



STANDARD OPERATION PROCEDURE – FIELD SAMPLE COLLECTION AND HANDLING

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1. SCOPE AND APPLICATION

The purpose of this Standard Operation Procedure (SOP) is to establish a uniform procedure for collecting specimens from wild samples with the purpose of isolating offspring strains for seedbanking purposes. This SOP is applicable to all individuals or organizations who are sampling for the Kelp Ark Organization.

2. SUMMARY OF METHODS

Tissue sample collection is subject to State and local permit requirements. Samples are excised from wild material and transported in cooled closed containers. Data will be gathered from the sampling site conditions and will be added to databases for recordkeeping.

3. DATA AND RECORDS MANAGEMENT

Entries written on the collection sheet will be transferred into a database for recordkeeping. Subsequent accession of collected material offspring (ie. Gametophytes) into the culture collection will reference this data and be necessary for future work.

4. HEALTH AND SAFETY

Boating: All users should be properly trained in the safe use and operation of boats in accordance with local permit requirements. Personal floatation devices must be available for all passengers and must be always worn when in a boat. Safety should be considered not only while on the open water, but also during docking procedures, as this is often when accidents and injuries can occur.

Diving: For individuals that require diving for sample collection, follow OSHA Scientific Diving Guidelines (29CFR1910.402) as set by the American Academy of Underwater Sciences (AAUS).

Weather: If a student/employee encounters dangerous working conditions, the student/employee may question the dangers with the principal investigator/research supervisor, and if not satisfied that the work can be performed safely, may cease work without repercussions, until the student/employee considers the conditions to be safe.

- **Safety Equipment:** First-aid Kit A fully-stocked first aid kit must be available in the vehicle and boat when in use.
- **Boat Safety Kit** A boat safety kit, including a whistle, horn, fire-extinguisher, a life-jacket (one per passenger), and a throwable life-saving device (cushions) must be on board the boat during operation.

5. EQUIPMENT AND SUPPLIES

A. Field Materials

1. Cooler with ice packs for transportation from collection site
2. Burlap or cloth to separate ice from sample materials

3. A knife or cutting tool
4. A dive bag for keeping seaweed tissue while underwater
5. Collection sheet with preferred information
6. SCUBA Gear, weight belts
7. Wetsuit, fins, snorkel
8. Digital Thermometer

B. Laboratory Materials

9. 0.22 µm Filtered Seawater
10. 1 gal Ziplock bags
11. Paper towel roll
12. Permanent Marker
13. 1.5 mL microcentrifuge tubes
14. Primary shipping container (e.g. Foam Cooler of at least 1 cu ft)
15. Secondary shipping container (e.g. Corrugated cardboard box to fit primary container)

6. QUALITY CONTROL

1. Operator must record name, entity and position held in said entity.
2. Operator should familiarize themselves with target species prior to field sampling to ensure accurate collection.
3. Checking collected tissues post-collection for pigmentation, or other notable traits of sporophyll/sorus (See APPENDIX A).
4. Avoid collecting material with epiphytes (e.g. microscopic algae, ciliates, cnidarians) or debris when out in the field, if not possible to avoid, ensure to remove all these epiphytes upon return to land.
5. If possible, pictures of individuals should be taken, these will be kept along with all metadata and can also be used to confirm identification.
6. Collection should be made early in the week, to ensure shipment is timely within workdays, taking weather and tides into consideration. Ideally only collect ripe material from individuals. This can be determined by looking at the tissue for darker pigmentation (i.e. APPENDIX B. Fig 1,2,3,4).

7. PROCEDURE.

7.1 KELP SPOROPHYTES

1. Determine if the collection will be made by boat or by wading into the collection area.
2. Determine if you will be required to use SCUBA equipment or not.
3. Find a suitable or known kelp bed, and use an appropriate approach based on previous steps.
4. Cut the sporophyll/sorus tissue using a knife, ensuring you only get a single sori per individual, to not have duplicates in the dive bag.
5. Bring the collected kelps back to the cooler.
6. Keep the material in damp cloth or burlap inside the cooler with ice packs while out in the field. Take notes in the collection sheet (Section 8), use one sheet per site.

7. Once back from the field, clean the material by rinsing in filtered seawater, and clean off with paper towel. move the tissue into a clean paper towel and place inside a Ziplock bag.
8. Label the bag with collection details: ID#, Species ID, site, date. Include the collection sheet inside a separate Ziplock bag. Put all sorus/sporophyll tissues, collection sheet, and ice packs inside shipping foam cooler.

7.2 KELP MEIOSPORES

1. Follow the steps in section 7.1
2. Sending meiospore material to Kelp Ark should follow [SOP#2001_Meiospore Release](#) to ensure quality material for seedbanking.
3. Meiospores should be sent in 1.5 mL microcentrifuge tubes, at a density of no more than 1,000 spores ml⁻¹. Collection details for their parental sporophytes should also be given with details like: ID#, Species ID, site, date. Include collection sheet inside a separate Ziplock bag.
4. Put all tubes, collection sheet, and ice packs, separated by a cushioning (bubble wrap, wadding rolls, crinkled paper) inside a shipping foam cooler.

7.3 KELP ASSOCIATED MICROBES

See [SOP#6002_Microbial Field Collection](#) (**Hyperlink here**) **OR just add the whole protocol here? I don't think so, would be too convoluted, I think...**

8. SHIPPING

1. Before shipping any material, communicate with Kelp Ark personnel to ensure they are ready for receiving materials.
2. Use Kelp Ark's FedEx Account number
3. Ship samples to:
Michael Marty-Rivera
Kelp Ark
2451 Signal Street, San Pedro, CA 90731

Collector:
Identifier:
Collection Site:
Temperature:

Date:
1/27/2025
Time:

[illegible]

APPENDIX A. SPOROPHYLL/SORUS TISSUE EXAMPLE PHOTOS



Macrocystis pyrifera
sorus tissue



Laminaria farlowii sorus tissue

APPENDIX B. SPOROPHYLL/SORUS TISSUE EXAMPLE
DIAGRAMS