

Lichens at Chelsea Physic Garden

How many lichens are here? In the Chelsea Physic Garden (CPG), the most recent count of lichen species (2004) was 38. Before then, in the 1970's, only 11 lichen species were found in the Garden. Why? **Read on....**

Where can I see a lichen? Lichens are growing on wooden benches (some with as many as 11 species), clay paving tiles and urn, and trees, all adding colour and interest and providing an important component of our biodiversity heritage. Over the years certain lichen species are lost as conditions change (e.g. if a tree is felled or air quality changes); other lichens appear as new pioneers, carried as small fragments in the air and on birds' feet. The 'chewing gum lichen', *Lecanora muralis*, also frequent on benches and walls, is especially well seen as small greyish blobs on the paving tiles in the Philip Miller garden (1). This lichen has been a constant feature in the CPG since 1977. Nearby on the clay urn (which has at least eight lichen species), the pale-grey, crescent-shaped, crustose lichen, *Trapelia coarctata* is a conspicuous recent arrival (2).

(1) *Lecanora muralis* (magnification x2)



(2) Urn with *Trapelia coarctata*

Do lichens have any uses? Lichens (not mosses) provide food for reindeer, material for birds' nests and, until recently, were used for dyeing, a practice which has resulted in almost total extinction of some species. Today, lichens serve as important biological indicators of air quality, and monitoring of the changes in lichen diversity and abundance informs us of changes in our air. **In 1977** only 11 lichen species were recorded in the CPG. At that time London was recovering from the acidic effects of the past sulphur dioxide pollution (from coal burning) which had turned London into a 'lichen desert'. Now all over London's parks and gardens lichens are returning, but many of the species are different and indicate increasing nutrient enrichment (eutrophication). Bird droppings and pollen (as under the Yew tree in the Garden) contribute to this, while traffic exhaust (with nitrogenous gases) is now adding to the effect. **In 2004**, *Lecanora conizaeoides*, the pollution lichen known for its dependence on sulphur dioxide and earlier common in the Garden, had been lost from all the trees and was restricted to a small patch on acidic sandstone wall capping. A third of the lichens now recorded in the CPG are those recognised as indicators of eutrophication; these (described as nitrophiles) are increasing.

(3) *Xanthoria parietina* (mag x2)



(4) *Candelaria concolor* on Date-Plum

What is a lichen? Lichens are most remarkable organisms due to their partnership (symbiosis) of fungus threads and algal cells. Unlike a parasitic or saprophytic fungus which requires an external source of organic food (e.g. from a living host or decaying matter), the lichen fungus relies upon its algal partner to produce its food. This and its unique construction equip it for colonisation on a wide variety of substrates (e.g. rock, cement, brick, asphalt, wood, tiles, tree bark and peat) which provide support. As long as the lichen receives light and moisture for photosynthesis it will respond by slowly growing (about 1 to 6 mm per year) on a suitable substance, the pH (acidity, alkalinity) being especially important and often species-specific. As crustose, leafy or shrubby forms, in a range of colours, lichens grow on new volcanic ash and the stones of Stonehenge, on young twigs and the bark of ancient oaks. Many lichens are very long-lived (several centuries old). They reproduce by fungus spores (which must find new algal partners) and small fragments which are spread from powdery masses (soralia) or minute projections (isidia) of the thallus.

Good examples include the leafy orange lichen (grey-yellow in shade), *Xanthoria parietina*, on benches and trees (3), and the spectacular display of the yellow-orange lichen, *Candelaria concolor*, supported (epiphytic) on the bark of the reclining trunk of the Date-Plum tree (*Diospyrus lotus*) (4).

The strategic position of the Chelsea Physic Garden provides us with a delightful resource and important opportunity for monitoring the changing patterns of lichen diversity as indicators of air quality in London.

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Suggested further reading and information:

- 1) www.thebls.org.uk - the website of the British Lichen Society which provides information on lichens and useful contacts.
- 2) Baron, G. 1999. Understanding Lichens. Slough: Richmond Publishing Co. Ltd.
- 3) Dobson, F. 2005. Lichens. An Illustrated Guide to the British and Irish Species. Slough: Richmond Publishing Co. Ltd. New fifth edition with colour photographs.
- 4) Dobson, F. AIDGAP Key to Urban Lichens. This will contain about 80 colour photographs and is in the popular FSC AIDGAP series of field keys; to be published by the Field Studies Council, 2005
- 5) Purvis, W. 2000. Lichens. London: Natural History Museum. Life Series.

MAP OF CHELSEA PHYSIC GARDEN : Lichens

