LICHENS AT ST MARY'S, FEN DITTON

A survey by Mark Powell and the Cambridgeshire Lichen Group, 11th November 2017
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Summary

- 74 taxa were recorded, four of which are lichenicolous fungi (specialized fungi which infect lichens).
- The term 'taxa' (singular = taxon) is used for any separate entities that have been described in the scientific literature and include subspecies and forms as well as species.
- All the taxa are designated by the International Union for the Conservation of Nature as Least Concern, except for *Lecanora horiza* which is currently listed as Near Threatened. However, Malíček & Powell (2013) showed that *L. horiza* has been much under-recorded due to confusion with *L. campestris*.
- Thirteen of the taxa are Nationally Scarce (recorded in 16 to 100 hectads of the British Lichen Society's mapping database). Two of the taxa are Nationally Rare (recorded in 15 or fewer hectads). However, some of these taxa are greatly under-recorded.

A website devoted to the taxonomy of fungi (including lichens) is being developed in collaboration with the Natural History Museum and Kew Gardens. Images and micrographs of most of the species found at Fen Ditton are available there. See for example:
http://fungi.myspecies.info/all-fungi/rinodina-calcarea

Lichens are curious dual organisms, a close association between a fungus and a photosynthetic partner (usually a green alga). This association is so intimate that Victorian biologists argued about whether lichens were a single organism or a partnership. One school of thought maintained that the microscopic green cells within them were organelles produced by the fungus while others argued that the green cells were algae that had been entrapped by the fungus. We now know that the latter is correct but the degree to which the algae are exploited is still a matter for debate.

The number of lichen species that are recorded at individual churchyard and cemetery sites is increasing. Nowadays it is not uncommon to find more than a hundred. There are various reasons for this increase in the totals recorded. The decline of atmospheric sulphur dioxide pollution is one factor. The lichen communities of the Midlands were seriously impoverished by this pollutant. The concentration of sulphur dioxide has declined enormously in recent years and we are witnessing a spectacular re-invasion of lichen species which were previously unable to grow in our region. The lichens which grow on tree bark are spreading particularly quickly. Advances in our taxonomic knowledge of lichens has resulted in a more refined understanding of the taxa involved. Finally, the development of collection techniques which are non-damaging to stonework has allowed a more thorough study of cryptic species using microscopic techniques.

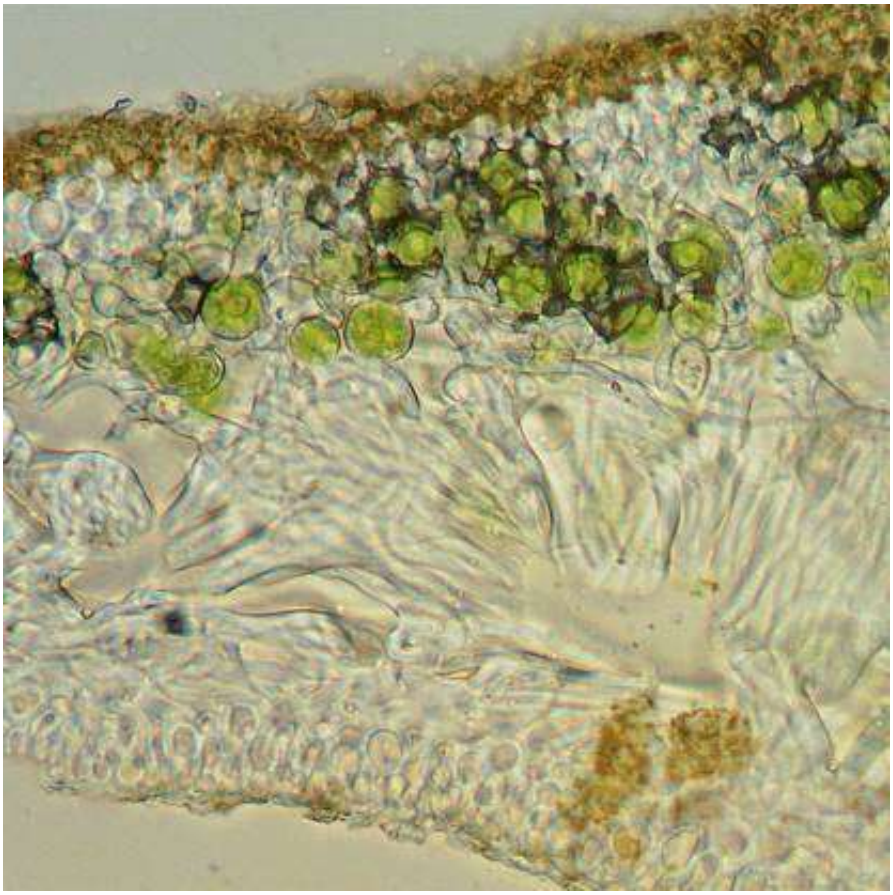


FIG 1. A cross section through a lobe of *Xanthoria parietina* (an extremely common lichen) as seen through a microscope. The thin section was cut by hand using a razor blade and mounted on a microscope slide. The algal cells (looking rather like peas but only one thousandth of the size) are seen in a layer towards the upper part. The glassy structures forming the bulk of the lichen are the fungal hyphae.

FIG 2. Gravestones to the south of the church.

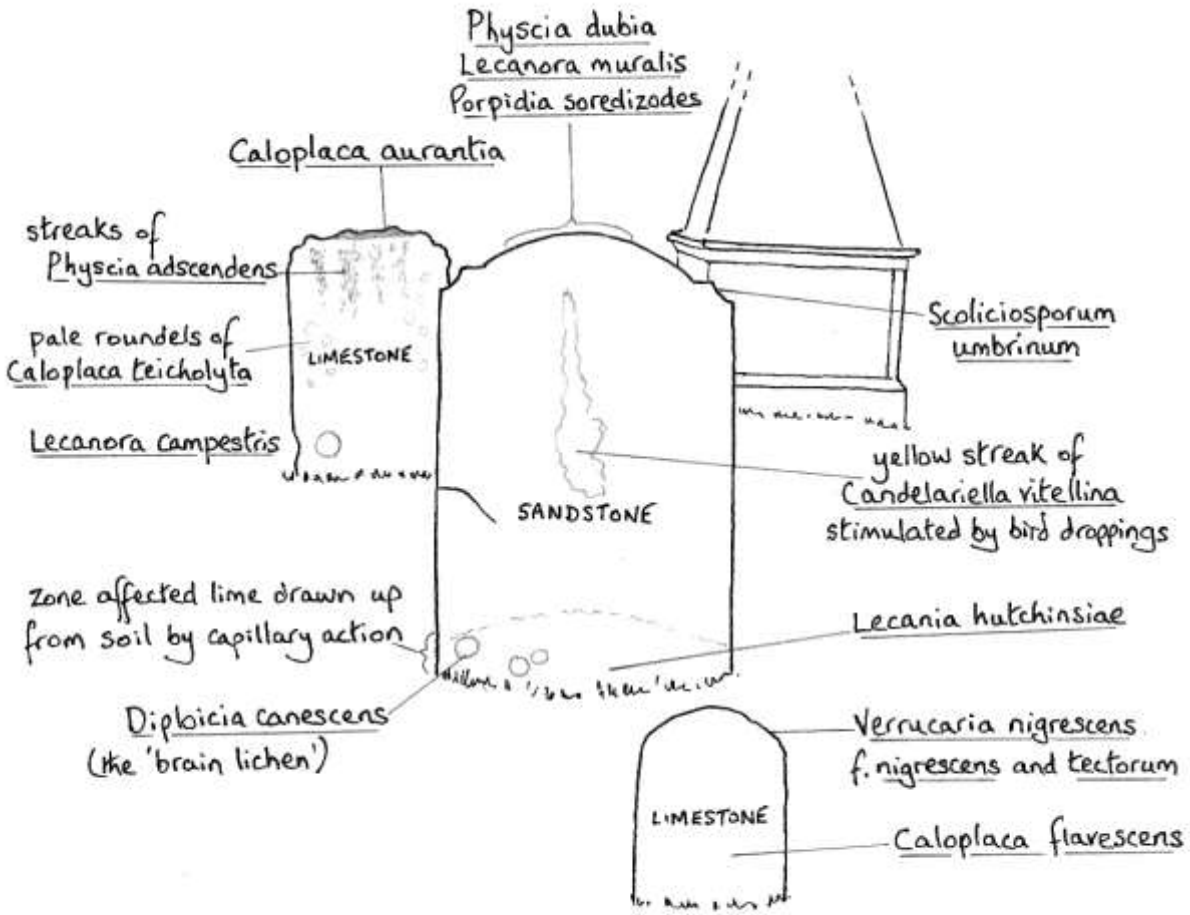


FIG 3. Drawing of the memorials shown in the photograph of Fig. 2. Limestone gravestones support a completely different community of lichens to those on sandstone. In both cases there are streaks of nutrient-loving lichens which are stimulated by the droppings by perching birds. *Caloplaca aurantia* forms beautiful orange crusts on the tops of several old limestone gravestones in this part of the churchyard. The lower nine inches or so of sandstone gravestones in this region provide a specialist habitat where the community is different from that of the rest of the stone. This is because ground water containing traces of lime and other minerals are drawn up by capillary action. The tops of gravestones receive much more attention by lichenologists than the bases and so species typical of the basal zone, such as *Lecania hutchinsiae*, are seldom recorded on gravestones.

FIG 4. Limestone headstone to the south of the church. There is almost a complete cover of lichens; even the pale patches are mainly lichen crusts. Note the pale green patch narrowing down from the apex, where *Physconia grisea* is stimulated by bird droppings. The intensely nutrient-enriched top of the apex is dominated by *Lecania erysibe*. Just below the bottom edge of the photograph (out of shot) is a limestone 'footstone' marking the opposite end of the grave marked by this headstone. The footstone, despite being small, supports a rich community of 'immersed pyrenocarps', including *Thelidium pyrenophorum* (Nationally Scarce), *Verrucaria calciseda* and *V. viridula*. Footstones tend to have a subtly different community of lichens since they are seldom used by birds for perching.

FIG 5. Gravestones in the south-east portion of the churchyard. On the left is a headstone of sandstone while to its right is one of limestone. The face of the sandstone gravestone is dominated by the yellow-green powdery crust of *Psilolechia lucida*. This lichen prefers surfaces which are non-calcareous, and it is excluded in the basal zone where lime has been drawn up from the soil. The limestone gravestone to the right has a rich community containing a range of species belonging to the family Verrucariaceae, including *Thelidium pyrenophorum*, *Verrucaria calciseda*, *V. hochstetteri*, *V. macrostoma* f. *furfuracea* and *Verrucaria nigrescens* f. *tectorum*.

FIG 6. *Psilolechia lucida* (at another site) colouring the background to the ornamental carving.

FIG 7. Memorials to near the south side of the church.

FIG 8. *Rinodina calcarea* (Nationally Rare).

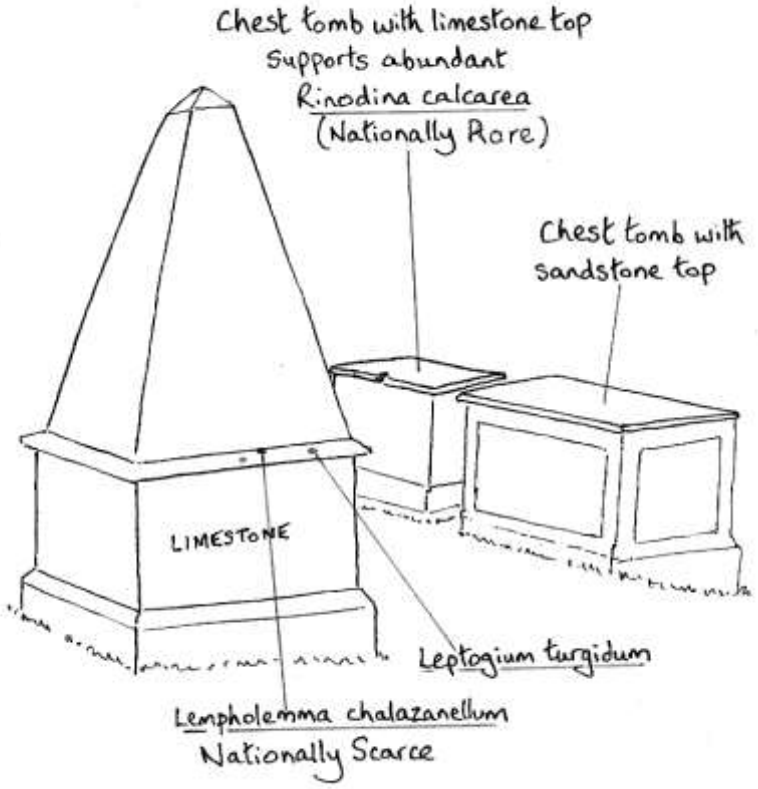


FIG. 9. Drawing of the memorials shown in the photograph of Fig. 8.

FIG 10. South wall of church, to west of porch.

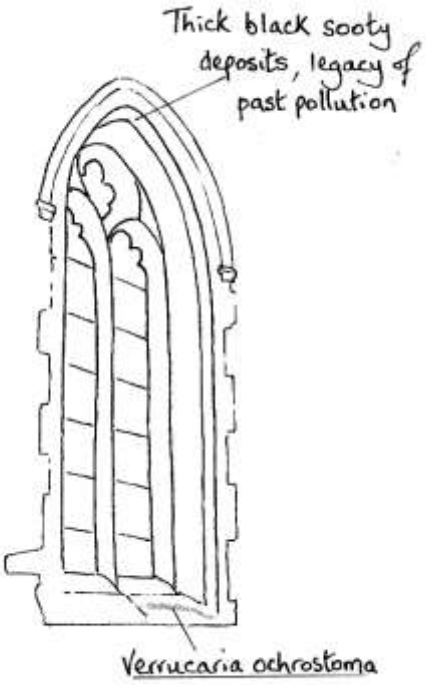


FIG 10. The far half of the lower windowsill has been replaced by newly dressed stone. A good colony of *Verrucaria ochrostoma* is present. Although this species is currently listed by Woods & Coppins (2012) as Nationally Rare, Powell (2015) subsequently showed that this lichen is perhaps one of the most overlooked of all British species. Described by the eminent botanist William Borrer in the first half of the nineteenth century, it was almost completely lost to the consciousness of British lichenologists until very recent years. In the sheltered arch underhangs, where the stonework hasn't been cleaned by weathering, thick black sooty deposits are present, an indication of the intensity of pollution in the days when coal burning was common.

FIG. 11. Church buildings often support specialist metallophyte communities associated with various metal fittings. Here, the windowsill is dominated by *Arthonia lapidicola* which will have colonised when a former rusty window grille was present. Modern replacements, such as this galvanized grille, tend to be toxic to most lichens, though *A. lapidicola* is surviving here.

FIG 12. The north side of the church. The church has been quite heavily restored (perhaps in Victorian times) and does not retain its old chamfered plinth. This has a bearing on the lichen community present which here is relatively poor for an old church. The stone slab just in front of the bicycle has a thallus of *Verrucaria squamulosa*, a species which was described as new in 2001.

Lichens tend to require no management, slowly doing their own thing if left alone. The largest threat to gravestone communities tends to be ivy which can quickly engulf a gravestone and kill off lichen communities which have taken many decades to develop. Another potential source of damaging shade is from tree branches. The British Lichen Society provides further information about churchyard lichens:
www.britishlichensociety.org.uk
The author is always happy to correspond and offer further advice.

Table 1: list of lichens and lichenicolous fungi recorded at St Mary's, Fen Ditton
Column A gives the standard BLS number for each taxon.
Column B gives the name of each taxon recorded.
Column C indicates whether the taxon is a lichenicolous fungus (LF) or a lichen (0).
Column D gives the conservation designations as follows: NT = Near Threatened, LC = Least Concern, NS = Nationally Scarce, NR = Nationally Rare.
Column E gives the substratum upon which the taxon was growing: Bry = bryicolous (growing on moss), Cort = corticolous (growing on bark), Lic = lichenicolous, Sax = saxicolous (growing on stonework).
Column F provides details of substratum using standard BLS codes.

A	B	C	D	E	F
10	*Acarospora fuscata*	0	LC	Sax	XY,SSd,XHd
212	*Amandinea punctata*	0	LC	Sax	XY,SSd,XHd

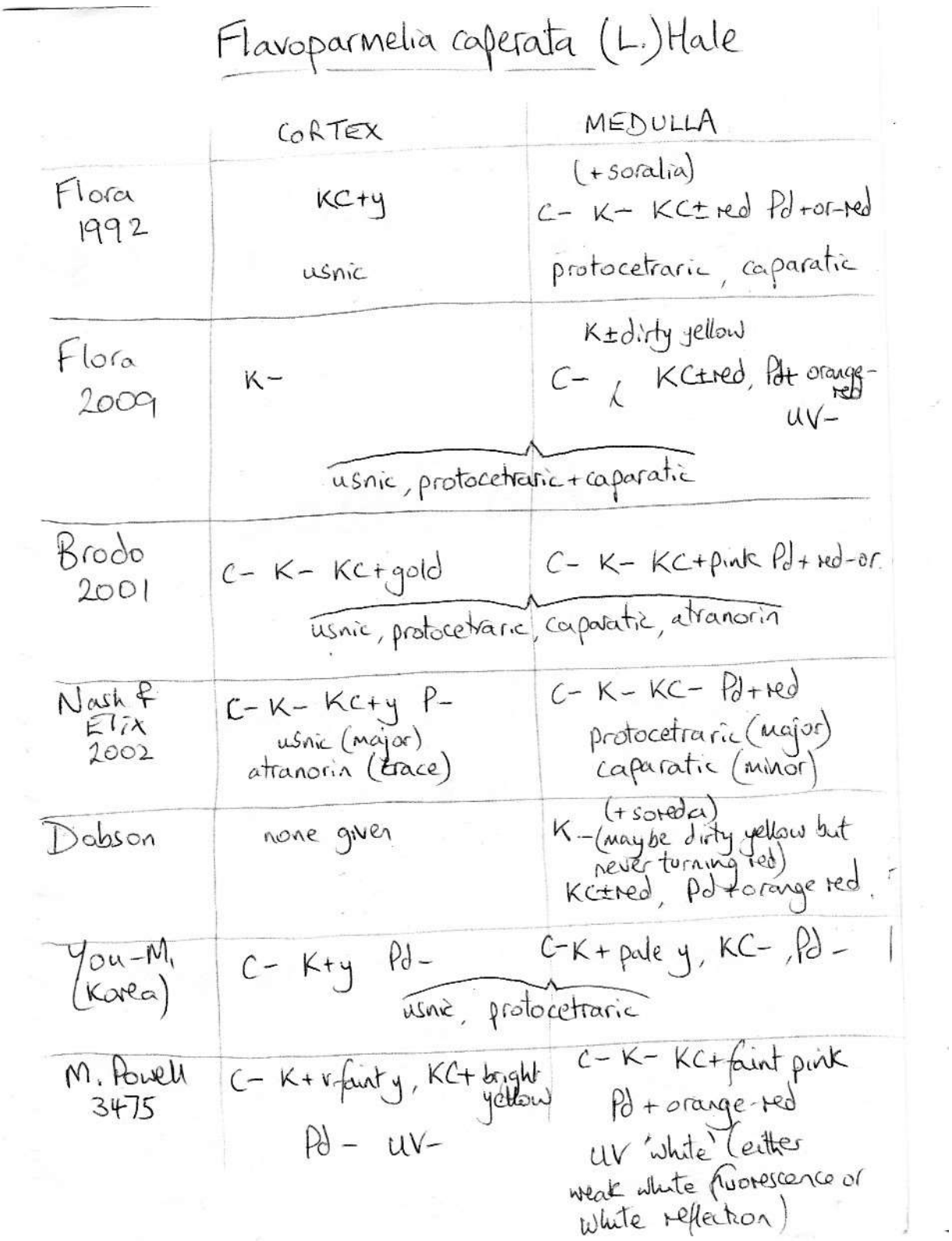
1501	*Arthonia apotheciorum*	{LF}	LC NS	Lic	XX,Z0627
64	*Arthonia lapidicola*	0	LC	Sax	XX
69	*Arthonia radiata*	0	LC	Cort	XY,CQ
113	*Aspicilia contorta subsp. hoffmanniana*	0	LC NS	Sax	XY,SLm,XCh
148	*Bacidia fuscoviridis*	0	LC NS	Sax	XY,SLm,XCh
165	*Bilimbia sabuletorum*	0	LC	Bry	XY,SLm,XHd
2442	*Caloplaca arcis*	0	LC NS	Sax	XX
239	*Caloplaca aurantia*	0	LC	Sax	XY,SLm,XHd
2443	*Caloplaca dichroa*	0	LC NS	Sax	XY,SLm,XFt
259	*Caloplaca flavescens*	0	LC	Sax	XY,SLm,XFt
2607	*Caloplaca limonia*	0	LC	Sax	XY,SSd,XHd
277	*Caloplaca saxicola*	0	LC	Sax	XX
281	*Caloplaca teicholyta*	0	LC	Sax	XY,XBw
284	*Caloplaca variabilis*	0	LC	Sax	XY,SLm,XCh
291	*Candelariella aurella f. aurella*	0	LC	Sax	XY,SLm,XHd
296	*Candelariella medians f. medians*	0	LC	Sax	XY,SLm,XHd
298	*Candelariella vitellina f. vitellina*	0	LC	Sax	XY,SSd,XHd
306	*Catillaria chalybeia var. chalybeia*	0	LC	Sax	XY,SLm,XHd
311	*Catillaria lenticularis*	0	LC	Sax	XY,SLm,XPed
440	*Collema crispum var. crispum*	0	LC	Sax	XY,SLm,XCh
463	*Collema fuscovirens*	0	LC	Sax	XY,XBw
491	*Diploicia canescens*	0	LC	Sax	XY,SLm,XHd
496	*Diplotomma alboatrum*	0	LC	Sax	XY,XBw
500	*Dirina massiliensis f. sorediata*	0	LC	Sax	XX
616	*Lecania erysibe s. str.*	0	LC	Sax	XY,SLm,XHd
1625	*Lecania hutchinsiae*	0	LC	Sax	XY,SSd,XHd
1707	*Lecania inundata*	0	LC NS	Sax	XY,SLm,XFt
1708	*Lecania rabenhorstii*	0	LC	Sax	XX,XY,XBw
627	*Lecanora albescens*	0	LC	Sax	XY,SLm,XFt
639	*Lecanora chlarotera*	0	LC	Cort	XY,CIx
644	*Lecanora crenulata*	0	LC	Sax	XY,SLm,XHd
646	*Lecanora dispersa*	0	LC	Sax	XY,XBw
1764	*Lecanora horiza*	0	NT NS	Sax	XX
661	*Lecanora muralis*	0	LC	Sax	XY,SSd,XHd
796	*Lecidella carpathica*	0	LC	Sax	XY,XBw
802	*Lecidella scabra*	0	LC	Sax	XY,SSd,XFt
803	*Lecidella stigmatea*	0	LC	Sax	XY,SSd,XHd
811	*Lempholemma chalazanellum*	0	LC NS	Sax	XX,XY,SLm,XPed
1974	*Lepraria incana s. str.*	0	LC	Sax	XY,SSd,XHd
1604	*Lepraria vouauxii*	0	LC	Bry	XY,SLm,XCh
849	*Leptogium turgidum*	0	LC	Sax	XY,SLm,XPed
719	*Micarea erratica*	0	LC	Sax	XY,SSd,XFt
2116	*Muellerella lichenicola*	{LF}	LC	Lic	XY,Z1764,SLm,XHd
21	*Myriospora rufescens*	0	LC	Sax	XY,SSd,XHd
952	*Opegrapha mougeotii*	0	LC NS	Sax	XX
1107	*Phaeophyscia orbicularis*	0	LC	Sax	XY,SCo
1114	*Physcia caesia*	0	LC	Sax	XX

1116	*Physcia dubia*	0	LC	Sax	XY,SSd,XHd
1492	*Placopyrenium fuscellum*	0	LC	Sax	XY,SLm,XHd
2165	*Polycoccum pulvinatum*	{LF}	LC NS	Lic	XX,Z1114
1167	*Polysporina simplex*	0	LC	Sax	XY,SSd,XHd
1690	*Porpidia soredizodes*	0	LC	Sax	XY,SSd,XHd
1189	*Protoblastenia rupestris*	0	LC	Sax	XY,SLm,XPed
1200	*Psilolechia lucida*	0	LC	Sax	XY,SSd,XHd
1801	*Rinodina calcarea*	0	LC NR	Sax	XY,SLm,XCh
1289	*Rinodina oleae*	0	LC	Sax	XY,XBw
1306	*Sarcogyne regularis*	0	LC	Sax	XX
1322	*Scoliciosporum umbrinum*	0	LC	Sax	XY,SSd,XHd
630	*Tephromela atra var. atra*	0	LC	Sax	XY,SSd,XFt
1395	*Thelidium pyrenophorum*	0	LC NS	Sax	XY,SLm,XFt
1415	*Toninia aromatica*	0	LC	Sax	XY,SLm,XHd
1480	*Verrucaria calciseda*	0	LC NS	Sax	XY,SLm,XFt
1495	*Verrucaria hochstetteri*	0	LC	Sax	XY,SLm,XHd
1519	*Verrucaria macrostoma f. furfuracea*	0	LC	Sax	XX,XY,SLm,XHd
1507	*Verrucaria muralis*	0	LC	Sax	XY,SSd,XHd
1510	*Verrucaria nigrescens f. nigrescens*	0	LC	Sax	XY,SLm,XHd
2514	*Verrucaria nigrescens f. tectorum*	0	LC	Sax	XY,SLm,XFt
1511	*Verrucaria ochrostoma*	0	DD NR	Sax	XY,SLm,XHd
2621	*Verrucaria squamulosa*	0	NE NR	Sax	XY,SSd,XLg
1518	*Verrucaria viridula*	0	LC	Sax	XY,SLm,XFt
2267	*Weddellomyces epicallopisma*	{LF}	LC NS	Lic	XY,Z0659,SLm,XHd
1530	*Xanthoria parietina*	0	LC	Cort	XY,CAes

LICHENS IN FEN DITTON CEMETERY

This small cemetery provides a good indication of how much the knowledge of British lichens has progressed this century. *Arthonia parietinaria* was described as new to science in 2015 and *Caloplaca dichroa* was described as new in 2006. Both are common species. Nine of the species in the cemetery are listed by Woods & Coppins as Nationally Scarce but most are merely under-recorded. *Psorotichia schaereri* appears to be genuinely scarce, occurring on limestone close to ground level where the stone is slow to dry out.

Flavoparmelia caperata is a common and well-known species of lichen and yet the modern accounts of it give different information about the chemical spot tests that it gives:



Knowing the full set of chemical reactions may be useful if suspected specimens of *Flavopuntelia flaventior* turn up in England. Currently this species has not been found in Britain but has recently spread on the near-Continent. *F. flaventior* resembles *Punctelia subrudecta* but with the colour of *F. caperata*. It shares a medullary chemistry with *P. subrudecta* and a cortical chemistry with *F. caperata*.

The British lichen 'Flora' (Smith et al. 2009) states of *F. caperata* that pycnidia are 'not seen'. However, A.L. Smith in British Lichens (1918) states that 'spermogones [pycnidia] are minute and brown, with spermatia [conidia] 6-7 × 1 μm.' A lobe of *F. caperata* was taken from a wooden bench

seat in the cemetery since it was seen to contain dark dots immersed in the thallus. Microscopic examination proved these to be pycnidia belonging to the lichen and the conidia were of the size given by A.L. Smith.

See images here:
http://fungi.myspecies.info/taxonomy/term/3866/media

Table 2. Taxa recorded in Fen Ditton cemetery.

A	B	C	D	E	F
2649	*Arthonia parietinaria*	{LF}	NE NS	Lic	XY,Z1530,CCt
69	*Arthonia radiata*	0	LC	Cort	XY,CCt
113	*Aspicilia contorta subsp. hoffmanniana*	0	LC NS	Sax	XY,SLm,XHd
165	*Bilimbia sabuletorum*	0	LC	Bry	XY,SLm,XHd
200	*Buellia aethalea*	0	LC	Sax	XY,SSd,XK
219	*Buellia ocellata*	0	LC	Sax	XY,SGr,XHd
263	*Caloplaca chlorina*	0	LC	Sax	XY,SGr,XK
2443	*Caloplaca dichroa*	0	LC NS	Sax	XY,SLm,XHd
259	*Caloplaca flavescens*	0	LC	Sax	XY,SLm,XHd
2607	*Caloplaca limonia*	0	LC	Sax	XY,SLm,XHd
281	*Caloplaca teicholyta*	0	LC	Sax	XY,SLm,XHd
291	*Candelariella aurella f. aurella*	0	LC	Sax	XY,SLm,XHd
296	*Candelariella medians f. medians*	0	LC	Sax	XY,SLm,XHd
298	*Candelariella vitellina f. vitellina*	0	LC	Sax	XY,SSd,XHd
1609	*Catillaria atomarioides*	0	LC NS	Sax	XY,SGr,XHd
306	*Catillaria chalybeia var. chalybeia*	0	LC	Sax	XY,SGr,XK
496	*Diplotomma alboatrum*	0	LC	Sax	XY,SLm,XHd
987	*Flavoparmelia caperata*	0	LC	Lig	XY,LWT,XBe
582	*Hypogymnia physodes*	0	LC	Lig	XY,LWT,XBe
2071	*Illosporiopsis christiansenii*	{LF}	LC NS	Lic	XY,Z1112,SLm,XK
616	*Lecania erysibe s. str.*	0	LC	Sax	XY,SLm,XHd
1707	*Lecania inundata*	0	LC NS	Sax	XY,SLm,XHd
627	*Lecanora albescens*	0	LC	Sax	XY,SLm,XHd
635	*Lecanora campestris subsp. campestris*	0	LC	Sax	XY,SLm,XHd
649	*Lecanora expallens*	0	LC	Lig	XY,LWT,XBe
661	*Lecanora muralis*	0	LC	Sax	XY,SSd,XK
610	*Lecanora semipallida*	0	LC NS	Sax	XY,SLm,XK
688	*Lecanora symmicta*	0	LC	Lig	XY,LWT,XBe
797	*Lecidella elaeochroma f. elaeochroma*	0	LC	Lig	XY,LWT,XBe
802	*Lecidella scabra*	0	LC	Sax	XY,SSd,XHd
803	*Lecidella stigmatea*	0	LC	Sax	XY,SLm,XHd
2108	*Marchandiobasidium aurantiacus*	{LF}	LC	Lic	XY,Z1530,CCt
1106	*Phaeophyscia nigricans*	0	LC	Sax	XY,SLm,XHd
1107	*Phaeophyscia orbicularis*	0	LC	Sax	XY,SLm,XHd
1112	*Physcia adscendens*	0	LC	Sax	XY,SLm,XHd
1114	*Physcia caesia*	0	LC	Sax	XY,SLm,XK
1127	*Physconia grisea*	0	LC	Sax	XY,SLm,XHd

1492	*Placopyrenium fuscellum*	0	LC	Sax	XY,SLm,XHd
1167	*Polysporina simplex*	0	LC	Sax	XY,SGr,XK
1690	*Porpidia soredizodes*	0	LC	Sax	XY,SSd,XHd
1189	*Protoblastenia rupestris*	0	LC	Sax	XY,SLm,XHd
1200	*Psilolechia lucida*	0	LC	Sax	XY,SSd,XHd
1208	*Psorotichia schaereri*	0	LC NS	Sax	XY,SLm,XLg
1266	*Rhizocarpon reductum*	0	LC	Sax	XY,SSd,XK
1289	*Rinodina oleae*	0	LC	Sax	XY,SGr,XK
1322	*Scoliciosporum umbrinum*	0	LC	Sax	XY,SSd,XK
1495	*Verrucaria hochstetteri*	0	LC	Sax	XY,SLm,XHd
1510	*Verrucaria nigrescens f. nigrescens*	0	LC	Sax	XY,SLm,XHd
2514	*Verrucaria nigrescens f. tectorum*	0	LC	Sax	XY,SLm,XHd
2649	*Verrucaria obfuscans*	0	NE NR	Sax	XY,SLm,XHd
1820	*Verrucaria polysticta*	0	LC NS	Sax	XY,SLm,XK
1518	*Verrucaria viridula*	0	LC	Sax	XY,SLm,XK
1530	*Xanthoria parietina*	0	LC	Sax	XY,SLm,XHd

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Spectacular fluorescence – see below:

ENDPIECE

I recently received a present from Ireland (on a windblown twig) of the beautiful *Teloschistes chrysophthalmus*. It is even more attractive in UV light as shown below. If you want to get a UV torch, go for one of 1 to 3W, and (most importantly) 365nm wavelength. The cheap ones give off too much visible light in addition to the UV. For around £15 to £20 you should find one that is reasonably economical but not rubbish. http://www.ebay.co.uk/itm/QUALITY-BRAND-FIRE-Ultra-Violet-UV-Flashlight-Pen-Torch-3W-Cree-365nm-Blacklight/162034924428?hash=item25ba08bb8c:g:drAAAOSwf-VWVMue

This sort of torch should be OK. Of course, there are better and more expensive ones, but I can't give you much feedback about those.

Teloschistes chrysophthalmus, photograph taken by holding my old Nikon Coolpix 4500 to the eyepiece of my dissecting scope and with a UV torch shining on the specimen. My camera was struggling with the low light levels of the fluorescence, but my old faithful Coolpix made a good attempt.