



Report of the 20th Meeting of the World Flora Online Council

Organised by Royal Botanic Gardens, Kew, United Kingdom

14 to 17 March 2023

The 20th meeting of the World Flora Online (WFO) Council was held in hybrid format (in person and with online virtual participation) on Thursday 16 to midday Friday 17 March 2023, in Royal Botanic Gardens, Kew, United Kingdom. The meeting of Council was preceded by two days of meetings of the WFO Taxonomic and Technical Working Groups (14 to 15 March), including joint sessions to discuss common topics. There were two workshops on Friday 17 afternoon, one on the Australian Species List infrastructure (led by Anthony Whalen and Anne Fuchs, Australian National Botanic Gardens), the other on the development of Echinopscis software system (led by Nicky Nicolson and Eve Lucas, Kew). Over the five days, 31 individuals participated in person, and 17 virtually, representing 26 institutions, organizations or projects.

Attendance:

Adil Güner	Nezahat Gökyiğit Botanik Bahcesi, Istanbul, Turkey
Alan Elliott	Royal Botanic Garden Edinburgh, Edinburgh, UK
Ann Fuchs* ^w	Australian National Botanic Gardens, Canberra, Australia
Alan Paton	Royal Botanic Gardens, Kew, UK
Alex Monro	Royal Botanic Gardens, Kew, UK
Andreas Müller	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
Anthony Whalen* ^C	Australian National Botanic Gardens, Canberra, Australia
Chuck Miller	Missouri Botanical Garden, St Louis, Missouri, USA
Dalila Espírito Santo*	Instituto Superior de Agronomia, Universidade de Lisboa, Portugal
Dmitry Geltman*	Komarov Botanical Institute, St Petersburg, Russian Federation
Domingos Cardoso* ^C	Universidade Federal da Bahia, Salvador, Brazil
Eduardo Dalcin*	Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro, Brazil
Emma Wrangmore* ^w	IPNI, Royal Botanic Gardens, Kew, UK
Eve Lucas	Royal Botanic Gardens, Kew, UK
Gerardo Salazar* ^C	Universidad Nacional Autónoma de México, Mexico City, Mexico
Gunter Fischer	Missouri Botanical Garden, St Louis, Missouri, USA
Helen Hartley	IPNI, Royal Botanic Gardens, Kew, UK
Jainine Victor* ^C	South African National Biodiversity Institute (SANBI), Pretoria, South Africa
Jana Leong-Škoeničová*	Singapore Botanic Gardens, Singapore
Jin Xiaohua*	Institute of Botany, Beijing, China
Joe Miller* ^C	Global Biodiversity Information Facility, Copenhagen, Denmark

John Parnell	Trinity College Dublin, Dublin, Ireland
Jonathan Krieger ^w	IPNI, Royal Botanic Gardens, Kew, UK
Lauren Raz	Universidad Nacional de Colombia, Bogotá, Colombia
Marc Sosef	Meise Botanic Garden, Meise, Belgium
Marianne Le Roux*	South African National Biodiversity Institute (SANBI), Pretoria, South Africa
Mark Watson	Royal Botanic Garden Edinburgh, Edinburgh, UK
Nadja Korotkova*	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
Nicky Nicolson ^w	Royal Botanic Gardens, Kew, UK
Nicola Schoenenberger	Conservatoire et Jardin Botaniques, Geneva, Switzerland
Olaf Bánke ^c	Catalogue of Life/Species2000
Olwen Grace	Royal Botanic Gardens, Kew, UK
Martin Ricker ^{*c}	National Autonomous University of Mexico (UNAM), Mexico City, Mexico
Nye Hughes	Associate, Royal Botanic Garden, Edinburgh, UK
Paul Kersey	Royal Botanic Gardens, Kew, UK
Peter Fritsch	Fort Worth Botanic Garden, Botanical Research Institute of Texas, Texas, USA
Peter Wyse Jackson	Missouri Botanical Garden, St Louis, Missouri, USA
Quonita Daniels*	National Herbarium of National Botanical Research Institute, Namibia
Rafaël Govaerts	Royal Botanic Gardens, Kew, UK
Rashad Salimov*	Institute of Botany, Baku, Azerbaijan
Roger Hyam	Royal Botanic Garden Edinburgh, Edinburgh, UK
Ronell Klopper*	South African National Biodiversity Institute (SANBI), Pretoria, South Africa
Sandy Knapp	Natural History Museum, London, UK
Sebsebe Demissew	Addis Ababa University, Ethiopia
Thomas Borsch	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
Visotheary Ung	Muséum National d'Histoire Naturelle, Paris, France
Walter Berendsohn*	Botanic Garden and Botanical Museum Berlin-Dahlem, Berlin, Germany
William Ulate	Missouri Botanical Garden, St Louis, Missouri, USA
*Online, ^w Working Group sessions only, ^c Council Only	

The following is a summary report of the meeting of Council and decisions adopted. Recordings of the meeting, and associated documents, are available on the WFO OwnCloud online storage, <https://cloud.worldfloraonline.org>

1. Welcome

Richard Deverell, Director of Royal Botanic Gardens, Kew, welcomed the WFO delegates at the start of the meetings, noting that taxonomy is central to Kew's mission and that Kew fully supports WFO. Richard Deverell stressed that collaborative working is key to success, and that WFO is one of the largest botanical collaborations in the world, strengthening relationships and supporting research.

Council Co-chair Peter Wyse Jackson welcomed all participants, including Quonita Daniels from the National Botanical Research Institute, Namibia, who was attending for the first time. Domingos Cardoso of the Jardim Botânico do Rio de Janeiro, Brazil was welcomed as the new WFO representative of that institution. Peter WJ thanked Richard Deverell and his team for their generosity and work in hosting the meetings. He also thanked the teams in St Louis and Edinburgh for their outstanding efforts on the WFO

since the last meeting in Meise, in July 2022. Peter WJ outlined the achievements of WFO to date (we now have 51 Consortium members, 1.6 million names in the portal, and more than 300 taxonomic experts who are participating in the TENS. We expect these numbers to continue growing, and looking forward to the challenges ahead.

The draft agenda was adopted as follows:

1. Welcome and adoption of the draft agenda *Peter Wyse Jackson*
2. Apologies for absence
3. Adoption of the Report from the 19th meeting of the WFO Council (Meise, 18 to 22 July 2022)
4. New WFO Consortium Members
5. Update on the WFO Portal and Content *William Ulate*
6. Report on Taxonomic Expert Networks (TENS) and WFO Classification in Rhakhis *Alan Elliott*
7. Report from the Taxonomic Working Group *Mark Watson and Alan Elliott*
 - a. Discussion and adoption of recommendations from the Taxonomic Working Group.
8. Report from the Technical Working Group *Chuck Miller and Walter Berendsohn*
 - a. Discussion and adoption of recommendations from the Technical Working Group
9. International Plant Name Index/WCVP/WFO cooperation
10. Communications Working Group
11. Presentations at conferences and other outreach activities
12. Update on the new CoL/GBIF infrastructure, including ChecklistBank *Olaf Bánki*
13. Review Action Points from the last meeting (other than those covered above)
14. Montreal-Kunming Global Biodiversity Framework and GSPC *Peter Wyse Jackson*
15. WFO Strategic Plan *Peter Wyse Jackson*
16. WFO registering as a NGO *Nicola Schoenenberger*
17. Election of WFO Officers
18. Plans for 21st and 22nd Council meetings
19. Any Other Business

2. Apologies for absence

Apologies for absence from the meeting were received from Demitry Geltman (St Petersburg), Thomas Haeevermans (Paris), Patrick Herendeen (International Association for Plant Taxonomy), Fabián Michelangeli (New York), David Middleton (Singapore), and Colin Pendry (Edinburgh). Erik Smets (Naturalis, Leiden, Netherlands) had retired from Council since the last meeting:

3. Adoption of the Report from the 19th meeting of the WFO Council

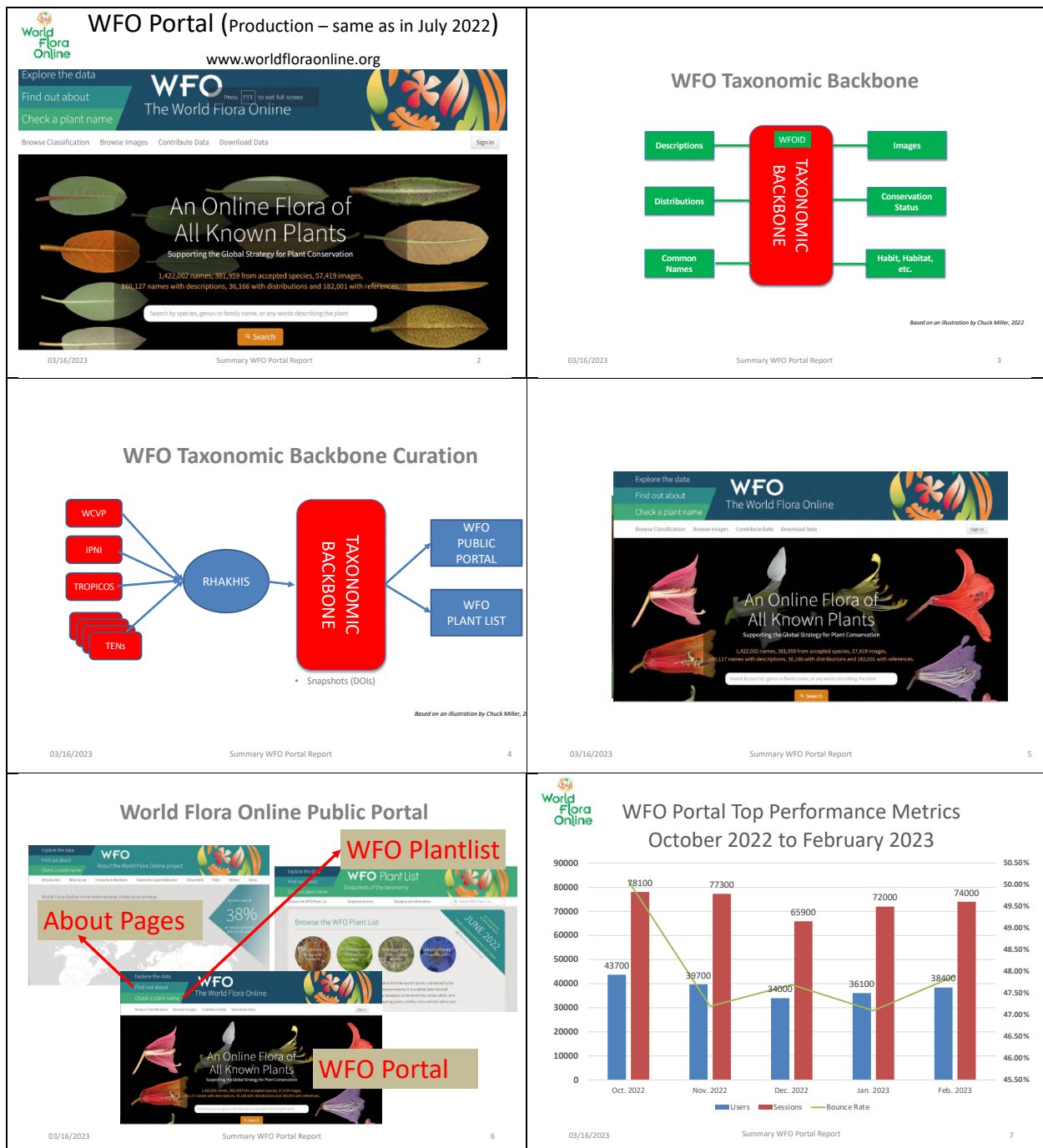
The Report of the 19th WFO Council meeting, held in person and with virtual participation 18 to 22 July 2022 in Meise, Belgium, was adopted and will be posted on the WFO About Pages.

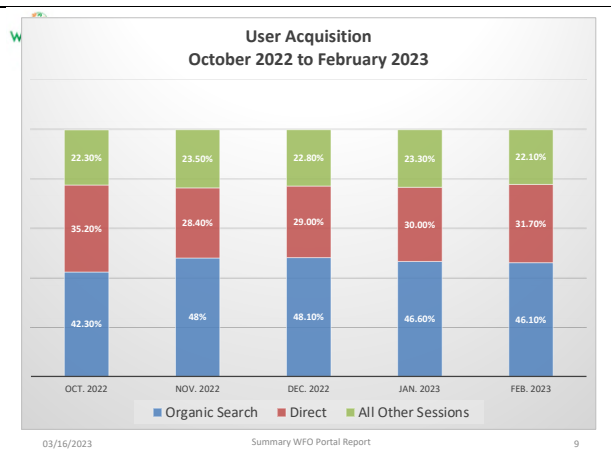
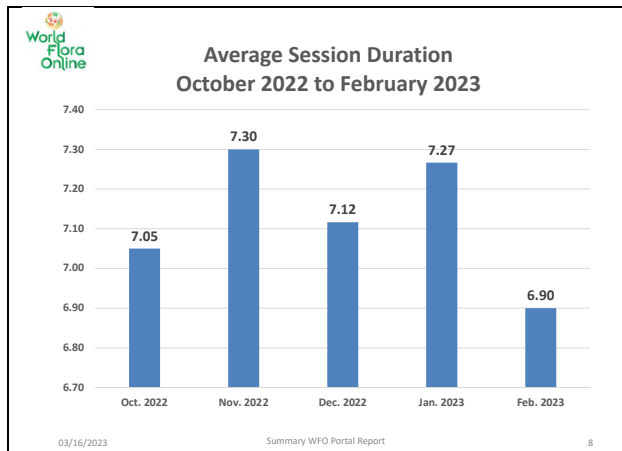
4. New WFO Consortium Members

The Royal Botanic Garden of Jordan was welcomed as a new member of the WFO Consortium, the only new member since the last meeting of the WFO Council.

5. Update on the WFO Portal and Content

William Ulate, WFO Gatekeeper, provided an update on progress made with the WFO portal since the last meeting. The report below was given in the form of the Powerpoint slides presented and received (copy available in the WFO File store on OwnCloud).





WFO Portal (Test – changes proposed Mar. 2023)
<http://34.134.193.75>

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Linking to WFO Plantlist

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Before Rhakhis...

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The Plant List
Action Item 103: updated yellow warnings

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Example of Name Matching Result

WFO_scientificName	MadCat_scientificName	Authorship	Notes	WFO_Author
Faucherea ambrensis	Capuron ex Aubrev.		correct (Art 46, see ex 16)	Aubrev.
Faucherea urschii	Capuron ex Aubrev.		correct (Art 46, see ex 16)	Aubrev.
Solenostemma founieriana	Wierzb. Schitz.		MadCat corrected	(Wierzb.) Schitz.
Bulbophyllum pallens	Wierzb. Schitz.		MadCat corrected	(Wierzb.) Schitz.
Colea obtusifolia	A. DC.		MadCat corrected	DC.
Dypsis forficifolia	Mart.		Mart. is correct	Noronha ex Mart.
Erythroxylum mocquersii	Aug. DC.		Aug. DC. is correct	DC.
Helichrysum madagascariense	(Poir.) DC.		(Poir.) DC. is correct	DC.
Indigofera pedunculata	Hilsenberg & Bojer ex Baker		correct (Art 46, see ex 16)	Baker
Landolphia trichostigma	Jum. & H. Perrier		????	Jum.
Mantikara suarezensis	Capuron ex Aubrev.		correct (Art 46, see ex 16)	Aubrev.
Mesanthemum pubescens	Wierzb. Schitz.		MadCat corrected	(Wierzb.) Schitz.
Pandanus madagascariensis	Balf. f. ex Warb.		MadCat corrected	(Gaudich.) Balf. f.
Panicum luridum	Hack.		Hack. is correct	Hack. ex Scott Elliot
Psychotria obtusifolia	Poir.		Poir. is correct	Lam. ex Poir.
Schlotheimia trypanoclasta	Schimp. ex Müll. Hal. & Geh.			Müll. Hal.
Sphedammocarpus multiflorus	(Bojer ex A. Juss.) Nied.			Nied.

There are 3 lines I haven't been able to confirm:

- Landolphia trichostigma - I was unable to locate the relevant reference online, I will try to find a printed copy tomorrow
- Pandanus madagascariensis - This is a muddle, I hoped to contact a Pandanus specialist today, hopefully tomorrow
- Schlotheimia trypanoclasta - This is a Bryophyte - I suggest you ask John Brinda in St Louis (copied).

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Excluded taxa

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Zenodo DOIs

Action Item 29

Versions

New versions of this global consensus classification are released every six months, in June and December. Detail of the changes since June 2022, incorporated this December 2022 release, are given here:
<https://about.worldfloraonline.org/december-2022-release>

This data repository includes the following files:

- **wfo_plantlist_2022-12.zip**: The Catalogue of Life Data Package of the WFO Plant List. This is the most expressive standard base single format of the list.
- **plant_list_2022-12.json.zip**: JSON formatted version of the WFO Plant List. This has been designed for direct import into a schemaless instance of a SOLR index and is used to drive the WFO Plant List API (<https://api.worldfloraonline.org>) which in turn drives the WFO Plant List in the portal. This is recommended if you want a local, read only version of the list rather than use the API.
- **plant_list_2022-12.sql.gz**: This is the complete production database (minus logging data and API keys) as a MySQL backup file. It can be restored directly to a MySQL 5.7 or later instance if you require the list in SQL format.
- **family_to_wfo_csv.gz**: A mapping all the IPNI IDs we track to their associated WFO IDs.
- **family_desc_down_tax.zip**: Individual Darwin Core Archive files for each of 71 recognized families. If you want a single family in Darwin Core, just download the whole list download and expand this file. Family and genus files are also available for download from our website (<http://www.worldfloraonline.org/>).
- **Dwc_CArchive_RuleSet.zip**: Single Darwin Core Archive file containing non deprecated names and taxa for use in the existing R package.
- **uber.zip**: A single Darwin Core Archive file containing all names and taxa even those that are deprecated along with some extra columns.

Keywords:

Accepted	Conservation	Endemic	Extinct	Extinct in the wild	Least concern	Near threatened	Vulnerable	Endangered	Critically endangered	Not evaluated
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eMonocot

WFO decided to make Family the Authority Basis

Source FAMILY FAMILY FAMILY FAMILY

Authority Authority Authority Authority

G S S S G S S S G S S S G S S S

The eMonocot system - a quick view

MySQL Database
Ver. 14.14
Oracle 5.5.62

Apache Tomcat
JavaServer Pages
web server environment
Ver. 7.0.52 (2014, deprecated)
Ver. 4.0 (2014, deprecated)

Bootstrap
CSS (Cascading Style Sheets)
Front-end Framework
Ver. 2.3.1 (2013, deprecated)

User Interface

Linux OS
Canonical, (Ubuntu 14.04 LTS
(2014, deprecated 2019))


Java
Open JDK Runtime Environment 1.7
10ced5e 2.6.17 (2009, deprecated 2016)

Geoserver
Version 2.7.5
(2016, maintenance release)
GeoTools Version 11.6
GeoWebCache Version 1.7.4

Complex legacy code base

- Outdated, unsupported technologies
- Programmers need to learn/relearn old coding languages
- Dependencies/software libraries no longer available – cannot rebuild from scratch without reprogramming

Based on an illustration by Mark Watson, 2022



Achariaceae

Type	Devinci Core Archive
Owned By	Achariaceae
url	http://004.138.145.115/Files/Temp/hot/harvest/Achariaceae_uml_1000000002.zip
Parameters	reference_processing.mode=HPCWF, REFERENCE_CHECKED=1 typedata_processing.mode=SWP_TNPS_AND_SPECIMEN image_processing.mode=HPCWF, TMA_IP_ALLTHEORY=1 description_processing.mode=SWP_2015_WF7203 taxon_processing.mode=SWP_IMAGES
Harvest periodically	false
Harvesting interval	Every Day
Next harvested after	
Last Harvested	Jan 12, 2023 1:09:52 PM
Last Attempt	Jan 13, 2023 1:09:50 PM
Harvester Link	http://35.168.64.68:8080/world-flora-harvest/job/invoice/1473
Status	COMPLETE
Started	Jan 12, 2023 1:09:52 PM
Duration	3 minutes, 48 seconds and 809 milliseconds
Exit Code	COMPLETE
Exit Description	Harvested Achariaceae COMPLETE. 26 Steps Completed. Duration: 3 minutes and 48 seconds. Issues - Info: 3524, Warnings: 0, Errors: 66
Total Records	11776
Read	11776
Processed	11720

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Meise to December WFO Plant List release

- 65K additional names

Activity in 2022	
Labels added	1,234
Labels removed	567
Labels updated	890
Labels added to WFO	1,567
Labels removed from WFO	234
Labels updated in WFO	345
Labels added to WFO (by TEs)	1,234
Labels removed from WFO (by TEs)	567
Labels updated in WFO (by TEs)	890
Labels added to WFO (by TEs) - 2022	1,567
Labels removed from WFO (by TEs) - 2022	234
Labels updated in WFO (by TEs) - 2022	345

New names	
IPNI	41837
Bryophytes	16669
Legumes	4640
Ericaceae	708
Global Tree Search	565
Compositae	523
Begoniaceae	302
Gesneriaceae	152

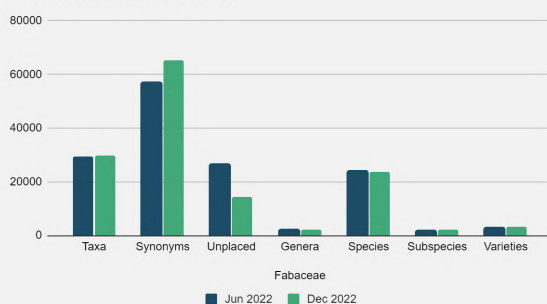
- 286k records had nomenclatural or classification improvements.

Activity updates from approved TENS

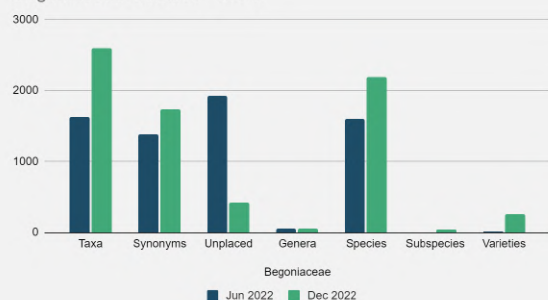
Changes to the December 2022 snapshot

Achatocarpaceae - revised	Ericaceae
Agdestidaceae	Fabaceae (2022 checklist)
Aizoaceae - revised	Fagaceae - <i>Quercus</i> - UI
Asteropeiaceae	Halophytaceae
Barbeuiaceae	Phytenaceae
Begoniaceae	Sarcolaenaceae
Cactaceae - revised	Sphaerosepalaceae
Caryophyllaceae - <i>Dianthus</i>	Styracaceae - UI
Dipterocarpaceae	

Fabaceae Curation - WFO

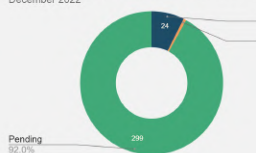


Begoniaceae Curation - WFO

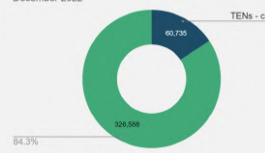


Progress metrics

Curation status of approved TEN Families/groups as of December 2022



Percentage of Accepted species (387k) curated by a TEN



Activity updates from approved TENS

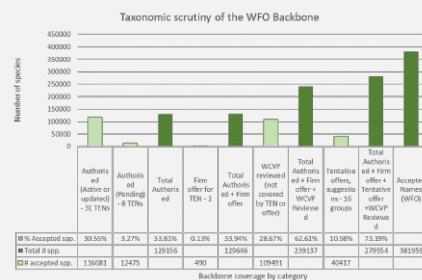
Name matching

- Bryophytes (90K names) – Bryonames.
 - Reported 70K matched (Meise)
 - Of the ca. 20K unmatched names
 - 16.6k additional names.
 - “Only” 1.6k still need resolved.
- Gesneriaceae
 - Done – added 152 new names.

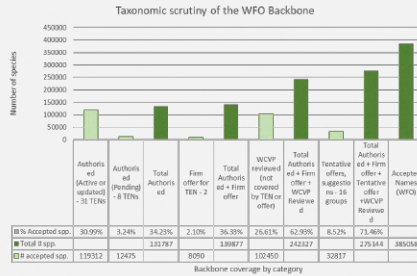
Activity updates from approved TENS

- Name matching in process/pending
 - Asteraceae (in process)
 - 168K names (82% matched)
 - 30.2k left to resolve
 - We will look at a partial update once we’ve matched the last 4k accepted names.

Backbone coverage June 2022



Backbone coverage December 2022



January to March 2023

2723 additional names

Activity in WFO

Activity	Count
Accepted Names	2723
Accepted Families	19
Accepted Genera	75
Accepted Species	295
Accepted Varieties	622
Accepted Subspecies	1444

New names

Category	Count
IPNI	1444
Asteraceae	622
Bryophytes	277
WCVP Families	295
Conifer TEN	75
Ericaceae	19

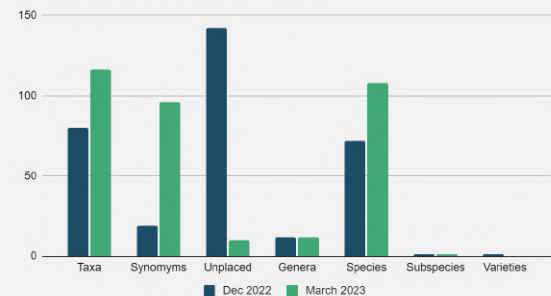
78,094 records have had nomenclatural and/or classification improvements.

Activity updates from approved TENs

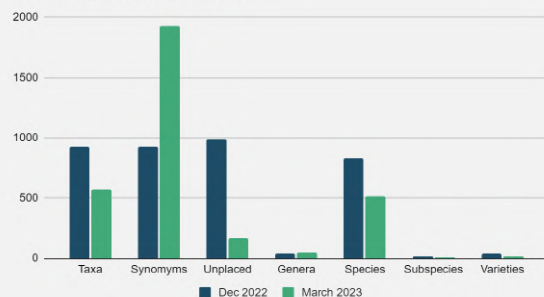
Changes implemented since December 2022 snapshot

Category	Family/Genus	Family/Genus
Annonaceae	Fossombroniales: Petalophyllaceae	Jungermanniales: Lophocoleaceae
Araucariaceae	Funariales: Funariaceae	Porellales: Frullaniaceae
Ginkgoaceae	Grimmiales: Grimmiaceae	Porellales: Goebeliellaceae
Ericaceae: Erica	Grimmiales: Ptychomitriaceae	Porellales: Jubulaceae
Andreaeobryales: Andreaebryaceae	Grimmiales: Saelaniaceae	Porellales: Lejeuneaceae
Bryoxiphales: Bryoxiphaceae	Grimmiales: Seligeriaceae	Porellales: Lepidolaenaceae
Fossombroniales: Allisoniaceae	Jungermanniales: Adelanthaceae	Porellales: Porellaceae
Fossombroniales: Calyculariaceae	Jungermanniales: Anastrophyllaceae	Porellales: Radulaceae
Fossombroniales: Fossombroniaceae	Jungermanniales: Cephalozaceae	Timmiales: Timmiaceae
Fossombroniales: Makinoaceae	Jungermanniales: Cephalozellaceae	

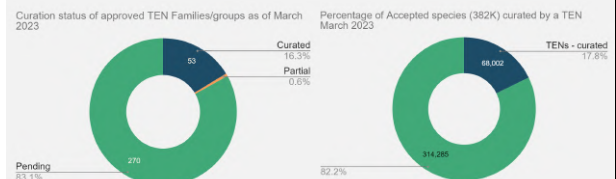
Fossombroniales Curation - WFO



Grimmiales Curation - WFO



Progress metrics



January to March 2023 Rhakhis - WCVP/POWO functionality

WCVP Data

By: Top	2023-02-17 12:51:29 - New row count (1410007) in 1 to 260 count (1410007) so database searched
Total Rows	1,410,007
Names Matched	1,275,024
% Matched	90.32%
Families	480
Genus Names	35,324

Families

Family	Names	Matched	Not P/W	Accepted	Synonyms
Asteraceae	15,812	14,308	14,878	6,103	8,043
Actinaceae	524	496	499	219	275
Actinobacteraceae	25	25	25	16	7
Actinobacteraceae	25	25	25	16	7
Actinobacteraceae	995	909	909	519	415
Actinobacteraceae	2	2	2	0	2
Actinobacteraceae	2	2	2	0	0
Actinobacteraceae	6,368	6,018	6,148	2,102	3,965
Actinobacteraceae	1	1	1	0	0

Classification updates from WCVP/POWO

Changes implemented since December 2022 snapshot

Category	Family/Genus
Achariaceae	Corsiaceae
Acoraceae	Crypteroniaceae
Aextoxicaceae	Dipentodontaceae
Akaniaceae	Lacistemataceae
Alseuosmiaceae	Lauraceae
Alstroemeriaceae	Melastomataceae
Araliaceae	Myodocarpaceae
Bruniaceae	Nothofagaceae
Celastraceae	Myrtaceae
Chrysobalanaceae	Rubiaceae
Combretaceae	Schlegeliaceae

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Backbone coverage March 2023

Taxonomic scrutiny of the WFO Backbone

Category	Number of species
Authorial (Active on updated - 31 TENs)	119,312
Authorial (Pending - 8 TENs)	10,075
Total Authorial	129,387
Firm offer for TENs	9,835
Total Authorial (not covered by TENs offer)	100,450
WCVF reviewed (not covered by TENs offer)	26,806
Total Authorial offer + Firm offer + WCVF Reviewed	246,072
Tentative offer - 16 groups	8,586
Tentative offer + WCVF Reviewed	214,658
Accepted names (WFO)	382,294

Backbone coverage by category

WFO
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Plan - now to June WFO Plant List

Monthly IPNI imports: March, April, May data.

TEN Classifications

- Conifer TEN - Pinaceae, Cupressaceae, Taxaceae, Podocarpaceae, Sciadopityaceae.
- Bryophytes ca. 200 Families remaining.
- WCVF curated TENs – Dioscoraceae, Poaceae, Sapotaceae (+ newly approved TENs)
- Any other TENs with updates (if they ask nicely).

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WCVP – Default classifications

Set a priority list – need input on this.

Name deduplication [Task 44]

On going. We deal with them as we work on the classification.

7. Report from the Taxonomic Working Group

Mark Watson, co-chair of the Taxonomic Working Group, presented a report from the meetings of the Taxonomic Working Group earlier in the week. The report below is given in the form of the Powerpoint slides presented and received (copy available in the WFO File store on OwnCloud).

Attendees (v=virtual)

Mark Watson, Co-chair	Edinburgh, UK	Ronell Kloppe ^v	Pretoria, South Africa
Thomas Borsch, Co-chair	Berlin, Germany	Sandy Knapp ^v	London, UK
Alan Elliott, TEN Manager	Edinburgh, UK	Nadja Korotkova ^v	Berlin, Germany
Olaf Bánki	Leiden, Netherlands	Jonathan Krieger ^v	London, UK
John Brinda ^v	Missouri, USA	Marianne Le Roux ^v	Pretoria, South Africa
Quanita Daniels ^v	Namibia	Eve Lucas	London, UK
Sebsebe Demissew	Addis Ababa, Ethiopia	Alex Monro	London, UK
Gunter Fischer	Missouri, USA	Nicky Nicolson	London, UK
Peter Fritsch	Texas, USA	Alan Paton	London, UK
Rafaël Govaerts	London, UK	John Parnell	Dublin, Ireland
Olwen Grace	London, UK	Lauren Raz	Botogá, Colombia
Adil Güner	Istanbul, Turkey	Rashid Salimov ^v	Azerbaijan
Helen Hartley	London, UK	Nicola Schoenenberger	Geneva, Switzerland
Nye Hughes ^v	Edinburgh, UK	Marc Sosef	Meise, Belgium
Paul Kersey	London, UK	Janine Victor ^v	Pretoria, South Africa

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Report of the Taxonomic Working Group

Royal Botanic Gardens, Kew, Tuesday 14 and Wednesday 15 March 2023

Kew

Royal Botanic Gardens, Kew

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<div>   </div> <p>Report of the Taxonomic Working Group Royal Botanic Gardens, Kew, Tuesday 14 and Wednesday 15 March 2023</p> <p>TEN Engagement</p> <p>Supporting the TEN Community</p> <ul style="list-style-type: none"> Nadja Korotkova presented an update on the Caryophyllales TEN 38 approved TENs including over 300 taxonomists from 'many' countries Need for supporting the development and running of WFO TENs – promote co-operation and self-help between members of the TEN community Case studies and lessons learned to be incorporated into TEN guidelines and other materials Annual online symposium to be established to support the TEN community – Nadja and Caryophyllales to organise the first of these Side event proposed for XX IBC, Madrid 2024, to accompany the proposed WFO session – Thomas Borsch to follow up with the Conference organisers <p>Recommendation 5: Council to approve the proposal of a TEN-focused side event at IBC 2024.</p> <p>Recommendation 6: Council to approve holding a virtual symposium for TENs in 2023, and explore ways to promote and support co-operation and collaboration between TENs.</p>	<div>   </div> <p>Report of the Taxonomic Working Group Royal Botanic Gardens, Kew, Tuesday 14 and Wednesday 15 March 2023</p> <p>Promoting use of WFO Consensus Classification in other systems</p> <ul style="list-style-type: none"> WFO APIs offer a variety of machine access to the consensus classification data Being used by BIEN (Taxon Name Resolution Service), SynTreeSys, Ploidy Database Need for IUCN to use of WFO Plant List for names accepted in the Red Data List <ul style="list-style-type: none"> Alan Elliott to produce a paper comparing IUCN and WFO classifications (3,500 names accepted by IUCN are not currently accepted by WFO) Peter Wyse Jackson to lead on a Missouri+Kew approach to the Red List governing bod Catalogue of Life has a working group including managers of global datasets (e.g. CITES, IUCN) on high-level criteria by which global lists can be considered authoritative. Lauren Raz is a member of this working group. <p>Recommendation 7: WFO to request to the IUCN Red List governing body to adopt WFO Plant List as the accepted classification used by IUCN for plant groups covered by WFO.</p>
<div>   </div> <p>Report of the Taxonomic Working Group Royal Botanic Gardens, Kew, Tuesday 14 and Wednesday 15 March 2023</p> <p>Content Vetting [Task 80]</p> <ul style="list-style-type: none"> Need for criteria by which potential Content can be judged as suitable for inclusion in WFO was assessed and re-affirmed, this will continued as an ongoing action Potential approaches were outlined, breaking into subcategories such as: <ul style="list-style-type: none"> Textural descriptions Images (photographs and drawings) Common names Geography Listing of what we would not accept (drawing on case studies) Promote the digitisation of legacy, non-digital, floristic and monographic works 	<div>   </div> <p>Report of the Taxonomic Working Group Royal Botanic Gardens, Kew, Tuesday 14 and Wednesday 15 March 2023</p> <p>Geographic Distributional Data in WFO</p> <ul style="list-style-type: none"> Need for country-level geography reaffirmed (for CBD reporting, national lists, etc) November 2022 dataset from WCVF includes comprehensive Botanical Recording Level distribution data. This will be included as Content in the near future William Ulate is working on getting the GeoServer working in the Portal WFO's deep link to GBIF occurrence mapping should be more obvious/convenient Once these are live we will review what geographic information we are presenting/storing/managing/editing in WFO [new Tax WG Action Point]
<div>   </div> <p>Report of the Taxonomic Working Group Royal Botanic Gardens, Kew, Tuesday 14 and Wednesday 15 March 2023</p> <p>Other Matters Arising</p> <ul style="list-style-type: none"> Review of Identification Tools provided/recommended by WFO – Marc Sosef to lead on writing of a report to the Taxonomic Working Group Review of terminology used in the WFO webpages and user guides – Marc Sosef to lead User feedback mechanisms – Portal Comments, 'Contact Us' email, other methods? - keep a watching brief on this for now 	

Marc S. mentioned that there are many regional e-flora projects that could benefit from updating their taxonomy automatically, and suggested producing guidelines for making these updates. Roger H. has written technical guidelines for using the API, and some case studies would be useful. Lauren R. volunteered for Catalogue of the Plants of Colombia as a case study for regional flora updates. Alan E. mentioned that some users have just autonomously downloaded and implement R package for this purpose. Mark W. suggests these experiences be documented on the About pages.

Olaf B. reported that Stephen Garnett (Catalogue of Life) is leading on the development of assessment criteria for global species lists which are considered authoritative. WFO could be a case study for this.

Council decisions on the Taxonomic Working Group recommendations

- 1) Council to approve the removal of name deduplication as a specific task, name duplication to be treated as an ongoing action and reported in curation metrics. **APPROVED**
- 2) Council to approve the recognition of Cephalotaxaceae. **APPROVED**
- 3) Council to approve the Taxonomic WG deciding on a supra-order classification to be used in WFO and provided to Catalogue of Life. **APPROVED**
- 4) Council to approve the creation of six Taxonomic Expert Networks (TENs): Buxaceae, Cyperaceae, Dipsacales, Lowiaceae, Putranjivaceae and Urticaceae. **APPROVED**
- 5) Council to approve the proposal of a TEN-focused side event at IBC 2024. **APPROVED**
- 6) Council to approve holding a virtual symposium for TENs in 2023, and explore ways to promote and support cooperation and collaboration between TENs. **APPROVED**
- 7) WFO to request the IUCN Red List governing body to adopt WFO Plant List as the accepted classification for plants covered by WFO. **APPROVED**

8. Report of the Technical Working Group

Chuck Miller, co-chair of the Technical Working Group, presented the following report from the meetings of the Taxonomic Working Group earlier in the week. The report below is given in the form of the Powerpoint slides presented and received (copy available in the WFO File store on OwnCloud).

Attendees (v=virtual)

Walter Berendsohn^v, Co-chair
Chuck Miller, Co-chair
William Ulate, WFO Gatekeeper
Nigel Black
Patrick Cox
Roger Hyam
Marianne Le Roux^v
Alex Monro
Andreas Müller
Rob Turner
Eduardo Dalcin^v
Anne Fuchs^v
Visotheary Ung

Berlin, Germany
Missouri, USA
Missouri, USA
London, UK
London, UK
Edinburgh, UK
Pretoria, South Africa
London, UK
Berlin, Germany
London, UK
Rio de Janeiro, Brazil
Canberra, Australia
Paris, France

Technical Working Group Progress Since July 2022

- 2 Virtual Meetings
- Portal, Backbone and Content Progress
 - William's report
- Rhakhis, WFO Plant List Progress
 - Roger's report

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Technical Working Group Issues Discussed

- Action Items
- Google Servers Migration
- Accelerating Portal Update Process
- Portal "Download Data" Text
- Contributor Guides Refresh
- New IPNI links to WFO
- OpenRefine Tool
- Name Matching
- DwCA vs COLDP file formats
- GBIF DwCA Validator and IPT

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Standard Terminology from Meise

Checklist – a hierarchy of (accepted, ambiguous and unchecked) scientific names, with linked synonyms (often used in a thematic context, e.g. geographic)

Taxonomic backbone – a checklist when used as a structure to arrange other name-based data

Content data – descriptive data, including geographic distributions, that are connected to a taxonomic backbone

Dynamic dataset – one which may change at any point in time

Static dataset – one which does not change.

Dataset snapshot – a downloaded static dataset taken at a specified point in time.

Dataset version – one in a series of citable updated/changed static datasets

Public webpages – of the part of a website that is accessible without login.

Restricted webpages – of the part of a website that requires login/authentication before us

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Standard Terminology

- **WFO Portal** – everything accessible at www.worldfloraonline.org
- **WFO Flora Pages** – the part of the portal displaying descriptive information linked to the WFO Taxonomic Backbone ("Explore the data").
- **WFO About Pages** – the part of the portal displaying information about the WFO project ("Find out about").
- **WFO Plant List** – the part of the portal displaying snapshots of the current and past versions of the WFO Taxonomic Backbone ("Check a plant name").

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WFO Google Cloud Server Migration

Total 16 Linux, 1 Windows VMs

#	Name	OS	Release	Platform	IP	RAM	CPU	Storage	Location	Backup	Size	Usage	Notes
1	info-prod-servers	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
2	info-prod-databases	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	40	Standard Persistent				
3	info-prod-images	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
4	info-stage-servers	stage	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
5	info-stage-databases	stage	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	40	Standard Persistent				
6	info-stage-images	stage	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
7	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
8	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
9	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
10	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
11	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
12	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
13	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
14	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
15	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
16	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				
17	info-prod-backbone	production	standard-4	4	15.00	Intel Haswell	ubuntu-1404-vmware-20171010	100	Standard Persistent				

Plus Mailman server for WFO Mail Distribution Lists

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Google Cloud Servers

- Missouri Botanical Garden has migrated 17 servers from Google Cloud to their infrastructure.
 - Harvesting of December Backbone and Content is beginning
 - New OwnCloud is operational
 - RedMine server not started
- A new Mailman server has been created.
 - New lists to be ready by March 31

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Action Items Progress

- 6. Add descriptive data – **As reported by William**
- 42. Portal Modifications – **Completed 2 – Order of descriptions**
- 91. Google Server migration to MBG – **Nearly complete**

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Action Items to Close

- 31. Formal request to GBIF for custom IPT & DwCA Validator – **Working okay as is.**
- 42. New Names – **Rhakhis supports all new names.**
- 48. Modifications
 - Item 17 – Order of Descriptions – **Added to Portal**
 - Item 30 – Order by Provider or Description Type – **Added to Portal**
- 59. Re-run IPNI WFO Name Matching – **Done**
- 60. Kew add WFO link to IPNI – **Done**
- 68. Data Paper of WFO Backbone with DOI – **Done**
- 69. Explore Frictionless Data – **Related to COLDP [102]**
- 96. Lower TPL Google search rank – **Unneeded**
- 102. Review COLDP vis a vis DwCA – **Done**
- 103. TPL grey out & yellow warnings – **Done**
- 104. Software for Tax Backbone management – **Done, Rhakhis**

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<div data-bbox="207 142 272 205">World Flora Online</div> <h2 data-bbox="297 163 763 205">Ongoing/Pending Action Items</h2> <ol data-bbox="280 237 776 426" style="list-style-type: none"> 7. Create a Harvester/Admin Guide - Ongoing 15. Develop Markup Tools for a Toolkit – Deferred at St Louis 69. Give percentages of what data have been uploaded from what is published for each source of Content – Pending 70. Check WFO webpages and guidelines for consistency in the use of terms - Ongoing 108. Review guidance on Data Downloads on the WFO website - Ongoing <div data-bbox="240 569 277 581">3/16/23</div> <div data-bbox="467 569 550 581">Kew, Richmond, UK</div> <div data-bbox="764 569 777 581">11</div>	<div data-bbox="828 142 893 205">World Flora Online</div> <h2 data-bbox="1015 184 1279 216">Recommendation</h2> <ol data-bbox="906 247 1365 300" style="list-style-type: none"> 1. Explore use of badges for the kind of object and institution on Portal pages. - Accepted <div data-bbox="1057 321 1157 380"></div> <div data-bbox="859 569 896 581">3/16/23</div> <div data-bbox="1084 569 1167 581">Kew, Richmond, UK</div> <div data-bbox="1382 569 1395 581">12</div>
<div data-bbox="207 600 272 663">World Flora Online</div> <h2 data-bbox="394 642 662 674">Recommendation</h2> <ol data-bbox="285 705 727 789" style="list-style-type: none"> 2. Send request to Pensoft Publishers to put papers that mention WFO into the WFO Zenodo community (DOIs). - Accepted <div data-bbox="240 1026 277 1039">3/16/23</div> <div data-bbox="467 1026 550 1039">Kew, Richmond, UK</div> <div data-bbox="764 1026 777 1039">13</div>	<div data-bbox="828 600 893 663">World Flora Online</div> <h2 data-bbox="1015 642 1279 674">Recommendation</h2> <ol data-bbox="906 705 1365 789" style="list-style-type: none"> 3. Update Contributor Guides with latest data process changes after addition of Rhakhis. - Accepted <div data-bbox="859 1026 896 1039">3/16/23</div> <div data-bbox="1084 1026 1167 1039">Kew, Richmond, UK</div> <div data-bbox="1382 1026 1395 1039">14</div>
<div data-bbox="207 1058 272 1121">World Flora Online</div> <h2 data-bbox="394 1100 662 1131">Recommendation</h2> <ol data-bbox="285 1163 755 1215" style="list-style-type: none"> 4. Complete harvesting of WCVF Distributions. Restore GeoServer on the Portal. - Accepted <div data-bbox="240 1482 277 1495">3/16/23</div> <div data-bbox="467 1482 550 1495">Kew, Richmond, UK</div> <div data-bbox="764 1482 777 1495">15</div>	<div data-bbox="828 1058 893 1121">World Flora Online</div> <h2 data-bbox="1015 1100 1279 1131">Recommendation</h2> <ol data-bbox="906 1163 1386 1247" style="list-style-type: none"> 5. Contact Taxonomic Names Resolution Service (TNRS) to update their WFO version. - Accepted <div data-bbox="859 1482 896 1495">3/16/23</div> <div data-bbox="1084 1482 1167 1495">Kew, Richmond, UK</div> <div data-bbox="1382 1482 1395 1495">16</div>
<div data-bbox="207 1516 272 1579">World Flora Online</div> <h2 data-bbox="415 1537 574 1568">Next Steps</h2> <ul data-bbox="285 1600 719 1705" style="list-style-type: none"> • Complete June Taxonomic Backbone Data Reload • Load More Content Data • Continue integration of Rhakhis into Content Harvesting process <div data-bbox="240 1934 277 1946">3/16/23</div> <div data-bbox="467 1934 550 1946">Kew, Richmond, UK</div> <div data-bbox="764 1934 777 1946">17</div>	

Council decisions on the Technical Working Group recommendations

- 1) Explore use of badges for the kind of object and institution on Portal pages. **APPROVED**
- 2) Send request to Pensoft Publishers to put papers that mention WFO into the WFO Zenodo community (DOIs). **APPROVED**
- 3) Update Contributor Guides with latest data process changes after addition of Rhakhis. **APPROVED**
- 4) Complete harvesting of WCVF Distributions. Restore GeoServer on the Portal. **APPROVED**
- 5) Contact Taxonomic Names Resolution Service (TNRS) to update their WFO version. **APPROVED**

9. International Plant Name Index/WCVF/WFO cooperation

WFO is collaborating with the International Plant Name Index (IPNI) to bring in monthly updates from IPNI (new names and edits to existing names) into the WFO classification managed in Rhakhis. WFO uses IPNI as the 'single source of truth' for nomenclature information. Corrections to IPNI data are fed back to IPNI, where they are corrected manually and the corrections brought into WFO at the next update. It is hoped that batch updates to IPNI from WFO will be possible.

Rob Turner reported that there is now a badge on IPNI name pages giving forward links to WFO. Next priority is to link out from Plants of the World Online to WFO.

WFO uses World Checklist of Vascular Plants (WCVF) as the primary default classification for non-TEN groups, and some WFO TENs manage their data in WCVF. Classification data updates from WCVF are incorporated into Rhakhis family by family as time permits, with priority given to TEN datasets and families with major changes.

IPNI and WCVF (both managed by Kew) and WFO are looking to cooperate further in coordinating the development of software infrastructure to streamline these processes.

A paper to be published in New Phytologist comparing the big four global plant checklists (WCVF, WFO, World Plants and the Leipzig List) is in final draft, Mark W. is one of the authors representing WFO. Alan E. commented that the comparison analysis has resulted in improvements to the WFO backbone. Olaf B. said work should focus towards creating a consolidated plant list of all plant species, something which Catalogue of Life and GBIF support.

10. Communications Working Group

Nicola S. outlined a structure for a media promotion campaign, highlighting the need for a landing page for media on the WFO website. Components of a media campaign could include:

- Press releases, provided to all Consortium members, distributed by their communications department, and advertised on WFO social media and regular media platforms.
- Live demo video explaining how to use WFO tools
- Online press conference on the launch day
- Social media campaign running up to the launch, creating a buzz. Short videos, fun facts, key numbers, short posts.

A meaningful date needs to be chosen for the launch and a successful campaign must be well coordinated and committed to by Consortium members. Press releases at the national level on how

national actions in support of/supported by WFO are relevant to CBD could be impactful. Endorsement of WFO at the SBSTTA meeting could be a springboard for a launch

Geneva should have a communications office before the next meeting of Council, and may be in a position to help coordinate these activities. The situation should be reviewed at next meeting of Council.

Peter Wyse Jackson asked that Council members please also let Richelle at Missouri Botanical Garden know when there are WFO related items or when making presentations on WFO so that she can post on social media. She is also asking for stories we can tell, things to tweet.

11. Presentations at conferences and other outreach activities

There is a folder in the OwnCloud for presentations that can be shared/recycled/translated. Please add materials there.

Recent presentations:

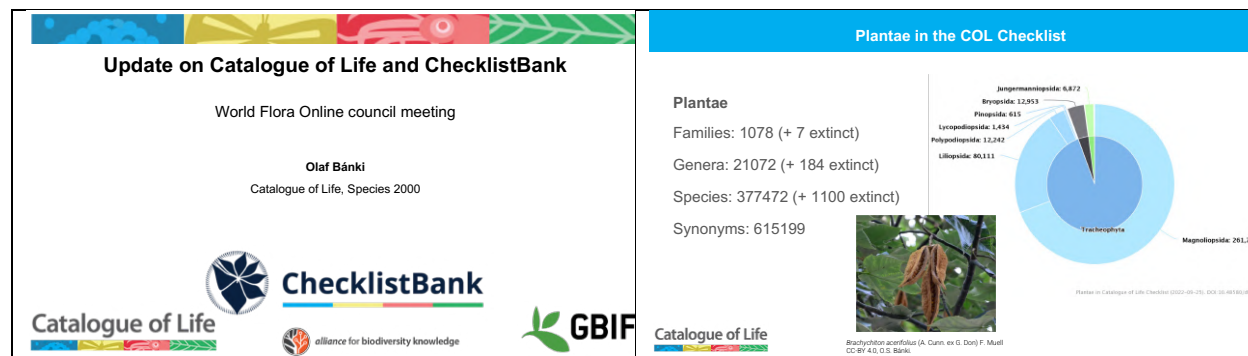
- There was a WFO session at TDWG, 2022, with presentations by Chuck Miller, Walter Berendsohn, William Ulate, Alan Elliott and Roger Hyam.
- Lauren Raz presented at the XI Congreso Colombiano de Botánica at Villavicencio, Nov 2022
- Mark Watson gave a keynote presentation on WFO at a Botanical Survey of India conference, Kolkata, February 2023.

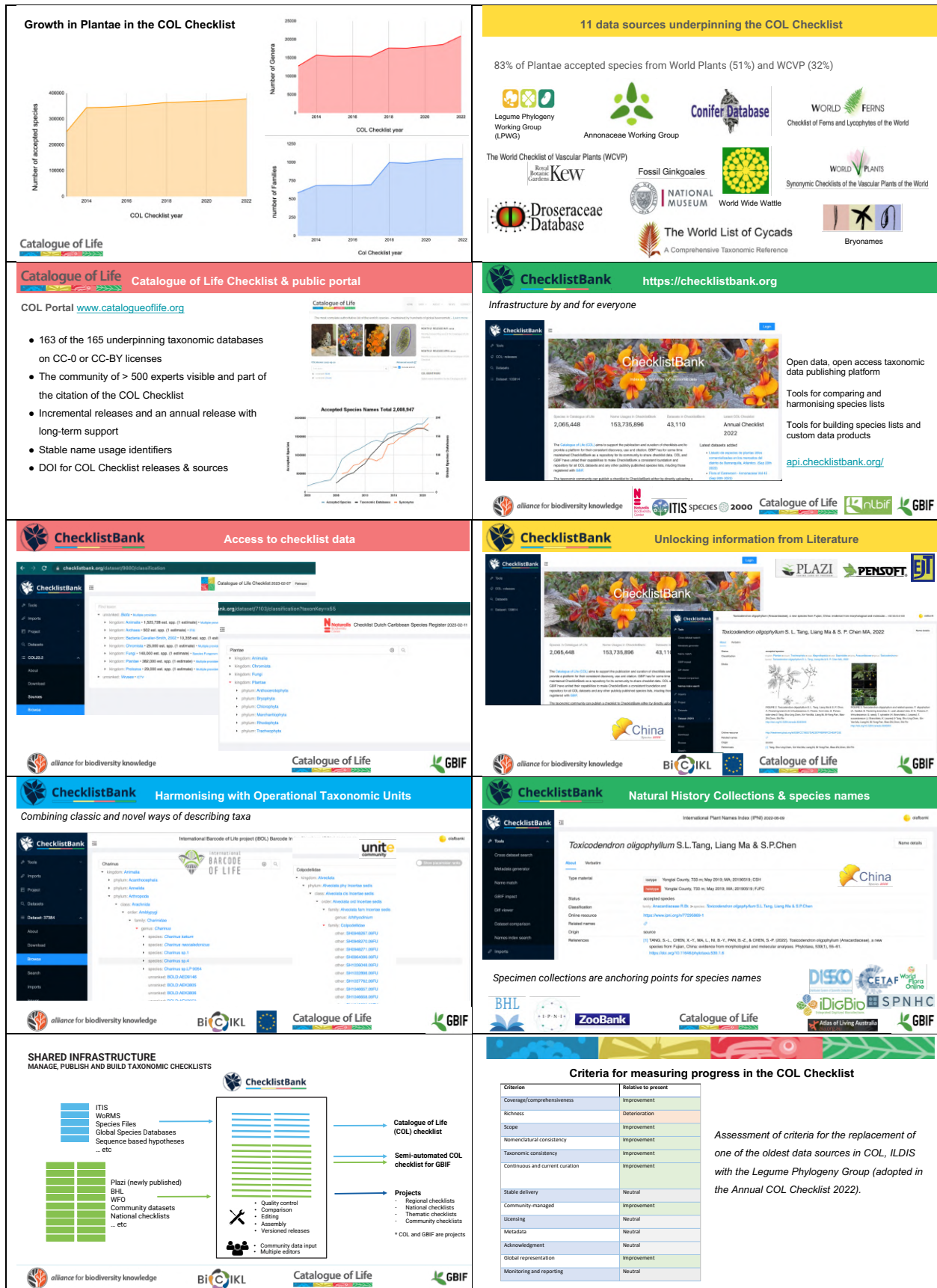
Opportunities to Promote WFO at upcoming meetings were discussed:

- XX IBC: a WFO symposium has been proposed at IBC in Madrid, July 2024, and several presentations in other sessions (e.g. Marianne Le Roux, Leguminosae) will highlight WFO. Organising a side event will be explored.
- TWDG: there will be a series of WFO talks at the next meeting in Tasmania, October 2023.

12. Update on new CoL/GBIF infrastructure, including ChecklistBank

Olaf Bánke presented an update on the new Catalogue of Life/GBIF infrastructure and ChecklistBank. The report below is given in the form of the Powerpoint slides presented and received (copy available in the WFO File store on OwnCloud).





All Action Points were covered in previous discussions during the meeting.

14. Montreal-Kunming Global Biodiversity Framework and GSPC

Peter Wyse Jackson reported on recent developments in relation to the Global Strategy for Plant Conservation (GSPC). He reminded the Council that the 2nd phase of the GSPC had come to an end in 2020 and that a 3rd phase was being negotiated by the Parties to the Convention on Biological Diversity (CND), and would be reviewed by a forthcoming meeting of the CBD's SBSTTA. He pointed out that with the adoption of the new Montreal-Kunming Global Biodiversity Framework (GBF) and its targets in December 2022 and the CBD's most recent COP, it was unlikely that the new GSPC would contain specific targets. He mentioned that the original impetus and mandate for the WFO came from the call in the GSPC (2011) for the development of a Flora of the world online and that the work of the WFO Consortium had subsequently been endorsed by the Parties at a CBD COP. He outlined that various entry points for the WFO were included in the draft materials being prepared for the new or updated GSPC.

He was confident that the WFO would remain as relevant to the new GSPC as it had been for the previous phase and stressed the importance that was being placed by the CBD Parties on having information on plants available to support plant conservation at national and sub-national levels, including distributional information. He agreed to update the Council on the continued GSPC negotiations which would take place at SBSTTA 25 meeting in Nairobi in October 2023. He also pointed out that the Global Partnership for Plant Conservation, of which the WFO Consortium is a member, is the body that has been requested by the CBD COP to prepare "a set of complementary actions related to plant conservation" what would form the basis of the GSPC update, and which would relate specifically to each of the GBF's 2030 targets. He proposed that responses to the new GSPC should be incorporated in the WFO's new and developing strategic plan.

It was suggested that a conversation should be initiated between WFO and the Global Taxonomy Initiative of the Convention on Biological Diversity in relation to capacity building in taxonomy. WFO could also link with national CBD GTI focal points to strengthen such linkages. Such linkages may be easier once the new GSPC has been adopted by the CBD COP and when WFO is recognised in that.

15. WFO Strategic Plan

A draft post-2022 WFO Strategic Plan was circulated for the meeting (Annex 3). The key elements of the plan were presented by Peter Wyse Jackson and reviewed by the Council. Following discussions, the draft Objectives for the WFO for the period 2022-2030 were outlined and updates (as below).

Draft objectives for the WFO 2022-2030 Strategic Plan

- ☐ By 2030, taxonomic coverage by the TENs will be comprehensive, covering over 80% of all known plant species.
- ☐ WFO will seek to increase the geographic diversity of the TENs leadership.

- ☐ Descriptive Content of WFO will grow to include information from over 90% of all known plant species, and comprehensive for every region of the world.
- ☐ WFO will promote collaborative capacity building programs for early career taxonomists, with special emphasis on working with biodiverse countries and focus on addressing knowledge gaps [career development].
- ☐ WFO will double the number of Consortium members (to at least 100), with special emphasis on research institutions from biodiverse countries.
- ☐ WFO will support and encourage increased activity in collaborative global level revisionary studies.
- ☐ Distribution data will be comprehensive [target?], resolved to at least country-level distributions and with links to specimen data.
- ☐ WFO will [be the best] and provide the plant content for Catalogue of Life and GBIF.
- ☐ WFO will contribute to the development, achievement and monitoring of targets for the Post-2020 Global Biodiversity Framework, and an agreed plant conservation action agenda.
- ☐ The WFO Council will achieve a balanced diversity (gender, geography...EDI) at its meetings and within its membership.
- ☐ Enhance the use of WFO to support plant conservation, and habitat conservation and restoration.

The following are some of the discussion points made in relation to areas that could be included in the Strategic Plan:

- Thomas B. asked how institutions can contribute, what are institutional commitments and whether this would be included in the Plan. On capacity building, Peter WJ suggested that postdocs or grad students in various institutions could be 'branded' as WFO Fellowships, which could be helpful to the students, the host institution and the WFO too. Alan P. pointed out that we can measure WFO progress by looking at TEN membership over time. Other indicators of progress could include who are the users of the portal and who is following WFO on social media, etc.
- On distribution data, Marc S. asked how we will manage distribution data going forward (after WCVF data get included). Alan P. asked how would TENS validate the data, including links to GBIF and national level checklists? What will be the future basis of distribution data? Ideally curated sources, reviewed by TENS. How to harmonize efforts across countries? Thomas B. mentioned the TETTRIs project (three years of funding, led by BGBM) as a potential ally. Mark W. wondered if WFO could create a module for managing geographic info. Alan P. clarified that we should facilitate creation of national checklists. Mark W. asked whether we should be asking TENS to edit distributions and providing tools to do so? Probably not was the consensus conclusion. We can offer downloadable but unedited lists. Thomas B. commented on Caryophyllales experience with the EDIT system, which is also used to derive national lists, such as in the case of Mexico. Alan E. told us that we can include and manage distribution data with our current system to some extent. We need to evaluate gaps and desired functionality in the working group.

- With national lists, we will need reciprocal communication between WFO and national list managers, which may be a question of tools to facilitate data exchange (APIs, alerts, etc.). Perhaps a survey can be developed about what national list managers want from WFO?
- Marc S. would like to see inclusion of maps. He suggested the creation of a distribution data subgroup to delve into the details. Marc S. distinguished between reviewed (published) data and non-reviewed content from dynamic datasets like Solanaceae source. We could link these to non-reviewed sources (or have reciprocal links) but not pull in the content directly.
- Gunther F. suggested that it would be ideal if WFO could have more TEN manager positions, to help especially to coordinate and facilitate large TENS. Thomas B. suggested that this can be part of a WFO consortium member's institutional commitment, where leading a TEN is recognized officially as part of their job. This could be one mechanism for strengthening TENS.
- Gunther F. suggested that WFO could be used to identify gaps and incentivize fieldwork. Alan E. added this has been done for Ericaceae.
- Nicola S. mentions that the MoU has not been updated since 2013 and that we should update it and be more explicit about governance and role of TENS. Peter mentioned that a new version of the MoU that was adopted by the Council last year, and that existing signatories were automatically updated to that, unless any institution had reservations on doing so (there were none). He agreed that going forward we need to review the governance of WFO, document practices and be transparent about it.
- Marc S. mentioned that we need to talk about promotion of WFO (related to incentives), as an example, linking to national lists and helping them to update their information (receiving alerts or other mechanisms). Marc S. would like to see a link from IPNI name to WFO page. Mark W. and Alan P. confirm that this is already in the works, and has been accepted by Kew and that this will be implemented.
- Peter WJ. asked if we can invite the TENS to WFO meetings so that they have a better idea of how WFO works and so that they feel more integrated. Thomas B. suggested we organize side meetings at IBC. He also suggested a joint project with the TENS to assess gaps, create other common products (could be via surveys). The suggestion was made that perhaps virtual online meetings or symposia for the members of TENS could be held, maybe before or after virtual WFO Council meetings.
- Peter WJ suggested that perhaps we need an objective related to what percentage of the backbone is resolved by consensus.

Consideration of these comments can be incorporated as appropriate into the next version of the draft Strategic Plan.

16. WFO registering as a NGO

Nicola Schoenenberger made a presentation on the possibility of the registration of WFO as an international NGO in Switzerland. This would enable WFO to receive funds, and it would also strengthen our governance by establishing external scrutiny of our governance systems.

Switzerland is one of the countries with the most liberal arrangements for registering legal entities in the world. Within non-commercial entities, options for WFO would include: a Foundation (Art. 80-89 of Swiss Civil Code), or an Association (Art. 60-79).

Nicola S. suggested that an Association would be a good option for WFO as our current MoU arrangement would not need much alteration. WFO Consortium members would be the General Assembly; the WFO Executive Committee would be the Association Board; the secretariat may be part of the Association Board or the General Assembly; the working groups could be commissions of the Association, and the Council meetings would be the General Assembly meeting of the members. The accounting elements needed for an Association would need to be established.

If desired, WFO could later establish a Foundation as a fundraising arm (Conservatoire et Jardin Botaniques, Geneva, operates this way).

There was much interest from the WFO Council on this possibility and the members requested Nicola S. to further review possibilities, implications (including financial costs and if existing members of the Consortium could sign up), timetable for this move, and next steps to take this forward.

17. Election of WFO Officers

The term of office of WFO Council Officers is considered to be from one in-person meeting to the next. Peter Wyse Jackson, Lauren Raz and Mark Watson indicated that they would be happy to continue as WFO Council Co-chairs. Peter Wyse Jackson said that he could continue to provide WFO secretariat support (maintaining the registry of MoUs, etc.). There being no other proposals, these were accepted by the Council.

Thomas Borsch, Thomas Haevermans and Mark Watson accepted renewal of their terms as co-chairs of the Taxonomic Working Group, and Technical Working Group will continue under the leadership of Walter Berendsohn and Chuck Miller. The reactivated Communications Working Group (with membership from the Promotion subgroup of the Taxonomic WG), is under the leadership of Thomas Haevermans and Nicola Schoenenberger agreed to become a co-chair.

18. 21st meeting of the WFO Council and future meetings

It was agreed that the 21st Council meeting would be held virtually on 13 November 2023. Peter Fritsch's generous offer of holding the 22nd Council meeting in person at BRIT, Texas, in the spring of 2024 was accepted. In due course, the offer to have a Council meeting in Australia should be considered again.

19. Any Other Business

Building Capacity for Taxonomy

Peter WJ. suggested that linkages could be explored between WFO and the Global Taxonomy Initiative (GTI) to strengthen capacity building. Thomas B. commented that this should be part of lobbying for support for WFO for integrative taxonomy in general. Roger H. mentioned that GTI National Focal Points could help identify and plug taxonomic gaps and help with TENS. Sebsebe D. agreed that it would be worth connecting with the GTI Secretariat and use this opportunity to support taxonomists all over the world. This would support GTI and give it more relevance. Peter WJ suggested that in future WFO may establish a Capacity Building Working Group, and said that he will approach the GTI Secretariat to discuss formalising links.

Type Specimen information in WFO

Nicky N. offered to help with incorporating links in WFO to type specimens cited in protologues.

Identification Tools

Marc S. suggested that WFO should look into the use/promotion of identification tools. He offered to lead a Task Force to investigate the issues around identification tools and report back to Council. This was accepted by the Council.

There being no further business the Co-chairs thanked all of the presenters and participants and closed the meeting.

Annex 1

20th WFO Council Meeting Group Photograph



Annex 2

WFO –ACTION ITEMS FROM 20th COUNCIL MEETING – Kew March 2023

#	TASKS	WHO?	WHEN?	COMMENTS
1	Presentations on WFO. Take advantage of the meetings we attend to promote the WFO. Presentations to be uploaded to WFO Presentations folder in ownCloud.	All	Standing Item	Recent and next presentations: TDWG 202, October 2022: Chuck Miller, Walter Berendsohn, William Ulate, <i>Linking World-wide Plant Data – World Flora Online, WFO Plant List, IPNI, and beyond.</i> Roger Hyam, Alan Elliott, William Ulate, <i>Rhakhis: A workflow for managing the WFO taxonomic backbone presented at the XI Congreso Colombiano de Botánica at Villavicencio, Nov 2022</i> Mark Watson, WFO presentation at Botanical Survey of India conference, Kolkata February 2023. TDWG, October 2023, WFO presentations by William, Roger, Chuck. XX IBC 2024, Madrid, July, WFO symposium accepted.
2	Update current signatories. Secretariat to maintain an archive of hard copies of any formal agreements with WFO. List of Consortium members on the WFO website to be updated.	Peter Wyse Jackson	Standing Item	Royal Botanic Garden Jordan had joined the Consortium since the Meise meeting.
3	Update Social Media. Keep updating FaceBook, Twitter, etc with news and current information.	Comms Working Group	Standing Item	Richelle Wiehe (MBG) will do the updates, send images and news items to her.
5	Videos. Links to videos by partner institutions to be included on WFO Website.	All	Standing Item	Anyone with videos relevant to WFO, please send to William Ulate & Alan Elliott.
6	Enhance Production Portal with Descriptive Data. Production portal should be enhanced with descriptive data content as advised by Taxonomic WG/Council.	William	Standing Item When ready, William Ulate will touch base with the intermediary	See Meise Tax WG report for revised priority list for harvesting. Initial harvesting of content for names matched in first

#	TASKS	WHO?	WHEN?	COMMENTS
	Send a tweet as content is loaded to Production.		contacts of the Content providers for the next digital resources to bring into the WFO Portal, as determined by the Taxonomic WG in order to increase the diversity of content and geographic coverage.	<p>name-matching process prioritized for as many datasets as possible (rather than resolving the residual un-matched names).</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fl. Trop. East Africa & Fl. Trop. West Africa (Kew) – descriptions divided, need to be combined <input type="checkbox"/> IUCN Conservation Status – Pending new Version. <input type="checkbox"/> Improve Metadata for Images from Solanaceae & Flora of China - Pending <p>Continue to load remaining and new datasets:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Solanaceae Source – Contacted back to coordinate an updated dataset <input type="checkbox"/> NYBG – Harvested all descriptions in Test: NorthEastern US, Neotropica, Brittonia & NYBG Memoirs <input type="checkbox"/> Catalogo de las Plantas de Colombia –26K names - Waiting for content. <input type="checkbox"/> Australian Floras – First dataset of descriptive data harvested in Test. <input type="checkbox"/> Flora of Nepal – No data received. <input type="checkbox"/> Illustrated Treatments for Korea - Got a response, coordinating to convert Word documents into structured data <input type="checkbox"/> Fl. Helvetica –French descriptions pending. <input type="checkbox"/> Flora do Brazil – more descriptions being provided. <input type="checkbox"/> eMonocot descriptions (Kew, TBC) –PalmWeb descriptions pending harvesting <input type="checkbox"/> New FNA data - Got data and content sample. Issues with Authors format. Reviewed file's DwCA format. Repeated Name Matching process as requested. <input type="checkbox"/> African Plants Database – (distributions, ecology, biology) 200K names, 78K taxa. - Pending. <input type="checkbox"/> eFloramaghreb.org - 6400 taxa – Pending.

#	TASKS	WHO?	WHEN?	COMMENTS
				<input type="checkbox"/> Flora of Ireland – Implementing corrections to Name Matching Report. <input type="checkbox"/> Caryophyllales- Harvested Nepenthes taxa. Pending other taxa and all content from EDIT platform.
7	Create a Harvester administration/operations guide. The development of a Harvester administration/operation guide should be carried out immediately through testing and collaboration.	William	Ongoing	New updates should be included. Created documentation for “Name-Matching” process and made code and SQL Stored Procedures available for Geneva in Github (private MBG-CBI repository)
13	Taxonomic Expert Networks (TENS). 1) Encourage proposals of new TENS by contacting potential taxonomic experts and supporting them in the formulation of a TEN. 2) Make a survey of existing global taxonomic networks and the systems used and ask if they are willing to participate in WFO 3) Update and publish the Order/Family coverage/gap analysis on About Pages of WFO website 4) Engage with WCSP Reviewers for potential TENS 5) Explore links with Yuri Roskov and COL GSDs as potential WFO TENS 6) Build on the offer of a Fern TEN to involve wider community opinions 7) Rafaël Govaerts to advise on WCSP/WCVP reviewers as potential TEN focals [new] 8) Connect with CoL Brassicaceae experts [new] 9) Connect with UCN SSC Specialist Groups not already approached [new]	TEN Manager Alan Elliott	Standing Item	1) TENS approved by Council March 2023: Buxaceae, Cyperaceae, Dipsacales, Lowiaceae, Putranjivaceae and Urticaceae 2) Closed – folded into reworded 1 3) Gap analysis for plant families to be updated for higher classifications has started. 4) Closed – folded into reworded 1 5) Closed – all CoL GSDs now considered. 6) Ongoing.

#	TASKS	WHO?	WHEN?	COMMENTS
15	Develop markup Tools for a Toolkit. Consolidate the Markup Tools being used; develop them to integrate them into a toolkit. - SANBI has developed Markup tools and are available for others to use. Available from GitHub: github.com/rudivs/SpeciesMarkupAddIn	Technical Working Group	Deferred at St Louis	
18	Save the Dates of next meetings of Council	Peter Wyse Jackson	21 st Meeting – Virtual, 13 November 2023 22 nd Meeting – In Person, Texas, March/April 2024	Post the report of the previous Council Meeting on the WFO website. Date of next physical meeting to be reviewed by Co-Chairs
31	Send formal request to GBIF for WFO-tailored versions of IPT and DwCA Validator, involving SANBI and Flora do Brasil	Technical Working Group	Closed	They are working as is.
33	Resolve insufficient resources to support: a) Software development staffing. b) Institution to maintain OwnCloud	WFO Council	Ongoing	a) Missouri is committed to providing William's role, but we have an issue with software development staffing. b) Done - Missouri is now managing the OwnCloud on its servers.
42	New Names. Implement a mechanism to deal with new names coming from Content Providers or IPNI and updating the Taxonomic Backbone, as recommended by the Taxonomic Working Group. A 'new name' is an Effectively Published name not already in the Taxonomic Backbone. Content Providers only provide one name, their accepted name of the taxon for which they are providing content	Technical Working Group	Closed	Rhakhis now manages all new names and assigns WFO-IDs. IPNI names are routinely ingested to Rhakhis. New IPNI names are loaded with Status of Unchecked. New TEN names are loaded with Status of Accepted, Synonym or Unplaced
44	Duplicates. There are ca. 40K name duplications in the Taxonomic Backbone due to TPL artifacts and import issues	Taxonomic Working Group	Closed	Closed – de duplication now undertaken as a general task in Consensus Classification data management by the TEN Manager
48	Make modifications to the Portal	Technical Working Group	Ongoing	NB Code changes required 17. Done

#	TASKS	WHO?	WHEN?	COMMENTS
	17. Assess if order of Descriptions can be prioritized (for display). 18. Assess how to provide page hit statistics by data provider. 28. Reveal hidden fields (e.g. Basionym) 29. Enable alternate classifications 30. Advise on display options to have descriptive data on the Taxon Page with alternate views: order by content provider vs by description type.			18. Pending 28. Deferred at St. Louis 29. Deferred at St. Louis 30. Done Meise update - Added 3 changes – popup texts, Search instructions
59	Re-run IPNI-WFO Name Matching after the WCSP/IPNI Update to improve the number of matching names from 68% and analyse the results. Update Protologue information for matched names using IPNI data (Related to #44)	Roger Hyam, Alan Elliott and William	Closed	Rerun completed.
66	Negotiate with Kew to add a WFO link to IPNI name pages.	WFO Council	Closed	March 2023 – IPNI contains links to WFO Plant List page.
68	Create a data paper of the WFO Backbone data with a DOI. Use this DOI for backbone download. (related to #29)	Technical Working Group	Closed	Rhakhis now produces Data Paper for the biannual snapshots.
69	Explore use of Frictionless Data for backbone data ingestion	Technical Working Group	Closed	Related to COLDP action item.
80	Develop Criteria for judging authorisation of potential Content Providers	Taxonomic Working Group	Pending (revisit with strategic review)	Criteria (scientific credibility, completeness, substantial contribution, currency, etc.), similar to those used for assessing TENs. Another approach is to list what we would not accept.
81	WFO to give percentages of what data have been uploaded from what is published for each source of Content	Technical Working Group	Pending	Possibly include in a Content stock take and show against source in the Flora page in About Pages. Derive percentages from table of content data records maintained by William.
84	Contact Consortium Members to solicit additional Content datasets	WFO Council Co-chairs	Ongoing	

#	TASKS	WHO?	WHEN?	COMMENTS
86	Explore formalising WFO's relationship with IPNI with a written agreement covering the nature of the collaboration and the exchange of data	WFO Council	Pending	
91	Google Cloud servers Migrate WFO servers on Google cloud to Missouri.	Missouri	March 2023	Migration is nearly complete. New Mailman server created.
92	WFO post 2020 strategic review and forward planning	Council Co-chairs to lead	2022/23	Consider Garnett et al. (2020) ' <i>Principles for creating a single authoritative list of the world's species</i> ' Review the WFO Portal interface (previously #63) – Tax WG Review suppressing display of Taxonomic Status for names above Species in the search results and Taxon Page and adding them to Taxon Pages (previously #77) – Tax WG At Meise: a strategic planning subgroup to be formed to take forward the key objectives put forward by the Working Groups.
93	Conduct stock take of Content and approved providers	WFO Gatekeeper and TEN Manager	For next Council	To be done after December/January relaunch
96	Investigate modification of TPL and WFO Portals to lower Google Search result standings for TPL below WFO.	Technical Working Group	Closed	Requires portal code changes
100	Use the major upgrade to promote WFO, especially in response to Leipzig List	Taxonomic Working Group	Closed	Communications WG to use data releases for promotion.
102	Relook at Catalogue of Life's COLDP data exchange format vis a vis Darwin Core Archive	Technical Working Group	Closed	Conduct an analysis of pros and cons of COLDP for WFO. Now exporting COLDP to Checklist Bank.

#	TASKS	WHO?	WHEN?	COMMENTS
103	The Plant List website to be 'greyed out', and the yellow warnings updated to make it clearer that users should now use WFO Plant List. Look to add redirects on TPL pages	Technical Working Group	Closed	Multiple text and color changes to be made to make Superseding of TPL more blatant.
104	RBGE to produce standalone, open source software to: manage the WFO Taxonomic Backbone Incorporate updates from data providers Provide clean datasets to MBG and to take responsibility for managing the WFO Taxonomic Backbone	RBGE	Closed	Rhakhis is in production.
105	Reconstitute a Communications Working Group to promote WFO	Thomas Haevermans	In process	Nicola Schoenenberger drafted a media promotion campaign
106	Explore registration of WFO as an NGO in Switzerland	Nicola Schoenenberger	In process	Nicola Schoenenberger presents options at the March 2023 Council, to follow up for next Council
107	Review consistency of terminology used in WFO webpages and guidelines	Marc Sosef	Next Council	
108	Review guidance on Data Downloads on the WFO website	William Ulate, Alan Elliott	Next Council	Replace text and downloads on 'Download Data' page of the WFO Portal with instructions on how Content and classification data can be downloaded, e.g. links to Zenodo, ChecklistBank, WFO Plant List, Portal downloads by registered users, etc.
109	Explore use of badges for the kind of object and institution on Portal pages.	Roger Hyam, William Ulate	Next Council	
110	Send request to Pensoft Publishers to put papers that mention WFO into the WFO Zenodo community (DOIs).	Technical Working Group	Next Council	

#	TASKS	WHO?	WHEN?	COMMENTS
111	Update Contributor Guides with latest data process changes after addition of Rhakhis.	William Ulate, Roger Hyam	Next Council	
112	Complete harvesting of WCVF Distributions. Restore GeoServer on the Portal.	William Ulate	Next Council	
113	Contact Taxonomic Names Resolution Service (TNRS) to update their WFO version.	Technical Working Group	Next Council	
114	Consensus classification data development in Rhakhis 1) Incorporate updates from TENS 2) Update non-TEN groups with data from WCVF, or other published classifications approved by the Taxonomic WG 2) Report on deduplication in curation metrics	TEN Manager Alan Elliott		Taxonomic WG to decide on the use of selected published classifications in preference to WCVF for non-TEN groups in the WFO Taxonomic Backbone. (Meise decision) What names are included in the Rhakhis? Currently 'All effectively published names' <ul style="list-style-type: none"> • Correctable original spellings? • Orthographic variants from providers? • Used for name-matching and providing feedback on searches • For internal use, not to be shown on the public portal • Sub-group set up to support the development of names handling in Rhakhis
115	Consider modifications to the Family and Higher order classifications	Taxonomic Working Group	Ongoing	Cephalotaxaceae recognised as distinct from Taxaceae in Kew 2023.
116	Establishing a supra-order classification	Lauren Raz Taxonomic Working Group	Next Council	Supra-order classification to be decided by Taxonomic WG and provided to Catalogue of Life

#	TASKS	WHO?	WHEN?	COMMENTS
117	Building a TEN global community 1) Run a WFO TEN side event at XX IBC Madrid July 2027 2) Develop an annual WFO TEN online symposium to share lessons learned and promote collaboration between TENs	Taxonomic Working Group	Ongoing	Seek to run an online symposium. Nadja Korotkova and Caryophyllales to organise the first of these in 2023
118	IUCN Red List to adopt WFO Plant List as its accepted classification	Peter Wyse Jackson (Missouri and Kew)	Next Council	WFO to request to the IUCN Red List governing body to adopt WFO Plant List as the accepted classification used by IUCN for plant groups covered by WFO
119	Promote WFO in the development of GSPC Complementary Actions supporting the Kunming-Montreal Global Biodiversity Framework	Peter Wyse Jackson	SBSTTA Nairobi, October 2023	
120	Review of Identification Tools provided/recommended by WFO	Marc Sosef Taxonomic Working Group	Next Council	

Annex 3

WFO Draft Strategy 2022-2030 (as presented at the meeting)

Introduction and Vision

A widely accessible Flora of all known plant species has been recognized as a fundamental requirement for plant conservation. The development of the World Flora Online was therefore stimulated, proposed and encouraged by the development of the Global Strategy for Plant Conservation (GSPC), first in 2002 when the GSPC was adopted by the U.N. Convention on Biological Diversity and subsequently when it was updated in 2010.

The first WFO-related target was included in the 2002-2010 GSPC to develop “*a widely accessible working list of known plant species as a step towards a complete world flora*” and this target was achieved at the end of 2010, as ‘The Plant List’. Drawing from the knowledge gained in producing The Plant List, an online World Flora of all known plant species was projected for 2020, as part of the updated GSPC. In 2010, the updated GSPC included as its first target the need for “An online flora of all known plants”.

When the WFO project was launched in 2012 it clearly defined its vision and it was agreed that it was not intended to be a critical, monographic revision of each of the world’s plant species. Nor was it envisioned to be a detailed local Flora with vouchered distributional data. Initially it was proposed to be a synoptic Flora with a defined, descriptive data set containing largely pre-existing data on the world’s plant species. Limited resources, by and large, make it unrealistic to develop new or collated descriptions. Although these may be required in the future, it has been necessary first to collect and make available existing data. Once the foundation is available, new technologies can be employed to analyse, manipulate, and enhance the Flora. In the vision outlined for the period up to 2020 it was recognized that in the future it would be important to explore mechanisms, including capacity-building at national level, to fill the gaps in existing knowledge. This aspiration remains a part of the ongoing vision of the WFO.

The structure of the World Flora Online was determined to ensure that it could be a framework capable of accommodating regional floristic information (at national or lower level) that can provide answers in both regional and global contexts. Hoped for enhancements included more complete synonymy; geographic distributions to at least country level, drawing on national floras, checklists, and monographs; habitat data; identification tools, principally interactive keys, images, and descriptions; conservation status; and other enhancements as practicable, e.g., vernacular names. Much of these data already exist in digital or printed format, and they have been used to populate the Flora. Such work needs to continue in the period following 2020.

The vision for the World Flora Online recognizes that the project is much more than an information technology project, though, and plant taxonomists have and will continue to play a crucial role in:

- resolving taxonomy to ensure that the World Flora Online can include as close as possible to a 'consensus classification' of the world's plants, and
- generating new floristic and monographic work to update old information and fill in the considerable gaps that exist.

The primary technical challenge of the WFO has been to develop an open and transparent, Web-based data collection, manipulation, and storage facility. Secondly, the system must provide open access to this accumulated data resource for the scientific community and other users of botanical data. The system is required to support research and conservation as an authoritative information system to facilitate the implementation of the Convention on Biological Diversity, and in particular, those related to plant conservation.

The WFO organization sees the World Flora Online as a critical resource for the conservation of plants by providing the information necessary to provide a baseline on the plant diversity of each region or country, as well as to identify the organisms under study effectively, evaluate their distributions, and help improve both regional and global estimates of status of threatened or endangered taxa supporting their conservation.

The open access Web site provides free access to the recorded information on the world's plants and allows for data to be extracted and used to support a wide variety of purposes, particularly related to facilitating plant conservation planning and action.

While the WFO already provides a valuable and comprehensive baseline on the world's plants, further work is required to ensure that accessibility is improved to meet the needs of users, including verification of the correct names and synonymy, up-to-date geographic distributional information, comprehensive descriptions, verified images and conservation assessments. The plant diversity of some countries, regions, and of specific plant groups too are still inadequate known and understood.

The ongoing vision of the World Flora Online will therefore be to contribute towards ensuring that access to comprehensive and authoritative global and national expertise, and online information systems, documentation and inventories is available in all countries on floras and the status of known plant species and natural habitats.

Vision of the Strategic Plan

For the period 2023 to 2030 therefore, the specific elements of the Vision of this Strategic Plan are as follows:

- ❑ To build on the two decades of endeavor on the World Flora Online to provide the most comprehensive and accurate knowledge base on the plants of the world available;
- ❑ To ensure that the data content of the WFO continues to be enhanced, improved and substantially increased, and that new data (such as on recently discovered species) can be added in a timely and sustainable manner;
- ❑ To improve and develop the means by which data are stored and accessible so that it will be increasingly usable and available for plant conservation planners and practitioners;
- ❑ To develop and refine the means and efficiency by which data are added to the WFO;
- ❑ To provide an increasingly authoritative consensus classification and taxonomic backbone on the world's plants;
- ❑ To provide a platform for plant taxonomists to share their expert knowledge on the diversity of the world's plant species;
- ❑ To improve and enhance the user interface so that WFO data will increasingly be used to support plant conservation planning and actions;
- ❑ To continue to build the WFO community and build capacity for plant taxonomy and floristics throughout the world;
- ❑ To safeguard and enhance the cooperative and collaborative ethos of the WFO organization whereby shared ownership of the project is recognized as a fundamental part of its ongoing operations, focus and governance.

Mission

The Mission of the World Flora Online is to collate, compile, develop, organize, make accessible and disseminate accurate and up-to-date scientific information on the world's plant species, and ensure that this information is available and used to support the conservation, restoration and sustainable use of plant diversity and natural habitats.

Objectives

1. Increase the coverage and scope of WFO data to increase its utility for ensuring the conservation and sustainable use of global plant resources.
2. Enhance the relevance of WFO.
3. Strengthen the governance and inclusiveness within WFO.
4. Improve the resilience of WFO.
5. Strengthen global capacity for biodiversity documentation and contribution to WFO.

Targets/Goals

Coverage and Scope

1. By 2030, taxonomic coverage by the TENs will be comprehensive, covering over 80% of all known plant species.
2. Descriptive Content of WFO will grow to include information from over 90% of all known plant species, and comprehensive for every region of the world. Indicators will be included as to whether the occurrence of species at national levels represents the native distribution of the species, as well as when they are naturalized or invasive.
3. Distribution data will be comprehensive, resolved to at least country-level distributions, supported by and with links to specimen data, and becoming an essential resource for the management of national plant lists.

Relevance

4. WFO will be recognized as the best source of checklist data, providing the plant content for Catalogue of Life/GBIF, and be the discovery portal for biodiversity data.
5. WFO will contribute to the development, achievement and monitoring of goals of the Montreal-Kunming Global Biodiversity Framework 2022, and GSPC's plant conservation agenda of complementary actions supporting the GBF.
6. WFO will enhance the utility and use of WFO to support plant conservation, and habitat conservation, restoration, and the sustainable use of plant resources, e.g. monitoring of protected areas, food security, and combatting invasive species.

Governance and inclusiveness

7. WFO will double the number of Consortium members, to at least 100, with emphasis on the inclusion of research institutions from biodiverse countries.
8. The WFO Council will achieve a balanced diversity (gender, geography, etc.) at its meetings and within its membership.
9. WFO will seek to increase the geographic diversity of the leadership of TENs.

Resourcing WFO development

10. WFO will put in place a ten year business plan outlining resource needs to achieve its objectives and potential sources.
11. WFO will recognize that the primary long-term source of support for the development and maintenance of WFO will be the members of the WFO Consortium. However, it is accepted that significant financial contributions and support will be required from external sources to allow the achievement of its targets and goals.

Informatic resilience

12. WFO will strengthen resilience of its informatics architecture by moving off the eMonocot system into a new, modular infrastructure.

Global Capacity for Biodiversity Research

13. WFO will promote collaborative capacity building programs for early career taxonomists, with special emphasis on working with biodiverse countries, focusing on addressing knowledge gaps, promoting fieldwork and career development.

14. WFO will support and encourage increased activity in collaborative global level taxonomic revisionary studies.

Communications

15. WFO recognized that the development and implementation of a comprehensive communications plan will be necessary to achieve:

- Widespread use of the WFO data by conservation practitioners;
- International recognition of the importance of WFO and the data it includes;
- The use of WFO data in the provision of taxonomic backbones for many conservation related initiatives;
- Successful financial and other resource generation.

Alignment of the WFO with the Montreal-Kunming Global Biodiversity Framework 2022

The World Flora Online will make a significant contribution to the achievement of TARGET 21 of the Global Biodiversity Framework adopted by the 15th Conference of the Parties to the Convention on Biological Diversity (December, 2022):

" Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity, and to strengthen communication, awareness-raising, education, monitoring, research and knowledge management and, also in this context, traditional knowledge, innovations, practices and technologies of indigenous peoples and local communities should only be accessed with their free, prior and informed consent, in accordance with national legislation".

A strategic objective of the WFO in relation to the GBF will be as follows:

Access to comprehensive and authoritative global and national expertise, and online information systems, documentation and inventories is available in all countries on floras and the status of known plant species and natural habitats.

CBD-COP15. 2022. Kunming-Montreal Global Biodiversity Framework.

Indicators of achievement for 6 of the 23 GBF targets will explicitly require species level information*. These include TARGETS 4 (threatened species), 5 (harvesting and trade of wild species), 6 (alien species), 9 (management and use of wild species), 10 (sustainable use of managed areas) and 21 (biodiversity information). As the authoritative resource for up-to-date information on accepted names for plant species, WFO will support monitoring and reporting of these TARGETS.

* <https://www.cbd.int/doc/c/179e/aecb/592f67904bf07dca7d0971da/cop-15-l-26-en.pdf>

GBF Target 21 is as follows:

21. Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity, and to strengthen communication, awareness-raising, education, monitoring, research and knowledge management and, also in this context, traditional knowledge, innovations, practices and technologies of indigenous peoples and local communities should only be accessed with their free, prior and informed consent, in accordance with national legislation.