# GUIDELINES FOR PREPARING A BOTANICAL MONOGRAPH

Christiane Anderson, 2009

These notes are meant as a general guide and reflect *Systematic Botany Monographs*; other series may have different instructions. Compose the manuscript to fit the format of the series for which the work is intended; consult the editor for aspects not covered in published guidelines. Proofread all parts.

Structure. The sections of a monograph generally follow this sequence: introduction, taxonomic history, materials and methods, morphology (and anatomy), [other topics, such as chromosomes, pollination syndromes, reproductive biology, etc.], habitats and distribution, explanation of the classification presented [this may range from a detailed phylogeny, or a summary with reference(s) to such work already published or in press, to a minimal statement of species concept used and rationale for sequence of species presented (if not alphabetical)], taxonomy [see details below], acknowledgments, literature cited, [appendices], index to numbered collections examined, index to scientific names.

The Introduction should provide a summary of the work. At a minimum state the size of the genus (or other group), what characters define it, its range, where it fits in with the rest of the family, and, as appropriate, what problems were encountered, how these were addressed, and which, if any, remain.

Taxonomy. Start with a treatment of the genus (or group): full synonymy, description (as a rule, omit measurements), [discussion if appropriate].

Key(s). The leads of a couplet must be parallel. Avoid lazy leads, e.g., "leaves small" (give measurements), "leaves not as above" (give characteristics). All the information used in the key(s) should be included in the descriptions and must agree with the descriptions. Work the descriptions through the key(s) to catch discrepancies.

Treatment of species. Provide a full synonymy; include only validly published names. Names not validly published (e.g., nomina nuda, names merely listed as synonyms, etc.) and those for which the application is not known should be listed at the end of the Taxonomy under the heading "Doubtful and Excluded Names." Present the synonymy in paragraph format, i.e., group names with their type in one paragraph (the names in chronological order), and list these paragraphs chronologically by the basionym. An alternate format, now mostly out of favor, is to list all names chronologically, the type cited with the basionym. Use standard citations for authors and literature (BPH, IPNI, TL-2; see part I under "Resources" below). ALWAYS check the literature and examine the types; do NOT rely on secondary sources if at all possible. If it is necessary to rely on a secondary source, then indicate that.

Descriptions should be strictly parallel at the same rank, i.e., all species descriptions should be parallel to each other, etc. Omit generic characters. If a particular structure is not present or was not seen, then say so ("glands absent"; "fruits not seen"; "chromosome number unknown").

Start the discussions by noting the distinguishing characters for the particular species, and then, if appropriate, state how it may be separated from similar species with which it might be confused. It may not be necessary to repeat this separation later in the paper; for subsequent species you might state, e.g., "For a separation from *P. alpha* see that species (no. 1)." This orients the reader and allows for readier comprehension of all that follows, and also is reassuring after slogging through the key. Put nomenclatural matters last.

Make certain that all references cited in the text are listed in the "Literature Cited" and that all entries in the "Literature Cited" are mentioned in the text.

Figures. Prepare illustrations with reproduction in mind. Photos are best provided at the final size; line drawings are often prepared to be reduced by half. Be aware of the resolution requirements for electronic files. Usually, photos should be at 300 ppi and line drawings at 1200 ppi; the color setting should be CMYK (use RBG for websites but not for printed work).—Check the text to make sure that all figures are correctly cited. Check captions against the figures for agreement; measurements indicated must agree with the descriptions. Check maps to make sure that the ranges indicated agree with the information given in the species treatments.

## RESOURCES

**Caveat:** IPNI, Tropicos, Aluka, and their ilk were compiled by mortals, not the deity. They are secondary sources and contain errors; these websites are starting points, not truths handed down from heaven.

### I. ESSENTIALS

*The Elements of Style* by William Strunk and E. B. White (4th ed.; 1999). Everyone should own a copy. Read it, memorize it, and repent your sins against the English language.

*Botanical Latin* by William T. Stearn (4th ed.; 2004). This exhaustive how-to book includes a brief history of descriptive botany, introduction to grammar, botanical Latin dictionary, and sections on terminology, formulation of names, Greek elements, and related topics. It is an indispensable aid for anyone working with botanical Latin (and Greek), and enables the diligent novice to understand and compose Latin descriptions and diagnoses.

*Taxonomic Literature* by Frans Stafleu and Richard S. Cowan; commonly referred to as "TL-2". This multi-volume work (1976–1988), with supplements to volume 1 (1992–2009), offers bibliographic details about free-standing botanical publications (mostly books but also reprints and preprints, if issued as separates). Each entry includes a brief biography of the author, location of herbaria and/or types, and references to pertinent books and articles. Most botanical publications use TL-2 as the standard for title abbreviations of books.—Available on-line (free to IAPT members): http://tl2.idcpublishers.info

*Botanico-Periodicum-Huntianum* by G. H. M. Lawrence et al. (1968); commonly referred to as "BPH." This book and the supplement (1991) give the full titles and dates of periodicals relevant to botany and unmask the more enigmatic journal abbreviations. Many botanical publications use BPH as the standard for abbreviations of journal titles.—Available on-line, sponsored by the Hunt Library: http://fmhibd.library.cmu.edu/fmi/iwp/cgi?-db=BPH_Online&-loadframes

*IPNI (International Plant Names Index)*. This on-line compendium provides an index to names of vascular plants and their place of publication, and to names of authors and their standard abbreviations. The index to plant names is based on an aggregation of entries from Index Kewensis, the Gray Herbarium Index, the Australian Plant Name Index, and Index Filicum. The index to authors is based *Authors of Plant Names*, edited by R. K. Brummitt and C. E. Powell (1992). Explore the commonly overlooked "Links" section at the bottom of the left-hand navigation bar. http://www.ipni.org

*International Code of Botanical Nomenclature (Vienna Code)*, ed. by J. McNeill et al. (2006), Regnum vegetabile 146. See below under "*Nomenclature*" for a glossary explaining technical terms.—The *Code* is available on-line: http://ibot.sav.sk/icbn/main.htm

## II. Useful Books and Websites

### *Latin (and Greek)*

*Three-Language List of Botanical Name Components* by A. Radcliffe-Smith (1998). A three-column listing giving Latin, Greek, and English equivalents.

*A Source-book of Biological Names and Terms* by Edmund C. Jaeger (1955 and later editions). Detailed, dictionary-style listing of Latin and Greek terms.

*An English Classical Dictionary for the Use of Taxonomists* by Robert S. Woods (1966). Intended to assist in finding "the most adaptable form of … words that could conceivably be used in scientific nomenclature" [quoted from Preface]; includes a brief introduction to the structure of Latin and Greek.

### *Nomenclature*

*Index Nominum Genericorum (ING)*. A compilation of generic names published for organisms covered by the *Code*. Each entry includes the place of publication and the type for the name. Available on-line: http://botany.si.edu/ing

*Conserved and Rejected Plant Names: Proposals and Disposals*. This database displays all activity associated with a name proposed for conservation or rejection. http://botany.si.edu/references/codes/props/index.cfm

*An Annotated Glossary of Botanical Nomenclature* by Rogers McVaugh et al. (1968); Regnum vegetabile 56. Although a little dated, this 31-page booklet is a handy guide to terms employed in the *Code*.

### *Linnaeana*

*The Linnaean Plant Name Typification Project*, sponsored by the British Museum (Natural History): http://www.nhm.ac.uk/research-curation/research/projects/linnaean-typification/index.html

*A List of Linnaean Generic Names and their Types* by C. E. Jarvis et al. (1993). Regnum vegetabile 127.

*Order out of Chaos : Linnaean Plant Names and their Types* by C. E. Jarvis (2007).

For an overview of Linnaeus's work and its importance to systematics, see W. T. Stearn's comprehensive introduction for volume 1 of the facsimile of the first edition of *Species plantarum*, published by the Ray Society (1957). In volume 2 of this facsimile J. L. Heller provides in an appendix a detailed explanation of all the works and authorities cited by Linnaeus.—Both accounts are useful for interpreting not only Linnaean publications but also other 18th and early 19th century literature.

*Linnaeus and the Linnaeans* by Frans Stafleu (1971), Regnum vegetabile 79. This is an excellent account of Linnaeus's impact on taxonomy during his lifetime, the dissemination of his work in Europe, and the changes embraced in the early part of the 19th century. Crammed with information, this book is a pleasure to read and highly recommended.

*Handwritings*

*Auxilium ad botanicorum graphicem* by Hervé M. Burdet (1979). Handwriting samples of noted botanists; each entry includes a brief biographical note and a listing of herbaria that have collections associated with that person. In French with an English preface. Available on-line (in French): http://www.ville-ge.ch/cjb/bd/auxilium/index.php

*Digital Libraries and Indices to Publications*

Biodiversity Heritage Library: http://www.biodiversitylibrary.org/subject/Botany

Botanicus (Missouri Botanical Garden): http://www.botanicus.org

Madrid Botanical Garden: http://bibdigital.rjb.csic.es/ing/index.php

Seed lists (Leiden Herbarium): http://www.nationaalherbarium.nl/seedlists/home.htm

Harvard index to botanical publications:
http://asaweb.huh.harvard.edu:8080/databases/publication_index.html

Kew Bibliographic Databases: http://kbd.kew.org/kbd/searchpage.do

Index to American Botanical Literature [1995 onward, but see introductory notes on website]:
http://sciweb.nybg.org/science2/IndexToAmericanBotanicalLiterature.asp

*Bibliographic Works*

The following were among the most widely consulted bibliographic references before the advent of TL-2.

*Thesaurus Literaturae Botanicae* by G. A. Pritzel (1847–1852). This book was the main reference for botanical titles until the publication of TL-1 and TL-2.

*Guide to the Literature of Botany* by B. D Jackson (1881). This book was intended to supersede Pritzel, in accuracy and scope.

*A Selected Guide to the Literature on the Flowering Plants of Mexico* by Ida Kaplan Longman (1964). Exhaustive listing (by author) of books and articles about Mexican botany published through 1950 (but including much material published through 1962), with a comprehensive index.

*Taxonomic Literature* by Frans A. Stafleu (1967). This book is now known as "TL-1"; the enthusiastic response prompted the second, much more detailed, multi-volume edition "TL-2" (see above).

*Illustrations*

*Botanical Illustration* by N. H. Holmgren and B. Angell (1986). Written before the advent of Photoshop and Illustrator, this slim book lacks guidance on preparing electronic files but provides sound advice for creating informative illustrations.

*Collections and Botanists*

Many herbaria now offer on-line access at least to part of their collections (especially types); some provide only label data, but many include images of specimens. Check the institution's home page for listings of searchable databases.

*Index herbariorum, part 1*. Index of public herbaria of the world; entries include mailing and e-mail addresses, URL's, and listings of staff and important holdings (by region and major collectors): http://sciweb.nybg.org/science2/IndexHerbariorum.asp

*Tropicos* (Missouri Botanical Garden). Information about names, collectors, literature, and specimens: http://www.tropicos.org

*Aluka* includes an encompassing section on names published for African plants, their types (with excellent images), and relevant publications: http://www.aluka.org

The Field Museum offers on-line access to the collection of pre-WWII photos of types from the Berlin herbarium: http://emuweb.fieldmuseum.org/botany/search_berlin.php

*Index herbariorum, part 2* — An index to collectors. The brief entry for each name includes the regions visited and year(s) of activity, and the herbaria that house at least some of that person's collections.

Lanjouw, J., and F. A. Stafleu. 1954. *Index herbariorum*. Part. 2(1): Collectors A–D. Regnum vegetabile 2: 1–174.
Lanjouw, J., and F. A. Stafleu. 1957. *Index herbariorum*. Part. 2(2): Collectors E–H. Regnum vegetabile 9: 175–295.
Chaudhri, M. N., et. al. *Index herbariorum*. Part. 2(3): Collectors I–L. Regnum vegetabile 86: 297–473.
Vegter, I. H. 1976. *Index herbariorum*. Part. 2(4): Collectors M. Regnum vegetabile 93: 475–576.
Vegter, I. H. 1983. *Index herbariorum*. Part. 2(5): Collectors N–R. Regnum vegetabile 109: 577–803.
Vegter, I. H. 1986. *Index herbariorum*. Part. 2(6): Collectors S. Regnum vegetabile 114: 805–985.
Vegter, I. H. 1988. *Index herbariorum*. Part. 2(7): Collectors T–Z. Regnum vegetabile 117: 987–1213.

*Biographical Notes upon Botanists* compiled by John Henley Barnhart (1965), 3 volumes. Each entry includes dates of birth (and death) and references.

*Harvard Index to Botanists*: http://asaweb.huh.harvard.edu:8080/databases/botanist_index.html

*Flora Malesiana Collectors*: http://www.nationaalherbarium.nl/fmcollectors/Home.htm

*Australian Botanists*: http://www.anbg.gov.au/biography/index.html

*Index Collectorum* (GOET), a detailed list of collectors represented in the herbarium at Göttingen: http://www.sysbot.uni-goettingen.de/index_coll/default.htm

*Botanical exploration in Nueva Galicia, Mexico, from 1790 to the present time* by R. McVaugh (1972). Contributions from the University of Michigan Herbarium 9: 205–357 plus map. Available on-line from Botanicus: http://www.botanicus.org

*Naturalists and their travels in Mexico: Annotated bibliography and roster of natural history collectors* by H. R. Burke and P. A. Fryxell (1995). Contributions from the University of Michigan Herbarium 20: 37–128. Available on-line from Botanicus: http://www.botanicus.org

SOME DATES OF NOMENCLATURAL IMPORTANCE

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| 1 May 1753 | Article 13 | publication of Linnaeus's *Species plantarum*; starting date for valid publication of names for vascular plants, Sphagnaceae, Hepaticae, lichens, most algae (see *Code*), myxomycetes; see *Code* for fungi and fossils |
| 1 January 1890 | Article 35.4 | rank of infraspecific taxa must be designated (undesignated taxa before this date are assumed to be varieties unless otherwise indicated by the author) |
| 1 January 1908 | Article 44.1 | an illustration with analysis (i.e., details necessary for identification) may no longer serve in place of a written diagnosis or description for valid publication of a species or infraspecific taxon |
| 1 January 1935 | Article 36.1 | a Latin diagnosis or description is required for valid publication of all new plant taxa (or reference to a previously and effectively published Latin description or diagnosis) |
| 1 January 1953 | Article 30.3 | publication in tradesmen's catalogs or non-scientific newspapers is no longer effective |
| 1 January 1953 | Article 30.4 | publication by distribution of printed matter with exsiccatae is no longer effective |
| 1 January 1953 | Article 33.2 | citation of basionym and place of publication is required for valid publication of a new combination or replacement name |
| 1 January 1953 | Article 35.1 | for valid publication the rank of taxon must be indicated for new names and new combinations |
| 1 January 1958 | Article 37.1 | types of names for new taxa (from family on down) must be indicated for valid publication |
| 1 January 1973 | Article 30.3 | publication in seed-exchange lists is no longer effective |
| 1 January 1973 | Article 45.1 | conditions for valid publication must be fulfilled simultaneously, or reference given to work in which unfulfilled conditions are accomplished |
| 1 January 1990 | Article 37.6 | for new names at rank of genus or below, indication of the type must include the word "typus" or "holotypus," or its abbreviation, or its equivalent in a modern language |
| 1 January 1990 | Article 37.7 | for names of new species or new infraspecific taxa the institution where the type is conserved must be stated |
| 1 January 2001 | Article 7.11 | the typification statement for lectotypes, neotypes, and epitypes must include the phrase "designated here" (hic designatus) or an equivalent |
| 1 January 2001 | Article 9.21 | designation of a lectotype or neotype for the name of a species or infraspecific taxon must include the word "lectotypus" or "neotypus," or its abbreviation, or its equivalent in a modern language |