

Collecting quillworts to preserve DNA

Materials (links are just examples, can be substituted)

- Coin envelopes https://www.amazon.com/Quality-Park-Envelopes-Brown-Kraft/dp/B000Y50ZD8/ref=dp_prsubs_2?pd_rd_i=B000Y50ZD8&psc=1
- Plastic bags https://www.amazon.com/dp/B0781BDHZJ?psc=1&ref=ppx_yo2_dt_b_product_details
- Silica gel https://www.amazon.com/gp/product/B071S914ZP/ref=ppx_yo_dt_b_asin_title_o07_s01?ie=UTF8&th=1
- Alcohol wipes https://www.amazon.com/Sanitizing-Alcohol-Fragrance-Individually-Portable/dp/B014EVXZ9S/ref=sr_1_20?keywords=alcohol+wipes&qid=1638887236&sr=8-20
- Ziploc bags
- Paper towels and water (purified or distilled if possible) for cleaning leaves
- Pen/marker

For systematic work, I try to sample 5 individuals selected pseudo-randomly from each population. For populations genetics, sampling 25-30 individuals is standard, but quillwort populations are often smaller than this. Sampled individuals can be flagged and labeled for further study (to collect material to determine ploidy, spores, etc.).

Procedure

1. Select sporophylls (leaves) that are young and healthy looking. These are towards the center of the plant, generally a bright green color. Avoid older, damaged, or sick-looking leaves.
2. Cut a minimum of ~3 in. (7.5 cm) of leaf (combined length if individual leaves smaller). If possible, collect up to 12 in. (30 cm) per plant to have some backup material.

3. Remove all soil, algae, or other contaminants from leaf and wipe with alcohol wipe until clean.
4. Cut leaf into ~1 in. (2.5 cm) sections and put in coin envelope. Seal when finished. Label envelope with sample ID, collection site info, date, etc. Put envelope in plastic bag with silica gel.
5. Keep samples away from heat and direct sun, especially during initial drying. Room temperature (~70-75 F) is OK.
6. After 1-2 days, check that silica gel isn't saturated (color changes from orange to dark blue-green). If all silica gel in a bag has changed color, replace it. Silica gel can be dried and reused by warming in an oven at 200 F for 30-60 minutes. Sealed plastic bags still leak air over time, so for long term storage put sample bags in a larger Ziploc bag or an air-tight container. Samples can also be stored in a freezer for an additional layer of preservation.