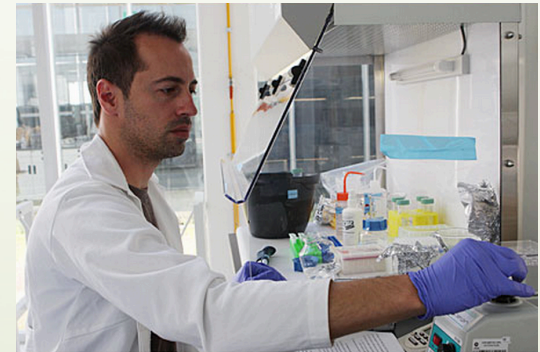


STANDARDS FOR COLLECTION OF GENOMIC RESOURCES



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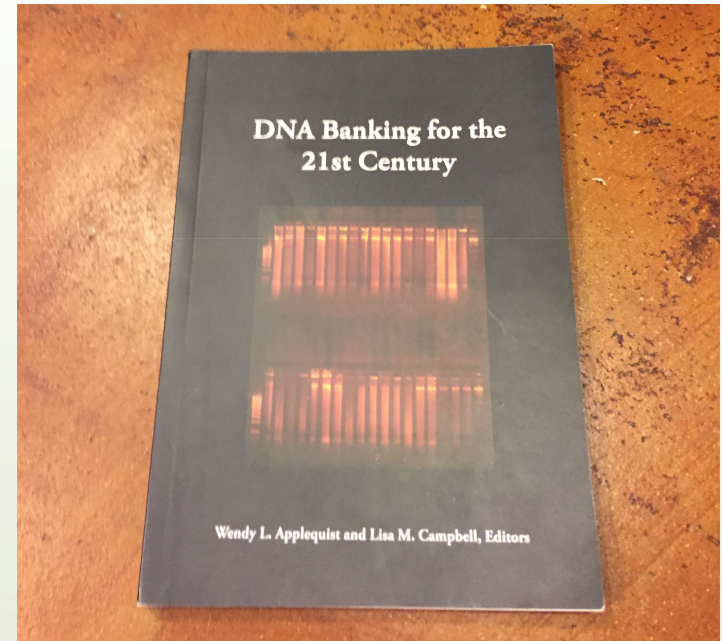
FIELD TO PUBLICATION...AND BEYOND

- ✦ Specimens → Museums → Databases
- ✦ Sequence data → GenBank / Other
- ✦ Phylogenetic trees → TreeBase
- ✦ Genetic resources → ?



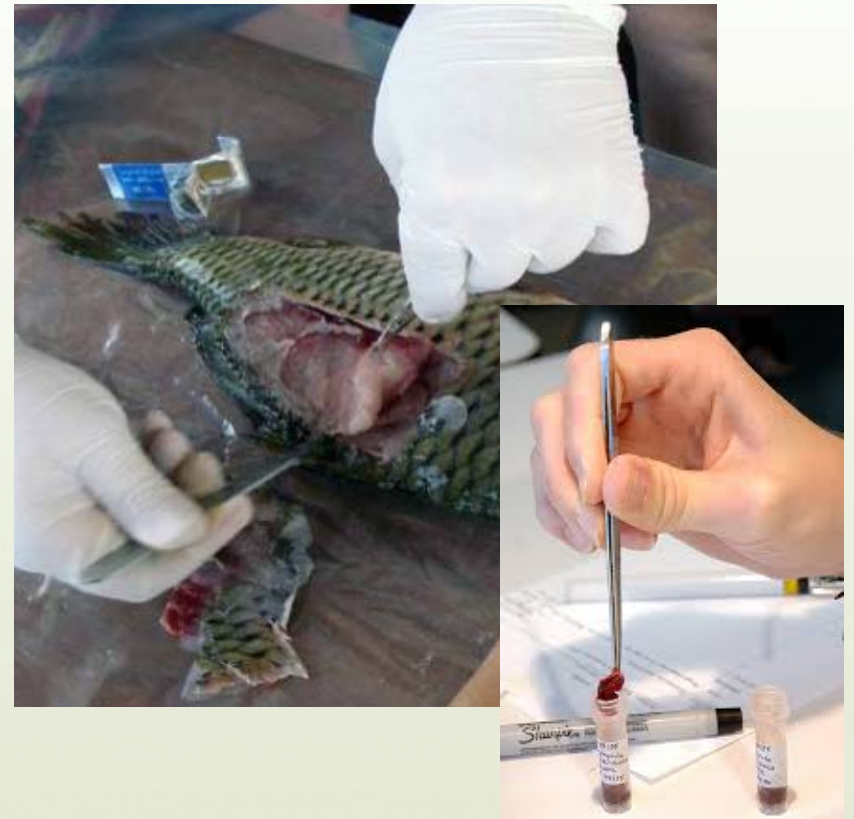
ARE THERE STANDARDS?

- ✦ US Workshop on DNA Banking
Missouri Botanical Garden
St. Louis, MO
January 2013
- ✦ Capturing Genomes Workshop
Smithsonian, Washington, DC
May 2013
 - What is the “gold standard” for collection and storage of genomic resources?
- ✦ Darwin Core Extensions
(TDWG 2013)



COLLECTING TISSUES

- ✦ Research best practices for tissue collection and preservation
- ✦ Consult with a genetics resources repository



COLLECTING TISSUES

- ✦ How much tissue should you collect?
 - DNA/RNA yield required
 - Compensate for sample loss
- ✦ From how many individuals?
 - Compensate for sample loss
 - Document genetic diversity

- ✦ Genomic DNA
 - e.g. silica / ethanol
- ✦ RNA
 - e.g. flash-freeze in liquid nitrogen vs. RNA-Later
- ✦ Duration of expedition and transport

MAXIMIZING SAMPLE UTILITY

- ✦ Link samples with specimens

- ✦ Use standardized labeling schemes
 - e.g. RC GTG 431-01
 - e.g. RC GTG 431-02

- ✦ Use vials with barcodes

- Handwritten labels wash off or fade
- “Unique” identifier
- Easy to reconcile with collection notebook

MAXIMIZING SAMPLE UTILITY

✦ Record metadata:

- Tissue description
- Environmental conditions
- Special circumstances







PRESERVATION & TRANSPORT

- ✦ How were tissues preserved?
 - Liquid Nitrogen
 - RNA-Later
- ✦ Under what conditions were tissues transported/stored? For how long?



SAMPLE DATA COLLECTION

✧ *Ruellia ciliatiflora*

DNA: RC GTG 431-01

RNA:


- Mature leaf from uppermost node (Y2133394; RC GTG 431-01).
- Floral buds in multiple stages of development; population-level sampling (Y2133389).
- 10 am; Full sun exposure, dry soil.
- Collected in-situ. Samples preserved in RNA-Later.
- 1 week storage at ambient temp followed by transfer to -20-deg C for two weeks.



- ✧ Anthocyanin: RC GTG 431
- ✧ FPA tissues: RC GTG 431
- ✧ Reflectance: RC GTG 431

ARCHIVAL

- ✦ Specimens document organisms in space & time.
- ✦ So do genomic resources!
- ✦ Find a genomic resources repository and archive your samples



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DNA Banks and Genetic Resources Repositories in the United States

iDigBio is actively compiling a list of DNA banking facilities and genetic resources repositories in the United States that maintain collections of nucleic acid extracts (DNA or RNA) or preserved tissues suitable for genetic and genomic studies of biodiversity.

The following resources (listed alphabetically by institution) represent collections currently known by or reported to iDigBio. Each entry includes the name of the institution, a brief description, and institutional link.

To report the availability of genetic resources at your institution, or to revise or update an existing entry, please contact [Grant Godden](#).

iDigBio thanks the participants of the DNA Banking Workshop hosted by the Missouri Botanical Garden (January 2013) and Breda Zimkus (Museum of Comparative Zoology, Harvard University), in particular, for assistance in compiling these resources.

Florida Museum of Natural History, Genetic Resources Repository (University of Florida)

Title Florida Museum of Natural History, Genetic Resources Repository (University of Florida)

PublicationWebsite Type

Year of Publication 2013

Keywords -180C, botany, centralized repository, cryogenic collection, DNA bank, entomology, frozen tissue collection, genetic resources, herpetology, ichthyology, invertebrates, liquid nitrogen, mammalogy, nucleic acid extracts, online database, ornithology, vertebrates

Abstract The Florida Museum of Natural History's Genetic Resources Repository (GRR) archives more than 30,000 tissue samples and DNA and RNA preparations from specimens housed in the Museum's Mammals, Herpetology, Birds, Invertebrate Zoology and Ichthyology divisions, the McGuire Center for Lepidoptera and Biodiversity, the Herbarium, and the Laboratory of Molecular Systematics and Evolutionary Genetics.

URL <http://www.flmnh.ufl.edu/grr/>

www.idigbio.org/genetic-resources

BENEFITS OF ARCHIVAL

- ✦ Long-term curation
- ✦ Optimal storage
- ✦ Save space
- ✦ Avoid sample loss
- ✦ Embargo samples
- ✦ Ensure repeatability
- ✦ Facilitates future science!

