT: Colección Española de Cultivos Tipo, Valencia University, Spain; CGMCC: China General Microbiological Culture Collection, Beijing, China; CIP: Culture collection of Pedro Crous, housed at CBS; DAFM: Canadian Collection of Fungal Cultures, Ottawa, Canada; DSM: Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH, Braunschweig, Germany; FMR, Facultat de Medicina, Universitat Rovira i Virgili, Reus, Spain; ICMP: International Collection of Microorganisms from Plants, Auckland, New Zealand; IMI: International Mycological Institute, CAB-I-Bioscience, Egham, Bukeham Lane, U.K.; LC: Corresponding author’s personal collection deposited in laboratory, housed at CAS, China; LEV: Plant Health and Diagnostic Station, Auckland, New Zealand; MFLUCC: Mae Fah Luang University Culture Collection, Chiang Rai, Thailand; MUCM: Mycotheque de l’Universite catholique de Louvain, Louvain-la-Neuve, Belgium; PD: Plant Protection Service, Wageningen, the Netherlands; PDDCC: Plant Diseases Division Culture Collection, Auckland, New Zealand; PREM: National Collection of Fungi: Culture Collection, Pretoria, South Africa; UAMH: University of Alberta Microfungus Collection and Herbarium, Canada; UPSC: Uppsala University Culture Collection, Sweden; UTHSC: Fungus Testing Laboratory at the University of Texas Health Science Center, San Antonio, Texas, USA; VKM: All-Russian Collection of Microorganisms, Pushchino, Russia.

2 T: ex-type strain; R: representative strain.

3 ITS: internal transcribed spacer regions 1 & 2 including 5.8S nrDNA gene; LSU: 28S large subunit of the nrRNA gene; RPB2: RNA polymerase II second subunit; TUB: ß-tubulin.
RESULTS

Phylogeny

A multi-locus phylogeny, based on four loci, was used to infer the relationships among species in Didymellaceae (Fig. 1). The resulting concatenated aligned dataset comprised 360 ingroup isolates belonging to 194 taxa and consisted of 2460 characters (964 for LSU, 531 for ITS, 599 for rpb2 and 354 for tub2, including alignment gaps), of which 265 are conserved and 901 are phylogenetically informative (173 for LSU, 230 for ITS, 310 for rpb2 and 188 for tub2). The trees generated from ML and Bayesian analyses of the individual loci (data not shown) and the combined dataset showed essentially congruent topologies. The ML tree based on the combined dataset was presented, with bootstrap support values (MLBS) and Bayesian posterior probabilities (BPP) indicated for well-supported clades in Fig. 1. The LSU sequences were the least successful in resolving species with only 59 out of 194 taxa resolved (30%), followed by ITS with 104 out of 194 taxa (54%), and tub2 (90%) and rpb2 (92%) which proved to be more suitable for the resolution of species.

A total of 194 ingroup taxa formed a clade (BPP = 1; MLBS = 100%) representing the Didymellaceae, which include 19 monophyletic generic clades. Seventeen genera previously recognised, namely Allophoma (BPP = 1; MLBS = 100%), Ascochyta (BPP = 1; MLBS = 87%), Boeremia (BPP = 1; MLBS = 100%), Calophoma (BPP = 1; MLBS = 90%), Didymella (BPP = 0.97; MLBS = 60%), Epicoccum (BPP = 1; MLBS = 99%), Heterophoma (BPP = 1; MLBS = 99%), Leptosphaerulina (BPP = 1; MLBS = 100%), Macroventuria (BPP = 1; MLBS = 100%), Neoascocychta (BPP = 1; MLBS = 80%), Neodidymellliopsis (BPP = 1; MLBS = 100%), Notophoma (BPP = 1; MLBS = 76%), Paraboeremia (BPP = 1; MLBS = 77%), Phoma (BPP = 1; MLBS = 100%), Phomatoses (BPP = 1; MLBS = 100%), Sta- gonosporopsis (BPP = 1; MLBS = 93%) and Xenodidymella (BPP = 1; MLBS = 96%), and two genera recently added in this family, namely Briansuttonomyces (BPP = 1; MLBS = 100%) and Neomicrosphaeropsis (BPP = 1; MLBS = 97%) were highly supported as independent groups.

Host specificity analysis

The heatmap was plotted to reveal the distribution of Didymellaceae species in various host families. The colour-coding columns indicate the number of species in each fungal genus that are associated with a particular host family. A darker colour indicates more fungal species related to the host family. In the present study, all the plant-associated species are linked to 70 different host families in total, of which Asteraceae, Fabaceae, Poaceae, Ranunculaceae, Rosaceae and Solanaceae are the most common hosts for Didymellaceae. Most of the Didymellaceae genera have a wide host range, while Ascochyta, Neo- ascocychta and Neomicrosphaeropsis showed relatively high host specificity within Fabaceae, Poaceae and Tamaricaceae, respectively (Fig. 2).

Taxonomy

As a result of morphological comparisons and multi-locus sequence analysis of 360 strains, including 108 strains studied in the present paper and 252 reference strains, 194 taxa are recognised in 19 different genera of Didymellaceae. Recognised clades of novel taxa are described and illustrated, and two new combinations are proposed below. One species proved to be sterile in culture, and therefore is described based on DNA sequence data, following the approach of Gomes et al. (2013) and Lombard et al. (2016). Novel taxa are arranged in alphabetical order by genus and species.

Allophoma Q. Chen & L. Cai, Stud. Mycol. 82: 162. 2015.

Allophoma oligotrophica Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818956. Fig. 3.

Etymology: Oligotrophica, referring to the oligotrophic substrate of the fungus.

Conidiotnata pycnidial, solitary, globose to subglobose, brown, glabrous, semi-immersed or immersed, 150 – 440(-590) × 145 – 420 μm. Ostioles single, slightly papillate. Pycnidal wall pseudoparenchymatous, composed of oblong to isodiametric cells, 3 – 5 layers, 11 – 19.5 μm thick. Conidigenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 4.5 – 7 × 3.5 – 6.5 μm. Conidia oblong to cylindrical, smooth- and thin-walled, hyaline, aseptate, 3.4 – 4.5 × 1.5 – 2.5 μm, with 2 distinct pale green polar guttules. Conidia matrix whitish.

Culture characteristics: Colonies on OA, 45 – 50 mm diam after 7 d, margin regular, covered by white floccose aerial mycelia, white to pale olivaceous; reverse buff, with pale olivaceous concentric rings near the centre. Colonies on MEA 50 – 55 mm diam after 7 d, margin regular, aerial mycelia sparse, olivaceous, white near the centre; reverse olivaceous. Colonies on PDA, 50 – 55 mm diam after 7 d, margin regular, covered by dense white flety aerial mycelia, white, olivaceous near the centre; reverse buff, olivaceous near the centre. NaOH test negative.

Specimens examined: China, Guizhou, Shuanghe Cave National Geopark, from air, 8 May 2015, Z.F. Zhang (holotype HMAS 247035, dried culture, ex-holotype living culture CGMCC 3.18114 = LC 6245); ibid. CGMCC 3.18115 = LC 6246; ibid. CGMCC 3.18116 = LC 6247.

Notes: Species of Allophoma were hitherto all known as plant pathogens, while Al. oligotrophica is the first species which was isolated from air using carbon-free silica gel medium (Jiang et al. 2017). Allophoma oligotrophica is closely related to Al. nicaraguensis (1 bp difference in ITS, 14 bp in rpb2 and 3 in tub2) and Al. tropica (1 bp difference in ITS, 15 bp in rpb2 and 2 in tub2) (Fig. 1). Morphologically, Al. oligotrophica produces larger pycnidia (150 – 440 × 145 – 420 μm vs. 30 – 150 × 28 – 120 μm) and longer conidigenous cells (4.5 – 7 × 3.5 – 6.5 μm vs. 3 – 4.5 × 3.5 – 4.5 μm) than Al. nicaraguensis (Chen et al. 2015a), and differs from Al. tropica in its slightly larger conidigenous cells (4.5 – 7 × 3.5 – 6.5 μm vs. 2.6 – 3 × 3 – 6 μm) and oblong to cylindrical conidia (de Gruyter & Noordeloos 1992).

Ascochyta Lib. emend. Q. Chen & L. Cai. Stud. Mycol. 82: 185. 2015.

Synonym: Heracleicola Tibpromma et al., Fungal Divers. 75: 58. 2015.
Fig. 1. Phylogenetic tree inferred from a Maximum likelihood analysis based on a concatenated alignment of LSU, ITS, rpb2 and tub2 sequences of 360 strains representing species in Dothideomycetes. The RAxML bootstrap support values (MLBS) and Bayesian posterior probabilities (BPP) are given at the nodes (BPP/MLBS). Some branches were shortened to fit them to the page – these are indicated by two diagonal lines with the number of times a branch was shortened indicated next to the lines. New taxa and new combination introduced in this study are formatted in bold. Ex-type strains are marked by an asterisk (*). The tree was rooted to Leptosphaeria cononoea (CBS 616.75) and L. doliolum (CBS 505.75).
Fig. 1. (Continued).
Fig. 1. (Continued)
Fig. 1. (Continued)
Fig. 1. (Continued).
Ascochyta boeremae L.W. Hou, Crous & L. Cai, sp. nov. MycoBank MB820000. Fig. 4.

Etymology: Named after Gerhard H. Boerema, who collected the holotype of this species.

Conidiomata pycnidial, mostly solitary, sometimes confluent, (sub-) globose or flask-shaped, glabrous, semi-immersed in or superficial on the agar, ostiolate, 170–550(−650) × 140–400(−650) μm. Ostiole single, slightly papillate, sometimes elongated as a short neck. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 3–6-layers, with outer 2–3-layers pigmented, 25–50 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform or doliform, 9.5–14.5 × 8.5–13 μm. Conidia greatly variable in shape and size, large conidia mostly oblong to bacilliform, or fusiform, mainly aseptate but sometimes uniseptate; small
conidia ellipsoidal to oval, broadly ovoid, smooth- and thin-walled, hyaline, aseptate, (14–)16.5–26(–32) × 4.5–7.5(–8.5) μm, eguttulate or sometimes with 1–2 guttules per cell. Conidial matrix whitish cream.

Culture characteristics: Colonies on OA, 25–30 mm diam after 7 d, margin regular, covered by sparsely flat aerial mycelia, yellowish olivaceous; reverse concolourous. Colonies on MEA 20–25 mm diam after 7 d, margin regular, covered with floccose aerial mycelia, white, grey near the centre; reverse sienna to pale brown. Colonies on PDA, 15–20 mm diam after 7 d, margin regular, covered by woolly aerial mycelia, greenish olivaceous, buff near the margin; reverse concolourous. NaOH spot test: a dark reddish brown discolouration on MEA.

Specimens examined: Australia, from a leaf of Pisum sativum, deposited in CBS Sep. 1984, G.H. Boerema (holotype CBS H-23017, dried culture, ex-holotype living culture CBS 372.84 = PD 80/1246); from a leaf of Pisum sativum, deposited in CBS Sep. 1984, G.H. Boerema, CBS H-9078, culture CBS 373.84 = PD 80/1247.

Notes: CBS 372.84 and CBS 373.84 were originally deposited as “Ascochyta fabae”, but are distinct from the authentic cultures of As. fabae (CBS 524.77, CBS 649.71 and PD 83/492) in the phylogenetic tree. Morphologically, these two strains produce aseptate conidia differing from the uniseptate conidia of As. fabae (Saccardo 1902). Therefore, we describe it as a new species, As. boeremae. Ascochyta boeremae is genetically closely related to As. nigripycnidia (Fig. 1), but differs morphologically from the latter by producing larger conidia (14–32 × 4.5–8.5 μm vs. 5.5–15 × 1.5–4 μm; Boerema et al. 2004).
Ascochyta premilcurensis (Tibpromma et al.) Q. Chen, Crous & L. Cai, comb. nov. MycoBank MB820001.
Basionym: Heracleicola premilcurensis Tibpromma et al., Fungal Divers. 75: 59. 2015.

Description: Ariyawansa et al. (2015).

Specimen examined: Italy, Premilcuore, Province of Forli-Cesena, Valbura, on dead stem of Heracleum spondylium, 6 Jun. 2014, E. Camporesi (holotype MFLUCC 14-0725, ex-holotype living culture MFLUCC 14-0518).

Notes: The genus Heracleicola was introduced by Ariyawansa et al. (2015) to accommodate a single species Heracleicola premilcurensis, which is located in the genus Ascochyta based on combined LSU and ITS analysis (Supplementary Fig. S1) in the present study. Heracleicola is therefore synonymised under Ascochyta, and a new combination in Ascochyta proposed.

Boeremia Aveskamp et al., Stud. Mycol. 65: 36. 2010.

Boeremia exigua var. opuli Q. Chen, Crous & L. Cai, var. nov. MycoBank MB818957. Fig. 5.

Etymology: Named after the host species from which the holotype was collected, Viburnum opulus.

Conidiomata pycnidial, solitary or aggregated, globose to subglobose, brown, covered with hyphae, produced on the agar surface or (semi-)immersed, 245–360 × 200–305 μm. Ostiole single, slightly papillate. Pycnidial wall pseudoparenchymatous, composed of isodiametric cells, 4–5 layers, 20–37.5 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliform, 4–9(–10) × 4–7.5 μm. Conidia oblong to cylindrical, obovoid, incidentally slightly curved, or reniform, smooth- and thin-walled, hyaline, aseptate, 5.5–9.5 × 2.5–4 μm, with 2 or several minute guttules. Conidia matrix cream.

Culture characteristics: Colonies on OA, 70–76 mm diam after 7 d, margin regular, covered by white fuscose aerial mycelia, white with a pale green concentric ring, pale olivaceous near the centre; reverse reddish brown, grey near the centre. Colonies on MEA 70–75 mm diam after 7 d, margin regular, aerial mycelia white, velvety, olivaceous; reverse concolourous. Colonies on PDA, 65–80 mm diam after 7 d, margin regular, aerial mycelia white, feltly, in some sectors covered by a low mat of fuscose white to grey aerial mycelia, olivaceous near the centre; reverse olivaceous, with a buff margin. Application of NaOH results in a pale green discoloration of the agar.

Specimens examined: USA, from seedlings of Viburnum opulus, 2014, W.J. Duan (holotype HMAS 247147, dried culture, ex-holotype living culture CGMCC 3.18354 = LC 8117); ibid. LC 8118.

Notes: Boeremia exigua var. opuli is phylogenetically closely related to B. exigua var. exigua, B. exigua var. forsythiae, B. exigua var. glivescens and B. exigua var. viburni (Fig. 1). Although similar in conidial dimensions, pycnidia of B. exigua var. opuli (245–360 × 200–305 μm) are much larger than those of the other four varieties (75–200 μm; van der Aa et al. 2000). Boeremia exigua var. opuli also differs from those four varieties in seven positions in the rpb2 locus. Varieties of B. exigua are morphologically very similar and phylogenetically closely related to each other. Boeremia exigua var. exigua and var. forsythia have a wide host range, while other varieties appear host specific to a certain group of plants, such as var. coffeae to Coffea arabica (Rubiaceae), var. forsythia to Forsythia hybrids (Oleaceae), var. heteromorpha to Nerium oleander and Vinca spp. (Apocynaceae), var. linicola to Linum usitatissimum (Linaceae), var. populi to Populus and Salix (Salicaceae), and var. viburni to Viburnum spp. and occasionally Lonicera sp. (Caprifoliaceae) (Boerema et al. 2004). Besides, B. exigua var. pseudolilacis has been found only on Syringa vulgaris (Oleaceae; Aveskamp et al. 2010) and var. opuli only on Viburnum opulus. A host-range determination of B. exigua...
var. *rhapontica* indicates that this variety also has a very narrow host range (Berner et al. 2015). Thus, the plant generic interrelatedness is presumed to be the basis for susceptibility to *Boeremia exigua* varieties (Berner et al. 2015).

**Calophoma** Q. Chen & L. Cai, Stud. Mycol. 82: 191. 2015.

**Calophoma rosae** Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818976. Fig. 6A.

**Etymology**: Named after the host genus *Rosa*, from which the holotype was isolated.

**Leaf spots** amphigenous, circular to irregular, up to 15 mm diam, occurring on or close to the tip of the leaf, brown, surrounded by a dark purple border (Fig. 7). *Conidiomata* pycnidial, mostly aggregated but sometimes solitary, globose to subglobose, brown, glabrous or covered with some hyphal outgrowths, semi-immersed in or superficial on the agar, ostiolate, (110–)130–210 × (110–)130–180 μm. *Ostiole* single, sometimes with short necks, slightly papillate. *Pycnidial wall* pseudoparenchymatous, composed of isodiametric cells, 3–4 layers, 11–20 μm thick, pigmented. *Conidiogenous cells* phialidic, hyaline, smooth, ampulliform to doliiform, 6.5–7 × 7–8.5 μm. *Conidia* ellipsoidal to oblong, smooth- and thin-walled, 0–1-septate, hyaline, later becoming pale brown with ageing, 6–10 × 3–4.5 μm, eguttulate or sometimes with several guttules. *Conidial matrix* initially buff, gradually becoming dark brown.

**Culture characteristics**: Colonies on OA, 35–40 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, white; reverse buff. Colonies on MEA 33–35 mm diam after 7 d, margin regular, aerial mycelia sparse, flattened, white; reverse concolourous. Colonies on PDA, 30–36 mm diam after 7 d, margin regular, aerial mycelia covering the whole colony, floccose, dense, white; reverse yellowish green, with concentric rings. NaOH test negative.

Specimens examined: China, Qinghai, Xunhua, from leaves of *Rosa* sp., 2 Sep. 2013, Q. Chen (holotype HMAS 247148, dried culture, ex-holotype living culture CGMCC 3.18347 = LC 5169); ibid. LC 8119.
Notes: Calophoma rosae is phylogenetically closely related to C. clematidis-rectae and C. vodakii (Fig. 1). Morphologically C. rosae differs from C. clematidis-rectae in having larger conidiogenous cells (6.5–7 × 7–8.5 μm vs. 3–5 × 2.5–4.5 μm), larger conidia (6–10 × 3–4.5 μm vs. 3–8 × 2–3.5 μm) (Aveskamp et al. 2010), and from C. vodakii in having shorter and wider conidia (6.5–7 × 7–8.5 μm vs. 14–22 × 4–4.5 μm; Saccardo & Trotter 1913, Müller 1953).
Calophoma rosae is the first and only record thus far from the Rosaceae, while most species in this genus are associated with species of Ranunculaceae.

Didymella Sacc. ex Sacc., Syll. Fung. 1: 545. 1882, emend. Q. Chen & L. Cai, Stud. Mycol. 82: 173. 2015.

Didymella aeria Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818968. Fig. 8.

Etymology: Name linked to the fact that this species was collected from air.

Conidiomata pycnidial, solitary or aggregated, globose to sub-globose, later becoming irregular, brown, glabrous, superficial or semi-immersed, 155–375(–460) × 130–340(–460) μm. Ostiole single, with a short neck, slightly papillate or non-papillate. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 2–3 layers, 8.5–25 μm thick, brown-pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliform, 5–7 × 4.5–6 μm. Conidia ellipsoidal, smooth- and thin-walled, hyaline, aseptate, 3–5 × 2–3 μm, with 2 large dull green polar guttules. Conidial matrix salmon.

Culture characteristics: Colonies on OA, 55–60 mm diam after 7 d, margin regular, white aerial mycelia sparse, brownish olivaceous; reverse white to reddish brown. Colonies on MEA 44–48 mm diam after 7 d, margin regular, white to olivaceous, with sparse white aerial mycelia spreading over the colony; reverse concolourous. Colonies on PDA, 15–20 mm diam after 7 d, margin irregular, fluffy to felty, white; reverse amber to saffron. NaOH spot test: a brown discoloration on MEA.

Specimens examined: China, Guizhou, Zunyi, Shuanghe Cave National Geo-park, from air, 8 May 2015, Z.F. Zhang (holotype HMAS 247149, dried culture, ex-holotype living culture CGMCC 3.18353 = LC 7441); ibid. LC 8120.

Notes: The most closely related species to Didymella aeria are D. sinensis and D. pomorum (Fig. 1), but with respectively 33 bp and 55 bp differences in four sequenced loci. Didymella aeria produces hyaline conidia measuring 3–5 × 2–3 μm, while D. pomorum produces longer, brown conidia (4–8 × 1.5–3 μm; Boerema 1993). The asexual morph of D. sinensis was
unfortunately not observed. Didymella aeria was trapped from air in a Karst cave in China.

**Didymella aquatica** Q. Chen, Crous & L. Cai, sp. nov. Myco-Bank MB818973. Fig. 9.

**Etymology:** Name derived from the substrate where the holotype was collected, water.

**Conidiomata** pycnidial, solitary, sometimes aggregated, globose to subglobose, brown, glabrous or covered with some hyphal outgrowths, superficial, ostiolate, 105–355 × 95–315 μm. **Ostioles** 2–13, sometimes elongated as a short neck, up to 50.5 μm long, papillate. **Pycnidial wall** pseudoparenchymatous, composed of oblong to isodiametric cells, 14–35 μm thick, outer wall 2–3-layers pigmented. **Conidigenous cells** phialidic, hyaline, smooth, ampulliform to doliiform, 4–5 × 3.5–5 μm. **Conidia** ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 4–5.5 × 2–3 μm, with 2 distinct polar guttules. **Conidial matrix** cream.

**Culture characteristics:** Colonies on OA, 15–40 mm diam after 7 d, margin regular, covered by velvety aerial mycelia, flat, white to amber; reverse concolourous. Colonies on MEA 46–53 mm diam after 7 d, margin regular, white to pale green, with sparse aerial mycelia near the centre; reverse concolourous. Colonies on PDA, 54–56 mm diam after 7 d, margin regular, floccose to felty, white to grey, iron grey near the centre; reverse white, hazel to brown. NaOH test negative.

**Specimens examined:** China, Guizhou, Kuankuoshui National Geopark, water, 23 Jul. 2014, Z.F. Zhang (holotype HMAS 247150, dried culture, ex-holotype living culture CGMCC 3.18349 = LC 5556); ibid. LC 5555.

**Notes:** Didymella aquatica formed a distinct lineage sister to D. macrophylla, with 6 bp differences in both rpb2 and tub2 loci. Morphologically, D. aquatica is clearly differentiated from D. macrophylla in producing smaller conidiogenous cells (4–5 × 3.5–5 μm vs. 6–8 × 4.5–8 μm), longer and narrower conidia (4–5.5 × 2–3 μm vs. 1.5–2.5 × 3.5–5.5 μm), and in the number of conidiomatal ostioles (2–13 vs. 1). This is the first Didymella species known from water.
Didymella chloroguttulata Q. Chen, Crous & L. Cai, sp. nov.
MycoBank MB818970. Fig. 10.

Etymology: Latin, chloro- = green, referring to the two green guttules of the conidia.

Conidiomata pycnidal, confluently globose to subglobose, brown, glabrous, superficial, 145–260(–410) × 130–230(–365) μm. Ostiole single, sometimes with a short neck, slightly papillate or non-papillate. Pycnidal wall pseudoparenchymatous, composed of isodiametric cells, 3–4 layers, 14.5–22 μm thick, pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliform, 5.5–8 × 4–8.5 μm. Conidia oblong to cylindrical, incidentally slightly curved, smooth and thin-walled, hyaline, asceptate, 4–6 × 2–3 μm, with 2–3 dull green polar guttules. Conidial exudates not recorded.

Culture characteristics: Colonies on OA, 54–57 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, grey; reverse black. Colonies on MEA 44–47 mm diam after 7 d, margin regular, white aerial mycelia sparse, fluffy, greenish brown; reverse concolourous. Colonies on PDA, 57–62 mm diam after 7 d, margin regular, floccose, grey to leaden-black; reverse leaden-black. NaOH spot test: a pale reddish brown discolouration on MEA.

Specimens examined: China, Guizhou, Zunyi, Shuanghe Cave National Geopark, air, 8 May 2015, Z.F. Zhang (holotype HMAS 247151, dried culture, ex-holotype living culture CGMCC 3.18351 = LC 7435); ibid. LC 8122.

Notes: Didymella chloroguttulata is characterised by having two to three dull green polar guttules in its oblong to cylindrical conidia and sometimes having conidiomata with a short neck. In the phylogenetic tree, it formed a distinct clade sister to D. dactylidis and D. rhei (Fig. 1). Didymella chloroguttulata is well distinguished from these two species in the NaOH reactions (pale reddish brown discolouration on D. chloroguttulata, slight greenish discolouration on D. dactylidis, and no effect on D. rhei) (de Gruyter et al. 2002, Aveskamp et al. 2010).

Didymella ellipsoidea Q. Chen, Crous & L. Cai, sp. nov.
MycoBank MB818971. Fig. 11.

Etymology: Name refers to its ellipsoidal conidia.

Conidiomata pycnidal, solitary, globose to subglobose, brown, glabrous or covered with some hyphal outgrowths, superficial, ostiolate, 335–400(–460) × 290–340(–440) μm. Ostioles 1–8, often developing to elongated short necks, up to 80 μm long, papillate. Pycnidal wall pseudoparenchymatous, composed of isodiametric cells, 3–5 layers, 23.5–50 μm thick, pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliform, 5.5–7.5 × 4.5–6.5 μm. Conidia ellipsoidal, smooth and thin-walled, hyaline, asceptate, 3–4.5 × 2–3 μm, with 2 pale green guttules. Conidial matrix cream.

Culture characteristics: Colonies on OA, 56–62 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, white to pale brown; reverse white to greenish brown. Colonies on MEA 61–64 mm diam after 7 d, margin regular, white aerial mycelia sparse, fluffy, grey to olivaceous; reverse concolourous. Colonies on PDA, 52–54 mm diam after 7 d, margin regular, floccose, grey to leaden-black, with a white concentric ring near the centre; reverse concolourous. NaOH test negative.

Specimens examined: China, Guizhou, Zunyi, Shuanghe Cave National Geopark, air, 8 May 2015, Z.F. Zhang (holotype HMAS 247152, dried culture, ex-holotype living culture CGMCC 3.18350 = LC 7434); ibid. LC 8123.
Notes: This species is represented by two isolates trapped from air in a Karst cave which cluster in a distinct lineage clearly differentiated from other species in *Didymella* (Fig. 1). Morphologically, *Didymella ellipsoidea* is distinguishable from its closest neighbours, *D. viburnicola*, in producing wider conidia (3–4.5 × 2–3 μm vs. 3.5–5.5 × 1.5–2 μm; de Gruyter & Noordeloos 1992), from *D. macrostoma* in having shorter conidia (3–4.5 × 2–3 μm vs. 4–11 × 2–4 μm; de Gruyter et al. 2002), and from *D. pteridis* in producing larger conidiogenous cells (5.5–7.5 × 4.5–6.5 μm vs. 4–5 × 3.5–4.5 μm).

*Didymella ilicicola* Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818969. Fig. 12.

**Etymology:** Name derived from *ilex*, the plant from which the holotype was collected.

**Conidiomata** pycnidial, solitary or aggregated, (sub-)globose to flask-shaped, or obpyriform, brown, later becoming irregular when matured, covered by hyphal outgrowths, mostly erumpent, sometimes semi-immersed, ostiolate, (80–)150–200 × (70–)150–180 μm. **Ostioles** 2–3, elongated as short papillate necks. **Pycnidial wall** pseudoparenchymatous, composed of oblong to isodiametric cells, 2–5 layers, 15–20 μm thick, outer wall 2–3-layers pigmented. **Conidiogenous cells** phialidic, hyaline, smooth, ampulliform to doliiform, 4.5–8 × 3.5–5 μm. **Conidia** ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 3–4 × 1.5–2.5 μm, with two minute guttules. **Conidial matrix** cream to buff.

**Culture characteristics:** Colonies on OA, 43–50 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, white to pale buff, with a dull green concentric ring near the centre; reverse reddish brown to buff, with a brown concentric ring. Colonies on MEA 56–65 mm diam after 7 d, margin irregular, white, aerial mycelia sparse; reverse concolourous. Colonies on PDA, 62–65 mm diam after 7 d, margin regular, feltly to floccose, dense, white to pale yellow; reverse white to buff with some pale reddish brown tints in concentric rings. NaOH test negative.

**Fig. 11.** *Didymella ellipsoidea* (CGMCC 3.18350). A–B. Colony on OA (front and reverse). C–D. Colony on MEA (front and reverse). E–F. Colony on PDA (front and reverse). G. Pycnidia sporulating on OA. H. Pycnidia. I. Ostioles on pycnidium. J. Section of pycnidium. K. Section of pycnidial wall. L. Conidia. Scale bars: G = 100 μm; H = 50 μm; I, K–L = 10 μm; J = 20 μm.
Specimens examined: Italy, from seedlings of *Ilex chinensis*, 2013, W.J. Duan (holotype HMAS 247153, dried culture, ex-holotype living culture CGMCC 3.18355 = LC 8126); ibid. LC 8127.

Notes: *Didymella ilicicola* clustered in a clade together with *D. subherbarum* and *D. pedeiae* (Fig. 1), but with 1 bp and 9 bp differences in ITS and tub2 respectively from *D. subherbarum* (lack of rpb2 sequence), and 26 bp and 12 bp differences in rpb2 and tub2 respectively from *D. pedeiae*. Morphologically, *D. ilicicola* differs from *D. subherbarum* in producing shorter conidia (3–4 × 1.5–2.5 μm vs. 4–6.5 × 1.5–2 μm; de Gruyter et al. 1993), and from *D. pedeiae* in producing larger conidiogenous cells (4.5–8 × 3.5–5 μm vs. 3.5–4.5 × 3–4 μm; Aveskamp et al. 2010).

*Didymella infuscatispora* Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818974. Fig. 13.

Etymology: Latin, *infuscato-*= brownish, referring to the colour of its conidia.

Leaf spots amphigenous, irregular, 3–11 mm diam, extending along leaf margin to the whole leaf, dark grey to dark brown (Fig. 7B). Pycnidial solitary, globose to subglobose, brown, later becoming irregular when mature, covered with some hyphal outgrowths, superficial, ostiolate, (50–) 95–265 × (20–)75–165 μm. Ostiole single, sometimes elongated as short necks, slightly papillate. Pycnidial wall pseudo-parenchymatous, composed of isodiametric cells, 2–3 layers, 13.5–23 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliform, 6–8.5 × 5.5–8 μm. Conidia globose to broadly ellipsoidal, oblong, smooth- and thin-walled, hyaline, later becoming pale brown, mostly aseptate, occasionally 1-septate, 5–8.5 × 3.5–5.5 μm, with several indistinct minute guttules. Conidial matrix dark brown.
**Didymella macrophylla** Q. Chen, Crous & L. Cai, **sp. nov.** MycoBank MB819189. Fig. 14.

**Etymology**: Named after the host species *Hydrangea macrophylla*, from which the holotype was collected.

**Conidiomata** pycnidial, mostly solitary, sometime aggregated, globose to subglobose, pale brown, glabrous, semi-immersed or immersed in agar, ostiolate, (80–)120–200 × (60–)100–150 μm. Ostiole single, slightly papillate. **Pycnidial wall** pseudoparenchymatous, composed of oblong to isodiametric cells, 1–2 layers, 7–15 μm thick, pigmented. **Conidiogenous cells** phialidic, hyaline, smooth, ampulliform to doliform, 6–8 × 4.5–8 μm. **Conidia** obvoid, ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 3.5–5.5 × 1.5–2.5 μm, with two polar guttules. **Conidial matrix** buff.

**Culture characteristics**: Colonies on OA, 15–20 mm diam after 7 d, margin regular, covered by felty aerial mycelia, white to buff, pale brown near the centre; reverse white to amber, hazel near the centre. Colonies on MEA 10–15 mm diam after 7 d, margin irregular, aerial mycelia sparse, white to pale green; reverse white to pale green, yellowish brown near the centre. Colonies on PDA, 14–16 mm diam after 7 d, margin regular, aerial mycelia felty, flat, white to pale brown; reverse buff to brown. NaOH test negative.

**Specimens examined**: China, Tibet, Lulang, on leaves of *Chrysanthemum indicum*, 15 Jun. 2015, Q. Chen (*holotype* HMAS 247154, dried culture, ex-holotype living culture CGMCC 3.18356 = LC 8128); ibid. LC 8129.

**Note**: This species clustered in a distinct lineage separated from other species in this genus, and is characterised by pale brown and broadly ellipsoidal conidia and a dark brown conidial matrix when mature.

**Didymella ocimicola** Q. Chen, Crous & L. Cai, **sp. nov.** MycoBank MB819127. Fig. 15.

**Etymology**: Name derived from *Ocimum*, the plant host from which the holotype was collected.

**Leaf spots** amphigenous, irregular, 8–15 mm diam, next to or close to the leaf margin, pale brown (Fig. 7C). **Conidiomata** pycnidial, solitary, sometimes aggregated, globose to flask-shaped, brownish olivaceous, covered by some hyphal outgrowths, superficial or semi-immersed, ostiolate, 100–235 × 95–180 μm. Ostiole single, with an elongated neck, slightly papillate or non-
papillate. Pycnidial wall pseudoparenchymatous, composed of isodiametric cells, 2–5 layers, 12–35.5 μm thick, brown-pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 5–5.5 × 3.5–5 μm. Conidia globose to broadly ellipsoidal, smooth- and thin-walled, hyaline, aseptate, 4–6.5 × 3–4.5 μm, with one to several distinct guttules. Conidial exudates not recorded.

Culture characteristics: Colonies on OA, 10–15 mm diam after 7 d, margin regular, aerial mycelia floccose, flat, white to buff; reverse concolourous. Colonies on MEA 9–12 mm diam after 7 d, margin irregular, aerial mycelia floccose, white, dull green; reverse white to dull green. Colonies on PDA, 10–15 mm diam after 7 d, margin regular, aerial mycelia floccose, white; reverse olivaceous with white to pale brown patches. NaOH test negative.

Specimens examined: China, Tibet, Lulang, on leaves of Ocimum sp., 15 Jun. 2015, Q. Chen (holotype HMAS 247156, dried culture, ex-holotype living culture CGMCC 3.18358 = LC 8137); ibid. LC 8138.

Notes: Didymella ocimicola grouped closely with D. chenopodii and D. senecionicola (Fig. 1), but differs from D. chenopodii in smaller conidiogenous cells (5–5.5 × 3.5–5 μm vs. 4–8 × 4–6 μm) and wider conidia (4–6.5 × 3–4.5 μm vs. 5–5.5 × 2–2.2 μm) and from D. senecionicola in wider conidia (4–6.5 × 3–4.5 μm vs. 4–6.5 × 1.5–2.5 μm) (de Gruyter et al. 1993). Didymella ocimicola has 44 bp and 30 bp differences in three loci (lack of rpB2 sequence) from D. chenopodii and D. senecionicola respectively.

Didymella pteridis L.W. Hou, Crous & L. Cai, sp. nov. MycoBank MB820002. Fig. 16.

Etymology: Named after the host genus Pteris, from which the holotype was collected.

Conidiomata pycnidial, mainly solitary, sometimes aggregated, (sub-)globose or flask-shaped, glabrous or with some mycelial outgrowths, superficial or semi-immersed, ostiolate, 170–350(–430) × 150–330 μm. Ostiole single, papillate, sometimes elongated as a short neck, with dark colour near the ostioles. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 3–6 layers, 9–28 μm thick, with outer 1–2-layers pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 4–5 × 3.5–4.5 μm. Conidia ovoid to broadly oval, smooth- and thin-walled, hyaline, aseptate, (3–)4–6 × 2.5–3.5 μm, with two polar guttules. Conidial matrix pale salmon.

Culture characteristics: Colonies on OA, 58–60 mm diam after 7 d, margin regular, aerial mycelia flat, cinnamon to hazel, mycelia sparse in some furrowed zone, pycnidia abundant near the margin; reverse buff to pale olivaceous. Colonies on MEA 20–25 mm diam after 7 d, margin regular, aerial mycelia floccose, white, grey near the centre, pale salmon conidial matrix appeared near the centre; reverse yellow in outer ring, changing towards the centre from saffron, hazel, greyish brown to brown. Colonies on PDA, 65–68 mm diam after 7 d, margin regular, densely covered by floccose aerial mycelia, greenish brown, with...
Didymella segeticola (Q. Chen) Q. Chen, Crous & L. Cai, comb. nov. MycoBank MB819327.

Description: Chen et al. (2015b).

Specimens examined: China, Hubei, Shennongjia Forest Region, on diseased leaves of Cirsium segetum, 1 Aug. 2011, K. Zhang (holotype HMAS 245746, ex-holotype living culture CGMCC 3.17489); ibid. CGMCC 3.17498 = LC 1635; ibid. LC 1633; ibid. LC 1634.

Notes: This species was introduced as Phoma segeticola, before the comprehensive revision of Didymellaceae (Chen et al. 2015b). Under current circumstance of Didymellaceae, it belongs to Didymella. Didymella segeticola is closely related to D. bellidis, and has 12 bp differences in four loci from the latter. Morphologically, D. segeticola could be distinguished from the latter in producing wider conidia (4.5–7 × 2.5–4 μm vs. 4–6.5 × 2–2.5 μm; Chen et al. 2015b).

Didymella sinensis Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB819867. Fig. 17.

Etymology: Epithet derived from the country of origin, China.

Leaf spots amphigenous, angular to irregular, 3–5 mm diam, scatter over the leaf, dark brown to black (Fig. 7D). Ascomata aggregated, globose to irregular, brown, small, up to 170 μm diam, papillate. Pseudothecial wall 18–29.5 μm thick, outer wall consisting of 2–5 layers of cells of textura angularis. Pseudoapophysides hyaline, 1.5–2 μm diam, septate. Asci bitunicate, clavate to short cylindrical, 32–52 × 8.5–16 μm. Ascospores biseriate, ellipsoidal, straight to slightly curved, 12–18 × 4.5–7.5 μm, hyaline, smooth, apex obtuse, base broadly obtuse to subobtuse, medianly 1-septate, upper cell often wider than lower cell, slightly constricted at the septum.

Culture characteristics: Colonies on OA, 49–52 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, grey to black; reverse black. Colonies on MEA 57–60 mm diam after 7 d, margin regular, greyish brown; reverse concolourous. Colonies on PDA, 56–60 mm diam after 7 d, margin regular, pale...
grey, with brownish olivaceous margin; reverse dark brown.
NaOH spot test: a hazel discolouration on MEA.

Specimens examined: China, Guizhou, Huangguoshu waterfall, on leaves of Cerasus pseudocerasus, 21 Jul. 2014, Q. Chen (holotype HMAS 247157, dried culture, ex-holotype living culture CGMCC 3.18348 = LC 5210); Guizhou, Kuankuoshui National Geopark, Urticaceae, 20 Jul. 2014, Q. Chen, LC 5246; Guizhou, Xingyi, on leaves of Dendrobium of ficeae, 4 Jul. 2015, Q. Chen, LC 8142; ibid. LC 8143.

Notes: Didymella sinensis has only been observed as a sexual morph, which is not common among species of Didymellaceae. Four isolates from diseased leaves of three host plants in different families were collected, i.e. Cerasus pseudocerasus (Rosaceae), Dendrobium officinale (Orchidaceae) and Urticaceae, indicating an opportunistic pathogen with very broad host range.

Didymella suiyangensis Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818972. Fig. 18.

Etymology: Epithet derived from the location of origin, Suiyang County in Guizhou, China.

Conidiomata pycnidial, solitary, sometimes aggregated, globose to irregular, brown, covered by some hyphal outgrowths, superficial or semi-immersed, ostiolate, (65–)90–240 × 55–180 μm. Ostiole single, slightly papillate or non-papillate. Pycnidal wall pseudo-parenchymatous, composed of oblong to isodiametric cells, 2–4 layers, 15–36.5 μm thick, outer wall 2-layers pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 4–4.5 × 3–4 μm. Conidia ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 3.5–7 × 2–3 μm, with indistinct guttules. Conidial matrix cream.

Culture characteristics: Colonies on OA, 52–55 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, sparsely, white to buff; reverse concolourous. Colonies on MEA 59–64 mm diam after 7 d, margin regular, floccose, pale grey to greenish olivaceous; reverse white to yellowish green. Colonies
Didymella suiyangensis formed a distinct clade sister to *D. bellidis* and *D. segeticola* (Fig. 1), with respectively 18 bp and 19 bp differences in four loci from the latter two species. However, *D. suiyangensis* is differentiated from *D. bellidis* and *D. segeticola* in producing narrower conidiogenous cells (4-4.5 × 3-4 μm vs. 3-6 × 4-8 μm and 5-6.5 × 4-5.5 μm), and the number of ostioles (1 vs. 1-5 and 1-2, respectively). Moreover, the NaOH reactions on MEA showed a reddish brown discoloration on *D. suiyangensis*, but green to red on *D. bellidis* and negative on *D. segeticola* (de Gruyter et al. 1993, Chen et al. 2015b).

**Notes:** *Didymella suiyangensis* is closely related to *E. viticis* with a high support value in the phylogenetic tree (Fig. 1), and has 10 bp differences in four loci from the latter. Two isolates of this species are both from *Camellia sinensis*, one as endophyte in healthy leaves and the other as pathogenic fungus from diseased leaves. Both isolates proved to be sterile on the defined media used in this study.

**Epicoccum dendrobii** Q. Chen, Crous & L. Cai, *sp. nov.* MycoBank MB818964. Fig. 19.

**Etymology:** Named after the host plant, *Dendrobium*.

**Leaf spots** amphigenous, subcircular, up to 10 mm diam, black (Fig. 7E). *Conidiomata* sporodochial, aggregated, semi-immersed or superficial, clavate, pale brown. *Hyphae* septate, frequently branched, 2.5-4.5 μm. *Conidia* globose, aseptate and smooth when young, later becoming multicellular-phragmosporous, verrucose, subglobose-pyriform, brown, with a basal cell, 11-19 μm diam.

**Culture characteristics:** Colonies on OA, 58-64 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, based on alignments of the separate loci deposited in TreeBASE (S20724): LSU positions: 66(T), 398(T); *tub2* positions: 30(T), 258(C); *rpb2* positions: 47(C), 95(C), 197(A), 419(C), 554(A).

Specimens examined: China, Jiangxi, Ganzhou, leaves of *Camellia sinensis*, 7 Sep. 2013, Y. Zhang (*holotype* HMAS 247159, dried culture, culture ex-*holotype* CGMCC 3.18348 = LC 4858); *ibid.* LC4862.

**Notes:** *Epicoccum camelliae* is closely related to *E. viticis* with a high support value in the phylogenetic tree (Fig. 1), and has 10 bp differences in four loci from the latter. Two isolates of this species are both from *Camellia sinensis*, one as endophyte in healthy leaves and the other as pathogenic fungus from diseased leaves. Both isolates proved to be sterile on the defined media used in this study.

*Epicoccum camelliae* Q. Chen, Crous & L. Cai, *sp. nov.* MycoBank MB818958. Fig. 17.

**Etymology:** Name refers to the host genus from which the holotype was collected, *Camellia*.

Cultures sterile. *Epicoccum camelliae* differs from its closest phylogenetic neighbour *E. viticis* by unique fixed alleles in three loci based on alignments of the separate loci deposited in TreeBASE (S20724): LSU positions: 66(T), 398(T); *tub2* positions: 30(T), 258(C); *rpb2* positions: 47(C), 95(C), 197(A), 419(C), 554(A).

Specimens examined: China, Guizhou, Zunyi, Shuanghe Cave National Geo-park, air; 8 May 2015, Z.F. Zhang (*holotype* HMAS 247158, dried culture, ex-*holotype* living culture CGMCC 3.18352 = LC 7439); *ibid.* LC 8144.

**Notes:** *Didymella suiyangensis* formed a distinct clade sister to *D. bellidis* and *D. segeticola* (Fig. 1), with respectively 18 bp and 19 bp differences in four loci from the latter two species. However, *D. suiyangensis* is differentiated from *D. bellidis* and *D. segeticola* in producing narrower conidiogenous cells (4-4.5 × 3-4 μm vs. 3-6 × 4-8 μm and 5-6.5 × 4-5.5 μm), and the number of ostioles (1 vs. 1-5 and 1-2, respectively). Moreover, the NaOH reactions on MEA showed a reddish brown discoloration on *D. suiyangensis*, but green to red on *D. bellidis* and negative on *D. segeticola* (de Gruyter et al. 1993, Chen et al. 2015b).

**Epicoccum dendrobii** Q. Chen, Crous & L. Cai, *sp. nov.* MycoBank MB818964. Fig. 19.

**Etymology:** Named after the host plant, *Dendrobium*.

**Leaf spots** amphigenous, subcircular, up to 10 mm diam, black (Fig. 7E). *Conidiomata* sporodochial, aggregated, semi-immersed or superficial, clavate, pale brown. *Hyphae* septate, frequently branched, 2.5-4.5 μm. *Conidia* globose, aseptate and smooth when young, later becoming multicellular-phragmosporous, verrucose, subglobose-pyriform, brown, with a basal cell, 11-19 μm diam.

**Culture characteristics:** Colonies on OA, 58-64 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense,
white to greyish yellow; reverse white to pale grey, with some purple dots scattered over the colony. Colonies on MEA 65–68 mm diam after 7 d, margin regular, grey, with sparse white aerial mycelia; reverse white to yellow. Colonies on PDA, 34–38 mm diam after 7 d, margin regular, aerial mycelia felty to floccose, flat, white to buff, olivaceous near the centre; reverse pale salmon, hazel to brown near the centre. NaOH test negative.
Specimens examined: China, Guizhou, Xingyi, on leaves of *Dendrobium* fimbriatum, 4 Jul. 2015, Q. Chen (holotype HMAS 247160, dried culture, ex-holotype living culture CGMCC 3.18359 = LC 8145); ibid. LC 8146.

Notes: *Epicoccum dendrobii* formed a distinct clade basal to *E. nigrum*, *E. poae* and *E. layuense* (Fig. 1). These species all produce typical epicoccoid conidia (multicellular-phragmosporous, verrucose), with phoma-like conidia only observed in *E. nigrum*. *Epicoccum dendrobii* differs in the length of its epicoccoid conidia (11–19 μm) from *E. nigrum* (15–35 μm; Punithalingam et al. 1972) and *E. poae* (10–23 μm), and in its NaOH reaction (negative) from *E. layuense* (a pale reddish brown discolouration on MEA, with a yellowish brown margin).

*Epicoccum duchesneae* Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818966. Fig. 20.

**Eymology:** Name derived from *Duchesnea*, the plant genus from which the holotype was collected.

Leaf spots amphigenous, circular to irregular, 2–5 mm diam, yellowish brown, surrounded by a purple border (Fig. 7F). *Conidiomata* pycnidial, solitary, globose to subglobose, covered with hyphal outgrowths, immersed in agar, ostiolate, (150–) 170–270 × (100–)150–230 μm. Ostiole single, sometimes with an elongated, pale brown neck, slightly papillate. *Pycnidial wall* pseudoparenchymatous, composed of isodiametric cells, 3–5 layers, 13–30 μm thick, outer wall of 2–3 pigmented layers. *Conidiogenous cells* phialidic, hyaline, smooth, ampulliform to doliiform, 4.5–9.5 × 3.5–7 μm. *Conidia* ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 2.5–3.5 × 1.5–2 μm, eguttulate or sometimes with 1(–3) small guttules. *Conidial matrix* whitish to salmon.
Culture characteristics: Colonies on OA, 62–65 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, white to grey, greyish brown near the centre; reverse white to dark brown. Colonies on MEA 24–27 mm diam after 7 d, margin regular, covered by white, sparse floccose aerial mycelia, grey to pale olivaceous; reverse concolourous. Colonies on PDA, 55–60 mm diam after 7 d, margin regular, aerial mycelia covering the whole colony, floccose, white to grey; reverse greenish olivaceous to dark brown. Application of NaOH results in a pale olivaceous discolouration of the agar.

Specimens examined: China, Jiangxi, Ganzhou, on leaves of Duchesnea indica, 12 May 2013, Q. Chen (holotype HMAS 247161, dried culture, ex-holotype living culture CGMCC 3.18345 = LC 5139); ibid. LC 8147.

Notes: Epicoccum duchesneae formed a distinct lineage close to E. huancayense (Fig. 1). Epicoccum duchesneae differs in producing smaller conidia from E. huancayense, 2.5–3.5 × 1.5–2 μm vs. (4–)5–6(–12) × 2.5–4.5 μm (de Gruyter et al. 1998).

Epicoccum hordei Q. Chen, Crous & L. Cai, sp. nov. Myco-Bank MB818961. Fig. 21.

Etymology: Named after the host genus Hordeum, from which the holotype was isolated.

Conidiomata pycnidial, solitary or aggregated, globose to sub-globose, glabrous, semi-immersed or on the surface of agar, ostiolate, (85–)115–190(–260) × (70–)95–180 μm. Ostiole single, non-papillate. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 2–3 layers, 11–18.5 μm thick, pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 7–8.5 × 5.5–7.5 μm. Conidia obovoid, ellipsoidal to oblong, cylindrical, smooth- and thin-walled, hyaline, aseptate, 6.5–9 × 3–4 μm, with several minute guttules. Conidial matrix pale brown. Chlamydospores unicellular, produced on the agar, yellowish brown to dark brown, intercalary, in chains, globose to subglobose, 6–21.5 μm diam, thick-walled.

Culture characteristics: Colonies on OA, 58–62 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, white to grey; reverse greenish olivaceous to dark brown. Application of NaOH results in a pale olivaceous discolouration of the agar.
grey, pale olivaceous near the centre; reverse white to amber. Colonies on MEA 43–46 mm diam after 7 d, margin regular, aerial mycelia white, fluffy to floccose, grey to greenish yellow; reverse concolourous. Colonies on PDA, 54–56 mm diam after 7 d, margin regular, aerial mycelia floccose, white to grey, with pale olivaceous concentric rings; reverse pale greenish brown to olivaceous, with concentric rings. Application of NaOH results in a pale brown discolouration of the agar.

Specimens examined: Australia, on seeds of Hordeum vulgare, 2014, W.J. Duan (holotype HMAS 247162, dried culture, ex-holotype living culture CGMCC 3.18360 = LC 8148); ibid. LC 8149.

Notes: Isolates of this species clustered in a lineage closely related to Epicoccum pimprinum (49 bp differences in four sequenced loci) (Fig. 1). Morphologically, E. hordei differs in the colour of its conidial matrix (pale brown) from E. pimprinum (salmon) and the absence of elongated necks of pycnidia (with pronounced necks in E. pimprinum) (Boerema 1993).

Epicoccum italicum Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818965. Fig. 22.

Etymology: Named after the country where the holotype was collected, Italy.

Conidiomata sporodochial, aggregated, semi-immersed or superficial, clavate, yellowish brown. Hyphae septate, branched, 3.5–5 μm. Conidia multicellular-phragmosporous, verrucose, subglobose-pyriform, brown, with a basal cell, 12.5–28 μm diam.

Culture characteristics: Colonies on OA, 48–50 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, white to yellow, dark iron-grey near the centre, with a pale yellow halo near the margin, and a yellow concentric ring; reverse buff to yellowish brown. Colonies on MEA 50–55 mm diam after 7 d, margin regular, grey to pale yellowish green, with sparse white aerial mycelia; reverse concolourous. Colonies on PDA, 35–39 mm diam after 7 d, margin irregular, aerial mycelia floccose, yellow with a white margin, black near the centre; reverse salmon to saffron, with a yellow margin. Application of NaOH results in a yellow discoulouration of the agar.

Specimens examined: Italy, on seedlings of Acca sellowiana, 2013, W.J. Duan (holotype HMAS 247163, dried culture, ex-holotype living culture CGMCC 3.18361 = LC 8150); ibid. LC 8151.

Notes: Phylogenetically, Epicoccum italicum formed a distinct lineage closely related to E. dendrobii. Morphologically, the two species could be distinguished in the length of epicoccoid conidia (12.5–28 μm in E. italicum vs. 11–19 μm in E. dendrobii), and the results of NaOH test (a yellow discoulouration in E. italicum vs. negative in E. dendrobii).

Epicoccum latusicollum Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818960. Fig. 23.

Etymology: Name refers to the wide neck of pycnidia, latus = wide, collum = neck.

Conidiomata pycnidial, mostly solitary, sometime aggregated, globose to subglobose or pyriform, glabrous, produced on the agar surface, ostiolate, 110–155 × 90–130 μm. Ostioles 1–2, sometimes elongated as a short, slightly papillate neck. Pycnidal wall pseudoparenchymatous, composed of oblong to isodiametric cells, 3–4 cell layers of which outer 2–3 are brown pigmented, 15–20 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 5–8 × 4–5.5 μm. Conidia ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 4–6.5 × 2–3 μm, guttulate. Conidial matrix buff.
Culture characteristics: Colonies on OA, 70–72 mm diam after 7 d, margin regular, flattened, whole colony covered by floccose aerial mycelia, white, grey to smoke grey near the centre; reverse white to buff. Colonies on MEA 75–80 mm diam after 7 d, margin regular, aerial mycelia floccose, greyish dull green, forming several mycelial pellets, white or pale salmon; reverse grey, with some yellow sections. Colonies on PDA, 80–85 mm diam after 7 d, margin regular, floccose aerial mycelia covering the whole colony, dense, white to grey, forming several white mycelial pellets; reverse white to hazel. NaOH spot test: a green discolouration on MEA, later changing to three colour layers, via dark green, pale red to purple, from the centre to the outer ring.

Specimens examined: China, Jiangxi, Ganzhou, on leaves of Vitex negundo, 25 Apr. 2013, Q. Chen, LC 5124; Jiangxi, Ganzhou, endophyte of Camellia sinensis, 7 Sep. 2013, Y. Zhang, LC 4859; Shandong, Jinan, on leaves of Sorghum bicolor, 3 Aug. 2013, N. Zhou (holotype HMAS 247164, dried culture, ex-holotype living culture CGMCC 3.18346 = LC 5158). Japan, Podocarpus macrophyllus, 2013, W.J. Duan, LC 8152; ibid. LC 8153; on stem of Acer palmatum, LC 8154.

Notes: Isolates of Epicoccum latusicollum clustered in a sister clade to E. camelliae, E. sorghinum and E. viticis (Fig. 1). Although the conidial dimensions are similar in these species, E. latusicollum differs in 1 bp in ITS, 14 bp in rpb2 and 5 bp in tub2 from E. camelliae; 16 bp in rpb2 and 7 bp in tub2 from E. sorghinum; and 1 bp in ITS, 1 bp in LSU, 16 bp in rpb2 and 4 bp in tub2 from E. viticis.

This is the first report of an Epicoccum species from Acer palmatum (Aceraceae), Podocarpus macrophyllus (Podocarpaceae) and Vitex negundo (Verbenaceae).

Epicoccum layuense Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818963. Fig. 24.
**Etymology:** Epithet derived from the location of origin, Layue Village in Tibet, China.

**Leaf spots** distinct, angular to irregular, up to 12 mm diam, dark brown. **Conidiomata** sporodochial, aggregated, superficial, clavate, brown. **Hyphae** septate, branched, 2–5.5 μm. **Conidia** multicellular-phragmosporous, verrucose, subglobose-pyriform, with a basal cell, dark brown, 13–19.5 μm diam.

**Culture characteristics:** Colonies on OA, 27–37 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, yellow to reddish brown near the centre, with a white margin; reverse yellow to saffron, bright yellow. Colonies on MEA, 25–27 mm diam after 7 d, margin irregular, aerial mycelia white to greenish yellow, fluffy to floccose, grey to greenish yellow; reverse white to greenish yellow. Colonies on PDA, 20–22 mm diam after 7 d, margin irregular, aerial mycelia flattened, brownish yellow, with a white margin; reverse yellow to saffron, brown towards the centre. NaOH spot test: a pale brown discolouration on MEA.

**Specimens examined:** China, Tibet, Lulang, on leaves of *Perilla* sp., 15 Jun. 2015, Q. Chen (holotype HMAS 247165, dried culture, ex-holotype living culture CGMCC 3.18362 = LC 8155); ibid. LC 8156.

**Notes:** This species is phylogenetically closely related to *E. nigrum* and *E. poae*, but *E. layuense* has differences at 19 positions from *E. nigrum* and 14 positions from *E. poae* in the multi-locus sequences of their ex-type strains. Morphologically, *E. layuense* produces smaller epicoccoid conidia than *E. nigrum* (13–19.5 μm vs. 15–35 μm; Punithalingam *et al.* 1972), and they also differ in their NaOH reactions (a pale reddish brown discolouration on *E. layuense*, but pale brown on *E. poae*).

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**Epicoccum poae** Q. Chen, Crous & L. Cai, **sp. nov.** MycoBank MB818962. **Fig. 25.**

**Etymology:** Name derived from *Poa*, the plant genus from which the holotype was collected.

**Conidiomata** sporodochial, aggregated, superficial, clavate, brown. **Hyphae** septate, branched, 2–3 μm. **Conidia** multicellular-phragmosporous, verrucose, subglobose-pyriform, with a basal cell, dark brown, 10–23 μm diam.

**Culture characteristics:** Colonies on OA, 49–51 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, yellow, reddish brown to brown near the centre, with a white margin; reverse yellow to saffron, with some brown sections. Colonies on MEA, 25–27 mm diam after 7 d, margin irregular, aerial mycelia white to greenish yellow, fluffy to floccose, grey to greenish yellow; reverse white to greenish yellow. Colonies on PDA, 20–22 mm diam after 7 d, margin irregular, aerial mycelia flattened, brownish yellow, with a white margin; reverse yellow to saffron, brown towards the centre. NaOH spot test: a pale brown discolouration on MEA.

**Specimens examined:** USA, on seeds of *Poa annua*, Oct. 2014, X.M. Wang, strain isolated by Q. Chen (holotype HMAS 247166, dried culture, ex-holotype living culture CGMCC 3.18363 = LC 8160); ibid. LC 8161, LC 8162.

**Notes:** *Epicoccum poae* is phylogenetically closely related to *E. nigrum* (Fig. 1), but differs in producing smaller epicoccoid...
conidia (10–23 μm vs. 15–35 μm; Punithalingam et al. 1972). Furthermore, E. poae hasn’t been observed to have phoma-like conidia, while E. nigrum readily produces short-cylindrical conidia, 3–7(–10) × 1.5–3(–3.5) μm (Punithalingam et al. 1972).

E. poae Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818959. Fig. 26.

Etymology: Name derived from Vitex, the plant genus from which the holotype was collected.

Leaf spots amphigenous, circular to irregular, 2–8 mm diam, close to the leaf margin, reddish brown, single lesions may coalesce to form larger lesions and become dark brown (Fig. 7H). Conidiomata pycnidial, aggregated or solitary, (sub-)globose, glabrous, brown, produced on the agar surface, 120–200 × 100–175 μm. Ostioles 1–2, papillate. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 2–3 cell layers, outer 1–2 layers brown pigmented, 8–16 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 5.5–6 × 3.5–5 μm. Conidia ellipsoidal to obovoid, smooth- and thin-walled, hyaline, aseptate, 3.5–6 × 2–3 μm, with two minute polar guttules. Conidial matrix buff to cinnamon.

Culture characteristics: Colonies on OA, 48–67 mm diam after 7 d, margin regular, aerial mycelia floccose, white to grey, with a greyish olivaceous concentric ring; reverse white to pale olivaceous, with a broad greyish olivaceous concentric ring. Colonies on MEA 75–80 mm diam after 7 d, margin regular, aerial mycelia fluffy to floccose, grey to pale yellowish green; reverse concolourous. Colonies on PDA, 70–75 mm diam after 7 d, margin regular, floccose aerial mycelia covering the whole colony, grey; reverse white to buff, with some dull green dots. NaOH test negative.

Specimens examined: Australia, Darwin, Northern Territory University, Greenhouse, from Andropogon gayanus, 2002, A. Hollingsworth, BRIP 29294 = LC 5257. China, Jiangxi, Ganzhou, on leaves of Vitex negundo, 25 Apr. 2013, Q. Chen (holotype HMAS 247167, dried culture, ex-holotype living culture CGMCC 3.18344 = LC 5126).

Note: Epicoccum viticis is phylogenetically closely related to E. camelliae (Fig. 1), with 10 bp differences in four sequenced loci.

Heterophoma Q. Chen & L. Cai, Stud. Mycol. 82: 165. 2015.

H. verbascicola Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB819128. Fig. 27.

Etymology: Named after the host genus from which the holotype was collected, Verbascum.

Leaf spots amphigenous, angular to irregular, 2–7 mm diam, scattered over the leaf, brown, with a pale yellow diffuse halo (Fig. 7J). Conidiomata pycnidial, aggregated or solitary, globose to subglobose or obpyriform, brown, covered with some hyphal outgrowths, semi-immersed or superficial, ostiolate, 120–300 × (100–)150–300 μm. Ostioles 2–3, elongated as short necks, slightly papillate or non-papillate. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 2–3 layers, 7–20 μm thick, outer wall 1–2-layers pigmented. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 5.5–6 × 3.5–5 μm. Conidia ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, incidentally
produce 1-septate large conidia, 3.5–6(–8) × 1.5–3.5 μm, with 1–2 guttules. Conidial matrix cream to buff.

Culture characteristics: Colonies on OA, 40–45 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, white, with grey margin, greyish olivaceous near the centre; reverse white to pale olivaceous with a broad white concentric ring. Colonies on MEA 50–52 mm diam after 7 d, margin regular, aerial mycelia fluffy to floccose, white; reverse concolourous. Colonies on PDA, 50–53 mm diam after 7 d, margin irregular, crenate, dense, felty, white to mouse-grey; reverse white to hazel, with brown concentric rings. NaOH test negative.

Specimens examined: China, Tibet, Lulang, on leaves of Verbascum thapsus, 15 Jun. 2015, Q. Chen (holotype HMAS 247168, dried culture, ex-holotype living culture CGMCC 3.18364 = LC 8163); ibid. LC 8164.

Notes: Heterophoma verbascicola is phylogenetically closely related to H. novae-verbascicola, but is distinguishable from the latter species in its slightly narrower conidiogenous cells (5.5–6 × 3.5–5 μm vs. 2–6 × 4–6 μm; de Gruyter et al. 1993) and larger conidia (3.5–8 × 1.5–3.5 μm vs. 3.5–5.5 × 1.5–2.5 μm). Moreover, the NaOH test showed a yellowish green discolouration that became reddish in H. novae-verbascicola, but remained negative in H. verbascicola.

Neoascocya Q. Chen & L. Cai, Stud. Mycol. 82: 198. 2015.

Neoascocya argentina L.W. Hou, Crous & L. Cai, sp. nov. MycoBank MB820003. Fig. 28.

Etymology: Epithet derived from the country of origin, Argentina.
Conidiomata pycnidial, solitary or aggregated, (sub-)globose
of flask-shaped, glabrous, semi-immersed or immersed, ostiolate,
210–390 × 140–270 µm. Ostioles 1–3, sometimes elongated as a
long neck (up to 350 µm), papillate. Pycnidial wall pseudoen-
chymatous, composed of oblong to isodiametric cells, 4–6
layers, with outer 3–4-layers pigmented, 14.5–52 µm thick.
Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliform,
7.5–14.5 × 6–13.5 µm. Conidia cylindrical, smooth- and thin-
walled, hyaline, 0–1-septate, (10.5–)11.5–14.5(–16) × 3–5 µm,
guttulate. Conidial matrix whitish cream.

Culture characteristics: Colonies on OA, 50–55 mm diam after
7 d, margin regular, densely covered by floccose aerial mycelia,
greyish olivaceous, with some white zones near the margin;
reverse greyish black. Colonies on MEA 55–60 mm diam after
7 d, margin regular, densely covered by woolly aerial mycelia,
fawn, white near margin; reverse brown. Colonies on PDA,
60–65 mm diam after 7 d, margin regular, covered by pale grey
aerial mycelia, floccose, dark olivaceous near the margin;
reverse greyish brown. NaOH spot test: a pale reddish brown
discolouration on MEA.

Specimen examined: Argentina, Tandil, from a leaf of Triticum aestivum, Oct.
2002 (holotype CBS H-23014, dried culture, ex-holotype living culture CBS 112524).

Notes: CBS 112524 was initially received as “Ascochyta hordei”. However, this isolate clustered in the Neoascochyta clade, and
produces much smaller conidia (10.5–16 × 3–5 µm) than As.
hordei (15–22 × 3.5–4.5 µm; Punithalingam 1979). Therefore,
Neo. argentina is introduced as a new species, based on isolate
CBS 112524. Neoascochyta argentina is well distinguished from
its most closely related species Neo. triticicola by its smaller
conidia (10.5–16 × 3–5 µm vs. 16.5–27 × 5–8.5 µm).
**Neoascochyta triticicola** L.W. Hou, Crous & L. Cai, sp. nov. MycoBank MB820004. Fig. 29.

**Etymology**: Name refers to the host genus *Triticum*, from which the holotype was collected.

Conidiomata pycnidial, mostly confluent, flask-shaped, glabrous or sometimes with hyphal outgrows, superficial or semi-immersed on the agar, (170–)230–420(–620) × 160–430 μm; conidiomata becoming black, irregular with age, and ostiolate. Ostioles 1–3(–5), developing to conspicuously elongated necks (up to 400 μm tall), papillate. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 4–6 layers, with outer 2–3-layers pigmented, 25–40 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, 8.5–13 × (4.5–)7.5–12(–13) μm. Conidia bacilliform to fusiform, smooth- and thin-walled, hyaline, mainly uniseptate, occasionally aseptate, (16.5–)20–27 × 5–8.5 μm, guttulate. Conidial matrix whitish cream to pale salmon.

**Culture characteristics**: Colonies on OA, 55–65 mm diam after 7 d, margin regular, aerial mycelia floccose, greyish black, with some greyish mycelia tufts; reverse concolourous. Colonies on MEA 40–55 mm diam after 7 d, margin irregular, slightly lobate, covered by floccose mycelia, white, greyish olivaceous to greyish pink near the centre; reverse dark brown, saffron near the margin. Colonies on PDA, 55–65 mm diam after 7 d, margin irregular, slightly lobate, covered by floccose, greenish black mycelia, with erected tufts of white mycelia; reverse greyish olivaceous. NaOH spot test: a pale reddish brown discoloration on MEA.

Specimen examined: South Africa, Heilbron, from *Triticum aestivum*, deposited in CBS Sep. 1974, W.J. Jooste (holotype CBS H-9008, ex-holotype living culture CBS 544.74).

**Notes**: Isolate CBS 544.74 was originally identified as “Ascochyta hordei” but clustered in the Neoascochyta clade. Morphologically, it differs in producing larger conidia (16.5–27 × 5–8.5 μm) from *Ascochyta hordei* (15–22 × 3.5–4.5 μm; Punithalingam 1979).
Therefore, we introduce CBS 544.74 as a new species, *Neoascocytta* *triticicola*. In *Neoascocytta*, it should be compared with *Neoascocytta* *argentina*, which is discussed under the notes of the latter species.

*Neoascocytta soli* Q. Chen, Crous & L. Cai, sp. nov. Myco-Bank MB818975. Fig. 30.

**Etymology:** Name derived from the substrate where the holotype was collected, soil.

*Neoascocytta* *solii* Q. Chen, Crous & L. Cai, sp. nov. Myco-Bank MB818975. Fig. 30.

**Etymology:** Name derived from the substrate where the holotype was collected, soil.

**Conidiomata** pycnidial, aggregated or solitary, globose to sub-globose, dark brown, glabrous, superficial, ostiolate, (135–) 390–630 × (110–) 340–565 μm. Ostiole single, slightly papillate or non-papillate. **Pycnial wall** pseudoparenchymatous, composed of isodiametric cells, 3–5 layers, 18–42 μm thick, outer wall of 1–2-pigmented layers. **Conidiogenous cells** phialidic, hyaline, smooth, ampulliform to doliiform, 6–10.5 × 5.5–9 μm. **Conidia** ellipsoidal to oblong, smooth- and thin-walled, hyaline, aseptate, 7–10 × 3–4 μm, with 2 to several polar guttules. Conidial exudates not recorded.

**Culture characteristics:** Colonies on OA, 62–64 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, white, greyish olivaceous near the centre; reverse white to iron grey. Colonies on MEA 45–47 mm diam after 7 d, margin irregular, grey, white near the centre; reverse white to olivaceous, forming concentric rings. Colonies on PDA, 50–53 mm diam after 7 d, margin regular, aerial mycelia fluffy, white to olivaceous; reverse concolourous. NaOH test negative.

**Specimens examined:** China, Guizhou, Kuankuoshui National Geopark, soil, 23 Jul. 2014, Z.F. Zhang (holotype HMAS 247169, dried culture, ex-holotype living culture CGMCC 3.18365 = LC 8165); ibid. LC 8166.
Neoascochyta soli clustered with Neoa. paspali in a distinct clade in this genus, but can be differentiated from the latter in producing larger conidiogenous cells (6–10.5 × 5.5–9 μm vs. 4–6 × 4–6 μm). In addition, the test of metabolite E production was negative for Neoa. soli, while a green to bluish discolouration, becoming red, appeared in Neoa. paspali (de Gruyter et al. 1998).

Neodidymelliopsis Q. Chen & L. Cai, Stud. Mycol. 82: 207. 2015.

Neodidymelliopsis achlydis L.W. Hou, Crous & L. Cai, sp. nov. MycoBank MB820005. Fig. 31.

Etymology: Named after the host genus Achlys, from which the holotype was collected.

Conidiomata pycnidial, solitary or aggregated, (sub-)globose, glabrous, semi-immersed or superficial, ostiolate, (150–)300–550(–630) × (120–)250–500(–630) μm. Ostioles 1–5, slightly papillate. Pycnidial wall pseudoparenchymatous, composed of oblong to isodiametric cells, 4–9 layers, with outer 2–4-layers pigmented, 30–80 μm thick. Conidiogenous cells phialidic, hyaline, smooth, ampulliform to doliiform, (4–)6.5–10 × (3.5–)4.5–6.5 μm. Conidia oblong to cylindrical, incidently slightly curved, smooth- and thin-walled, hyaline, aseptate, 7.5–10(–18) × 2–3.5(–5) μm, with two polar guttules. Conidial matrix whitish cream.

Culture characteristics: Colonies on OA, 45–50 mm diam after 7 d, margin regular, aerial mycelia floccose and compact, white to pale grey; reverse saffron to pale yellowish brown, yellow near margin. Colonies on PDA, 50–52 mm diam after 7 d, margin regular, densely covered by floccose, grey aerial mycelia, white near the margin; reverse pale brown to brown. NaOH spot test: a dull green discolouration with a reddish brown margin on MEA.

Specimen examined: Canada, British Columbia, from a leaf of Achlys triphylla, Jun. 1976, J. Gremmen (holotype CBS H-23015, dried culture, ex-holotype living culture CBS 256.77).

Notes: Isolate CBS 256.77 was received as “Ascochyta achlydis”, which was from the same host (Achlys triphylla) and the same location (Canada) as reported for Ascochyta achlydis (Dearness 1916). However, it produces narrower and aseptate conidia compared to the uniseptate conidia of As. achlydis (7.5–18 × 2–5 μm vs. 14–20 × 5–6.5 μm; Dearness 1916), and is obviously a different species. Phylogenetically, CBS 256.77 clustered in the Neodidymelliopsis clade, closely related to Neod. polemonii and Neod. xanthina (Fig. 1), and has differences at six positions from Neod. polemonii and 12 positions from Neod. xanthina in multi-locus sequences of their ex-type strains. We therefore introduce a new species, Neod. achlydis based on CBS 256.77. Morphologically, Neod. achlydis produces pycnidia with 1–5 ostioles, while Neod. xanthina only has pycnidia with a single ostiole (Boerema et al. 2004). Neodidymelliopsis achlydis differs from Neod. polemonii in its whitish cream conidial matrix from whitish/smoke grey of Neod. polemonii (Boerema et al. 2004). Neodidymelliopsis achlydis is also well distinguished from Neod. polemonii and Neod. xanthina in the NaOH reactions (dull green with pale reddish brown margin in Neod. achlydis, pale sienna to rust colour in Neod. xanthina).
polemonii, reddish brown discolouration in Neod. xanthina; Boerema et al. 2004).

**Neodidymelliopsis longicolla** L.W. Hou, Crous & L. Cai, sp. nov. MycoBank MB820006. Fig. 32.

*Etymology*: Name refers to the elongated, long ostiolar necks.

*Conidiomata* pycnidial, solitary or aggregated, globose to flask-shaped, glabrous or with some hyphal outgrows, superficial or semi-immersed, ostiolate, 200–490 × 150–360 μm. Ostioles 1–3, developing into elongated necks, up to 250 μm tall, papillate. *Pycnidial wall* pseudoparenchymatous, composed of isodiametric cells, 4–7 layers, outer 3–6-layers pigmented, 20–45 μm thick. *Conidiogenous cells* phialidic, hyaline, smooth, ampulliform, 4.5–6.5 × 4.5–6 μm. *Conidia* oblong to cylindrical, smooth- and thin-walled, initially aseptate and hyaline, later becoming 1-septated and pale brown, somewhat constricted at the septum, 12–15(–16.5) × 4–7 μm, guttulate. *Conidial matrix* brown.

**Culture characteristics**: Colonies on OA, 45–52 mm diam after 7 d, margin regular, aerial mycelia white and woolly, greenish olivaceous; reverse darker brown. Colonies on MEA 55–57 mm diam after 7 d, margin regular, covered by floccose, white aerial mycelia, black pycnidia visible; reverse brown, saffron near the margin. Colonies on PDA, 55–60 mm diam after 7 d, margin
regular, densely covered by floccose aerial mycelia, grey, greenish olivaceous near the margin; reverse dark brown, pale brown near the margin. Application of NaOH results in a pale reddish brown discolouration on MEA.

Specimen examined: Israel, En Avdat, Negev desert, from soil in desert, Feb. 1996, A. van Iperen (holotype CBS H-23016, dried culture, ex-holotype living culture CBS 382.96).

Notes: CBS 382.96 was deposited as "Ascochyta scotinospora", but differs from As. scotinospora by its larger pycnidia (200–490 × 150–360 μm vs. 140 μm diam) and forming elongated long necks. (Punitthalingam 1979). Phylogenetically, it clustered in the Neodidymelliopsis clade, basal to Neod. achlydis, Neod. polemonii and Neod. xanthina (Fig. 1). Hence, CBS 382.96 was described as a new species, Neod. longicolla. Neodidymelliopsis longicolla differs from Neod. achlydis in its septate conidia (mainly 1-septated vs. aseptate) and colour of its conidial matrix (brown vs. whitish cream); from Neod. polemonii in producing wider conidia (12–16.5 × 4–7 μm vs. 4.5–7.5 × 1.5–4 μm; Chen et al. 2015a); from Neod. xanthina in the number of pycnidial ostioles (1–3 vs. 1; Boerema et al. 2004).

**Phoma** Sacc. emend. Q. Chen & L. Cai, Stud. Mycol. 82: 194. 2015.

**Phoma herbarum** Westend., Bull. Acad. R. Sci. Belg., Cl. Sci. 19(3): 118. 1852, emend. Q. Chen & L. Cai, Stud. Mycol. 82: 195. 2015.

Synonyms: Phoma neerlandica Q. Chen & L. Cai, Stud. Mycol. 82: 197. 2015. Atradidymella muscivora M.L. Davey & Currah, Amer. J. Bot. 96: 1283. 2009. Phoma muscivora M.L. Davey & Currah, Amer. J. Bot. 96: 1283. 2009. Phoma cruris-hominis Punith., Nova Hedwigia 31: 135. 1979.
Specimens examined: **Canada**, Alberta, Wolf Lake, from gametophytes of *Polytrichum juniperinum*, 2008, M.L. Davey, UAMH 10909 = CBS 127589. **Switzerland**, Kt. Graubünden, from *Achillea millefolium*, deposited in CBS Mar. 1951, E. Müller, CBS 304.51. **The Netherlands**, Emmeloord, from the stem of *Rosa multiflora* cv. *Cathayensis*, deposited in CBS Dec. 1975, G.H. Boerema, CBS 615.75 = PD 73665 = IMI 199779; Emmeloord, from a leaf of *Delphinium* sp., deposited in CBS Feb. 1996, culture ex-holotype of *"Phoma neerlandica"* CBS 134.96 = PD 84/676; Naaldwijk, from a stem base of *Nerium* sp., deposited in CBS Sep. 1991, J. de Gruyter, CBS 502.91 = PD 82/276. **UK**, from a leg of a woman, Apr. 1977, Y.M. Clayton, CBS 377.92 = IMI 213845; near Dumfries, from die-back of *Picea excelsa*, deposited in CBS Oct. 1937, T.R. Peace, CBS 274.37.

**Notes:** *Phoma neerlandica* was regarded distinct from *P. herbarum* based on its slightly longer and occasionally uniseptate conidia (Chen et al. 2015a). Similar to many other species in *Didymellaceae*, such an overlapping morphology often caused confusion with regards to species boundaries.

Unfortunately, a sequencing error occurred in the *tub2* sequence of CBS 134.96, which was not detected in the subsequent control and processing steps. *Phoma neerlandica* therefore became a name introduced with ambiguous data, and is therefore reduced to synonymy.

**Stagonosporopsis** Died. emend. Aveskamp et al., Stud. Mycol. 65: 44. 2010.

**Stagonosporopsis bomiensis** Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818955. Fig. 33.

**Etymology:** Epithet derived from its location of origin, Bomi in Tibet, China.

**Leaf spots** amphigenous, circular to irregular, 2–5 mm diam, scattered over the leaf, brown, surrounded by a greenish yellow
border, single lesions may coalesce to form larger lesions till the whole leaf and getting dark brown (Fig. 7G). *Conidiomata* pycnidial, solitary, sometimes aggregated, globose to sub-globose, pale brown, glabrous, superficial, ostiolate, 100–200 × 100–180 μm. *Ostiole* single, with an elongated neck, slightly papillate or non-papillate. *Pycnidial wall* pseudoparenchymatous, composed of oblong to isodiametric cells, 2–3 layers, 20–30 μm thick, outer wall 1–2-layers pigmented. *Conidiogenous cells* phialidic, hyaline, smooth, ampulliform to doliform, 5–8 × 4.5–7 μm. *Conidia* ovoid to ellipsoidal, smooth-and-thin-walled, hyaline, aseptate, 3.5–6.5 × 2–3.5 μm, with 1–2 distinct polar guttules. *Conidial matrix* buff.

**Culture characteristics:** Colonies on OA, 35–43 mm diam after 7 d, margin regular, covered by floccose aerial mycelia, dense, white to greyish olivaceous; reverse white to olivaceous. Colonies on MEA 45–47 mm diam after 7 d, margin irregular, olivaceous, with sparse white aerial mycelia near the centre; reverse concolourous. Colonies on PDA, 53–55 mm diam after 7 d, margin regular, aerial mycelia floccose, white to olivaceous, forming concentric rings; reverse olivaceous with pale green margin. NaOH test negative.

**Specimens examined:** China, Tibet, Bomi, leaves of Boraginaceae, 14 Jun. 2015, Q. Chen (holotype HMAS 247170, dried culture, ex-holotype living culture CGMCC 3.18366 = LC 8167); ibid. LC 8168.

**Notes:** *Stagonosporopsis bomiensis* is most closely related to *S. papillata*, another novel species collected from Tibet. However, *S. bomiensis* is distinguishable from *S. papillata* by having...
slightly shorter and wider conidia (3.5–6.5 × 2–3.5 μm vs. 3.5–9 × 1.5–3 μm), and based on its number of ostioles (1 vs. 2–3).

This is the first record of a Stagonosporopsis species on a member of the Boraginaceae.

**Stagonosporopsis papillata** Q. Chen, Crous & L. Cai, sp. nov. MycoBank MB818954. Fig. 34.

**Etymology:** Name refers to its papillate pycnidia.

**Leaf spots** amphiogenous, angular to irregular, 2–8 mm diam, reddish brown, indefinite border (Fig. 7K). *Conidionoma* pycnidial, solitary or aggregated, yellowish brown to brown, globose to subglobose or obpyriform, with hyphal outgrowths, semi-immersed in the agar, ostiolate, (130–)280–250 × (100–)150–250 μm. *Ostioles* 2–3, slightly papillate. *Pycnidal wall* pseudoparenchymatous, composed of oblong to isodiametric cells, 2–3 layers, 10–15(–20) μm thick, outer wall 1–2-layers pigmented. *Conidigenous cells* phialidic, hyaline, smooth, ampulliform to doliiform, 5–8.5 × 4–7.5 μm. *Conidia* ellipsoidal to oblong, incidentally slightly curved, smooth- and thin-walled, hyaline, aseptate, 3.5–6.5(–9) × 1.5–3 μm, with two large polar guttules. *Conidial matrix* buff.

**Culture characteristics:** Colonies on OA, 44–50 mm diam after 7 d, margin regular, covered by white, dense aerial mycelia, grey near the centre, with white margin; reverse olivaceous with white margin. Colonies on MEA 50–52 mm diam after 7 d, margin regular, dull green, aerial mycelia sparsely; reverse concolourous. Colonies on PDA, 55–57 mm diam after 7 d, margin regular, aerial mycelia covering the whole colony, white; reverse olivaceous with white margin. NaOH test negative.

Specimens examined: China, Tibet, Bomi, on leaves of Rumex nepalensis, 14 Jun. 2015, Q. Chen (holotype HMAS 247171, dried culture, ex-holotype living culture CGMCC 3.18367 = LC 8169); ibid. LC 8170; Bomi, on leaves of Boraginaceae, 14 Jun. 2015, Q. Chen, LC 8171.

**Notes:** *Stagonosporopsis papillata* is phylogenetically allied to *S. bomiensis* and *S. dorenboschii* (Fig. 1). Morphological differences between *S. papillata* and *S. bomiensis* are discussed under the latter species. *Stagonosporopsis papillata* could be differentiated from *S. dorenboschii* by producing slightly larger conidiogenous cells (5–8.5 × 4–7.5 μm vs. 4–6 × 3–6 μm) and conidia (3.5–9 × 1.5–3 μm vs. 3–5.5 × 1.5–2.5 μm; de Gruyter & Noordeloos 1992).

**DISCUSSION**

The *Didymellaceae* has recently undergone extensive revision based on its phylogenetic relationships (Aveskamp et al. 2009a, b, 2010, de Gruyter et al. 2009, Chen et al. 2015a). In this study, 32 new taxa and two new combinations are proposed in nine genera, mostly based on specimens collected from Asia.

The majority of members in *Didymellaceae* are plant associated fungi. So far, only a few species were reported from other substrates, such as *Phoma herbarum*, *Didymella glomerata*, *D. pomerum* from inorganic materials including asbestos, cement, paint, etc. (Aveskamp et al. 2008), *D. eucalyptica* from water, *D. gardeniae* from air, and *Leptosphaerulina australis* from soil (Aveskamp et al. 2010). In the present study, several new species, namely *Allopoma oligotrophic*, *Didymella aeria*, *D. aquatica*, *D. chloroguttulata*, *D. ellipsoidae*, *D. suiyangensis* were collected from substrates such as air, soil, water and limestone from caves in South-west China, a typical environment with relatively low temperature, low nutrition, high humidity, and absolute darkness (Zhang et al. 2017). All these species are oligotrophic fungi except *D. aquatic*. It is interesting that many of these new species present pale green to dull green polar guttules which are not often observed in other species, while few other recognizable morphological differences could be observed.

The 360 isolates belonging to 194 taxa investigated in this study represent a large collection of *Didymellaceae*, which occurred on 163 different host genera within 70 families. Our results indicated that *Asteraceae*, *Fabaceae*, *Poaceae*, *Ranunculaceae*, *Rosaceae* and *Solanaceae* were the six most common host families associated with *Didymellaceae* (Fig. 2). Based on currently available data, several genera exhibited a certain level of host-specificity, i.e. *Ascochyta* species show relatively high host specificity to *Fabaceae*, *Neoascocytta* to *Poaceae* and *Neomicrosphaeropsia* to *Tamaricaceae*. *Heterophoma* species appear somewhat specific to *Scrophulariaceae*, as well as *Phomatodes* to *Brassicaceae*. Other genera appear to have a rather broad range of host families. Among the five apparently host-specific genera listed above, *Neoascocytta* is located in the earliest divergent clade in *Didymellaceae*, followed by *Phomatodes*, *Ascochyta*, *Neoascocytta* and *Heterophoma*. Surprisingly, this evolutionary direction is consistent with that of their respective host families, i.e. *Poaceae* as earliest, followed by *Brassicaceae*, *Fabaceae*, *Tamaricaceae* and *Scrophulariaceae* (Bremer et al. 2009). Our data suggest, therefore, a general trend of coevolution in the host-specific groups in *Didymellaceae*.

Nine new species belonging to *Epicoccum* and 10 in *Didymella* are proposed in this paper, which reflect the high diversity of species in these two genera. The most remarkable feature of *Epicoccum* species is the formation of the darkly pigmented multi-septate conidia (dictyochlamydoospores) from sporodochia. Of the nine new taxa, four were only observed as typical *Epicoccum* conidia, while the pycnidial morphs proved to be absent. These four species could also produce yellowish pigments that diffuse into culture media. In addition, six of the new *Epicoccum* species showed positive reactions in the NaOH test, that detects the production of metabolite E. *Epicoccum camelliae* is likely an opportunistic pathogen that could asymptptomatically colonise plants as a potential destructive invader, as we obtained two strains, one from a healthy leaf, and another from a diseased leaf. Among the 10 new species described in the sexual genus *Didymella*, *D. sinensis* was recorded as sexual morph in all the single ascospore isolates obtained from three different hosts, while the asexual morph was not observed, revealing the homothallic nature of this species.

In spite of the good performance on the resolution of genera and species in *Didymellaceae* using the combined four loci, LSU, ITS, rp2b and tub2, there are still several taxa or species complexes that await further assessment, such as the *Boeremia* exigua varieties (Abeln et al. 2002, Aveskamp et al. 2009b) and the *Epicoccum nigrum* complex (Fávaro et al. 2011). Additional loci and more isolates are required for a future study to clarify their phylogenetic relationships as well as species boundaries.

Following the 17 genera accepted in *Didymellaceae* by Chen et al. (2015a), *Briansuttonomyces* (Crous and Groenewald 2016) and *Neomicrosphaeropsia* (Thambubala et al. 2017) were subsequently embedded in this family based on the multi-focus
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APPENDIX A. SUPPLEMENTARY DATA

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.simyco.2017.06.002.

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