

“HOW TO” NO.2

HOW TO PREPARE SEAWEED SPECIMENS

Seaweed is a common term for species of multi-cellular algae that grow attached to various substrates in the marine environment or in some cases such as *Sargassum* drift in the open ocean.

The tradition of pressing seaweeds goes back at least to the 17th century - for example, the dried seaweed specimens reserved in the herbarium of Sir Hans Sloane - at the Natural History Museum London (BM). During the early 19th century a seaweed collecting craze developed which may have depleted the marine flora of South West England. Victorian ladies such as Mary Wyatt made a living from selling bound sets of seaweeds, and dried specimens accompanied the publication of the early 19th century *Ocean Flowers and Their Teachings*. Pressing remains an effective way of preservation to this day and specimens over a hundred years old remain useful, not just for morphological studies but for the extraction of usable genomic DNA.

This sheet gives some methods and hints on how to prepare seaweed specimens from collection to dry storage. Little specialist equipment is required, and the natural mucilage that seaweeds produce makes mounting relatively easy as they glue themselves to paper. Larger and/or coralline specimens may need a little help from straps and glue (Figure 1).



Figure 1. Finished, strapped specimen of *Sargassum*.

Many seaweeds and other algae are best preserved for future examination using liquid preservatives such as formalin or alcohol, but this is not dealt with here. (See references.)

Ideally the drying and pressing process should be started as soon as possible after collection, but this is not always possible. Most seaweeds will stay fresh if kept in a refrigerator for a couple of days, providing that they have been rinsed with seawater, and that small animals on and amongst them that might rapidly decay are removed. However, if the collections are going to be left for some time - and particularly if the weather is very warm - then they should be placed in a container such as a plastic bag or polypropylene jar with a solution of approximately 3% formalin (40% formalin, diluted 10:1 in seawater) added. This technique should be avoided if material may be used

for DNA extraction, as the formalin will denature DNA. For this reason, formalin is considered a carcinogen, and local health and safety regulations regarding its use (e.g., handling in a fume hood) should always be strictly followed.

SAFETY IN THE FIELD WHEN COLLECTING SPECIMENS

Details of collecting seaweeds can be found in Moore (1992); however, the following health and safety points should always be noted.

The sea shore can be a fascinating and beautiful but also **very dangerous** place and a number of simple precautions should always be taken before collecting.

1. **Check times of tides** from local tide tables and note any peculiarities such as double tides etc. Continually observe the state of the tide, as an incoming/rising tide may prevent return to shore.
2. **Check weather forecasts** - the shore is an exposed place. Strong winds can bring tides in faster than expected.
3. **Check your escape route** when on the shore. Be aware of any deep channels between you and safety.
4. **Work in pairs.**
5. **Carry a cell (mobile) phone.**
6. **Know the phone number to call for the coastguard.**

Ensure that collecting permits and land owners' permission are obtained where needed.

HOW TO PREPARE SEAWEED SPECIMENS

Equipment needed:

- Shallow plastic dish or tray (e.g., photographic developing tray)
- Strong cartridge paper or similar that will remain rigid when wet (cut to various sizes to support different shapes and sizes of specimen)
- Wire mesh (or plastic sheet) of dimensions that will allow it to be easily lowered into the dish
- Forceps, mounted needle, small artists' paint brush
- Nylon (or other non-woven fabric, such as muslin) e.g. pieces cut from nylon stockings, etc. At the NHM we use a product available from Picreator. (See references.)
- Plant press
- Absorbent drying paper (e.g. newspaper) and corrugated cardboard for press
- Gummed fabric tape

METHOD

1. Fill a plastic dish with seawater and completely immerse the specimen.

HOW TO PREPARE SEAWEED SPECIMENS (CONT.)

2. Drain most of the water away but allow a sufficient amount for the next stage.
3. Select a piece of cartridge paper cut to a suitable size to hold the specimen and write (in pencil) the species name (if known), plus a number (or other identifying mark) to identify the specimen and link it to field notes, etc.
4. Place an appropriately-sized piece of cartridge paper on the wire mesh sheet.
5. Slide the paper supported by the mesh under the specimen, carefully floating the specimen on to the paper.
6. Use forceps, mounted needle or paintbrush to tease apart the fronds of the seaweed, to display the branching pattern (Figure 2).
12. Add another specimen, and so on, until press is full.
13. Dry in a warm atmosphere. Place corrugated cardboard between the drying sheets to increase air circulation through the press.
14. Change the drying paper daily to prevent fungal contamination. Once dry, remove the specimens and supporting cartridge paper, and then either mount on an herbarium sheet or place in an appropriately-sized capsule (paper pocket). Unattached parts of the specimen should be temporarily fastened using an appropriate adhesive or gummed fabric tape.



Figure 2. Arranging a floating seaweed specimen on paper (step 6).

7. Carefully lift the wire mesh support by one end and allow the water to drain off.
8. Remove specimen and paper from the tray, and gently remove the wire mesh.
9. Place paper and specimen onto absorbent drying paper.
10. Place muslin or nylon fabric squares over the specimen to stop it sticking to the drying papers. (Figure 3).



Figure 3. Applying fabric squares over a specimen in a plant press.

11. Place drying paper on top of the nylon fabric and place several layers [The thicker the specimen, the more layers you will need].

SOME HINTS TO MAXIMISE USEFUL SPECIMEN

- Dry quickly to avoid decay, but not too quickly as specimens may become brittle.
- Clump some branches together. This makes it easier to remove material for later examination.
- Attaching a 'fragment folder' (a small capsule) to the herbarium sheet is useful for holding small bits of the specimen which may fall off (or are removed by a user) in the future.

BIBLIOGRAPHY

Dawson, E.Y. 1956. *How to know the seaweeds*. H. E. Jaques, Iowa [p 10-11].

Lee, T.F. 1977. *The seaweed handbook*. The Mariners Press, Boston Mass. [p 29-30].

Taylor, W.R. 1957. *Marine algae of the northeastern coast of North America*. Ed 2. University of Michigan Press, Ann Arbor. [p 14-15].

Moore, J.A. 1992 The Collection and Curation of Algae in Bridson and Forman. in *The Herbarium Handbook*. [p 237-241]

SOURCE FOR PICREATOR

<http://www.picreator.co.uk/>
Telephone +44 (0)20 8202 8972
US contact: Talas, 20, West 20th Street, 5th floor, New York, NY 10011, tel: (212) 219 0770, fax: (212) 219 0735.

AUTHORS

Rob Huxley, Head of Collections, Department of Botany, The Natural History Museum, London SW7 5BD, UK; r.huxley@nhm.ac.uk.

Jenny Bryant, Curator, Department of Botany, The Natural History Museum, London SW7 5BD, UK.