

Plant Microremains and Environmental Reconstruction

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Discrete, specific microfossils

NB: usually one form per species (although it may not be possible to distinguish related species, or even genera within the same family in some cases)

- **Pollen and spores** (Palynology)
Pollen from conifers and flowering plants (Gymnosperms and Angiosperms)
Spores from ferns, mosses, fungi

Some phytoplankton types provide information on aquatic environments, such as salinity or ocean depth, including
- **Diatoms** (taxonomic Class Bacillariophyceae)
Unicellular, aquatic algae with siliceous exoskeletons
- **Dinoflagellates** (taxonomic Division Pyrrophyta)
Unicellular 'red' algae, with cellulose armor plates.
Certain dinoflagellates are an important component of corals

Disarticulated, non-specific morphotypes

NB: Numerous forms produced in a given plant and species, extensive sharing of forms between different species, including distantly related ones, occasional morphotypes are more taxonomically diagnostic, especially when still articulated (therefore reflecting epidermal cell patterns).

- **Phytoliths** (also called plant opals)
- **Articulated phytoliths** (multiple silicified cells attached, sometimes called spodograms)

Sampling for Microremains

Processing is done in the laboratory with chemical extraction. Bulk sediment samples, either from on-site archaeological contexts/ strata, or Off-site from coring of natural sedimentary deposits, e.g. bogs, lake beds, etc. Sample sizes are small (e.g. 50mL), with only a fraction processed at one time. For non-sealed (e.g. core) samples, caution must be taken to avoid to minimise contamination by windborne particles, e.g. through immediate samples of freshly cleaned sections.

Pollen: Further Reading

Moore, P. D., J. A. Webb, and M. E. Collinson 1991. *Pollen Analysis*, second edition. Blackwell Scientific, Oxford.

Traverse, Alfred. 1988. *Paleopalynology*. London : Unwin Hyman

Dimbleby, G. 1985. *The Palynology of Archaeological Sites*. London: Academic Press

Godwin, Harry 1975. *History of the Flora of the British Isles*, second edition. Cambridge: Cambridge University Press

Fægri, K and J. Iversen 1975. *A Textbook of Pollen Analysis*, third edition. Blackwell Scientific, Oxford.

For some images of pollen on the Web:

Pollen catalogue of the British isles (University of Uppsala):

<http://www.kv.geo.uu.se/pc-intro.html>

http://srl.usda.gov/srl/apmru/imms/pollen/Light_Micrographs/LMicro.htm

http://www.geo.arizona.edu/palynology/sit_mnt0.html

Diatoms: Further reading

Battarbee, R. W. 1988. The use of diatoms analysis in archaeology: A review, *Journal of Archaeological Science* 15: 621-644

Juggins, S. and N. Cameron 1999. Diatoms and Archaeology, in *The Diatoms. Applications for the Environmental and Earth Sciences* (E. F. Stroermer and J. P. Smol eds.), pp. 389-401. Cambridge University Press

For images of selected diatoms, see these web sites:

<http://www.calacademy.org/research/diatoms/>

<http://www.bgsu.edu/departments/biology/algae/index.html>

<http://www.indiana.edu/~diatom/diatom.html>

Phytoliths: Further Reading

Rovner, I. 1983. Plant opal phytolith analysis: Major Advances in Archaeobotanical Research, *Advances in Archaeological Method and Theory* 6: 225-266

Piperno, D. 1988. *Phytolith Analysis: An Archaeological and Geological Perspectives*. New York: Academic Press

D. Pearsall and D. Piperno (eds.) 1993. *Current Research in Phytolith Analysis: Applications in Archaeology and Paleoecology*, MASCA Research Papers in Science and Archaeology 10. Philadelphia.

For images of phytoliths, try these websites:

<http://reled.byu.edu/ascript/tball/index2.html>

<http://www.southalabama.edu/geography/fearn/phyto.htm>