

Bark pH determination for the Bryophyte Habitats Survey

These notes assume that you have already read the document 'Soil pH determination for the Bryophyte Habitats Survey' which gives some more general information on pH measurement. They describe the protocol to be used for pH analysis of bark and wood samples from living trees and logs. Air-dried samples can be sent to me for pH determination if you do not possess the means for doing this yourself.

Bark/wood collection and storage

The preferred method of collecting bark and deadwood samples is using a 'cheese-grater' type of scraper. These have long been manufactured in larger sizes as 'Surform' wood files but are now retailed by various companies in single-handed models expressly for removing stubborn wallpaper. For our purposes they have three advantages over knives. First, they remove a thin upper layer of bark only, without leaving unsightly wounds and exposing the living wood to infection. Second, it is much more difficult to injure yourself accidentally with a scraper than with a knife. Third, the thin slivers produced are ready-made for pH determination without there being a need to grind the samples further.

Unlike for soils, where fresh or dried samples may be analysed, the method described here uses air-dried bark or wood samples and is based on sample weight not volume. If the bark is collected in newspaper packets it can be simply laid on a table or bench to air dry over a week or two in normal room conditions. Otherwise it will be necessary to open the tops of polythene bags to allow drying over a similar period. I normally allow samples to accumulate over several weeks or even months until I have 15 or 20 for analysis.

pH determination

1. Accurately weigh out 0.5 g samples into clean specimen tubes. I use inexpensive 50-ml universal tubes which are made from clear plastic and have screw tops, and I keep them in a rack to prevent them toppling over. They are numbered 1-20 and I wash, dry and re-use them for each batch of samples. I print off a simple form on which I enter the details given on each sample packet, the weights and pH values, which encourages error-free cross-referencing to the field cards and database. The tubes are first weighed empty on an electric balance and then taken up to the target weight using forceps to transfer slivers or particles of bark into each.
2. Add 10 ml of distilled water to the bark or wood sample in each tube. Seal the top and gently shake to thoroughly wet the sample. Note the time and leave to steep for 1 hour with occasional shaking to ensure the sample is thoroughly mixed. At first much of the sample will float but eventually the particles become waterlogged and sink.
3. While the samples are steeping, calibrate your pH meter against buffers of pH 7 and pH 4. Note that nearly all bark and wood samples give reactions on the acid side of neutrality, though readings above pH 7 are occasionally obtained.
4. After 1 hour give a final gentle shake and insert the pH electrode/temperature probe (rinsed to remove any buffer and gently blotted), stir it around gently and allow to stabilise for a minute or two before recording the reading.

5. Clean the electrode(s) with distilled water between samples and gently blot. Unfortunately, small floating bark pieces have an annoying tendency to stick between the electrode bulb and its housing and may need to be removed very carefully with forceps taking great care not to damage the bulb.

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