Remedy to Anatomical Discrepancy of Species of Dirca

A Data Management Plan created using DMPTool

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Template: U.S. Department of Agriculture (USDA)

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Expected Data Type

Describe the type of data (e.g. digital, non-digital), how it will be generated, and whether the data are primary or metadata. Research examples include: lab work, field work and surveys; Education examples include: number of students enrolled/participated, degrees granted, curriculum, and training products; Extension examples include: outreach materials, number of stakeholders reached, number of activities, and assessment questionnaires.

Cell characteristics of bark tissue of species of *Dirca* will be measured from stained micrographs. Thirty-three replicates representing the native geographical distribution of *Dirca* palustis, *Dirca* occidentalis and *Dirca decipiens*, and eight replicates representing cultivated plants of *Dirca mexicana* will be analyzed.

Data types will include: pen and paper records of cell measurements and the digitalized version of data as an excel file (digitalized the same day as measurements are taken). Micrograph image files used to take measurements. Prepared slides from which micrographs are taken. Fixed tissue samples in vials. R software output files including script, analysis, and graphics.

Excel data table setup, top row: species, population, tissue sample code, and cellular characteristics. Multiple independent data sheets depending if the character is at the cellular (e.g. lumen diameter or cell length) or tissue level (e.g. vascular arrangment or presence of intraxylary phloem).

Boxplot graphics with cell characteristic (y-axis) and species (x-axis).

Data Format

For scientific data to be readily accessible and usable it is critical to use an appropriate community-recognized standard and machine readable formats when they exist. If the data will be managed in domain-specific workspaces or submitted to public databases, indicate that their required formats will be followed. Regardless of the format used, the data set must contain enough information to allow independent use (understand, validate and use) of the data.

Raw data: characteristics measured will follow the score sheet for describing bark characters provided by Hamann et al. (2011). Data will be recorded with paper and pen and then transfered to excel and saved as Microsoft Excel Worksheet (.xlsx) and Comma-separated values (.csv) files.

Analyzed data: statistical program R will be used for statistical analysis and outputs saved in the form they are generated.

Images: micrographs will be made from stained sectioned tissue mounted on slides. Images will be saved as TIFF files. Files will be named as followed: species abbreviation (DP=*palustris*, DO=*occidentalis*, DD=*decipiens*, DM=*mexicana*), magnification, section thickness (Xum [micrometer]), section plane (X=cross-section/transverse, R=radial/longitudial, T=tangential), and date mounted slide was prepared (MM, DD, YY).

Hamann T, Smets E, Lens F. 2011. A comparison of paraffin and resin-based techniques used in bark anatomy. Taxon 60: 841--851.

Data Storage and Preservation

Data must be stored in a safe environment with adequate measures taken for its long-term preservation. Applicants must describe plans for storing and preserving their data during and after the project and specify the data repositories, if they exist. Databases or data repositories for long-term preservation may be the same that are used to provide Data Sharing and Public Access. Estimate how much data will be preserved and state the planned retention period. Include any strategies, tools, and contingency plans that will be used to avoid data loss, degradation, or damage.

All data will be recorded with paper and pen and then transfered to excel and saved as Microsoft Excel Worksheet (.xlsx) and Comma-separated values (.csv) files.

Photocopies of paper and pen worksheets will be submitted as an appendix with Ph.D. dissertation, as well as stored on investigators personal computer and uploaded to FigShare folder associatied with study.

Micrographs will be uploaded to FigShare folder associated with study with reference in manuscript and saved on the primary investigator's personal computer for personal future uses.

Prepared slides used to create micrographs, and fixed tissue samples in vials will be kept with the investigator.

R software output files will be uploaded to FigShare folder associated with the study.

Data Sharing and Public Access

Describe your data access and sharing procedures during and after the grant. Name specific repositories and catalogs as appropriate. include a statement, when applicable, of plans to protect confidentiality, personal privacy, proprietary interests, business confidential information, and intellectual property rights. Outline any restrictions such as copyright, confidentiality, patent, appropriate credit, disclaimers, or conditions for use of the data by other parties.

Results will be disseminated in the form of publication in the International Association of Wood Anatomists (IAWA) journal and made open access. Supplementary materials such as micrograph images, raw data files, and R output will be uploaded to the IAWA's FigShare linked with the publication.

Pre-journal-reviewed manscript will be available as a dissertation chapter archieved within the Iowa State University Library and ProQuest.

Prepared slides and fixed tissue samples would not be publically accessible unless requested form the investigator.

Roles and Responsibilities

Who will ensure DMP implementation? This is particularly important for multi-investigator and multi-institutional projects. Provide a contingency plan in case key personnel leave the project. Also, what resources will be needed for the DMP? If funds are needed, have they been added to the budget request and budget narrative? Projects must budget sufficient resources to develop and implement the proposed DMP.

The primary investigator, Zachary J. Hudson, is responsible for ensuring the implementation of the data management plan.

Monitoring and Reporting

Successful projects should monitor the implementation of the DMP throughout the life of the project and after, as appropriate. Implementation of the DMP must be a component of annual and final reports to NIFA (REEport) and include progress in data sharing (publications, database, software, curriculum, outreach materials, etc.). The final report should also describe the data that was produced during the award period and the components that will be stored and preserved (including the expected duration) after the award ends. The DMP should be compliant with the Research Terms and Conditions that govern NIFA-funded project. The DMP is not intended to be a replacement for other grant reporting requirements.

FigShare folders associated with the study and publication will be kept active until FigShare no longer exists or is not supported by publication's journal.

Prepared slides and fixed tissue samples will be kept for a period of 10 years after publication date at which time follow-up studies or material requests are assumed to have been completed or slides or tissues are transfered to another study and referenced in the new study's data management plan.