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NOMENCLATURE

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Making nomenclature governance more inclusive through virtual attendance and electronic voting at the Nomenclature Section of an International Botanical Congress

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Abstract Participating in, and voting at, the Nomenclature Section of an International Botanical Congress is neither simple nor easily affordable. The technology of virtual meeting attendance and electronic voting should presently be sufficient to allow people from around the world to participate in the Nomenclature Section and thus make the process of nomenclature governance more inclusive and democratic.

Keywords Code; governance; International Botanical Congress; nomenclature; Nomenclature Section; virtual meetings

The *International Code of Nomenclature for algae, fungi, and plants (ICN)* (McNeill & al., 2012), formerly the *International Code of Botanical Nomenclature*, is an important document that governs the scientific naming of algae, fungi, and plants (<http://www.iapt-taxon.org/nomen/main.php>). One of the principles (Principle IV) of the *ICN* is that each taxonomic group with a particular taxonomic circumscription, position, and rank can have only one correct name. Usually the generally accepted taxonomy is that of a specialist in that group of organisms. The *ICN* provides a precise, widely accepted system of naming organisms that enables accurately referencing them in international commerce, agriculture, forestry, horticulture, medicine, conservation, research, and more. Thus we might say that the *ICN* is one of the bases of international law. Consider for instance a plant from which active ingredients, such as secondary metabolites, are extracted for inclusion in a drug. If there is no widely accepted scientific name for that plant it is more difficult to pass enforceable laws in the many countries

of the world where the plant occurs naturally, or is grown commercially, and/or the drug is used. One of the major benefits of having the well-respected *ICN* available is that governments globally generally accept the names botanists tell them are correct. Therefore, for the organisms covered by the *ICN*, a comprehensive, if at times intricate, system is provided for publishing new scientific names and applying old ones. Some might think that the *ICN* is governed by some international institution or organization such as the United Nations or the International Association for Plant Taxonomy (IAPT), but it is not. It is associated with International Botanical Congresses that take place every six years, a tradition over 100 years old. These Congresses are authorized by the International Association of Botanical and Mycological Societies. Only through action of a plenary session of an International Botanical Congress (IBC) may the *ICN* be modified (McNeill & al., 2012, Div.III.1). In between Congresses, a cluster of committees, appointed at the preceding IBC makes decisions about nomenclature and these

are then nearly always approved at the next IBC, following a resolution moved by the Nomenclature Section (NS) of that Congress. The NS is a five-day meeting of persons interested in nomenclature that precedes the main IBC. Recommendations of the NS are essentially always approved by the plenary session of an IBC.

One logistical challenge for prospective participants in a NS associated with an IBC is that these events are of necessity held in one city of one country, and that locality changes every six years. The location where a meeting is held matters because of the difficulty or ease of attending the meeting and because opinions on some issues may differ from region to region. For instance one region might favor stability of names over the principle of priority, but another region may have the opposite view. It is our opinion that if the Saint Louis, U.S.A., Congress of 1999 where the registration of names (Borgen & al., 1998) and Names in Current Use (Greuter, 1998) were major issues, had been held in Europe where the level of support was probably different than in the Americas, it is likely that the outcomes of the voting on these two matters would have been different. Further we believe that if the Vienna Congress of 2005, where the conservation of *Acacia* Mill. with a new type was a contentious issue (Moore & al., 2010; Smith & al., 2006), had been held in Africa or Latin America where *Acacia*, in the original sense, is an important genus, the result would have been different. So far, no IBC has ever been held in either Africa or Latin America, so those regions have been under-represented in past decisions (Smith & al., 2010, 2011; Rico Arce, 2012).

These practicalities raise important questions, such as: Who should decide, through participating and voting at a NS, how the *ICN* that regulates the naming of algae, fungi, and plants should be amended? Should it be a fully democratic process (i.e., with worldwide representation and each person participating with one vote), or should nomenclature be left to experts? Who should participate? How should they participate?

At present, we view the process as rather complicated, and in need of further democratization.

There are currently three ways of participating in the governance of the *ICN* that we explain below: Mail Votes, Institutional Votes, Personal Votes.

First, anyone can make a proposal to change the *ICN* by sending a proposal to the editors of *Taxon*, the journal of the IAPT (<http://www.iapt-taxon.org/pages/taxon>), during an approximately three-year period prior to an IBC. The proposal will be published, with open access to the online edition, and people around the world can read it and consider if it is an improvement on how the *ICN* deals with the particular matter, or not. About six months before an IBC takes place a synopsis of the published proposals to amend the *ICN* is published in an issue of *Taxon*. The synopsis is produced by the Rapporteur-général and the Vice-rapporteur, who additionally pass comment on the proposals. Where appropriate, the synopsis may include opinions of the Permanent Nomenclature Committees (see McNeill & al., 2012, Div.III).

Mail Votes. — Before an IBC, a ballot on all the proposals is sent to all the members of IAPT, as well as members

of the Permanent Nomenclature Committees and to persons who proposed changes to the *ICN*, even if they are not members of IAPT. Recipients of the ballot can express their opinion in a preliminary guiding mail vote (McNeill & al., 2012, Div.III4(a)). This “Mail Vote” has often not been given much weight in the past. When 75% or more of the votes are against a proposal, a rather high bar, it is generally treated as rejected at the NS and not open to discussion there. But even a proposal with 75% of the votes against it may be considered for discussion and voting at the NS if there are a few supporters present there. Of course, if the mail vote is strongly against a proposal, for instance 60% against, that might influence the outcome of a vote at the NS.

Institutional Votes. — Herbaria around the world are allocated “Institutional Votes” that can be taken to an IBC by someone attending the NS (McNeill & al., 2012, Div.III4(b(2))). One proposed justification for Institutional Votes has been to diminish the importance of the location of a meeting (Demissew & Funk, 2013). If no one from an institution can attend an IBC’s NS, that institution’s vote can be carried by a person who is able to be present, or it can be sent to the “Bureau of Nomenclature” (i.e., the Rapporteur-général mentioned below, and others, officiating the NS; McNeill & al., 2012, Div.III.3), stating how an institution wants to vote on a certain proposal. Any individual can carry up to 14 Institutional Votes and will have a Personal Vote as well. Presently the Bureau of Nomenclature (see McNeill & al., 2012, Div.III.3; see also Knapp & al., 2016a, b) of the International Botanical Congress assigns the Institutional Votes, with some institutions getting more than others (but this is a controversial matter; see Smith & al., 2010, 2011). The responsibility of assigning Institutional Votes may change to a special committee, a topic to be discussed at the next NS (Knapp & al., 2016a, b). For the 2017 IBC a special committee has worked with the Bureau of Nomenclature to establish a list of institutions and their votes and many new Institutional Votes have been allocated (Funk & Turland, 2016). Allocation of Institutional Votes can vary widely. The country of Chile, for example, has had until now only two institutions with votes: one for SGO (Museo Nacional de Historia Natural) and one for CONC (Herbario de la Universidad de Concepción). The large herbaria of Europe, China, and North America have as many as seven votes each(!) (see Smith & al., 2010 for a comprehensive analysis).

If an institution has no vote a request for one or more Institutional Votes can be submitted to the leading officer of nomenclature, the Rapporteur-général (at present Nicholas J. Turland, n.turland@bgbm.org), or a vote may be requested from the Special Committee on Institutional Votes that was established at the last IBC in Melbourne (http://www.iapt-taxon.org/pages/sp_committee_inst). Smaller herbaria around the world should request that votes be allocated to them. The first, simple step is registering your herbarium in Index Herbariorum (<http://sweetgum.nybg.org/science/ih/>), which lists the vast majority of the herbaria of the world. By being part of Index Herbariorum an institution demonstrates its willingness to be part of the world community of taxonomists of algae, fungi, and plants.

Personal Votes. — The most direct way to participate in the governance of the ICN is to attend the NS of an IBC, pay registration for at least one day of the Congress proper, and participate in the week-long NS using your Personal Vote (McNeill & al., 2012, Div.III.4(b(1))) and up to 14 Institutional Votes that may have been assigned to you by institutions without representatives at the NS. The next IBC will be held in Shenzhen, China, and the NS will take place from 17 to 21 July 2017 (<http://www.ibc2017.cn/>). Unfortunately it is an expensive proposition to attend as travel, lodging, and registration fees must be paid; this makes participation in this international nomenclature governance forum that occurs only once every six years challenging for a host of potential participants. Inevitably, those with little or no research funding, or health and/or mobility limitations are less likely to attend. It is left to a few dedicated people who can afford to go. Sometimes a small group of people representing a much larger community, no matter how well meaning, may have ideas that differ widely from the community as a whole. This is analogous to the founder effect in population genetics, in which a small sample of individuals derived from a large population often has a genetic make-up differing from the population as a whole. This may especially be evident when the small sample is filtered in some way, e.g., ability to attend the NS.

We believe that in this day of comparatively easy, low-cost internet usage it should be possible for people to attend the IBC's Nomenclature Section virtually and submit **Electronic Votes**. It might not yet be possible to participate in discussions on an issue easily, but the discourse at the meeting can be followed, which will facilitate an informed choice on how to vote. Once virtual participation is implemented, how would it work?

(1) The Nomenclature Section meetings would need to be broadcast via the web. The cost and feasibility may still differ from country to country, but we are optimistic that it can be achieved. SKYPE or a form of “live streaming” (e.g., <https://livestream.com/>) should suffice. The cost might be covered by virtual participants paying fees mentioned below. Obviously the total cost of attending a NS meeting virtually will be lower than in-person attendance.

(2) Participants casting Personal Votes from remote stations may have to register and pay some fee equivalent to those participants attending the meeting personally, e.g., paying for at least one day of the IBC and/or a special fee for virtual participation in the Nomenclature Section. Casting Institutional Votes, either electronically or with the help of an attendee at the NS, should remain free, as it is now.

(3) A safe and rapid method of voting would have to be implemented, probably with password protected access linked to a computer at the IBC Nomenclature Section.

What might be the benefits of this method of voting? The NS of the IBC would be open to a much broader sample of botanists from around the world and thus be more democratic. The location of the meeting would not be as important. International travel and, by implication, the carbon footprint of the Nomenclature Section will be reduced.

While we anticipate significant positive aspects to this development, there may be some fears or concerns. Would

the electronic voters somehow overwhelm the voters physically present at the NS? How much control would there be as to who the electronic voters are? To cast Personal Votes would require the voters paying some fee mentioned above. This unfortunately would be a form of fiscal discrimination, but would perhaps be necessary to satisfy those who are physically present, and would have the benefit of limiting participation to those who are truly interested.

The organizers of the NS at the Shenzhen Congress are considering if the NS meeting can be broadcast via the web (N. Turland, pers. comm.). Perhaps some of us can test the concept of virtual participation by sending unofficial “e-mail votes” to colleagues at the meeting. This would be a good test of the feasibility of a virtual meeting. Then perhaps a Special Committee can be established at the Shenzhen meeting that will prepare a plan for the next IBC's NS, in 2023, where virtual participation with voting rights will be possible, given how rapidly technology is developing.

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