

David
Kofranek
Botany

Rev 1

Standard Operating Procedures and Protocols for
Aquatic Plant Taxonomic Identification

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1.0 Traceability of Analysis

Taxonomic keys/references used for identification

Taxonomic resources within the laboratory's library include a wide array of floras, peer reviewed articles, and notes taken at workshops from national and international experts. In addition the University of Oregon is in close proximity, which has made its science library and interlibrary loan available to the public.

Some examples of pertinent keys, floras, and articles in the laboratory are:

Crum, H. & L.E. Anderson. 1981. *Mosses of Eastern North America. 2 volumes.* Columbia University Press, New York. 1328 pp.

Damsholt, K. 2002. *Illustrated Flora of Nordic Liverworts and Hornworts.* Nordic Bryological Society, Lund, Sweden. [Applicable to Alaskan flora]

Flora of North America Editorial Committee. 2007. *Flora of North America north of Mexico.* Volume 27. Oxford University Press, New York. 713 pp.

Flora of North America Editorial Committee. 2014. *Flora of North America north of Mexico.* Volume 28. Oxford University Press, New York. 702 pp.

Hallingbäck, Tomas, Niklas Lönnell, Henrik Weibull, Lars Hedenäs, Karin Wiklund. 2006. *The Encyclopedia of the Swedish Flora and Fauna, Bladmossor, Sköldmossor – Blåmossor.* ArtDatabanken (Swedish Threatened Species Unit). 416 pg. [Applicable to Alaskan flora]

Hallingbäck, Tomas, Niklas Lönnell, Henrik Weibull. 2008. *The Encyclopedia of the Swedish Flora and Fauna, Bladmossor, Kompaktmossor – Kapmossor.* ArtDatabanken (Swedish Threatened Species Unit). 504 pg. [Applicable to Alaskan flora]

Hedenäs, Lars, Tomas Hallingbäck, Christopher Reisborg. 2014. *The Encyclopedia of the Swedish Flora and Fauna, Bladmossor: Skirmossor – Baronmossor.* ArtDatabanken (Swedish Threatened Species Unit). 366 pg. [Applicable to Alaskan flora]

Schofield W. B. 2002. *Field Guide to Liverwort Genera of Pacific North America.* Global Forest Society in association with University of Washington Press. 228 pp. [Applicable to Alaskan flora]

Schuster, R. M. 1966-1992. *The Hepaticae and Anthocerotae of North America, East of the Hundredth Meridian*. 6 vols. New York, London, and Chicago.

Weber, William A., Ronald C. Wittmann. 2007. *Bryophytes of Colorado Mosses, Liverworts, and Hornworts*. Pilgrims' Process, Inc. 232 pg.

Experts working on analysis and summary of years of experience on relevant work

22 years of experience of specifically performing taxonomic identifications.

Training policy if non-experts (technicians/graduate students) are working on analysis

Not applicable. There are not any other personnel to train.

2.0 Procedure

Receiving, sample tracking, storage procedure

Samples are immediately transported to the laboratory and stored in a protective metal cabinet in cool dry conditions. The small nature of the facility and single person staff ensures traceability.

Identification and group specimen procedure

Positive identifications are not reached until all characteristics of a specimen are found to be in accord of a specific species description before a determination is satisfactorily made.

Furthermore similar species and/or look-a-likes are compared to further assure positive identifications. Personal reference specimens verified by the national or international experts are also at hand to aid in confirming identifications.

Point and pin specimen procedure

Not applicable

Polled sample procedure

Not applicable

Data reporting procedure (this can come directly from NEON description of ingest sheets)

Reported values will conform to the definitions, format, and units provided in the field definitions file so the data is not rejected by the NEON project database.

Once completed, the template spreadsheet will be saved in .csv format with UTF-8 encoding before loading to BOX. Posted files will be named using the naming format included in the File Name section below.

When a web-based data return platform is developed and implemented, I will upload .csv files directly to the web-based site. If the .csv file is accepted, no further action will be needed. However, if any there are any invalid fields they will be corrected and submitted until all are accepted.

Format: File Type = csv

o Encoding=UTF-8 o Delimiter = comma o String convention = double quoted o Blank cells within a data field = leave empty (do not use “NA”, “NULL”, etc.)

o Dates(andTimes):Reportlocaldates

o Max characters within a cell = 255

o If lines of data need to be removed at the bottom of a file, I will delete the whole row, I will not backspace to delete information in each cell because it will show up as a “ghost row”. Ghost rows can be seen if the csv file is opened in a text editor such as Notepad and show up as a series of commas (, , , , , , , , ,).

Text strings will be placed within double quotes unless the csv file is being created using Microsoft Excel. When using Excel, I will allow Excel to do its own formatting of text strings when the file is saved as .csv, i.e., I will not purposefully add double-quotes as Excel will do this automatically where needed.

File Names

For sample data: Prefix for the module (“aqPlantTaxMLL”) and the date data were uploaded (YYYYMMDD), separated by underscores (“_”) and with no spaces.

o Examples: aqPlantTaxMLL_20160628.csv

Work station picture



Anything else typically a part of sample handling or analysis

Only two chemicals may potentially be used for the identification of bryophytes: a stain for species of Sphagnum and a 10% solution of KOH for species of the Pottiaceae. If these are

needed they are only used in micro-quantities on minute fragments of the specimens, which are then discarded. They are not replaced back into the collection packet that would contaminate the remainder of the specimen and violate archival protocol.

3.0 QAQC Protocols

Detail any quality checks in place (secondary or rechecks or what happens when identification not certain) and acceptance criteria if exists.

In the rare case that an identification is not certain then an established network of colleagues can be consulted. This would be a simple and quick matter and entirely my responsibility.

Data entry of the results is checked at least twice.