

SECOND INTERNATIONAL WORKSHOP ON ASCOMYCETE SYSTEMATICS

Following the *First International Workshop on Ascomycete Systematics*, which was held in Paris in 1993, the *Second International Workshop on Ascomycete Systematics* took place in Amsterdam on 22–24 April 2015, organized by the CBS-KNAW Fungal Biodiversity Centre. The first two days were at the premises of the Royal Dutch Academy of Arts and Sciences (KNAW) and the final day was held in a beautiful meeting room at Artis Zoo. There were 150 attendees and speakers from 27 countries, including 50 students and postdocs. The CBS symposium week included three meetings, two of which were held on the CBS premises in Utrecht (20–21 April). These were the *Genomics of Neglected Pathogens* (organised by Sybren de Hoog, with 70 participants; see p. (15), focusing on human pathogens and opportunists like *Coccidioides*, *Sporothrix*, black yeasts, and other significant but frequently overlooked fungi. The *Yeast Taxonomy Workshop* (organised by Teun Boekhout, with 30 participants), discussed how to implement an updated taxonomy based on phylogenomic DNA data, which will have significant impact on various industries. Previous CBS Spring Symposia, namely “One Fungus = One Name” (2011), “One Fungus = Which Name” (2012), “One Fungus = Which Genes” (2013), and “Genera and Genomes” (2014), all had a great impact on the mycological community, and on mycology in general.

The ascomycete symposium, which was dedicated to the memory of the late Emory Simmons, who was a pioneer in confirming ascomycete life-cycles, was kicked off with a talk by Meredith Blackwell on his life and career. The session continued with Thorsten H. Lumbsch providing an outline of ascomycete phylogeny, Joseph W. Spatafora on Phylogenomics of *Dothideomycetes*, John Taylor on “What’s next after next generation biodiversity?” and Andrew Miller on an overview of the *Sordariomycetes*. Specific topics addressed were *Pezizomycotina* (François Lutzoni), *Arthoniomycetes* (Martin Grube), *Eurotiales* (Jos Houbraken), *Hypocreomycetidae* (Lorenzo Lombard), *Saccharomycotina* and *Taprinomycotina* (Clete Kurtzman), *Leotiomycetes* (Peter Johnston), *Chaetothyriales* and *Onygenales*

(Sybren de Hoog), and a talk by Markus Goeker on how to define taxonomic ranks phylogenetically. The day was rounded off by a speaker’s dinner in an Indonesian restaurant in the middle of bubbly Amsterdam.

Thursday kicked off with a talk by David Hawksworth, providing an update on the “One Fungus One Name” *status quo*, followed by Tom May, who provided insights into the new *Code*, and the workings of the Nomenclature Committee for Fungi (NCF). Kevin Hyde linked morphology to phylogeny, and Gerard Verkley explained the new hurdles that the Nagoya Protocol (see pp.(3)–(5)) presented for mycologists collecting fungi. Specific groups and topics covered on this day included *Orbiliomycetes* (Hans Otto Baral), *Dothideomycetes* (Ewald Groenewald), *Lecanoromycetes* (Jolanta Miadlikowska), *Ophiostomatales* and *Microascales* (Wilhelm de Beer), the workings of GenBank (Conrad Schoch), *Lichinomycetes* (Maria Prieto) *Pezizomycetes* (Karen Hansen), *Laboulbeniomycetes* (Meredith Blackwell), the Open Tree of Life Project (David Hibbett). The day was rounded off with the two CBS awards, namely the Johanna Westerdijk (awarded to Walter Jaklitsch) and Josef von Arx Awards (awarded to Uwe Braun) (see pp. (18)–(19)). Following the reception, members of the ICTF departed for Amsterdam Science Park, where the ICTF convened its annual meeting (see p. (14)).

Friday started with a change of venue, as mycologists moved to Artis zoo, where they also were given free access to the world’s first living zoo for microbes, Micropia (see *IMA Fungus* 5 (2): (30)–(31), December 2014: <http://www.imafungus.org/Issue/52/02.pdf>). The session started with talks covered further fungal groups, namely *Erysiphales* (Uwe Braun), *Pleomassariaceae* (Walter Jaklitsch & Hermann Voglmayr), *Geoglossomycetes* (Andrew Miller), new yeast lineages (Meredith Blackwell), *Xylariomycetidae* (Marc Stadler), *Hypocreomycetidae* (Gareth Jones), *Pezizales* (Rosanne Healy), the ultrastructural of sporebodies of *Orbiliomycetes* (Donald Pfister), *Helvella* (Trond Schumacher), *Trypetheliales* (Andre Aptroot), the *Ascomycota* fossil

record (Mary Berbee), *Archeorhizomycetes* (Anna Rosling), *Metschnikowia* (Andre Lachance), Barcoding of yeast strains (Vincent Robert), *Candida* and *Lodderomyces* (Heide-Marie Daniel), *Pleosporales* (Ying Zhang), and dematiaceous hyphomycetes (Keith Seifert). A special session was included, namely “Integrating unknown fungi into the tree of life: a perspective from endophytes”. This included contributions by Betsy Arnold (endophytes), François Lutzoni (speeding up the naming of unknown fungal species), and Ignazio Carbone (new online tools for species delimitation and classification).

It is envisioned that outputs of the meeting will be published in two separate volumes. A volume of *Studies in Mycology* will be dedicated to the overall higher phylogeny (revision of major orders and classes), while a second issue of *Mycologia* will be dedicated to a revision of important families of ascomycetes. These two works will form a set presenting an updated “New Outline for the Ascomycota”. To attain this goal, participants would be required to deliver multigene DNA sequence data of key species (at least two species per genus, preferably types). Each paper will be coordinated by a PI, who together with his or her editorial team will try to obtain these data for as many of these key taxa as possible (genera to be found on www.generaoffungi.org). The outline of topics and papers will soon be placed on the same website. Additional papers can be proposed to p.crous@cbs.knaw.nl and Keith.Seifert@AGR.GC.CA (please copy to both in any e-mails). Deadlines are: submission end of 2016 for publication in 2017. More details will follow soon.

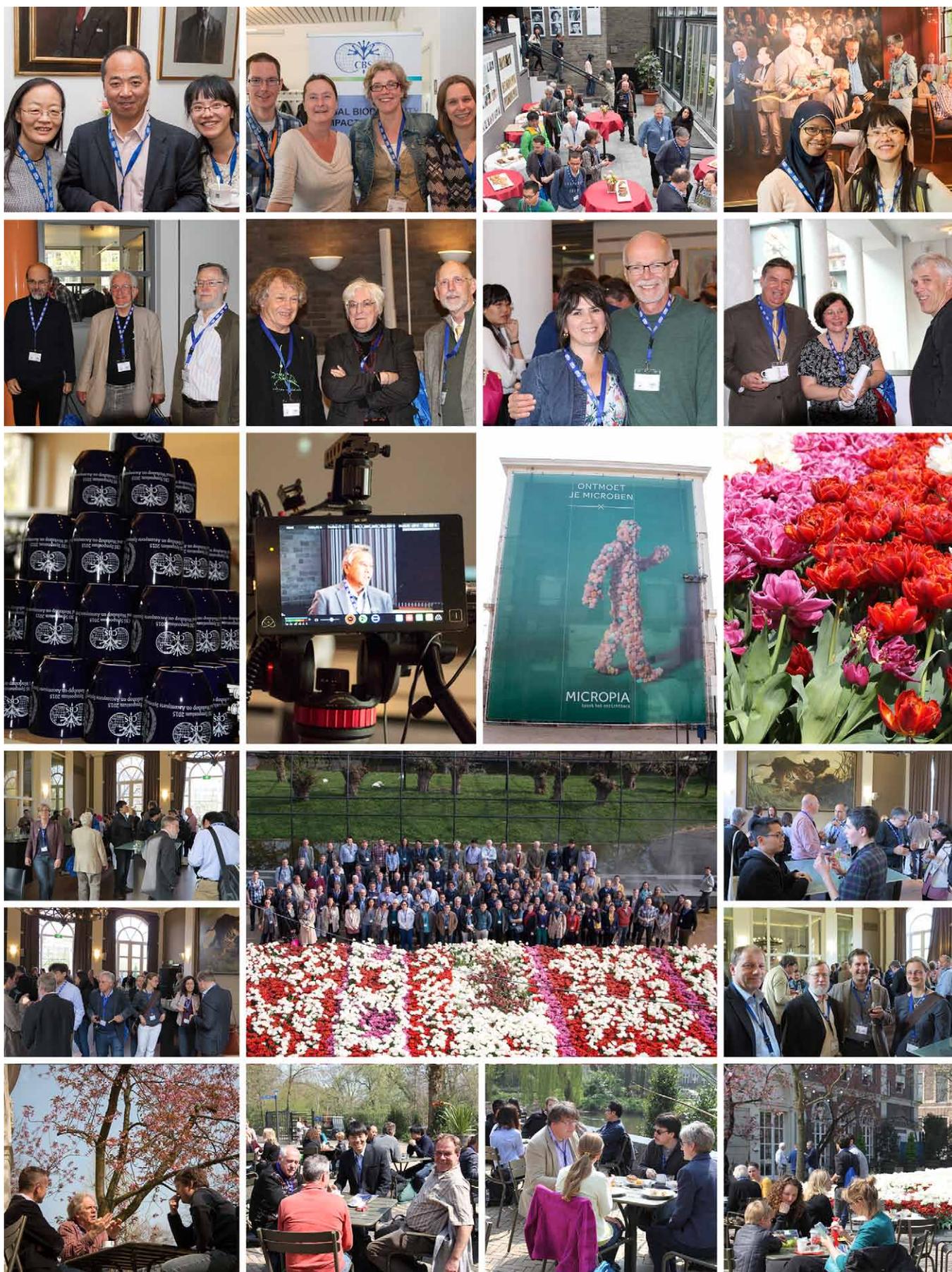
The week was concluded with members of the IMA Executive Committee again convening at CBS in Utrecht on Saturday for the annual IMA EC meeting (see pp. (12)–(13)). All participants look back on highly successful meetings with many interesting talks and speakers and time for networking. As part of the CBS mission is to promote mycology and share this important meeting with the global community, all talks were captured digitally. Talks from those mycologists that gave permission for their presentations to be



Speakers and scenes from “The Second International Workshop on Ascomycete Systematics” held in Amsterdam on 22–24 April 2015. The first 2 days the meeting was hosted at the “Trippenhuys” by the Royal Netherlands Academy of Arts and Sciences (“KNAW”). The third day the meeting was hosted by Artis Zoo, the oldest Zoo in The Netherlands. The pictures shown above were captured at the KNAW location.



Speakers and scenes from “The Second International Workshop on Ascomycete Systematics” held in Amsterdam on 22–24 April 2015. The pictures shown above were captured at the Artis Zoo location at the third day of the meeting.



Scenes from “The Second International Workshop on Ascomycete Systematics” held in Amsterdam on 22–24 April 2015. At the meeting the CBS “Josef Adolf von Arx Award” and the “Johanna Westerdijk Award” were awarded to Uwe Braun and Walter Jaklitsch respectively. Pictures of this can be found in the “Awards and Personalia” section, pp. (18)–(19).

shared, can now be viewed on Youtube: <http://www.cbs.knaw.nl/index.php/pr/616-youtubecbs2015>.

Planning is already well advanced for the 2016 CBS Symposium week. A two-day symposium will be held in Amsterdam on *Fusarium* taxonomy (12–13 April 2016). This event will also see the launch of the *Marasas Centre (MC) for International*

Fusarium Research. The evening of the 13th will see a free public symposium in Amsterdam on the topic: "Fungi and Global Challenges". This will set the stage for a symposium (14–15 April 2015), which will be on the same topic. This symposium will focus on the role Fungi play in food security, human and animal wellbeing, industrial applications, and related topics. It

is expected that additional workshops will be added. For details and updates, please consult the CBS website, www.cbs.knaw.nl.

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IMA EXECUTIVE COMMITTEE MEETING



The IMA Executive Committee met on 25 April 2015 at CBS in Utrecht. Those present included Keith Seifert (President), Jennifer Luangsa-ard (Vice-President), Sharon Cantrell (Vice-President), Karen Hansen (Treasurer), Pedro Crous (Secretary General), John W. Taylor (Past President) David Hawksworth (Hon. President); EC members Dominik Begerow, David Hibbett, Xingzhong Liu, Chiharu Nakashima, Mike Wingfield, Wieland Meyer (via internet); RMMO members: Wilhelm de Beer (representing Africa), Xingzhong Liu (representing Asia), Tom May (Australasia), David Minter (Europe), Sharon Cantrell (Latin America), John Taylor (North America); SMMO representatives: John W. Taylor (Mycological Society of America), Marc Stadler (German Society of Mycology), Yuri Hirooka (The Mycological Society of Japan), Xingzhong Liu (Mycological Society of China), Nick Read (British Mycological Society); and Guest: Vincent Robert (via internet).

Finances

IMA treasurer Karen Hansen presented a summary of the revenue, expenditures, and balance sheet of the IMA. Seed money from IMC10 was returned by the IMC10 organizers and the IMA had received an endowment from Emory Simmons. The EC congratulated Jennifer Luangsa-ard and the entire Thai organizational team for a highly successful and enjoyable congress. Several ideas were discussed to develop a financial plan for the IMA, including setting up a trust, and these will be followed up in 2016.

The President recognized a need for IMA to be incorporated, and various ways in which that could be done were discussed. A small subgroup was asked to pursue this and report to the 2016 EC meeting.

Manual of Operations and Calendar

Prior to the meeting, the President circulated a calendar of proposed deadlines

for anticipated action items for 2014–2018. He also indicated that he would be recruiting EC members to assist with an evaluation of the statutes. Furthermore, an Operations Manual to manage awards, *IMA Fungus*, and elections, was needed. The President indicated the need to appoint a coordinator for awards, probably as an Acting Vice-President position pending approval of a permanent officer by the next General Assembly. The President also noted that there was no procedure in place to deal with resignations from the EC, as one new member had resigned soon after being elected to the EC, and the position would remain vacant.

David Hibbett and Tom May suggested the need to generate a taxonomic list of all life, including fungi. Communities of taxonomists could come up with a draft global checklist of fungi, owned and curated by an entity like the IMA. This could resemble a new edition of *Ainsworth & Bisby's Dictionary of Fungi*. This would need to be done in collaboration with on-going initiatives such as Species 2000 and Species Fungorum; coordination was needed to prevent duplication. This could also be done through MycoBank if a system of remote curatorships could be introduced. A fundamental point was that such a service would need to be financially stable in the long-term.

MycoBank

Vincent Robert (online) announced that MycoBank now had a new version (Version 10) of software in development, and the upgrade would be done after it has been tested on smaller websites. By the end of May 2015, all websites would be migrated and then the CBS and MycoBank databases will follow. Scripts to facilitate the use of remote curators were to be prepared. Resolving discrepancies between the MycoBank and GenBank classifications are

under discussion, and MycoBank needed a strategy to deal with Latinized names and epithets. Following the retirement of Arthur de Cock, Nathalie van de Wiele had been appointed to this role, and orthographic checks were being managed by Shaun Pennycook and Joost Stalpers.

The long-term stability of the system needed to be guaranteed, and May suggested that the MycoBank Advisory Board assess what the user community needs, what extra features the database would need, the technical aspects, and the costs involved. The Board membership was discussed and some additional members agreed, and it was charged with advising on remote curatorship and the improvement of the treatments of synonymy and taxonomic opinions.

IMC11 planning progress

Vice-President Cantrell updated the EC on progress with planning for IMC11. Dates were finalized as July 15–20, 2018. The theme would be “Mycological Discoveries for a Better World”. The website was being constructed and planned to go live on 31 August 2015. Potential sponsors were now being approached. The Mycological Society of America (MSA) would give bursaries and assist with student travel, and the local Convention Bureau (“Meet Puerto Rico”) offered additional support to the IMC11 if delegates used elected hotels. A private university near the venue had dormitories that could be used by students.

There was extended discussion of the structure of the meeting, including the number of days devoted to the scientific programme. Three or four sites would be selected for collecting trips before, during, and after the congress. The Nomenclatural Session would be on the Thursday. There would probably be six concurrent symposia, and possible topics were discussed. Arrangements for the Scientific Program Committee and its structure were starting to be made.

IMA Fungus

The journal was running very well, and Hawksworth apologized for the slight delay over release of the December issue due to Ingenta closing down for a longer holiday than anticipated. More news and general stories would be welcome, especially from



The IMA Executive Committee in session at CBS.

the MMOs. The collaboration with CBS in the editing and publishing effort continued to go smoothly. It was hoped that the journal would get an impact factor soon, but it was being considered for inclusion in Elsevier’s Scopus.¹

Member Organizations

Increased collaboration with the Regional Member Mycological Organizations (RMMOs) and Member Mycological Organizations (MMOs) was discussed, particularly with respect to representation at EC committee meetings. Minter felt that the present RMMO structure left some regions unrepresented, e.g. the Middle East, and it was suggested that the IMA should have an acting Vice-President for MMO relations, a role Stadler agreed to take on.

Website and social media

Keeping the public face of the webpage, particularly uploading news in a timely manner, was a particular challenge. News of job opportunities and upcoming events would be welcome additions. EC members were encouraged to be more involved in sending information to webmaster Begerow. The President reported that he had set up a Twitter account for the IMA, but had used it sparingly so far. A Facebook account was yet to be established. The IMA needed to find how to use social media effectively.

IMA Fellows

Past President Taylor proposed assigning existing Fellows the responsibility of administering the process of nominating

and electing new Fellows at each IMC, and perhaps also to stimulate financial donations to the IMA. Deadlines for the process needed to be included in the manual of operations and calendar being setting up.

Nagoya protocol

In light of the new regulations that came into force in 2014 on the collection and holding of biological materials, the IMA needed to make its concerns clear, starting with a background item in *IMA Fungus*.²

International Society for Fungal Conservation

Minter updated the EC on this society, established in 2010. The focus was political, and it had been actively lobbying conservation bodies, especially the International Union for the Conservation of Nature (IUCN), which now had formally recognized that fungi were important to protect. It was felt that links with the IMA should be strengthened, perhaps by an EC member being given this responsibility.

Video conferencing

The EC agreed that different options for video conferencing be investigated, in order to facilitate the participation of EC members unable to travel to the committee meetings.

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¹This has since happened.

²See pp. (3)–(5) in this issue.

ICTF MEETS IN AMSTERDAM



The ICTF Meeting in Amsterdam, 23 April 2015.

Members of the International Commission on the Taxonomy of Fungi (ICTF) met for a general meeting at the Amsterdam Science Park, Amsterdam, The Netherlands on 23 April 2015. The meeting marked the change from the long-standing chair, Keith Seifert, to Conrad Schoch. In his opening remarks the new chair acknowledged the important work done by his predecessor. Andrew Miller continues in his post as Secretary. Thirteen of the current 25 members were present, with a number of guests as well.

The meeting was mainly focused on actions required by changes in the

International Code of Nomenclature for algae, fungi and plants (ICN). This will involve continued cooperation with the Nomenclature Committee for Fungi (NCF). ICTF will coordinate work with the 19 currently recognised working groups and subcommissions (see below). Many of these groups are in various stages of ratifying fungal names in response to a single name system and it is expected they will present their work to the NCF before the end of 2015. Additional time was devoted to discussion of seven nomenclature proposals by David Hawksworth. The

meeting concluded with discussion on the usage and standards for DNA based taxonomy. More details of these and other matters of discussion can be found in the full meeting minutes posted on the ICTF website (http://www.fungaltaxonomy.org/files/4814/3325/9934/ICTF_meeting_minutes_April_23_2015.pdf)

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ICTF-recognized working groups preparing lists of names for protection

International Subcommittee on *Colletotrichum* Taxonomy
International Subcommittee on *Fusarium* Taxonomy
International Subcommittee on Rust Taxonomy
International Subcommittee on *Trichoderma* and *Hypocrea*
International Subcommittee for the Taxonomy of
Phytopathogenic Fungi
International Commission on *Penicillium* and *Aspergillus* (ICPA)
Homobasidiomycetes Working Group
Heterobasidiomycetes Working Group
Erysiphales Working Group

Diaporthales Working Group
Hypocreales Working Group
Dothideomycetes Working Group
Cordyceps Working Group
Leotiomycetes Working Group
Orbiliomycetes Working Group
Yeast Working Group
Medical Mycology Working Group
Pyricularia/Magnaporthe Working group
Oomycota Working Group

GENOMICS OF NEGLECTED PATHOGENS

As a satellite of the CBS Spring Symposium Week, a workshop on “Genomics of Neglected Pathogens” was organised at the CBS-KNAW Fungal Biodiversity Centre on 20–21 April 2015. With close to 70 participants, human pathogens and opportunists like *Coccidioides*, *Sporothrix*, black yeasts, and other significant but frequently overlooked fungi were put

in the spotlight. Genomes of several opportunists often with fascinating natural ecologies have recently become available or will be sequenced in the near future. Joint initiatives were started as an outcome of the workshop to analyse these data. A selection of papers from these initiatives has been agreed upon to be published as joint efforts. The workshop was organized

by Sybren de Hoog, Benjamin Stielow, Anne van Diepeningen, and Bert Gerrits van den Ende, who thank the sponsors of this workshop ISHAM, ECMM, Astellas, and Elsevier.

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Participants in the “Genomics of Neglected Pathogens” workshop in Utrecht.

2ND INTERNATIONAL CONFERENCE ON BASIC AND APPLIED MYCOLOGY

The first of this series of conferences was held at Assiut University, Assiut, Egypt, in 2010, which was also the venue for the second which met on 14–15 March 2015. The event was jointly organized by the Egyptian Society of Basic and Applied Mycology, and the Assiut University Mycological Centre in collaboration with the Union of Arab Universities. About 100 researchers participated, coming from New Zealand, South Korea, Saudi Arabia, Sudan, and Yemen, in addition to ones from several Egyptian universities (Assiut, Aswan, Cairo, Suez Canal, and Zagazig) and research centres (Agricultural Research Centre Giza; Radiation Technology Centre, Atomic Energy Organization, Cairo; and City of Scientific Research and Technological Applications, Alexandria).

Amongst the topics addressed were: Challenges confronting Mycology,



Some participants in the 2nd International Conference on Basic and Applied Mycology, Assiut, Egypt, 14–15 March 2015.

including a synopsis on the fundamental changes in the *International Code of*

Nomenclature; The capability of fungi to grow in high water stress environments;

Biodiversity of halophilic and halotolerant fungi; Fungi in the biological control of insect pests and phytopathogenic fungi; Fungi in biotechnological applications for the production of pharmaceutical compounds; Mycotoxin tests for presence in food; Nanoparticles in the control of phytopathogenic and mycotoxigenic fungi; *Trichoderma* in the production of volatile compounds from soil; Ecological studies on *Cryptococcus* species; Outdoor and indoor air-borne fungi in the incidence of allergic diseases; Fungal infections in diabetic feet; Fungi in the scalps of those with Alopecia areata; Fungi and the formation of dandruff; and Dermatophytic fungi.

The conference raised the issue of establishing a Union of Arab Mycologists to strengthen collaboration between mycologists in the Arab world. The idea was first introduced at the 2010 conference, and now needed to be implemented. In addition, mycologists were urged to be more interdisciplinary in their approaches.

During the Opening Ceremony, Mohamad Raafat Mohmoud (Assistant Secretary-General, Union of Arab Universities) expressed his esteem for the distinguished scientific performance of the Assiut University Mycological Centre (AUMC) which was established while he was President of Assiut University. The Centre organized its 18th workshop on

“Yeast Fungi: their biodiversity and their Role in Biotechnology and in Human Animal and Plant Diseases” immediately after the conference on 16–18 March 2015 which had about 40 participants.

Further information about this conference, including abstracts or presentations and a list of participants is available on the website: aun.edu.eg/aumc/aumc.htm. The third conference in the series is scheduled for March 2018.

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FUNGI IN THE BUILT ENVIRONMENT

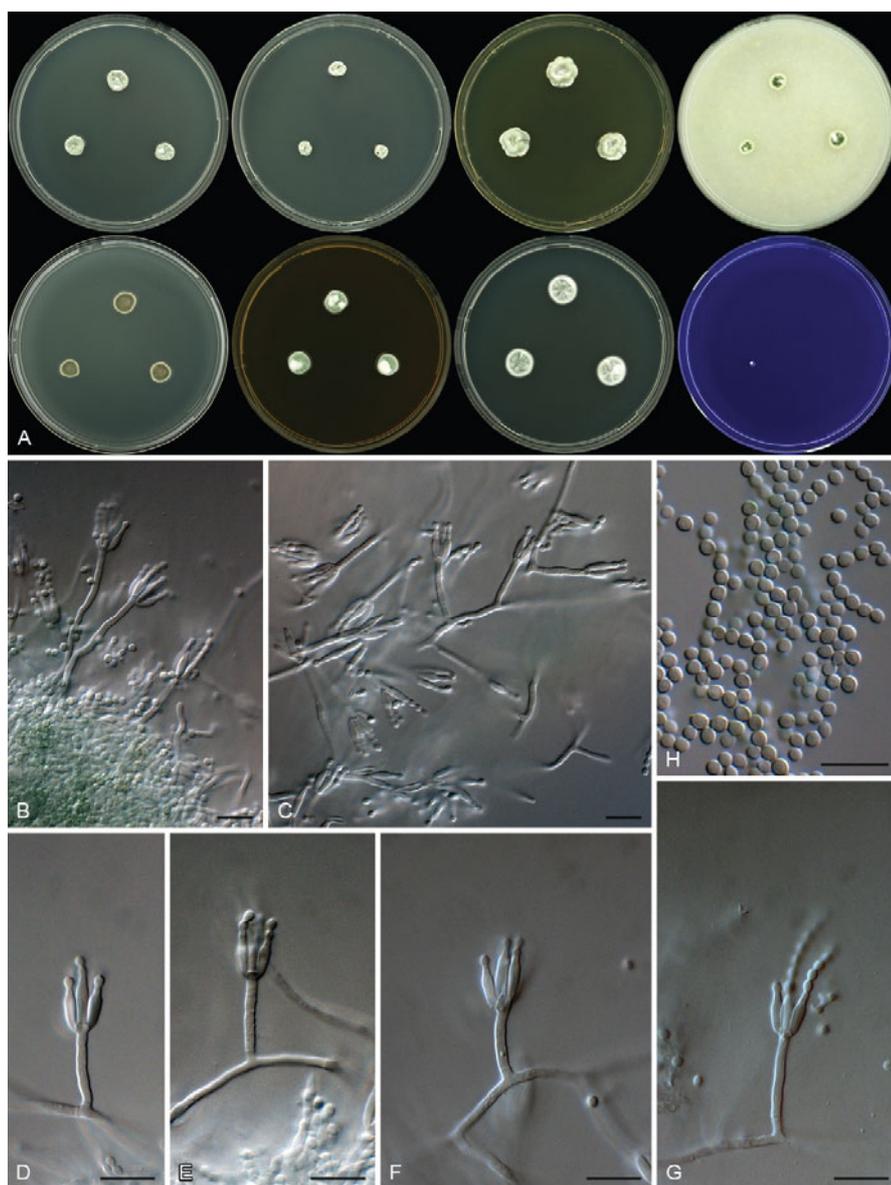


The Alfred P. Sloan Foundation sponsored a workshop on ‘Fungi and Indoor Air’ in Berkeley, CA in September 2014. Thirty-one scientists participated, predominately from the US and Canada, but also from The Netherlands, Denmark, Singapore, Sweden, and Finland.

Fungi are fundamentally important components of the built environment. Beyond being unsightly, unwanted fungal growth in indoor environments is detrimental to human health – that is unequivocal. Yet, the precise agent of those ill effects, whether it is the fungal bodies themselves or a chemical or particulate product, is still unknown. At the same time, there is also growing evidence that in some instances exposure to fungi can be protective against respiratory ailments.

In many ways, however, fungal research indoors lags behind that of bacterial research, despite the prominent role that fungi play indoors. To that end, the ‘Fungal Workshop to Advance Studies of Fungi in the Built Environment’ was designed to bring together fungal researchers of different expertise to discuss current work in the area of fungi in the

Aspergillus sloanii. A. Colonies: top row left to right, obverse CYA, DG18 of non-sexual strain, DG18 of sexual strain and OA; bottom row left to right, MEA, reverse DG18 of non-sexual strain, reverse DG18 of sexual strain and obverse CREA. B. Ascoma. C. Asci with ascospores. D–G. Conidiophores. H. Conidia. Scale bars: B = 50 µm; C–H = 10 µm. Photos: Cobus Visagie.



Penicillium alfredii. A. Colonies: top row left to right, obverse CYA, CYA 30 °C, YES and OA; bottom row left to right, reverse CYA, obverse MEA, DG18 and CREA. B–G. Conidiophores. H. Conidia. Scale bars: B–H = 10 µm. Photos: Cobus Visagie.

dilution-to-extinction method (Visagie *et al.* 2014), revealing two new species (*Aspergillus sloanii* and *Penicillium alfredii*). These new approaches will find the maximal utility through strengthened databases, such as those for metabolites (Kildgaard *et al.* 2014) and reference genetic sequences (Nilsson *et al.* 2011). These tools could be used to address ongoing questions in mycological research, such as the link between fungal exposure and human health (e.g. Dannemiller *et al.* 2014).

Most of the presentations are publicly available and can be accessed on the microBE.net website: <http://microbe.net/2014/10/06/fungal-workshop/>.

Amend AS, Seifert KA, Samson R, Bruns TD (2010) Indoor fungal composition is geographically patterned and more diverse in temperate zones than in the tropics. *Proceedings of the National Academy of Sciences, USA* 107: 13748–13753.

Dannemiller KC, Mendell MJ, Macher JM, Kumagai K, Bradman A, *et al.* (2014) Next-generation DNA sequencing reveals that low fungal diversity in house dust is associated with childhood asthma development. *Indoor Air* 24: 236–247.

Kildgaard S, Mansson M, Dosen I, Klitgaard A, Frisvad J, *et al.* (2014) Accurate replication of bioactive secondary metabolites from marine-derived fungi by UHPLC-DAD-QTOFMS and a MS/HRMS Library. *Marine Drugs* 12: 3681–3705.

Nilsson RH, Abarenkov K, Larsson KH, Kõljalg U (2011) Molecular identification of fungi: rationale, philosophical concerns, and the UNITE database. *The Open Applied Informatics Journal* 5: 81–86.

Visagie CM, Hirooka Y, Tanney JB, Whitfield E, Mwangi K, *et al.* (2014) *Aspergillus*, *Penicillium* and *Talaromyces* isolated from house dust samples collected around the world. *Studies in Mycology* 78: 63–39.

built environment, with the goal of identifying particular research areas that would most advance understanding of fungi indoors.

Talks were centered around four basic themes: (1) Fungi and fungal products indoors; (2) Fungi and health; (3) Fungal bioinformatics and databases; and (4)

Sampling fungi. A recurring topic was the need to integrate existing knowledge with more recently developed approaches. For example, a survey of fungi in global dust has been conducted using pyrosequencing technology (Amend *et al.* 2010) and more recently, isolates were identified using the

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