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UPDATE OF THE TAXONOMY OF THE FUNGAL CLASSIFICATIONS LISTS OF COGEM



Update of the taxonomy of the fungal classifications lists of COGEM

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“Taxonomy is often regarded as the dullest of subjects, fit only for mindless ordering and sometimes denigrated within science as mere ‘stamp collecting.’ If systems of classification were neutral hat racks for hanging the facts of the world, this disdain might be justified. But classifications both reflect and direct our thinking. The way we order represents the ways we think. Historical changes in classification are the fossilized indicators of conceptual revolutions” (Steven Jay Gould, in ‘Finders, Keepers: Eight Collectors’, 1992 Hutchinson)

Foreword

The COGEM advises on the pathogenicity classification of microorganisms in the Netherlands. To ensure transparency for third parties, COGEM publishes annual overviews of the classified microorganisms, including fungal species. As part of the publication of the annual overviews, changes in nomenclature and other taxonomic revisions are incorporated as much as possible. Fungi form a special group in this respect, as they reproduce both sexually and asexually. Because the sexual and asexual stages differ in appearance, fungi have often been given different species names for these stages in the past. In 2011, an international decision was made to discontinue this dual nomenclature and to adopt a single-name system for fungal species, a process that is still ongoing. During the 2024 update of the list of pathogenic and non-pathogenic fungal species it became apparent that the COGEM lists contained inaccuracies.

COGEM therefore commissioned a research project to review and correct the lists of pathogenic and non-pathogenic fungal species with regard to duplicate names and species, taxonomic errors, and related inconsistencies. The study was conducted by Teun Boekhout, an authority in yeast taxonomy who has for many years been affiliated with the Westerdijk Institute as a fungal taxonomist. In the course of this study, several international fungal taxonomists and curators of the principal fungal databases were consulted, and a thorough evaluation of relevant literature was conducted. The report presents an updated overview of the fungal species. For several fungal species it was concluded that they may have been incorrectly included in the COGEM lists and therefore required correction. For the species concerned, the author has proposed amendments. In addition, the author has proposed a methodology to verify whether new fungal species added to the COGEM lists are included under the correct taxonomic name. Beyond these specific updates, the project highlights the importance of ongoing expert collaboration and consensus in fungal taxonomy to ensure accurate and reliable species lists.

The supervisory committee expresses its appreciation for the interaction with the author, both with regard to the methodology and the presentation of the results in this report. The literature review conducted is of particular value and enables COGEM to correct the current overview of classified fungal species and to ensure that future additions are made in accordance with the proposed methodology following the single-name principle.

Dr. ir. Jos Wubben

Chair of the Advisory Committee

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English summary

This project aimed at a critical revision of the fungal species names as present in the COGEM Pathogenicity classification list of fungi. All names were initially screened in the following fungal name repositories: Mycobank (MB), Index Fungorum (IF), and Fungal Names (FN). For both MB and IF the web-based databases as well as the available Excel files have been compared. Later GenBank (GB) and Atlas of Clinical Fungi (ACF) were also included. About 15% (n=95) of the names on the COGEM fungal lists showed conflicting names in at least one of the fungal name repositories. An extensive discussion is provided on the preferred fungal names, including some of their synonyms. 81 fungal families did not show a conflicting name in any of the fungal name repositories, but 18 families showed at least one conflicting name in at least one of the fungal name repositories. The percentage of conflicting names ranged from 4% (*Saccharomycetaceae*) to 80% (*Glomeraceae*). Families with high numbers of conflicting names (or poor nomenclatural quality statistics) need to be urgently revised by the three major fungal name repositories, in consultation with taxonomy experts. The final updated COGEM fungal list was made based on the comparisons of names in the various name repositories and extensive investigation of literature of those names that were found to be non-concordant in the name repositories. This final fungal name list found to be most similar to that of GB, followed by MB. Some variation was also observed in author citations, years of publication and the spelling of names (so-called orthographic variants). Twenty-nine major name changes have been made on the COGEM fungal list. ACF contained several ACF-unique names when compared with all fungal name repositories plus GenBank and theyeasts.org. It is advised that the three major fungal name repositories (MB, IF, FN) harmonize their content more often. The mycological user community will benefit from a merger of the three name repositories. COGEM should not include fungi with only a genus name in their fungal lists. Finally, a strategy is described that can serve as a guide for future additions of fungal names to the COGEM list of fungi.

Dutch summary

Dit project was gericht op een kritische herziening van de namen van schimmelsoorten zoals aanwezig op de COGEM pathogeniteitsclassificatie-lijsten. Alle namen werden aanvankelijk gescreend in de volgende schimmelnamenregisters: Mycobank (MB), Index Fungorum (IF) en Fungal Names (FN). Van MB en IF zijn zowel de web gebaseerde databanken als de beschikbare Excel-bestanden vergeleken. Later werden ook GenBank (GB) en Atlas of Clinical Fungi (ACF) meegenomen. Ongeveer 15% (n=95) van de namen op de COGEM-schimmellijsten vertoonde conflicterende namen in ten minste één van de databanken van schimmelnamen. Er wordt een uitgebreide analyse gegeven van de voorkeursnamen voor schimmels, inclusief enkele synoniemen. Eenentachtig schimmelfamilies vertoonden geen conflicterende naam in een van de databanken, maar 18 families vertoonden ten minste één conflicterende naam in ten minste één van de databanken. Het percentage

conflicterende namen varieerde van 4% (*Saccharomycetaceae*) tot 80% (*Glomeraceae*). Families met een hoog aantal conflicterende namen (of slechte nomenclatuurkwaliteitsstatistieken) moeten dringend worden herzien door de curatoren van deze drie databanken van schimmelnamen, in overleg met taxonomie-experts. De uiteindelijke bijgewerkte COGEM-schimmellijst kwam tot stand door de namen in de verschillende databanken van schimmelnamen te vergelijken en in geval dat deze verschillen lieten zien door uitgebreid aanvullend literatuuronderzoek. Deze uiteindelijke COGEM namenlijst bleek het meest te lijken op die van GB, gevolgd door MB. Er werd ook enige variatie waargenomen in auteurscitaten, publicatiejaren en spelling van de naam (zogenaamde orthografische varianten). Er zijn 29 belangrijke naamswijzigingen aangebracht in de COGEM-schimmellijst. ACF bevatte verschillende ACF-unieke namen in vergelijking met de drie databanken van schimmelnamen plus GenBank en theyeasts.org. Het wordt aanbevolen dat de drie belangrijkste databanken van schimmelnamen (MB, IF, FN) hun inhoud beter harmoniseren. De mycologische gebruikersgemeenschap zal profiteren van de samenvoeging van deze drie naamregisters. COGEM zou geen fungi met alleen een geslachtsnaam in hun schimmellijsten moeten opnemen. Tenslotte is een strategie beschreven die een handreiking kan zijn voor toekomstige toevoegingen van schimmelnamen op de COGEM lijst van schimmels.

Keywords

Fungi, taxonomy, nomenclature, name repositories

List of abbreviation

5.8S rDNA	5.8S Ribosomal DNA
ACF	Atlas of Clinical Fungi
acl1	ATP citrate lyase
ACT1, act	Actin I
AFLP	Amplified Fragment Length Polymorphisms
BenA, BT2	β -Tubulin
CaM, cmdA	Calmodulin
CHS1	Chitin synthase I
CoQ	Coenzyme Q
COGEM	Commission on Genetic Modification
CoxII	Cytochrome oxidase II
D1/D2	D1/D2 domains of the LSU rDNA
FN	Fungal Names
GAPDH	Glyceraldehyde 3-phosphate dehydrogenase
GB	GenBank
his3	Histone H3
HMG	High Mobility Group box
ICBN	International Code of Botanical Nomenclature
ICN	International Code of Nomenclature for algae, fungi, and plants
IF	Index Fungorum
IT	Information Technology
ITS	Internal Transcribed Spacer
ITS1	Internal Transcribed Spacer 1
ITS2	Internal Transcribed Spacer 2
LSU	Large SubUnit
MALDI-TOF MS	Matrix-Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry
MB	MycoBank

MspI	MspI restriction enzyme
mtSSU	Mitochondrial Small SubUnit
CoQ	Coenzyme Q
RP60S	Ribosomal protein 60S L10
RPB1	RNA polymerase I
RPB2	RNA polymerase II
rDNA	Ribosomal DNA
rRNA	Ribosomal RNA
SSU	Small SubUnit
TEF1, Tef-1 α	Translation elongation factor 1- α
TEF3, tef3	Translation elongation factor 3
TUB, tub, Tub2	β -Tubulin gene
TYTS	The Yeasts, a Taxonomic Study
UNITE	User-friendly Nordic ITS Ectomycorrhizal Database
Xls	Excel

1. Introduction

The Commission on Genetic Modification (COGEM) advises on the pathogenicity classifications of microorganisms in The Netherlands. To ensure transparency for third parties COGEM publishes annual overviews of its classified microorganisms, including fungal species. For instance, in 2024 an update was published on the 'Update of the pathogenicity classification lists with non-pathogenic and pathogenic fungal species' (COGEM, 2024).

Fungi are a special group of organisms that reproduce both sexually and asexually, i.e. clonally. The sexual and asexual stages differ in appearance, and, therefore, fungi have often been given different species names for these stages in the past. In 2011, a decision was made to discontinue this dual naming and adopt a single name for fungal species, a process that is still ongoing. Currently, COGEM uses the MycoBank (MB) database as a reference when implementing taxonomic changes.

Unfortunately, the recent update of the pathogenic and non-pathogenic fungal species revealed apparent errors in the COGEM lists of pathogenic and non-pathogenic fungi. Therefore, in the current project 'Update of the taxonomy of fungal species in the COGEM classification lists' (project CGM/250422-01) the COGEM list of fungal species will be reviewed.

The research goal taken from the project description is 'Correction of the lists of pathogenicity classifications for non-pathogenic and pathogenic fungal species for duplicate names and species, taxonomic errors, etc.' and its research objective 'Improvement of the lists of pathogenicity classifications. Incorrect naming or taxonomic classification can lead to incorrect classification of work or unnecessary procedures for classifying fungi.'

The research will consist of desk research using existing databases on fungal names, scientific literature, taxonomic expertise, as well as consulting with fungal taxonomy experts and was executed May-November 2025.

2. Fungal Diversity

Fungi represent one of the most diverse and ecologically significant kingdoms of eukaryotic life. They include a vast range of morphologies, from microscopic yeasts to macroscopic mushrooms, and they play critical roles in ecosystems as decomposers, mutualists, and pathogens, influencing nutrient cycling, plant productivity, and global carbon dynamics (Blackwell, 2011). Despite their ubiquity, fungal diversity remains incompletely documented, with estimates suggesting that only a small fraction of existing species have been formally described (Hawksworth & Lücking, 2017). This unknown majority of fungal diversity remains hidden because many species cannot or have not yet been cultured. Modern high-throughput sequencing and metagenomics

have unveiled vast numbers of unknown fungal lineages that are referred to as “dark taxa” and that are only known by DNA sequences, mainly of the ITS (Tedersoo et al., 2017). Lücking and colleagues (2021) estimated that c. 2,000 years will be needed to formally describe the fungal taxa that are currently known as dark taxa. Fungi encompasses several major phylogenetic lineages, namely *Chytridiomycota*, *Blastocladiomycota*, *Zoopagomycota*, *Mucoromycota*, *Ascomycota*, and *Basidiomycota* (Spatafora et al., 2017). The *Ascomycota* and *Basidiomycota* account for the majority of described species and include most familiar fungi, such as moulds, yeasts, and mushrooms.

Fungi occupy nearly every habitat on Earth — terrestrial, aquatic, marine, air, and even extreme environments, such as polar ice, deserts, and hydrothermal vents. Their ecological success is due to extraordinary physiological and metabolic versatility. As saprotrophs, fungi decompose organic matter, breaking down complex polymers, such as cellulose and lignin, which few other organisms can digest (Baldrian, 2017). This decomposition is fundamental to nutrient recycling and soil formation. Mycorrhizal fungi form mutualistic associations with over 90% of land plants, exchanging mineral nutrients for photosynthetic carbohydrates and profoundly influencing plant community structure and dynamics (Smith & Read, 2008). Endophytic fungi, which live asymptotically inside plant tissues, contribute to plant defence and stress tolerance (Arnold et al., 2000). Fungi also include pathogens impacting plants, animals, and humans. Species such as *Batrachochytrium dendrobatidis* have decimated amphibian populations globally, while others like *Candidozyma* (formerly *Candida*) *auris* and *Cryptococcus neoformans* cause human diseases (Fisher et al., 2020).

Fungi are indispensable in biotechnology, serving as producers of enzymes, organic acids, and antibiotics, and as hosts for heterologous protein expression (Meyer et al., 2011; Nevalainen et al., 2005). Their metabolic versatility enables applications in bioremediation, biofuel production, and industrial fermentation (de Vries et al., 2020). Advances in genomics and synthetic biology continue to expand fungal utility in sustainable bioprocessing (Cairns et al., 2018). In addition, fungi play crucial roles in food production, contributing to fermentation, flavour development, and nutrient enhancement in products such as bread, cheese, soy sauce, and alcoholic beverages, while also providing valuable food ingredients like enzymes and vitamins (Hui et al., 2004; Wolf-Hall & Njoroge, 2016; Zhang et al., 2021). In contrast, they are also major agents of food spoilage, causing decay and contamination through enzymatic degradation and the production of mycotoxins, such as aflatoxins and ochratoxins that pose serious health risks (Frisvad et al., 2019; Magan & Aldred, 2007; Pitt & Hocking, 2009).

Fungi are among the most significant plant pathogens globally, causing devastating crop diseases that threaten food security, biodiversity, and economies, with major examples including rusts, smuts, and wilt diseases (Fisher et al., 2012; Dean et al., 2012; Strange & Scott, 2005; Bebbler & Gurr, 2015; Fisher et al., 2020). Certain yeast species are potentially interesting as effective biocontrol agents against food spoilage

and postharvest pathogens by competing for nutrients and producing antifungal metabolites (Liu et al., 2013; Spadaro & Droby, 2016).

Yeasts are unicellular fungi that reproduce primarily by budding or fission and occur in multiple, evolutionarily independent lineages within both *Ascomycota* and *Basidiomycota* (Kurtzman et al., 2011, TYTS). *Saccharomyces cerevisiae* that has been studied for centuries as a model organism and fermentation agent is the most well-known yeast species. In 2011 more than 1,500 yeast species have been described in TYTS, and molecular and metagenomic analyses indicate that many more remain to be discovered (Boekhout et al., 2022) [note that dd. December 16, 2025, 3223 yeast species have been described that belong to 260 genera, theyeasts.org]. Yeasts display remarkable metabolic diversity, capable of fermenting sugars, degrading hydrocarbons, and tolerating extreme pH or salinity. Some, like *Cryptococcus* and *Candida* species, are medically important pathogens, while others, such as *Yarrowia lipolytica* and *Pichia pastoris*, are industrially exploited for biotechnological production of proteins, enzymes, and biofuels (Hittinger et al., 2015). Boekhout et al. (2022) further demonstrated that global yeast discovery is accelerating due to improved culturing techniques and the application of next-generation sequencing, linking environmental data with taxonomy.

The estimates of total fungal diversity have increased dramatically with molecular studies. Hawksworth (1991) proposed that approximately 1.5 million fungal species exist, but modern DNA-based analyses suggest between 2.2 and 3.8 million species globally (Hawksworth & Lücking, 2017, Lücking et al., 2021). Yet, only about 150,000 species have been formally described (Hyde, 2022). This discrepancy is largely due to the cryptic nature of many fungi, difficulties in culturing them, and the existence of “dark taxa” that are known only through DNA sequences (Tedersoo et al., 2017). Molecular tools have become the standard for taxonomy and identification of fungi. The internal transcribed spacer (ITS1+2) regions, including the 5.8 S rDNA, also referred to as the ITS region or ITS barcode, are the standard barcode for identifying fungal species and uncovering hidden diversity (Schoch et al., 2012). Alternative fungal barcodes, such as *TEF1 α* (translation elongation factor 1-alpha) and *RPB1/RPB2* (RNA polymerase subunits), are increasingly used to complement ITS for improved species resolution in certain fungal groups (Stielow et al., 2015). Recently, alternative options to describe fungal taxa based solely based on DNA-based information is under discussion.

In short, fungi are a hyper-diverse, but poorly known lineage of eukaryotes with many fundamental and applied aspects, but with a complicated history of naming. The change to a system in which only one name for each fungal species is allowed caused [temporary] confusion for the users, but has improved over time as the names get accepted by the various user communities.

3. How to name fungal taxa

Fungal nomenclature, the system for naming and classifying fungi, has recently undergone major transformations. Historically, fungal taxonomy relied heavily on morphology, genetics and life-cycle stages, and ecological associations. However, with the advent of molecular systematics and changes to the International Code of Nomenclature for algae, fungi, and plants (ICN), fungal naming has been modernized to reflect molecular phylogenetic and phylogenomic relationships and to promote nomenclatural stability (Hawksworth, 2011, McNeill et al., 2012; Turland et al., 2018).

A fungal name is the formal scientific designation assigned to a fungus according to the rules of the ICN. Each fungal name is composed of a binomial name (genus name followed by species epithet), followed by the author citation indicating who first described it, for example, *Aspergillus niger* van Tieghem. Although it is not compulsory to add the year of publication after the fungal name this may be useful, e.g. in the case when one wants to discriminate between a previously published but invalid name that later was validated using the same name. An example of this is *Nannizzia nana* (C.A. Fuentes) Y. Gräser & de Hoog, Mycopathologia 182 (1-2): 23 (2016) [Mycobank (MB) #629705] nom. inval. This name was originally published in 2016 (de Hoog et al. 2017), but as these authors did not include a registration number in one of the recognized fungal repositories. As a result, this recombined name was not validly published, and, hence, the name did not formally exist. Two years later the authors validated the name as *N. nana* (C.A. Fuentes) Y. Gräser & de Hoog, Index Fungorum 356: 2 (2018) [MB#554303]. In such cases the inclusion of the year of publication, 2018 in this case, after the formal species name is useful.

When describing a fungal taxon, the respective names are tied to type specimens or type cultures that need to be preserved metabolically inactive in an herbarium, fungarium or a culture collection, and that serves as permanent reference points for the application of the name. Valid publication of a name requires a formal description, designation of a (preferably a holo-)type, and, since 2013, registration in one of the approved repositories MycoBank, Index Fungorum, or Fungal Names (Kirk, 2012; McNeill et al., 2012; Robert et al., 2013). The ICN also governs rules on priority, conservation, and rejection of names to maintain nomenclatural stability. Following major revisions of specific fungal groups, fungal species may be split or lumped or be placed in other genera. In the latter case, the genus name of the binomial name will change and the new name is presented as a new combination (comb. nov.). See also the case above of *N. nana*. The procedure of correctly recombining a fungal name is also governed by ICN, and, importantly, the basionym, which is the original name under which the species was validly published has to be cited, next to a new deposition number of the newly recombined name in one of the fungal name repositories. This process of recombining names in new genera, may initially cause confusion for the users as species names that might have been used for a long time will have a changed new name. Next to new species discovery, taxonomic revisions may also result in the recognition of certain species that are synonymous to other species, and thus in a

reduction of the number of species recognized in a certain genus. This interpretation also depends on the species concepts used, or interpretation of the available data. For instance, when checking the names on the COGEM list, I was confronted with two taxonomic opinions on *Scopulariopsis alboflavescens* versus *Scopularopsis brevicaulis*. Woudenberg et al. (2017) claimed that these are two species, whereas Sandoval-Denis et al. (2016) stated that they are conspecific. Here, we followed the opinion of dr. J. Houbraken, another expert who was involved in the Woudenberg et al. study, also because some minor differences were seen between both taxa in the molecular phylogenies. However, the final judgement on this matter has not been made. Particular species that are clinically or industrially important may have several to many synonyms, e.g. *Aspergillus niger*, *Saccharomyces cerevisiae*, *Candida albicans*, and *Cryptococcus neoformans*. In such cases the availability of type material, preferable alive, is most helpful in sorting out the taxonomy of described, but potentially conspecific species. As a fungal name is not only a label but also provide access to the taxonomic, ecological, clinical, biotechnological and genetic information of that species, it is important to change only names when sufficient scientific support justify such a decision.

Traditionally, fungi exhibiting both sexual (teleomorphic) and asexual (anamorphic) forms had separate names under earlier versions of the International Code of Botanical Nomenclature (ICBN). This 'dual nomenclature' was permitted because many fungi were discovered and described only in one form, leading to parallel naming systems. For instance, the same species could be known as *Aspergillus nidulans* in its asexual form and *Emericella nidulans* in its sexual form. The name *A. nidulans* was commonly used in genetic studies, while *E. nidulans* in food and indoor mycology. Sometimes, a newly described species got two names in a single publication. For instance, the teleomorph name *Talaromyces derxii* Takada & Udagawa was also named *Penicillium derxii* for the anamorph in the same publication (Takada & Udagawa 1988). While this system of using dual names provided temporary practicality, it created long-term confusion in communication, taxonomy, and applied fields such as medicine, biotechnology, and agriculture (Hawksworth, 2011; Taylor, 2011).

In 2011, a group of leading mycologists published the Amsterdam Declaration on Fungal Nomenclature aiming to unify the naming of sexual and asexual forms of fungi under a single legitimate name, i.e., using the 'One fungus = One name' principle (Hawksworth et al., 2011). This proposal was further discussed at the 2011 International Botanical Congress in Melbourne, which formally effectuated these changes of fungal nomenclature (McNeill et al., 2012). Thus, the new Melbourne Code abolished the dual nomenclature and replaced it with a procedure in which each fungal species could have only one name. Consequently, effective from 1 January 2013, each fungal species must have a single, unified name regardless of its reproductive state (Hawksworth, 2011; Norvell, 2011). To ensure continuity, expert committees were established to decide which names to retain when multiple names existed for the same species. Decisions were based on priority, stability, and widespread usage. As a result,

some long-standing names were conserved, while others were replaced or suppressed (Kirk et al., 2013). Some examples of recent proposals for naming some important fungal species are:

1. *Talaromyces marneffe* (formerly *Penicillium marneffe*) – The species was transferred from *Penicillium* to *Talaromyces* based on molecular evidence showing its phylogenetic placement; *Talaromyces marneffe* was conserved as the correct name (Samson et al., 2011).
2. *Clonostachys rosea* (formerly *Gliocladium roseum*) – The teleomorphic name *Clonostachys rosea* was chosen over the older anamorphic name *Gliocladium roseum* to reflect genetic relationships and comply with ‘One fungus, one name’ (Schroers et al., 1999).
3. *Fusarium graminearum* (formerly *Gibberella zeae*) – The well-known anamorphic name *Fusarium graminearum* was conserved over *Gibberella zeae* due to widespread use in plant pathology and applied research (Geiser et al., 2013).
4. *Aspergillus nidulans* (formerly *Emericella nidulans*) – The genus *Aspergillus* was retained for this species and *Emericella* was suppressed to maintain consistency with the globally recognized anamorph-based name (Samson et al., 2014).
5. *Colletotrichum gloeosporioides* (formerly *Glomerella cingulata*) – The name *Colletotrichum gloeosporioides* was conserved for this major plant pathogen complex because it is more commonly used and better reflects the genus concept in current taxonomy (Cannon et al., 2012).
6. *Cryptococcus gattii* (formerly *Filobasidiella bacillispora*) – Similarly, the sexual name *Filobasidiella bacillispora* was replaced with the more commonly used name *Cryptococcus gattii* to ensure consistency in medical and taxonomic contexts (Hagen et al., 2015).

Another major change was the requirement that all new names of fungal taxa must be registered in one of three recognized online databases, i.e., MycoBank (MB) (<https://www.mycobank.org/>), Index Fungorum (IF) (<https://www.indexfungorum.org/names/names.asp>), or Fungal Names (FN) (<https://nmdc.cn/fungalnames/>) (Penev et al. 2016, Robert et al., 2013, Wang et al., 2023). This change ensures transparency, accessibility, and standardization in the publication of new taxa. Since 2013, the effective publication of any new fungal name under the ICN must include a unique identifier from one of these repositories (Turland et al., 2018). These databases primarily serve as integrated hubs for nomenclature, taxonomy, and type information (Lücking et al., 2020). They contain the most comprehensive information on fungal names, but are also used by end users to find the correct writing of a fungal name. In addition, the fungal name repositories use the concept ‘current name’ but with clearly stating that they are not an authority on fungal

taxonomy. As the content between the three fungal name repositories is shared between them on a regular base, one would expect similar information on fungal names in each database. Importantly, the content of the three repositories is also integrated with other important databases such as GenBank (<https://www.ncbi.nlm.nih.gov/genbank/>) and UNITE (<https://unite.ut.ee/>). An important source for information of clinically important fungi is the 'Atlas of Clinical Fungi' (ACF, <https://www.atlasclinicalfungi.org/>; de Hoog et al. 2020). Both GenBank and ACF provide information on current names of fungal species. An important source for taxonomic information on yeasts is given in the 5th edition of *The Yeasts, a Taxonomic Study* (TYTS, Kurtzman et al. 2011) and its electronic successor theyeasts.org (<https://theyeasts.org/>).

4. Material and methods

The initial COGEM fungal list was published in 2024 (COGEM 2024) list and is available at <https://cogem.net/publicatie/actualisatie-van-de-pathogeniteitsclassificatielijsten-met-apatogene-en-pathogene-schimmelsoorten-2024/>. The list was sent as an Excel file by email, dd. May 6, 2025. Later two names were added to the list, namely *Talaromyces derxii* (July 29, 2025) and *Neocucurbitaria* sp. VM-36 (September 6, 2025).

Some of the consulted fungal taxonomy experts (see Annex) suggested to include a few more species names in some fungal groups, notably the dermatophytes. Hence, the list of species names that was investigated for consistency in the various fungal name repositories differed slightly from the initial COGEM list. These species are not included in the final fungal name lists under 8.13.

This final list consists of a list of pathogen species (n = 322) belonging to 91 families, although some fungal species were not assigned to a family, and a list for nonpathogen species (n = 288) belonging to 70 families, and also here some species were not assigned to a family. For a first analysis the nonpathogen and pathogen lists were combined and sorted per family.

The current names for all species were searched in the online databases Mycobank (MB), Index of Fungi (IF), Fungal Names (FN), and for MB and IF also the Excel files. For MB this Excel file is present at the website (version January 13, 2025). For IF this was sent by its curator dr. Mounes Bakhsi (Kew, June 30, 2025). The curator of Fungal Names, dr. Ke Wang, send (June 5 and some days thereafter, 2025) me the entries of the species present on the COGEM list as they appeared in FN. The curator of MB, dr. Konstanze Bensch, was most helpful in advising on fungal nomenclature.

For each of the fungal names on the COGEM list, the nomenclatural status, whether they were validly published, the authors, year of publication, as well as the current names were investigated. For MB and IF, the Excel files were also investigated in

comparison to their respective websites as some discrepancies were noted between the Excel files and the entries at the respective websites. Later, the names as present in GenBank (GB) were also added. As ACF (de Hoog et al. 2020) is widely used by medical mycologist, and because there is an ongoing debate in this community on the use of fungal names, it was decided that also the names as listed in ACF were included, but, by default, this was limited to those species that were listed in ACF. For yeasts the same was done for entries as they are present in the 5th edition of TYTS (Kurtzman et al. 2011) and its electronic successor, theyeasts.org. The argument to consider both yeast sources is that after the publication of TYTS in 2011 the taxonomy of several yeast taxa has been changed considerably. Hence, a comparison between both sources made it possible to compare the effect of such taxonomic changes on the entries in the various fungal name repositories. Because COGEM uses the current names as present at the website of MB this was taken as the final reference. In addition to name changes, also orthographic variants, varying author citations, and different years of publication were noted. For synonymous names that are based on the same type specimen, the so-called obligate synonyms, were considered correct by default, because they are based on the same original type. However, putative synonymous names that are based on a different type, the so-called facultative synonyms, were also checked.

Unfortunately, in fungal taxonomy the recognition of species – and generic concepts are subject to continuous debates, and, hence, different outcomes may be possible. This is reflected in the use of different current names in the various fungal databases as observed in this project. It is important to stress that for some important genera distinct ‘schools’ occur that accept one or the other naming system. This is particularly true for *Nectriaceae*, especially the name of the genus *Fusarium* versus *Neocosmospora*. Notably, most North American authors continue to use the name *Fusarium*, while others prefer the name *Neocosmospora*. In these cases, it is preferred to use the same arguments that have been used for other genera as consistently as possible.

The final lists of current names as present in MB, MB xls, IF, IF xls, FN, GB, ACF, TYTS and theyeasts.org were critically compared. Initially, MB, MB xls, IF, IF xls and FN were used. Names that were similar in these databases were considered to be correct by default. For conflicting names in one or more of the databases (see results), a detailed literature investigation was made, and, in some cases, also the number of hits in Google Scholar and PubMed was used to make a decision on the correct current name. In addition, a number of fungal taxonomy experts was consulted on their opinion which name to use best (see below). After a decision was made on the best name to be used this was compared with those present in the original COGEM lists and this resulted in an updated COGEM fungal list. Attention was paid to those names that occurred twice on the COGEM lists, those that had differences in author citations, including year of publication, and orthographic variants. The updated COGEM list of fungal names was used as the reference when comparing the current names as present in the various databases with the aim to find the database that matched most

closely with the updated names on the COGEM list. The database(s) that most closely resembled the COGEM updated list of fungal names may be used by COGEM when implementing new names in the future.

As a consequence of taxonomic revisions, species may be reduced as a synonym under another species. After finalization and updating of the COGEM fungal list, the synonyms as presented in the original COGEM fungal list were evaluated as well. Obligate synonyms, i.e. that are based on the same type specimen, were accepted by default. Facultative synonyms that are based on different type specimen were further investigated by studying recently published literature, preferably those that used multilocus-based - or comparative genomics-based phylogenies of the relevant species complexes, and including all relevant type specimens.

5. Results and Discussion

The first part of the Results and Discussion section describes the outcome of the literature investigation into those names that were treated differently in at least one of the consulted fungal name repositories. The fungal taxa are listed per family. The second part deals with some comments on the purported synonyms. Here the names are listed alphabetically. This is followed by the other sections as listed in the Table of Contents.

5.1. Comparison of fungal names in fungal name repositories

Comparison of the different databases showed that the list of non-conflicting names contained 542 names (85.1%), and the list of conflicting names 95 entries (14.9%). Thus almost 15% of the 637 analysed names differed in at least one of the fungal name repositories. This is a stunning observation as the fungal name repositories were founded to increase nomenclatural stability. They serve a good purpose in that they contain all new fungal taxon names that are proposed as well as those that have been proposed in the past. However, they do not sufficiently accommodate the needs of a user of fungal names who might also be interested in the current name that should be used. Apparently, it depends on the database used what the outcome will be.

Fungal families with three or more entries with the same current name in all repositories were *Botryosphaeraceae*, *Cephalothecaceae*, *Clavicipitaceae*, *Coniochaetaceae*, *Cyphellophoraceae*, *Didymellaceae*, *Dothideomycetaceae*, *Glomerellaceae*, *Hypocreaceae*, *Lichtheimiaceae*, *Malasseziaceae*, *Metschnikowiaceae*, *Mucoraceae*, *Myxotrichaceae*, *Ophiocodycipitaceae*, *Pleurotaceae*, *Pneumocystiaceae*, *Pseudoeurotiaceae*, *Sacotheciaceae*, *Sarocladiaceae*, *Sordariaceae*, *Sporidiobolaceae*, *Thermoascaceae*, *Togniniaceae*, *Trematosphaeriaceae*, *Trichosphaeriaceae*, and *Trichosporonaceae*.

For families *Testidinaceae* and *Ustilaginaceae* the single species in each family had conflicting names among the fungal name repositories. Fungal families with three or more conflicting names were: *Ajellomycetaceae*, *Arthrodermataceae*, *Aspergillaceae*, *Cordycipitaceae*, *Glomeraceae*, *Hypocreaceae*, *Meruliaceae*, *Nectriaceae*, *Onygenaceae*, and *Sympoventuriaceae*. The list of observed conflicting generic names in MB, IF, and FN is presented in Table 1.

Table 1. List of 38 conflicting generic names as observed in Mycobank, Index Fungorum and Fungal Names. The relevant species names are placed between squared brackets.

Number	Conflicting genus names with relevant species placed between brackets
1.	<i>Achaetomium</i> / <i>Chaetomium</i> [<i>strumarium</i>]
2.	<i>Actonimortierella</i> / <i>Mortierella</i> [<i>wolfii</i>]
3.	<i>Akanthomyces</i> / <i>Lecanicillum</i> [<i>attenuatus</i> , <i>lecanii</i> , <i>muscarius</i>]
4.	<i>Anthracoystis</i> / <i>Pseudozyma</i> [<i>flocculosa</i>]
5.	<i>Arthrotrrys</i> / <i>Duddingtonia</i> [<i>fragrans</i>]
6.	<i>Arthroderma</i> / <i>Nannizzia</i> / <i>Microsporium</i> / <i>Epidermophyton</i> / <i>Keratinomyces</i> / <i>Lobophyton</i> [<i>aenigmaticum</i> , <i>ajelloi</i> , <i>corniculata</i> , <i>duboisii</i> , <i>fulva</i> , <i>gallinae</i> , <i>gypseum</i> , <i>nana</i> , <i>praecox</i> , <i>racemosum</i>]
7.	<i>Aspergillus</i> / <i>Emericella</i> [<i>versicolor</i>]
8.	<i>Bipolaris</i> / <i>Curvularia</i> / <i>Cochliobolus</i> [<i>australiensis</i> , <i>geniculata</i> , <i>hawaiiensis</i> , <i>spicifera</i>]
9.	<i>Bisfusarium</i> / <i>Fusarium</i> / <i>Neocosmospora</i> [<i>cyanescens</i> , <i>dimerum</i> , <i>falciforme</i> , <i>lichenicola</i> , <i>solanii</i>]
10.	<i>Blastomyces</i> / <i>Zymonema</i> / <i>Emmonsia</i> [<i>dermatitidis</i> , <i>parva</i>]
11.	<i>Ceriporiopsis</i> / <i>Obba</i> / <i>Gelatispora</i> [<i>rivulosa</i> , <i>subvermispora</i>]
12.	<i>Chaemaeleomyces</i> / <i>Metarhizium</i> [<i>viride</i>]
13.	<i>Chrysosporium</i> / <i>Aphanoascus</i> [<i>subvermispora</i> , <i>tropicum</i>]
14.	<i>Coniothyrium</i> / <i>Paraconiothyrium</i> [<i>fuckelii</i>]
15.	<i>Cordyceps</i> / <i>Beauveria</i> [<i>bassiana</i>]
16.	<i>Cryptococcus</i> / <i>Filobasidium</i> [<i>uniguttulatus</i>]
17.	<i>Eremomyces</i> / <i>Arthrographis</i> / <i>Pithoascus</i> [<i>arxii</i> , <i>langeroni</i>]
18.	<i>Gliomastix</i> / <i>Acremonium</i> [<i>roseogrisea</i>]
19.	<i>Gymnoascus</i> / <i>Arachniotus</i> / <i>Gymnascaella</i> [<i>dankaliensis</i>]
20.	<i>Hypocrea</i> / <i>Trichoderma</i> [<i>koningii</i>]
21.	<i>Kazachstania</i> / <i>Arxiozyma</i> [<i>telluris</i>]
22.	<i>Lomentospora</i> / <i>Scedosporium</i> [<i>prolificans</i>]
23.	<i>Magnusiomyces</i> / <i>Dipodascus</i> / <i>Saprochaete</i> [<i>capitatus</i> , <i>clavata</i>]
24.	<i>Massarina</i> / <i>Lentithecium</i> [<i>fluviatilis</i>]
25.	<i>Merulius</i> / <i>Phlebia</i> [<i>tremellosus</i>]
26.	<i>Neoarachnotheca</i> / <i>Neocucurbita</i> [<i>keratinophilum</i>]
27.	<i>Neotestudina</i> / <i>Zopfia</i> [<i>rosatii</i>]
28.	<i>Ochroconis</i> / <i>Scolecobasidium</i> [<i>brevicaulis</i> , <i>constrictum</i> , <i>humicola</i> , <i>tshawyttschae</i>]
29.	<i>Ophiostoma</i> / <i>Ceratocystis</i> [<i>piceae</i> , <i>quercus</i>]
30.	<i>Phanerochaete</i> / <i>Phanerodontia</i> [<i>chrysosporium</i>]
31.	<i>Phialophora</i> / <i>Cadophora</i> [<i>bubakii</i>]
32.	<i>Pichia</i> / <i>Issatchenkia</i> [<i>kudriavsevii/orientalis</i>]
33.	<i>Proxiovicillium</i> / <i>Mastigocladium</i> [<i>blochii</i>]
34.	<i>Pseudomicrodochium</i> / <i>Cyphellophora</i> [<i>suttonii</i>]
35.	<i>Rhizoglyphus</i> / <i>Rhizophagus</i> [<i>aggregatus</i> , <i>clarus</i> , <i>irregulare</i> , <i>manihotus</i>]
36.	<i>Scedosporium</i> / <i>Pseudoallescheria</i> [<i>apiospermum</i>]
37.	<i>Triangularium</i> / <i>Podospora</i> [<i>pauciseta</i>]
38.	<i>Uncinocarpus</i> / <i>Aphanomyces</i> / <i>Pseudoarachniotus</i> / <i>Apinisia</i> / <i>Brunneospora</i> [<i>orissi/orissae</i> , <i>queenslandica</i>]

5.2. Detailed discussion on conflicting names

Here we present the results of a literature investigation into the names of those taxa that had conflicting names in the various fungal name repositories. Conflicts are apparently due to different taxonomic opinions held by the curators of the various databases and are caused by: 1. Different opinions on species concepts, 2. Different opinions on generic concepts, 3. Differences in author citations, including year of publication, and 4. Orthographic variants. Note that the status of several synonyms will be further discussed in another paragraph below (8.3.).

5.2.1. Family *Ajellomycetaceae*

Molecular phylogenetic studies using multilocus sequencing yielded four monophyletic lineages in *Ajellomycetaceae* that were interpreted as genera, namely *Blastomyces*, *Emergomyces*, *Emmonsia*, and *Emmonsiiellopsis* (Jiang et al. 2018).

5.2.1.1. *Blastomyces dermatitidis* versus *Zymonema dermatitidis*

MB, MB xls, IF, ACF, and GB recognize *B. dermatitidis*, whereas FN and IF xls name it *Z. dermatitidis*. Google scholar searches of both names yielded the following numbers: *B. dermatitidis* 19,200; *Z. dermatitidis* 210. Pubmed gave 1,767 and zero hits, respectively [note that these hits in Google Scholar and Pubmed were unrelated to taxonomy, but related to features of meiosis]. The species is by far the most common cause of a blastomycosis, an endemic mycotic disease in North America. ACF considers *Zymonema dermatitidis* an obligate synonym under *B. dermatitidis*. Van Oorschot (1980) considered *Zymonema* the preferred name over *Blastomyces* due to priority rules. This apparently was not followed by other researchers who, likely, considered the name *Blastomyces* to be better known, and linked to a disease name. Importantly, from a nomenclatural point of view the genus name *Blastomyces* Gilchrist & W.R. Stokes is conserved against *Blastomyces* Costantin & Rolland (de Hoog et al. 2016, Jiang et al. 2018). In agreement with the above, the consulted expert preferred *B. dermatitidis* as well.

From many studies, including epidemiological and molecular phylogenetic ones (Jiang et al. 2018, Klein et al. 1986, Brown et al. 2013, Roy et al. 2013), reviews (Hagen et al. 2023, Linder et al. 2023, Saccante & Woods 2010), reference works (ACF), expert judgement, number of hits in google scholar, as well the higher number of fungal name repositories that use the name *B. dermatitidis*, the current name to be used is *Blastomyces dermatitidis* Gilchrist & W.R. Stokes 1898.

5.2.1.2. *Blastomyces parvus* versus *Emmonsia parva*

MB, MB xls and GB prefer *B. parvus* over *Emmonsia parva*, whereas IF, IF xls, and FN prefer *E. parva*. ACF prefers *B. parvus*. Google scholar gives 137 hits for *B. parvus* and 690 for *E. parva*. Pubmed yielded only one hit for both names and this was the same publication. A multilocus gene dataset-based phylogenetic analysis revealed that *E. parva*, the type species of the genus *Emmonsia* clustered with *B. dermatitidis* Gilchrist & W.R. Stokes, the type of the genus *Blastomyces* (Jiang et al. 2018). The authors of this study concluded that *E. parva* should be recombined in the genus *Blastomyces* as *Blastomyces parvus* (Emmons & Ashburn) Y. Jiang, Sigler & de Hoog. This decision is supported, 1. because of the larger number of recombined names that would be required if *Emmonsia* was chosen as the generic name, 2. the priority of *Blastomyces* over *Emmonsia* as the former has been described in 1898 and the latter in 1959, and, 3. because *Blastomyces* has been proposed for conservation (de Hoog et al. 2016).

Because of the above, *Blastomyces parvus* (C.W. Emmons & Ashburn) Y.P. Jiang, Sigler & de Hoog 2018 is the current name to use, which was also the recommendation of the expert consulted.

5.2.1.3. *Histoplasma capsulatum* var. *farciminosum* versus *Histoplasma farciminosum* versus *Histoplasma capsulatum*

The species *H. capsulatum* was split into three varieties: *H. capsulatum* var. *capsulatum*, *H. capsulatum* var. *duboisii* and *H. capsulatum* var. *farciminosum* because of host and geographical differences (Teixeira et al. 2016) with the latter being known from infections of horses and mules in Europe, Northern Africa, India, and Southern Asia (Teixeira et al. 2016). Phylogenetic analysis of ribosomal and other DNA loci, suggested the presence of many more clades in the *H. capsulatum* complex (Teixeira et al. 2016, Rodrigues et al. 2020), however, in most cases taxonomic conclusions have not yet been made. Comparative genomics analysis using American isolates resulted in the recognition of three new species from the Americas in the genus (Sepúlveda et al. 2017). A recent comparative genomics study including 36 isolates from Africa identified lineages that seem to represent both *H. capsulatum* var. *duboisii* and *H. capsulatum* var. *farciminosum* and it was noted by these authors that the latter two might need to be recognized at the species level (Mapengo et al. 2025). According to ACF the variety *farciminosum* is a synonym of *H. capsulatum*.

From a nomenclatural point of view, FN, IF, IF xls, and MB use the species name *H. capsulatum* for *Histoplasma capsulatum* var. *farciminosum*, whereas GB and MB xls suggest recognition at the variety level as *H. capsulatum* var. *farciminosum*. Importantly, the varietal name is an invalidly published name due to breach of Art. 41.5 of the Melbourne code (no basionym cited) (McNeil et al. 2012). Thus, irrespective whether this taxon deserves intraspecific or species status, its associated varietal name cannot be used. When recognized at the species level the correct name is *H.*

farminosum (Rivolta) Cif. & Redaelli 1934. Based on the above, it seems likely that this taxon needs species status.

Hence, *Histoplasma farminosum* (Rivolta) Cif. & Redaelli 1934 is the preferred name to be used at this moment, but the final verdict on this matter still needs to be made. *H. capsulatum* var. *farminosum* (nom. invalid) is a synonym. To avoid confusion, *H. capsulatum* is a separate valid species.

5.2.1.4. *Histoplasma duboisii* versus *Histoplasma capsulatum* var. *duboisii*

Histoplasma duboisii is restricted to tropical areas in Africa where it causes cutaneous, subcutaneous [i.e., lymph node] and bone lesions (Mapengo et al. 2025). All nomenclatural repositories, FN, IF, IF xls, MB, and MB xls, use *H. duboisii*. Only GB uses the varietal name. Although GB is not an official repository of fungal names, it is widely used for fungal name searches, hence, we report this discrepancy. ACF recognizes this taxon at species level. Recent comparative genomics analyses also showed evidence for a species concept [or species complex] that fits with *H. duboisii* at species level (Mapenga et al. 2025).

Thus, *Histoplasma duboisii* Vanbreuseghem 1952 is the current name to be used.

5.2.2. Family *Apiosporaceae*

5.2.2.1. *Nigrospora sphaerica* versus *Nigrospora oryzae*

MB, MB xls, and GB use the name *N. sphaerica* (Sacc.) E.W. Mason, whereas IF, IF xls and FN use *N. oryzae* (Berk. & Broome) Petch as current name for *N. sphaerica*. ACF also reports *N. sphaerica* from a few clinical cases, but indicates that it is mainly known as a plant-inhabiting species occurring in warmer climate zones, where it causes leaf spots on a variety of plants. Besides, the species may occur as an endophyte. Several recent taxonomic publications report both *N. sphaerica* and *N. oryzae* as distinct species (Hao et al. 2020, Wang et al. 2017). Multigene-based phylogenies clearly separated both species (Hao et al. 2020) indicating that both should be recognized at species level. In addition, morphological characteristics are provided by these authors, although they also indicate that these are sometimes overlapping. Hence, the purported synonymy of both species in IF and FN is strongly questioned.

Because of the above, *Nigrospora sphaerica* (Sacc.) E.W. Mason 1927 is the current name to be used.

5.2.3. Family *Arthrobotryaceae*

5.2.3.1. *Arthrotrrys flagrans* versus *Duddingtonia flagrans*

All fungal name repositories, except MB xls, report this species as *A. flagrans*. When searching *A. flagrans*, MB xls gives *D. flagrans* (Duddington) R.C. Cooke as current name, however, when checking *D. flagrans* it gives *A. flagrans* as current name. Hence, the position of MB xls on this name is not clear. From the above it is clear *Arthrotrrys flagrans* (Dudd.) Mekht. 1964 is the preferred current name.

5.2.4. Family *Arthrodermataceae*

Arthrodermataceae comprise dermatophytes and phylogenetically related fungal species that occur in the environment. It is one of the largest families occurring on the COGEM list of fungal names. A large part does not have any associated nomenclatural issues (n = 50), but 19 showed inconsistent search results among the various fungal name repositories. The taxonomy, and hence, also the naming of dermatophytes has been largely reviewed in recent years due to the implementation of the results of molecular phylogenies (de Hoog et al. 2017, Dudik et al. 2020).

The latter studies analysed the phylogeny of *Arthrodermataceae* using multigene-based phylogenies and concluded that the genus *Trichophyton* is polyphyletic. The authors suggested to place the major anthropophilic dermatophytes in the genera *Trichophyton* and *Epidermophyton*. The genus *Microsporum* became restricted to *M. canis* and related species. Geophilic - and several zoophilic species were classified in the genera *Arthroderma*, *Lophophyton* and *Nannizzia*. Finally, they proposed to place *Keratinomyces ceretanicus* in the new genus *Guarromyces*. From a nomenclatural perspective the name *Epidermophyton* Sabouraud with type species *Epidermophyton floccosum* (Harz) Langeron & Milochevitch has been conserved (de Hoog et al. 2017). Based on the cited work the following genera are currently recognized in *Arthrodermataceae*:

1. *Trichophyton* Malmsten 1848 with type species *T. tonsurans* Malmsten (Clade 1). According to de Hoog et al. (2017) the genus contains 16 species: *Trichophyton benhamiae* (Ajello & Cheng) Gräser & de Hoog, *Trichophyton bullosum* Lebasque, *Trichophyton concentricum* Blanchard, *Trichophyton equinum* Gedoelst, *Trichophyton eriotrephon* Papegaaij, *Trichophyton erinacei* (J.M.B. Smith & Marbles) Quaife, *Trichophyton interdigitale* Priestley, *Trichophyton mentagrophytes* (Robin) Blanchard, *Trichophyton quinckeanum* (Zopf) MacLeod & Münde, *Trichophyton rubrum* (Castellani) Semon, *Trichophyton schoenleinii* (Lebert) Nannizzi, *Trichophyton simii* (Pinoy) Stockdale, MacKenzie & Austwick, *Trichophyton soudanense* Joyeux, *Trichophyton tonsurans* Malmsten, *Trichophyton verrucosum* Bodi, and *Trichophyton violaceum* Sabouraud.
2. *Epidermophyton* Sabouraud 1907 with *Epidermophyton floccosum* (Harz) Langeron & Milochevitch as type and only species (Clade 2).

3. *Nannizzia* Stockdale 1961 with type species *Nannizzia incurvata* Stockdale (Clade 3). According to de Hoog et al. (2017) the genus contains nine species: *Nannizzia aenigmaticum* (Hubka et al.) Gräser & de Hoog, *Nannizzia corniculata* (Takashio & De Vroey) Gräser & de Hoog, *Nannizzia duboisii* (Vanbreuseghem) Gräser & de Hoog, *Nannizzia fulva* (Uriburu) Stockdale, *Nannizzia gypsea* (Nannizzi) Stockdale, *N. incurvata* Stockdale, *N. nana* (Fuentes) Gräser & de Hoog, *Nannizzia persicolor* (Sabouraud) Stockdale, and *Nannizzia praecox* (Padhye, Ajello & McGinnis) Gräser & de Hoog. A later study added four species to the genus (Dukik et al. 2020): *N. graeserae* Rahul Sharma, Rohit Sharma & Shouche, *Nannizzia perplicata* Borman, M. Fraser, A. Szekely & Eliz.M. Johnson, *Nannizzia polymorpha* Dukik, S.A. Ahmed & de Hoog, and the species described as *Microsporum racemosum* was renamed *Nannizzia lorica* Dukik, S.A. Ahmed & de Hoog.
4. *Microsporum* Gruby 1843 with type species *Microsporum audouinii* Gruby (Clade 4). According to de Hoog et al. (2017) the genus contains three species: *M. audouinii* Gruby, *Microsporum canis* (Bodin) Bodin, and *Microsporum ferrugineum* Ota.
5. *Lophophyton* Matruchot & Dassonville 1899 with type species *Lophophyton gallinae* Matruchot & Dassonville (Clade 5). So far, the genus contains only one species.
6. *Arthroderma* Berkeley 1860 with type species *Arthroderma curreyi* Berkeley (Clade 6). According to de Hoog et al. (2017) the genus contains 21 species: *Arthroderma amazonicum* (Moraes, Borelli & Feo) Gräser & de Hoog, *Arthroderma ciferrii* Varsavsky & Ajello, *Arthroderma cuniculi* Dawson, *Arthroderma curreyi* Berkeley, *Arthroderma eboreum* (Brasch & Gräser) Gräser & de Hoog, *Arthroderma flavescens* R.G. Rees, *Arthroderma gertleri* Böhme, *Arthroderma gloriae* Ajello & Cheng, *Arthroderma insingulare* Padhye & Carmichael, *Arthroderma lenticulare* Pore, Tsao & Plunkett, *Arthroderma melis* Krivanec, Janečková & Otčenášek, *Arthroderma multifidum* Dawson, *Arthroderma onychocola* (Cmokova et al.) Gräser & de Hoog, *Arthroderma phaseoliforme* (Borelli & Feo) Gräser & de Hoog, *Arthroderma quadrifidum* Dawson & Gentles, *Arthroderma redellii* (Minnis, Lorch, D.L. Lindner & Blehert) Gräser & de Hoog, *Arthroderma silverae* Currah, S.P. Abbott & Sigler, *Arthroderma thuringiensis* (Koch) Gräser & de Hoog, *Arthroderma tuberculatum* Kuehn, *Arthroderma uncinatum* Dawson & Gentles, and *Arthroderma vespertilii* (Guarro, Vidal & De Vroey) Gräser & de Hoog.
7. *Guarromyces* Gräser & de Hoog 2018 with *Guarromyces ceretanicus* (Punsola & Guarro) Gräser & de Hoog as only species.
8. *Paraphyton* Gräser, Dukik & de Hoog 2018 with type *Microsporum cookei* Ajello (Clade D) with three species: *Paraphyton cookei* (Ajello) Gräser, Dukik & de Hoog, *Paraphyton cookiellum* (de Clerq) Gräser, Dukik & de Hoog, and *Paraphyton mirabile* (J.S. Choi, Gräser, Walther, Peano, Symoens & de Hoog) Gräser, Dukik & de Hoog.

The above indicated generic concept was initially mainly based on ITS sequences, but supported by subsequent multigene-based phylogenies (de Hoog et al. 2017, Dukik et al. 2020). To further complicate the matter, other studies indicated the presence of additional clades in the genera *Arthroderma* and *Nannizzia*, but taxonomic changes were not yet made (Zhang et al. 2022). According to these authors the genera *Ctenomyces*, *Epidermophyton*, *Guarromyces*, *Lophophyton*, *Microsporium*, *Paraphyton*, and *Trichophyton* were all monophyletic.

The species concept used before in dermatophytes that was mainly based on phenotypic and clinical data has been challenged by the application of molecular phylogenetic data. Several species complexes are recognized. For instance, the following species were recognized in the respective complexes in the genera *Trichophyton* (de Hoog et al. 2017):

1. *Trichophyton mentagrophytes* series: *T. equinum*, *T. interdigitale*, *T. mentagrophytes*, *T. quinckeanum*, *T. schoenleinii*, *T. simii*, *T. tonsurans*.
2. *Trichophyton benhamiae* series: *T. benhamiae*, *T. concentricum*, *T. erinacei*, *T. eriotrephon*, *T. verrucosum*.
3. *Trichophyton rubrum* series: *T. rubrum*, *T. violaceum*.

In a review Hagen et al. (2023) this was summarized somewhat different as follows: Zoophilic *Trichophyton mentagrophytes* contains: *T. benhamiae* var. *benhamiae*, *T. benhamiae* var. *luteum*, *T. europaeum*, *T. japonicum*, *T. africanum*, *T. mentagrophytes* sensu stricto, and *T. quinckeanum*. Species formerly known as *Microsporium gypseum* may now be recognized as *N. duboisii*, *N. fulva*, *N. gypsea*, or *N. incurvata*. The sometimes somewhat varying species concepts used by various dermatophyte taxonomists makes it even more difficult for the non-fungal taxonomy expert to interpret the names.

A number of dermatophytes were added in the fungal name repository comparisons as suggested by one of the consulted experts. These species are *Nannizzia aenigmatica*, *Nannizzia vriesii*, *Trichophyton erinacei*, *Trichophyton indotinae*, *Trichophyton quinckeanum*, and *Trichophyton singulare*. The pathogenicity of these dermatophytes is not yet addressed by COGEM and therefore they are not included in tables 4 and 5. In case COGEM will decide to classify their pathogenicity in the future they will be added to the COGEM fungal lists.

For most, if not all, clinically relevant species additional information, including lists of obligate and facultative synonyms, can be found in ACF. In the paragraphs below the conflicting names in the COGEM list belonging to the family *Arthrodermataceae* are discussed.

5.2.4.1. *Arthroderma gypseum* versus *Nannizzia gypsea*

MB and GB list this species as *N. gypsea*, whereas MB xls, IF, IF xls and FN refer to it as *A. gypseum*. ACF, and Hagen et al. (2023) name the species *N. gypsea*. An

important synonym that has been used in the past is *Microsporium gypseum*. Here there is a difference in the assigned current names between MB and MB xls.

Because we believe that solid generic boundaries based on molecular phylogenetic studies are preferred to obtain a reliable future proof taxonomy and, hence, also a stable naming system of dermatophytes, as well as other fungi, we suggest that COGEM follows the taxonomic proposals made by de Hoog et al (2017) and Dukik et al. (2020).

Thus, in this case the name *Nannizzia gypsea* (Nann.) Stockdale 1963 is recommended, but also indicating the alternative name *Arthroderma gypseum* and *Microsporium gypseum* as important synonyms.

5.2.4.2. *Arthroderma racemosum* versus *Nannizzia racemosa* versus *Paraphyton cookei*

MB and MB xls list this species as *A. racemosum*, whereas IF, IF xls, FN, and GB list it as *N. racemosa*. De Hoog et al. (2017), however, named this species *Paraphyton cookei* (Ajello) Gräser, Dukik & de Hoog. Thus, in their opinion, the names *Microsporium racemosum* Borelli, *Nannizzia racemosa* (Borelli) Rush-Munro, J.M.B. Smith & Borelli, and *Arthroderma racemosa* (Rush-Munro, J.M.B. Smith & Borelli) Weitzman, McGinnis, Padhye & Ajello are synonyms of *P. cookei*. Searches for *P. cookei* in MB, MB xls, IF, IF xls, FN, and GB did not refer to either *A. racemosum* or *N. racemosa*. Only ACF listed the purported synonymy under *P. cookei*. However, following de Hoog et al. (2017) Baert et al. (2020) supported the recognition of the genus *Paraphyton* based on the phylogenetic analysis of ITS and b-tubulin sequences, and also Zhang et al. (2022) indicated that the genus *Paraphyton* is monophyletic. Thus, recognition of the genus *Paraphyton* is warranted. Because *Microsporium cookei* Ajello, the type species of the genus *Paraphyton*, was published in 1961, four years before *Microsporium racemosum* Borelli, a species that was found to be conspecific with *M. cookei*, the name *M. cookei* Ajello had nomenclatural priority, hence *Paraphyton cookei* (de Hoog et al. 2017). Thus, we suggest to recognize *Paraphyton cookei* (Ajello) Gräser, Dukik & de Hoog 2017 and consider the names *A. racemosum* and *N. racemosa* as synonyms of this name.

5.2.4.3. *Epidermophyton stockdaleae* versus *Arthroderma uncinatum* versus *Epidermophyton floccosum*

MB, MB xls, IF, and IF xls refer to this species as *A. uncinatum* C.O. Dawson & Gentles. FN and GB use the name *E. stockdaleae* Prochacki & Eng.-Zas. ACF refer to this species as a synonym of *Trichophyton ajelloi*. However, when searching this name in ACF one ends up with *Arthroderma uncinatum* Dawson & Gentles. Interestingly, in ACF the name of *E. stockdaleae* is also listed as a synonym under *A.*

uncinatum. De Hoog and coworkers (2017) placed *E. stockdaleae* as a facultative synonym under *A. uncinatum*.

Based on these notes and the phylogenetic placement of the species, *Arthroderma uncinatum* C.O. Dawson & Gentles 1961 is the current name. See also below 8.2.4.4.

5.2.4.4. *Keratinomyces ajelloi* versus *Trichophyton ajelloi* versus *Arthroderma uncinatum*

De Hoog and coworkers (2017) placed *Keratinomyces* as a facultative synonym under *Arthroderma* with *K. ajelloi* being conspecific with *A. uncinatum*. This view is supported by MB, IF, IF xls and GB. FN and MB xls name the species *Trichophyton ajelloi* (Vanbreus.) Ajello. ACF refers to it as *A. uncinatum* with *K. ajelloi* listed as a common synonym.

This species is listed three times on the COGEM list. In the nonpathogen list it is listed as *Arthroderma uncinatum* with *Trichophyton ajelloi* as the asexual state, as *Epidermophyton stockdaleae*, and also on the pathogen list as *Keratinomyces ajelloi*. As indicated above, all, except one, of the fungal name repositories list the species as *Arthroderma uncinatum* Dawson & Gentles 1961. Only FN names it under the anamorph name *Trichophyton ajelloi*. The purported synonyms *K. ajelloi*/*T. ajelloi* and *E. stockdaleae* are supported by de Hoog et al (2017) and MB, IF and ACF. FN and MB xls list *K. ajelloi* and *T. ajelloi* as *T. ajelloi*. The name *E. stockdaleae* is used in FN and GB. The pathogen status in ACF as a geophilic fungus with BSL-1 status, and the reported rare cases of cutaneous infectious justify a position on the nonpathogen list, rather than on the pathogen list. However, this evaluation as a pathogen/nonpathogen should be subject to another project.

Arthroderma uncinatum C.O. Dawson & Gentles 1961 is the current name for *K. ajelloi*, *T. ajelloi* and *E. stockdaleae*. It is advised to list the latter species names as important synonyms.

5.2.4.5. *Lophophyton gallinae* versus *Microsporum gallinae*

As indicated above clade 5 of *Arthrodermataceae* with *M. gallinae* was raised to genus level with the resurrected name *Lophophyton* (de Hoog et al. 2017, Dukik et al. 2020). This decision is supported by MB and GB, but not by IF, IF xls, MB xls, and FN that keep the older name *M. gallinae*. ACF uses *L. gallinae*. Use in Genbank and Google Scholar of the name *M. gallinae* is higher (20 respectively 1660 hits) than that of *L. gallinae* (3 respectively 138 hits). However, we favour the use of well-defined smaller genera when they are supported from a molecular phylogenetic point of view.

Because of this, *Lophophyton gallinae* (Méglin) Matr. & Dassonv. 1899 is the preferred current name with mentioning of *M. gallinae* (Méglin) Grigoraki 1929 as an important synonym.

5.2.4.6. *Nannizzia aenigmatica* versus *Nannizzia aenygmatica* versus *Microsporium aenigmaticum*

MB, MB xls, and GB support *N. aenigmatica* (with *M. aenygmatica* as an orthographic variant). However, IF, IF xls, and FN use *M. aenigmaticum*. ACF uses *N. aenigmatica* and also provides a full list of synonyms. The species belongs to clade 3 in de Hoog et al. (2017) indicating that the generic name should be *Nannizzia*. *Nannizzia aenigmatica* (Hubka, Dobiášová & M. Kolařík) Y. Gräser & de Hoog 2018 is the current name of this species, with *M. aenigmaticum* being a synonym.

5.2.4.7. *Nannizzia corniculata* versus *Arthroderma corniculatum*

MB, IF, IF xls, FN, and GB report this species as *N. corniculata* Takashio & De Vroey. The species is not included in ACF. MB xls reports the species under two names, namely *Nannizzia corniculata* and *Arthroderma corniculatum* with making reciprocal references to each other. The correct and accepted name is *Nannizzia corniculata* Takashio & De Vroey 1982.

5.2.4.8. *Nannizzia fulva* versus *Arthroderma fulvum*

MB, IF, IF xls, FN, GB, ACF support *Nannizzia fulva* Stockdale. Like under 8.2.4.7., MB xls suggests both names *Nannizzia fulva* and *A. fulvum*. Given the general acceptance of *Nannizzia fulva* Stockdale 1963 this is the current name to be used.

5.2.4.9. *Nannizzia nana* versus *Microsporium nanum*

MB, MB xls, and GB mention *N. nana* (C.A. Fuentes) Y. Gräser & de Hoog, whereas IF, IF xls, and FN prefer *M. nanum*. ACF uses *M. nana*. Given the support for the genus *Nannizzia* as redefined by de Hoog (2017) and Dukik et al (2020) we strongly recommend the use of *Nannizzia nana* (C.A. Fuentes) Y. Gräser & de Hoog 2018 as current name [Note that in 2016 this name was invalidly published].

5.2.4.10. *Nannizzia praecox* versus *Microsporium praecox*

MB, MB xls, GB and ACF use *N. praecox* (Rivalier ex A.A. Padhye, Ajello & McGinnis) Y. Gräser & de Hoog as current name, whereas IF, IF xls and FN name it *M. praecox*. As indicated above it is preferred to use molecularly well-defined genera and, hence, we strongly recommend to use *Nannizzia praecox* (Rivalier ex A.A. Padhye, Ajello & McGinnis) Y. Gräser & de Hoog 2018 as current name [not 2016, see above 8.2.4.9.]

5.2.4.11. *Nannizziopsis vriesii* versus *Arachnotheca vriesii*

All name repositories, MB, FN, IF, IF xls, and GB, as well as ACF prefer *Nannizziopsis vriesii* (Apinis) Currah over *A. vriesii*. MB xls, however, suggest both names as names in current use by making reciprocal references to each other.

From the above it is clear that *Nannizziopsis vriesii* (Apinis) Currah 1985 is the preferred current name to be used.

5.2.4.12. *Trichophyton equinum* versus *Trichophyton tonsurans*

MB and MB xls list this species as *T. tonsurans* Malmsten 1848, whereas IF, IF xls, F, and GB refer to *T. equinum* Gedoelst 1902. ACF refers to it as *T. equinum*, but mentions that this species belongs to the *T. tonsurans* complex. In this case the generic classification in *Trichophyton* is not questioned, but rather its position as a species. *T. equinum* occurs mainly on horses whereas *T. tonsurans* is mainly isolated from humans. Several attempts have been made to clarify the matter, but the general conclusion is that the border between both species is not fully resolved. Kandemir et al. (2020) studied phenotypes, phylogenies based on multilocus genes datasets and amplified fragment polymorphisms (AFLP) of 52 isolates of *T. tonsurans* and 15 of *T. equinum*, and concluded that neither dataset fully coincided with the purported species barriers, except that the mating type genes fully separated both species, hinting at genetic isolation via the mating process. Proteomics analysis of a relatively small strain set (n=12) could not convincingly separate both species (Dukik et al. 2018). For practical identification, it has been suggested that ITS sequences can largely identify individuals of both species (Summerbell et al. 2007). Apparently, previously generated sequences suffered from sequencing errors hampering the distinction of both species at the ITS level. The authors observed that globally collected isolates of *T. equinum* have uniform ITS sequences, whereas a single-base change was seen among isolates of *T. tonsurans*. Rezaei-Matehkolaei and coworkers (2012) found that the translation elongation factor 1- α (TEF1) locus showed a consistent indel of 13 bp between both species, thus allowing their identification.

Because of the above, we recommend the use of *Trichophyton equinum* Gedoelst 1902 as current name and not *T. tonsurans* as this likely will blur taxonomic insight in the occurrence of both species.

5.2.4.13. *Trichophyton erinacei* versus *Trichophyton mentagrophytes*

MB, MB xls, and GB report *T. erinacei* J.M.B. Smith & Marples, whereas IF, IF xls, and FN list *T. mentagrophytes* (C.P. Robin) R. Blanch. ACF names the species *T. erinacei* (J.M.B. Smith & Marbles) Quaife and adds that this belongs to the *Trichophyton verrucosum* complex. Note that the name *T. erinacei* J.M.B. Smith & Marples was invalidly published (info from MB). Like above, this case deals with species boundaries

within the genus *Trichophyton*. *T. erinacei* occurs on different hedgehog species both in Europe and Africa (Čmoková et al. 2022). Early mating experiments concluded that the species might be considered as a variety of *T. mentagrophytes* that was named *T. mentagrophytes* var. *erinacei* (Padhye and Ajello, 1977). Molecular phylogenies and phenotypic studies recognize the species (Gräser et al. 1999a; de Hoog et al. 2017). An extensive biosystematics study on *T. erinacei* was conducted by Čmoková et al. (2022). Based on a multigene phylogenetic analysis and a microsatellite analysis *T. erinacei* revealed to be a monophyletic species. However, other markers yielded infraspecific differences and two subpopulations were recognized. The authors provided evidence that *T. erinacei* is a single species, with intraspecific genotypic and phenotypic variation. De Hoog and coworkers (2017) noted that *T. erinacei* belongs to the *T. benhamiae* series and not to the *T. mentagrophytes* series. A finding supported by the results of Čmoková et al. (2022). Thus, it is not clear why IF and FN refer to *T. erinacei* as *T. mentagrophytes*.

Trichophyton erinacei (J.M.B. Smith & Marples) A.A. Padhye & J.W. Carmichael 1969 is the preferred current name to be used. Note that this species is not included in the COGEM fungal list.

5.2.4.14. *Trichophyton indotineae* versus *Trichophyton mentagrophytes* var. *indotineae* versus *Trichophyton mentagrophytes*

Like above (8.2.4.13) this case also deals with the species concepts in dermatophytes. *T. indotinae* R. Kano, U. Kimura, M. Kakurai, J. Hiruma, H. Kamata, Y. Suga & K. Harada is listed in FN and GB, but it is referred as *T. mentagrophytes* in IF, and MB, IF xls name it *Trichophyton mentagrophytes* var. *indotineae*, and MB xls has no current name. ACF refers to *T. indotineae*, and has updated information on clinical impact, taxonomy and provides a list of synonyms. The fungus is the same as genotype VIII within the *T. mentagrophytes*/*T. interdigitale* species complex, and was described by Japanese researchers using phenotypic and molecular data, most notably ITS sequence analysis, as well as antifungal susceptibility and clinical data (Kano et al. 2020). Since its description the species emerged in various parts of the world largely due to its resistance to some commonly used antifungals, such as terbinafine (Uhrlaß et al. 2022). A molecular and phenotypic comparative study showed that *T. indotinae* is distinct from [other] genotypes of *T. mentagrophytes* and *T. interdigitale* in a multigene-based phylogeny that used Tef1- α , ITS, and HMG sequences (Tang et al. 2021).

Based on this recent research it is clear that *T. indotinae* should be recognized at the species level as *Trichophyton indotineae* R. Kano, U. Kimura, M. Kakurai, J. Hiruma, H. Kamata, Y. Suga & K. Harada 2020. Note that this species is not included in the COGEM fungal list, but as an important and emerging pathogen this species might be added to the COGEM fungal list.

5.2.4.15. *Trichophyton interdigitale* versus *Trichophyton mentagrophytes*

The species is listed in MB, MB xls and GB, but in IF, IF xls, and FN it is mentioned as *T. mentagrophytes*. ACF lists *T. interdigitale* as member of the *T. mentagrophytes* complex. *T. interdigitale* forms a separate cluster amongst many genotypes of in a molecular phylogenetic study that used Tef1- α , ITS, and HMG sequences (Tang et al. 2021). A maximum likely hood analysis of the HMG sequences separated *T. interdigitale*, *T. mentagrophytes* and *T. indotineae* (Tang et al. 2021), thus suggesting that these represent three species. A problem when using ITS sequences for identification in the complex is that databases seem to be contaminated with erroneous sequences or that used wrongly identified strains (Chowdary et al. 2019). In a study of Czech isolates it was concluded that the two species cannot be distinguished unequivocally by phenotypic means, *T. interdigitale* is anthropophilic, and more associated with onychomycosis, whereas *T. mentagrophytes* is zoophilic. ITS sequences can, to some extent, differentiate both species, whereas MALDI-TOF MS failed to do so (Švarcová et al. 2023). Based on these results, as well as practicalities related to identifications of unknown isolates, and ease of reporting clinical results, the authors concluded that *T. indotineae*, *T. interdigitale* and *T. mentagrophytes* should be interpreted as varieties within the broader defined species *T. mentagrophytes*. Interestingly, a multigene-based phylogeny separated *T. interdigitale* from both *T. indotineae* and *T. mentagrophytes* (de Hoog et al. 2017), thus supporting recognition at species level.

Trichophyton interdigitale Priestley 1917 should be recognized at species level with this current name.

5.2.4.16. *Trichophyton quinckeanum* versus *Trichophyton mentagrophytes*

All fungal name repositories, except MB xls, refer to this species as *T. quinckeanum* (Zopf) D.M. MacLeod & Muende. MB xls refers to the species as *T. mentagrophytes*. A multilocus-based phylogeny placed the species rather distant from *T. mentagrophytes* in a sister relationship to *T. schoenleinii* (de Hoog et al. 2017). This species should be referred to as *Trichophyton quinckeanum* (Zopf) D.M. MacLeod & Muende, 1940. Note that this species is not included in the COGEM fungal list.

5.2.4.17. *Trichophyton singulare* versus *Trichophyton verrucosum*

This species is listed in MB, but in IF, IF xls and FN it is named *T. verrucosum*. No current name is given in MB xls and the name showed no hit in GB. ACF refers to it as a doubtful dermatophyte species. Pubmed and Google Scholar gave very limited and largely outdated references. From the above it is clear that the concept of *T.*

singulare is not clear and, hence, use of the name should be avoided. Given the unclear concept of the species also the purported synonymy under *T. verrucosum* is questionable. *T. verrucosum* Bodin 1902, however, is a valid species.

5.2.4.18. *Trichophyton soudanense* versus *Trichophyton violaceum*

All name repositories, MB, FN, IF, IF xls, and GB refer to this species as *T. soudanense* Joyeux. Only MB xls lists its current name as *T. violaceum*. ACF lists both species as member of the *T. rubrum* complex. De Hoog et al. (2017) listed both species next to *T. rubrum*, although the phylogenetic tree shown in this publication did not show clear separation between them. In an early molecular study using ITS sequences and AFLP banding patterns it was concluded that only two species, *T. rubrum* and *T. violaceum*, including *T. soudanense*, could be recognized (Gräser et al. 2000a). In a later study using ITS sequence analysis, MALDI-TOF MS, AFLP and phenotype comparisons it was concluded that *T. soudanense*, *T. violaceum* and *T. rubrum* should be interpreted as distinct species with geographic, clinical, and some phenotypic features. For identification ITS sequencing was recommended (Su et al. 2019).

Based on the above considerations, *T. soudanense* Joyeux 1912, *T. violaceum* Sabouraud ex E. Bodin 1902, and *T. rubrum* (Castell.) Sabouraud 1911 should be considered distinct species. The purported synonymy of *T. soudanense* under *T. violaceum* as indicated on the COGEM fungal lists is not supported.

5.2.4.19. *Microsporum canis* versus *Arthroderma otae* versus *Microsporum distortum*

MB, MB xls, IF, IF xls, FN, GB and ACG list this as *Microsporum canis* (E. Bodin) E. Bodin, whereas for the teleomorph *A. otae* MB, GB and ACF lists this as *M. canis*, MB xls as *Arthroderma otae*, and IF, IF xls and FN as *Nannizzia otae*. *Microsporum distortum* Di Menna & Marples 1954 is listed by IF, IF xls, FN and GB, but MB and MB xls have this species as *M. equinum* (Delacr. & E. Bodin) Guég. 1904, and only ACF lists it as a synonym under *M. canis*. *Microsporum equinum* is listed in MB, IF, FN and GB, whereas ACF has no link to the name. *M. canis* is a zoophilic dermatophyte responsible for tinea capitis and tinea corporis in humans and animals, particularly cats and dogs. *A. otae* represents the teleomorphic stage of *M. canis*. From the above it can be concluded that *M. canis* and its teleomorph *A. otae*/*N. otae* represent the same species, but for *M. distortum* this is not clear, despite its listing as a facultative synonym under *M. canis* in ACF. Already in 1983, Matsumoto et al. were able to mate *M. distorta* with *M. canis*/*N. otae* suggesting at least a close relationship that these authors recognised at the variety level. Gräser and colleagues (2000b) reduced *M. distortum* as a synonym under *M. canis* because of the occasional occurrence of distorted macroconidia in *M. canis* and because of similar ITS sequences and AFLP fingerprints. Unfortunately, in a recent extensive study by Zhou et al. (2023) on the *M.*

canis complex no *M. distortum* strains were included. Based on the above, *M. distortum* is considered a morphological variant and synonym within the *M. canis* complex (Hoog et al., 2017). Although we believe that this complex needs further study using extensive genetics and phylogenomics analysis to full settle its taxonomy, it is proposed to keep *M. distortum* as a synonym under *M. canis*.

Thus, *Microsporium canis* (E. Bodin) E. Bodin 1902 is the preferred current name. COGEM should keep only one entry for the species in its fungal names database.

5.2.4.20. *Nannizzia gypsea* (Nann.) Stockdale 1963 versus *Arthroderma gypsea* versus *Microsporium gypseum*; *Nannizzia fulva* versus *Arthroderma fulvum* versus *Microsporium fulvum*; *Arthroderma incurvatum*

These species belong to the *Microsporium/Nannizzia gypsea* species complex. *Nannizzia gypsea* is listed in MB, MB xls, GB and ACF, whereas IF, IF xls, and FN list it as *Arthroderma gypseum* (Nann.) Weitzman, McGinnis, A.A. Padhye & Ajello. MB lists *A. gypseum* and *M. gypsea* as synonyms.

Nannizzia fulva Stockdale 1963, another species listed on the COGEM list, is present in all fungal name repositories. Thus, it is clear that this is recognized as a distinct species (also see discussion paragraph 8.2.4.8.). *Nannizzia incurvata* Stockdale 1961 is present in the COGEM pathogens list as a synonym under *N. fulva* and with *M. gypseum* as another synonym. However, Dukik et al. (2020) recognized *N. gypsea*, *N. fulva*, and *N. incurvata* as distinct species in the genus *Nannizzia* based on an extensive multigene based phylogeny study. Note that *N. gypseum* is also present on the list of nonpathogenic fungi of COGEM (also see discussion paragraph 8.2.4.1.).

Hence, we recommend to use the species *Nannizzia gypsea* (Nann.) Stockdale 1963, *Nannizzia fulva* Stockdale 1963 and *Nannizzia incurvata* Stockdale 1961, respectively.

5.2.4.21. *Arthroderma phaseoliforme* versus *Trichophyton phaseoliforme*

All fungal name repositories list this species as *Arthroderma phaseoliforme* (Borelli & Feo) Y. Gräser & de Hoog 2018. Hence, we suggest this as the current name.

5.2.5. Family *Aspergillaceae*

The taxonomy and nomenclature of the genus *Aspergillus* stabilized after the introduction of molecular phylogenies recognizing previously recognized subgeneric groups, that were to a large extent also characterized by features of the sexual morph, with infrageneric lineages recognized as Series. Samson et al. (2014) proposed the

use of a single but large genus *Aspergillus*, subdivided by subgenera and sections, such as section *Flavi*, *Nidulantes*, *Versicolores* etc. in order to promote nomenclatural stability (Samson et al. 2014). These authors argued against the introduction of several genera that could also, and likely even with more statistic power, be introduced as an alternative option as advocated by Pitt and Taylor (2016). This alternative view as presented by the latter authors wanted to recognize the morphological and molecular diversity in a generic classification that maintained previously recognized sexual names (Pitt and Taylor 2016, Taylor et al. 2016). Until today, this latter proposal received little support. In my view, this may change when more objective parameters, e.g. based on genome statistics, will be used for genus demarcation in fungi, as has been recently explored among Saccharomycotina yeasts (Liu et al. 2024).

For the current work, we will maintain the current consensus classification by keeping the broad concept of the genus *Aspergillus*.

5.2.5.1. *Aspergillus oryzae* versus *Aspergillus flavus* var. *oryzae* versus *Aspergillus flavus*

MB, Mb xls and IF xls keep this taxon at the variety level as *Aspergillus flavus* var. *oryzae*, IF and FN name it as *A. flavus*, and GB as *A. oryzae*. ACF lists it also as a species, *A. oryzae*, but also indicates that from a biological point of view it belongs to *A. flavus* or the *A. flavus* complex. Distinction at the species level is largely argued by industrial interests as well as to trace the source of potential infections, although the taxa show 99.5% similarity in coding genes (Watarai et al. 2019). Hedayati and coworkers (2019) found that to some extent MALDI-TOF MS was able to distinguish between *A. oryzae* and *A. flavus*. Only 10 % of the *A. flavus* isolates (n = 200) was correctly identified, but 20% were identified as *A. oryzae*, and 70% as *A. flavus/A. oryzae*. In a review, Chang and Ehrlich (2010) indicated that distinction of both species using a variety of methods is not reliably possible, but they suggest to keep them as distinct species due to industrial and food safety aspects. A comparative genomics study by Watarai et al. (2019) including 82 '*A. oryzae*' isolates yielded interesting views on the partial separation between *A. oryzae* and *A. flavus* after they diverged from their common ancestor. *A. oryzae* formed a monophyletic clade nested within an *A. flavus* clade. Importantly, aflatoxin biosynthetic gene clusters were observed to be present in the confirmed non-aflatoxigenic strains. An extensive taxonomic study of *Aspergillus* section *Flavi* using various gene sequences, viz. *BenA*, *CaM*, *RPB2*, and extrolite profiles, next to other phenotypic data, showed that the type strains of *A. flavus* and *A. oryzae* were positioned very closely related on the same branch (Frisvad et al. 2019, Visagie et al. 2024) with *A. oryzae* placed within the broader *A. flavus* clade. However, the authors kept *A. oryzae* at the species level, also because some phenotypic differences were noted to be specific for the species. The domesticated *A. oryzae* differs from wild type *A. flavus* because it has larger and more smooth conidia that are browner en masse, the colonies are more floccose, sporulation is weaker,

sclerotia are not formed, and production of aspergillic acid and aflatoxins is absent (Frisvad et al. 2019). Hence, these authors accept *Aspergillus oryzae* (Ahlb.) Cohn 1884 as a species distinct from *Aspergillus flavus* Link, 1809.

Taken together, *A. flavus* and *A. oryzae* are genetically conspecific, but the latter is the domesticated form of the former species. Although, very likely, the final word on the matter has not yet been made, for the time being *Aspergillus oryzae* (Ahlb.) Cohn 1884 and *Aspergillus flavus* Link 1809 are treated as distinct species.

5.2.5.2. *Aspergillus thermomutatus* versus *Aspergillus fischeri* versus *Neosartorya fischeri*

Aspergillus thermomutatus is listed in MB, MB xls, GB and ACF, whereas IF, IF xls, FN name it *A. fischeri*. When searching for taxonomic information an obvious source is a publication by Samson et al (2007) in which *Aspergillus* section *Fumigati* is revised based on morphological, chemical, i.e. extrolite data, and multigene-based phylogenies. In this work the species is named *Neosartorya pseudofischeri* Peterson with *A. thermomutatus* (Paden) Peterson as the asexual name (anamorph). In 2014, Samson et al. (2014) lists the species as *A. thermomutatus* with *Aspergillus pseudofischeri* var. *thermomutatus* and *Neosartorya pseudofischeri* as synonyms. *Aspergillus fischeri* is not mentioned. When searching for the current name of *A. thermomutatus* in the various name repositories, MB and GB refer to the correct species, although these databases do not mention *N. pseudofischeri*. Interestingly, the name *A. fischeri* Whemer that is given as the current name for *A. thermomutatus* by IF and FN is considered in this work a synonym under *Aspergillus fischeri* Wehmer with *Neosartorya fischeri* (Wehmer) Malloch & Cain and *Aspergillus fischerianus* as synonyms under that name (Samson et al. 2014).

When searching the name *N. pseudofischeri* in the various name repositories the following is noted. MB and MB xls refer to this name, IF, IF xls and FN refer to it as *A. fischeri*, and GB refers to it as *A. thermomutatus*. From this it can be concluded that IF and FN need to revise the name designated for *A. thermomutatus*/*N. pseudofischeri*.

Given the general consensus on the use of the broad generic concept of *Aspergillus* we propose to use *Aspergillus thermomutatus* (Paden) S.W. Peterson 1992 as current name and keep *A. fischeri* Wehmer 1907 as a separate species on the list.

5.2.5.3. *Aspergillus versicolor* versus *Emericella versicolor*

This species is listed as *A. versicolor* in MB, MB xls, GB, whereas the name *E. versicolor* is used in IF, IF xls, and FN. These two names are obligate synonyms with *A. versicolor* being the asexual name and *E. versicolor* the sexual name. The choice between these two names illustrates a long debate in mycology on the use of either

sexual or asexual name. Both are correct and the choice has to be made by the community. ACF reports the species as *A. versicolor*, and does not mention *E. versicolor* in the list of synonyms. In Google Scholar *A. versicolor* has 88,300 hits and 2,890; in Pubmed *A. versicolor* yielded 562 hits, and *E. versicolor* 11. This shows a preponderance of the use of the name *A. versicolor*, but this does not necessarily reflect a proper taxonomic decision. As indicated above, the taxonomy of *Aspergillus* and associated teleomorph genera, that were the base of an alternative generic classification, has long been debated.

Given the current consensus on the use of a broad concept of the genus *Aspergillus*, *Aspergillus versicolor* (Vuill.) Tirab. 1908 is the current name to be used.

5.2.6. Family *Basidiobolaceae*

5.2.6.1. *Basidiobolus haptosporus* versus *Basidiobolus ranarum*

MB, MB xls and GB refer to this species as *B. haptosporus*, whereas IF, IF xls and FN name it *B. ranarum*. ACF refers to it as *B. haptosporus*. A maximum likelihood phylogenetic based on three genes, viz., rDNA, mitochondrial small subunit (mtSSU) and RPB2, clearly placed *B. ranarum* separate from *B. haptosporus* (Gryganskyi et al. 2012). An ITS2 based phylogeny placed *B. ranarum* and *B. haptosporus* in the same lineage, albeit both species occurred separated from each other (Sitterlé et al. 2017). A combined ITS and LSU rDNA-based phylogenetic tree clearly showed both *Basidiobolus* species as distinct (Al-Hatmi et al. 2021). Recently, *B. haptosporus* has been found to be implicated in mite infections (Werner et al. 2012).

Judging from this, it is concluded that *B. haptosporus* and *B. ranarum* are distinct species with *Basidiobolus haptosporus* Drechsler 1947 and *Basidiobolus ranarum* Eidam 1886 as current names.

5.2.7. Family *Bionectriaceae*

Two extensive phylogenetic studies addressed the diversity of Bionectriaceae (Summerbell et al. 2011; Hou et al. 2023). Both studies made considerable taxonomic revisions including the recognition of the genera *Gliomastix* and *Mastigocladium*.

5.2.7.1. *Gliomastix roseogrisea* versus *Acremonium roseogriseum*

All name repositories, viz., MB, IF, IF xls, FN, GB and ACF refer to this species as *Gliomastix roseogrisea*. Only MB xls refers to it as *Acremonium roseogriseum*. Summerbell and coworkers (2011) generated sequences of SSU and large subunit (LSU) ribosomal (rDNA) for > 200 members of the old and broadly [read morphologically] defined genus *Acremonium*. Based on the phylogenetic analysis

three genera, a.o., *Gliomastix*, were recognized. The recognition of *Gliomastix* was also supported in the study of Hou et al (2023). Based on the current names used in most fungal name repositories the name *G. roseogrisea* is strongly recommended.

Hence, the name *Gliomastix roseogrisea* (S.B. Saksena) Summerb. 2011 is the preferred current name.

5.2.7.2. *Proxiovicillium blochii* versus *Mastigocladium blochii*

MB, IF, IF xls list *M. blochii*, whereas FN and GB refer to it as *P. blochii*. MB xls has not designated a current name. ACF has no entry. Hou et al. (2023) provided an extensive revision of fungi previously classified in the genus *Acremonium* using phylogenetic analyses based on three gene (ITS, LSU, rpb2, tef-1 α) dataset. In this work 633 cultures with *Acremonium*-like morphology were studied, including 261 ex-type strains. As of to date this is the most extensive study on *Acremonium*-like fungi. This study recognized the new genus *Proxiovicillium* (clade O36) with *P. blochii* (basionym: *Mastigocladium blochii*, syn. *Acremonium blochii*), the type species, and the new species *Paraacremonium lepidopterorum*. The question is what the original *Mastigocladum blochii* might represent? In the notes on the new genus *Proxiovicillium*, Hou et al. (2023) wrote '*Mastigocladium blochii* (syn. *Acremonium blochii*) was originally described from verrucose cankers on human hands and elbows in France (Matruchot 1911). Gams (1971) examined two cultures, CBS 324.33 and CBS 993.69 with possible human pathogenicity as representatives of *A. blochii*. According to our phylogenetic inference, CBS 993.69 clustered within *Bulbithecium*, and has broadly ellipsoid conidia arranged in slimy heads, which are morphologically incompatible with the original description of *A. blochii*, while culture CBS 324.33 falls into a fully supported clade (BPP/MLBS = 1/100 %), together with another culture (CBS 427.93) from human skin, that is representative of a novel genus in the *Bionectriaceae* close to *Ovicillium*'. Thus, the two representative strains are phylogenetically different with one belonging to the genus *Bulbithecium*, and the other representing the new genus *Proxiovicillium*.

Although this name was only recently introduced, we consider that the taxonomic interpretation of the phylogenetic trees warrants recognition as a distinct genus, hence, we suggest *Proxiovicillium blochii* (Matr.) L.W. Hou, L. Cai & Crous 2023 as the current name to be used.

5.2.8. Family *Chaetomiaceae*

5.2.8.1. *Achaetomium strumarium* versus *Chaetomium strumarium*

MB, IF, and IF xls list this species as *A. strumarium*, whereas MB xls, FN, GB, ACF name it *C. strumarium*. The genus *Achaetomium* was described by Rai et al. (1964) for *Chaetomium*-like fungi that lack hairy ornamentation. Three species were originally

included, *A. globosum* Rai et al. (1964) was designated the type species. *A. strumarium* was one of three species initially recognized. According to Cannon (1986), however, the ascocarps of all *Achaetomium* species were sort of tomentose, thus questioning the generic characteristics. Based on morphological considerations Cannon (1986) recombined the species in *Chaetomium* as *Chaetomium strumarium* (J. N. Rai, J. P. Tewari & K. G. Mukerji) P. Cannon, 1986. Recently, Wang and collaborators (2022) made an extensive multigene-based phylogeny using sequences of ITS 1+2, 5.8S rDNA, LSU rDNA, rpb2, and tub2 (β -tubulin gene) sequences for many strains of Chaetomiaceae and other families in Sordariales. The resulting phylogenetic tree clearly showed that the genus *Achaetomium*, including *A. strumarium*, is distantly related to *Chaetomium*.

Based on these results it is clear that the current name for this species is *Achaetomium strumarium* J.N. Rai, J.P. Tewari & Mukerji, 1964.

5.2.8.2. *Corynascus thermophilus* versus *Thermothelomyces fergusii* versus *Myceliophthora thermophila*

MB, IF, IF xls, FN and GB refer to this species as *Thermothelomyces fergusii*, MB xls names it *Corynascus thermophilus*, whereas ACF lists it as *Myceliophthora thermophila*. A recent monograph of *Chaetomiaceae* used multigene-based phylogeny reconstructions of the ITS 1+2, D1/D2 domains of the LSU rDNA, rpb2 and tub2 (Wang et al. 2022). The study accepted 50 genera and 275 species in the family. In addition, the publication provides extensive information on how to study and describe these fungi. Importantly, the genus *Corynascus* was limited to a clade with six species, whereas *C. thermophilus* occurred in the genus *Thermothelomyces* that was erected by Marin-Felix et al. (2015) who split the broadly defined genus *Myceliophthora* (van den Brink et al. 2012) into four genera, namely *Corynascus*, *Crassicarpon*, *Myceliophthora*, and *Thermothelomyces*. Wang and collaborators found that the genus *Crassicarpon* did not differ from the genus *Thermothelomyces*, and, in addition, was found not to be validly described as no repository was indicated. These authors stated in the list of synonyms under *Thermothelomyces fergusii* that *Thielavia thermophila* Fergus & Sinden 1969 is not identical to *Thermothelomyces thermophilus* (Apinis) Y. Marín et al. (Marín-Felix et al. 2015). Furthermore, *Chrysosporium fergusii* Klopotek 1974 also named *Corynascus thermophilus* (Fergus & Sinden) Klopotek 1974 and *Myceliophthora fergusii* (Klopotek) Oorschot 1977 were considered to be synonyms. *Crassicarpon thermophilum* (Fergus & Sinden) Y. Marín et al., 2015, was rejected because of its invalid nature (Wang et al. 2022).

Based on the above, it is advised to COGEM to name this species *Thermothelomyces fergusii* X. Wei Wang & Houbraken 2022.

5.2.9. Family *Coniothyriaceae*

5.2.9.1. *Coniothyrium fuckelii* versus *Paraconiothyrium fuckelii*

MB, IF, IF xls, and FN list this species as *C. fuckelii*, whereas GB, ACF and MB xl name it *P. fuckelii*. The genus *Paraconiothyrium* was created by Verkley and co-authors in a phylogenetic analysis using ITS and partial SSU rDNA sequence analysis of a number of *Coniothyrium*-like coelomycetes (Verkley et al. 2004). In a later study, Verkley and co-authors found that *C. fuckelii* phylogenetically belonged to the genus *Paraconiothyrium*, and, hence, this species was recombined as *Paraconiothyrium fuckelii* (Fuckel) Verkley & Gruyter (Verkley et al. 2014). Important synonyms are *Coniothyrium fuckelii* Sacc., *Sphaeria coniothyrium* Fuckel, and *Leptosphaeria coniothyrium* (Fuckel) Sacc. (Verkley et al. 2014). The name has been used in recently published literature, e.g. Lorenzini et al. (2016) and Tennakoon et al. (2022).

We follow this modern classification and use the name *Paraconiothyrium fuckelii* (Sacc.) Verkley & Gruyter 2012.

5.2.10. Family *Cordycipitaceae*

5.2.10.1. *Akanthomyces* versus *Lecanicillium* (*Akanthomyces attenuates*, *Akanthomyces lecanii*, *Akanthomyces muscarius* versus *Lecanicillium attenuatum*, *Lecanicillium lecanii*, *Lecanicillium muscarium*)

All fungal name repositories (MB xls, IF, IF xls, FN, GB), except MB, list these species under *Akanthomyces*. Only MB keeps them under *Lecanicillium*. Apparently, the taxonomy of this group of important insects inhabiting and biocontrol fungi has been in a circling flux. Names changed from *Lecanicillium* to *Akanthomyces* back to *Lecanicillium*. The question is 'who is right'?

Zare and Gams (2001) studied the morphology and molecular phylogeny using SSU, LSU and ITS parts of rDNA and concluded that most entomogenous and fungicolous species of the genus *Verticillium* section Prostrata should be classified in a new genus that they named *Lecanicillium* W. Gams & Zare with *Lecanicillium lecanii* as type species. Kepler et al. (2017) sought to resolve the nomenclature of *Cordycipitaceae* after the abandonment of the dual nomenclature. Therefore, they generated phylogenetic trees using SSU and LSU rDNA, TEF1, RPB1 and RPB2 sequences and they concluded that *Lecanicillium* is congeneric with the genus *Akanthomyces* with the latter having nomenclatural priority. Thus, the three species listed above were recombined into the genus *Akanthomyces*. However, this proposal was later questioned by Khonsanit and coworkers (2024). These authors studied the molecular phylogeny of a large collection of entomopathogenic fungi from Thailand and included previously generated data and used an almost identical dataset as Kepler et al. (2017). Khonsanit and coworkers did not include SSU rDNA sequences, so they considered LSU rDNA, TEF1, RPB1 and RPB2 sequences. In their resulting phylogenetic the

above listed three species that were only recently combined in the genus *Akanthomyces* (Kepler et al. 2017) were found to cluster a in separate clade B distinct from *Akanthomyces sensu stricto* and for which the genus name *Lecanicillium* was resurrected.

This leaves us with a difficult conundrum. Should one accept more narrowly or more broadly defined genera, or, in general, how should fungal genera be defined? For sure, the reclassification of important entomopathogens in a short time does not contribute to nomenclatural stability. In this case, I suggest to follow the broader genus concept as used by Kepler et al. (2017) until more support for the narrower defined genus suggest acceptance by a broader user community. Importantly, here the alternative *Lecanicillium* names should be listed as important synonyms.

Thus, it is advised to use *Akanthomyces attenuates* (Zare & W. Gams) Spatafora, Kepler & B. Shrestha, *Akanthomyces lecanii* (Zimm.) Spatafora, Kepler & B. Shrestha and *Akanthomyces muscarius* Petch as current names.

5.2.10.2. *Cordyceps bassiana* versus *Beauveria bassiana*

This species is listed as *B. bassiana* by MB, IF, IF xls, FN, GB, ACG, but only MB xls names it *C. bassiana*. The above cited paper by Kepler et al. (2017) also addresses the naming of *Cordyceps* versus *Beauveria*. In this multigene-based phylogeny support for both genera is presented, and, consequently both are accepted genera. Chuang et al. (2024) conformed the use of the name *B. bassiana*.

Because the type species of *Beauveria* is *B. bassiana* (Bals.-Criv.) Vuill. 1912, the correct name of this species is *Beauveria bassiana* (Bals.-Criv.) Vuill. 1912.

5.2.10.3. *Cordyceps brongniartii* versus *Beauveria brongniartii*

MB, MB xls, IF, IF xls, and FN cite this species as *C. brongniartii*, and only GB refers to it as *B. brongniartii*. Kepler et al. (2017) clearly showed that this species belongs to the genus *Beauveria* where it is relatively closely related to *B. bassiana*. Chuang et al. (2024) confirmed the use of *B. brongniartii*.

Hence the correct name is *Beauveria brongniartii* (Sacc.) Petch, 1926.

5.2.11. Family *Cunninghamellaceae*

5.2.11.1. *Cunninghamella bertholletiae* versus *Cunninghamella elegans*

MB, MB xls, GB, ACG refer to this species as *Cunninghamella bertholletiae*, whereas IF, IF xls and FN use *C. elegans*. ACF provides some differential features between the two species as follows: The mostly non-pathogenic species *Cunninghamella elegans* differs by purely grey colonies and absence of growth at 45°C. Separation was

confirmed by rDNA ITS analysis (Liu et al., 2001). An extensive DNA barcoding study of Mucorales using D1D2 domains of LSU rDNA and ITS sequences distinguished both species (Walther et al. 2013). Another DNA barcoding study using ITS and *tef-1 α* sequences confirmed the presence of both species with the data correlating well with phenotypic features (Yu et al. 2015). Finally, a Korean study also confirmed the presence of two species (Nguyen et al. 2017).

Thus, both species should be recognized separately and it is recommended to use the name *Cunninghamella bertholletiae* Stadel 1911 for that species only.

5.2.11.2 *Chlamydoabsidia padenii*

This species has been mistakenly placed on the 2024 COGEM fungal list as a synonym under *Metarhizium viride*. *C. padenii*, however, belongs to the family Cunninghamellaceae and not Clavicipaceae. Therefore, *C. padenii* Hesselt. & J.J. Ellis 1966 has been reinstated as a separate species on the nonpathogens list.

5.2.12. Family *Dipodascaceae*

5.2.12.1. *Magnusiomyces capitatus* versus *Dipodascus capitatus*

MB, MB xls, GB list this species as *M. capitatus*, whereas IF, IF xls and FN name it *D. capitatus*. ACF refers to it as *M. capitatus*. TYTS (Kurtzman et al., 2011) and theyeasts.org refer to the species as *M. capitatus*. The taxonomy of arthroconidia-forming *Saccharomycotina* yeasts has long been messy. Only the introduction of molecular phylogenetic studies clarified the picture. Amongst the first studies that used DNA sequence data was the study of de Hoog and Smith (2004) who made a major attempt to clarify the taxonomic relationships of these yeast-like fungi. Using ITS sequences and DNA/DNA reassociation studies they noted that two separate lineages occurred both with sexual and asexual states, namely *Galactomyces* / *Dipodascus* with *Geotrichum* anamorphs, and *Magnusiomyces* with *Saprochaete* anamorphs. Zhu and coworkers (2024) re-addressed the taxonomic structure of these yeasts by studying the D1/D2 domains of LSU rDNA and the ITS rDNA. They recognized two monophyletic groups that were recognized as genera: 1. *Dipodascus*, *Galactomyces*, and *Geotrichum* species with the latter name being selected as genus name; 2. *Magnusiomyces* and *Saprochaete* species and here the first generic name was selected.

Despite considerable intracladal variation was observed, we will adhere to the genus concept as presented by Zhu et al. (2024). In this work *M. capitatus* clustered within the *Magnusiomyces* clade.

Because of the above, the correct name for the species is *Magnusiomyces capitatus* (de Hoog, M.T. Smith & E. Guého) de Hoog & M.T. Smith 2004. Important and widely used synonyms are *Blastoschizomyces capitatus* (Diddens & Lodder) Salkin,

Saprochaete capitata (Diddens & Lodder) de Hoog & M.Th. Smith, and *Geotrichum capitatum* (Diddens & Lodder) von Arx, 1977.

5.2.13. Family *Eremomycetaceae*

5.2.13.1. *Eremomyces langeronii* versus *Pithoascus langeronii* versus *Arthrographis arxii*

MB and MB xls list this species as *P. langeronii*, whereas IF, IF xls, FN and GB name it *A. arxii*. None use the name *E. langeronii*, but list this name as a synonym under the respective names.

Pithoascus langeronii was described van von Arx (1978) for a sexual state of *Arthrographis langeroni* Cochet 1939. Sandoval-Denis et al. (2016) made a revision based on a multigene phylogenetic analysis of *Scopulariopsis*, *Microascus* and related fungi. *P. langeroni* was not included in their concept of the genus *Pithoascus*. Giraldo and collaborators (2014) published a revision of the genus *Arthrographis* using a multigene-based phylogeny with D1/D2 LSU -, ITS rDNA, and parts of the ACT1 and CHS1 genes. This study included the type strain of *Eremomyces langeronii*, i.e., CBS 203.78. From a nomenclatural point of view the authors proposed a new name for the species known as *Pithoascus langeronii* Arx, because this latter name was not available as *A. kalrae* and *E. langeronii*, in contrast to previously held views, were found to represent different species. It remains unclear why MB still uses the name *P. langeronii* as from the above it is clear that *A. arxii* is the preferred name for this species.

Hence, we recommend the use of the name *Arthrographis arxii* Guarro, Giraldo, Gené & Cano, 2014.

5.2.14. Family *Filobasidiaceae*

5.2.14.1. *Filobasidium uniguttulatum* versus *Cryptococcus uniguttulatus*

MB, MB xls, GB, ACF refer to this species as *F. uniguttulatum*, whereas IF, IF xls and FN name it *C. uniguttulatus*. Interestingly, when searching the name repositories for *C. uniguttulatus* a different picture emerges despite both represent one and the same species. MB and MB xls refer in this case to *Cryptococcus neoformans* var. *uniguttulatus* (Zach) Lodder & Kreger-van Rij, 1952, whereas all the other databases maintain the same name as they do for *F. uniguttulatum*. The genus *Cryptococcus* has been revised using a 5-locus phylogeny (Hagen et al. 2015, Liu et al. 2015). Its type species, *C. neoformans*, belongs to Tremellales whereas *F. uniguttulatum*/*Cr. uniguttulatus* belongs to Filobasidiales.

Hence, the correct name for this species is *Filobasidium uniguttulatum* Kwon-Chung 1977.

5.2.15. Family *Glomeraceae*

5.2.15.1. *Rhizoglopus* versus *Rhizophagus*: *Rhizoglopus aggregatum* versus *Rhizophagus aggregatus*; *Rhizoglopus clarum* versus *Rhizophagus clarus*; *Rhizoglopus irregulare* versus *Rhizophagus irregularis*; *Rhizoglopus manihotis* versus *Rhizophagus manihotis*

MB and MB xls use the generic name *Rhizoglopus* whereas all other name depositories have *Rhizophagus* as the generic name. Sieverding and colleagues (2015) wrote an extensive text why, in their opinion, the name *Rhizophagus* should not be applied to any taxon of *Glomeromycetes*. Their argumentation is mainly based on different view of the host/endomycorrhiza interaction and focussed mainly on what originally might have been present at the roots of a poplar studied by Dangeard (1900). Sieverding et al. (2015) proposed *Rhizoglopus* (*Glomeraceae*, *Glomeromycetes*) with *Glomus intraradices* [\equiv *Rhizoglopus intraradices*] as the generic type. This view has been debated by authors who want to adhere to the more commonly used generic name *Rhizophagus*. In order to maintain nomenclatural stability, a proposal to conserve the name *Rhizophagus* with a different type than in the original description by Dangeard, was proposed, namely *Rhizophagus intraradices* (N.C. Schenck & G.S. Sm.) C. Walker & A. Schüßler (Schüßler & Walker, 2010; Walker et al. 2017). An rDNA based molecular phylogeny using two overlapping nuclear DNA regions of c. 3 kb showed *Rhizophagus* species as a distinct monophyletic lineage, thus strongly supporting a generic status of this clade (Krüger et al. 2012). The question remains whether to name this genus *Rhizophagus* or *Rhizoglopus*? In my view, we need to approach this pragmatically. A search in Google Scholar gave 26,800 hits for *Rhizophagus* and 2,410 for *Rhizoglopus* (Aug. 23 2025).

At this stage the use of *Rhizophagus* names with the *Rhizoglopus* names given as important synonyms is preferred. Thus, *Rhizophagus aggregatus* (N.C. Schenck & G.S. Sm.) C. Walker 2010, *Rhizophagus clarus* (T.H. Nicolson & N.C. Schenck) C. Walker & A. Schüßler 2010, *Rhizophagus irregularis* (Blaszkowski, Wubet, Renker & Buscot) C. Walker & A. Schüßler 2010, and *Rhizophagus manihotis* (R.H. Howeler, Sieverding & N.C. Schenck) C. Walker & A. Schüßler 2010.

5.2.16. Family *Gymnoascaceae*

5.2.16.1. *Gymnoascus dankaliensis* versus *Gymnascella dankaliensis* versus *Arachniotus dankaliensis*

Two names are used in the various name repositories. MB, MB xls, GB and ACF use *Gymnascella dankaliensis*, and IF, IF xls and FN use *A. dankaliensis*. A recent molecular phylogenetic study of order Onygenales addressed the phylogenetic and

taxonomic relationships with Gymnoascaceae (Kandemir et al. 2022). They used sequences of ITS rDNA, LSU rDNA, TUB, TEF1, TEF3, RPB1, RPB2, and ribosomal protein 60S L10. In the resulting phylogenetic tree, the genera *Gymnoascus*, *Gymnascella* and *Arachniotus* could be clearly recognized.

Gymnascella dankalienis clustered with the genus *Gymnascella* and, therefore the correct name of the species is *Gymnascella dankaliensis* (Castell.) Currah 1985.

5.2.17. Family *Herpotrichiellaceae*

5.2.17.1. *Exophiala castellanii* versus *Exophiala mansonii*

All fungal name repositories refer to this fungus as *Exophiala castellanii* Iwatsu, Nishimura & Miyaji 1984. Only GB has a different option, namely *Exophiala mansonii* (Castell.) de Hoog, 1977. A phylogenetic study using ITS rDNA, SSU rDNA, *tef*, *act* and *tub* genes showed a significant distance between both species. Therefore, they are not conspecific (Thitla et al. 2022).

Based on the above it is recommended to use the name *Exophiala castellanii* Iwatsu, Nishimura & Miyaji 1984.

5.2.17.2. *Phialophora americana* versus *Phialophora verrucosa*

MB, MB xls, GB and ACF list this species as *P. americana*, whereas IF, IF xls and FN use *P. verrucosa*. ACF mentions that *A. americana* is part of the *P. verrucosa* complex, but it also provides some phenotypic and molecular means to distinguish both species [‘The species is distinct from *P. verrucosa* by vase-shaped rather than funnel-shaped collarettes, and by ITS × MspI-profiles.’]. Li et al. (2017) produced a multigene-based phylogeny of *Phialophora* and related fungi using ITS rDNA, and partial SSU rDNA, LSU rDNA, TEF1, and BT2 sequences. Both species occur in the phylogenetic tree at a distant position from each other clearly indicating that they are not conspecific. *Capronia semiimera* is the teleomorph name of *P. americana* (Li et al. 2017).

Hence, *Phialophora americana* (Nannfeldt) S. Hughes 1958 and *Phialophora verrucosa* are distinct species.

5.2.18. *Hypocreales incertae sedis*

5.2.18.1. *Pseudomicrodochium suttonii* versus *Cyphellophora suttonii*

Almost all fungal name repositories use the name *P. suttonii*, except GB and ACF that use *C. suttonii*. Feng et al. (2014) studied a representative collection of *Cyphellophora* species using a multigene phylogenetic analysis of partial LSU rDNA, ITS rDNA and RPB1 sequences. They placed the species in *Cyphellophora* as *Cyphellophora*

suttonii (Ajello, A.A. Padhye & M. Payne) Decock with *Pseudomicrodochium suttonii* Ajello, A.A. Padhye & M. Payne, 1980 as an obligate synonym. Placement of *P. suttonii* in the genus *Cyphellophora* was based on a phylogenetic analysis of partial SSU rDNA sequences (Decock et al. 2003).

Although the basis of the synonymy likely needs to be further supported by more extensive comparative studies, both in terms of species included and genome coverage, at this stage it is preferred to use the name *Cyphellophora suttonii* (Ajello, A.A. Padhye & M. Payne) Decock 2003.

5.2.19. Family *Massarinaceae*

5.2.19.1 *Massarina fluviatilis* versus *Lentithecium fluviatile*

All fungal name repositories name this species *Lentithecium fluviatile* (Aptroot & Van Ryck.) K.D. Hyde, J. Fourn. & Y. Zhang ter, but only MB xls names it *Massarina fluviatilis* Aptroot & Van Ryckegem. A major taxonomic phylogenetic study using DNA sequences of ITS, partial LSU rDNA and RPB2 confirmed the polyphyletic nature of the genus *Massarina*. Hence the clade with the type species *M. eburnean* remained *Massarina* and two other clades were renamed. The former *M. fluviatilis* belonged to a small clade that was named *Lentithecium* with *L. fluviatile* as generic type (Zhang et al. 2009).

As this genus is widely accepted, the name *Lentithecium fluviatile* (Aptroot & Van Ryck.) K.D. Hyde, J. Fourn. & Y. Zhang ter 2009 is the preferred current name.

5.2.20. Family *Meruliaceae*

5.2.20.1. *Ceriporiopsis rivulosa* versus *Obba rivulosa*; *Ceriporiopsis subvermispora* versus *Gelatoporia subvermispora*

MB and MB xls list *Ceriporiopsis rivulosa* under this name, whereas IF, IF xls, FN, and GB name it *Obba rivulosa*. *Ceriporiopsis subvermispora* is listed under this name in almost all fungal name repositories, MB, MB xls, IF, IF xls, and FN, but GB lists it as *Gelatoporia subvermispora*. Using the results from an ITS rDNA and D1/D2 LSU rDNA based phylogenetic tree, Miettinen and Rajchenberg (2012) concluded that the so-called *Cinereomyces* clade comprises three genera. *C. subvermispora* belongs to the genus *Gelatoporia*, and they described the new genus *Obba* to incorporate *C. rivulosa*. In addition, they also listed some morphological differences between the three genera. It is not clear why most fungal name repositories accept *Obba* but not *Gelatiporia*. Based on the phylogenetic analysis of the *Cinereomyces* clade, the generic names *Obba* and *Gelatiporia* are preferred.

Hence, the names of the two species will be *Obba rivulosa* (Berk. & M.A. Curtis) Miettinen & Rajchenb., 2012 and *Gelatoporia subvermispora* (Pilát) Niemelä 1985,

respectively. To maintain optimal access to scientific literature it is important to indicate the names of their respective synonyms, *Ceriporiopsis rivulosa* (Berkeley & M.A. Curtis) Gilbertson & Ryvarden 1986 and *Ceriporiopsis subvermispota* (Pilát) Gilbertson & Ryvarden 1985.

5.2.20.2. *Merulius tremellosus* versus *Phlebia tremellosa*

The name *Merulius tremellosus* has been used twice in history to name apparently different species. According to MB the first time the name was used was *Merulius tremellosus* Schrad. in 1794, based on an even older name *Agaricus cantharellus* Batsch 1783. According to MB this latter name is invalid. In 1821, Fries described *Merulius tremellosus* Fr., a name that according to MB was validly described. Based on data in the various name repositories it seems that two different fungal species were described. The species described by Schrader seems to represent a species of *Phlebia*, referred to as *Phlebia tremellosa* (Schrad.) Nakasone & Burds. 1984, while the species described by Fries is still known as *Merulius tremellosus* Fr. 1821.

MB, MB xls, IF, and IF xls list the species as *Merulius tremellosus* Fr. 1821, whereas FN, GB, and ACF refer to *Phlebia tremellosa* (Schrad.) Nakasone & Burds. 1984. IF refers to *M. tremellosus* Schrad. 1794 as *Agaricus cantharellus* Batsch 1783. FN has entries for both names. The given current name of *M. tremellosus* Schrad. is *P. tremellosa* (Schrad.) Nakasone & Burds. 1984, whereas the given current name of *M. tremellosus* Fr. remains *M. tremellosus* Fr. 1821. If we assume that the older (1783) name is indeed invalid as indicated by MB, the Friesian name *Merulius tremellosus* Fr., 1821 seems to be the correct name. From a nomenclatural point of view, it is important that the generic name *Phlebia* was also proposed by Fries in 1821. This concept is also followed by Moreno and co-authors (2011). A recent extensive molecular phylogenetic study using sequence data of ITS, LSU rDNA, *tef1*, *mtSSU*, glyceraldehyde 3-phosphate dehydrogenase (*GAPDH*), RNA polymerase II largest subunit (*rpb1*), and RNA polymerase II second largest subunit (*rpb2*) placed *M. tremellosus* in the genus *Merulius*, that was positioned distantly from the genus *Phlebia*.

Because of the above we suggest to use the name *Merulius tremellosus* Fr. 1821.

5.2.21. Family *Microascaceae*

Lackner et al. (2014) proposed the following generic names within *Microascaceae* with mostly *Scedosporium* anamorphs: *Parascedosporium*, *Lomentospora*, *Petriella*, *Petriellopsis*, and *Scedosporium*.

5.2.21.1. *Lomentospora prolificans* versus *Scedosporium prolificans*

All fungal name repositories refer to this species as *Lomentospora prolificans*, except MB xls that refers to it as *Scedosporium prolificans* as current name. According to Lackner and colleagues (2014) the preferred genus name is *Lomentospora*.

From the above it is clear that *Lomentospora prolificans* Hennebert & B.G. Desai, 1974 is the preferred current name. For the sake of the user, it is advised to also give the two synonyms *Scedosporium inflatum* Malloch & Salkin 1984 and *Scedosporium prolificans* (Hennebert & B.G. Desai) E. Guého & de Hoog 1991.

5.2.21.2. *Scedosporium apiospermum*, *Scedosporium boydii* versus *Pseudallescheria boydii*

MB, MB xls, GB, and ACF refer to this species as *S. boydii*, whereas IF, IF xls and FN name it *Scedosporium apiospermum*. *P. boydii* is referred to in MB, GB, and ACF as *S. boydii*, whereas in IF and FN it is mentioned *P. boydii*. ACF gives entries to both species with providing differential features. According to Lackner and colleagues (2014) the preferred genus name is *Scedosporium*. Min et al. (2016) concluded that it is better to refer to *S. apiospermum*, *S. boydii* and *S. angusta* as members of the ‘*S. apiospermum*-species complex’. However, such species complexes have no nomenclatural basis. In 2011, Lackner and de Hoog stated that *P. apiosperma* and *P. boydii* are molecular siblings that can be distinguished by sequences of the tubulin and calmodulin genes, but they show limited morphological and physiological discriminative parameters.

Based on the above, it is appropriate to recognize two species that should be referred to with two names. For *S. apiospermum* it is advised to use *Scedosporium apiospermum* (Sacc.) Sacc. ex Castell. & Chalm. 1919 as the current name. It is useful to add the synonym *Pseudallescheria apiosperma* Gilgado, Gené, Cano & Guarro (Gilgado et al. 2010).

5.2.21.3. *Microascus paisii* versus *Scopulariopsis brumptii*

Microascus paisii (Pollacci) Sandoval-Denis, Gené & Guarro 2016 is listed in MB, MB xls, IF, IF xls, FN, GB and ACF. Its synonym *Scopulariopsis brumptii* Salv.-Duval 1935 (Sandoval-Denis et al. 2016) is listed as *M. paisii* in MB, MB xls and ACF, but as *S. brumptii* in IF, IF xls, FN and GB. A multigene-based phylogenetic analysis showed that a strain of *S. brumptii* belonged to *M. paisii*, but, unfortunately, no type material is available for the former (Sandoval-Denis et al. 2016). Because of this uncertainty on the identity of *S. brumptii* and because the type strain of *Torula paisii*, the basionym of *M. paisii*, is the oldest type material in this clade, nomenclatural priority rules imply that *M. paisii* is the oldest and correct name of this species.

Hence, *Microascus paisii* (Pollacci) Sandoval-Denis, Gené & Guarro 2016 is the preferred current name.

5.2.21.4. *Scopulariopsis brevicaulis* and related species

Scopulariopsis alboflavescens Zach 1934 and *Scopulariopsis candida* Vuill. 1911 occur on the nonpathogens list and *Scopulariopsis brevicaulis* (Sacc.) Bainier 1907 is present on the pathogens list.

There is agreement on the taxonomic and nomenclatural status of *S. brevicaulis* and *S. candida* as all fungal name repositories list those names. Note that ACF does not contain *S. candida*. Sandoval-Denis and coworkers (2016a) recognized both species. MB, MB xls and GB list *S. alboflavescens*, but IF, IF xls and FN name it *S. candida*, and ACF lists it as *S. brevicaulis*. *Scopulariopsis koningii* (Oudem.) Vuill. 1911 is listed as an anamorphic name under *S. alboflavescens* at the nonpathogens list. When searching for this name, MB, MB xls, IF and IF xls list this as *S. brevicaulis*, but FN, GB and ACF as *S. koningii*. Hence, the status of *S. alboflavescens* and *S. koningii* is not clear. Sandoval-Denis et al. (2016) synonymized *S. alboflavescens* and *S. koningii* under *S. brevicaulis*, although both latter species clustered somewhat separated from the type strain of *S. brevicaulis* MUCL 40726. Woudenberg and coworkers (2017) found that *S. alboflavescens*, including CBS 399.34 the type strain, formed a basal lineage to *S. brevicaulis* in a phylogeny based on ITS rDNA, *tub2* and *tef1* sequences and in their phylogenetic tree they indicated both species. This lineage also included CBS 208.61, another strain that was listed as *S. koningii*. Dr. J. Houbraken, who was coauthor of the Woudenberg et al. paper, suggested to keep *S. alboflavescens* as a separate species from *S. brevicaulis*, because of the reported (small) molecular differences, as well as a different colour of the conidia. It is unfortunate that no consensus on the taxonomic status of *S. alboflavescens* could be reached by the authors from both publications. Jagielski and coworkers (2016) confirmed the taxonomic status of *S. alboflavescens* with *S. koningii* as a synonym.

Here, we follow dr. Houbraken's recommendation and keep *Scopulariopsis alboflavescens* Zach 1934 and *Scopulariopsis brevicaulis* (Sacc.) Bainier 1907 as distinct species with *S. koningii* as a synonym under *S. alboflavescens*.

5.2.22. Family *Mortierellaceae*

5.2.22.1. *Actinomortierella wolfii* versus *Mortierella wolfii*

MB, IF, IF xls, FN, and GB refer to this species as *A. wolfii*, whereas MB xls and ACF name it *M. wolfii*. A recent phylogenetic study of family Mortierellaceae (Vandepol et al. 2020) using a six gene multilocus approach with comparative genomics recognized the genus *Actinomortierella* as a basal lineage within the family and supported earlier

findings by Wagner et al. (2013) and Petkovich et al. (2011). In the phylogenetic trees, *Actinomortierella* is positioned distantly to *Mortierella*.

Because of the above, *Actinomortierella wolfii* (B.S. Mehrotra & Baijal) Vandepol & Bonito 2020 is the preferred current name.

5.2.23. Family *Nectriaceae*

A main taxonomic issue in this family is how to interpret generic boundaries in the genus *Fusarium*. One can recognize an ‘American’ school that uses one large genus *Fusarium* and, hence, place all species in the genus *Fusarium*, and an ‘European’ school led by the Westerdijk Institute that recognizes several smaller clades within the once large form genus *Fusarium* as genera (Crous et al. 2021). Lombard and co-authors (2015) made a comprehensive multigene-based phylogeny of family *Nectriaceae* using sequences of LSU rDNA, ITS rDNA, the large subunit of the ATP citrate lyase (*acl1*), the RPB I, RPB II, *act*, *tub2*, calmodulin (*cmdA*), histone H3 (*his3*), and *tef1*. Based on the resulting phylogenetic tree the authors recognized 47 genera in the family, and they recognized seven genera in the *Fusarium* sensu lato clade, namely *Fusarium*, *Albonectria*, *Bisifusarium*, *Cyanonectria*, *Geejayessia*, *Neocosmospora*, and *Rectifusarium*. In the COGEM list of fungi, the three names *Fusarium*, *Neocosmospora* and *Bisifusarium* occur. Based on the above mentioned multigene-based phylogeny these genera are well separated. The genus *Fusarium* sensu stricto agreed with the *Fusarium* spp. that belong to the *Gibberella* clade (O’Donnell et al. 2013). The genus *Neocosmospora* includes *Fusarium*-like spp. that are associated with the sexual genus *Haematonectria* (Lombard et al. 2015). The genus *Bisifusarium* L. Lombard, Crous & W. Gams, 2015 was based on a multigene-based phylogeny and some morphological considerations (Lombard et al. 2015). Morphologically it is characterized by short, (0–)1–2(–3)-septate macroconidia and the formation of lateral phialidic pegs arising from the hyphae (Lombard et al. 2015).

As long as there are no fully objective measures available to define fungal genera, it is hard to make a choice in either direction. As a consequence, a major debate of using *Fusarium* or *Neocosmospora* has emerged (O’Donnell et al. 2020). The American school did a major attempt to accept many [micro]species in important species, such as *Fusarium solani* resulting in a major increase of species recognized. The recognition of many smaller genera has largely increased the number of name changes in the once single genus *Fusarium*. As the general development is a trend towards smaller, but phylogenetically well recognized genera [but see *Aspergillus* above, where the community decided otherwise] the acceptance of such smaller genera may be favoured (Lücking et al. 2021). Most of the fungal name repositories accept the genus *Bisifusarium*, whereas they do not accept the genus *Neocosmospora* for *N. falciforme* and *F. solani*, but they do for *N. cyanescens* and *N. licheniforme*. Only MB and GB seem to use a consistent generic concept, be it narrow in MB and broad in GB. However, in all cases it is important to list the important synonyms with a

Fusarium generic name, or vice versa when another generic name is used, e.g. *Bifusarium* or *Neocosmospora*. Here, we suggest following the narrow genus concept as it aligns well with our view on the other names treated here.

5.2.23.1. *Bisifusarium dimerum* versus *Fusarium dimerum*

MB, MB xls, IF, IF xls, FG list this species as *Bisifusarium dimerum*, whereas GB and ACF use the name *Fusarium dimerum*. Using sequence analysis, the morphospecies *Fusarium dimerum* comprises at least 12 phylogenetically distinct species. *F. dimerum* is characterized by macroconidia with a single, median septum, according to the original description and illustration (Schroers et al. 2009). Zhang et al. (2025) provided a modern taxonomic concept of the genus *Bisifusarium* based on a multilocus phylogenetic analysis. The authors used sequence data of *tef1*, partial RPB II, RPB II, and the ITS 1+2 rDNA with the 5.8 s rDNA. As *B. dimerum* is the type species of the genus, the clade that contains this species will by default be named *Bisifusarium*.

Hence, *Bisifusarium dimerum* (Penz.) L. Lombard & Crous 2015 is the currently accepted name.

5.2.23.2. *Fusarium* versus *Neocosmospora*: *Fusarium falciforme* versus *Neocosmospora falciforme*; *Fusarium cyanescens* versus *Neocosmospora cyanescens* versus *Cylindrocarpon cyanescens*; *Fusarium lichenicola* versus *Neocosmospora lichenicola*; *Fusarium solani* versus *Neocosmospora solani*

As indicated above, we suggest to use the name *Neocosmospora* for the *Fusarium solani* clade as recognized by Crous et al. (2021). Hence, we suggest COGEM to use the names *Neocosmospora falciformis* (Carrión) L. Lombard & P.W. Crous 2015, *Neocosmospora cyanescens* (G.A. de Vries, de Hoog & Bruyn) Summerbell, Schroers & Scott, 2016, *Neocosmospora lichenicola* (C. Massalongo) M. Sandoval-Denis & P.W. Crous 2018, and *Neocosmospora solani* (Mart.) L. Lombard & Crous, 2015. Note that ACF uses the name *Cylindrocarpon cyanescens* (de Vries et al.) Sigler for *N. cyanescens* and FN the name *Cylindrocarpon lichenicola* (C. Massal.) D. Hawksw. 1979 that should be considered synonyms.

5.2.23.3. *Fusarium subglutinans* versus *Fusarium fujikuroi*

MB, MB xls, GB, ACF refer to this species as *F. subglutinans*, whereas IF, IF xls and FN name it *F. fujikuroi*. The species belongs to the *Fusarium/Gibberella fujikuroi* species complex. Steenkamp and co-authors found that the use of a phylogenetic species concept in this complex was most useful (Steenkamp et al. 2002). Use of

sequences from six DNA domains found the presence of two cryptic species in *F. subglutinans*. Scaufaire and collaborators (2012) developed molecular diagnostics to detect and identify *F. subglutinans*.

Based on the above, *Fusarium subglutinans* (Wollenw. & Reinking) P.E. Nelson, Toussoun & Marasas 1983 can be recognized as distinct species.

5.2.23.4. *Fusarium verticillioides* versus *Fusarium fujikuroi*

MB, MB xls, GB, and ACF name the species *Fusarium verticillioides*, whereas IF, IF xls and FN list it as *F. fujikuroi*. The species belongs to the *Fusarium/Gibberella fujikuroi* species complex and more specifically mating population A (Jurjevic et al. 2005). Scaufaire and collaborators (2012) developed molecular diagnostics to detect and identify *F. verticillioides*. Harish et al. (2023) could identify the species using morphological and molecular means.

Fusarium verticillioides (Sacc.) Nirenberg 1976 is the currently accepted name.

5.2.24. Family *Onyngaceae*

5.2.24.1. *Uncinocarpus orissi* versus *Uncinocarpus orissae* versus *Aphanoascus orissae* versus *Pseudoarachniotus orissae* versus *Chrysosporium zonatum*

This species is listed with four [!] names in the various databases indicating the taxonomic and nomenclatural confusion. MB lists it as *Pseudoarachniotus orissae* B. Sur & G.R. Ghosh 1987, MB xls has no current name, IF, IF xls, FN, and GB name it *Aphanoascus orissae* (B. Sur & G.R. Ghosh) Cano & Guarro, ACF lists it as *Chrysosporium zonatum* Al-Musallam & Tan. Note that MB writes the names as *U. orissi*, whereas IF, FN, GB and ACF give *U. orissae*. Sigler and coworkers (1998) changed the concept of the genus *Uncinocarpus* to also include keratinophilic fungi with globose gymnothecia without differentiated hyphae on the ascocarps, but with or without helical uncinuate appendages, and with oblate punctate ascospores. They proposed the name *U. orissi* for *P. orissi*. Vidal and coworkers (2000) found that the species *C. zonatum* was affiliated with the *Aphanoascus* clade and not the *Uncinocarpus* clade. However, *U. orissi/orissae* is not the preferred name in any of the databases, thus this name can be ignored for the COGEM list of fungal names. ACF uses the name *C. zonatum*, but in the text under this name it writes 'The sexual state and currently accepted name for this taxon is *Uncinocarpus orissae*'. Note that Sigler et al. (1998) referred to *C. zonatum* as a synonym of *U. orissi*. Thus, ACF, a major reference work for medical mycology, is causing confusion here. Hence, the name *C. zonatum* should not be used. In short, two names remain: *Aphanoascus orissae* versus *Pseudoarachniotus orissae*. Cano and coworkers (2002) published a molecular phylogeny of the genus *Aphanoascus* using ITS 1+2 rDNA and the 5.8S rDNA and

proposed the combination *A. orissi*, for which the correct spelling (IF, FN, GB) is *Aphanoascus orissae* (B. Sur & G.R. Ghosh) Cano & Guarro 2002. Kandemir and colleagues (2022) studied the molecular phylogeny of Onygenales using sequences of ITS, LSU, TUB, TEF1, TEF3, RPB1, RPB2, and ribosomal protein 60S L10 (L1) (RP60S) and found that the type species of *Uncinocarpus*, *Uncinocarpus reesei*, clustered in a clade with *Coccidioides* and related genera. *A. orissae* did not belong to this cluster but occurred as a basal species within the genus *Aphanoascus*. According to FN, the genus *Pseudoarachniotus* is a synonym under the genus *Gymnascella*. According to the molecular phylogeny of Kandehir et al. (2022), the neotype species of this genus, *Gymnascella aurantiaca*, is distantly related to *Aphanoascus* (= *Pseudoarachniotus*) *orissa/orissae*. Based on this analysis, the name *P. orissae* should preferably not be used.

Therefore, it is recommended to use the name *Aphanoascus orissae* (B. Sur & G.R. Ghosh) Cano & Guarro 2002.

5.2.24.2. *Uncinocarpus queenslandicus* versus *Apinisia queenslandica* versus *Brunneospora queenslandica* versus *Chrysosporium queenslandicum*

Almost all fungal name repositories list this species as *B. queenslandicus* (MB, IF, IF xls, FN, GB). MB xls lists it as *A. queenslandicus* and ACF as *Chrysosporium queenslandicum*. The latter seems to be the result of a not timely update of the ACF database as the main author who is responsible for ACF was also involved in the recombination as *B. queenslandica*. The above mentioned multigene-based phylogenetic analysis also addressed the phylogenetic position of *Uncinocarpus queenslandicus* (Kandemir et al. 2022). This species was found to belong to the *Coccidioides* clade, together with *U. reesii*, but positioned distantly from the latter species. Based on this data the authors proposed to transfer *U. queenslandicus* to the genus *Brunneospora* (Kandehir et al. 2022).

Because this decision is based on a thorough molecular phylogenetic study including many type specimen, *Brunneospora queenslandica* (Apinis & R.G. Rees) Kandemir & de Hoog 2022 is the current name.

5.2.24.3. *Chrysosporium tropicum* versus *Aphanoascus verrucosus*

Chrysosporium tropicum is listed in MB, MB xls, IF, IF xls, FN and ACF. GB, however, lists it under *Aphanoascus verrucosus* Cano & Punsola 1990 without further explanation. There is no current literature on this link between *C. tropicum* and the genus *Aphanoascus* with *Aphanoascus cinnabarinus* Zukal 1890 as type species. Note that Kandemir et al. (2022) selected *Aphanoascus fulvescens* as the generic type. These authors also performed an extensive multilocus-based phylogeny of order

Onygenales and concluded that the type strain of *C. tropicum* was sufficiently similar with *A. verrucosus* to warrant synonymy. Hence, *C. tropicus* was placed in synonymy under *A. verrucosus*.

Therefore, it is advised to use the name *Aphanoascus verrucosus* Cano & Punsola 1990, but with reporting *Chrysosporium tropicum* J.W. Carmichael 1962 as an important synonym.

5.2.24.4. *Onygenales incertae sedis*

Neoarachnotheca keratinophila versus *Neocucurbitaria keratinophila* versus *Myriodontium keratinophilum*

MB, IF, IF xls, and FN refer to this fungus as *Neoarachnotheca keratinophila*, GB names it *Neocucurbitaria keratinophila*, ACF lists it as *Myriodontium keratinophilum*, and MB xls has no preferred name. *Neoarachnotheca* was proposed as a new genus of Onygenales by Cano et al. (1997). The genus is characterized by white, globose ascocarps with a hyphal wall. The ascospores are spherical and subhyaline with an irregular sheath. *Neoarachnotheca keratinophila* is the type species and *M. keratinophilum* its anamorph. Kandemir et al. (2022) studied the molecular phylogeny and taxonomy of *Onygenales* using sequences of ITS, LSU, TUB, TEF1, TEF3, RPB1, RPB2, and RP60S, and included CBS 947.73, the type strain of *Myriodontium keratinophilum*, the anamorph name for *Neoarachnotheca keratinophila* and found that this strain clustered in clade 4, called *incertae sedis*, so the taxonomic affiliations remain unclear. Other taxa included in this clade 4 were *Chrysosporium georgiae* CBS 625.79, *Apinisia racovitzae* (*Kuehniella racovitzae*) CBS 156.77, *Chrysosporium pallidum* CGMCC3.19575 T, *Chrysosporium carmichaelii* CBS 643.79, *Arachnotheca glomerata* CBS 348.71 T, *Arthrospis hispanica* CBS 351.92 T, *Arachnotheca albicans* CBS 151.65 T, and *Chrysosporium undulatum* CBS 964.97. Likely more taxa need to be added in order to obtain a reliable picture of its phylogeny, taxonomy, and, hence, its naming. The name *Neocucurbitaria keratinophila* that shows up in GB when searching *Neoarachnotheca keratinophila* is another fungus that belongs to Dothideomycetes, order Pleosporales. *Apinisia keratinophila* (Samson & Polon.) M. Li & L. Cai [as 'keratinophilum'], 2023 has recently been suggested as a recombination for *M. keratinophilum*. This name is not [yet] used and, hence, we suggest to ignore it until the community accepts it.

Based on the consensus amongst the fungal name repositories we suggest to use the name *Neoarachnotheca keratinophila* Ulfing, Cano & Guarro 1997.

5.2.25. Family *Ophiostomataceae*

5.2.25.1. *Ophiostoma piceae* versus *Pesotum piceae* versus *Ceratocystis piceae*

MB, IF and IF xls list this species as *P. piceae*, FN refers to it as *C. piceae*, and ACF, GB and MB xls name it *O. piceae*. Harrington and coworkers (2001) studied the *O. piceae* complex by morphological, genetic (mating) and molecular (ITS sequences) means. They concluded that *O. piceae* and *O. quercii*, although morphologically difficult to separate, clearly differed in the ITS rDNA sequences and, hence, they accepted both species. A similar approach was used by de Beer et al. (2003) who studied isolates of the *O. piceae* complex from the Southern hemisphere. They also included the SSU rDNA next to ITS and confirmed the presence of *O. quercus* as a distinct species next to *O. piceae*, and other close relatives. De Beer and Wingfield (2013) revised all names in *Ophiostomataceae* following the acceptance of the 'One fungus = One name' principle. Because the type species of *Pesotum* belongs to *Ophiostoma* sensu stricto (De Beer & Wingfield, 2013), this genus is considered a synonym under *Ophiostoma*.

Ophiostoma piceae (Münch) Syd. 1919, is the preferred name according to de Beer and Wingfield (2013) with *Pesotum piceae* Crane & Schoknecht 1973 being a synonym. *Ceratocystis piceae* is an older synonym of *O. piceae*.

5.2.25.2. *Ophiostoma quercus* versus *Ceratocystis piceae*

MB, MB xls, and GB refer to this species as *O. quercus*, IF and FN list it as *C. piceae*. When searching IF xls with *O. quercus* one finds *C. piceae*, and when searching with *C. piceae* one finds *Pesotum piceae*. In studies listed above (Harrington et al. 2001, de Beer et al. 2003) it became clear that *O. quercuum* is a species different from *O. piceae*.

Hence, *Ophiostoma quercus* (Georgev.) Nannf. 1934 is the current name for this species.

5.2.26. Family *Phanerochaetaceae*

5.2.26.1. *Phanerochaete chrysosporium* versus *Phanerodontia chrysosporium* versus *Sporotrichum pruinosum*

MB, MB xls, ACF use *Phanerochaete chrysosporium*, whereas IF, IF xls, FN and GB name it *Phanerodontia chrysosporium*. Hjortstam and Ryvarden (2010) created the genus *Phanerodontia* characterized by species with a typically ornamented hymenophore that rarely is almost smooth. Xu et al. (2020) studied the molecular phylogeny of *Phanerochaete* using ITS - and LSU rDNA sequences. In the resulting phylogenetic tree, *P. chrysosporium* clustered separately from the type species of the genus, *P. alnea* (Xu et al. 2020). These authors, however, stated that no distinct

subclades with strong support values can be recognized in the *Phanerochaete* clade. Miettinen et al. (2016) published a study on the taxonomic structure of Phanerochaetaceae using both morphological and molecular features, including sequences of ITS, LSU rDNA and rpb1 to revise genus concepts. They concluded that *Phanerodontia* belongs to the genus *Phanerochaete*. Because this study used molecular phylogenetic data whereas the study by Hjortstam and Ryvaerden (2010) was only based on morphology, we do not accept the genus *Phanerodontia*.

Therefore, we recommend to use the widely used name *Phanerochaete chrysosporium* Burds. 1974 with *Sporotrichum pruinosum* Gilman & Abbott as a common synonym.

5.2.27. Family *Pichiaceae*

5.2.27.1. *Pichia kudriavzevii* versus *Candida krusei* versus *Issatchenkia orientalis*

MB, MB xls, GB, ACF, TYTS and theyeasts.org list this species as *Pichia kudriavzevii*. IF, IF xls and FN use *I. orientalis*. Douglass and collaborators (2018) studied the genomes of representative strains, including typematerial, of *Candida krusei*, *Pichia kudriavzevii*, *Issatchenkia orientalis* and *Candida glycerinogenes*, and concluded that they all belong to the same species because of collinear genomes sharing 99.6% identity. They also stated that this species should be classified in the genus *Pichia* as *P. kudriavzevii*. Kurtzman and collaborators (2008) studied the molecular phylogeny of species classified in the yeast genera *Pichia*, *Issatchenkia* and *Williopsis*, which are characterized by the ubiquinone CoQ-7 and inability to utilize methanol, using sequences of LSU and SSU rDNA and translation elongation factor-1 α . It was concluded that the species of *Issatchenkia* are members of the *Pichia membranifaciens* clade and, consequently, they were transferred to *Pichia*. It is unclear to me why IF and FN still use the name *I. orientalis* for this species that is both clinically and biotechnologically relevant.

Because of the above, the use of the name *Pichia kudriavzevii* Boidin, Pignal & Besson 1965 is strongly recommended. The name *Candida krusei* (Castellani) Berkhout is still widely used in the clinic and should be listed as an important synonym.

5.2.27.2. *Ogataea methanolica* versus *Pichia methanolica*

All fungal name repositories, except MB xls, name this species *Ogataea methanolica*. This name is also used in TYTS and theyeasts.org. Yamada and collaborators (1994) used LSU and SSU rDNA sequence analysis and created the genus *Ogataea* for species that formerly were classified in the genus *Pichia*. The genus was confirmed in many subsequent studies, e.g. Kurtzman and Robnett (2010), and is also recognized in recent monographs (TYTS, theyeasts.org). Kurtzman and Robnett used sequence

analysis of LSU, SSU rDNA, translation elongation factor-1a and mt SSU rRNA and found that *Pichia ethanolica* belonged to the *Ogataea* clade. Consequently, they recombined the species in the genus *Ogataea*.

Therefore, *Ogataea methanolica* (Makig.) Kurtzman & Robnett 2010 is the preferred current name.

5.2.28. Family *Pleosporaceae*

5.2.28.1. *Bipolaris australiensis* versus *Curvularia australiensis*

MB, IF, IF xls, FN, ACF, GB refer to this species as *Curvularia australiensis*. Only MB xls names it *Bipolaris australiensis*. Manamgoda et al. (2012) studied the molecular phylogeny of species that were classified in the genera *Bipolaris*, *Cochliobolus*, and *Curvularia*. They constructed a multigene-based phylogeny based on ITS - and LSU rDNA, GAPDH and TEF1- α sequences, and found that the species fall into two clades. *Bipolaris* and *Cochliobolus* species clustered in Group 1, whereas *Curvularia* species clustered in Group 2.

From a nomenclatural perspective, priority was given to the names *Bipolaris* and *Curvularia*. *C. australiensis* belonged to the *Curvularia* clade, and hence it should be named *Curvularia australiensis* (Bugnic. ex M.B. Ellis) Manamgoda, L. Cai & K.D. Hyde, 2012. This view was also supported by Kidd and Westblade (2014).

5.2.28.2. *Curvularia geniculata* versus *Cochliobolus geniculatus*

MB, MB xls, GB, ACF list this species as *Curvularia geniculata*, whereas IF, IF xls and FN refer to it as *Cochliobolus geniculatus*. Ram et al. (2024) using ITS -, LSU -, and SSU rDNA sequences found that *C. geniculata* clustered in the genus *Curvularia*.

Therefore, *Curvularia geniculata* (Tracy & Earle) Boedijn 1933 is the preferred current name.

5.2.28.3. *Curvularia spicifera* versus *Bipolaris spicifera*

MB, IF, IF xls, FN and GB refer to this species as *Curvularia spicifera*, but IF xls and ACF name it *Bipolaris spicifera*. In the above listed study of Manamgoda et al. (2012) *C. spicifera* belonged to the *Curvularia* clade and, hence, its correct name is *Curvularia spicifera* (Bainier) Boedijn, 1909. This view was also supported by Kidd and Westblade (2014).

5.2.28.4. *Exserohilum longirostratum* versus *Exserohilum rostratum*

MB, MB xls, IF, IF xls, ACF refer to this species as *E. rostratum*, whereas FN and GB list it as *E. longirostratum*. Here the problem is not the generic name, but rather the species name. Hernandez-Restrepo and co-workers (2018) studied the species concept in the genus by comparing morphological data with inferred molecular phylogenies that used ITS, LSU, act, tub2, cam, gapdh, his, tef1 and rpb2 sequences. Based on this work the species *Exserohilum longirostratum* was considered a synonym under *Exserohilum rostratum*.

Thus, it is recommended to use the name *Exserohilum rostratum* (Drechsler) K.J. Leonard & Suggs 1974.

5.2.28.5. *Exserohilum mcginnisii* versus *Exserohilum rostratum*

MB, MB xls, IF, and IF xls list this species as *E. rostratum*, whereas FN and GB name it *E. mcginnisii*. Hernandez-Restrepo and co-workers (2018) concluded that *E. mcginnisii* is best considered as a synonym under *E. rostratum*.

Therefore, it is recommended to use the name *Exserohilum rostratum* (Drechsler) K.J. Leonard & Suggs 1974.

5.2.29. Family *Podosporaceae*

5.2.29.1. *Triangularia pauciseta* versus *Podospora pauciseta*

All fungal name repositories use *Triangularia pauciseta* for this species, except GB that lists *Podospora pauciseta*. Wang et al (2019) studied the phylogeny of *Thielavia* and related genera using sequences of rpb2, tub2, and ITS - and LSU rDNA sequences. Several species previously classified in *Podospora*, *Zopfiella* and related genera were placed in the genus *Triangularia*, including *P. pauciseta* that is now named *T. pauciseta*.

Thus, the appropriate name for this species is *Triangularia pauciseta* (Ces.) X. Wei Wang & Houbraken 2019.

5.2.30. Family *Rhizopodaceae*

5.2.30.1. *Rhizopus microsporus* var. *oligosporus* versus *Rhizopus microsporus* versus *Rhizopus oligosporus*

This variety is listed as *R. microsporus* in MB, IF, IF xls, FN and ACF, but as *Rhizopus microsporus* var. *oligosporus* in MB xs and GB. *R. oligosporus*, a name that us associated with fermented foods, is listed as *R. microsporus* in MB, IF, FN, and ACF, whereas GB names it *R. microsporus* var. *oligosporus*. Dolatabadi et al. (2014) studied

many isolates of the *R. microsporus* complex using sequence analysis of ITS rDNA, and parts of the elongation factor 1- α genes. Furthermore, they studied temperature/growth relationships, mating experiments and compared profiles obtained by MALDI-TOF MS. As no correlation was observed between mating and the subspecific varieties, nor between the results of the molecular phylogeny and phenotypes, it was concluded that there was no biological basis to recognize the varieties.

Based on the above, *Rhizopus microsporus* Tiegh. 1875 is the current species name.

5.2.31. Family *Saccharomycetaceae*

5.2.31.1. *Arxiozyma telluris* versus *Kazachstania telluris*

This species is listed as *Axiozyma telluris* in MB, MB xls, IF, IF xls and GB, whereas FN and ACF list it as *Kazachstania telluris*. The same holds for TYTS and theyeasts.org. Note that TYTS was published in 2011 (Kurtzman et al. 2011), long before the study of Liu et al (2024) appeared, and theyeasts.org has not yet been updated for this species (T. Boekhout, pers. commun.).

The genus *Arxiozyma* was created by van der Walt and Yarrow (1984) to accommodate *Saccharomyces telluris*, due to its diploid anamorphic hyphae, a somewhat different cell wall as seen by electron microscopy, and the presence of CoQ-6. Later Kurtzman and Robnett (2003) reclassified many yeast taxa that hitherto were thought to belong to the genus *Saccharomyces*, the so-called *Saccharomyces* sensu lato concept, using a multigene-based phylogenetic approach including SSU -, LSU - and ITS rDNA, translation elongation factor 1 α , actin-1, RPB II, the mt genes SSU rDNA, and cytochrome oxidase II (CoxII). One of the conclusions was that *A. telluris* belonged to the newly created genus *Kazachstania* and, consequently, they recombined *A. telluris* as *K. telluris*. In a recent phylogenomics based study of Saccaromycetaceae, however, the genus *Arxiozyma* was reinstated, and consequently the name *A. telluris* was reintroduced (Liu et al. 2024).

Arxiozyma telluris (van der Walt) van der Walt & Yarrow 1984 is the currently accepted name of this species.

5.2.32. Family *Symptoventuriaceae*

5.2.32.1. *Ochroconis humicola* versus *Scolecobasidium humicola*

MB, MB xls and ACF list this species as *Ochroconis humicola* [ACF in a phylogenetic tree based on ITS sequences], whereas IF, IF xls, FN and GB name the species *Scolecobasidium humicola*. Samerpitak et al. (2014) accepted the genus *Ochroconis* and not *Scolecobasidium*. Although the latter name is older and, hence, should have priority, its type species *Scolecobasidium terreum* represented by CBS 203.27 is not

clear and, therefore, the authors recommended against the use of the name *Scolecobasidium*. Horré et al. (1999) and Samerpitak et al. (2014) claimed that the type strain, CBS 203.27, likely was lost and replaced by a contaminant. According to these authors, the identity of the genus *Scolecobasidium* remained doubtful. Based on this it could be argued that the generic name *Ochroconis* should be used for all three species listed on the COGEM fungal list. Using a multi-gene phylogenetic approach including LSU -, SSU - and ITS rDNA, and ACT1, BT2, and TEF1 sequences all three species were found to be distinct and they are also characterized by morphological features (Samerpitak et al. 2014). Other authors did not agree with this view. In another molecular phylogenetic study, Wei et al. (2022) using SSU -, ITS -, LSU rDNA, ACT1, TUB2, TEF1 and RPB2 sequences, recognized 22 genera in family *Symptoventuriaceae*. All three species present at the COGEM fungal list were also distinct in this study, but contrary to Semerpitak (2014) they were placed in the genus *Scolecobasidium*. Wei et al. (2022) considered *Ochroconis* a synonym under *Scolecobasidium* with *Scolecobasidium terreum* E.V. Ab as generic type. The study by Wei et al. (2022) demonstrated that the *Scolecobasidium* clade is monophylic and has sexual and asexual morphs, and ecological characters that characterizes it as a genus. Other arguments against the use of the name *Ochroconis* were given by Gams (2015) and Shen et al. (2020). Notably the first author questioned the invalidity of a sterile type strain to argue against the use of the name *Scolecobasidium*. These authors argued that despite the original holotype of the genus *Scolecobasidium* is lost, the species *S. terreum* is well represented by other cultures. Unlike the other authors cited above, Shen et al. (2020) confirmed that the ex-type strains of both the genus *Ochroconis* and the genus *Scolecobasidium* do occur in the same clade. This gives an indication that they are congeneric and the name *Scolecobasidium* was given priority. Additionally, many species of *Ochroconis* for which DNA data are available have since been transferred to *Scolecobasidium* (Shen et al. 2020). Although it is unfortunate that several species have changed names in a short time span, we agree that the best option is to name the species at the COGEM fungal list in the genus *Scolecobasidium*. It is also noteworthy to see that different repositories of fungal names decide differently for the names of three species that seem to be congeneric from a biological point of view.

Scolecobasidium humicola G.L. Barron & L.V. Busch 1962 is the currently accepted name.

5.2.32.2. *Scolecobasidium constrictum* versus *Ochroconis constricta*

All fungal name repositories (MB, IF, IF xls, FN, and GB) refer to this species as *S. constrictum*, but MB xls lists it as *O. constricta*. From the above (see 8.2.32.1) we recommend the use of the name *Scolecobasidium constrictum* E.V. Abbott, 1927.

5.2.32.3. *Scolecobasidium tshawytschae* versus *Ochroconis tshawytschae*

This species is listed as *S. tshawytschae* in MB, GB and ACF, whereas IF, IF xls, MB xls and FN list it as *O. tshawytschae*. From the above (8.2.32.1) we recommend the use of the name *Scolecobasidium tshawytschae* (Doty & D.W. Slater) McGinnis & Ajello, 1974.

5.2.33. Family *Testudinaceae*

5.2.33.1. *Neotestudina rosatii* versus *Zopfia rosatii*

MB, MB xls and ACF list this species as *N. rosatii*, whereas IF, IF xls, FN and GB list *Z. rosatii*. IF states that *Neotestudina rosatii* Segretain & Destombes 1961 is an invalidly published name (Nom. inval., Art. 40.1, Shenzhen), but MB claims that it is a legitimate name. The species was described by Segretain and Destombes (1961). McGinnis and collaborators (1999) listed *N. rosatii* as the currently used name with *Z. rosatii* as a synonym. Hawksworth and Booth (1974) recombined the name *N. rosatii* in the genus *Zopfia* but in 1979 Hawksworth reinstated the genus *Neotestudina*. Mouchacca (2004) considered the name *N. rosatii* as invalid. De Hoog and coworkers (2004) used the name *N. rosatii*, and noted that based on ITS rDNA sequences the species may represent a species complex. Both names are not commonly used in the literature. *N. rosatii* gives 311 hits in Google Scholar and six in pubmed, whereas *Z. rosatii* has 54 and one in the respective databases.

From the above it is concluded that *Neotestudina* is the preferred genus name and *Neotestudina rosatii* Segretain & Destombes 1961 the current species name.

5.2.34. Family *Ustilaginaceae*

5.2.34.1. *Anthracystis flocculosa* versus *Pseudozyma flocculosa*

MB, IF, and IF xls list this species as *Anthracystis flocculosa*, whereas MB xls, FN and GB list it as *Pseudozyma flocculosa*. This fungus has a strange history. Initially it was described as an ascomycetous fungus, *Stephanoascus flocculosus* (Traquair et al. 1988), but in 1995 Boekhout noted its basidiomycetous nature with an affiliation to smut fungi (Ustilaginomycotina, genus *Ustilago*). Boekhout (1995) recombined the name in the anamorphic genus *Pseudozyma*. This was confirmed by Begerow et al. (2000). Later Piątek and collaborators reinvestigated the molecular phylogeny and noted an affiliation with the smut genus *Anthracystis* (Piątek et al. 2015). Unfortunately, this decision was based on the use of an erroneous strain. At present, an attempt has to be made to properly reclassify this fungus within Ustilaginomycotina and this work is in progress (T. Boekhout, pers. obs.).

Therefore, it is suggested to use the name *Pseudozyma flocculosa* (Traquair, L.A. Shaw & Jarvis) Boekhout & Traquair, 1995, until the correct reclassification has been made.

5.2.35. Family *Xylariaceae*

5.2.35.1. *Xylaria flabelliformis* versus *Xylaria cubensis*

MB, MB xls, IF, IF xls and GB refer to this species as *Xylaria flabelliformis*, but FN lists it as *Xylaria cubensis*. Mead and coworkers (2019) refer to the name *X. cubensis* as an earlier name for *X. flabelliformis*. Lee and coworkers (2000) used ITS 1+ 2 and 5.8s rDNA sequences to study phylogenetic relationships of *Xylaria* species. These authors noted that *X. cubensis* was phylogenetically heterogeneous. The anamorph species *Xylocoremium flabelliforme* (Rogers 1984) is considered a synonym of *X. flabelliformis* in MB, MB xls, IF and IF xls, but is listed as *X. cubensis* in FN. Réblová et al. (2016) argued against the use of the name *Xylocoremium*, in favour of *Xylaria*. Ju et al. (2016) commented on the morphological differences between *X. cubensis* and *X. flabelliformis* as follows 'X. cubensis has short fusoid ascospores with a conspicuous, sporelength germ slit, whereas X. flabelliformis has ellipsoid-inequilateral ascospores with an inconspicuous, much less than spore-length germ slit. While X. cubensis is largely confined to the tropics and subtropics, X. flabelliformis is distributed worldwide'. Based on these observations it is most likely that the two names represent different species.

Hence, we suggest *Xylaria flabelliformis* (Schwein.) Berk. & M.A. Curtis 1869 as the current name for this species and not *Xylaria cubensis* (Mont.) Fr. 1851.

5.3. Some comments on purported synonyms in the COGEM lists

Many fungal species have synonymous names that are a usually result of decisions made in taxonomic revisions of specific fungal groups, such as species, genera, families etc. The decision to declare a species synonymous under another species should be made with the same dedication as used to describe new species. When type material of the species, that preferably should be ex-type strains, are available modern DNA-based studies can be performed to decide on the taxonomic status of such species. In case such type material is not available, the presence of authentic material from the original author(s) of a species is the next best option. However, in many cases such material is not available and the interpretation whether a species is a synonym of another species is more questionable or even impossible to make. Below, we present the results of data from the scientific mycological literature on various names that are considered synonyms in the COGEM fungal lists. Note that the species are listed alphabetically in a single list.

5.3.1. *Aphanoascus orissi* versus *Chrysosporium zonatum*

Phylogenetic analyses within the family *Onygenaceae* (order *Onygenales*) showed that *Chrysosporium zonatum* clusters with *Aphanoascus orissi* and related keratinophilic fungi (Currah, 1985; Cano et al., 2002). *Chrysosporium zonatum* is the asexual morph of *Aphanoascus orissi*, and both names refer to the same fungal species within the *Onygenaceae*. The correct name is *Aphanoascus orissae* (see 5.2.24.1).

5.3.2. *Arachnomyces nodosetosus* versus *Onychocola canadensis*

Arachnomyces nodosetosus and *Onychocola canadensis* represent the same species with *A. nodosetosus* representing the sexual name and *O. canadensis* the asexual name (Gibas et al. 2002). Initially, *O. canadensis* was described as a cause of onychomycosis in humans and was difficult to classify because of its morphological resemblance to *Arachnomyces* species (Sigler et al., 1994). The genus name *Arachnomyces* was given priority over *Onychocola*. Hence, the preferred name is *A. nodosetosus* (Bing-Da Sun et al., 2019).

5.3.3. *Arthroderma gertleri* versus *Trichophyton vanbreuseghemii*

Synonymy is supported by MB, ACF, and de Hoog et al. (2017). Mating studies and molecular phylogenetic analyses showed that isolates of *T. vanbreuseghemii* produce the sexual morph *A. gertleri* when compatible strains are crossed, demonstrating that they are the same biological species (Gräser et al., 1999b; De Hoog et al., 2017). *Arthroderma gertleri* is the currently accepted name with *Trichophyton vanbreuseghemii* as a facultative synonym (de Hoog et al. 2017).

5.3.4. *Arthroderma insingulare* versus *Trichophyton terrestre*

ACF lists *T. terrestre* as a synonym under *Arthroderma terrestre*. According to Hainsworth et al. (2021), *Arthroderma terrestre*, including the anamorph *Trichophyton terrestre*, *Arthroderma insingulare*, *A. lenticulare* and *A. quadrifidum* are phylogenetically different and represent distinct species. Thus, *A. insingulare* and *T. terrestre* are not synonyms. *A. singulare* is not included in ACF. The latter is now named *Arthroderma terrestre* (Hainsworth et al. 2021).

5.3.5. *Arthroderma insingulare* versus *Arthroderma lenticulare* versus *Arthroderma quadrifidum*

According to de Hoog et al. (2017) and Hainsworth et al. (2021) these species are not conspecific and remain as separate entries.

5.3.6. *Arthrographis arxii* versus *Eremomyces langeronii* versus *Arthrographis kalrae* (see also 5.2.13.1)

Arthrographis arxii, *E. langeronii*, and *A. kalrae* are closely related species. *E. langeronii* was described for a sexual species, while *A. kalrae* represented the asexual form. However, molecular and phenotypic analyses demonstrated that *A. kalrae* and *E. langeronii* are distinct, but closely related taxa (Giraldo et al., 2014). *A. arxii* was later described by Giraldo et al. (2014) as a new species within this complex with *E. langeronii* as a synonym. This species is phenotypically different from *A. kalrae* and belonged to another phylogenetic lineage based on ITS and LSU rDNA sequences. Thus, *A. arxii* and *A. kalrae* are not conspecific.

5.3.7. *Aspergillus fumigatus* versus *Neosartorya fumigata* versus *Aspergillus arvii*

Aspergillus fumigatus is listed twice in the COGEM fungal list with synonyms *Neosartorya fumigata* and *Aspergillus arvii*. Note that according to MB and IF the latter name was not published correctly as no type was indicated, and therefore should be considered as an invalid name. It is not clear why this species is presented twice on the COGEM fungal species list and we keep only one entry of *Aspergillus fumigatus* Fresen. 1863.

5.3.8. *Aspergillus montevidensis* versus *Aspergillus hollandicus*

Aspergillus montevidensis was described as a distinct species based on morphological characteristics such as conidial ornamentation and colony colour (Samson et al., 2014). However, molecular phylogenetic analyses using multi-locus sequences of β -tubulin, calmodulin, and the ITS regions, showed that *A. montevidensis* and *A. hollandicus* are closely related but genetically somewhat distinct species within the same clade (Houbraken et al., 2020). Chen et al. (2017) and Hubka et al. (2013) placed *A. hollandicus* and *Eurotium amstelodami* var. *montevidense* as synonyms under *A. montevidensis*. According to Hubka et al. (2013) *Aspergillus amstelodami* (= *Eurotium amstelodami*) differs from *A. montevidense*. Hence, we consider *A. hollandicus* and *E. amstelodami* var. *montevidensis* as synonyms under *A. montevidensis*.

5.3.9. *Aspergillus neotritici* versus *Aspergillus tritici*

According to Glässnerová et al. (2022) *Aspergillus tritici* [as *tritici*] was not validly described. They replaced the name by *Aspergillus neotritici* Glässnerová & Hubka 2022. Consequently, *A. tritici* (*A. triticus*) is a synonym of *A. neotritici*.

5.3.10. *Aspergillus niger* versus *Aspergillus foetidus*

Aspergillus foetidus is regarded as part of the *Aspergillus niger* complex. *A. foetidus* was described as a separate species based on morphological traits, such as colony colour and odour production. According to dr. J. Houbraken *Aspergillus foetidus* var. *acidus* and *Aspergillus foetidus* var. *pallidus* are synonyms of another species, namely *Aspergillus luchuensis* (Bian et al. 2022). According to him, when in the past a strain has been identified using morphology as *A. foetidus* it is impossible to infer its proper identity, except that it was a black *Aspergillus* species. Molecular phylogenetic studies using DNA sequencing (e.g., ITS rDNA, β -tubulin, calmodulin, and RNA polymerase II genes) showed that *A. foetidus* genetically is indistinguishable or extremely close to *A. niger* (Varga et al., 2011). The latter authors consider *A. foetidus* a synonym under *A. niger* and we follow this proposition.

5.3.11. *Aspergillus pseudoglaucus* versus *Eurotium repens* versus *Aspergillus repens*

Eurotium repens was used to describe the sexual (teleomorphic) state, while *Aspergillus repens* referred to the asexual (anamorphic) state (Pitt & Hocking, 2009). According to the consulted expert dr. J. Houbraken, *Aspergillus pseudoglaucus* is the current name with *Eurotium repens* a synonym of that species. Molecular phylogenetics showed that these names represent the same species with *Aspergillus pseudoglaucus* as preferred name (Samson et al., 2014, Houbraken et al. 2020). Thus, *E. repens* and *A. repens* are synonyms of *A. pseudoglaucus*.

5.3.12. *Aspergillus quadrilineatus* versus *Emericella quadrilineata* versus *Aspergillus tetrazonus*

Emericella quadrilineata was introduced to describe the sexual (teleomorphic) form, while *A. quadrilineatus* referred to its asexual (anamorphic) state (Samson et al., 2014). The accepted name is *A. quadrilineatus* (Houbraken et al., 2020). *A. tetrazonus* was described earlier based on morphological similarities, but molecular data and taxonomic revisions have revealed it to be conspecific or closely related to *A. quadrilineatus* (Samson et al., 2014). Here, we consider *A. tetrazonus* and *E. quadrilineata* as synonyms of *A. quadrilineatus*.

5.3.13. *Chlorociboria aeruginascens* versus *Dothiorina tulasnei*

Tudor et al. (2014) confirmed the genetic connection between both states with molecular means. *C. aeruginascens* is the preferred name with *D. tulasnei* as a synonym.

5.3.14. *Candida maltosa* versus *Candida cloacae* versus *Candida novellus* versus *Candida subtropicalis*

Candida maltosa and *C. cloacae* were described in a single publication (Komagata et al., 1964). Later taxonomic revisions and comparative studies showed that *Candida subtropicalis* represents the same species as *Candida maltosa*. In TYTS (Kurtzman et al., 2011) *C. cloaca*, *C. novellus* and *C. subtropicalis* are listed as synonyms of *C. maltosa*. Here we follow this proposition and consider *C. cloaca*, *C. novellus* and *C. subtropicalis* synonyms of *C. maltosa*.

5.3.15. *Colletotrichum gloeosporioides* versus *Glomerella cingulata*

Colletotrichum gloeosporioides and *G. cingulata* are two names for the same fungal species, representing the asexual and sexual stages, respectively. *Colletotrichum gloeosporioides* is the preferred name (Cannon et al. 2012).

5.3.16. *Colletotrichum graminicola* versus *Glomerella tucumanensis*

Colletotrichum graminicola and *G. tucumanensis* are two morphs of the same fungal species. Phylogenetic analyses of ITS, β -tubulin, and GAPDH gene sequences supported this and *Colletotrichum graminicola* is the preferred name (Cannon et al., 2012).

5.3.17. *Conidiobolus coronatus* versus *Delacroixia coronata*

In the COGEM pathogens list *D. coronata* is listed under *C. coronatus*. This synonymy is supported by all fungal name repositories.

5.3.18. *Coniochaeta ligniaria* versus *Lecythophora hoffmannii*

In the original COGEM list *Coniochaeta ligniaria* is listed with *Lecythophora hoffmannii* as synonym. When searching *Coniochaeta ligniaria* the name repositories MB, IF, FN, and GB give *C. ligniaria*, but ACF gives *Lecythophora hoffmannii*. Searching for *L. hoffmannii* results in *Coniochaeta hoffmannii* for MB, IF, FN and GB, but ACF gives *L. hoffmannii* with *C. ligniaria* as a common synonym. Thus, most fungal name repositories keep *C. hoffmannii* and *C. ligniaria* as two entries, suggesting that they are distinct species.

Khan et al. 2013 transferred the *Lecythophora* species to the genus *Coniochaete* and in a community-based paper on preferred names in *Sordariomycetes*, Réblová et al. (2016) this proposal was followed. Unfortunately, they included only *C. hoffmannii*. Damm and coworkers (2010) published an extensive study on *Coniochaeta* and related genera using sequences of ITS-1 and ITS-2 rDNA, 5.8S nuclear ribosomal gene, a 200-bp intron of the GAPDH, TEF-1 α , and a part of the LSU rDNA, but unfortunately only *C. ligniaria* was included. Nasr et al. (2018) published a D1/D2 LSU rDNA-based phylogenetic tree of the genus *Coniochaeta* including both species. As they clearly clustered separately, it is clear that they represent distinct species. The experts, Drs Damm and Gené, supported this view. Hence, the supposed synonymy is not true. Thus, COGEM should keep only *Coniochaeta ligniaria* (Grev.) Cooke 1887.

5.3.19. *Cosmospora episphaeria* versus *Fusarium aquaeductuum* / *Fusicolla aqueductuum*

In COGEM report CGM/111024-02 the teleomorph name *Cosmospora episphaerica* is listed with *Fusarium aquaeductuum* as anamorph name. In the revised COGEM list resulting of the current project this species is listed as *Fusicolla aqueductuum*. When searching those names in the various name repositories MB, IF, FN, GB and ACF list *C. episphaerica* as *Dialonectria episphaerica*. ACF list *Fusicolla aquaeductuum* as a synonym under *D. episphaerica*. Searching *Fusarium aquaeductuum* MB, IF, FN and GB give *Fusicolla aquaeductuum*, but ACF *Dialonectria episphaerica*.

Gräfenhan et al. (2011) published a comprehensive study on the phylogeny and taxonomy of the genus *Cosmospora* using sequence data of rpb2 and acl1. They confirmed placement of *Cosmospora episphaerica* in the genus *Dialonectria* as *Dialonectria episphaerica*. In contrast, *Fusarium aquaeductuum* was placed in the genus *Fusicolla* as *Fusicolla aqueductuum*. Thus, the stated synonymy of *Dialonectria episphaerica* and *Fusicolla aqueductuum* is not supported. *Cosmospora episphaerica* should be listed as *Dialonectria episphaerica* (Tode) Cooke 1884 with *Fusarium episphaerica* (Tode:Fr.) Snyder & Hansen 1945 and *Cosmospora episphaerica* (Tode:Fries) Rossman & Samuels 1999 as important synonyms. *Fusarium aquaeductuum* should be listed as *Fusicolla aqueductuum* (Radlk. & Rabenh.) Gräfenhan, Seifert & Schroers 2011. *Cosmospora episphaerica* belongs to the genus *Dialonectria* as *Dialonectria episphaerica*.

5.3.20. *Eurotium herbariorum* versus *Aspergillus glaucus*

MB, IF, FN and ACF list *E. herbariorum* as *A. glaucus*, GB as *E. herbariorum*. Houbraken et al. (2020) accepts *A. glaucus* but does not mention *E. herbariorum*. *E. herbariorum* and *A. glaucus* represent two forms of the same fungal species, distinguished by their reproductive states (Chen et al. 2017, Samson et al., 2014). *Aspergillus glaucus* is the current name with *E. herbariorum* as a synonym.

5.3.21. *Exophiala castellanii* versus *Exophiala mansonii*

DNA sequence analyses of the ITS - and LSU rDNA regions demonstrated that *E. castellanii* forms a separate clade from *E. mansonii*, confirming its status as an independent species (de Hoog et al., 2000). Thus, the two species are not conspecific.

5.3.22. *Fonsecaea pedrosoi* versus *Fonsecaea compacta*

Fonsecaea pedrosoi and *F. compacta* are morphologically slightly different black yeasts, but molecular studies using ITS rDNA and rDNA sequencing demonstrated that they are conspecific (de Hoog et al., 2000), thus they should be regarded as synonyms. *F. pedrosoi* is the current name.

5.3.23. *Ilyonectria destructans* versus *Nectria radiculicola*

Originally, this pathogen was known as *N. radiculicola* (anamorph *Cylindrocarpon destructans*). Molecular phylogenetic studies showed that the species belonged to a distinct clade within the *Nectriaceae* family, leading to its reclassification into the genus *Ilyonectria*. Therefore, *Ilyonectria destructans* is the current accepted name, while *Nectria radiculicola* is considered a facultative synonym (Chaverri et al. 2011, Cabral et al. 2012).

5.3.24. *Irpex lacteus* versus *Polyporus tulipiferae*

Taxonomic and morphological studies confirmed that *P. tulipiferae* represents the same species as *I. lacteus*, with *I. lacteus* being the currently accepted name (Ryvarden & Gilbertson, 1993; Bernicchia & Gorjón, 2010).

5.3.25. *Lasiodiplodia theobromae* versus *Botryosphaeria rhodina*

Botryosphaeria rhodina was described as the sexual state, while *L. theobromae* referred to the asexual state. Molecular phylogenetic analyses based on ITS rDNA, EF1- α , and β -tubulin gene sequences confirmed that *B. rhodina* and *L. theobromae* are conspecific, belonging to the genus *Lasiodiplodia* (Slippers et al., 2004). *Lasiodiplodia theobromae* is the currently accepted name with *B. rhodina* as a facultative synonym (Phillips et al., 2013).

5.3.26. *Lichtheimia ramosa* versus *Mycocladius lutetiensis*

Lichtheimia ramosa and *M. lutetiensis* are the same fungal species. Molecular phylogenetic studies using rDNA and ITS sequences demonstrated that *M. lutetensis* and *Absidia ramosa* (syn. *L. ramosa*) are conspecific, leading to the reclassification of the genus *Mycocladius* into *Lichtheimia* (Alastruey-Izquierdo et al., 2010). *Lichtheimia ramosa* is the accepted name and *M. lutetiensis* a synonym.

5.3.27. *Lophophyton gallinae* versus *Arthroderma grubyi* (see also 5.2.4.5)

Phylogenetic and morphological studies confirmed that these are the same species with *Lophophyton gallinae* as the accepted name (de Hoog et al., 2017).

5.3.28. *Metarhizium viride* versus *Chamaeleomyces viridis* versus *Paecilomyces viridis* versus *Chlamydoabsidia padenii*

In the original COGEM nonpathogens list *M. viride* is listed twice, one time under this name and the second time as *Chamaeleomyces viridis*. These two species are obligate synonyms and *M. viride* has priority. MB, IF, FN, and GB use this latter name, and only ACF uses *C. viridis*. *Paecilomyces viridis* is an obligate synonym and listed as *M. viride* in MB. IF, FN and GB, and as *C. viridis* in ACF. *M. viride* is the preferred name with *C. viridis* and *P. viridis* as synonyms.

In the original COGEM nonpathogens list *Chlamydoabsidia padenii* is listed as a synonym. As this species belongs to family *Cunninghamellaceae* and not *Clavicipitaceae* this claim is not true and this synonymy should be removed from the COGEM list. Note that in CGM/111024-02 *C. padenii* is listed as a separate entry (<https://cogem.net/publicatie/actualisatie-van-de-pathogeniteitsclassificatielijsten-met-apathogene-en-pathogene-schimmelsoorten-2024/>) and *Chlamydoabsidia padenii* Hesselt. & J.J. Ellis 1966 is again placed separately on the COGEM fungal list.

5.3.29. *Microascus cirrosus* versus *Scopulariopsis paisii* (see also 5.2.19.3)

In the original COGEM fungal list of nonpathogens *Microascus cirrosus* is mentioned as teleomorph with *Scopulariopsis paisii* as anamorph name. However, in the list of pathogens, *Microascus paisii*, an obligate synonym of *Scopulariopsis paisii*, is the preferred name over *Scopulariopsis brumptii*. The preferred name of *S. brumptii* is *Microascus paisii* (see 19.3). Thus, *Microascus cirrosus* occurs twice on the COGEM list. One time directly (nonpathogens list) and one time indirectly (pathogens list). The question is now whether *M. cirrosus* is the same species as *M. paisii*? Sandoval-Denis and coworkers (2016a) answered this question. In this paper they stated 'However, according to our results, the ex-type strain of *Torula paisii* (i.e., MUCL 7915) was shown to be phylogenetically distant to the ex-type strain of *M. cirrosus* (i.e., CBS 217.31), and thus should be considered as a distinct species. *M. cirrosus* can be distinguished by having subglobose to obovate conidia measuring 4–6.5 × 4–6 µm, while those of *M. paisii* are broadly ellipsoidal to short clavate, measuring 4–6 × 2–4.5 µm'.

From this is it clear that the purported synonymy of *S. paisii* and *M. cirrosus* is not supported. Hence, *M. cirrhosis* and *M. paisii*, the latter is the preferred name of *S. paisii*, are distinct species.

5.3.30. *Microsporum audouinii* versus *Microsporum langeronii* versus *Microsporum rivalieri*

Microsporum audouinii is a well-known anthropophilic dermatophyte that causes scalp ringworm and other superficial infections in humans. The names *M. langeronii* and *M. rivalieri* were proposed as separate species based on slight morphological variations and differences in cultural characteristics. However, later taxonomic and molecular studies demonstrated that these names represent synonyms under *Microsporum audouinii* (Ajello, 1953; De Hoog et al., 2017). Thus, *M. audouinii* is the preferred name and *M. langeronii* and *M. rivalieri* are facultative synonyms.

5.3.31. *Mucor irregularis* versus *Rhizomucor variabilis*

This is a somewhat complicated case. *Mucor irregularis* and *Rhizomucor variabilis* were long considered the same taxon, and this was confirmed by molecular and morphological studies. *M. irregularis* is the correct and current name, while *Rhizomucor variabilis* is an older synonym. Detailed phylogenetic studies demonstrated that the *R. variabilis* isolates differ significantly from *Rhizomucor* and cluster within the genus *Mucor* (Lu et al. 2013; Walther et al. 2019). *M. irregularis* was established to accommodate the species previously referred to as *Rhizomucor*

variabilis var. *regularior*, that belongs to *Mucor irregularis*. In contrast, *R. variabilis* var. *variabilis* remained within the true *Rhizomucor* clade, closely related to *R. pusillus* and *R. miehei*, and retains the name *Rhizomucor variabilis*. Thus, the former two varieties of *R. variabilis* represented two distantly related taxa that are recognized as species (Lu et al. 2013; Walther et al. 2019). In short, *M. irregularis* is the preferred name for *M. irregularis* var. *regularior*, and *R. variabilis* is the preferred name of *M. variabilis* var. *variabilis*.

5.3.32. *Muyocopron sahnii* versus *Mycoleptodiscus indicus*

Hernández-Restrepo and Crous (2019) reclassified certain *Mycoleptodiscus*-like taxa into other genera based on DNA sequence data (ITS rDNA, LSU rDNA, and *tef1*). *Muyocopron sahnii*, which is morphologically similar to *Mycoleptodiscus indicus* due to its *Mycoleptodiscus*-like conidial morphology, belongs to *Muyocopronaceae* (order *Muyocopronales*), while *M. indicus* remains in the *Didymosphaeriaceae* (order *Pleosporales*). Thus, *Muyocopron sahnii* and *Mycoleptodiscus indicus* are not conspecific, but rather belong to different orders within the *Dothideomycetes*.

5.3.33. *Nannizzia fulva* versus *Arthroderma fulvum* versus *Microsporium fulvum* versus *Microsporium boullardii* versus *Trichophyton longifusum* (see also 5.2.4.20)

Phylogenetic studies using ITS and β -tubulin sequences (de Hoog et al., 2017; Kano et al., 2020) placed *N. fulva* within the *N. gypsea* complex, closely related to *Nannizzia gypsea* and *Nannizzia incurvata*. *N. fulva* is the preferred name and *M. boullardii*, *M. fulvum*, and *T. longifusum*, are synonyms of this species.

5.3.34. *Nannizzia nana* versus *Arthroderma obtusum* (see also 5.2.4.9)

These two names refer to the same species, representing the asexual (*Nannizzia nana*) and sexual (*Arthroderma obtusum*) morphs, respectively. Molecular phylogenetic analyses (Gräser et al., 1999; De Hoog et al., 2017) confirmed that they represent a single species for which *Nannizzia nana* is the preferred name, while *Arthroderma obtusum* is a synonym.

5.3.35. *Neocucurbitaria unguis-hominis* versus *Pyrenochaeta unguishominis*

Neocucurbitaria unguis-hominis and *P. unguishominis* are different names for the same fungal species based on molecular and morphological evidence. *Neocucurbitaria unguis-hominis* is the accepted name (Wanasinghe et al. 2017).

5.3.36. *Neocosmospora solani* versus *Nectria haematococca* var. *breviconia* (see also 5.2.23, 5.2.23.2)

Historically, the species was classified within the genus *Nectria* as *Nectria haematococca*, the teleomorph of *Fusarium solani*. Advances in molecular phylogenetics showed that the *F. solani* species complex represents a distinct lineage, distinct from the core *Fusarium* clade. This led to the establishment of the genus *Neocosmospora*, with *N. solani* now recognized as the correct name for what was previously referred to as *Nectria haematococca* var. *breviconia*. *Neocosmospora solani* is the current, phylogenetically supported name, while *N. haematococca* var. *breviconia* is a facultative synonym (Lombard et al. 2015).

5.3.37. *Neoscytalidium dimidiatum* versus *Scytalidium hyalinum* versus *Nattrassia mangiferae*

Molecular phylogenetic studies showed that they represent the same species or are closely related morphs of *N. dimidiatum*, a pathogen and opportunistic human and plant-associated fungus. *Scytalidium hyalinum* was described for the hyaline form of the same fungus. Phylogenetic and cultural studies confirmed that *S. hyalinum* and *N. dimidiatum* are synonyms (Phillips et al., 2013). *N. mangiferae* represents the asexual form producing pycnidia. Molecular phylogenetic studies using ITS, EF1- α , β -tubulin) sequence data showed that *N. mangiferae* and *N. dimidiatum* are conspecific, leading to the synonymization under *Neoscytalidium dimidiatum* (Summerbell et al., 2011). *Neoscytalidium dimidiatum* (Penzig) Crous & Slippers is the currently accepted name (Crous et al., 2006).

5.3.38. *Ophiocordyceps humberitii* versus *Hirsutella saussurei*

According to Biota of New Zealand *O. humberitii* is the sexual name for a fungus whose asexual form was formerly known as *H. saussurei*. *O. humberitii* is the preferred name.

5.3.39. *Ophiostoma quercus* versus *Ophiostoma roboris* (see also 5.2.23.2)

Grobbelaar et al. (2009) using multilocus DNA sequence comparisons found that *O. quercus*, *O. fagi*, and *O. roboris* formed a single, well-supported clade. Przybył (1992) reported morphological and ecological similarities between the two taxa further supporting their synonymy. *Ophiostoma quercus* is the accepted name with *Ophiostoma roboris* is treated as a facultative synonym.

5.3.40. *Paracoccidioides lobogeorgii* versus *Paracoccidioides lutzii*

Multilocus-based phylogenetic analyses show that *P. lobogeorgii* and *P. lutzii* are distinct species (Vilela et al. 2023, Mendoza & Vilela, 2024).

5.3.41. *Paraconiothyrium fuckelii* versus *Leptosphaeria coniothyrium* (see also 5.2.9.1)

Molecular phylogenetic studies using ITS rDNA, LSU rDNA, and β -tubulin sequences demonstrated that the genus *Coniothyrium* is polyphyletic. *C. fuckelii* belongs to a distinct lineage within the *Didymellaceae*. Therefore, Verkley and de Gruyter (2012) reclassified it as *Paraconiothyrium fuckelii*, separating it from *Leptosphaeria* and confirmed that *L. coniothyrium* represents *P. fuckelii* (Verkley et al., 2004; Verkley & de Gruyter, 2012). *P. fuckelii* is the preferred name with *L. coniothyrium* as a synonym.

5.3.42. *Petriella setifera* versus *Graphium* sp. versus *Scedosporium* sp. E148

Petriella setifera produces a characteristic *Graphium*-like asexual morph, implicating that *Graphium* represent one of its anamorphic stages. Molecular phylogenetic analyses using ITS rDNA and β -tubulin sequences showed that some isolates historically identified as *Scedosporium* sp. (such as *Scedosporium* sp. E148) cluster within the *Microascaceae*, closely related to the *Petriella* and *Graphium* lineages, but in a different clade (Sandoval-Denis et al., 2016), and, thus, they do not seem conspecific. *P. setifera* is the preferred name.

5.3.43. *Phoma herbarum* versus *Phoma minutella* versus *Phoma cruris-hominis*

The taxonomic position of *P. minutella* is not clear. The species is not included in recent molecular phylogenetic studies on the genus, nor is it present in a monographic study. A consulted expert, dr. Pedro Crous, is also not aware of its identity. Thus, it remains best to consider it a doubtful species in *Didymellaceae*.

Taxonomically, *P. cruris-hominis* and *P. herbarum* share the same genus name currently, but molecular phylogenetics indicate that they may belong to different lineages (and likely will end up in different genera as the taxonomy is refined). Thus, the species are not synonyms.

5.3.44. *Plectosphaerella cucumerina* versus *Plectosporium tabacinum*

Plectosporium tabacinum is the asexual name of *Plectosphaerella cucumerina* (Palm et al. 1995). *Plectosphaerella cucumerina* is the currently accepted name.

5.3.45. *Scedosporium apiospermum* versus *Polycytella hominis* versus *Microascus paisii* (see also 5.2.21.2, 5.2.21.3)

Scedosporium apiospermum and *P. hominis* represent different morphs of the same fungal species, representing the asexual and sexual stages, respectively. Cultural, morphological, mating studies and molecular phylogenetic analyses confirmed this and *Scedosporium apiospermum* is the preferred name (Guarro et al., 1999; Gilgado et al., 2008). *M. paisii*, originally described as *Petriellidium paisii*, shares morphological similarities with *S. apiospermum* but belongs to a separate clade, and is recognized as a different species (Sandoval-Denis et al., 2016). Thus, *S. apiospermum* is the preferred name for *P. hominis*, and *M. paisii* belongs to a different genus.

5.3.46. *Scedosporium boydii* versus *Graphium eumorphum*

Scedosporium boydii and *G. eumorphum* are two morphs of the same fungal species. Molecular phylogenetic analyses confirmed that *S. boydii* and *G. eumorphum* are genetically identical, and, hence, conspecific. *Scedosporium boydii* is the preferred name.

5.3.47. *Scopulariopsis asperula* versus *Scopulariopsis fusca*

Molecular phylogenetic studies using ITS rDNA and β -tubulin gene sequences confirmed that these two species are phylogenetically related, but distinct from *Scopulariopsis brevicaulis*, and represent distinct species (Sandoval-Denis et al., 2013).

5.3.48. *Scopulariopsis candida* versus *Microascus manginii*

Microascus manginii produces a *S. candida*-like anamorph. Under the 'One fungus = one name' principle these two names are considered synonymous, with *Scopulariopsis candida* being the accepted name (Sandoval-Denis et al., 2013).

5.3.49. *Sporidiobolus johnsonii* versus *Sporobolomyces salmonicolor*

In the original COGEM nonpathogens *Sporobolomyces salmonicolor* is listed as a synonym of *Sporidiobolus johnsonii*. A multigene-based phylogenetic study showed that the genus *Sporidiobolus* is congeneric with *Sporobolomyces*, and because of the 'One fungus = One name' principle, the latter name was given priority because it is older and more widely used it (Wang et al. 2015). In the same publication it was shown that *S. johnsonii* and *S. salmonicolor* are two species. Also theyeasts.org takes this position.

Therefore, the purported synonymy is not valid and *Sporobolomyces johnsonii* and *Sporobolomyces salmonicolor* are two species.

5.3.50. *Sydowia polyspora* versus *Hormonema dematioides*

Molecular phylogenetic analyses using ITS - and LSU rDNA sequences confirmed that the two names represent the same species. *Sydowia polyspora* is the preferred name, while *H. dematioides* is a synonym (Bills et al., 2004; Crous et al., 2007).

5.3.51. *Talaromyces piceus* versus *Talaromyces piceae*

On the COGEM nonpathogens list *Talaromyces piceae* is mentioned. According to MB, IF and Yilmaz et al. (2011) the correct writing is *T. piceus*. FN, GB and ACF list it as *T. piceae*. The curator of MB, dr. Konstanze Bensch, has the opinion that the correct name is *T. piceus* because the fungus name derived from its resemblance to a spruce and it has to be in the masculine form, hence *T. piceus*. Therefore, *Talaromyces piceus* is the correct name.

5.3.52. *Thermothelomyces fergusii* versus *Thermochaetoides thermophila* versus *Myceliophthora fergusii* versus *Thielavia thermophila* versus *Crassicarpon thermophilum* versus *Chaetomidium thermophilum*

Thermothelomyces fergusii was previously known by different names describing its sexual and asexual stages, including *Thielavia thermophila* (teleomorph) and *M. fergusii* (anamorph) (Wang & Houbraken, 2022). Later, some researchers transferred it to the genus *Crassicarpon* as *Crassicarpon thermophilum*, but this genus was

abandoned following molecular phylogenetic studies. Phylogenetic analyses of ITS, β -tubulin, and LSU DNA sequences demonstrated that these taxa represent the same species, leading to their unification under *Thermothelomyces fergusii* within the family *Chaetomiaceae*. The name *Chaetomidium thermophilum* occasionally appears in older literature but is not a synonym of this species. Wang and Houbraken al. (2022) reclassified this species as *Thermochaetoides thermophila* (La Touche) X. Wei Wang & Houbraken 2022. *Thermochaetoides thermophila* is the preferred name with *Thermothelomyces fergusii*, *Myceliophthora fergusii*, *Thielavia thermophila*, *Crassicarpon thermophilum*, and *Chaetomidium thermophilum* as synonyms.

5.3.53. *Thermothielavioides terrestris* versus *Acremonium alabamense* versus *Thielavia terrestris*

Thermothielavioides terrestris (Wang & Houbraken, 2019) was originally described as *Thielavia terrestris* Apinis. Later, the asexual (anamorphic) state of this fungus was described as *A. alabamense* (Samson et al., 1977), reflecting its filamentous *Acremonium*-like conidiogenous structures (Pitt & Hocking, 2009). Phylogenetic analysis of ITS rDNA, LSU rDNA, β -tubulin, and calmodulin genes revealed that *Thielavia terrestris* and *A. alabamense* represent the same species, distinct from the core *Thielavia* lineage. Therefore, Wang and Houbraken (2019) established the new genus *Thermothielavioides* to accommodate this species and renamed it *Thermothielavioides terrestris*. Thus, *Thielavia terrestris* and *A. alabamense* are now considered synonyms of *Thermothielavioides terrestris*.

5.3.54. *Torulaspota delbrueckii* versus *Candida colliculosa*

Torulaspota delbrueckii and *Candida colliculosa* are the same yeast species, representing two different names for the teleomorphic and anamorphic states, respectively (TYTS, Kurtzman et al. 2011). *T. delbrueckii* is the preferred name and *C. colliculosa* a facultative synonym.

5.3.55. *Triangularia pauciseta* versus *Podospora pauciseta* versus *Podospora anserina*

Triangularia pauciseta and *P. pauciseta* represent the same species, while *P. anserina* is a closely related but distinct species. Molecular phylogenetic analyses using multiple loci (ITS, LSU, RPB2, TUB2) revealed that *Podospora* was polyphyletic, containing species belonging to several distinct lineages. Wang and Houbraken (2019) transferred several species, including *P. pauciseta*, to the genus *Triangularia*, resulting in the new combination *Triangularia pauciseta*. *P. anserina*, though morphologically similar to *P. pauciseta*, remained in the genus *Podospora sensu stricto* and serves as

the type species of the genus. A proposal has been made to conserve the genus name *Podospora* Ces. with *P. anserina* as type (Vogan et al. 2021). Thus, *P. anserina* is not a synonym of *T. pauciseta*.

5.3.56. *Trichoderma harzianum* versus *Trichoderma viride*

Lieckfeldt and coworkers (1999) used a phylogenetic analysis with combined ITS rDNA and partial LSU rDNA data and found that *T. viride* and *T. harzianum* are distinct species. Hence, they are not synonymous.

5.3.57. *Trichoderma viride* versus *Hypocrea rufa*

Trichoderma viride and *H. rufa* are two morphs of the same fungal species, representing the asexual and sexual stages, respectively. Molecular phylogenetic analyses confirmed this (Druzhinina & Kubicek, 2005) and *Trichoderma viride* is the currently accepted name.

5.3.58. *Trichophyton benhamiae* versus *Trichophyton erinacei*

Trichophyton benhamiae and *T. erinacei* are closely related species within the *Trichophyton benhamiae* complex (*Arthrodermataceae*). Molecular phylogenetic analyses showed that *T. erinacei*, originally isolated from hedgehogs (*Erinaceus europaeus*), is a distinct but closely related zoonotic lineage derived from *T. benhamiae* (Gräser et al., 2006; De Hoog et al., 2017). Thus, they are not synonymous.

5.3.59. *Trichophyton interdigitale* versus *Arthroderma vanbreuseghemii*

Trichophyton interdigitale and *A. vanbreuseghemii* are two very closely related species in the *T. mentagrophytes* species (Gräser et al., 1999a; de Hoog et al., 2017) (see also 8.2.4.15). *A. vanbreuseghemii* is the sexual name for *T. mentagrophytes* and now known under that name (de Hoog et al. 2017).

Thus, both species *Trichophyton interdigitale* and *Arthroderma vanbreuseghemii* are not synonyms.

Note that *Trichophyton vanbreuseghemii* is not the same species as *A. vanbreuseghemii*. The former belongs to the genus *Arthroderma* and has *A. gertleri* as current name, while *A. vanbreuseghemii* is now named *T. mentagrophytes* (see above, de Hoog et al. 2017).

5.3.60. *Trichophyton rubrum* versus *Trichophyton fischeri* versus
Trichophyton gourvilii var. *intermedium* versus *Trichophyton kanei*
 versus *Trichophyton raubitschekii*

All these taxa belong to the *T. rubrum* complex, one of the most important anthropophilic dermatophyte groups within family *Arthrodermataceae*. Morphological variation and subtle physiological differences among isolates led to the description of several species or varieties, including *T. fischeri*, *T. gourvilii* var. *intermedium*, *T. kanei*, and *T. raubitschekii*. Molecular phylogenetic and mating studies showed that these taxa are conspecific with *T. rubrum*, the currently preferred name, with *T. fischeri*, *T. gourvilii* var. *intermedium*, *T. kanei*, and *T. raubitschekii* representing synonyms of this species (Gräser et al., 2000a; de Hoog et al., 2017).

5.3.61. *Xepicula leucotricha* versus *Myrothecium indicum* versus
Myrothecium leucotrichum

According to Lombard et al. (2016), the genus *Myrothecium* was historically used in a broad sense, but molecular and morphological studies revealed that several species previously placed in *Myrothecium* belong to distinct genera, such as *Xepicula*. *Myrothecium indicum* and *Myrothecium leucotrichum* were reassigned to *Xepicula*, with *Xepicula leucotricha* representing the currently accepted name.

5.3.62. *Xerochrysium dermatitidis* versus *Chrysosporium inops*

Chrysosporium inops has been reclassified into the genus *Xerochrysium*, and its correct name is *Xerochrysium dermatitidis* (Pitt et al. 2013).

5.4. Comparison of current names in the various fungal name repositories

Most of the names on the original COGEM fungal list (n=542, 85.1%) agreed with those in the various fungal name repositories. However, 95 (14.9%) showed a different name in at least one of the fungal name repositories. When comparing the list of conflicting names (n=95) in the updated COGEM list with the current names in MB, MB xls, IF, IF xls, FN, and GB the following was observed. IF and IF xls differed only in three names, whereas MB and MB xls showed 37 differences. Names in GB most closely matched those on the COGEM updated list with 17 differences, followed by MB with 24 differences. IF, IF xls and FN differed in 49-51 names with the updated COGEM list and in 49 to 61 names with MB (Table 2). From this it can be concluded that the 'current' names in the various fungal name repositories vary to a significant degree. This is an unfortunate situation as users may use one of those databases and may get different results, which, in turn, may harm the quality of the work in which

those names are used and it will also complicate an easy comparison between those works.

Table 2. Number of mismatches in current names of 95 fungal species that showed differences in at least on the fungal name repositories. COGEM, updated COGEM fungal lists; MB web, MycoBank website; MB xls, Excel file of MB; IF xls, Excel file of Index Fungorum; IF web, Index Fungorum website; FN web, Fungal Names website.

	COGEM	MB web	MB xls	IF xls	IF web	FN web	GenBank
COGEM	0	24	24	50	49	51	17
MB web		0	37	49	49	61	46
MB xls			0	61	62	62	52
IF xls				0	3	15	50
IF web					0	13	52
FN web						0	50
GenBank							0

5.5. Nomenclatural quality statistics

The total COGEM fungal list comprises 123 families, next to a few species that are not (yet) assigned to a family. Eighty-nine families had no species with a conflicting name in any of the fungal name repositories. From those, the following contained at least five species: *Cyphellophoraceae* (n = 5): *Debaryomycetaceae* (n = 17), *Didymellaceae* (n = 6), *Lichtheimiaceae* (n = 6), *Malasseziaceae* (n = 8), *Mucoraceae* (n = 10), *Sordariaceae* (n = 5), *Sporidiobolaceae* (n = 6), *Togniniaceae* (n = 10), and *Trichocomaceae* (n = 11). Eighteen families containing five or more species showed at least one conflicting name in at least one of the fungal name repositories (Table 3). When calculating the percentage of conflicting names in those families this ranged from 4.2% (*Saccharomycetaceae*) to 80% (*Glomeraceae*) (overall average 28.5%, n=18) (Table 3). From this it is clear that the stability of current names given in the repositories is far from optimal. In all of these families, harmonization of the current names in the fungal name repositories needs attention, but most notably in the fungal families *Ajellomyctaceae*, *Arthrodermataceae*, *Chaetomiaceae*, *Filobasidiaceae*, *Glomeraceae*, *Hypocreaceae*, *Microascaceae*, *Nectriaceae*, *Onygaceae*, *Ophiostomataceae* and *Pichiaceae*. The data presented in Table 3 might be used as a first indication that a name of a fungal species belonging to any of the families with a high percentage of conflicting names needs further scrutiny. It is urgently advised that the official three fungal name repositories, MB, IF and FN, harmonize their content. Other databases, such as ACF, GB, and theyeasts.org, just to name a few, can then use this data without further curation. An even better solution might be when

the three fungal name repositories merge into a single, optimally curated one. The human and IT power involved in keeping three databases running can then be utilized for optimizing only one.

Table 3. Percentage of conflicting names in families with at least 5 representatives.

Family	Percentage of conflicting names	Number of species in family considered in this study
<i>Ajellomycetaceae</i>	40	10
<i>Arthrodermataceae</i>	27.5	69
<i>Aspergillaceae</i>	5.6	54
<i>Chaetomiaceae</i>	13.3	15
<i>Cordycipitaceae</i>	50	8
<i>Filobasidiaceae</i>	14.3	7
<i>Glomeraceae</i>	80	5
<i>Herpotrichiellaceae</i>	5.7	35
<i>Hypocreaceae</i>	50	20
<i>Microascaceae</i>	13.3	15
<i>Nectriaceae</i>	61.5	13
<i>Onygiaceae</i>	33.3	9
<i>Ophiostomataceae</i>	22.2	9
<i>Pichiaceae</i>	18.2	11
<i>Pleosporaceae</i>	25	24
<i>Rhizopodiaceae</i>	20	5
<i>Saccharomycetaceae</i>	4.2	24
<i>Trichocomaceae</i>	6.7	15

5.6. Authors and year of publication issues

When comparing the various databases, including ACF and GB, it was noted that in several cases differences occur in the author citations, the years of publications, and the writing of the names. Although it goes beyond the scope of this project to make an in-depth analysis, it is important to address this issue as it relates to database quality and potential use of (in)correct fungal names by the users. More than 45 variations have been noted in the author citations, four variations in years of publication, and three orthographic name variants. Some examples are *Trichophyton violaceum* Sabouraud ex E. Bodin 1902 in MB, IF and FN versus *Trichophyton violaceum* Sabouraud 1902 in GB and ACF; *Aspergillus chevalieri* (L. Mangin) Thom & Church 1926 in MB, IF and FN versus *Aspergillus chevalieri* Thom & Church 1926 in GB versus *Aspergillus chevalieri* Mangin in ACF. Orthographic variants were e.g. *Absidia caerulea* Bainier 1889 in MB versus *Absidia coerulea* Bainier 1889 in MB xls;

Talaromyces piceus (Raper & Fennell) Samson, Yilmaz, Houbraken, Spierenburg, Seifert, Peterson, Varga & Frisvad 2011 in MB versus *Talaromyces piceae* (Raper & Fennell) Samson, Yilmaz, Houbraken, Spierenburg, Seifert, Peterson, Varga & Frisvad 2011 in MB xls.

When asking the curator of MycoBank, dr. Konstanze Bensch reason for these differences, she replied that 'recent import of authors of fungal names in International Plant Names Index (IPNI, <https://www.ipni.org/>) with many new author abbreviations that still need to be adapted both in IF and MB'. Apparently, the curator of MB is aware of this unfortunate situation of variations in the author citations, but, unfortunately, this also impacts the users of IF, GB, and ACF.

5.7. Names used in the Atlas of Clinical Fungi

The Atlas of Clinical Fungi (ACF, de Hoog et al. 2020) is seen as a major source of information on clinically important fungi. Sixty-seven names that appear on the list with conflicting names also appeared in ACF. A significant part of those names showed a different name in ACF. For the updated COGEM fungal list, MB, MB xls, IF, IF xls, FN and GB lists this was 4, 5, 6, 10, 10, 10 and 4 names, respectively. Thus, it seems that ACF uses deviating names to a large extent. ACF also uses names that are not used by any of the other name repositories. From the list with conflicting names, we noted the following ACF-unique names: *Epidermophyton floccosum*, *Myceliophthora thermophila*, and *Myriodontium keratinophilum*.

However, also a large number of ACF-unique names appeared on the COGEM concordant name list, which is the list that showed agreement on names in MB, IF, FN and GB. From this list with concordant names, we noted the following ACF-unique names: *Aspergillus violaceofuscus*, *Aspergillus awamori*, *Acremonium egyptiacum*, *Acremonium spinosum*, *Phialemoniopsis curvata*, *Chaetomium atrobrunneus*, *Chaetomium murorum*, *Paecilomyces marquandii*, *Chamaeleomyces viridis*, *Lecytophora hoffmannii*, *Lecytophora mutabilis*, *Paecilomyces javanicus*, *Rhodotorula minuta*, *Phoma eupyrena*, *Hormonema dematioides*, *Naganishia albida* (for *Naganishia diffluens*), *Tilletiopsis minor*, *Gymnascella hyalinospora*, *Candida haemuli*, *Cylindrocarpon desstructans*, *Acremonium recifei*, *Bipolaris hawaiiensis*, *Bipolaris papendorfii*, *Drechslera biseptata*, *Arnium leporinum*, *Geomyces pannorum*, *Candida glabrata*, *Candida nivariensis*, *Acremonium curvatum*, *Rhodotorula glutinis* (for *Rhodotorula toruloides*), *Tetraploa aristate* (for *Tetraploa scheueri*), *Phialemoniopsis curvata* (for *Thyridium curvatum*), and *Cutaneotrichosporon cutaneum* (for *Trichosporon beigelii*). Despite we covered only a small part of the species included in ACF, it seems clear that part of the names of fungi in ACF deviate from those present in MB, IF, FN and GB.

5.8. Nonpathogens on the COGEM list that occur in ACF

The COGEM fungal lists comprise two parts, namely a list of nonpathogens and a list of pathogens. Although this report does not address the classification of fungi in pathogenicity classes as done by COGEM, it is at least noteworthy to see that > 200 species on the COGEM nonpathogens list appear in ACF, suggesting that they might have some clinical relevance. It is up to COGEM to decide to revise the classification in pathogenicity classes of those fungi. One of the most striking examples is *Saccharomyces cerevisiae*, a yeast that is widely used in traditional fermentations, in biotechnology and as a model species in biomedical research, but more thermo-tolerant isolates of this species can cause infection, see the cases reported in ACF. Rather than making judgements at a species level, in such cases pathogenicity evaluations by COGEM at the strain level may be required.

5.9. Names of yeasts

The reference work 'The Yeasts, a Taxonomic Study' (TYTS, Kurtzman et al. 2011) and its recent electronic successor theyeasts.org serve as a source for yeast names. In the list of species that show different names in the various name repositories only six yeast species are present. For TYTS and theyeasts.org the same picture emerged. One species name differed in the updated COGEM list, MB, and GB, two differed in MB xls, and all six showed a different name in IF, IF xls and FN. Among the list of species with concordant names in all fungal name repositories 22 yeast names were different when compared to TYTS and only six in theyeasts.org. In the case of the latter, several names have not yet been updated, e.g. *Candidozyma haemuli*, and *Nakaseomyces glabratus* and *Nakaseomyces nivariensis* (T. Boekhout, M. Groenewald, pers. commun.), but the data suggest that recent changes in yeast taxonomy are readily incorporated in the various fungal name repositories.

5.10. Duplicated names on COGEM list

Until recently many fungal species were known by two (or even more) names, and this caused that several species occur twice or more on the original COGEM fungal list. Examples of such duplicated names are *Metarhizium viride*, *Microsporum canis*, *Aspergillus fumigatus*, and *Curvularia australiensis*. In the updated COGEM fungal lists (8.13) only one entry is retained and the alternative name is placed in the synonyms. *Arthroderma uncinatum*, *Aspergillus niger*, *Exserohilum rostratum*, *Kluyveromyces marxianus*, and *Rhizopus microsporus* occur both on the pathogens and the nonpathogens lists. *A. uncinatum* is mentioned in ACF as BSL-1 with some rare human cutaneous cases listed. Therefore, placement on the nonpathogens list seems warranted. *A. niger* was listed on the nonpathogens list whereas *A. welwitschiae*, currently seen as a synonym of *A. niger*, was listed on the pathogens list. ACF lists various clinical cases caused by *A. niger*, but as the species has also a

Generally Recognized As Safe (GRAS) status its classification needs further attention. *Exserohilum longirostratum* and *Exserohilum mcginnisii*, now synonymized under *E. rostratum*, were listed on the original COGEM nonpathogens list. Given the many clinical cases caused by *E. rostratum* as reported in ACF, it is suggested to keep *E. rostratum* on the pathogens list. *Candida pseudotropicalis*, currently a synonym of *K. marxianus*, was placed on the original COGEM pathogens list, whereas *K. marxianus* occurred on the nonpathogens list. ACF reports the species as BSL-1, and occurring mostly in immunocompromised patients. Given the importance of the species in e.g. the dairy industry (viz. kefir production, enzyme production) a closer look at its pathogen classification is recommended. ACF lists various clinical cases caused by *R. microsporus*, a species that also causes plant diseases, but that is also used in soy fermentations. Hence, its pathogen classification needs to be re-investigated.

5.11. Entries that are present on the COGEM list with a generic name only

Two entries are present on the nonpathogens COGEM list with their generic name only, namely *Neocucurbitaria* sp. VM-36 and *Termitomyces* R. Heim 1942 sp. Because a species name is absent in these cases, it is impossible to infer their pathogenicity class, except when all species of that genus have a similar or identical pathogenicity. It is advised to keep the presence of such 'generic names only' cases limited, and preferably zero on the COGEM fungal list.

5.12. Strategy to follow when entering new names

From the above it is clear that just checking a name of a fungal species in any of the fungal name repositories is not recommended. When entering a species name that belongs to a family with a high number of conflicting names (Table 3) careful consideration is needed. The analysis presented showed that the updated COGEM fungal classification is most similar with the naming of fungi as done in GB, followed by MB. Thus, we recommend that these two databases are compared firstly. In case of concordance, this name can be used, but in case of conflict, IF and FN might be consulted, even if this may cause more confusion. For clinically relevant fungi ACF should be considered, and for yeasts theyeasts.org. In case that the conflicting names are presented more widely in the various name repositories and other databases, it is advised to search for recent multilocus-based phylogenetic analyses with a taxonomic interpretation that may confirm some of the entries in the databases. As indicated above, it is important that such studies must make 1. taxonomic inferences based on multilocus - or comparative genomics inferences, and 2. include as many available type specimens of the taxonomic group concerned in order to reach taxonomic conclusions with maximal trustability. In case of further doubt, it is advised that COGEM contacts a relevant specialist on fungal taxonomy and – nomenclature who may help to reach a final decision. It should, however, be kept in mind that experts may have opposing views on the interpretation of phylogenetic trees with respect to

the taxonomic and nomenclatural implementation (see e.g. the case of *Fusarium* versus *Neocosmospora*), and this may also be reflected in the literature to be consulted. The curator of MB, dr Konstanze Bensch, is a Latin trained scholar and thus the entries in MB are most likely to be grammatically correct. It is fair to realize that each of the fungal name repositories have a single curator, so updating with new species (and other taxa) may take some time

5.13. Updated fungal COGEM lists

Below the updated COGEM fungal lists of nonpathogens and pathogens, respectively, are presented (Tables 4, 5).

Table 4. List of nonpathogenic fungi. T – known to potentially produce toxin; PG – pathogen classes; sp. – subspecies; var. – variety.

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
Agaricaceae	<i>Agaricus bisporus</i> (J.E. Lange) Imbach 1946				1	CGM/111024-02
Ajellomycetaceae	<i>Ovadendron sulphureo-ochraceum</i> (J.F.H. Beyma) Sigler & J.W. Carmichael 1976	<i>Ovadendron sulphureo-ochraceum</i>			1	CGM/111024-02
Arthrobotryaceae	<i>Arthrobotrys flagrans</i> (Dudd.) Mekht., 1964	<i>Duddingtonia flagrans</i> ; <i>Trichothecium flagrans</i>			1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma flavescens</i> R.G. Rees 1967	<i>Trichophyton flavescens</i>			1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma gertleri</i> H. Böhme 1967	<i>Trichophyton vanbreuseghemii</i>			1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma gloriae</i> Ajello 1967	<i>Trichophyton gloriae</i>			1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma insingulare</i> A.A. Padhye & J.W. Carmichael 1972		<i>Trichophyton terrestre</i> ; <i>Arthroderma terrestre</i> ; <i>Arthroderma lenticulare</i> ; <i>Arthroderma quadrifidum</i> are not synonyms of <i>A. insingulare</i>		1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma pannicola</i> (Corda) Kandemir & de Hoog 2022	<i>Chrysosporium pannicola</i>			1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma thuringiense</i> (H.A. Koch) Y. Gräser & de Hoog 2018	<i>Trichophyton thuringiense</i>			1	CGM/111024-02
Arthrodermataceae	<i>Arthroderma uncinatum</i> C.O. Dawson & Gentles 1961	<i>Epidermophyton stockdaleae</i> ; <i>Keratinomyces ajelloi</i> ; <i>Trichophyton ajelloi</i>			1	CGM/111024-02
Arthrodermataceae	<i>Guarromyces ceretanicus</i> (Punsola & Guarro) Y. Gräser & de Hoog 2018	<i>Keratinomyces ceretanicus</i>			1	CGM/111024-02
Arthrodermataceae	<i>Nannizzia gypsea</i> (Nann.) Stockdale 1963	<i>Arthroderma gypseum</i> ; <i>Microsporum gypseum</i> ; <i>Nannizzia gypsea</i>			1	CGM/111024-02
Arthrodermataceae	<i>Paraphyton cookei</i> (Ajello) Y. Gräser, Dukik & de Hoog	<i>Arthroderma racemosum</i> ; <i>Microsporum racemosum</i> ; <i>Nannizzia racemosa</i>	<i>Nannizzia fulva</i> is not a synonym of <i>P. cookei</i>		1	CGM/111024-02
Ascodesmidaceae	<i>Cephalophora irregularis</i> Thaxter 1903				1	CGM/111024-02
Ascomycota, incertae sedis	<i>Phaeotrichoconis crotalariae</i> (M.A. Salam & P.N. Rao) Subramanian 1956				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus avenaceus</i> G. Sm. 1943				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus brasiliensis</i> Varga, Frisvad & Samson 2007				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus caesiellus</i> Saito 1904				1	CGM/111024-02

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
Aspergillaceae	<i>Aspergillus calidoustus</i> Varga, Houbraken & Samson 2008				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus candidus</i> Link 1809				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus chevalieri</i> (L. Mangin) Thom & Church 1926	<i>Eurotium chevalieri</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus conicus</i> Blochwitz 1914				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus deflectus</i> Fennell & Raper 1955				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus fischeri</i> Wehmer 1907	<i>Aspergillus fischerianus</i> ; <i>Neosartorya fischeri</i>		T	1	CGM/111024-02
Aspergillaceae	<i>Aspergillus flavipes</i> (Bainier & R. Sartory) Thom & Church 1926	<i>Fennellia flavipes</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus fumigatiaffinis</i> S.B. Hong, Frisvad & Samson 2006				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus fumisynnematus</i> Y. Horie, Miyaji, Nishim., Taguchi & Udagawa 1993				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus glaucus</i> (L.) Link 1809	<i>Eurotium herbariorum</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus granulatus</i> Raper & Thom 1944				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus insolitus</i> (G. Sm.) Houbraken, Visagie & Samson 2014	<i>Polypaecilum insolutum</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus janus</i> Raper & Thom 1944				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus japonicus</i> Saito 1906				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus luchuensis</i> Inui 1901				1	CGM/211004-01
Aspergillaceae	<i>Aspergillus montevidensis</i> Talice & J.A. Mackinnon 1931	<i>Aspergillus hollandicus</i> ; <i>Eurotium amstelodami</i> var. <i>montevidense</i>	<i>Aspergillus amstelodami</i> ; <i>Eurotium amstelodami</i> are not synonyms of <i>A. montevidensis</i>		1	CGM/111024-02
Aspergillaceae	<i>Aspergillus neotritici</i> Glässnerová & Hubka 2022	<i>Aspergillus tritici</i> nom. inval.			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus nidulans</i> (Eidam) G. Winter 1884	<i>Emericella nidulans</i>		T	1	CGM/111024-02
Aspergillaceae	<i>Aspergillus niger</i> Tiegh. 1867	<i>Aspergillus foetidus</i> ; <i>Aspergillus awamori</i> ; <i>Aspergillus welwitschiae</i>		T	1	CGM/170628-02
Aspergillaceae	<i>Aspergillus ochraceopetaliformis</i> Bat. & Maia 1957				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus oryzae</i> (Ahlb.) Cohn 1884	<i>Aspergillus flavus</i> var. <i>oryzae</i>	<i>Aspergillus flavus</i> is not a synonym of <i>A. oryzae</i>	T	1	CGM/111024-02

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
Aspergillaceae	<i>Aspergillus parvulus</i> G. Sm. 1961				1	CGM/210805-01
Aspergillaceae	<i>Aspergillus pseudoglaucus</i> Blochwitz 1929	<i>Eurotium repens</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus quadrilineatus</i> Thom & Raper 1939	<i>Aspergillus tetrazonus</i> ; <i>Emericella quadrilineata</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus restrictus</i> G. Sm. 1931				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus sojae</i> Sakag. & K. Yamada ex Murak. 1971			T	1	CGM/080131-05
Aspergillaceae	<i>Aspergillus spinosus</i> Kozak. 1989	<i>Neosartorya spinosa</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus sydowii</i> (Bainier & Sartory) Thom & Church 1926				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus udagawae</i> Y. Horie, Miyaji & Nishim. 1995	<i>Neosartorya udagawae</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus unguis</i> (Émile-Weill & L. Gaudin) Thom & Raper 1935	<i>Emericella unguis</i>			1	CGM/111024-02
Aspergillaceae	<i>Aspergillus ustus</i> (Bainier) Thom & Church 1926				1	CGM/111024-02
Aspergillaceae	<i>Aspergillus vadensis</i> Samson, R.P. de Vries, Frisvad & J. Visser 2005				1	CGM/111024-02
Aspergillaceae	<i>Monascus ruber</i> Tiegh. 1884	<i>Basipetospora rubra</i>		T	1	CGM/100813-01
Aspergillaceae	<i>Penicillium aurantiogriseum</i> Dierckx 1901			T	1	CGM/111024-02
Aspergillaceae	<i>Penicillium brasilianum</i> Bat. 1957			T	1	CGM/150108-01
Aspergillaceae	<i>Penicillium chrysogenum</i> Thom 1910			T	1	CGM/111024-02
Aspergillaceae	<i>Penicillium decumbens</i> Thom 1910				1	CGM/111024-02
Aspergillaceae	<i>Penicillium discolor</i> Frisvad & Samson 1997			T	1	CGM/231204-01
Aspergillaceae	<i>Penicillium roqueforti</i> Thom 1906			T	1	CGM/170316-01
Aspergillaceae	<i>Penicillium spinulosum</i> Thom 1910				1	CGM/111024-02
Aspergillaceae	<i>Penicillium subrubescens</i> Houbraken, Mansouri, Samson & Frisvad 2012				1	CGM/190122-02
Aspergillaceae	<i>Xerochrysium dermatitidis</i> (A. Agostini) Pitt 2013	<i>Chrysosporium inops</i>			1	CGM/111024-02
Bionectriaceae	<i>Acremonium potronii</i> Vuill. 1910				1	CGM/111024-02
Bionectriaceae	<i>Bulbithecium spinosum</i> (Negroni) L.W. Hou, L. Cai & Crous 2023				1	CGM/111024-02

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Bionectriaceae	<i>Caespitomonium hyalinulum</i> (Sacc.) Crous 2021				1	CGM/111024-02
Bionectriaceae	<i>Gliomastix roseogrisea</i> (S.B. Saksena) Summerb. 2011				1	CGM/111024-02
Bionectriaceae	<i>Phialemonium atrogriseum</i> (Panas.) Dania García, Perdomo, Gené, Cano & Guarro 2013	<i>Acremonium atrogriseum</i>			1	CGM/111024-02
Bionectriaceae	<i>Proxiovicillium blochii</i> (Matr.) L.W. Hou, L. Cai & Crous 2023	<i>Acremonium blochii</i> ; <i>Mastigocladium blochii</i>			1	CGM/111024-02
Botryosphaeriaceae	<i>Neodeightonia subglobosa</i> C. Booth 1970	<i>Botryosphaeria subglobosa</i> ; <i>Sphaeropsis subglobosa</i>			1	CGM/111024-02
Chaetomiaceae	<i>Acrophialophora fusispora</i> (S.B. Saksena) Samson 1970				1	CGM/111024-02
Chaetomiaceae	<i>Amesia atrobrunnea</i> (L.M. Ames) X.Weï Wang & Samson 2016	<i>Chaetomium atrobrunneum</i>			1	CGM/111024-02
Chaetomiaceae	<i>Botryotrichum murorum</i> (Corda) X.Weï Wang & Samson 2016	<i>Chaetomium murorum</i>			1	CGM/111024-02
Chaetomiaceae	<i>Achaetomium strumarium</i> J.N. Rai, J.P. Tewari & Mukerji 1964	<i>Chaetomium strumarium</i>			1	CGM/111024-02
Chaetomiaceae	<i>Corynascus fumimontanus</i> Y. Marín, Stchigel, A.N. Mill., J. Guarro & Cano 2015	<i>Corynascus fumimontanus</i>			1	CGM/170216-01
Chaetomiaceae	<i>Thermothelomyces fergusii</i> X. Wei Wang & Houbraken 2022	<i>Corynascus thermophilus</i> ; <i>Crassicarpon thermophilum</i> ; <i>Thielavia thermophila</i> ; <i>Myceliophthora fergusii</i>	<i>Chaetomidium thermophilum</i> ; <i>Thermochaetoides thermophila</i> are not synonyms of <i>T. fergusii</i>	NA	1	CGM/170313-01
Chaetomiaceae	<i>Dichotomopilus funicola</i> (Cooke) X.Weï Wang & Samson 2016				1	CGM/111024-02
Chaetomiaceae	<i>Melanocarpus albomyces</i> (Cooney & R. Emers.) Arx 1975	<i>Myriococcum albomyces</i> ; <i>Thielavia albomyces</i>		T	1	CGM/170124-01
Chaetomiaceae	<i>Mycothermus thermophilus</i> (Cooney & R. Emers.) X. Wei Wang, Houbraken & D.O. Natvig 2019	<i>Coryneascus thermophila</i> ; <i>Myceliophthora thermophila</i>	<i>Scytalidium thermophilum</i> ; <i>Torula thermophila</i> ; <i>Humicola insolescens</i> are not synonyms of <i>M. thermophilus</i>		1	CGM/170110-01
Chaetomiaceae	<i>Parathielavia hyrcaniae</i> (Nicot) X. Wei Wang & Houbraken 2019				1	CGM/211001-01
Chaetomiaceae	<i>Staphylotrichum coccosporum</i> J.A. Meyer & Nicot 1957				1	CGM/111024-02
Chaetomiaceae	<i>Thermothelomyces heterothallicus</i> (Klopotek) Y. Marín, Stchigel, Guarro & Cano 2015	<i>Corynascus heterothallicus</i> ; <i>Myceliophthora heterothallicus</i> ; <i>Thermothelomyces heterothallicus</i>			1	CGM/111024-02

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Chaetomiaceae	<i>Thermothielavioides terrestris</i> (Apinis) X. Wei Wang & Houbraeken 2019	<i>Thielavia terrestris</i> ; <i>Acremonium alabamense</i>			1	CGM/111024-02
Chaetomiaceae	<i>Trichocladium asperum</i> Harz 1871				1	CGM/111024-02
Chlorociboriaceae	<i>Chlorociboria aeruginascens</i> (Nylander) Kanouse ex C.S. Ramamurthi, Korf & L.R. Batra 1958	<i>Dothiorina tulasnei</i>			1	CGM/210805-01
Cladosporiaceae	<i>Cladosporium sphaerospermum</i> Penz 1882				1	CGM/111024-02
Clavicipitaceae	<i>Marquandomyces marquandii</i> (Masse) Samson, Houbraeken & Luangsa-ard 2020	<i>Paecilomyces marquandii</i>			1	CGM/111024-02
Clavicipitaceae	<i>Metarhizium viride</i> (Segretain, Fromentin, Destombes, Brygoo & Dodin ex Samson) Kepler, S.A. Rehner & Humber 2014	<i>Chamaeleomyces viridis</i> ; <i>Paecilomyces viridis</i>	<i>Chlamydoabsidia padenii</i> is not a synonym of <i>M. viride</i>		1	CGM/111024-02
Coniochaetaceae	<i>Coniochaeta ligniaria</i> (Greville) Cooke 1887		<i>Lecytophora hoffmannii</i> is not a synonym of <i>C. ligniaria</i>		1	CGM/111024-02
Coniochaetaceae	<i>Coniochaeta mutabilis</i> (J.F.H. Beyma) Z.U. Khan, Gené & Guarro 2013	<i>Lecytophora mutabilis</i>			1	CGM/111024-02
Cordycipitaceae	<i>Cordyceps javanica</i> (Bally) Kepler, B. Shrestha & Spatafora 2017	<i>Paecilomyces javanicus</i>			1	CGM/111024-02
Cordycipitaceae	<i>Parengyodontium album</i> (Limber) C.C. Tsang, J.F.W. Chan, W.M. Pong, J.H.K. Chen, A.H.Y. Ngan, M. Cheung, C.K.C. Lai, D.N.C. Tsang, S.K.P. Lau & P.C.Y. Woo 2016	<i>Engyodontium album</i>			1	CGM/111024-02
Cucurbitariaceae	<i>Neocucurbitaria cava</i> (Schulzer) Valenzuela-Lopez, P.W. Crous, Stchigel, J. Guarro & J.F. Cano 2017	<i>Pleurophoma cava</i>			1	CGM/111024-02
Cucurbitariaceae	<i>Neocucurbitaria</i> Gray 1821 sp. VM-36				1	CGM/250915-01
Cunninghamellaceae	<i>Chlamydoabsidia padenii</i> Hesselt. & J.J. Ellis 1966				1	CGM/111024-02
Cylothyriellaceae	<i>Massariosphaeria phaeospora</i> (E. Müller) Crivelli 1983				1	CGM/211001-01
Cyphellophoraceae	<i>Cyphellophora deltoidea</i> (Fil. March., A. Fontana & Luppi Mosca) P.W. Crous 2023	<i>Anthopsis deltoidea</i>			1	CGM/111024-02
Cyphellophoraceae	<i>Cyphellophora laciniata</i> G.A. de Vries 1962	<i>Cyphellophora laciniata</i>			1	CGM/111024-02
Cyphellophoraceae	<i>Cyphellophora pluriseptata</i> G.A. de Vries, Elders & Luykx 1986				1	CGM/111024-02

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Cyphellophoraceae	<i>Cyphellophora reptans</i> (de Hoog) Réblová & Untereiner 2013	<i>Phialophora reptans</i>			1	CGM/111024-02
Cystobasidiaceae	<i>Cystobasidium minutum</i> (Saito) A.M. Yurkov, A. Kachalkin, H.M. Daniel, M. Groenewald, D. Libkind, V. de Garcia, P. Zalar, D. Gouliamova, T. Boekhout & D. Begerow 2014	<i>Rhodotorula minuta</i>			1	CGM/111024-02
Cystofilobasidiaceae	<i>Cystofilobasidium macerans</i> J.P. Sampaio 2009	<i>Cryptococcus macerans</i>			1	CGM/111024-02
Cystofilobasidiaceae	<i>Phaffia rhodozyma</i> M.W. Miller, Yoneyama & Soneda 1976	<i>Xanthophyllomyces dendrorhous</i>			1	CGM/111024-02
Debaryomycetaceae	<i>Candida maltosa</i> Komagata, Nakase & Katsuya 1964	<i>Candida cloaca</i> ; <i>Candida novellus</i> ; <i>Candida subtropicalis</i>			1	CGM/140905-01
Debaryomycetaceae	<i>Candida oleophila</i> Montrocher 1967				1	CGM/111024-02
Debaryomycetaceae	<i>Candida viswanathii</i> Viswanathan & H.S. Randhawa ex R.S. Sandhu & H.S. Randhawa 1962				1	CGM/111024-02
Debaryomycetaceae	<i>Candida zeylanoides</i> (Castellani) Langeron & Guerra 1938				1	CGM/111024-02
Debaryomycetaceae	<i>Debaryomyces hansenii</i> (Zopf) Lodder & Kreger-van Rij 1952	<i>Candida famata</i>			1	CGM/240313-01
Debaryomycetaceae	<i>Ditina rugosa</i> (H.W. Anderson) P. Khunnamwong, S. Jindamorakot, S. Limtong & M.A. Lachance 2015	<i>Candida rugosa</i>			1	CGM/111024-02
Debaryomycetaceae	<i>Kodamaea ohmeri</i> (Etchells & T.A. Bell) Y. Yamada, Tom. Suzuki, M. Matsuda & Mikata 1995	<i>Pichia ohmeri</i>			1	CGM/111024-02
Debaryomycetaceae	<i>Meyerozyma guilliermondii</i> (Wickerham) Kurtzman & M. Suzuki 2010	<i>Candida guilliermondii</i> ; <i>Pichia guilliermondii</i>			1	CGM/111024-02
Debaryomycetaceae	<i>Scheffersomyces stipitis</i> (Pignal) Kurtzman & M. Suzuki 2010	<i>Pichia stipitis</i>			1	CGM/170810-01
Debaryomycetaceae	<i>Schwanniomyces occidentalis</i> Klöcker 1909				1	CGM/150303-02
Didymellaceae	<i>Phoma Minutella</i> Sacc. & Penz. 1882		<i>Phoma minutella</i> is a doubtful species, see 5.3.43		1	CGM/111024-02
Didymosphaeriaceae	<i>Paraphaeosphaeria minitans</i> (W.A. Campbell) Verkley, Göker & Stielow 2014	<i>Coniothyrium minitans</i>			1	CGM/111024-02

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<i>Dipodascales, incertae sedis</i>	<i>Yarrowia lipolytica</i> (Wickerham, Kurtzman & Herman) van der Walt & Arx 1980	<i>Candida lipolytica</i>			1	CGM/111024-02
<i>Dothideomycetidae, Eurotiomycetidae, incertae sedis</i>	<i>Calyptrozyma arxii</i> Boekhout & Spaay 1995				1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Filobasidium magnum</i> (Lodder & Kreger-van Rij) Xin Zhan Liu, F.Y. Bai, M. Groenew. & Boekhout 2015	<i>Cryptococcus ater</i>			1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Filobasidium uniguttulatum</i> Kwon-Chung 1977	<i>Cryptococcus uniguttulatus</i>			1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Naganishia adeliensis</i> (Scorzetti, I. Petrescu, Yarrow & Fell) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus adeliensis</i>			1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Naganishia albida</i> (Saito) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus albidus</i>			1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Naganishia diffluens</i> (Zach) Xin Zhan Liu, F.Y. Bai, M. Groenew. & Boekhout 2015	<i>Cryptococcus diffluens</i>			1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Naganishia liquefaciens</i> (Saito & M. Ota) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus liquefaciens</i>			1	CGM/111024-02
<i>Filobasidiaceae</i>	<i>Naganishia uzbekistanensis</i> (Á. Fonseca, Scorzetti & Fell) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus uzbekistanensis</i>			1	CGM/111024-02
<i>Gjaerumiaceae</i>	<i>Gjaerumia minor</i> (Nyland) Q.M. Wang, F.Y. Bai, Begerow & Boekhout 2015	<i>Tilletiopsis minor</i>			1	CGM/111024-02
<i>Glomeraceae</i>	<i>Funneliformis mosseae</i> (T.H. Nicolson & Gerd.) C. Walker & A. Schüßler 2010	<i>Glomus mossae</i>			1	CGM/200128-01
<i>Glomeraceae</i>	<i>Rhizophagus irregularis</i> (Blaszkowski, Wubet, Renker & Buscot) C. Walker & A. Schüßler 2010	<i>Rhizoglomus irregulare</i>			1	CGM/180326-01
<i>Glomeraceae</i>	<i>Rhizophagus aggregatus</i> (N.C. Schenck & G.S. Sm.) C. Walker 2010	<i>Rhizoglomus aggregatum</i>			1	CGM/191017-01
<i>Glomeraceae</i>	<i>Rhizophagus clarus</i> (T.H. Nicolson & N.C. Schenck) C. Walker & A. Schüßler 2010	<i>Rhizoglomus clarum</i>			1	CGM/191017-01
<i>Glomeraceae</i>	<i>Rhizophagus manihotis</i> (R.H. Howeler, Sieverding & N.C. Schenck) C. Walker & A. Schüßler 2010	<i>Rhizoglomus manihotis</i>			1	CGM/191017-01

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Gymnoascaceae	<i>Narasimhella hyalinospora</i> (Kuehn, G.F. Orr & G.R. Ghosh) Arx 1971				1	CGM/111024-02
Helotiaceae	<i>Glarea lozoyensis</i> Bills & Peláez 1999				1	CGM/080131-05
Herpotrichiellaceae	<i>Exophiala xenobiotica</i> de Hoog, J.S. Zeng, Harrak & D.A. Sutton 2006				1	CGM/111024-02
Herpotrichiellaceae	<i>Exophiala exophialae</i> (de Hoog) de Hoog 2003				1	CGM/111024-02
Herpotrichiellaceae	<i>Cadophora bubakii</i> (Laxa) Damm & S. Bien 2020				1	CGM/111024-02
Herpotrichiellaceae	<i>Rhinocladiella atrovirens</i> Nannfeldt 1934				1	CGM/111024-02
Herpotrichiellaceae	<i>Rhinocladiella basitona</i> (de Hoog) Arzanlou & Crous 2007				1	CGM/111024-02
Herpotrichiellaceae	<i>Veronaea botryosa</i> Ciferri & Montemartini 1958				1	CGM/111024-02
Hypocreaceae	<i>Trichoderma asperellum</i> Samuels, Lieckfeldt & Nirenberg 1999		<i>Trichoderma harzianum</i> is not a synonym of <i>T. asperellum</i>	T	1	CGM/111024-02
Hypocreaceae	<i>Trichoderma atroviride</i> P. Karsten 1892				1	CGM/111024-02
Hypocreaceae	<i>Trichoderma gamsii</i> Samuels & Druzhinina 2006				1	CGM/111024-02
Hypocreaceae	<i>Trichoderma longibrachiatum</i> Rifai 1969				1	CGM/111024-02
Hypocreaceae	<i>Trichoderma polysporum</i> (Link) Rifai 1969				1	CGM/111024-02
Hypocreaceae	<i>Trichoderma pseudokoningii</i> Rifai 1969	<i>Hypocrea pseudokoningii</i>			1	CGM/111024-02
Hypocreaceae	<i>Trichoderma reesei</i> E.G. Simmons 1977				1	CGM/111024-02
Irpicaceae	<i>Irpex lacteus</i> (Fries) Fries 1828	<i>Polyporus tulipiferae</i>			1	CGM/140227-03
Lasiosphaeriaceae	<i>Cercophora scortea</i> (Cain) N. Lundq. 1972				1	CGM/211001-01
Leotiomyces, incertae sedis	<i>Scytalidium infestans</i> Iwatsu, Udagawa & Hatai 1990				1	CGM/111024-02
Leotiomyces, incertae sedis	<i>Scytalidium japonicum</i> Udagawa, K. Tominaga & Hamaoka 1986				1	CGM/111024-02
Leotiomyces, incertae sedis	<i>Scytalidium lignicola</i> Pesante 1957				1	CGM/111024-02
Lichtheimiaceae	<i>Rhizomucor miehei</i> (Cooney & R. Emerson) Schipper 1978	<i>Mucor miehii</i>			1	CGM/111024-02

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Lichtheimiaceae	<i>Thermomucor indicae-seudaticae</i> Subrahamanyam, B.S. Mehrotra & Thirumalachar 1977				1	CGM/111024-02
Lyophyllaceae	<i>Termitomyces</i> R. Heim 1942 sp.				1	CGM/180417-01
Malasseziaceae	<i>Malassezia dermatis</i> Sugita, M. Takashima, A. Nishikawa & Shinoda 2002				1	CGM/111024-02
Malbrancheaceae	<i>Malbranchea pulchella</i> Saccardo & Penzig 1882				1	CGM/111024-02
Massarinaceae	<i>Lentithecium fluviatile</i> (Aptroot & Van Ryck.) K.D. Hyde, J. Fourn. & Y. Zhang ter 2009	<i>Lentithecium fluviatile</i>			1	CGM/211001-01
Melanommataceae	<i>Pleurophomopsis lignicola</i> Petrak 1924				1	CGM/111024-02
Meruliaceae	<i>Obba rivulosa</i> (Berk. & M.A. Curtis) Miettinen & Rajchenb., 2012	<i>Ceriporiopsis rivulosa</i> ; <i>Physisporinus rivulosus</i>			1	CGM/140605-02
Meruliaceae	<i>Gelatoporia subvermispora</i> (Pilát) Niemelä 1985.	<i>Ceriporiopsis subvermispora</i>			1	CGM/140227-03
Meruliaceae	<i>Merulius tremellosus</i> Fr. 1821	<i>Phlebia tremellosa</i>			1	CGM/140227-03
Meruliaceae	<i>Phlebia radiata</i> Fries 1821	<i>Phlebia merismoides</i>			1	CGM/140227-03
Metschnikowiaceae	<i>Candidozyma haemuli</i> (Uden & Kolipinski) Q.M. Wang, A. Yurkov, T. Boekhout & F.Y. Bai 2024	<i>Candida haemulonii</i>			1	CGM/111024-02
Metschnikowiaceae	<i>Metschnikowia pulcherrima</i> Pitt & M.W. Miller 1968	<i>Candida pulcherrima</i>			1	CGM/111024-02
Microascaceae	<i>Acaulium acremonium</i> (Delacroix) Sandoval-Denis, Guarro & Gené 2016	<i>Scopulariopsis acremonium</i>			1	CGM/111024-02
Microascaceae	<i>Microascus cinereus</i> Curzi 1931	<i>Scopulariopsis cinereus</i>			1	CGM/111024-02
Microascaceae	<i>Microascus cirrosus</i> Curzi 1931		<i>Scopulariopsis paisii</i> ; <i>Microascus paisii</i> are not synonyms		1	CGM/111024-02
Microascaceae	<i>Petriella setifera</i> (Alf. Schmidt) Curzi 1930		<i>Graphium</i> , indicates the presence of a specific asexual state; <i>Scedosporium</i> sp. E148 seems to represent another species		1	CGM/111024-02
Microascaceae	<i>Scedosporium dehoogii</i> Gilgado, Cano, Gené & Guarro 2008				1	CGM/111024-02
Microascaceae	<i>Scopulariopsis asperula</i> (Saccardo) S. Hughes 1958		<i>Scopulariopsis fusca</i> is not a synonym of <i>S. asperula</i>		1	CGM/111024-02

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Microascaceae	<i>Scopulariopsis alboflavescens</i> Zach 1934	<i>Scopulariopsis koningii</i>	<i>Scopulariopsis brevicaulis</i> is not a synonym of <i>S. alboflavescens</i>		1	CGM/111024-02
Microascaceae	<i>Scopulariopsis candida</i> Vuill. 1911	<i>Microascus manginii</i>			1	CGM/111024-02
Microascaceae	<i>Scopulariopsis flava</i> (Sopp) F.J. Morton & G. Smith 1963				1	CGM/111024-02
Microsphaeropsidaceae	<i>Microsphaeropsis olivacea</i> (Bonorden) Höhnelt 1917				1	CGM/111024-02
Mortierellaceae	<i>Mortierella alpina</i> Peyronel 1913				1	CGM/120912-01
Mortierellaceae	<i>Mortierella polycephala</i> Coemans 1863				1	CGM/111024-02
Mucoraceae	<i>Mucor indicus</i> Lendner 1930				1	CGM/111024-02
Mucoraceae	<i>Mucor lusitanicus</i> Bruderlein 1916	<i>Mucor circinelloides</i> f. <i>lusitanicus</i>			1	CGM/180228-01
Mucoraceae	<i>Mucor ramosissimus</i> Samoutsevitch 1927				1	CGM/111024-02
Muyocoproneae	<i>Muyocopron sahnii</i> Hernández-Restrepo & P.W. Crous 2019		<i>Mycocleptodiscus indicus</i> is not a synonym of <i>M. sahnii</i>		1	CGM/111024-02
Mycenaceae	<i>Panellus stipticus</i> (Bulliard) P. Karsten 1879	<i>Agaricus stipticus</i>			1	CGM/170316-01
Myrmecridiaceae	<i>Myrmecridium schulzeri</i> (Saccardo) Arzanlou, W. Gams & Crous 2007	<i>Ramichloridium schulzeri</i>			1	CGM/111024-02
Mytiliniaceae	<i>Taeniolella stilbospora</i> (Corda) S. Hughes 1958				1	CGM/111024-02
Myxotrichaceae	<i>Myxotrichum deflexum</i> Berkeley 1838				1	CGM/111024-02
Myxotrichaceae	<i>Oidiodendron cereale</i> (Thümen) G.L. Barron 1962				1	CGM/111024-02
Myxotrichaceae	<i>Oidiodendron majus</i> G.L. Barron 1962				1	CGM/140605-02
Nanniziopsiaceae	<i>Nanniziopsis vriesii</i> (Apinis) Currah 1985		<i>Chrysosporium</i> sp. refers to the presence of a <i>Chrysosporium</i> anamorph		1	CGM/111024-02
Nectriaceae	<i>Bisifusarium dimerum</i> (Penzig) L. Lombard & P.W. Crous 2015	<i>Fusarium dimerum</i>			1	CGM/111024-02
Nectriaceae	<i>Dialonectria episphaeria</i> (Tode) Cooke 1884	<i>Cosmospora episphaeria</i>	<i>Fusarium aquaeductuum</i> ; <i>Fusicolla aquaeductuum</i> are not synonyms of <i>D. episphaeria</i>		1	CGM/111024-02
Nectriaceae	<i>Neocosmospora lichenicola</i> (C. Massalongo) M. Sandoval-Denis & P.W. Crous 2015	<i>Cylindrocarpon lichenicola</i>			1	CGM/111024-02

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Nectriaceae	<i>Volutella cinerascens</i> (Cesati) Saccardo 1886				1	CGM/111024-02
Neoconidiobolaceae	<i>Neoconidiobolus lamprauges</i> (Drechsler) B. Huang & Y. Nie 2021	<i>Conidiobolus lamprauges</i>			1	CGM/111024-02
Onygaceae	<i>Aphanoascus orissae</i> (B. Sur & G.R. Ghosh) Cano & Guarro 2002	<i>Aphanoascus orissi</i> ; <i>Chrysosporium zonatum</i> ; <i>Pseudoarachniotus orissae</i> ; <i>Uncinocarpus orissi</i>			1	CGM/111024-02
Onygenaceae	<i>Aphanoascus keratinophilus</i> Punsola & Cano 1990	<i>Chrysosporium keratinophilum</i>			1	CGM/111024-02
Onygaceae	<i>Brunneospora queenslandica</i> (Apinis & R.G. Rees) Kandemir & de Hoog 2022	<i>Apinisia queenslandica</i> ; <i>Chrysosporium queenslandicum</i> ; <i>Uncinocarpus queenslandicus</i>			1	CGM/111024-02
Onygenaceae	<i>Chrysosporium lucknowense</i> Garg 1966				1	CGM/080131-05
Onygenales, incertae sedis	<i>Neoarachnotheca keratinophila</i> Ulfig, Cano & Guarro 1997	<i>Myriodontium keratinophilum</i> ; <i>Neocucurbitaria keratinophila</i>			1	CGM/111024-02
Ophiostomataceae	<i>Ophiostoma piceae</i> (Münch) Syd., 1919	<i>Ceratocystis piceae</i> ; <i>Pesotum piceae</i> ; <i>Sporothrix</i> sp., refers to the presence of a <i>Sporothrix</i> anamorph	<i>Sporothrix</i> sp., refers to the presence of a <i>Sporothrix</i> anamorph		1	CGM/111024-02
Ophiostomataceae	<i>Sporothrix stenoceras</i> (Robak) Z.W. de Beer, T.A. Duong & M.J. Wingfield 2016		<i>Sporothrix</i> sp., refers to the presence of a <i>Sporothrix</i> anamorph		1	CGM/111024-02
Phaeoscleraceae	<i>Phaeosclera dematioides</i> Sigler, Tsuneda & J.W. Carmichael 1981				1	CGM/111024-02
Phaffomycetaceae	<i>Cyberlindnera fabianii</i> (Wickerham) Minter 2009	<i>Candida fabianii</i>			1	CGM/111024-02
Phaffomycetaceae	<i>Cyberlindnera jadinii</i> (Sartory, R. Sartory, Weill & J. Meyer) Minter 2009	<i>Candida utilis</i> ; <i>Pichia jadinii</i>			1	CGM/111024-02
Phanerochaetaceae	<i>Bjerkandera adusta</i> (Willdenow) P. Karsten 1879				1	CGM/111024-02
Phanerochaetaceae	<i>Phanerochaete chrysosporium</i> Burdsall 1974	<i>Phanerodontia chrysosporium</i> ; <i>Sporotrichum pruinosum</i>			1	CGM/111024-02
Phanerochaetaceae	<i>Phlebiopsis gigantea</i> (Fries) Jülich 1978				1	CGM/111024-02
Physalacriaceae	<i>Flammulina velutipes</i> (Curtis) Singer 1951				1	CGM/190930-01
Pichiaceae	<i>Brettanomyces bruxellensis</i> Kufferath & Van Laer ex Custers 1940	<i>Dekkera bruxellensis</i>			1	CGM/170810-01

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<i>Pichiaceae</i>	<i>Komagataella pastoris</i> (Guilliermond) Y. Yamada, M. Matsuda, K. Maeda & Mikata 1995	<i>Pichia pastoris</i>			1	CGM/111024-02
<i>Pichiaceae</i>	<i>Ogataea angusta</i> (Teunisson, H.H. Hall & Wickerham) Suh & Zhou 2010	<i>Hansenula angusta</i> ; <i>Pichia angista</i>			1	CGM/111024-02
<i>Pichiaceae</i>	<i>Ogataea parapolyomorpha</i> S.O. Suh & J.J. Zhou 2010	<i>Candida parapolyomorpha</i>			1	CGM/161222-01
<i>Pichiaceae</i>	<i>Ogataea polymorpha</i> (Morais & M.H. Maia) Y. Yamada, K. Maeda & Mikata 1994	<i>Hansenula polymorpha</i> ; <i>Pichia polymorpha</i>			1	CGM/111024-02
<i>Pichiaceae</i>	<i>Pichia fermentans</i> Lodder 1932	<i>Candida lambica</i>			1	CGM/111024-02
<i>Pichiaceae</i>	<i>Pichia kluyveri</i> Bedford ex Kudryavtsev 1960	<i>Hansenula kluyveri</i>			1	CGM/210526-01
<i>Pichiaceae</i>	<i>Ogataea methanolica</i> (Makig.) Kurtzman & Robnett 2010	<i>Pichia methanolica</i>			1	CGM/111024-02
<i>Pichiaceae</i>	<i>Pichia norvegensis</i> Leask & Yarrow 1976	<i>Candida norvegensis</i>			1	CGM/111024-02
<i>Piedraiaceae</i>	<i>Piedraia hortae</i> (Brumpt) Fonseca & Leão 1928				1	CGM/111024-02
<i>Piedraiaceae</i>	<i>Piedraia quintanilhae</i> van Uden, Barros-Machado & Castelo-Branco 1963				1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Alternaria botrytis</i> (Preuss) Woudenberg & Crous 2013				1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Alternaria chartarum</i> Preuss 1848	<i>Ulocladium chartarum</i>			1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Alternaria chlamydospora</i> Mouchacca 1973				1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Curvularia brachyspora</i> Boedijn 1933				1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Curvularia papendorfii</i> van der Aa 1967				1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Dichotomophthoropsis nymphaearum</i> (F.V. Rand) M.B. Ellis 1971				1	CGM/111024-02
<i>Pleosporaceae</i>	<i>Exserohilum rostratum</i> (Drechsler) K.J. Leonard & Suggs 1974	<i>Exserohilum longirostratum</i> ; <i>Exserohilum mcginnisii</i>			1	CGM/111024-02
<i>Pleosporales incertae sedis</i>	<i>Ochrocladosporium elatum</i> (Harz) Crous & U. Braun 2017	<i>Cladosporium elatum</i>			1	CGM/111024-02
<i>Pleurostomataceae</i>	<i>Pleurostoma repens</i> (R.W. Davidson) Réblová & Jaklitsch 2015	<i>Phialophora repens</i> ; <i>Pleurostomophora repens</i>			1	CGM/111024-02
<i>Pleurotaceae</i>	<i>Pleurotus eryngii</i> (DeCandolle) Quélet 1872				1	CGM/140227-03

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Pleurotaceae	<i>Pleurotus ostreatus</i> (Jacquin) P. Kummer 1871				1	CGM/111024-02
Pleurotaceae	<i>Pleurotus pulmonarius</i> (Fries) Quélet 1872				1	CGM/140227-03
Pleurotheciaceae	<i>Phaeoisaria clematidis</i> (Fuckel) S. Hughes 1958				1	CGM/111024-02
Pneumocystidaceae	<i>Pneumocystis murina</i> Keely, J.M. Fischer, Cushion & Stringer 2004				1	CGM/111024-02
Pneumocystidaceae	<i>Pneumocystis wakefieldiae</i> Cushion, Keely & Stringer ex Cushion Keely & Stringer 2005				1	CGM/111024-02
Podosporaceae	<i>Podospora leporina</i> (Cain) Cain 1962	<i>Arnium leporinum</i>			1	CGM/111024-02
Podosporaceae	<i>Triangularia pauciseta</i> (Cesati) X. Wei Wang & Houbraken 2019	<i>Podospora pauciseta</i>	<i>Podospora anserina</i> is not a synonym of <i>T. pauciseta</i>		1	CGM/140605-02
Polyporaceae	<i>Dichomitus squalens</i> (P. Karsten) D.A. Reid 1965				1	CGM/140605-02
Polyporaceae	<i>Trametes ochracea</i> (Persoon) Gilbertson & Ryvarden 1987	<i>Trametes multicolour</i> , <i>Boletus multicolor</i>			1	CGM/170316-01
Polyporaceae	<i>Trametes versicolor</i> (Linnaeus) Lloyd 1920	<i>Coriolus versicolor</i> ; <i>Microporus versicolor</i> ; <i>Boletus versicolor</i> ; <i>Bjerkandera versicolor</i> ; <i>Poria versicolor</i>			1	CGM/140227-03
Psathyrellaceae	<i>Coprinopsis cinerea</i> (Schaeffer) Redhead, Vilgalys & Moncalvo 2001	<i>Coprinus cinereus</i> ; <i>Coprinopsis cinereus</i> ; <i>Hormographiella aspergillata</i>			1	CGM/111024-02
Pseudeurotiaceae	<i>Pseudeurotium ovale</i> Stolk 1955		<i>Sporothrix</i> sp., refers to the presence of a <i>Sporothrix</i> anamorph		1	CGM/111024-02
Pseudeurotiaceae	<i>Pseudogymnoascus pannorum</i> (Link) Minnis & D.L. Lindner 2013	<i>Geomyces pannorum</i>			1	CGM/111024-02
Rhizopodaceae	<i>Rhizopus microsporus</i> Tiegh. 1875	<i>Rhizopus microsporus</i> var. <i>oligosporus</i> ; <i>Rhizopus oligosporus</i>			1	CGM/230828-02
Rhynchogastremataceae	<i>Papiliotrema flavescens</i> (Saito) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus flavescens</i>			1	CGM/111024-02
Rhynchogastremataceae	<i>Papiliotrema laurentii</i> (Kufferath) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus laurentii</i>			1	CGM/111024-02
Saccharomycetaceae	<i>Kazachstania africana</i> (van der Walt) Kurtzman 2003	<i>Kluyveromyces africanus</i>			1	CGM/171225-01

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Saccharomycetaceae	<i>Vanderwaltozyma polyspora</i> (van der Walt) Kurtzman 2003	<i>Kluyveromyces polysporus</i>			1	CGM/171225-01
Saccharomycetaceae	<i>Arxiozyma telluris</i> (van der Walt) van der Walt & Yarrow 1984	<i>Candida pintolopesii</i> ; <i>Kazachstania telluris</i>			1	CGM/111024-02
Saccharomycetaceae	<i>Kluyveromyces lactis</i> (Stelling-Dekker) van der Walt 1971	<i>Candida sphaerica</i> ; <i>Kluyveromyces marxianus</i> var. <i>lactis</i>			1	CGM/111024-02
Saccharomycetaceae	<i>Kluyveromyces marxianus</i> (E.C. Hansen) Van der Walt 1971	<i>Candida pseudotropicalis</i> ; <i>Candida kefyri</i>			1	CGM/111024-02
Saccharomycetaceae	<i>Lachancea kluyveri</i> (Phaff, M.W. Miller & Shifrine) Kurtzman 2003	<i>Saccharomyces kluyveri</i>			1	CGM/111024-02
Saccharomycetaceae	<i>Lachancea thermotolerans</i> (Filippov) Kurtzman 2003	<i>Kluyveromyces thermotolerans</i>			1	CGM/210118-01
Saccharomycetaceae	<i>Maudiozyma bulderi</i> (Middelhoven, Kurtzman & Vaughan Mart.) Q.M. Wang, Yurkov & Boekhout 2024	<i>Kazachstania bulderi</i> ; <i>Saccharomyces bulderi</i>			1	CGM/171225-01
Saccharomycetaceae	<i>Naumovozyma castellii</i> (Capriotti) Kurtzman 2008	<i>Saccharomyces castellii</i>			1	CGM/171225-01
Saccharomycetaceae	<i>Saccharomyces bayanus</i> Saccardo 1895		Is a hybrid of <i>S. eubayanus</i> and <i>S. uvarum</i> ; <i>Saccharomyces uvarum</i> ; <i>Saccharomyces bayanus</i> are not synonyms of <i>S. bayanus</i>		1	CGM/111024-02
Saccharomycetaceae	<i>Saccharomyces cerevisiae</i> (Desmazières) Meyen 1838				1	CGM/131029-01
Saccharomycetaceae	<i>Saccharomyces eubayanus</i> Sampaio, Libkind, Hittinger, P. Gonçalves, Valério, C. Gonçalves, Dover & Johnston 2011				1	CGM/140218-01
Saccharomycetaceae	<i>Saccharomyces kudriavzevii</i> G.I. Naumov, S.A. James, E.S. Naumova, E.J. Louis & I.N. Roberts 2000				1	CGM/140218-01
Saccharomycetaceae	<i>Saccharomyces mikatae</i> G.I. Naumov, S.A. James, E.S. Naumova, E.J. Louis & I.N. Roberts 2000				1	CGM/140218-01
Saccharomycetaceae	<i>Saccharomyces paradoxus</i> Bachinskaya 1914				1	CGM/140218-01
Saccharomycetaceae	<i>Saccharomyces pastorianus</i> Reess 1870		Is a hybrid of <i>Saccharomyces eubayanus</i> and <i>Saccharomyces cerevisiae</i>		1	CGM/140218-01

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Saccharomycetaceae	<i>Tetrapisispora phaffii</i> (van der Walt) Ueda-Nishimura & Mikata 1999	<i>Fabospora phaffii</i> ; <i>Kluyveromyces phaffii</i>			1	CGM/171225-01
Saccharomycetaceae	<i>Torulaspota delbrueckii</i> (Lindner) Lindner 1904	<i>Candida colliculosa</i> ; <i>Saccharomyces delbrueckii</i>			1	CGM/171225-01
Saccharomycetaceae	<i>Vanderwaltozyma polyspora</i> (van der Walt) Kurtzman 2003	<i>Kluyveromyces polysporus</i>			1	CGM/171225-01
Saccharomycetaceae	<i>Zygosaccharomyces bailii</i> (Lindner) Guillierm. 1912				1	CGM/091019-01
Saccharomycetaceae	<i>Zygosaccharomyces rouxii</i> (Boutroux) Yarrow 1977				1	CGM/070917-02
Saccharomycetaceae	<i>Zygotorulaspota mrakii</i> (Capriotti) Kurtzman 2003	<i>Zygosaccharomyces mrakii</i>			1	CGM/171225-01
Sacchettoeciaceae	<i>Aureobasidium melanogenum</i> (Hermanides-Nijhof) P. Zalar, C. Gostinčar & N. Gunde-Cimerman 2014		Before known as <i>Aureobasidium</i> sensu lato		1	CGM/170628-02
Sacchettoeciaceae	<i>Aureobasidium pullulans</i> (de Bary) G. Arnaud 1918		<i>Discosphaerina fulvida</i> is a synonym of <i>Kabatiella lini</i> , which is also referred to as <i>A. pullulans</i> var. <i>lini</i>		1	CGM/170628-02
Sacchettoeciaceae	<i>Aureobasidium namibiae</i> (Zalar, de Hoog & Gunde-Cimerman) P. Zalar, C. Gostinčar & N. Gunde-Cimerman 2014		Before known as <i>Aureobasidium</i> sensu lato		1	CGM/170628-02
Sacchettoeciaceae	<i>Aureobasidium subglaciale</i> (Zalar, de Hoog & Gunde-Cimerman) P. Zalar, C. Gostinčar & N. Gunde-Cimerman 2014		Before known as <i>Aureobasidium</i> sensu lato		1	CGM/170628-02
Sarcocladiaceae	<i>Chlamydocillium curvulum</i> (W. Gams) L.W. Hou, L. Cai & P.W. Crous 2023	<i>Acremonium curvulum</i>			1	CGM/111024-02
Schizosaccharomycetaceae	<i>Schizosaccharomyces japonicus</i> Yukawa & Maki 1931	<i>Hasegawaea japonica</i> ; <i>Octosporomyces japonicus</i>			1	CGM/181204-02
Schizosaccharomycetaceae	<i>Schizosaccharomyces pombe</i> Lindner 1893				1	CGM/111024-02
Sordariaceae	<i>Neurospora crassa</i> Shear & B.O. Dodge 1927				1	CGM/111024-02
Sordariaceae	<i>Neurospora intermedia</i> F.L. Tai 1935				1	CGM/201030-01
Sordariaceae	<i>Neurospora tetrasperma</i> Shear & B.O. Dodge 1927	<i>Chrysonilia tetrasperma</i> ; <i>Monilia tetrasperma</i>			1	CGM/201030-01
Sordariaceae	<i>Neurospora sitophila</i> Shear & B.O. Dodge 1927				1	CGM/111024-02

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<i>Sordariales, incertae sedis</i>	<i>Papulaspora equi</i> Shadomy & D.M. Dixon 1989				1	CGM/111024-02
<i>Sporidiobolaceae</i>	<i>Rhodotorula diobovata</i> (S.Y. Newell & I.L. Hunter) Q.M. Wang, F.Y. Bai, M. Groenewald & T. Boekhout 2015	<i>Rhodosporidium diobovatum</i>			1	CGM/111024-02
<i>Sporidiobolaceae</i>	<i>Rhodotorula glutinis</i> (Fresenius) F.C. Harrison 1928				1	CGM/111024-02
<i>Sporidiobolaceae</i>	<i>Rhodotorula mucilaginoso</i> (A. Jørgensen) F.C. Harrison 1928				1	CGM/111024-02
<i>Sporidiobolaceae</i>	<i>Rhodotorula sphaerocarpa</i> (S.Y. Newell & Fell) Q.M. Wang, F.Y. Bai, M. Groenewald & T. Boekhout 2015	<i>Rhodosporidium sphaerocarpum</i>			1	CGM/111024-02
<i>Sporidiobolaceae</i>	<i>Rhodotorula toruloides</i> (Banno) Q.M. Wang, F.Y. Bai, M. Groenewald & T. Boekhout 2015	<i>Rhodosporidium toruloides</i>			1	CGM/111024-02
<i>Sporidiobolaceae</i>	<i>Sporobolomyces johnsonii</i> (Nyland) Q.M. Wang, F.Y. Bai, M. Groenewald & T. Boekhout 2015		<i>Sporobolomyces salmonicolor</i> is not a synonym of <i>S. johnsonii</i>		1	CGM/111024-02
<i>Sporormiaceae</i>	<i>Westerdykella minutispora</i> (P.N. Mathur ex Gruyter & Noordeloos) Gruyter, Aveskamp & Verkley 2012	<i>Phoma minutispora</i>			1	CGM/111024-02
<i>Strophariaceae</i>	<i>Cyclocybe aegerita</i> (V. Brig.) Vizzini 2014	<i>Agrocybe aegerata</i>		T	1	CGM/170316-01
<i>Sympoventuriaceae</i>	<i>Scolecobasidium constrictum</i> E.V. Abbott 1927	<i>Ochroconis constricta</i>			1	CGM/111024-02
<i>Teratosphaeriaceae</i>	<i>Hortaea werneckii</i> (Horta) Nishimura & Miyaji 1984				1	CGM/111024-02
<i>Tetraplospira</i>	<i>Tetraploa scheueri</i> Kaz. Tanaka & K. Hirayama 2013	<i>Massarina tetraploa</i> ; <i>Tetraplospira tetraploa</i>			1	CGM/111024-02
<i>Thamniaceae</i>	<i>Cokeromyces recurvatus</i> Poitras 1950				1	CGM/111024-02
<i>Thermoascaceae</i>	<i>Paecilomyces fulvus</i> Stolk & Samson 1971	<i>Byssochlamys fulva</i>		T	1	CGM/220713-01
<i>Thermoascaceae</i>	<i>Thermoascus aurantiacus</i> Miehe 1907				1	CGM/190122-01
<i>Thermoascaceae</i>	<i>Thermoascus crustaceus</i> (Apinis & Chesters) Stolk 1965				1	CGM/111024-02
<i>Togniniaceae</i>	<i>Phaeoacremonium alvesii</i> L. Mostert, Summerbell & Crous 2005				1	CGM/111024-02
<i>Togniniaceae</i>	<i>Phaeoacremonium amstelodamense</i> L. Mostert, Summerbell & Crous 2005				1	CGM/111024-02

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Togniniaceae	<i>Phaeoacremonium griseorubrum</i> L. Mostert, Summerbell & Crous 2005				1	CGM/111024-02
Togniniaceae	<i>Phaeoacremonium inflatipes</i> W. Gams, Crous & M.J. Wingfield 1996				1	CGM/111024-02
Togniniaceae	<i>Phaeoacremonium rubrigenum</i> W. Gams, P.W. Crous & M.J. Wingfield 1996	<i>Togninia rubrigena</i>			1	CGM/111024-02
Togniniaceae	<i>Phaeoacremonium sphinctrophorum</i> L. Mostert, Summerbell & P.W. Crous 2006				1	CGM/111024-02
Togniniaceae	<i>Phaeoacremonium tardicrescens</i> L. Mostert, R.C. Summerbell & P.W. Crous 2005				1	CGM/111024-02
Togniniaceae	<i>Phaeoacremonium venezuelense</i> L. Mostert, R.C. Summerbell & P.W. Crous 2005				1	CGM/111024-02
Torulaceae	<i>Dendryphion nanum</i> (Nees) S. Hughes 1958			T	1	CGM/211001-01
Triadelphiaceae	<i>Triadelphia pulvinata</i> Maggi, Bartoli & Rambelli 1978				1	CGM/111024-02
Trichocomaceae	<i>Rasamsonia emersonii</i> (Stolk) Houbraken & Frisvad 2012	<i>Talaromyces emersonii</i>			1	CGM/111024-02
Trichocomaceae	<i>Talaromyces aculeatus</i> (Raper & Fennell) Samson, Yilmaz, Frisvad & K.A. Seifert 2011	<i>Penicillium aculeatum</i>			1	CGM/211001-01
Trichocomaceae	<i>Talaromyces columbinus</i> S.W. Peterson & Z. Jurjević 2014			T	1	CGM/170216-02
Trichocomaceae	<i>Talaromyces dextii</i> Takada & Udagawa 1988	<i>Penicillium dextii</i>			1	CGM/250127-01
Trichocomaceae	<i>Talaromyces funiculosus</i> (Thom) Samson, Yilmaz, Frisvad & K.A. Seifert 2011	<i>Penicillium funiculosum</i>			1	CGM/111024-02
Trichocomaceae	<i>Talaromyces macrosporus</i> (Stolk & Samson) Frisvad, Samson & Stolk 1990			T	1	CGM/060208-01
Trichocomaceae	<i>Talaromyces piceus</i> (Raper & Fennell) Samson, Yilmaz, Houbraken, Spierenburg, Seifert, Peterson, Varga & Frisvad 2011	<i>Penicillium piceum</i>			1	CGM/111024-02

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Note	PG	Classification by COGEM
Trichocomaceae	<i>Talaromyces purpureogenus</i> (Stoll) Samson, Yilmaz, Houbraken, Spierenburg, K.A. Seifert, Peterson, Varga & Frisvad 2011	<i>Penicillium purpurogenum</i>			1	CGM/111024-02
Trichocomaceae	<i>Talaromyces verruculosus</i> (Peyronel) Samson, Yilmaz, Frisvad & K.A. Seifert 2011	<i>Penicillium verruculosum</i>			1	CGM/181019-02
Trichocomaceae	<i>Thermomyces lanuginosus</i> Tsiklinsky 1899	<i>Humicola lanuginosa</i>			1	CGM/111024-02
Trichomeriaceae	<i>Knufia epidermidis</i> (D.M. Li, de Hoog, Saunte & X.R. Chen) Tsuneda, Hambl. & Currah 2011	<i>Coniosporium epidermidis</i>			1	CGM/111024-02
Trichomonascaceae	<i>Blastobotrys terrestris</i> (Van der Walt & Johannsen) Kurtzman & Robnett 2007	<i>Arxula terrestris</i>			1	CGM/111024-02
Trichosphaeriaceae	<i>Sodiomyces alkalinus</i> Grum-Grzhimaylo, Debets & Bilanenko 2019				1	CGM/140407-01
Trichosporonaceae	<i>Apiotrichum domesticum</i> (Sugita, A. Nishikawa & Shinoda) A.M. Yurkov & Boekhout 2015	<i>Trichosporon domesticum</i>			1	CGM/111024-02
Trichosporonaceae	<i>Cutaneotrichosporon curvatum</i> (Diddens & Lodder) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Cryptococcus curvatus</i>			1	CGM/160517-01
Trichosporonaceae	<i>Cutaneotrichosporon oleaginosum</i> (J.L. Zhou, S.O. Suh & Gujjari) Xin Zhan Liu, F.Y. Bai, M. Groenew. & Boekhout 2015	<i>Trichosporon oleaginosus</i>	<i>Cutaneotrichosporon oleaginosus</i> is an orthographic variant		1	CGM/160517-01
Trichosporonaceae	<i>Vanrija humicola</i> (Daszewska) R.T. Moore 1980	<i>Apiotrichum humicola</i> ; <i>Candida humicola</i>	<i>Moniliella suaveolens</i> is not a synonym of <i>V. humicola</i>		1	CGM/111024-02
Ustilaginaceae	<i>Pseudozyma flocculosa</i> (Traquair, L.A. Shaw & Jarvis) Boekhout & Traquair, 1995	<i>Staphoacus flocculosus</i> ; <i>Anthracoecystis flocculosa</i>			1	CGM/111024-02
Wallemiaceae	<i>Walleimia sebi</i> (Fr.) von Arx 1970				1	CGM/111024-02
Wickerhamomycetaceae	<i>Wickerhamomyces anomalus</i> (E.C. Hansen) Kurtzman, Robnett & Basehoar-Powers 2008	<i>Hansenula anomala</i> ; <i>Pichia anomala</i>			1	CGM/111024-02
Xylariaceae	<i>Ascotricha chartarum</i> Berkeley 1838				1	CGM/111024-02
Xylariaceae	<i>Xylaria flabelliformis</i> (Schweinitz) Berkeley & M.A. Curtis 1869		<i>Xylaria cubensis</i> is not a synonym of <i>X. flabelliformis</i>		1	CGM/211001-01

Table 5. List of pathogenic fungi. A, causes allergic reaction in humans; T, known to potentially produce toxin; PG – pathogenicity class; AN – strictly animal pathogen; P – strictly plant pathogen; F – strictly fungi pathogen; sp. – subspecies; var. – variety.

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
<i>Ajellomycetaceae</i>	<i>Blastomyces dermatitidis</i> Gilchrist & W.R. Stokes 1898	<i>Ajellomyces dermatitidis</i> ; <i>Zymonema dermatitidis</i>			3 ^{AN}	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Blastomyces parvus</i> (C.W. Emmons & Ashburn) Y.P. Jiang, Sigler & de Hoog 2018	<i>Emmonsia parva</i> var. <i>parva</i> ; <i>Emmonsia parva</i>			2 ^{AN}	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Emergomycetes pasteurianus</i> (Drouhet, E. Guého & Gori) Dukik, Sigler & de Hoog 2017	<i>Emmonsia pasteuriana</i>			2	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Emmonsia crescens</i> C.W. Emmons & Jellison 1960	<i>Ajellomyces crescens</i> ; <i>Emmonsia parva</i> var. <i>crescens</i> ; <i>Adiaspiromyces crescens</i>			2	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Histoplasma capsulatum</i> Darling 1906	<i>Ajellomyces capsulatus</i> ; <i>Emmonsella capsulata</i>			3 ^{AN}	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Histoplasma farciminosum</i> (Rivolta) Cif. & Redaelli 1934	<i>Histoplasma capsulatum</i> var. <i>farminosum</i>			2 ^{AN}	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Histoplasma duboisii</i> Vanbreuseghem 1952	<i>Histoplasma capsulata</i> var. <i>duboisii</i>			3	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Paracoccidioides brasiliensis</i> (Splendore) F.P. Almeida 1930				3	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Paracoccidioides lobogeorgii</i> R. Vilela, de Hoog, Bagagli & L. Mendoza 2023	<i>Loboa lobo</i> ; <i>Lacazia lobo</i>	<i>Paracoccidioides lutzii</i> is not a synonym of <i>P. lobogeorgii</i>		2 ^{AN}	CGM/111024-03
<i>Ajellomycetaceae</i>	<i>Paracoccidioides lutzii</i> R. Vilela, de Hoog, Bagagli & L. Mendoza 2023				3	CGM/111024-03
<i>Apiosporaceae</i>	<i>Nigrospora sphaerica</i> (Saccardo) E.W. Mason 1927		<i>Nigrospora oryzae</i> is not a synonym of <i>N. sphaerica</i>		2 ^P	CGM/170628-02
<i>Arachnomycetaceae</i>	<i>Arachnomycetes nodosetosus</i> Sigler & S.P. Abbott 1994	<i>Onychocola canadensis</i>			2	CGM/111024-03
<i>Arthrotrichaceae</i>	<i>Orbilia oligospora</i> (Fresenius) Baral & E. Weber 2020	<i>Arthrotrichs oligospora</i>			2 ^{AN}	CGM/111024-03
<i>Arthrodermataceae</i>	<i>Arthroderma amazonicum</i> (Moraes, Borelli & Feo) Y. Gräser & de Hoog 2018	<i>Arthroderma amazonicum</i> ; <i>Microsporium amazonicum</i> ; <i>Arthroderma borellii</i>			2	CGM/111024-03
<i>Arthrodermataceae</i>	<i>Arthroderma phaseoliforme</i> (Borelli & Feo) Y. Gräser & de Hoog 2018	<i>Trichophyton phaseoliforme</i>			2	CGM/111024-03
<i>Arthrodermataceae</i>	<i>Arthroderma uncinatum</i> C.O. Dawson & Gentles 1961	<i>Epidermophyton stockdaleae</i> ; <i>Keratinomyces ajelloi</i> ; <i>Trichophyton ajelloi</i>			2	CGM/111024-03

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
Arthrodermataceae	<i>Epidermophyton floccosum</i> (Harz) Langeron & Milochevich 1930			A	2	CGM/111024-03
Arthrodermataceae	<i>Lophophyton gallinae</i> (Méglin) Matr. & Dassonv. 1899	<i>Microsporium gallinae</i> ; <i>Arthroderma grubyi</i>			2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Microsporium audouinii</i> Gruby 1843	<i>Microsporium langeronii</i> ; <i>Microsporium rivalieri</i>			2	CGM/111024-03
Arthrodermataceae	<i>Microsporium canis</i> (E. Bodin) E. Bodin 1902	<i>Arthroderma otae</i> ; <i>Nannizzia otae</i> ; <i>Microsporium distortum</i> ; <i>Microsporium canis</i> var. <i>distortum</i>			2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Nannizzia duboisii</i> Vanbreuseghem ex Y. Gräser & de Hoog 2018	<i>Microsporium duboisii</i>			2	CGM/111024-03
Arthrodermataceae	<i>Microsporium equinum</i> (Delacroix & E. Bodin) Guéguen 1904		<i>Trichophyton tonsurans</i> is not a synonym of <i>M. equinum</i>		2	CGM/111024-03
Arthrodermataceae	<i>Microsporium ferrugineum</i> M. Ota 1921				2	CGM/111024-03
Arthrodermataceae	<i>Nannizzia corniculata</i> Takashio & De Vroey 1982	<i>Arthroderma corniculatum</i>		A	2	CGM/111024-03
Arthrodermataceae	<i>Nannizzia fulva</i> Stockdale 1963	<i>Arthroderma fulvum</i> ; <i>Microsporium fulvum</i> ; <i>Microsporium boullardii</i> ; <i>Trichophyton longofusum</i>			2	CGM/111024-03
Arthrodermataceae	<i>Nannizzia incurvata</i> Stockdale 1961	<i>Arthroderma incurvatum</i>	<i>Microsporium gypseum</i> is not a synonym of <i>N. incurvata</i>		2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Nannizzia nana</i> (C.A. Fuentes) Y. Gräser & de Hoog 2018	<i>Microsporium nanum</i> ; <i>Arthroderma obtusum</i> ; <i>Nannizzia obtusa</i>			2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Nannizzia persicolor</i> Stockdale, 1967	<i>Arthroderma persicolor</i>			2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Nannizzia praecox</i> (Rivalier ex A.A. Padhye, Ajello & McGinnis) Y. Gräser & de Hoog 2018	<i>Microsporium praecox</i>			2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton benhamiae</i> (Ajello & S.L. Cheng) Y. Gräser & de Hoog 2018	<i>Arthroderma benhamiae</i>	<i>Trichophyton erinacei</i> is not a synonym of <i>T. benhamiae</i>		2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Trichophyton concentricum</i> R. Blanchard 1896				2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton equinum</i> Gedoelst 1902		Belongs to <i>Trichophyton tonsurans</i> species complex		2 ^{AN}	CGM/111024-03

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
Arthrodermataceae	<i>Trichophyton interdigitale</i> Priestley 1917	<i>Trichophyton kraijdenii</i>	<i>Belongs to Trichophyton mentagrophytes species complex; Arthroderma vanbreuseghemii; Trichophyton mentagrophytes are not synonyms of T. interdigitale</i>		2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton mentagrophytes</i> (C.P. Robin) R. Blanchard 1896	<i>Arthroderma vanbreuseghemii</i>		T	2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton rubrum</i> (Castellani) Sabouraud 1911	<i>Trichophyton fischeri</i> ; <i>Trichophyton gourvillii</i> var. <i>intermedium</i> ; <i>Trichophyton kanei</i> ; <i>Trichophyton raubitschekii</i>		T	2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton schoenleinii</i> (Lebert) Langeron & Milochevich 1934				2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton simii</i> (Pinoy) Stockdale, D.W.R. Mackenzie & Austwick 1965	<i>Arthroderma simii</i>			2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Trichophyton tonsurans</i> Malmsten 1848				2	CGM/111024-03
Arthrodermataceae	<i>Trichophyton verrucosum</i> E. Bodin 1902		<i>Trichophyton singulare</i> is a doubtful species, see 5.2.4.17.		2 ^{AN}	CGM/111024-03
Arthrodermataceae	<i>Trichophyton violaceum</i> Sabouraud ex E. Bodin 1902		<i>Trichophyton soudanense</i> ; <i>Trichophyton rubrum</i> are not synonyms of <i>T. violaceum</i>	T	2	CGM/111024-03
Aspergillaceae	<i>Aspergillus flavus</i> Link 1803			T	2 ^{AN}	CGM/111024-03
Aspergillaceae	<i>Aspergillus fumigatus</i> Fresenius 1863	<i>Neosartorya fumigata</i> ; <i>Aspergillus arvii</i>		T	2	CGM/111024-03
Aspergillaceae	<i>Aspergillus lentulus</i> Balajee & K.A. Marr 2005			T	2	CGM/111024-03
Aspergillaceae	<i>Aspergillus parasiticus</i> Speare 1912	<i>Petromyces parasiticus</i>		T	2 ^P	CGM/220118-02
Aspergillaceae	<i>Aspergillus terreus</i> Thom 1918			T	2 ^{AN}	CGM/111024-03
Aspergillaceae	<i>Aspergillus thermomutatus</i> (Paden) S.W. Peterson 1992.	<i>Aspergillus fischeri</i> var. <i>thermomutatus</i> ; <i>Neosartorya pseudofischeri</i>			2	CGM/111024-03
Aspergillaceae	<i>Aspergillus tubingensis</i> Mosseray 1934	<i>Aspergillus niger</i> var. <i>tubingensis</i>			2 ^P	CGM/210712-02
Aspergillaceae	<i>Aspergillus versicolor</i> (Vuill.) Tirab., 1908	<i>Emericella versicolor</i>		T	2	CGM/111024-03

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Aspergillaceae	<i>Aspergillus niger</i> Tiegh. 1867	<i>Aspergillus awamori</i> ; <i>Aspergillus foetidus</i> ; <i>Aspergillus welwitschiae</i>	Not all strains that are labeled <i>A. awamori</i> represent <i>A. niger</i>	T	2 ^P	CGM/211004-01**
Basidiobolaceae	<i>Basidiobolus haptosporus</i> Drechsler 1947				2	CGM/111024-03
Basidiobolaceae	<i>Basidiobolus ranarum</i> Eidam 1886				2 ^{AN}	CGM/111024-03
Batrachochytriaceae	<i>Batrachochytrium dendrobatidis</i> Longcore, Pessier & D.K. Nichols 1999				2	CGM/111024-03
Bionectriaceae	<i>Clonostachys rosea</i> (Link) Schroers, Samuels, K.A. Seifert & W. Gams 1999	<i>Acremonium roseogrisea</i> ; <i>Gliocladium catenulaum</i>			2 ^P ; AN	CGM/170628-02
Botryosphaeriaceae	<i>Lasiodiplodia theobromae</i> (Patouillard) Griffon & Maublanc 1909	<i>Botryosphaeria rhodina</i>			2 ^P	CGM/111024-03
Botryosphaeriaceae	<i>Neoscytalidium dimidiatum</i> (Penzig) Crous & Slippers 2006	<i>Scytalidium dimidiatum</i> ; <i>Nattrassia mangiferae</i>			2	CGM/111024-03
Cephalothecaceae	<i>Phialemonium dimorphosporum</i> W. Gams & W.B. Cooke 1983				2	CGM/111024-03
Cephalothecaceae	<i>Phialemonium obovatum</i> W. Gams & McGinnis 1983				2	CGM/111024-03
Cladosporiaceae	<i>Cladosporium herbarum</i> (Persoon) Link 1816	<i>Mycosphaerella tassiana</i>			2 ^P	CGM/170628-02
Clavicipitaceae	<i>Metarhizium anisopliae</i> (Metschnikoff) Sorokin 1883				2 ^{AN}	CGM/151126-01
Conidiobolaceae	<i>Conidiobolus coronatus</i> (Costantin) A. Batko 1964	<i>Delacroixia coronata</i>			2	CGM/111024-03
Conidiobolaceae	<i>Conidiobolus incongruus</i> Drechsler 1960				2	CGM/111024-03
Coniothyriaceae	<i>Paraconiothyrium fuckelii</i> (Sacc.) Verkley & Gruyter 2012	<i>Coniothyrium fuckelii</i> ; <i>Leptosphaeria coniothyrium</i>			2 ^P	CGM/111024-03
Coniothyriaceae	<i>Coniothyrium glycines</i> (R.B. Stewart) Verkley & Gruyter 2012	<i>Phoma glycinicola</i>			2 ^P	CGM/111024-03
Cordycipitaceae	<i>Beauveria bassiana</i> (Bals.-Criv.) Vuill. 1912	<i>Cordyceps bassiana</i>		T	2 ^{AN}	CGM/141215-02
Cordycipitaceae	<i>Beauveria brongniartii</i> (Sacc.) Petch, 1926	<i>Cordyceps brongniartii</i>		T	2 ^{AN}	CGM/141215-02
Cordycipitaceae	<i>Beauveria pseudobassiana</i> S.A. Rehner & R.A. Humber 2011			T	2 ^{AN}	CGM/141215-02

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Cordycipitaceae	<i>Akanthomyces attenuates</i> (Zare & W. Gams) Spatafora, Kepler & B. Shrestha 2017	<i>Lecanicillium attenuatum</i>			2	CGM/181203-01
Cordycipitaceae	<i>Akanthomyces lecanii</i> (Zimm.) Spatafora, Kepler & B. Shrestha 2017	<i>Lecanicillium lecanii</i>			2 ^{AN}	CGM/111024-03
Cordycipitaceae	<i>Akanthomyces muscarius</i> (Petch) Spatafora, Kepler & B. Shrestha 2017.	<i>Lecanicillium muscarium</i>			2 ^{AN}	CGM/111024-03
Cordycipitaceae	<i>Zarea fungicola</i> (Preuss) Khonsanit, Thanakitpipattana & Luangsa-ard 2024	<i>Lecanicillium fungicola</i>			2 ^F	CGM/150303-02
Cryphonectriaceae	<i>Cryphonectria parasitica</i> (Murrill) M.E. Barr 1978	<i>Endothia parasitica</i>			2 ^{AN}	CGM/111024-03
Cryptococcaceae	<i>Cryptococcus deneoformans</i> F. Hagen & T. Boekhout 2015	<i>Filobasidiella neoformans</i> pro parte		A	2 ^{AN}	CGM/111024-03
Cryptococcaceae	<i>Cryptococcus gattii</i> (Vanbreuseghem & Takashio) Kwon-Chung & Boekhout 2002	<i>Filobasidiella bacillispora</i>			2 ^{AN}	CGM/111024-03
Cryptococcaceae	<i>Cryptococcus neoformans</i> (San Felice) Vuillemin 1901	<i>Filobasidiella neoformans</i> pro parte		A	2 ^{AN}	CGM/111024-03
Cucurbitariaceae	<i>Neocucurbitaria unguis-hominis</i> (Punithalingam & M.P. English) Wanasinghe, E.B.G. Jones & K.D. Hyde 2017	<i>Pyrenochaeta unguishominis</i>			2	CGM/111024-03
Cunninghamellaceae	<i>Absidia caerulea</i> Bainier 1889	<i>Absidia caerulea</i>			2	CGM/111024-03
Cunninghamellaceae	<i>Cunninghamella bertholletiae</i> Stadel 1911		<i>Cunninghamella elegans</i> is not a synonym of <i>C. bertholletiae</i>		2	CGM/111024-03
Cyphellophoraceae	<i>Cyphellophora europaea</i> (de Hoog, Mayser & Haase) Réblová & Untereiner 2013	<i>Phialophora europaea</i>			2	CGM/111024-03
Cyphellophoraceae	<i>Cyphellophora suttonii</i> (Ajello, A.A. Padhye & M. Payne) Decock 2004	<i>Pseudomicrodochium suttonii</i>		NA	2	CGM/111024-03
Debaryomycetaceae	<i>Candida albicans</i> (C.P. Robin) Berkhout 1923	<i>Candida stellatoidea</i>	The taxonomic status of <i>Candida africana</i> is not clear	A	2	CGM/010322-01*
Debaryomycetaceae	<i>Candida dubliniensis</i> D.J. Sullivan, Westerneng, K.A. Haynes, Dés.E. Bennett & D.C. Coleman 1995				2	CGM/111024-03

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<i>Debaryomycetaceae</i>	<i>Candida metapsilosis</i> Tavanti, A. Davidson, Gow, M. Maiden & Odds 2005				2	CGM/111024-03
<i>Debaryomycetaceae</i>	<i>Candida orthopsilosis</i> Tavanti, A. Davidson, Gow, M. Maiden & Odds 2005				2	CGM/111024-03
<i>Debaryomycetaceae</i>	<i>Candida parapsilosis</i> (Ashford) Langeron & Talice 1932				2	CGM/111024-03
<i>Debaryomycetaceae</i>	<i>Candida tropicalis</i> (Castellani) Berkhout 1923				2 ^{AN}	CGM/111024-03
<i>Didymellaceae</i>	<i>Didymella glomerata</i> (Corda) Qian Chen & L. Cai 2015	<i>Phoma glomerata</i>			2 ^P	CGM/111024-03
<i>Didymellaceae</i>	<i>Epicoccum sorghinum</i> (Saccardo) Aveskamp, Gruyter & Verkley 2010	<i>Phoma sorghina</i>		T	2 ^P	CGM/111024-03
<i>Didymellaceae</i>	<i>Juxtiphoma eupyrena</i> (Saccardo) Valenzuela-Lopez, P.W. Crous, Stchigel, J. Guarro & J.F. Cano 2017	<i>Phoma eupyrena</i>			2 ^P	CGM/111024-03
<i>Didymellaceae</i>	<i>Phoma herbarum</i> Westendorp 1852		<i>Phoma cruris-hominis</i> is not a synonym of <i>P. herbarum</i>		2 ^P	CGM/170628-02
<i>Didymellaceae</i>	<i>Stagonosporopsis oculi-hominis</i> (Punithalingam) Aveskamp, Gruyter & Verkley 2010	<i>Phoma dennissii</i> var. <i>oculohiminis</i>			2	CGM/111024-03
<i>Dipodascaceae</i>	<i>Geotrichum candidum</i> Link 1809	<i>Galactomyces geotrichum</i>			2 ^P	CGM/111024-03
<i>Dipodascaceae</i>	<i>Magnusiomyces capitatus</i> (de Hoog, M.T. Smith & E. Guého) de Hoog & M.T. Smith 2004	<i>Blastoschizomyces capitatus</i> ; <i>Dipodascus capitatus</i> ; <i>Geotrichum capitatum</i> ; <i>Saprochaete capitata</i>			2	CGM/111024-03
<i>Dipodascaceae</i>	<i>Magnusiomyces clavatus</i> (de Hoog, M.T. Smith & E. Guého) E. Kaplan 2017	<i>Geotrichum clavatum</i> ; <i>Saprochaete clavata</i>			2	CGM/111024-03
<i>Dothidiomycetaceae</i>	<i>Mycocentrospora acerina</i> (R. Hartig) Deighton 1972				2 ^P	CGM/111024-03
<i>Dothioraceae</i>	<i>Sydowia polyspora</i> (Bref. & Tavel) E. Müll. 1953	<i>Hormonema dematioides</i>			2 ^P	CGM/111024-03
<i>Eremomycetaceae</i>	<i>Arthrographis arxii</i> Guarro, Giraldo, Gené & Cano, 2014	<i>Eremomyces langeronii</i> ; <i>Pithoascus langeronii</i>	<i>Arthrographs kalrae</i> is not a synonym of <i>A. arxii</i>		2	CGM/111024-03
<i>Fomitopsidaceae</i>	<i>Fomitopsis pinicola</i> (Swartz) P. Karsten 1881				2 ^P	CGM/140605-02

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<i>Ganodermataceae</i>	<i>Ganoderma australe</i> (Fries) Patouillard 1889		<i>Ganoderma adspersum</i> and <i>Ganoderma europaeum</i> may represent different species		2 ^P	CGM/140227-03
<i>Glomerellaceae</i>	<i>Colletotrichum coccodes</i> (Wallroth) S. Hughes 1958				2 ^P	CGM/111024-03
<i>Glomerellaceae</i>	<i>Colletotrichum dematium</i> (Persoon) Grove 1918				2 ^P	CGM/111024-03
<i>Glomerellaceae</i>	<i>Colletotrichum gloeosporioides</i> (Penzig) Penzig & Saccardo 1884	<i>Glomerella cingulata</i>			2 ^P	CGM/111024-03
<i>Glomerellaceae</i>	<i>Colletotrichum graminicola</i> (Cesati ex Saccardo) G.W. Wilson 1914	<i>Glomerella tucumanensis</i>			2 ^P	CGM/111024-03
<i>Gymnoascaceae</i>	<i>Gymnascella dankaliensis</i> (Castell.) Currah 1985.	<i>Arachniotus dankaliensis</i> ; <i>Gymnascella dankaliensis</i>			2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora arxii</i> Tintelnot 1995				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora bantiana</i> (Saccardo) de Hoog, Kwon-Chung & McGinnis 1995				3 ^{AN}	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora boppii</i> (Borelli) de Hoog, Kwon-Chung & McGinnis 1995				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora carrionii</i> (Trejos) de Hoog, Kwon-Chung & McGinnis 1995				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora devriesii</i> (A.A. Padhye & Ajello) de Hoog, Kwon-Chung & McGinnis 1995				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora emmonsii</i> (A.A. Padhye, McGinnis & Ajello) de Hoog & A.A. Padhye 1999				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora immunda</i> Badali, Satow, Prenafeta-Boldú & de Hoog 2008				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora modesta</i> McGinnis, de Hoog & Haase 1999				3	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Cladophialophora mycetomatis</i> Badali, de Hoog & Bonifaz 2008				2	CGM/111024-03

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<i>Herpotrichiellaceae</i>	<i>Cladophialophora samoensis</i> Badali, de Hoog & Padhye 2008				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala asiatica</i> D.M. Li, R.Y. Li, de Hoog & D.L. Wang 2009				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala attenuata</i> Vitale & de Hoog 2002				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala bergeri</i> Haase & de Hoog 1999				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala castellanii</i> Iwatsu, Nishimura & Miyaji 1984		<i>Exophiala mansonii</i> is not a synonym of <i>E. castellanii</i>		2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala dermatitidis</i> (Kano) de Hoog 1977				2 ^{AN}	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala jeanselmei</i> (Langeron) McGinnis & A.A. Padhye 1977				2 ^{AN}	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala lecanii-corni</i> (Benedek & G. Specht) Haase & de Hoog 1999				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala moniliae</i> de Hoog 1977				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala oligosperma</i> Calendron ex de Hoog & Tintelnot 2003				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala phaeomuriformis</i> (Matsumoto, A.A. Padhye, Ajello & McGinnis) Matos, Haase & de Hoog 2003	<i>Sarcinomyces phaeomuriformis</i>			2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala pisciphila</i> McGinnis & Ajello 1974				2 ^{AN}	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala salmonis</i> Carmichael 1966				2 ^{AN}	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Exophiala spinifera</i> (H.S. Nielsen & Conant) McGinnis 1977	<i>Rhinocladiella spinifera</i>			2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Fonsecaea monophora</i> (M. Moore & F.P. Almeida) de Hoog, Vicente & D. Attili 2004				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Fonsecaea pedrosoi</i> (Brumpt) Negroni 1936	<i>Rhinocladiella pedrosoi</i> ; <i>Fonsecaea compacta</i> ; <i>Rhinocladiella compacta</i>			2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Phialophora americana</i> (Nannfeldt) S. Hughes 1958	<i>Capronia semiimmersa</i>	<i>Phialophora verrucosa</i> is not a synonym of <i>P. americana</i>		2	CGM/111024-03

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<i>Herpotrichiellaceae</i>	<i>Phialophora verrucosa</i> Medlar 1915		<i>Phialophora americana</i> is not a synonym of <i>P. verrucosa</i>		2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Rhinocladiella aquaspersa</i> (Borelli) Schell, McGinnis & Borelli 1983				2	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Rhinocladiella mackenziei</i> (C.K. Campbell & Al-Hedaithy) Arzanlou & Crous 2007	<i>Ramichloridium mackenziei</i>			3	CGM/111024-03
<i>Herpotrichiellaceae</i>	<i>Rhinocladiella similis</i> de Hoog & Caligiorno 2003				2	CGM/111024-03
<i>Hymenochaetaceae</i>	<i>Porodaedalea pini</i> (Brotero) Murrill 1905	<i>Phellinus pini</i>			2 ^P	CGM/140227-03
<i>Hypocreaceae</i>	<i>Trichoderma aggressivum</i> Samuels & W. Gams 2002			T	2 ^F	CGM/150303-02
<i>Hypocreaceae</i>	<i>Trichoderma koningii</i> Oudemans 1902	<i>Hypocrea koningii</i>			2 ^F	CGM/170628-02
<i>Hypocreaceae</i>	<i>Trichoderma viride</i> Persoon 1794	<i>Hypocrea rufa</i>	<i>Trichoderma harzianum</i> is not a synonym of <i>T. viride</i>		2 ^{F,AN}	CGM/080131-05
<i>Lichtheimiaceae</i>	<i>Lichtheimia corymbifera</i> (Cohn) Vuillemin 1903	<i>Absidia corymbifera</i> ; <i>Mycocladus corymbifera</i>			2 ^{AN}	CGM/111024-03
<i>Lichtheimiaceae</i>	<i>Lichtheimia ornata</i> (A.K. Sarbhoy) A. Alastruey-Izquierdo & G. Walther 2010	<i>Absidia ornata</i>			2	CGM/111024-03
<i>Lichtheimiaceae</i>	<i>Lichtheimia ramosa</i> (Zopf) Vuillemin 1903	<i>Absidia ramosa</i> ; <i>Mycocladus lutetiensis</i>			2	CGM/111024-03
<i>Lichtheimiaceae</i>	<i>Rhizomucor pusillus</i> (Lindt) Schipper 1978				2	CGM/111024-03
<i>Malasseziaceae</i>	<i>Malassezia furfur</i> (C.P. Robin) Baillon 1889				2	CGM/200407-01
<i>Malasseziaceae</i>	<i>Malassezia globosa</i> Midgley, E. Guého & J. Guillot 1996	<i>Pityrosporum oribiculare</i>			2	CGM/111024-03
<i>Malasseziaceae</i>	<i>Malassezia obtusa</i> Midgley, J. Guillot & E. Guého 1996				2	CGM/111024-03
<i>Malasseziaceae</i>	<i>Malassezia pachydermatis</i> (Weidman) C.W. Dodge 1935				2 ^{AN}	CGM/200407-01
<i>Malasseziaceae</i>	<i>Malassezia restricta</i> E. Guého, J. Guillot & Midgley 1996				2	CGM/111024-03
<i>Malasseziaceae</i>	<i>Malassezia slooffiae</i> E. Guého, J. Guillot & Midgley 1996				2	CGM/111024-03
<i>Malasseziaceae</i>	<i>Malassezia sympodialis</i> R.B. Simmons & E. Guého 1990				2	CGM/200407-01
<i>Metschnikowiaceae</i>	<i>Clavispora lusitaniae</i> Rodrigues de Miranda 1979	<i>Candida lusitaniae</i>			2	CGM/100122-02

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Microascaceae	<i>Lomentospora prolificans</i> Hennebert & B.G. Desai 1974	<i>Scedosporium prolificans</i> ; <i>Scedosporium inflatum</i>			2	CGM/111024-03
Microascaceae	<i>Microascus paisii</i> (Pollacci) M. Sandoval-Denis, J. Gené & J. Guarro 2015	<i>Scopulariopsis brumptii</i>			2	CGM/111024-03
Microascaceae	<i>Scedosporium apiospermum</i> (Saccardo) Saccardo ex Castellani & Chalmers 1919	<i>Monosporium apiospermum</i> ; <i>Pseudoallescheria apiosperma</i> ; <i>Polycytella hominis</i>	<i>Petriellidium paisii</i> : <i>Microascus paisii</i> are not synonyms of <i>S. apiospermum</i>		2 ^{AN}	CGM/111024-03
Microascaceae	<i>Scedosporium aurantiacum</i> Gilgado, Cano, Gené & Guarro 2005				2	CGM/111024-03
Microascaceae	<i>Scedosporium boydii</i> (Shear) Gilgado, Gené, Cano & Guarro 2008	<i>Pseudallescheria boydii</i> ; <i>Graphium eumorphum</i>			2 ^{AN}	CGM/111024-03
Microascaceae	<i>Scopulariopsis brevicaulis</i> (Sacc.) Bainier 1907	<i>Microascus brevicaulis</i>			2	CGM/111024-03
Mortierellaceae	<i>Actinomortierella wolfii</i> (B.S. Mehrotra & Baijal) Vandepol & Bonito, 2020	<i>Mortierella wolfii</i>			2 ^{AN}	CGM/111024-03
Mucoraceae	<i>Mucor amphibiorum</i> Schipper 1978				2	CGM/111024-03
Mucoraceae	<i>Mucor circinelloides</i> Tieghem 1875	<i>Mucor circinelloides</i> var. <i>circinelloides</i>			2 ^{AN}	CGM/111024-03
Mucoraceae	<i>Mucor griseocyanus</i> Hagem 1908	<i>Mucor circinelloides</i> var. <i>griseocyanus</i>			2 ^{AN}	CGM/111024-03
Mucoraceae	<i>Mucor hiemalis</i> Wehmer 1903				2 ^P	CGM/111024-03
Mucoraceae	<i>Mucor irregularis</i> Stchigel, Cano, Guarro & Ed. Álvarez 2011	<i>Rhizomucor variabilis</i> var. <i>regularior</i>	<i>Rhizomucor variabilis</i> var. <i>variabilis</i> is not a synonym of <i>M. irregularis</i>		2	CGM/111024-03
Mucoraceae	<i>Mucor janssenii</i> Lendner 1907	<i>Mucor circinelloides</i> f. <i>janssenii</i>			2 ^{AN}	CGM/111024-03
Mucoraceae	<i>Mucor racemosus</i> Bulliard 1791				2 ^P	CGM/111024-03
Nectriaceae	<i>Neocosmospora falciformis</i> (Carrión) L. Lombard & P.W. Crous 2015	<i>Acremonium falciforme</i> ; <i>Fusarium falciforme</i>			2	CGM/111024-03
Nectriaceae	<i>Fusarium oxysporum</i> Schlechtendal 1824			T	2 ^P	CGM/111024-03
Nectriaceae	<i>Fusarium proliferatum</i> (Matsushima) Nirenberg ex Gerlach & Nirenberg 1982		belongs to the <i>Gibberella fujikuroi</i> complex	T	2 ^P	CGM/111024-03

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Nectriaceae	<i>Fusarium sacchari</i> (E.J. Butler) W. Gams 1971				2 ^P	CGM/111024-03
Nectriaceae	<i>Fusarium subglutinans</i> (Wollenweber & Reinking) P.E. Nelson, Toussoun & Marasas 1983	<i>Gibberella fujikuroi</i> var. <i>subglutinans</i>	belongs to the <i>Gibberella fujikuroi</i> complex	T	2 ^P	CGM/111024-03
Nectriaceae	<i>Fusarium verticillioides</i> (Sacc.) Nirenberg, 1976	<i>Gibberella moniliformis</i>	belongs to the <i>Gibberella fujikuroi</i> complex	T	2 ^P	CGM/111024-03
Nectriaceae	<i>Ilyonectria destructans</i> (Zinssmeister) Rossman, L. Lombard & P.W. Crous 2015	<i>Cylindrocarpon destructans</i> ; <i>Nectria radicularia</i>			2 ^P	CGM/111024-03
Nectriaceae	<i>Neocosmospora cyanescens</i> (G.A. de Vries, de Hoog & Bruyn) Summerbell, Schroers & Scott, 2016	<i>Cylindrocarpon cyanescens</i> ; <i>Fusarium cyanescens</i>			2	CGM/111024-03
Nectriaceae	<i>Neocosmospora solani</i> (Martius) L. Lombard & P.W. Crous 2015	<i>Fusarium solani</i> ; <i>Nectria haematococca</i> var. <i>breviconia</i>		T	2 ^P	CGM/111024-03
Nectriaceae	<i>Xenoacremonium recifei</i> (Leão & Lôbo) L. Lombard & P.W. Crous 2015	<i>Acronium recifei</i>			2	CGM/111024-03
Nigrogranaceae	<i>Nigrograna mackinnonii</i> (Borelli) Gruyter, Verkley & Crous 2012	<i>Pyrenochaeta mackinnonii</i>			2	CGM/111024-03
Onygenaceae	<i>Aphanoascus fulvescens</i> (Cooke) Apinis 1968		<i>Chrysosporium</i> sp. refers to the presence of a <i>Chrysosporium</i> anamorph		2 ^P	CGM/111024-03
Onygenaceae	<i>Aphanoascus verrucosus</i> Cano & Punsola 1990	<i>Chrysosporium tropicum</i>			2	CGM/111024-03
Onygenaceae	<i>Coccidioides immitis</i> Rixford & Gilchrist 1896				3 ^{AN}	CGM/111024-03
Onygenaceae	<i>Coccidioides posadasii</i> M.C. Fisher, G.L. Koenig, T.J. White & J.W. Taylor 2023				3	CGM/111024-03
Ophiocordycipitaceae	<i>Ophiocordyceps albaconguae</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
Ophiocordycipitaceae	<i>Ophiocordyceps blakebarnesii</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
Ophiocordycipitaceae	<i>Ophiocordyceps camponotiatricipis</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2015				2 ^{AN}	CGM/220713-02

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<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-balzani</i> H.C. Evans & D.P. Hughes 2011				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-bispinosi</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2015				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-chartificis</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-femorati</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-floridani</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-hippocrepidis</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-indiani</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2015				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-leonardi</i> Kobmoo, Mongkolsamrit, Tasanathai, Thanakitpipattana & Luangsa-ard 2012				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-melanotici</i> H.C. Evans & D.P. Hughes 2011				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-nidulantis</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2019				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-novogranadensis</i> H.C. Evans & D.P. Hughes 2011				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-renggeri</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-rufipedis</i> H.C. Evans & D.P. Hughes 2011				2 ^{AN}	CGM/220713-02

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<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps camponoti-saundersi</i> Kobmoo, Mongkolsamrit, Tسانathai, Thanakitpipattana & Luangsa-ard 2012				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps halabalaensis</i> Luangsa-ard, Ridkaew, Tسانathai & Hywel-Jones 2011				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps humbertii</i> (C.P. Robin) G.H. Sung, J.M. Sung, Hywel-Jones & Spatafora 2007	<i>Hirsutella saussurei</i>			2 ^{AN}	CGM/220713-03
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps kimflemingiae</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps naomipierceae</i> J.P.M. Araújo, R.G. Shivas, S. Abell, T. Marney, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps ootakii</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps polyrhachis-furcata</i> Kobmoo, Mongkolsamrit, Tسانathai, Thanakitpipattana & Luangsa-ard 2012				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps pulvinata</i> Kepler, Kaitsu & Spatafora 2011				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps rami</i> Kobmoo, Mongkols., Tسان., Thanakitp. & Luangsa-ard 2015				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps satoi</i> J.P.M. Araújo, H.C. Evans & D.P. Hughes 2018				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Ophiocordyceps unilateralis</i> (Tulasne) Petch 1931				2 ^{AN}	CGM/220713-02
<i>Ophiocordycipitaceae</i>	<i>Purpureocillium lilacinum</i> (Thom) Luangsa-ard, Houbraken, Hywel-Jones & Samson 2011	<i>Paecilomyces lilacinus</i>			2 ^{AN}	CGM/240523-01

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<i>Ophiostomataceae</i>	<i>Ophiostoma quercus</i> (Georgevitch) Nannfeldt 1934	<i>Ophiostoma roboris</i>			2	CGM/111024-03
<i>Ophiostomataceae</i>	<i>Ophiostoma ulmi</i> (Buisman) Nannfeldt 1934	<i>Graphium ulmi</i>			2 ^P	CGM/151126-01
<i>Ophiostomataceae</i>	<i>Sporothrix brasiliensis</i> Marimon, Gené, Cano & Guarro 2007				2	CGM/111024-03
<i>Ophiostomataceae</i>	<i>Sporothrix globosa</i> Marimon, Cano, Gené, Sutton, Kawasaki & Guarro 2007				2	CGM/111024-03
<i>Ophiostomataceae</i>	<i>Sporothrix luriei</i> (Ajello & Kaplan) Marimon, Gené, Cano & Guarro 2008				2	CGM/111024-03
<i>Ophiostomataceae</i>	<i>Sporothrix pallida</i> (Tubaki) Matsushima 1975				2	CGM/111024-03
<i>Ophiostomataceae</i>	<i>Sporothrix schenckii</i> Hektoen & C.F. Perkins 1900				2 ^{AN}	CGM/111024-03
<i>Peronosporaceae</i>	<i>Peronosclerospora philippinensis</i> (W. Weston) C.G. Shaw 1978				2 ^P	CGM/111024-03
<i>Peronosporaceae</i>	<i>Sclerophthora zeae</i> J.A. Crouch & Thines 2022	<i>Sclerophthora rayssiae</i> var. <i>zeaea</i>			2 ^P	CGM/111024-03
<i>Pezizomycotina, incertae sedis</i>	<i>Dissitimurus exedrus</i> E.G. Simmons, McGinnis & Rinaldi 1987				2	CGM/111024-03
<i>Pichiaceae</i>	<i>Pichia kudriavzevii</i> Boidin, Pignal & Besson 1965	<i>Candida krusei</i> ; <i>Candida glycerinogenes</i> ; <i>Issatchenkia orientalis</i>			2 ^{AN}	CGM/111024-03
<i>Pleosporaceae</i>	<i>Alternaria caespitosa</i> (de Hoog & C. Rubio) Woudenberg & P.W. Crous 2013	<i>Botryomyces caespitosus</i>			2	CGM/111024-03
<i>Pleosporaceae</i>	<i>Alternaria dianthicola</i> Neergaard 1945				2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Curvularia australiensis</i> (Bugnic. ex M.B. Ellis) Manamgoda, L. Cai & K.D. Hyde 2012	<i>Bipolaris australiensis</i> ; <i>Cochliobolus australiensis</i> ; <i>Drechslera australiensis</i>			2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Curvularia clavata</i> B.L. Jain 1962				2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Curvularia geniculata</i> (Tracy & Earle) Boedijn 1923	<i>Cochliobolus geniculatus</i>			2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Curvularia hawaiiensis</i> (Bugnicourt ex M.B. Ellis)				2 ^P	CGM/111024-03

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
	Manamgoda, L. Cai & K.D. Hyde 2012					
<i>Pleosporaceae</i>	<i>Curvularia lunata</i> (Wakker) Boedijn 1933	<i>Cochliobolus lunatus</i>			2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Curvularia pallescens</i> Boedijn 1933	<i>Cochliobolus pallescens</i>			2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Curvularia spicifera</i> (Bainier) Boedijn 1933	<i>Biploraris spicifera</i> ; <i>Cochliobolus spiciferus</i> ; <i>Drechslera spicifera</i>			2 ^P	CGM/170628-02
<i>Pleosporaceae</i>	<i>Curvularia verruculosa</i> Tandon & Bilgrami ex M.B. Ellis 1966	<i>Cochliobolus verruculosus</i>			2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Dichotomophthora portulacae</i> Mehrlich & Fitzpatrick ex M.B. Ellis 1971				2 ^P	CGM/170628-02
<i>Pleosporaceae</i>	<i>Exserohilum rostratum</i> (Drechsler) K.J. Leonard & Suggs 1974	<i>Setosphaeria rostrata</i> ; <i>Exserohilum longirostratum</i> ; <i>Exserohilum mcginnisii</i>			2 ^P	CGM/111024-03
<i>Pleosporaceae</i>	<i>Pyrenophora biseptata</i> (Saccardo & Roumeguère) P.W. Crous 2013	<i>Drechslera biseptata</i>			2 ^P	CGM/111024-03
<i>Pleosporales, incertae sedis</i>	<i>Pseudochaetosphaeronema larense</i> (Borelli & R. Zamora) Punithalingam 1979				2	CGM/111024-03
<i>Pleurostomataceae</i>	<i>Pleurostoma richardsiae</i> (Nannfeldt) Réblová & Jaklitsch 2015	<i>Phialophora richardsiae</i>			2	CGM/111024-03
<i>Pneumocystidaceae</i>	<i>Pneumocystis jirovecii</i> Frenkel 1976				2	CGM/111024-03
<i>Protozoa</i>	<i>Rhinosporidium seeberi</i> (Wernicke) Seeber 1912				2	CGM/111024-03
<i>Pseudeurotiaceae</i>	<i>Pseudogymnoascus destructans</i> (Blehert & Gargas) Minnis & D.L. Lindner 2013	<i>Geomyces destructans</i>			2 ^{AN}	CGM/111024-03
<i>Pythiaceae</i>	<i>Pythium insidiosum</i> De Cock, L. Mendoza, A.A. Padhye, Ajello & Kaufman 1987				2 ^{AN}	CGM/111024-03
<i>Quambalariaceae</i>	<i>Quambalaria cyanescens</i> (de Hoog & G.A. de Vries) Z.W. de Beer, Begerow & R. Bauer 2006	<i>Cerinosterus cyanescens</i> ; <i>Fugomyces cyanescens</i>			2	CGM/111024-03
<i>Rhizopodaceae</i>	<i>Rhizopus arrhizus</i> A. Fischer 1892	<i>Rhizopus oryzae</i>			2 ^P	CGM/111024-03

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
Rhizopodaceae	<i>Rhizopus microsporus</i> Tieghem 1875	<i>Rhizopus azygosporus</i>			2	CGM/111024-03
Rhizopodaceae	<i>Rhizopus schipperae</i> Weitzman, McGough, Rinaldi & Della-Latta 1996				2	CGM/111024-03
Rhizopodaceae	<i>Rhizopus stolonifer</i> (Ehrenberg) Vuillemin 1902				2 ^P	CGM/111024-03
Saccharomycetaceae	<i>Eremothecium cymbalariae</i> Borzi 1888				2 ^P	CGM/171225-01
Saccharomycetaceae	<i>Kluyveromyces marxianus</i> (E.C. Hansen) van der Walt 1971	<i>Candida</i> <i>pseudotropicalis</i> ; <i>Candida kefyr</i>			2	CGM/111024-03
Saccharomycetaceae	<i>Nakaseomyces bracarensis</i> (A. Correia, P. Sampaio, S.A. James & C. Pais) Sugita & M. Takashima 2022	<i>Candida bracarensis</i>			2	CGM/111024-03
Saccharomycetaceae	<i>Nakaseomyces glabratus</i> (H.W. Anderson) Sugita & M. Takashima 2022	<i>Candida glabrata</i> ; <i>Torulopsis glabrata</i>			2 ^{AN}	CGM/010322-01
Saccharomycetaceae	<i>Nakaseomyces nivariensis</i> (Alcoba-Flórez, Méndez- Álvarez, Cano, Guarro, Pérez- Roth & Arévalo) Sugita & M. Takashima 2022	<i>Candida nivariensis</i>			2	CGM/111024-03
Saksenaeaceae	<i>Apophysomyces elegans</i> P.C. Misra, K.J. Srivastava & Lata 1979				2	CGM/111024-03
Saksenaeaceae	<i>Saksenaea vasiformis</i> S.B. Saksena 1953				2	CGM/111024-03
Sarocladiaceae	<i>Sarocladium kiliense</i> (Grütz) Summerbell 2011				2	CGM/111024-03
Sarocladiaceae	<i>Sarocladium strictum</i> (W. Gams) Summerbell 2011	<i>Acremonium strictum</i>			2 ^P	CGM/170628-02
Schizophyllaceae	<i>Schizophyllum commune</i> Fries 1815				2 ^P	CGM/111024-03
Sclerotiniaceae	<i>Ovulinia azalaea</i> F.A. Weiss 1940				2 ^P	CGM/111024-03
Sordariales, incertae sedis	<i>Madurella mycetomatis</i> (Laveran) Brumpt 1905				2	CGM/111024-03
Stachybotryaceae	<i>Xepicula leucotricha</i> (Peck) Nag Raj 2016	<i>Myrothecium</i> <i>leucotrichum</i> ; <i>Myrothecium indicum</i>		T	2 ^P	CGM/211215-01
Sympoventuriaceae	<i>Scolecobasidium humicola</i> G.L. Barron & L.V. Busch 1962	<i>Ochroconis humicola</i>			2	CGM/111024-03

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
<i>Sympoventuriaceae</i>	<i>Scolecobasidium tshawytschae</i> (Doty & D.W. Slater) McGinnis & Ajello, 1974	<i>Ochroconis tshawytschae</i>			2	CGM/111024-03
<i>Sympoventuriaceae</i>	<i>Verruconis gallopava</i> (W.B. Cooke) Samerpitak & de Hoog 2014	<i>Ochroconis gallopava</i>			2 ^{AN}	CGM/111024-03
<i>Syncephalastraceae</i>	<i>Syncephalastrum racemosum</i> Cohn 1886				2	CGM/111024-03
<i>Teratosphaeriaceae</i>	<i>Stenella araguata</i> Sydow 1930				2	CGM/111024-03
<i>Testudinaceae</i>	<i>Neotestudina rosatii</i> Segretain & Destombes 1961	<i>Zopfii rosatii</i>			2	CGM/111024-03
<i>Thermoascaceae</i>	<i>Paecilomyces variotii</i> Bainier 1907			T	2	CGM/111024-03
<i>Thyridiaceae</i>	<i>Thyridium curvatum</i> (W. Gams & W.B. Cooke) R. Sugita & Kaz. Tanaka 2022	<i>Phialemonium curvatum</i>			2	CGM/111024-03
<i>Togniniaceae</i>	<i>Phaeoacremonium krajdennii</i> L. Mostert, R.C. Summerbell & P.W. Crous 2005				2	CGM/111024-03
<i>Togniniaceae</i>	<i>Phaeoacremonium parasiticum</i> (Ajello, Georg & C.J.K. Wang) W. Gams, P.W. Crous & M.J. Wingfield 1996	<i>Phialophora parasitica</i> ; <i>Togninia parasitica</i>			2 ^P	CGM/111024-03
<i>Trematosphaeriaceae</i>	<i>Falciformispora senegalensis</i> (Segretain, Baylet, Darasse & Camain) S.A. Ahmed, W.W.J. van de Sande, A. Fahal & de Hoog 2014	<i>Leptosphaeria senegalensis</i>			2	CGM/111024-03
<i>Trematosphaeriaceae</i>	<i>Falciformispora tompkinsii</i> (El-Ani) S.A. Ahmed, W.W.J. van de Sande, A. Fahal & de Hoog 2014	<i>Leptosphaeria thompkinsii</i>			2	CGM/111024-03
<i>Trematosphaeriaceae</i>	<i>Medicopsis romeroi</i> (Borelli) Gruyter, Verkley & Crous 2012	<i>Pyrenochaeta romeroi</i>			2	CGM/111024-03
<i>Trematosphaeriaceae</i>	<i>Trematosphaeria grisea</i> (J.E. Mackinnon, Ferrada & Montemartini) S.A. Ahmed, W.W.J. van de Sande, A. Fahal & de Hoog 2014	<i>Madurella grisea</i>			2	CGM/111024-03
<i>Trichocomaceae</i>	<i>Redaellia elegans</i> Ciferri 1930				2	CGM/111024-03
<i>Trichocomaceae</i>	<i>Talaromyces marneffeii</i> (Segretain, Capponi & Sureau) Samson, Yilmaz, Frisvad & Seifert 2011			A	2	CGM/111024-03

Family	Name	Synonyms	Nomenclatural comments, including names reported in COGEM reports	Notes	PG	Classification by COGEM
<i>Trichomonasceae</i>	<i>Trichomonascus ciferrii</i> (M.T. Smith, van der Walt & Johannsen) Kurtzman & Robnett 2007	<i>Candida ciferrii</i> ; <i>Stephanoascus ciferrii</i>			2	CGM/111024-03
<i>Trichosphaeriaceae</i>	<i>Plectosphaerella cucumerina</i> (Lindfors) W. Gams 1968	<i>Plectosporium tabacinum</i>			2 ^P	CGM/170628-02
<i>Trichosphaeriaceae</i>	<i>Verticillium albo-atrum</i> Reinke & Berthold 1879	<i>Verticillium alboatrum</i>			2 ^P	CGM/111024-03
<i>Trichosphaeriaceae</i>	<i>Verticillium dahliae</i> Kleb., 1913				2 ^P	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Cutaneotrichosporon cutaneum</i> (Beurmann, Gougerot & Vaucher bis) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Trichosporon cutaneum</i>			2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Cutaneotrichosporon mucoides</i> (E. Guého & M.T. Smith) X.Z. Liu, F.Y. Bai, M. Groenewald & Boekhout 2015	<i>Trichosporon mucoides</i>			2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Trichosporon asahii</i> Akagi ex Sugita, A. Nishikawa & Shinoda 1994				2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Trichosporon asteroides</i> (Rischin) M. Ota 1926				2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Trichosporon beigelii</i> (Küchenmeister & Rabenhorst) Vuillemin 1902				2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Trichosporon dohaense</i> Taj-Aldeen, Meis & Boekhout 2009				2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Trichosporon inkin</i> (Oho ex M. Ota) do Carmo-Sousa & van Uden 1967				2	CGM/111024-03
<i>Trichosporonaceae</i>	<i>Trichosporon ovoides</i> Behrend 1890				2	CGM/111024-03
<i>Tritirachiaceae</i>	<i>Tritirachium oryzae</i> (Vincens) de Hoog 1972				2 ^P	CGM/111024-03

* Originally advised about *Candida africana* in COGEM advice CGM/111024-03

** Originally advised about *Aspergillus welwitschiae* in COGEM advice CGM/170628-02

6. Conclusions

About 15% (n=95) of the names on the COGEM fungal lists showed conflicting names in at least one of the fungal name repositories, MycoBank (MB), Index Fungorum (IF) and Fungal Names (FN).

An extensive discussion is provided on the preferred fungal names, including some of their synonyms.

When compared with the final updated COGEM fungal list, differences with the various fungal name repositories ranged from 17 to 61 names (n=95). GB was found to be most similar to the updated COGEM list, followed by MB.

At the family level, 81 fungal families did not show a conflicting name in any of the fungal name repositories. However, 18 families showed at least one conflicting name in at least one of the fungal name repositories. The percentage conflicting names ranged from 4% (*Saccharomycetaceae*) to 80% (*Glomeraceae*).

The names of fungal species in families with high numbers of conflicting names (or poor nomenclatural quality statistics) need to be urgently revised by the three major fungal name repositories.

It is advised that the three major fungal name repositories (MB, IF, FN) harmonize their content more often. The mycological community will benefit from a merger of the three name repositories.

The Atlas of Clinical Fungi (ACF) used several ACF-unique names when compared with the fungal name repositories plus GenBank and theyeasts.org.

Some variation was observed in author citations, years of publication and spelling of the name (so-called orthographic variants).

It is advised to COGEM not to include fungi with a genus name only in their fungal lists as it is (almost) impossible to judge the pathogen classification.

Twenty-nine name changes have been made on the COGEM fungal list:

Nonpathogens

- *Anthracoystis flocculosa* became *Pseudozyma flocculosa* (Traquair, L.A. Shaw & Jarvis) Boekhout & Traquair 1995
- *Arthroderma racemosum* became *Paraphyton cookei* (Ajello) Y. Gräser, Dukik & de Hoog
- *Chaetomium strumarium* became *Achaetomium strumarium* J.N. Rai, J.P. Tewari & Mukerji 1964
- *Chamaeleomyces viridis* became *Metarhizium viride* (Segretain, Fromentin, Destombes, Brygoo & Dodin ex Samson) Kepler, S.A. Rehner & Humber 2014

- *Corynascus thermophilus* became *Thermothelomyces fergusii* X. Wei Wang & Houbraken 2022
- *Epidermophyton stockdaleae* became *Arthroderma uncinatum* C.O. Dawson & Gentles 1961
- *Exserohilum longirostratum* became *Exserohilum rostratum* (Drechsler) K.J. Leonard & Suggs 1974
- *Exserohilum mcginnisii* became *Exserohilum rostratum* (Drechsler) K.J. Leonard & Suggs 1974
- *Kazachstania telluris* became *Arxiozyma telluris* (Van der Walt) Van der Walt & Yarrow 1984
- *Pichia methanolica* became *Ogataea methanolica* (Makig.) Kurtzman & Robnett 2010
- *Rhizogloium irregulare* became *Rhizophagus irregularis* (Blaszkowski, Wubet, Renker & Buscot) C. Walker & A. Schüßler 2010
- *Rhizogloium aggregatum* became *Rhizophagus aggregatus* (N.C. Schenck & G.S. Sm.) C. Walker 2010
- *Rhizogloium clarum* became *Rhizophagus clarus* (T.H. Nicolson & N.C. Schenck) C. Walker & A. Schüßler 2010
- *Rhizogloium manihotis* became *Rhizophagus manihotis* (R.H. Howeler, Sieverding & N.C. Schenck) C. Walker & A. Schüßler 2010
- *Rhizopus microsporus* var. *oligosporus* became *Rhizopus microsporus* Tiegh. 1875

Pathogens

- *Aspergillus welwitschiae* became *Aspergillus niger* Tiegh. 1867
- *Coniothyrium fuckelii* became *Paraconiothyrium fuckelii* (Sacc.) Verkley & Gruyter 2012
- *Bipolaris australiensis* became *Curvularia australiensis* (Bugnic. ex M.B. Ellis) Manamgoda, L. Cai & K.D. Hyde 2012
- *Candida pseudotropicalis* became *Kluyveromyces marxianus* (E.C. Hansen) van der Walt 1971.
- *Chrysosporium tropicum* became *Aphanoascus verrucosus* Cano & Punsola 1990
- *Fusarium falciforme* became *Neocosmospora falciformis* (Carrión) L. Lombard & P.W. Crous 2015
- *Histoplasma capsulatum* var. *farcimosum* became *Histoplasma farcimosum* (Rivolta) Cif. & Redaelli 1934
- *Keratinomyces ajelloi* became *Arthroderma uncinatum* C.O. Dawson & Gentles 1961
- *Lecanicillium attenuatum* became *Akanthomyces attenuates* (Zare & W. Gams) Spatafora, Kepler & B. Shrestha 2017
- *Lecanicillium lecanii* became *Akanthomyces lecanii* (Zimm.) Spatafora, Kepler & B. Shrestha 2017

- *Lecanicillium muscarium* became *Akanthomyces muscarius* (Petch) Spatafora, Kepler & B. Shrestha 2017
- *Mortierella wolfii* became *Actinomortierella wolfii* (B.S. Mehrotra & Baijal) Vandepol & Bonito 2020
- *Pseudomicrodochium suttonii* became *Cyphellophora suttonii* Ajello et al.) Decock 2004
- *Saprochaete clavata* became *Magnusiomyces clavatus* (de Hoog, M.T. Smith & E. Guého) E. Kaplan 2017

Finally, a strategy is proposed to COGEM when new fungal taxa have to be added in the future to the COGEM fungal lists.

7. Recommendation to the mycology community

One of the most striking outcomes of this research project are the various opinions presented on the 'current' names [and thus also on the taxonomy] of specific fungal groups in MB, IF, and FN. The available Excel files of IF [obtained via the curator] and MB [obtained from the MB website] differ slightly to quite extensively from the web-based versions. It is important that these differences disappear as soon as is possible. It is strongly advised that the three curators of the fungal name repositories harmonize the content of the databases more often, because it is harming the interpretation of the 'current' names by the user of those databases which name is best to use. Although, it seems not be feasible from a political point of view, the mycology community needs to start discussing how to unify the databases into a single and optimally curated database. To serve the users of the three respective websites, each may host an identical copy of the unified contents.

In addition, the names of species in the families with a large number of conflicting names in the various fungal name repositories (Table 3) should be harmonized with priority by the respective fungal experts.

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8. References

Ajello, L. (1953). The dermatophyte, *Microsporum gypseum*, as a saprophyte and parasite. *Journal of Investigative Dermatology*, 21, 157-171.

Alastruey-Izquierdo, A., Hoffmann, K., de Hoog, G. S., et al. (2010). Species recognition and clinical relevance of the zygomycetous genus *Lichtheimia* (syn. *Absidia* pro parte, *Mycocladius*). *Journal of Clinical Microbiology*, 48, 2154-2170.

Al-Hatmi, A. M. S., Balkhair, A., Al-Busaidi, I., et al. (2021). *Basidiobolus omanensis* sp. nov. causing angioinvasive abdominal basidiobolomycosis. *Journal of Fungi*, 7, 653. <https://doi.org/10.3390/jof7080653>

Arnold, A. E., Maynard, Z., Gilbert, G. S., et al. (2000). Are tropical fungal endophytes hyperdiverse? *Ecology Letters*, 3, 267–274.
<https://doi.org/10.1046/j.1461-0248.2000.00159.x>

Baert, F., Stubbe, D., D'hooge, E., et al. (2020). Updating the taxonomy of dermatophytes of the BCCM/IHEM collection according to the new standard: A phylogenetic approach. *Mycopathologia*, 185, 161–168.
<https://doi.org/10.1007/s11046-019-00338-7>

Baldrian, P. (2017). Forest microbiome: Diversity, complexity and dynamics. *FEMS Microbiology Reviews*, 41, 109–130. <https://doi.org/10.1093/femsre/fuw040>

Bebber, D. P., & Gurr, S. J. (2015). Crop-destroying fungal and oomycete pathogens challenge food security. *Fungal Genetics and Biology*, 74, 62–64.
<https://doi.org/10.1016/j.fgb.2014.11.004>

Begerow, D., Bauer, R., Boekhout, T. (2000). Phylogenetic placements of

ustilaginomycetous anamorphs as deduced from nuclear LSU rDNA sequences. *Mycological Research*, 104, 53–60. <https://doi.org/10.1017/S0953756299001750>

Bernicchia, A., & Gorjón, S. P. (2010). *Corticaceae s.l. Fungi Europaei Vol. 12*. Edizioni Candusso, Alassio, Italy.

Bian, C., Kusuya, Y., Sklenář, F., et al. (2022) Reducing the number of accepted species in *Aspergillus* series *Nigri*. *Studies in Mycology*, 102, 95-132. doi: 10.3114/sim.2022.102.03.

Bills, G. F., Collado, J., & Pelaez, F. (2004). Species of *Hormonema* and *Hormiscium* isolated from conifer endophytes: Correlation of morphology and rDNA sequences. *Mycologia*, 96, 607–627.

Bing-Da Sun, Y. G. Z., Chen, A. J., Hoybraken, J. (2019). Phylogeny and a new species of the genus *Arachnomyces* (Arachnomycetaceae). *Phytotaxa*, 394, 089-097.

Biota of NZ. *Hirsutella saussurei* (Cooke) Speare — synonym of *Ophiocordyceps humbertii*.

Blackwell, M. (2011). The fungi: 1, 2, 3 ... 5.1 million species? *American Journal of Botany*, 98, 426–438. <https://doi.org/10.3732/ajb.1000298>

Boekhout, T. (1995). *Pseudozyma Bandoni* emend. Boekhout, a genus for yeast-like anamorphs of Ustilaginales. *Journal of General and Applied Microbiology*, 41, 359–366. <https://doi.org/10.2323/jgam.41.359>

Boekhout, T., Amend, A. S., El Baidouri, F., et al. (2022). Trends in yeast diversity

discovery. *Fungal Diversity*, 114, 491-537. <https://doi.org/10.1007/s13225-021-00494-6>

Brown, E. M., McTaggart, L. R., Zhang, S. X., et al. (2013). Phylogenetic analysis reveals a cryptic species *Blastomyces gilchristii* sp. nov. within the human pathogenic fungus *Blastomyces dermatitidis*. *PLoS ONE*, 8, e59237. <https://doi.org/10.1371/journal.pone.0059237>

Cabral, A., Rego, C., Nascimento, T., et al. (2012). Multi-gene phylogeny and morphological characterization of *Cylindrocarpon*-like species associated with black foot disease of grapevines. *Fungal Biology*, 116, 747–766. <https://doi.org/10.1016/j.funbio.2012.04.006>

Cairns, T. C., Nai, C., & Meyer, V. (2018). How a fungus shapes biotechnology: 100 years of *Aspergillus niger* research. *Fungal Biology and Biotechnology*, 5, 13. <https://doi.org/10.1186/s40694-018-0054-5>

Cannon, P. F. (1986). A revision of *Achaetomium*, *Achaetomiella* and *Subramaniula*, and some similar species of *Chaetomium*. *Transactions of the British Mycological Society*, 87, 45–76.

Cannon, P. F., Damm, U., Johnston, P. R., et al. (2012). *Colletotrichum* – current status and future directions. *Studies in Mycology*, 73, 181–213. <https://doi.org/10.3114/sim0014>

Cano, J., Sagués, M., Barrio, E., et al. (2002). Molecular taxonomy of *Aphanoascus* and description of two new species from soil. *Studies in Mycology*, 47, 153–164.

Cano, J., Ulfig, K., Guillamon, J. M., et al. (1997). Studies on keratinophilic fungi. IX:

Neoarachnotheca gen. nov. and a new species of Nannizziopsis. *Antonie van Leeuwenhoek*, 72, 149–158. <https://doi.org/10.1023/A:1000394118040>

Chang, P. K., & Ehrlich, K. C. (2010). What does genetic diversity of *Aspergillus flavus* tell us about *Aspergillus oryzae*? *International Journal of Food Microbiology*, 138, 189–199. <https://doi.org/10.1016/j.ijfoodmicro.2010.01.033>

Chaverri, P., Salgado, C., Hirooka, Y., et al. (2011). Delimitation of *Nectria* and similar genera of the Nectriaceae, Hypocreales, using multigene phylogenetic analyses and morphology. *Mycologia*, 103, 209–227. <https://doi.org/10.3852/10-144>

Chen, A. J., Hubka, V., Frisvad, J. C., et al. (2017). Polyphasic taxonomy of *Aspergillus* section *Aspergillus* (formerly *Eurotium*), and its occurrence in indoor environments and food. *Studies in Mycology*, 88, 37-135. <https://doi.org/10.1016/j.simyco.2017.07.001>.

Chowdhary, A., Singh, A., Singh, P. K., et al. (2019). Perspectives on misidentification of *Trichophyton interdigitale*/*Trichophyton mentagrophytes* using internal transcribed spacer region sequencing: Urgent need to update the sequence database. *Mycoses*, 62, 11–15. <https://doi.org/10.1111/myc.12865>

Chuang, W. Y., Lin, Y. C., Shrestha, B., et al. (2024). Phylogenetic diversity and morphological characterization of cordycipitaceous species in Taiwan. *Studies in Mycology*, 109, 6–61. <https://doi.org/10.3114/sim.2024.109.01>

Čmoková, A., Kolařík, M., Guillot, J., et al. (2022). Host-driven subspeciation in the hedgehog fungus, *Trichophyton erinacei*, an emerging cause of human dermatophytosis. *Persoonia*, 48, 203–218.

<https://doi.org/10.3767/persoonia.2022.48.06>

COGEM (2024). Actualisatie van de pathogeniteitsclassificatielijsten met apathogene en pathogene schimmelsoorten (2024). COGEM-advies CGM/241205-01.

Crous, P. W., Lombard, L., Sandoval-Denis, M., et al. (2021). *Fusarium*: More than a node or a foot-shaped basal cell. *Studies in Mycology*, 98, 100116.

<https://doi.org/10.1016/j.simyco.2021.100116>

Crous, P. W., Slippers, B., Wingfield, M. J., et al. (2006). Phylogenetic lineages in the *Botryosphaeriaceae*. *Studies in Mycology*, 55, 235–253. <https://doi.org/10.3114/sim.55.1.235>

Crous, P. W., Schubert, B., Groenewald, J. Z., et al. (2007).

Delimiting *Cladosporium* from morphologically similar genera. *Studies in Mycology*, 58, 1-24. <https://doi.org/10.3114/sim.2007.58.02>

Currah, R. S. (1985). Taxonomy of the Onygenales: *Arthrodermataceae*, *Gymnoascaceae*, *Myxotrichaceae*, and *Onygenaceae*. *Mycotaxon*, 24, 1–216.

Damm, U., Fourie, P.H., Crous, P.W., 2010. *Coniochaeta* (*Lecythophora*), *Collophora* gen. nov. and *Phaeomoniella* species associated with wood necroses of *Prunus* trees. *Persoonia*, 24, 60-80. <https://doi.org/10.3767/003158510X500705>

de Beer, Z. W., Wingfield, B. D., Wingfield, M. J. (2003). The *Ophiostoma piceae* complex in the Southern Hemisphere: A phylogenetic study. *Mycological Research*, 107, 469–476. <https://doi.org/10.1017/s0953756203007445>

de Beer, Z. W., & Wingfield, M. J. (2013). Emerging lineages in the *Ophiostomatales*.

In K. A. Seifert, Z. W. De Beer, M. J. Wingfield (Eds.), *Ophiostomatoid fungi: Expanding frontiers*. CBS Biodiversity Series, 12, 21-46.

de Hoog, G. S., & Smith, M. Th. (2004). Ribosomal gene phylogeny and species delimitation in *Geotrichum* and its teleomorphs. *Studies in Mycology*, 50, 489–515.

de Hoog, G. S., Adelman, D., Ahmed, A. O., et al. (2004). Phylogeny and typification of *Madurella mycetomatis*, with a comparison of other agents of eumycetoma. *Mycoses*, 47, 121–130. <https://doi.org/10.1111/j.1439-0507.2004.00964.x>

de Hoog, G. S., Dukik, K., Monod, M., et al. (2017). Toward a novel multilocus phylogenetic taxonomy for the dermatophytes. *Mycopathologia*, 182, 5–31. <https://doi.org/10.1007/s11046-016-0073-9>

de Hoog, G. S., Guarro, J., Gené, J., et al. (2020). *Atlas of Clinical Fungi*, 4th Ed. Foundation Atlas of Clinical Fungi, Hilversum, The Netherlands, pp. 1500.

de Hoog, G. S., Redhead, S. A., Feng, P., et al. (2016). Proposals to conserve *Blastomyces* Gilchrist & W. R. Stokes against *Blastomyces* Costantin & Rolland and *Ajellomycetaceae* against *Paracoccidioidaceae* (Ascomycota: Onygenales). *Taxon*, 65, 1167–1169.

de Hoog, G. S., Vicente, V. A., Caligiorno, R. B., et al. (2000). Species diversity and polymorphism in the *Exophiala spinifera* clade containing opportunistic black yeast-like fungi. *Studies in Mycology*, 45, 1–24.

de Vries, R. P., Riley, R., Wiebenga, A., et al. (2020). Comparative genomics reveals high biological diversity and specific adaptations in the industrially and medically

important fungal genus *Aspergillus*. *Genome Biology*, 21, 142.

<https://doi.org/10.1186/s13059-020-02000-9>

Dean, R., van Kan, J. A. L., Pretorius, Z. A., et al. (2012). The top 10 fungal pathogens in molecular plant pathology. *Molecular Plant Pathology*, 13, 414–430.

<https://doi.org/10.1111/j.1364-3703.2011.00783.x>

Decock, C., Delgado-Rodríguez, G., Buchet, S., et al. (2003). A new species and three new combinations in *Cyphellophora*, with a note on the taxonomic affinities of the genus, and its relation to *Kumbhamaya* and *Pseudomicrodochium*. *Antonie van Leeuwenhoek*, 84, 209–216. <https://doi.org/10.1023/a:1026015031851>

Dolatabadi, S., Walther, G., Gerrits van den Ende, A. H. G., et al. (2014). Diversity and delimitation of *Rhizopus microsporus*. *Fungal Diversity*, 64, 145–163.

<https://doi.org/10.1007/s13225-013-0229-6>

Douglass, A. P., Offei, B., Braun-Galleani, S., et al. (2018). Population genomics shows no distinction between pathogenic *Candida krusei* and environmental *Pichia kudriavzevii*: One species, four names. *PLoS Pathogens*, 14, e1007138.

<https://doi.org/10.1371/journal.ppat.1007138>

Druzhinina, I. S., Kubicek, C. P. (2005). Species concepts and biodiversity in *Trichoderma* and *Hypocrea*: from aggregate species to species clusters. *Journal of Zhejiang University Science B*, 6, 100–112. <https://doi.org/10.1631/jzus.2005.B0100>

Dukik, K., De Hoog, G. S., Stielow, J. B., et al. (2020). Molecular and phenotypic characterization of *Nannizzia* (Arthrodermataceae). *Mycopathologia*, 185, 9–35.

<https://doi.org/10.1007/s11046-019-00336-9>

Dukik, K., Freeke, J., Jamalain, A., et al. (2018). Ultra-high-resolution mass spectrometry for identification of closely related dermatophytes. *Journal of Clinical Microbiology*, 56, e00102-18. <https://doi.org/10.1128/JCM.00102-18>

Feng, P., Lu, Q., Najafzadeh, M. J., et al. (2014). Cyphellophora and its relatives in Phialophora: Biodiversity and possible role in human infection. *Fungal Diversity*, 65, 17–45. <https://doi.org/10.1007/s13225-012-0194-5>

Fisher, M. C., Gurr, S. J., Cuomo, C. A., et al. (2020). Threats posed by the fungal kingdom to humans, wildlife, and agriculture. *mBio*, 11, e00449–20. <https://doi.org/10.1128/mBio.00449-20>

Fisher, M. C., Henk, D. A., Briggs, et al. (2012). Emerging fungal threats to animal, plant, and ecosystem health. *Nature*, 484, 186–194. <https://doi.org/10.1038/nature10947>

Fries, E. (1821). *Systema Mycologicum* Vol. 1, 1-520.

Frisvad, J. C., Hubka, V., Ezekiel, C. N., et al. (2019). Taxonomy of *Aspergillus* section *Flavi* and their production of mycotoxins. *Studies in Mycology*, 93, 1–63. <https://doi.org/10.1016/j.simyco.2018.06.001>

Gams, W. (1971). *Cephalosporium-artige schimmelpilze (Hyphomycetes)*. Gustav Fischer Verlag, Jena.

Gams, W. (2015). An ex-type culture cannot always tell the ultimate truth. *IMA Fungus*, 6, A69. <https://doi.org/10.1007/BF03449357>

Geiser, D. M., Aoki, T., Bacon, C. W., et al. (2013). One fungus, one name: Defining

the genus *Fusarium* in a scientifically robust way that preserves longstanding use. *Phytopathology*, 103, 400–408. <http://dx.doi.org/10.1094/PHTO-07-12-0150-LE>

Gibas, C. F. C., Sigler, L., Summerbell, R. C., & Currah, R. S. (2002). Phylogeny of the genus *Arachnomyces* and its anamorphs and the establishment of *Arachnomycetales*, a new eurotiomycete order in the Ascomycota. *Studies in Mycology*, 47, 131-139.

Gilgado, F., Gené, J., Cano, J., et al. (2008). Molecular phylogeny of the *Pseudallescheria boydii* species complex: proposal of two new species. *Journal of Clinical Microbiology*, 46, 684–689. <https://doi.org/10.1128/jcm.01122-07>

Gilgado, F., Gené, J., Cano, J., et al. (2010). Heterothallism in *Scedosporium apiospermum* and description of its teleomorph *Pseudallescheria apiosperma* sp. nov., *Medical Mycology*, 48, 122–128, <https://doi.org/10.3109/13693780902939695>

Giraldo, A., Gené, J., Sutton, D. A., et al. (2014). Phylogenetic circumscription of *Arthrographis* (Eremomycetaceae, Dothideomycetes). *Persoonia*, 32, 102–114. <https://doi.org/10.3767/003158514X680207>

Glässnerová, K., Sklenář, F., Jurjević, Ž., et al. (2022). A monograph of *Aspergillus* section *Candidi*. *Studies in Mycology*, 102, 1-51. doi: 10.3114/sim.2022.102.01.

Gräfenhan, T., Schroers, H. J., Nirenberg, H.I., et al. (2011). An overview of the taxonomy, phylogeny, and typification of nectriaceous fungi in *Cosmospora*, *Acremonium*, *Fusarium*, *Stilbella*, and *Volutella*. *Stud Mycol.* 68, 79-113. doi: 10.3114/sim.2011.68.04.

Gräser, Y., El Fari, M., Vilgalys, R., et al. (1999b). Phylogeny and taxonomy of the family Arthrodermataceae (dermatophytes) inferred from ITS and 28S ribosomal DNA sequence analyses. *Journal of Medical and Veterinary Mycology*, 37, 291–303. <https://doi.org/10.1080/02681219980000311>

Gräser, Y., Kühnisch, J., & Presber, W. (2006). Molecular taxonomy of the *Trichophyton mentagrophytes* complex. *Journal of Clinical Microbiology*, 44, 3329–3337. <https://doi.org/10.1128/JCM.00688-06>

Gräser, Y., Kuijpers, A. F. A., El Fari, M., et al. (2000b). Molecular and conventional taxonomy of the *Microsporum canis* complex. *Medical Mycology*, 38, 143–153. <https://doi.org/10.1080/mmy.38.2.143.153>

Gräser, Y., Kuijpers, A. F. A., Presber, W., et al. (1999a). Molecular taxonomy of *Trichophyton mentagrophytes* and *T. tonsurans*. *Medical Mycology*, 37, 315–330. <https://doi.org/10.1046/j.1365-280X.1999.00234.x>

Gräser, Y., Kuijpers, A. F. A., Presber, W., et al. (2000a). Molecular taxonomy of the *Trichophyton rubrum* complex. *Journal of Clinical Microbiology*, 38, 3329–3336. <https://doi.org/10.1128/jcm.38.9.3329-3336.2000>

Grobbelaar, J. W., de Beer, Z. W., Bloomer, P., et al. (2009). Delimitation of *Ophiostoma quercus* and its synonyms using multiple gene phylogenies. *Mycological Progress*, 8, 221-236. DOI: 0.1007/s11557-009-0594-4

Gryganskyi, A. P., Humber, R. A., Smith, M. E., et al. (2012). Molecular phylogeny of the Entomophthoromycota. *Molecular Phylogenetics and Evolution*, 65, 682-694. <https://doi.org/10.1016/j.ympev.2012.07.026>

Guarro, J., Gené, J., & Stchigel, A. M. (1999). Developments in fungal taxonomy. *Clinical microbiology reviews*, 12, 454-500. <https://doi.org/10.1128/cmr.12.3.454>

Hagen, F., Khayhan, K., Theelen, B., et al. (2015). Recognition of seven species in the *Cryptococcus gattii*/*Cryptococcus neoformans* species complex. *Fungal Genetics and Biology*, 78, 16–48. <https://doi.org/10.1016/j.fgb.2015.02.009>

Hagen, F., Walther, G., Houbraeken, et al. (2023). Molecular taxonomy. In D. R. Hospenthal et al. (Eds.), *Diagnosis and treatment of fungal infections*, Chapter 3. Springer, 31-60. https://doi.org/10.1007/978-3-031-35803-6_3

Hainsworth, S., Kučerová, I., Sharma, R., et al. (2021) Three-gene phylogeny of the genus *Arthroderma*: Basis for future taxonomic studies. *Medical Mycology*, 59, 355-365. doi: 10.1093/mmy/myaa057.

Hao, Y., Aluthmhandiram, J. V. S., Chethana, K. W. T., et al. (2020). *Nigrospora* species associated with various hosts from Shandong Peninsula, China. *Mycobiology*, 48, 169–183. <https://doi.org/10.1080/12298093.2020.1761747>

Harish, J., Jambhulkar, P. P., Bajpai, R., et al. (2023). Morphological characterization, pathogenicity screening, and molecular identification of *Fusarium* spp. isolates causing post-flowering stalk rot in maize. *Frontiers in Microbiology*, 14, 1121781. <https://doi.org/10.3389/fmicb.2023.1121781>

Harrington, T. C., McNew, D., Steimel, J., et al. (2001). Phylogeny and taxonomy of the *Ophiostoma piceae* complex and the Dutch elm disease fungi. *Mycologia*, 93, 111–136. <https://hdl.handle.net/10289/4723>

Hawksworth, D. L. (1979). Ascospore sculpturing and generic concepts in the

Testudinaceae. *Canadian Journal of Botany*, 57, 91–99. <https://doi.org/10.1139/b79-01>

Hawksworth, D. L. (1991). The fungal dimension of biodiversity: Magnitude, significance, and conservation. *Mycological Research*, 95, 641–655. [https://doi.org/10.1016/S0953-7562\(09\)80810-1](https://doi.org/10.1016/S0953-7562(09)80810-1)

Hawksworth, D. L. (2011). A new dawn for the naming of fungi: Impacts of decisions made in Melbourne in July 2011 on the future publication and regulation of fungal names. *MycoKeys* 1, 7-20. <https://doi.org/10.3897/mycokeys.1.2062>

Hawksworth, D. L., & Booth, C. (1974). A revision of the genus *Zopfia* Rabenh. *Mycological Papers*, 137, 1–37. [https://doi.org/10.1016/s0007-1536\(75\)80134-3](https://doi.org/10.1016/s0007-1536(75)80134-3).

Hawksworth, D. L., & Lücking, R. (2017). Fungal diversity revisited: 2.2 to 3.8 million species. *Microbiology Spectrum*, 5, 10.1128/microbiolspec.funk-0052-2016. <https://doi.org/10.1128/microbiolspec.FUNK-0052-2016>

Hawksworth, D. L., Crous, P. W., Redhead, S. A., et al. (2011). The Amsterdam Declaration on Fungal Nomenclature. *IMA Fungus*, 2, 105–112. <https://doi.org/10.5598/imafungus.2011.02.01.14>.

Hedayati, M. T., Taghizadeh-Armaki, M., Zarrinfar, H., et al. (2019). Discrimination of *Aspergillus flavus* from *A. oryzae* by MALDI-TOF MS. *Mycoses*, 62, 1182–1188. <https://doi.org/10.1111/myc.13010>

Hernández-Restrepo, M., Bezerra, J.D.P., Tan, Y.P., et al. (2019). Re-evaluation of *Mycoleptodiscus* species and morphologically similar fungi. *Persoonia*, 42, 205-227. doi: 10.3767/persoonia.2019.42.08.

Hernandez-Restrepo, M., Madrid, H., Tan, Y. P., et al. (2018). Multi-locus phylogeny and taxonomy of *Exserohilum*. *Persoonia*, 41, 71–108.

DOI: 10.3767/persoonia.2018.41.05

Hittinger, C. T., Rokas, A., Bai, F.-Y., et al. (2015). Genomics and the making of yeast biodiversity. *Current Opinion in Genetics & Development*, 35, 100–109.

<https://doi.org/10.1016/j.gde.2015.10.008>

Hjortstam, K., & Ryvarde, L. (2010). *Phanerodontia* and *Phaneroites*, two corticioid taxa (Basidiomycotina) proposed from tropical areas. *Synopsis Fungorum*.

<https://doi.org/10.1016/B978-0-12-372180-8.50042-1.27>, 26–33

Horré, R., de Hoog, G. S., Kluczny, C., et al. (1999). rDNA diversity and physiology of *Ochroconis* and *Scolecobasidium* species reported from humans and other sources. *Studies in Mycology*, 43, 194–205.

Hou, L. W., Giraldo, A., Groenewald, J. Z., et al. (2023). Redisposition of acremonium-like fungi in Hypocreales. *Studies in Mycology*, 105, 23–203.

<https://doi.org/10.3114/sim.2023.105.02>

Houbraken, J., Kocsubé, S., Visagie, et al. (2020). Classification of *Aspergillus*, *Penicillium*, *Talaromyces* and related genera (Eurotiales): An overview of families, genera, subgenera, sections, series and species. *Studies in Mycology* 95, 5-169. doi: 10.1016/j.simyco.2020.05.002.

Hubka, V., Kolarík, M., Kubatova, A., et al. (2013). Taxonomical revision of *Eurotium* and transfer of species to *Aspergillus*. *Mycologia*, 105, 912–937.

<https://doi.org/10.3852/12-151>

Hui, Y. H., Meunier-Goddik, L., Hansen, Å. S., et al. (2004). Handbook of Food and Beverage Fermentation Technology. CRC Press, 1-1000.

Hyde, K.D. (2022). The numbers of fungi. *Fungal Diversity* 114, 1.
<https://doi.org/10.1007/s13225-022-00507-y>

Jagielski, T., Sandoval-Denis, M., Yu, J., et al. (2016) Molecular taxonomy of Scopulariopsis-like fungi with description of new clinical and environmental species. *Fungal Biology*, 120, 586-602. doi: 10.1016/j.funbio.2016.01.014.

Jiang, Y., Dukik, K., Muñoz, J. F., et al. (2018). Phylogeny, ecology and taxonomy of systemic pathogens and their relatives in Ajellomycetaceae (Onygenales): Blastomyces, Emergomyces, Emmonsia, Emmonsiiellopsis. *Fungal Diversity*, 90, 245–291. <https://doi.org/10.1007/s13225-018-0403-y>

Ju, Y.-M., Hsieh, H.-M., & Dominick, S. (2016). The Xylaria names proposed by C. G. Lloyd. *North American Fungi*, 11, 1–31. <http://dx.doi:10.2509/naf2016.011.001>

Kandemir, H., Dukik, K., de Melo Teixeira, M., et al. (2022). Phylogenetic and ecological reevaluation of the order Onygenales. *Fungal Diversity*, 115, 1–72.
<https://doi.org/10.1007/s13225-022-00506-z>

Kandemir, H., Dukik, K., Hagen, F., et al. (2020). Polyphasic discrimination of *Trichophyton tonsurans* and *T. equinum*. *Mycopathologia*, 185, 113–122.
<https://doi.org/10.1007/s11046-019-00344-9>

Kano, R., Kimura, U., Kakurai, M., et al. (2020). *Trichophyton indotineae* sp. nov.: A terbinafine-resistant anthropophilic dermatophyte. *Mycopathologia*, 185, 947–958.
<https://doi.org/10.1007/s11046-020-00455-8>

Kepler, R. M., Luangsa-Ard, J. J., Hywel-Jones, N. L., et al. (2017). A phylogenetically based nomenclature for Cordycipitaceae (Hypocreales). *IMA Fungus*, 8, 335–353. doi: 10.5598/imafungus.2017.08.02.08.

Khan, Z., Gené, J., Ahmad, S., et al. (2013). *Coniochaeta polymorpha*, a new species from endotracheal aspirate of a preterm neonate, and transfer of *Lecythophora* species to *Coniochaeta*. *Antonie van Leeuwenhoek*, 104, 243-52. doi: 10.1007/s10482-013-9943-z.

Khonsanit, A., Thanakitpipattana, D., Mongkolsamrit, S., et al. (2024). A phylogenetic assessment of *Akanthomyces sensu lato* in Cordycipitaceae (Hypocreales, Sordariomycetes): Introduction of new genera and the resurrection of *Lecanicillium*. *Fungal Systematics and Evolution*, 14, 271–306.
<https://doi.org/10.3114/fuse.2024.14.17>

Kidd, S. E., Westblade, L. F. (2024). *Bipolaris* or *Curvularia*? Resolving the spicy issue of how clinical isolates should be reported. *PLoS Pathogens*, 20, e1012678.
<https://doi.org/10.1371/journal.ppat.1012678>

Kirk, P. M. (2012). *Index Fungorum: A global fungal names index*. Royal Botanic Gardens, Kew.

Kirk, P.M., Stalpers, J.A., Braun, U., et al. (2013). A without-prejudice list of generic names of fungi for protection under the International Code of Nomenclature for algae, fungi, and plants. *IMA Fungus*, 4, 381-443. doi: 10.5598/imafungus.2013.04.02.17.

Klein, B. S., Vergeront, J. M., Weeks, R. J., et al. (1986). Isolation of *Blastomyces*

dermatitidis in soil associated with a large outbreak of blastomycosis in Wisconsin. *New England Journal of Medicine*, 314, 529–534.
DOI: 10.1056/NEJM198602273140901

Komagata, K., Nakase, T., Katsuya, N. (1964). Assimilation of hydrocarbons by yeasts II. determination of hydrocarbon-assimilating yeasts. *The Journal of General and Applied Microbiology*, 10, 323-331. <https://doi.org/10.2323/jgam.10.323>

Krüger, M., Krüger, C., Walker, C., et al. (2012). Phylogenetic reference data for systematics and phylotaxonomy of arbuscular mycorrhizal fungi from phylum to species level. *New Phytologist*, 193, 970–984.
<https://doi.org/10.1111/j.1469-8137.2011.03962.x>

Kurtzman, C. P., Robnett, C. J. (2003). Phylogenetic relationships among yeasts of the “*Saccharomyces* complex” determined from multigene sequence analyses. *FEMS Yeast Research*, 3, 417–432. [https://doi.org/10.1016/S1567-1356\(03\)00012-6](https://doi.org/10.1016/S1567-1356(03)00012-6)

Kurtzman, C. P., Robnett, C. J. (2010). Systematics of methanol-assimilating yeasts and neighboring taxa from multigene sequence analysis and the proposal of *Peterozyma* gen. nov., a new member of the *Saccharomycetales*. *FEMS Yeast Research*, 10, 353–361. <https://doi.org/10.1111/j.1567-1364.2010.00625.x>

Kurtzman, C. P., Boekhout, T., Fell, J. W. (2011). *The Yeasts: A taxonomic study* (5th ed., 3 vols.). Elsevier, 1-2079.

Kurtzman, C. P., Robnett, C. J., Basehoar-Powers, E. (2008). Phylogenetic relationships among species of *Pichia*, *Issatchenkia*, and *Williopsis* determined from multigene sequence analysis, and the proposal of *Barnettozyma* gen. nov., *Lindnera* gen. nov., and *Wickerhamomyces* gen. nov. *FEMS Yeast Research*, 8, 939–954.

<https://doi.org/10.1111/j.1567-1364.2008.00419.x>

Lackner, M., de Hoog, G. S. (2011). *Scedosporium* spp.: Emerging agents of systemic disease. *Journal of Invasive Fungal Infections*, 5, 43-47.

Lackner, M., de Hoog, G. S., Yang, L., et al. (2014). Proposed nomenclature for *Pseudallescheria*, *Scedosporium*, and related genera. *Fungal Diversity*, 67, 1–10.
<https://doi.org/10.1007/s13225-014-0295-4>

Lee, J. S., Ko, K. S., Jung, H. S. (2000). Phylogenetic analysis of *Xylaria* based on nuclear ribosomal ITS1–5.8S–ITS2 sequences. *FEMS Microbiology Letters*, 187, 89–93. <https://doi.org/10.1111/j.1574-6968.2000.tb09142.x>

Li, Y., Xiao, J., de Hoog, G. S., et al. 2017). Biodiversity and human pathogenicity of *Phialophora verrucosa* and relatives in Chaetothyriales. *Persoonia*, 38, 1–19.
<https://doi.org/10.3767/003158517X692779>

Lieckfeldt, E., Samuels, G.J., Nirenberg, H.I., et al. (1999). A Morphological and Molecular Perspective of *Trichoderma viride*: Is It One or Two Species? *Applied and Environmental Microbiology* 65, 2418-2428. <https://doi.org/10.1128/AEM.65.6.2418-2428.1999>

Linder, K. A., Kauffman, C. A., Miceli, M. H. (2023). Blastomycosis: A review of mycological and clinical aspects. *Journal of Fungi*, 9, 117.
<https://doi.org/10.3390/jof9010117>

Liu, F., Hu, Z. D., Yurkov, A., et al. (2024). Saccharomycetaceae: Delineation of fungal genera based on phylogenomics. *Persoonia*, 52, 1–21.
<https://doi.org/10.3767/persoonia.2024.52.01>

Liu, J., Sui, Y., Wisniewski, M., et al. (2013). Utilization of antagonistic yeasts to manage postharvest fungal diseases of fruit. *International Journal of Food Microbiology*, 167, 153–160. <https://doi.org/10.1016/j.ijfoodmicro.2013.09.004>

Liu, X. X., Huang, H., Zheng, R. Y. (2001). Relationships within *Cunninghamella* based on sequence analysis of its rDNA. *Mycotaxon*, 87, 541–544.

Liu, X. Z., Wang, Q. M., Göker, M., et al. (2015). Towards an integrated phylogenetic classification of the Tremellomycetes. *Studies in Mycology*, 81, 85–147. <https://doi.org/10.1016/j.simyco.2015.12.001>

Lombard, L., Houbraken, J., Decock, C., et al. (2016). Generic hyper-diversity in Stachybotriaceae. *Studies in Mycology*, 85, 1–20. <https://pmc.ncbi.nlm.nih.gov/articles/PMC4988370/>

Lombard, L., van der Merwe, N. A., Groenewald, J. Z., et al. (2015). Generic concepts in Nectriaceae. *Studies in Mycology*, 80, 189–245. <https://doi.org/10.1016/j.simyco.2014.12.002>

Lorenzini, M., Cappello, M. S., Logrieco, A., et al. (2016). Polymorphism and phylogenetic species delimitation in fungi from withered grapes. *International Journal of Food Microbiology*, 238, 56–62. <https://doi.org/10.1016/j.ijfoodmicro.2016.08.039>

Lu, X. L., Najafzadeh, M. J., Dolatabadi, S., et al. (2013). Taxonomy and Epidemiology of *Mucor irregularis*, agent of chronic cutaneous mucormycosis. *Persoonia*, 30, 48-56. doi: 10.3767/003158513X665539.

Lücking, R., Aime, M. C., Robbertse, B., et al. (2020). Unambiguous identification of

fungi: Where do we stand and how accurate and precise is fungal DNA barcoding?

IMA Fungus, 11, 14. <https://doi.org/10.1186/s43008-020-00033-z>

Lücking, R., Aime, M. C., Robbertse, B., et al. (2021). Fungal taxonomy and sequence-based nomenclature. *Nature Microbiology*, 6, 540–548.

<https://doi.org/10.1038/s41564-021-00888-x>

Magan, N., Aldred, D. (2007). Post-harvest control strategies: Minimizing mycotoxins in the food chain. *International Journal of Food Microbiology*, 119, 131–139.

<https://doi.org/10.1016/j.ijfoodmicro.2007.07.034>

Manamgoda, D. S., Cai, L., McKenzie, E. H. C., et al. (2012). A phylogenetic and taxonomic re-evaluation of the *Bipolaris* – *Cochliobolus* – *Curvularia* complex.

Fungal Diversity, 56, 131–144. <https://doi.org/10.1007/s13225-012-0189-2>

Mapengo, R. E., Maphanga, T. G., Jofre, G. I., et al. (2025). Genomic epidemiology of *Histoplasma* in Africa. *mBio*, e00564–25. <https://doi.org/10.1128/mbio.00564-25>

Marín-Felix, Y., Stchigel, A. M., Miller, A. N., et al. (2015). Re-evaluation of *Myceliophthora* (Sordariales): Segregation into four genera. *Mycologia*, 107, 619–632. <https://doi.org/10.3852/14-228>

Matsumoto, T., Padhye, A. A., Ajello, L. (1983). Successful mating of *Microsporum distortum* with *Nannizzia otae*. *Transactions of the British Mycological Society*, 81, 645–650. [https://doi.org/10.1016/S0007-1536\(83\)80144-2](https://doi.org/10.1016/S0007-1536(83)80144-2)

McGinnis, M. R., Sigler, L., Rinaldi, M. G. (1999). Some medically important fungi and their common synonyms and names of uncertain application. *Clinical Infectious Diseases*, 29, 728–730.

McNeill, J., Barrie, F. R., Buck, W. R., et al. (2012). International Code of Nomenclature for algae, fungi, and plants (Melbourne Code) (Regnum Vegetabile 154). Koeltz Scientific Books.

Mead, M. E., Raja, H. A., Steenwyk, J. L., et al. (2019). Draft genome sequence of the griseofulvin-producing fungus *Xylaria flabelliformis* strain G536. *Microbiology Resource Announcements*, 8, e00890-19. <https://doi.org/10.1128/MRA.00890-19>

Mendoza, L., Vilela, R., (2024). Current taxonomic status of the cultivable and uncultivable *Paracoccidioides* species. *Medical Mycology*, 62, myae108. doi: 10.1093/mmy/myae108

Meyer, V., Wu, B., Ram, A. F. J. (2011). *Aspergillus* as a versatile cell factory for organic acids, proteins and secondary metabolites. *Fungal Biology and Biotechnology*, 8, 1–12. <https://doi.org/10.1186/s40694-021-00100-5>

Miettinen, O., Rajchenberg, M. (2012). *Obba* and *Sebipora*, new polypore genera related to *Cinereomyces* and *Gelatoporia* (Polyporales, Basidiomycota). *Mycological Progress*, 11, 131–147. <https://doi.org/10.1007/s11557-010-0736-8>

Miettinen, O., Spirin, V., Vlasák, J., et al. (2016). Polypores and genus concepts in *Phanerochaetaceae* (Polyporales, Basidiomycota). *MycKeys*, 17, 1–46. doi: 10.3897/mycokeys.17.10153

Min, C., Zeng, J., de Hoog, G. S., et al. (2016). The “species complex” issue in clinically relevant fungi: A case study in *Scedosporium apiospermum*. *Fungal Biology*, 120, 137–146. <https://doi.org/10.1016/j.funbio.2015.09.003>

Moreno, G., Blanco, M.-N., Checa, J., et al. (2011). Taxonomic and phylogenetic

revision of three rare irpicoid species within the Meruliaceae. *Mycological Progress*, 10, 481–491. <https://doi.org/10.1007/s11557-010-0717-y>

Mouchacca, J. (2004). Novel fungal taxa from the arid Middle East (1940–2000): Omissions from previous notes. *Cryptogamie Mycologie*, 25, 149–171.

Nasr, S., Bien, S., Soudi, M. R., et al. (2018). Novel Collophorina and Coniochaeta species from *Euphorbia polycaulis*, an endemic plant in Iran. *Mycological Progress*, 17, 755–771. <https://doi.org/10.1007/s11557-018-1382-9>

Nevalainen, H., Peterson, R., Penttilä, M. (2005). New developments in the production of industrial enzymes with *Trichoderma reesei*. *Current Opinion in Biotechnology*, 16, 447–453. <https://doi.org/10.1016/j.copbio.2005.04.006>

Nguyen, T. T. T., Choi, Y. J., Lee, H. B. (2017). Isolation and characterization of three unrecorded zygomycete fungi in Korea: *Cunninghamella bertholletiae*, *C. echinulata*, and *C. elegans*. *Mycobiology*, 45, 318–326.
<https://doi.org/10.5941/MYCO.2017.45.4.318>

Norvell, L. L. (2011). Fungal nomenclature. *Mycotaxon*, 116, 1–8.

O'Donnell, K., Al-Hatmi, A. M. S., Aoki, T., et al., (2020). No to *Neocosmospora*: Phylogenomic and practical reasons for continued inclusion of the *Fusarium solani* species complex in the genus *Fusarium*. *mSphere*, 5, e00810–20.
<https://doi.org/10.1128/mSphere.00810-20>

O'Donnell, K., Rooney, A. P., Proctor, R. H., et al. (2013). Phylogenetic analyses of RPB1 and RPB2 support a middle Cretaceous origin for a clade comprising all agriculturally and medically important *Fusaria*. *Fungal Genetics and Biology*, 52,

20–31. <https://doi.org/10.1016/j.fgb.2012.12.004>

Padhye, A. A., Ajello, L. (1977). The taxonomic status of the hedgehog fungus *Trichophyton erinacei*. *Sabouraudia*, 15, 103–114.

Palm, M.E., Gams, W., Nirenberg, H.I. (1995). *Plectosporium*, a new genus for *Fusarium tabacinum*, the anamorph of *Plectosphaerella cucumerina*. *Mycologia* 87, 397-406. <https://doi.org/10.1080/00275514.1995.12026545>

Penev, L., Paton, A., Nicolson, N., et al. (2016). A common registration-to-publication automated pipeline for nomenclatural acts for higher plants (International Plant Names Index, IPNI), fungi (Index Fungorum, MycoBank), and animals (ZooBank). *ZooKeys*, 550, 233–246. <https://doi.org/10.3897/zookeys.550.9551>

Petkovits, T., Nagy, L. G., Hoffmann, K., et al. (2011). Data partitions, Bayesian analysis and phylogeny of the zygomycetous fungal family Mortierellaceae, inferred from nuclear ribosomal DNA sequences. *PLoS ONE*, 6, e27507. <https://doi.org/10.1371/journal.pone.0027507>

Phillips, A. J. L., Alves, A., Abdollahzadeh, J., et al. (2013). The Botryosphaeriaceae: Genera and species known from culture. *Studies in Mycology*, 76, 51–167. <https://doi.org/10.3114/sim0021>

Piątek, M., Lutz, M., Yorou, N. S. (2015). A molecular phylogenetic framework for *Anthracoystis* (Ustilaginales), including five new combinations (inter alia for the asexual *Pseudozyma flocculosa*), and description of *Anthracoystis grodzinskae* sp. nov. *Mycological Progress*, 14, 88. <https://doi.org/10.1007/s11557-014-1039-6>

Pitt, J. I., Hocking, A. D. (2009). *Fungi and Food Spoilage* (3rd ed.). Springer, pp. 519.

Pitt, J. I., Taylor, J. W. (2016). Proposal to conserve the name *Aspergillus* with a conserved type to maintain Eurotium. *Taxon*, 65, 631–632. Doi 10.12705/653.17

Pitt, J. I., Lantz, H., Pettersson, O. V., et al. (2013). *Xerochrysium* gen. nov. and *Bettsia*, genera encompassing xerophilic species of *Chrysosporium*. *IMA Fungus* 4, 229–241. <https://doi.org/10.5598/imafungus.2013.04.02.08>

Przybył, K. (1992). Some aspects on *Ophiostoma roboris* (syn. *O. querci*) studies. *Rocznik Arboretum Kórnickiego*, 37, 61–73

Rai, J. N., Tewari, J. P., Mukerji, K. G. (1964). *Aghaetomium*, a new genus of Ascomycetes. *Canadian Journal of Botany*, 42, 693–697.

Ram, D., Devi, T. P., Koti, P. S., et al. (2024). Exploring the taxonomic classification of *Curvularia* genera: Enhancing understanding of phytopathogenic species in Poaceae through morphological and molecular approaches. *Journal of Plant Pathology*, 106, 539–551. <https://doi.org/10.1007/s42161-023-01560-5>

Réblová, M., Miller, A. N., Rossman, A. Y., et al. (2016). Recommendations for competing sexual-asexually typified generic names in Sordariomycetes (except Diaporthales, Hypocreales, and Magnaporthales). *IMA Fungus*, 7, 131–153. <https://doi.org/10.5598/imafungus.2016.07.01.08>

Rezaei-Matehkolaei, A., Makimura, K., De Hoog, G. S., et al. (2012). Discrimination of *T. tonsurans* and *T. equinum* by PCR-RFLP and gene sequencing. *Medical Mycology*, 50, 760–764. <https://doi.org/10.3109/13693786.2012.661885>

Robert, V., Vu, D., Amor, A. B. H., et al. (2013). MycoBank gearing up for new horizons. *IMA Fungus*, 4, 371–379.

<https://doi.org/10.5598/ima fungus.2013.04.02.16>

Rodrigues, A. M., Beale, M. A., Hagen, F., et al. (2020). The global epidemiology of emerging *Histoplasma* species in recent years. *Studies in Mycology*, 97, 100095.

<https://doi.org/10.1016/j.simyco.2020.02.001>

Rogers, J. D. (1984). *Xylaria cubensis* and its anamorph *Xylocoremium flabelliforme*, *Xylaria allantoidea*, and *Xylaria poitei* in continental United States. *Mycologia*, 76, 912–923. <https://doi.org/10.1080/00275514.1984.12023929>

Roy, M., Benedict, K., Deak, E., et al. (2013). A large community outbreak of blastomycosis in Wisconsin with geographic and ethnic clustering. *Clinical Infectious Diseases*, 57, 655–662. <https://doi.org/10.1093/cid/cit366>

Ryvarden, L., Gilbertson, R. L. (1993). *European Polypores. Part 1. Abortiporus–Lindtneria*. *Fungiflora*, Oslo, 387 pp.

Saccante M, Woods GL. (2010). Clinical and laboratory update on Blastomycosis. *Clinical Microbiological Reviews* 23. <https://doi.org/10.1128/cmr.00056-09>

Samerpitak, K., Van der Linde, E., Choi, H. J., et al. (2014). Taxonomy of *Ochroconis*, a genus including opportunistic pathogens on humans and animals. *Fungal Diversity*, 65, 89–126. <https://doi.org/10.1007/s13225-013-0253-6>

Samson, R. A., Evans, H. C., Latgé, J. P. (1977). *Acremonium alabamense*, a new thermophilic species from soil. *Transactions of the British Mycological Society*, 69,

307–310. [https://doi.org/10.1016/S0007-1536\(77\)80074-9](https://doi.org/10.1016/S0007-1536(77)80074-9)

Samson, R.A., Hong, S., Peterson, S.W., et al. (2007). Polyphasic taxonomy of *Aspergillus* section *Fumigati* and its teleomorph *Neosartorya*. *Studies in Mycology*, 59, 147–203. doi: 10.3114/sim.2007.59.14.

Samson, R. A., Visagie, C. M., Houbraken, J., et al. (2014). Phylogeny and nomenclature of the genus *Aspergillus*. *Studies in Mycology*, 78, 141–173. <https://doi.org/10.1016/j.simyco.2014.07.004>

Samson, R. A., Yilmaz, N., Houbraken, J., et al. J. C. (2011). Phylogeny and nomenclature of the genus *Talaromyces* and taxa accommodated in *Penicillium* subgenus *Biverticillium*. *Studies in Mycology*, 70, 159–183. <https://doi.org/10.3114/sim.2011.70.04>

Sandoval-Denis, M., Gené, J., Sutton, D. A., et al. (2016). Redefining *Microascus*, *Scopulariopsis* and allied genera. *Persoonia*, 36, 1–36. doi: 10.3767/003158516X688027.

Sandoval-Denis, M., Sutton, D.A., Fothergill, A.W., et al. (2013). *Scopulariopsis*, a poorly known opportunistic fungus: spectrum of species in clinical samples and in vitro responses to antifungal drugs. *Journal of Clinical Microbiology*, 51, 3937–3943. <https://doi.org/10.1128/jcm.01927-13>

Scauftaire, J., Godet, M., Gourgue, M., et al. (2012). A multiplex real-time PCR method using hybridization probes for the detection and quantification of *Fusarium proliferatum*, *F. subglutinans*, *F. temperatum*, and *F. verticillioides*. *Fungal Biology*, 116, 1073–1080. <https://doi.org/10.1016/j.funbio.2012.07.011>

Schoch, C. L., Seifert, K. A., Huhndorf, S., et al. (2012). Nuclear ribosomal internal transcribed spacer (ITS) region as a universal DNA barcode marker for Fungi.

Proceedings National Academy of Sciences U S A, 109, 6241-6. doi:
10.1073/pnas.1117018109.

Schroers, H. J., O'Donnell, K., Lamprecht, S. C., et al. (2009). Taxonomy and phylogeny of the *Fusarium dimerum* species group. *Mycologia*, 101, 44–70.

<https://doi.org/10.3852/08-002>

Schroers, H. J., Samuels, G. J., Seifert, K. A., et al. (1999). Classification of the *Gliocladium roseum* complex in *Clonostachys*, as shown by morphology and DNA sequence analysis. *Mycologia*, 91, 365–385. <https://doi.org/10.2307/3761383>

Schüßler, A., Walker, C. (2010). *The Glomeromycota: A species list with new families and new genera*. Gloucester, UK: Published privately, 56 pp.

Segretain, G., Destombes, P. (1961). Description of a new agent for maduromycosis, *Neotestudina rosatii*, n. gen., n. sp., isolated in Africa. *Comptes Rendus Hebdomadaires des Séances de Académie des Sciences*, 253, 2577–2579.

Sepúlveda, V. E., Márquez, R., Turissini, D. A., et al. (2017). Genome sequences reveal cryptic speciation in the human pathogen *Histoplasma capsulatum*. *mBio*, 8, e01339–17. DOI: 10.1128/mBio.01339-17

Shen, M., Zhang, J. Q., Zhao, L. L., et al. (2020). *Venturiales*. *Studies in Mycology*, 96, 185–308. doi: 10.1016/j.simyco.2020.03.001.

Sieverding, E., da Silva, G. A., Berndt, R., et al. (2015). *Rhizoglosum*, a new genus of the Glomeraceae. *Mycotaxon*, 129, 373–386. DOI: 10.5248/129.373

Sigler, L., Abbott, S. P. (1994). *Onychocola canadensis* gen. et sp. nov., an unusual new nail-inhabiting fungus. *Journal of Medical and Veterinary Mycology*, 32, 335–344.

Sigler, L., Flis, A. L., Carmichael, J. W. (1998). The genus *Uncinocarpus* (Onygenaceae) and its synonym *Brunneospora*: New concepts, combinations and connections to anamorphs in *Chrysosporium*, and further evidence of relationship with *Coccidioides immitis*. *Canadian Journal of Botany*, 76, 1624–1636.

DOI: 10.1139/b98-110

Sitterlé, E., Rodriguez, C., Mounier, R., et al. (2017). Ultra-deep sequencing in the diagnosis of *Basidiobolus meristosporus*. *Frontiers in Microbiology*, 8, 334.

<https://doi.org/10.3389/fmicb.2017.00334>

Slippers, B., Crous, P. W., Denman, S., et al. (2004). Combined multiple gene genealogies and phenotypic characters differentiate several species previously identified as *Botryosphaeria dothidea*. *Mycologia*, 96, 83–101.

Smith, S. E., Read, D. J. (2008). *Mycorrhizal Symbiosis* (3rd ed.). Academic Press, 787 pp.

Spadaro, D., Droby, S. (2016). Development of biocontrol products for postharvest diseases of fruit: The importance of elucidating the mechanisms of action of yeast antagonists. *Trends in Food Science & Technology*, 47, 39–49.

<https://doi.org/10.1016/j.tifs.2015.11.003>

Spatafora, J. W., Aime, M. C., Grigoriev, I. V., et al. (2017). The fungal tree of life: from molecular systematics to genome-scale phylogenies. *Microbiological Spectrum*

5, 10.1128/microbiolspec.funk-0053-2016. doi: 10.1128/microbiolspec.FUNK-0053-2016.

Steenkamp, E. T., Wingfield, B. D., Desjardins, A. E., et al. (2002). Cryptic speciation in *Fusarium subglutinans*. *Mycologia*, 94, 1032–1043. Doi: 10.2307/3761868

Stielow, J. B., Lévesque, C. A., Seifert, K. A., et al. (2015). One fungus, which genes? Development and assessment of universal primers for potential secondary fungal DNA barcodes. *Persoonia*, 35, 242–263.
<https://doi.org/10.3767/003158515X689135>

Strange, R. N., Scott, P. R. (2005). Plant disease: A threat to global food security. *Annual Review of Phytopathology*, 43, 83–116.
<https://doi.org/10.1146/annurev.phyto.43.113004.133839>

Su, H., Packeu, A., Ahmed, S. A., et al. (2019). Species distinction in the *Trichophyton rubrum* complex. *Journal of Clinical Microbiology*, 57, e00352-19.
<https://doi.org/10.1128/JCM.00352-19>

Summerbell, R. C., Moore, M. K., Starink-Willemse, M. et al. (2007). ITS barcodes for *Trichophyton tonsurans* and *T. equinum*, *Medical Mycology*, 45, 193–200, <https://doi.org/10.1080/13693780601087614>

Summerbell, R.C., Gueidan, C., Schroers H.J., et al. (2011). *Acremonium* phylogenetic overview and revision of *Gliomastix*, *Sarocladium*, and *Trichothecium*. *Studies in Mycology*, 68, 139-62. <https://doi.org/10.3114/sim.2011.68.06>.

Švarcová, M., Větrovský, T., Kolařík, M., et al. (2023). Relationship between

phylogeny and clinical manifestation in *T. mentagrophytes*/interdigitale complex.

Medical Mycology, 61, myad042. <https://doi.org/10.1093/mmy/myad042>

Takada, M., Udagawa, S. (1988). A new species of heterothallic *Talaromyces*.

Mycotaxon, 2, 417–425.

Tang, C., Kong, X., Ahmed, S. A., et al. (2021). Taxonomy of the *T.*

mentagrophytes/*T. interdigitale* species complex harboring *T. indotineae*.

Mycopathologia, 186, 315–326. <https://doi.org/10.1007/s11046-021-00544-2>

Taylor, J. W. (2011) One Fungus = One Name: DNA and fungal nomenclature twenty years after PCR. *IMA Fungus* 2, 113–120.

<https://doi.org/10.5598/imafungus.2011.02.02.01>

Taylor, J. W., Göker, M., Pitt, J. I. (2016). Choosing one name for pleomorphic fungi: the example of *Aspergillus* versus *Eurotium*, *Neosartorya* and *Emericella*. *Taxon*, 65,

593-601. <https://doi.org/10.12705/653.10>

Tedersoo, L., Bahram, M., Abarenkov, K. (2017). Fungal biogeography. *Global*

Ecology and Biogeography, 26, 805–818. <https://doi.org/10.1111/geb.12520>

Teixeira, M. M., Patané, J. S., Taylor, M. L., et al. (2016). Worldwide phylogenetic distributions and population dynamics of the genus *Histoplasma*. *PLoS Neglected*

Tropical Diseases, 10, e0004732. <https://doi.org/10.1371/journal.pntd.0004732>

Tennakoon, D. S., Thambugala, K. M., de Silva, N. I., et al. (2022). Novel and remarkable fungal species in *Didymosphaeriaceae* from plant litter. *Frontiers in*

Microbiology, 13, 1016285. <https://doi.org/10.3389/fmicb.2022.1016285>

Thitla, T., Kumla, J., Khuna, S., et al. (2022). Species diversity, distribution, and phylogeny of *Exophiala* with the addition of four new species from Thailand. *Journal of Fungi*, 8, 766. <https://doi.org/10.3390/jof8080766>

Traquair, J. A., Shaw, L. A., Jarvis, W. R. (1988). New species of *Stephanoascus* with *Sporothrix* anamorphs. *Canadian Journal of Botany*, 66, 926–933. <https://doi.org/10.1139/b88-133>

Tudor, D., Margaritescu, s., Sánchez-Ramírez, S., et al. (2014). Morphological and molecular characterization of the two known North American *Chlorociboria* species and their anamorphs. *Fungal Biology*, 118, 732-742. <https://doi.org/10.1016/j.funbio.2014.05.003>

Turland, N. J., Wiersema, J. H., Barrie, F. R., et al. (eds.) 2018: International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. *Regnum Vegetabile*, 159. Glashütten: Koeltz Botanical Books. <https://doi.org/10.12705/Code.2018>

Uhrlaß, S., Verma, S. B., Gräser, Y., et al. (2022). *Trichophyton indotineae*—An emerging pathogen causing recalcitrant dermatophytoses. *Journal of Fungi*, 8, 757. <https://doi.org/10.3390/jof8070757>

van den Brink, J., Samson, R. A., Hagen, F., et al. (2012). Phylogeny of industrially relevant thermophilic genera *Myceliophthora* and *Corynascus*. *Fungal Diversity*, 52, 1–10. <https://doi.org/10.1007/s13225-011-0107-z>

Vandepol, N., Liber, J., Desirò, A., Na, H., et al. (2020). Resolving the *Mortierellaceae* phylogeny through synthesis of multi-gene phylogenetics and

phylogenomics. *Fungal Diversity*, 104, 267–289. <https://doi.org/10.1007/s13225-020-00455-5>

van Oorschot, C. (1980). A revision of *Chrysosporium* and allied genera. *Studies in Mycology*, 20, 1-80.

Varga, J., Frisvad, J. C., Samson, R. A. (2011). Two new aflatoxin producing species, and an overview of *Aspergillus* section *Nigri*. *Studies in Mycology*, 69, 57–80. doi: 10.3114/sim.2011.69.05

Verkley, G. J. M., de Gruyter, J. (2012). Reconsideration of species described in *Coniothyrium* and introduction of *Paraconiothyrium* gen. nov. In Crous, P. W. et al. (Eds.), *CBS Biodiversity Series 11*, 351–361. CBS-KNAW Fungal Biodiversity Centre, Utrecht.

Verkley, G. J. M., Dukik, K., Renfurm, R., et al. (2014). Novel genera and species of coniothyrium-like fungi in Montagnulaceae. *Persoonia*, 32, 25–51. Doi: 10.3767/003158514X679191

Verkley, G. J. M., Silva, M., Wicklow, D. T., et al. (2004). *Paraconiothyrium*, a new genus to accommodate *Coniothyrium*-like fungi with hyaline conidia. *Studies in Mycology*, 50, 323–335. doi: 10.3767/003158514X679191

Vidal, P., Vinuesa, M. D. L. A., Sánchez-Puelles, J. M., et al. (2000). Phylogeny of the anamorphic genus *Chrysosporium* and related taxa based on rDNA internal transcribed spacer sequences. *Revista Iberoamericana de Micología*, 17, 22–29.

Vilela, R., de Hoog, S., Bensch, K., et al. (2023). A taxonomic review of the genus *Paracoccidioides*, with focus on the uncultivable species. *PLoS Neglected Tropical*

Diseases, 17, e0011220. <https://doi.org/10.1371/journal.pntd.0011220>

Visagie, C. M., Yilmaz, N., Kocsubé, S., et al. (2024). Review of recently introduced *Aspergillus*, *Penicillium*, *Talaromyces* and other Eurotiales species. *Studies in Mycology*, 107, 1–66. <https://doi.org/10.3114/sim.2024.107.01>

Vogan, A.A., Miller, A.N., Silar, P. (2021). Proposal to change the conserved type of *Podospora*, nom. cons. (Ascomycota). *Taxon*, 70, 429–430. <https://doi.org/10.1002/tax.12478>

von Arx, J. A. (1978). Notes on Microascaceae with the description of two new species. *Persoonia*, 10, 23–31.

Wagner, L., Stielow, B., Hoffmann, K., et al. (2013). A comprehensive molecular phylogeny of the Mortierellales (Mortierellomycotina) based on nuclear ribosomal DNA. *Persoonia*, 30, 77–93. doi: 10.3767/003158513X666268

Walker, C., Trappe, J. M., Schüßler, A., et al. (2017). Proposal to conserve the name *Rhizophagus* with a conserved type (Fungi: Glomeromycota: Glomeraceae). *Taxon*, 66, 199–200. <https://doi.org/10.12705/661.19>

Walt, J. P. van der, Yarrow, D. (1984). The genus *Arxiozyma* gen. nov. (Saccharomycetaceae). *South African Journal of Botany*, 3, 340–342. [https://doi.org/10.1016/S0022-4618\(16\)30022-5](https://doi.org/10.1016/S0022-4618(16)30022-5)

Walther, G., Pawłowska, J., Alastruey-Izquierdo, A., et al. (2013). DNA barcoding in Mucorales: An inventory of biodiversity. *Persoonia*, 30, 11–47. <https://doi.org/10.3767/003158513X665070>

Walther, G., Wagner, L., Kurzai, O. (2019). Updates on the taxonomy of Mucorales with an emphasis on clinically important taxa. *Journal of Fungi*, 5, 106.

<https://doi.org/10.3390/jof5040106>

Wanasinghe, D.N., Phookamsak, R., Jeewon, R. (2017). A family level rDNA based phylogeny of Cucurbitariaceae and Fenestellaceae with descriptions of new

Fenestella species and *Neocucurbitaria* gen. nov. *Mycosphere*, 8, 397–414. Doi

10.5943/mycosphere/8/4/2

Wang, X. W., Bai, F. Y., Bensch, K., et al. (2019). Phylogenetic re-evaluation of *Thielavia* with the introduction of a new family Podosporaceae. *Studies in Mycology*,

93, 155–252. <https://doi.org/10.1016/j.simyco.2019.08.002>

Wang, X. W., Han, P. J., Bai, F. Y., et al. (2022). Taxonomy, phylogeny, and identification of Chaetomiaceae with emphasis on thermophilic species. *Studies in Mycology*,

101, 121–243. <https://doi.org/10.3114/sim.2022.101.03>

Wang, M., Liu, F., Crous, P. W., et al. (2017). Phylogenetic reassessment of *Nigrospora*: Ubiquitous endophytes, plant and human pathogens. *Persoonia*, 39,

118–142. <https://doi.org/10.3767/persoonia.2017.39.06>

Wang, F., Wang, K., Cai, L., et al. (2023). Fungal names: A comprehensive nomenclatural repository and knowledge base for fungal taxonomy. *Nucleic Acids Research*,

51, D708–D716. <https://doi.org/10.1093/nar/gkac926>

Wang, Q. M., Yurkov, A. M., Göker, M., et al. (2015) Phylogenetic classification of yeasts and related taxa within Pucciniomycotina. *Studies in Mycology*, 81, 149-89.

doi: 10.1016/j.simyco.2015.12.002.

Watarai, N., Yamamoto, N., Sawada, K., et al. (2019). Evolution of *Aspergillus oryzae* before and after domestication. *DNA Research*, 26, 465–472. <https://doi.org/10.1093/dnares/dsz024>

Wei, T. P., Zhang, H., Zeng, X. Y., et al. (2022). Re-evaluation of Symptoventuriaceae. *Persoonia*, 48, 219–260. doi:10.3767/persoonia.2023.48.07

Werner, S., Peršoh, D., Rambold, G. (2012). *Basidiobolus haptosporus* is frequently associated with the gamasid mite *Leptogamasus obesus*. *Fungal Biology*, 116, 90–97. <https://doi.org/10.1016/j.funbio.2011.10.004>

Wolf-Hall, C. E., Njoroge, S. M. (2016). Fungi in the production of foods. In C.B. Batt & M.L. Tortorello (Eds.), *Encyclopedia of Food Microbiology* (2nd ed.). Academic Press, pp 950-956. <https://doi.org/10.1016/B978-0-12-384730-0.00143-6>

Woudenberg, J.H.C., Meijer, M., Houbraken, J., et al. (2017). *Scopulariopsis* and scopulariopsis-like species from indoor environments. *Studies in Mycology*, 88, 1-35. doi: 10.1016/j.simyco.2017.03.001.

Xu, Y. L., Cao, Y. F., Nakasone, K. K., et al. (2020). Taxonomy and phylogeny of *Phanerochaete sensu stricto* (Polyporales, Basidiomycota) with emphasis on Chinese collections and descriptions of nine new species. *Mycosphere*, 11, 1527–1552. Doi:10.5943/mycosphere/11/1/12

Yamada, Y., Maeda, K., Mikata, K. (1994). The phylogenetic relationships of the hat-shaped ascospore-forming, nitrate-assimilating *Pichia* species, formerly classified in the genus *Hansenula*, based on partial sequences of 18S and 26S ribosomal RNAs (Saccharomycetaceae): Proposals of three new genera, *Ogataea*, *Kuraishia*, and *Nakazawaea*. *Bioscience, Biotechnology, and Biochemistry*, 58, 1245–1257. doi:

10.1271/bbb.58.1245.

Yu, J., Walther, G., van Diepeningen, A. D., et al. (2015). DNA barcoding of clinically relevant *Cunninghamella* species. *Medical Mycology*, 53, 99–106.

<https://doi.org/10.1093/mmy/myu079>

Zare, R., Gams, W. (2001). A revision of *Verticillium* section *Prostrata*. IV. The genera *Lecanicillium* and *Simplicillium* gen. nov. *Nova Hedwigia*, 73, 1–50.

DOI: 10.1127/nova.hedwigia/71/2001/1

Zhang, C., Zhang, J., Liu, Y. (2021). The role of filamentous fungi in fermented foods. *Food Research International*, 140, 109875.

<https://doi.org/10.1016/j.foodres.2020.109875>

Zhang, K., Sandoval-Denis, M., Kandemir, H., et al. (2025). Taxonomic revision of *Bifusarium* (Nectriaceae). *Persoonia*, 54, 197–223.

<https://doi.org/10.3114/persoonia.2025.54.06>

Zhang, Y., Wang, H. K., Fournier, J., et al. (2009). Towards a phylogenetic clarification of *Lophiostoma*/*Massarina* and morphologically similar genera in the Pleosporales. *Fungal Diversity*, 38, 225–251.

<http://www.fungaldiversity.org/fdp/sfdp/FD38-13.pdf>

Zhang, Z. Y., Ren, Y. L., Li, X., et al. (2022). New taxonomic framework for *Arthrodermataceae*: Phylogenetic and biogeographic analysis. *Antonie van Leeuwenhoek*, 115, 1319–1333. <https://doi.org/10.1007/s10482-022-01774-0>

Zhou, X., Ahmed, S. A., Tang, C., et al. (2023). Human adaptation and diversification

in the *Microsporum canis* complex. *IMA Fungus*, 14, 14.

<https://doi.org/10.1186/s43008-023-00120-x>

Zhu, H. Y., Shang, Y. J., Wei, X. Y., et al. (2024). Taxonomic revision of *Geotrichum* and *Magnusiomyces*, with the descriptions of five new *Geotrichum* species from China. *Mycology*, 15, 400–423. <https://doi.org/10.1080/21501203.2023.2294945>

9. Websites

Atlas of Clinical Fungi, <https://www.atlasclinicalfungi.org/>

Fungal names, <https://nmdc.cn/fungalnames/allfungal>

Genbank, <https://www.ncbi.nlm.nih.gov/genbank/>

Genbank, Taxonomy browser, <https://www.ncbi.nlm.nih.gov/datasets/taxonomy/tree/>

Index Fungorum, <https://www.indexfungorum.org/names/Names.asp>

Mycology online, <https://www.adelaide.edu.au/mycology/fungal-descriptions-and-antifungal-susceptibility/dermatophytes/nannizzia#nannizzia-gypsea>

Mycobank, <https://www.mycobank.org/Simple%20names%20search>

Species Fungorum,
<https://www.speciesfungorum.org/Names/SynSpecies.asp?RecordID=361754>

TheYeasts.org, <https://theyeasts.org/>

10. Annex

Expert consultation

For several genera and families, well known taxonomic experts were consulted:

Ajellomycetaceae and *Herpotrichiellaceae*: dr. Markus Teixeira, Brasilia, Brazil

Arthrodermataceae: dr. Yvonne Gräser, Charité, Berlin, Germany, dr. Richard Summerbell, Toronto, Canada

Aspergillaceae and *Trichocomaceae*: dr. Jos Houbraken, Westerdijk Institute, Netherlands, dr. Cobus Visagie, University of Pretoria

Bionectriaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Chaetomiaceae: dr. Xuewei Wang, Institute of Microbiology, Chinese Academy of Sciences, China.

Clavicipitaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Coniochaetaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands; dr. Ulrike Damm, Senckenberg Museum of Natural History Görlitz, Germany

Cordycypitaceae and *Ophiocordycypitaceae*: dr. Joseph Spatafora, Oregon State University, USA.

Didymellaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Didymosphaeraceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Glomerellaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Gymnoascaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Herpotrichiellaceae: dr. Nakarin Suwannarach, Chiang Mai University, Thailand

Hypocreaceae: dr. Irina Druzhinina, Kew Gardens, UK

Lichtheimiaceae, *Mucoraceae*, *Rhizopodiaceae*, dr. Gritt Walter, Hans-Knöll-Institut, Jena, Germany

Microascaceae: dr. Tomasz Jagielski, University of Warsaw, Poland.

Nectriaceae: dr. David Geiser, Pennsylvania State University, USA, dr. Ewald Groenewald, Westerdijk Institute, The Netherlands, dr. Abdullah al-Hatmi, University of Nizwa, Oman

Onygenaceae: dr. Yvonne Gräser, Charité, Berlin, Germany, dr. Richard Summerbell, Toronto, Canada

Ophiostomataceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands

Pleosporaceae: dr. Josepa Gené Diaz, University of Reus, Spain

Togniniaceae: dr. Lizel Mostert, Stellenbosch University, South Africa

Trichospheariaceae: dr. Marcelo Sandoval-Denis, dr. Pedro Crous, Westerdijk Institute, The Netherlands