IMA FUNGUS Impact Factor in sight

On 19 October 2016, IMA President Keith Seifert was informed by Thomson Reuters that *IMA Fungus* is to be included in the Web of Science and associated products: Current Contents/Agriculture, Biology & Environmental Sciences, JCR, and SCIE as well as Biosis.

Essentially this means that, from June 2017, *IMA Fungus* will have an impact factor (IF) for the first time. The journal was launched at IMC9 in Edinburgh in 2010 with an account of the history of the IMA by the late Emory G, Simmons, and has been developing into a "*Nature* type" journal for mycology. Having an impact factor means that we can now encourage more students and early career researchers to publish in *IMA Fungus*, and also use it to build the international mycological platform, carrying out the IMA mandate.

We remain optimistic for the IF to be accorded, but whatever that might be, the IMA Executive Committee is starting to explore ways to develop the journal further over the next few years, while retaining accessibility to mycologists at all times, and also providing a platform for all.

It has also been proposed (see below) that *IMA Fungus* will become the only journal in which suggested changes to the *International Code of Nomenclature for algae, fungi, and plants* which solely relate to fungi are to be published, rather than in *Taxon* as is the current practice.

Changes proposed in the naming of fungi

Proposals to change arrangements for the governance of the nomenclature of fungi, fine-tune some rules relating to fungi, and allow DNA sequences to serve as name-bearing types published

The deadline by which proposals to modify the *International Code of Nomenclature for algae, fungi, and plants* (ICN; McNeill *et al.* 2012) had to be submitted to *Taxon* in order to be considered by the Nomenclature Section of the XIXth International Botanical Congress (IBC) to be held in Shenzhen, China, on 17–21 July 2017 was 30 June 2016. No new proposals can now be considered. All proposals made will be collected and commented on by the Rapporteur- and Vice-rapporteur-général appointed by the previous Congress congress in the February 2017 *Taxon*, and put to a preliminary guiding mail vote. Only members of the International Association for Plant Taxonomy (IAPT) and those who made proposals are eligible to take part in that ballot.

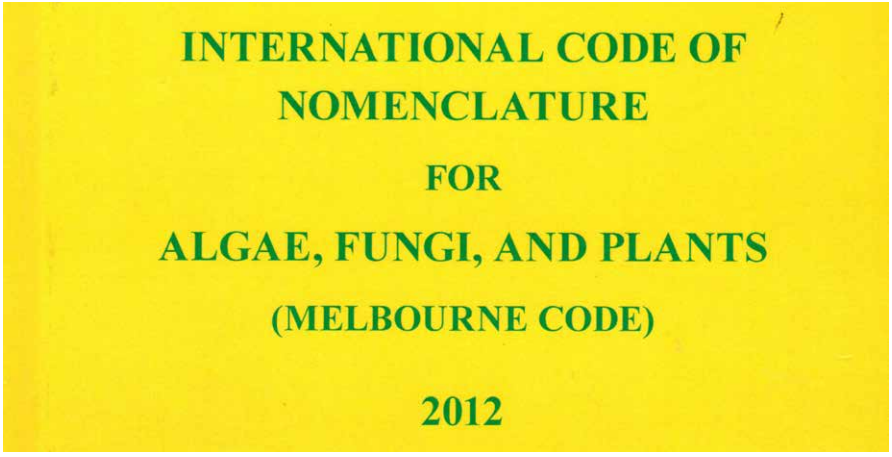
Governance

Significant changes were made in the rules relating to fungi at the Melbourne IBC in 2011. All issues raised in the Amsterdam Declaration on Fungal Nomenclature (Hawksworth *et al.* 2011) were actioned, apart from that of governance where the IBC formed a Subcommittee. That Subcommittee has now reported (May 2016) and formal proposals to modify the ICN published (May *et al.* 2016).These describe in detail how decision-making on matters related solely to fungi would be delegated to International Mycological Congresses (IMCs) and not ruled on at IBCs. Future IMCs will therefore include a Nomenclatural Session at which proposals can be voted on.

Proposals would be required to be published in *IMA Fungus*, and the preliminary mail vote would be open to individual members of the International Mycological Association (IMA), all organizations affiliated to the IMA, and other organizations approved by an overseeing Fungal Nomenclature Bureau set up for each IMC. In addition, the Nomenclature Committee for Fungi (NCF), which has a particular role in examining and voting on proposals for the conservation or rejection of names, would in future be elected at IMCs not IBCs.

As ICNs are revised every six years, the interval between IBCs, it is proposed that any changes adopted at IMCs would be indicated in the online version of the ICN.

This new system will ensure that in future mycologists will be able to take full responsibility for issues relating solely to the naming of fungi.



Fine-tuning

Experience in operating some of the changes introduced into the ICN in 2011 led to the views of mycologists being sought and discussions in Nomenclatural Sessions during IMC10 in 2014. The report of those meetings (Redhead *et al.* 2014) and subsequent discussions within the International Commission on the Taxonomy of Fungi (ICTF) led to a series of proposals being formally submitted for consideration at the 2017 IBC (Hawksworth 2015). Most far-reaching amongst those are: an extension of the protection accorded to names on the new protected lists, so that they are protected against unlisted as well as any listed names; a requirement to register later typifications in the same way as newly proposed names (already being required by some mycological journals); removal of the requirement not to take up a name with an asexual morph type over one with a sexual type without first making a proposal to reject the latter name; and modifying the conditions for epitypification so that an author does not have to demonstrate that no DNA was recoverable from the existing type material.

Amongst other proposals being put to the 2017 IBC, but which have not yet been subject to debate either at an IMC or within ICTF, are the suggestion not to allow the designation of illustrations of fungi as lecto-, neo-, or epitypes from 2019, and one to clarify the status of "special forms" (Hawksworth 2016).

DNA sequences as types

The controversial issue of whether to permit DNA sequence data to serve as the type of a name of a fungus was first raised by Don Reynolds and John Taylor in the early 1990s. The issue has no gone away. Indeed, the matter of naming fungi when no physical material was available was brought to the fore at IMC9 in 2010, and the issue was flagged as needing to be addressed in the Amsterdam Declaration on Fungal Nomenclature (Hawksworth *et al.* 2011). As more sequences not referable to any known sequenced taxon are recovered from environmental samples in particular, especially when these are found repeatedly in different studies (Nilsson *et al.* 2016; see *IMA Fungus* 7(1): (3), June 2016) the need has become more and more urgent. Fungi are already being name primarily from sequence data where the status of the names has been questioned (Tripp & Lendemer 2012). Recently, a fungus known only from sequence data was accorded a formal scientific name with only sequence data as the type, but with the suffix ENAS[1], following a critical discussion of the issues involved (de Beer *et al.* 2016).

An addition to the ICN has now been formally proposed to permit the type of a name to be DNA sequence data deposited in a public database where no physical specimen is available to serve as the type (Hawksworth *et al.* 2016). The proposal includes a recommendation about how that should be done. Opinions on the issue are divided within the ICTF, but if no action is taken at the upcoming ICN next summer, it could be 2025[2] before some provision could become effective.

Make your views known

The few mycologists who are members of IAPT will be able to make their views known in the preliminary mail ballot prior to the Shenzhen IBC. All mycologists concerned with the naming of fungi are urged to study these various proposals, as will the Nomenclature Committee for Fungi (NCF). If unable to attend the IBC personally, where possible make your views known to the individual and institutional delegates who will be voting at the Nomenclature Section meetings in July 2017 IBC.

de Beer ZW, Marincowitz S, Duong TA, Kim J-J, Rodrigues A, Wingfield MJ (2016) *Hawksworthiomyces* gen. nov. (*Ophiostomatales*), illustrates the urgency for a decision on how to name novel taxa known only from environmental nucleic acid sequences (ENAS). *Fungal Biology* **120**: 1323–1340.

Hawksworth DL (2015) (063–085) Proposals to clarify and enhance the naming of fungi under the *International Code of Nomenclature for algae, fungi, and plants. IMA Fungus* **6**: 199–205; *Taxon* **64**: 858–862.

Hawksworth DL (2016) (346–361) Miscellaneous proposals aimed at enhancing or clarifying aspects of the *International Code of Nomenclature for algae, fungi, and plants. Taxon* **65**: 915–917.

Hawksworth DL, Crous PW, Redhead SA, Reynolds DR, Samson RA, *et al.* (2011) The Amsterdam Declaration on Fungal Nomenclature. *IMA Fungus* **2**: 105–112.

Hawksworth DL, Hibbett DS, Kirk PM, Lücking R (2016) (308–310) Proposals to permit DNA sequenc data to serve as types of names of fungi. *Taxon* **65**: 899–900.

May TW (2016) Report of the Special Subcommittee on Governance of the Code with Respect to Fungi. *Taxon* **65**: 921–925.

May TW, de Beer ZW, Crous PW, Hawksworth DL, Liu X, Norvell LL, Pennycook SR, Redhead SA, Seifert KA. (2016) (363–363) Proposals to amend the *Code* to modify its governance with respect to names of organisms treated as fungi. *Taxon* **65**: 918–920.

McNeill J, Barrie FR, Buck WR, Demoulin V, Greuter W, *et al.* (2012) *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code) adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011.* [Regnum Vegetabile No. 154.] Königstein: Koeltz Scientific Books.

Nilsson RH, Wurzbacher C, Bahram M, Coimbra VRM, Larsson E, *et al.* (2016) Top 50 most wanted fungi. *MycoKeys* **12**: 29–40.

Redhead SA, Demoulin V, Hawksworth DL, Seifert KA, Turland NH (2014) Fungal nomenclature at IMC10: report of the Nomenclature Sessions. *IMA Fungus* **5**: 449–462.

Tripp EA, Lendemer JC (2012) (4–5) Request for binding decisions on the descriptive statements associated with *Mortierella sigyensis* (fungi: *Mortierellaceae*) and *Piromyces cryptodigmaticus* (fungi: *Neocallimastigaceae*). *Taxon* **61**: 886–888.

[1]ENAS = Environmental nucleic acid simple.

[2]If the governance proposals are accepted at the ICN in July 2017, a decision could be taken at IMC11 in 2018 or IMC12 in 2022 which could result in the effective this date being 2019/20 or 2023/24.

To split or not to split: the *Amanita* controversy

The segregation of the well-known genus *Amanita* into two separate genera, the mycorrhizal *Amanita* and the saprobic *Saproamanita,* by Redhead *et al.* (2016) in this journal has sparked a heated debate amongst agaricologists. An argued response by no less than ten other specialists from six countries rejects the proposal, primarily on the basis of the shared unique

Amanita muscaria. Photo: D L Hawksworth.

schizohymenial ontogeny (Tulloss *et al.* 2016). They argue that the split degrades an ability to communicate and complicates links with the past literature, and further that the ecological differences related to the presence or absence of cellulases are not as clear-cut as suggested by Redhead *et al.* (2016).

All taxonomic schemes are hypotheses subject to testing, and this appears to be a case where more information on the ecology and physiology of a wider range of taxa would be informative as to whether a decision to split as proposed is desirable.

Tulloss *et al.* (2016) provide a revised characterization of the family and the two genera they argue can be supported by the current data, *Amanita* and *Limacella*. This debate is evidently one that can be expected to run for some years before a consensus amongst specialist agaricologists emerges, so curators, field mycologists, and editors may be excused for biding their time. The mycologist Edmund W Mason (1890–1975) counseled that names in collections should be left as they were for at least ten years before being changed to see if they would stick . . . Perhaps times have not changed as much as we sometimes think.

Redhead SA, Vizzini A, Drehmel DC, Contu C (2016) *Saproamanita,* a new name for both *Lepidella* E.-J. Gilbert and *Aspidella* E.-J. Gilbert (*Amaniteae*, *Amanitaceae*). *IMA Fungus* **7**: 119–129.

Tulloss RE, Kuyper TW, Vellinga EC, Yang ZL, Halling RE, *et al.* (2016) The genus *Amanita* should not be split. *Amanitaceae* **1**(3): 1–16.

IMC11 – Puerto Rico and the 11th International Mycological Congress

Puerto Rico, the "Island of Enchantment", the "Shining Star of the Caribbean", the "Pearl of the Caribbean" or the "Continent of Puerto Rico", as it is often called, is 100 × 35 miles, has an strategic geographical position in the centre of the arc of the Antilles, and has been an essential crossroads of Hispanic and Anglo cultures. As one of the oldest and most diversified cultures in the world, Puerto Rico is a vibrant, modern, bilingual and multicultural society. Since the first humans came ashore thousands of years ago, the island that is now known as Puerto Rico has sheltered Tainos (indigenous people of the Caribbean), Spaniards, Africans, and Anglos. The Spaniards had the earliest and greatest influence on the Island after their arrival in 1493. During their 400-years of dominance, the Spaniards laid the foundation for the Puerto Rican language and culture. They brought slaves from Africa to work in the fields, a culture that enriched the language, music, and food. As a result of the Hispano-American War, Puerto Rico has been a part of the United States since 1898 and Puerto Ricans have been US citizens since 1917.

Puerto Rico has a perfect climate with an eternal summer. Temperature is almost perfect, averaging 22.7 °C (83 °F) in the winter and 29.4 °C (85°F) in the summer. The trade winds cool the coast and the temperature decreases as you go up into the higher mountains. We can distinguish two seasons based on the amount of precipitation, wet (October-December) and dry (February-April). The other months of the year have intermediate precipitation.

The natural history of the Island and its climate has provided Puerto Rico with a range of subtropical ecosystems, allowing the island to have a great diversity of forest types in only 3,500 square miles with a rich flora and mycobiota. The types of forests found in Puerto Rico are classified based on life-form zones, geology and climate. The major subtropical types of forests are: mangroves, dry, humid, wet, rain, lower montane wet, and lower montane rain. These forest types can be found over sedimentary, limestone, volcanic, or ultramafic rocks creating the perfect environment for unique plant and fungal species to grow. Some freshwater wetlands and extreme environments such as salterns and salt flats (Fig. 1) are also found in Puerto Rico. Each of these forests holds a great diversity of plants with *ca* 25 % endemics.

Puerto Rico is home of several natural and technological wonders. Deep in the north limestone region, the Arecibo Radio Telescope (ART; Fig. 2) was built between 1960–63. The Arecibo Ionospheric Observatory is open under the supervision of William E. Gordon who manages the world's largest single-dish radio telescope. The Observatory is recognized as one of the most important national centres for research in radio astronomy, planetary radar, and terrestrial aeronomy. One of the more important contributions of the ART has been in the study of pulsars, and two scientists, Russell A. Hulse and Joseph H. Taylor, received the 1993 Nobel Prize of Physics based on their discovery and studies of an extraordinary pulsar. At the ART

Fig. 1. Cabo Rojo salterns and salt flats in the southwest coast of Puerto Rico. Photo: S A Cantrell.

Fig. 2. Arecibo Radio Telescope in the north limestone region of Puerto Rico. Photo: S A Cantrell.

Fig. 3. El Yunque National Forest in the north east of Puerto Rico. Photo: S A Cantrell.

Fig. 4. Guánica Dry Forest in the south coast of Puerto Rico. Photo: http://discoverpuertoricousa.com/wp-content/uploads/2013/05/Guanica-Dry-Forest.jpg.

Fig. 5. El Morro, the biggest Spanish fortress in the Caribbean, in Old San Juan, Puerto Rico. Photo: S A Cantrell.

Fig. 6. The wall city of Old San Juan. At the center in dark red the only standing gate can be seen and the blue building at the right is La Fortaleza, the home of the Governor of Puerto Rico. Photo: S A Cantrell.

Visitor Center you can see the publications and the Nobel Prize.

In terms of natural wonders, Puerto Rico is the home of two UNESCO Biosphere Reserves. One is the Luquillo Mountains, home of the El Yunque National Forest (Fig. 3), the only tropical rainforest in the US National Forests System. El Yunque National Forest is characterized by different types of vegetation that occur along the elevation gradient over volcanic substrata, including cloud and dwarf forest at higher elevations. The vegetation is composed of approximately 1000 plant species of native trees, orchids, lianas, herbaceous, bromeliads, and ferns. The other Biosphere Reserve is the Guánica Dry Forest (Fig. 4) managed by the Puerto Rico Department of Natural Resources. This forest is located in the orographic rain shadow of the Central Mountain in the south coast of Puerto Rico, the driest part of the island. The forest can be divided into three vegetation groups, upland deciduous, semi-evergreen, and scrubland forests. It has approximately 700 plant species of native trees, cacti, xeromorphic epiphytes, lianas, orchids, and herbaceous.

San Juan, the host city

San Juan was founded in 1521 and is located in the Northern Coastal Plains region in the karst zone. In 1508, Juan Ponce de León founded the original settlement, Caparra, now known as Pueblo Viejo, behind the almost land-locked harbour. During the early 16th century, San Juan was the point of departure of Spanish expeditions to charter or settle unknown parts of the New World. Its fortifications repulsed the English navigator Sir Francis Drake in 1595, as well as later attacks. The old city has three stunning Spanish Colonial Fortresses: El Morro (Fig. 5), Fuerte San Cristóbal and La Fortaleza (Fig. 6), which have been designated World Heritage Sites by UNESCO. Old San Juan, the magnificent walled city (Fig. 6), is encircled by magical architecture, churches, and chapels. Pretty and comfortable plazas invite you to return hundreds of times to relax and enjoy seeing the charming people who adorn the streets, going about their typical town chores. San Juan has multiple urban forested areas accessible by public transport where people can enjoy some of our natural beauty.

The Puerto Rico Convention Center, the IMC11 congress venue, was opened in November 2005. It is a state-of-the- art convention centre with a huge exhibit hall and ballroom, multiple lecture and meeting rooms, and a spacious lobby area with a huge glass wall illuminated by the sunlight during the day. In its architectural expression, the design is meant to echo the sights and ambiance of Puerto Rico. For example, the large sweeping roof forms bring to mind ocean waves – their complex geometry, colour, and translucency. Island motif doors, wall hangings, and tiles adorn the interior.

San Juan is not only known for its Spanish history, but also by the nightlife and restaurants. The city has numerous restaurants serving Puerto Rican, international, and fusion foods. The nightlife ranges from sports to clubs and bars, serving local and imported beers, international wines, and cocktails. Some of these clubs also feature music from salsa and merengue to jazz, pop, and rap.

Fungi of Puerto Rico

Puerto Rico has a long history of mycology, beginning early in the 1800s with collections by Carlos Bertero, an Italian who collected in Puerto Rico and Hispaniola. Other mycologists who followed and published about the fungi of Puerto Rico were: C Schwanecke, J Bresadola, P Hennings, P Magnus, FS Earle, and JC Arthur. Fred. L. Stevens was a mycologist who made great contributions to mycology in Puerto Rico while he was Dean of the College of Agriculture and Mechanic Arts at the University of Puerto Rico in Mayagüez from 1912–14. The first mycologist born in Puerto Rico was Carlos E. Chardon Palacios, who was trained by Whetzel and Fitzpatrick and graduated from Cornell University in 1921. Chardon has many publications on rust, smuts, and pyrenomycetes. In 1923, Chardon, together with NL Britton, started a scientific survey of Puerto Rico. This resulted in the first publication of the "Scientific Survey of Puerto Rico and the US Virgin Island" in 1926, which included a chapter on fungi coauthored by Fred Seaver. In 1932, a supplement was published with another famous mycologist, F Kern. The first complete list of "Fungi of Puerto Rico and the US Virgin Islands" was published by John S. Stevenson in 1975. Medical mycology was also studied in Puerto Rico by Arturo Carrion, a contemporary of Chardon, who was also born in Puerto Rico.

There are 11,268 species of fungi so far reported from the Caribbean basin. The number of known fungal species for Puerto Rico represents only 30 % of these. Even though many mycologists have collected in Puerto Rico over the years, there are still many habitats to be explored and fungi to

Fig. 7. *Cookeina speciosa*, widespread species of cup fungi from lower elevation forests Photo: S A Cantrell.

Fig. 8. *Hygrocybe occidentalis* var. *scarletina*, a very common species found in El Yunque National Forest. Photo: S A Cantrell.

Fig. 9. *Hygrocybe miniatofirma*, an endemic cloud forest species only known from two locations in El Yunque National Forest. This species has been recently added to the Red List of Fungi. Photo: S A Cantrell.

Fig. 10. *Cantharellus coccolobae*, the only species of this genus found in association with different species of Coccoloba in Puerto Rico. This particular photo is from the Guánica Dry Forest after all the rain that Hurricane Georges left in the island. Photo: S A Cantrell.

be discovered. Of the 3,315 known fungal species in Puerto Rico, 24 % are endemic to the island. It is estimated that between 15-20 % of the fungi collected in a single field trip might represent new records or

Fig. 11. *Diplocystis wrightii*, an inconspicuous puffball found buried in the soil in the Guánica Dry Forest. Photo: S A Cantrell.

Fig. 12. The beach-loving ringless *Amanita arenicola*, one of the few species of *Amanita* known from Puerto Rico. Photo: S A Cantrell.

species. Some families of basidiomycetes that are restricted to wet forests, such as *Hygrophoraceae* and *Entolomataceae*, have higher rates of unique (endemic) species (60-75 %). **This makes the island of Puerto Rico a unique mycological paradise.**

El Yunque has very interesting fungal species, some of which are pantropical (e.g. *Cookeina speciosa,* Fig. 7), neotropical (e.g. *Hygrocybe occidentalis* var. *scarletina,* Fig. 8), or endemic (e.g. *Hygrocybe miniatofirma,* Fig.9). Also, some fungi can be found in the Guanica Dry Forest, including edible species such as *Cantharellus coccolobae* (Fig. 10) and unique puffballs such as *Diplocystis wrightii* (Fig. 11). There are other interesting species of fungi in sand, such as the beach-loving ringless *Amanita arenicola* (Fig. 12)

Mycological discoveries for a better world, the theme for IMC11

The Congress will be held from 16–21 July 2018, and will include workshops, special interest group meetings, plenaries, and symposia around the theme *Mycological discoveries for a better world.* The theme for IMC11 focuses on discussing how fungi in all their expression contribute to the health of society and of ecosystems. The Congress will explore from the diversity, ecology, and conservation of fungi to their biotechnology, evolution, genetics, and medical importance. The programme starts on Monday 16 July with field trips, workshops, registration, and the opening plenary session and a ceremony. Four full day programmes will be scheduled for the Tuesday, Wednesday, Friday, and Saturday. A free day for mycological field trips, tours, workshops, and special interest group meetings will be schedule for the Thursday.

The keynote speaker will be Paola Bonfante, professor in the Department of Life Science and Systems Biology, Universita di Torino, Italy. Paola is a leading figure in mycorrhizal symbiosie and discovered intrafungal bacteria (endobacteria) in AM fungi. The award and closing ceremony, follow by a banquet and a party will be organized for Saturday evening.

The Local Steering committee is Co-chaired by Sharon A. Cantrell and D. Jean Lodge. The other members of the committee are: Matías Cafaro, Benjamin Bolaños, José R. Pérez, Carmen Acevedo, Paul Bayman, Sandra Maldonado, Marian Spola, Barbara Sánchez, and Juan Acevedo. The Congress webpage is www.imc11.com, and any inquiries should be made to imc11.contact@gmail.com.

The Mycological Society of America (MSA), the Latin American Mycological Association (ALM), the Puerto Rican Mycological Society (SPM), Universidad del Turabo, and Meet Puerto Rico are all proud to sponsor the 11th International Mycological Congress in San Juan, Puerto Rico. This will be the first time an IMC has been held in Latin America and the Caribbean region. Puerto Rico is an ideal setting for a mycological congress because of the long history of mycology and its location in the subtropical region offering a diversity of ecosystems (from dry to rain forests) harbouring many tropical fungi. San Juan, the capital city, possesses a state of the art convention centre, excellent hotels, excellent cultural activities, and amazing culinary experience.

The Luis Muñoz Marin International Airport is a main hub for different airlines receiving direct flights from major airports in the USA, Europe, Central America, and South America. Do come and experience all that IMC 11 and Puerto Rico have to offer you, a great scientific and social programme, and our natural beauty, wonderful food, and exciting night life.

Sharon A. Cantrell Rodríguez
(scantrel@suagm.edu)