ST. IPPOLYTS

Grid Reference: TL 197 271
Altitude: 87 (m)
Vice County: 20
Date of survey: 25/09/2014
Surveyed by: Andrew Harris and Paula Shipway

Duration of survey: 6 hours

Introduction

Churchyards with their multitude of different features are important for the study of lichens as they support so many within a small area. Each species has a subtly different ecology and often occupies a specific place in the nooks and crannies of the church or a certain position on a memorial. Some lichens will be widespread in the local area, but in a county such as Hertfordshire underlain by soft sedimentary strata, many found on the stone monuments and church walls may be rare outside of the churchyard. The parish church is usually on an ancient site and the lichen communities have had opportunity to develop over time, with those slow to establish given a chance. They will be found alongside early-successional species which respond rapidly to fluctuations in both the local and wider environment. This makes the study of churchyards all the more interesting whose lichens can explain much about the nature and history of their surroundings as well as sustaining other organisms in the churchyard ecosystem. However our knowledge of them is very incomplete.

St. Ippolyts

Though nothing of great rarity was seen, the site was however very rich in lichens with over 100 taxa recorded (taxa in this case includes species, their subspecies and different forms, in fact any entity which has been given a British Lichen Society number). Seventy-two percent of these were saxicolous i.e. on stone mortar, brick etc.

This richness could be appreciated when making a close inspection the south side of the church, where a multitude of lichens of many shades and form could be seen jostling for space (figure 1). This colonisation of the sun-baked side of the church demonstrates how the lichen partnership is efficient at exploiting challenging environments and several adaptations can be observed. Many of the more prominent crusts such as dark brown patches of *Verrucaria nigrescens* were associated with inclined surfaces such as the chamfered plinth and windowsills which intercept rainfall more directly than the vertical faces of the walls. It is interesting to observe such a building after rain and see how lichens are zoned according to how wetted their substrate has become.

THE LICHEN PARTNERSHIP

Lichens are dual organisms – a fungus enclosing an alga. Most lichenised fungi are dependent on the association and the dominant partner, taking over an alga to exploit it for the sugars it manufactures by photosynthesis. Though the alga may be capable of living independently, it also benefits from the partnership being able to survive in exposed habitats such as sun-baked headstones protected from strong light and desiccation. Nearly everything a lichen needs can be taken from the atmosphere or rainwater, so they require little from the substrate they grow on, though the chemistry and texture of e.g. stone or bark has a strong influence on the species which can colonise. For these reasons, lichens can be good indicators of the quality of the atmosphere and health of the environment.

Some of the species in the most stressful environment on vertical stonework form small crusts or are seemingly reduced to no more than fruiting bodies. Sometimes the rest of the lichen is immersed within the stonework, but in some species with 'jam tart' fruits (technically lecanorine apothecia) the paler rim of the fruit is the functioning part of the lichen housing the alga. At St. Ippolyts this includes *Candelariella aurella* (figure 1) with an oily yellow centre; *Lecanora dispersa* with a buff-brown centre is one of the most resilient lichens known and *Lecanora crenulata* with an attractive crenulate margin enclosing a darker disc bearing a crystalline pruina which makes it look frosted.

Another adaptation, the reason why many of the *Caloplaca* species such as *C. saxicola* (figure 2) and *C. decipiens* on the chamfered plinth are so brightly coloured, is the manufacture of orange and yellow pigments. In exposed positions such as the walls of the church these act as a sun-block to protect the algae from harmful wavelengths of light.

Lecanora horiza, recorded from the south wall, is a strikingly elegant species with shiny chestnut-centred lecanorine fruits seeming it almost fall out of a while thallus, This has a IUCN threat category of 'Near Threatened' and is also classified at 'Nationally Scarce'. Before 2012 it was overlooked due to confusion with *Lecanora campestris.* It is however found in most churchyards often on the calcareous headstones so its conservation status will probably be lowered.

Buff patches resembling billowing clouds of dust recorded from the church are *Verrucaria ochrostoma.* This had been very much overlooked before survey work on Hertfordshire churchyards showed it to be a very common species often on window ledges or mortar on the south wall. This deficiency in data has meant it has been classified as Nationally Rare but this is likely to be downgraded.

The glacial cobbles incorporated in to the fill harbour a different suite of lichens more familiar on sandstone headstones in the churchyard. The north wall also differs from the better lit walls; the lichens on the shady side more subdued though *Psilolechia lucida* had formed attractive halos around some flints (figure 4).

The churchyard lacks old chest tombs with well established encrustations, but older coffin tombs were a feature of the south-western side (figures 5 and 6) with contrasting communities according to the inclination of the surface and whether it was limestone or sandstone, the most interesting lichen on the latter substrate being *Rinodina teichophila*. The churchyard Cherry trees were almost devoid of lichens, but the small Rowan had a fair selection of early-successional species. The wooden bench was well colonised by large leafy Parmelian lichens (figure 8), but of most interest on lignum was the crustose *Protoparmelia oleagina* though its identity could not be confirmed. Timber is an important habitat for several species also found on acid bark such as *Lecanora pulicaris* which are not favoured by the nitrogenous enrichment occurring in counties such as Hertfordshire.

There was one terricolous species (growing on soil) a Dog Lichen *Peltigera hymenina* on the top bank above the retaining wall by the northern entrance to the churchyard (figure 9). These species are restricted to low growing turf and thus have a localised distribution in Hertfordshire largely confined to heaths and old gravel pits as they otherwise lose out to more competitive vegetation.

The following pictorial tour gives an impression of the lichens on the church and in the churchyard:

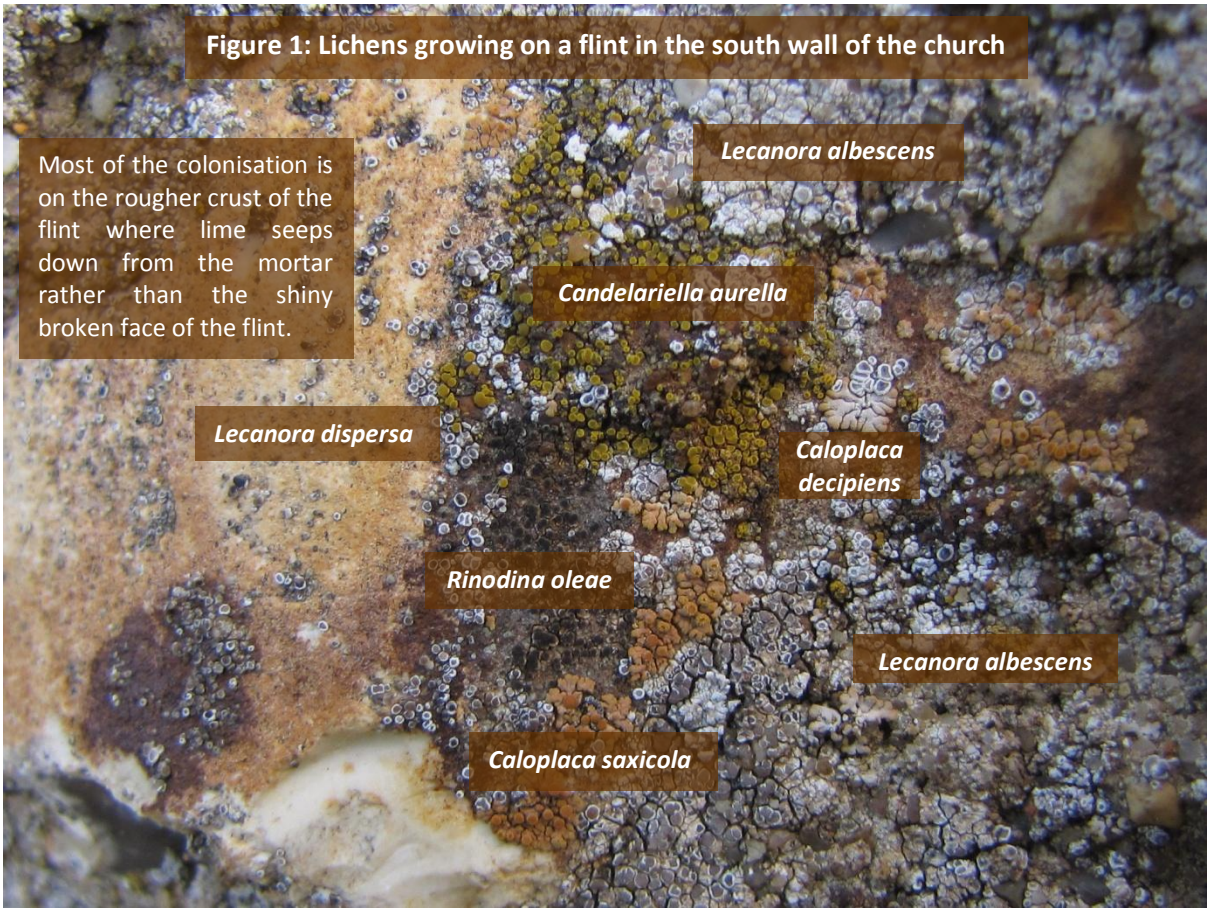
Figure 1: Lichens growing on a flint in the south wall of the church
Most of the colonisation is on the rougher crust of the flint where lime seeps down from the mortar rather than the shiny broken face of the flint.
Lecanora albescens
Candelariella aurella
Lecanora dispersa
Caloplaca decipiens
Rinodina oleae
Lecanora albescens
Caloplaca saxicola

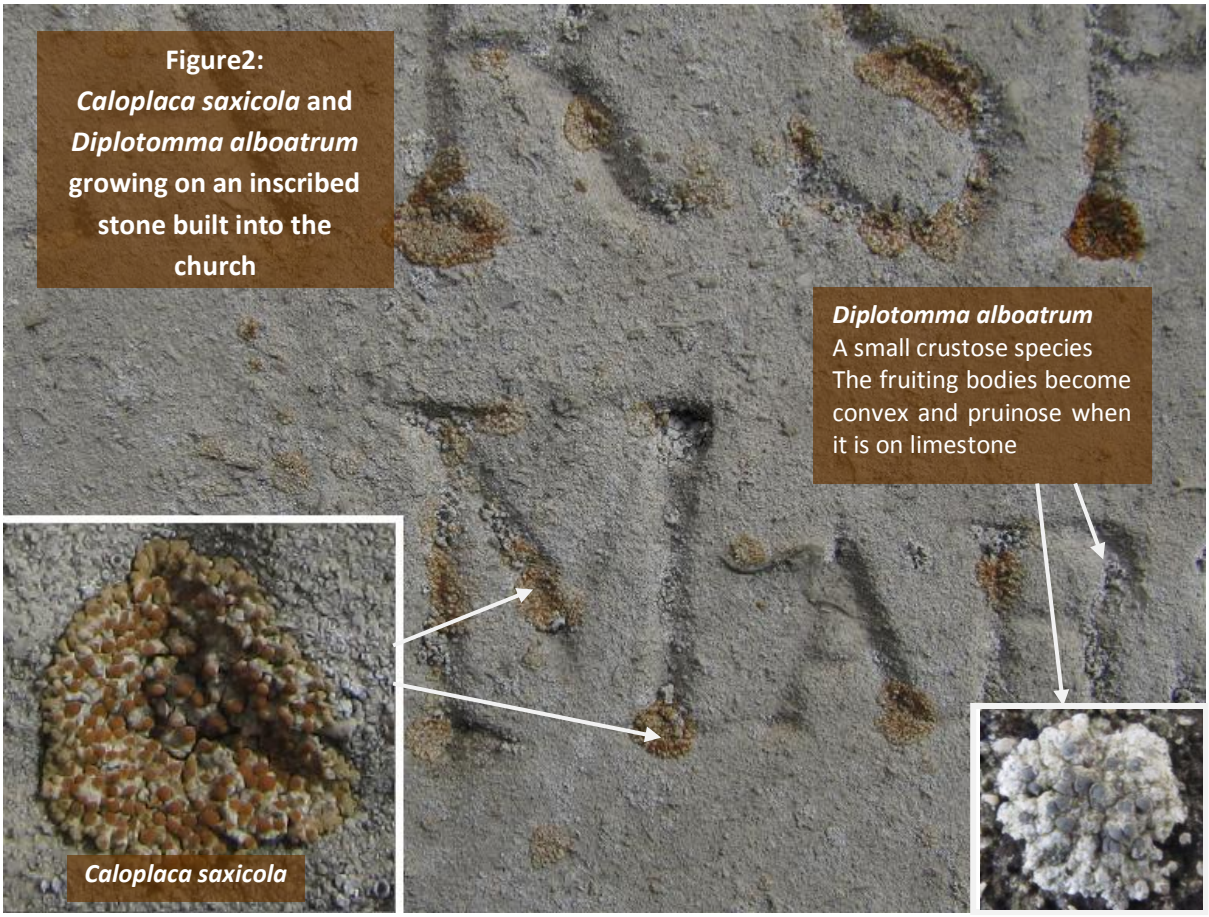
Figure2: Caloplaca saxicola and Diplotomma alboatrum growing on an inscribed stone built into the church
Diplotomma alboatrum
A small crustose species
The fruiting bodies become convex and pruinose when it is on limestone
Caloplaca saxicola

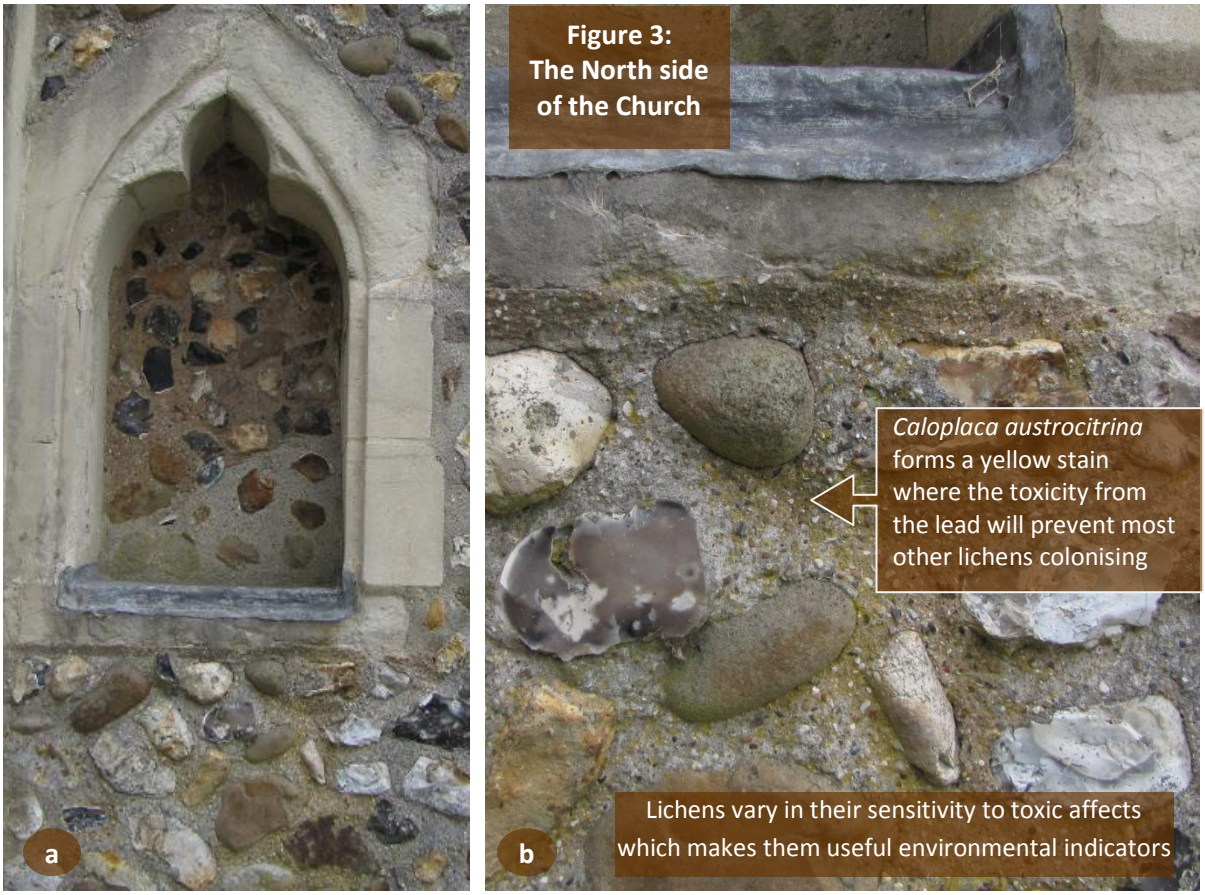
Figure 3:
The North side
of the Church
Caloplaca austrocitrina
forms a yellow stain
where the toxicity from
the lead will prevent most
other lichens colonising
Lichens vary in their sensitivity to toxic affects
which makes them useful environmental indicators
a
b

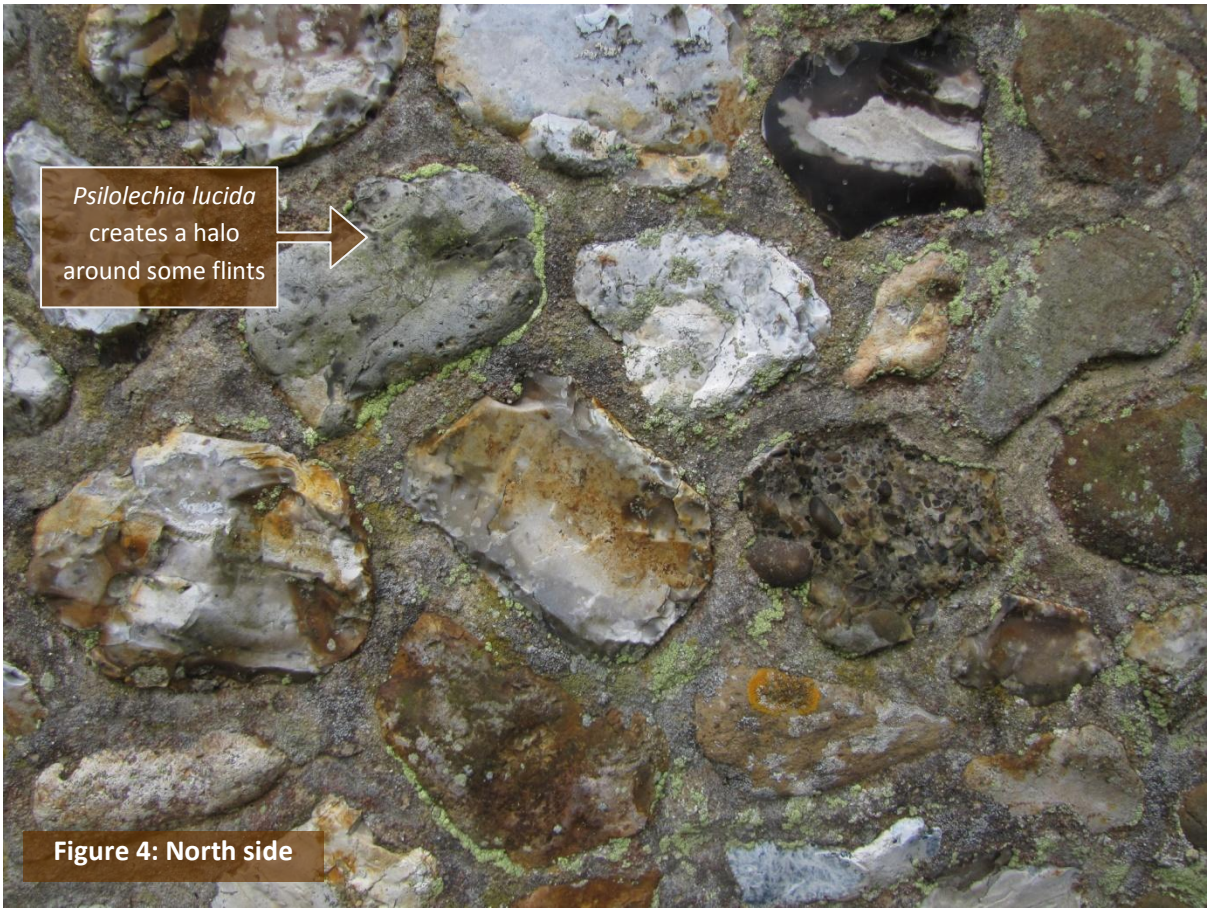
Psilolechia lucida
creates a halo
around some flints
Figure 4: North side

Figure 5: The south-west area of the churchyard

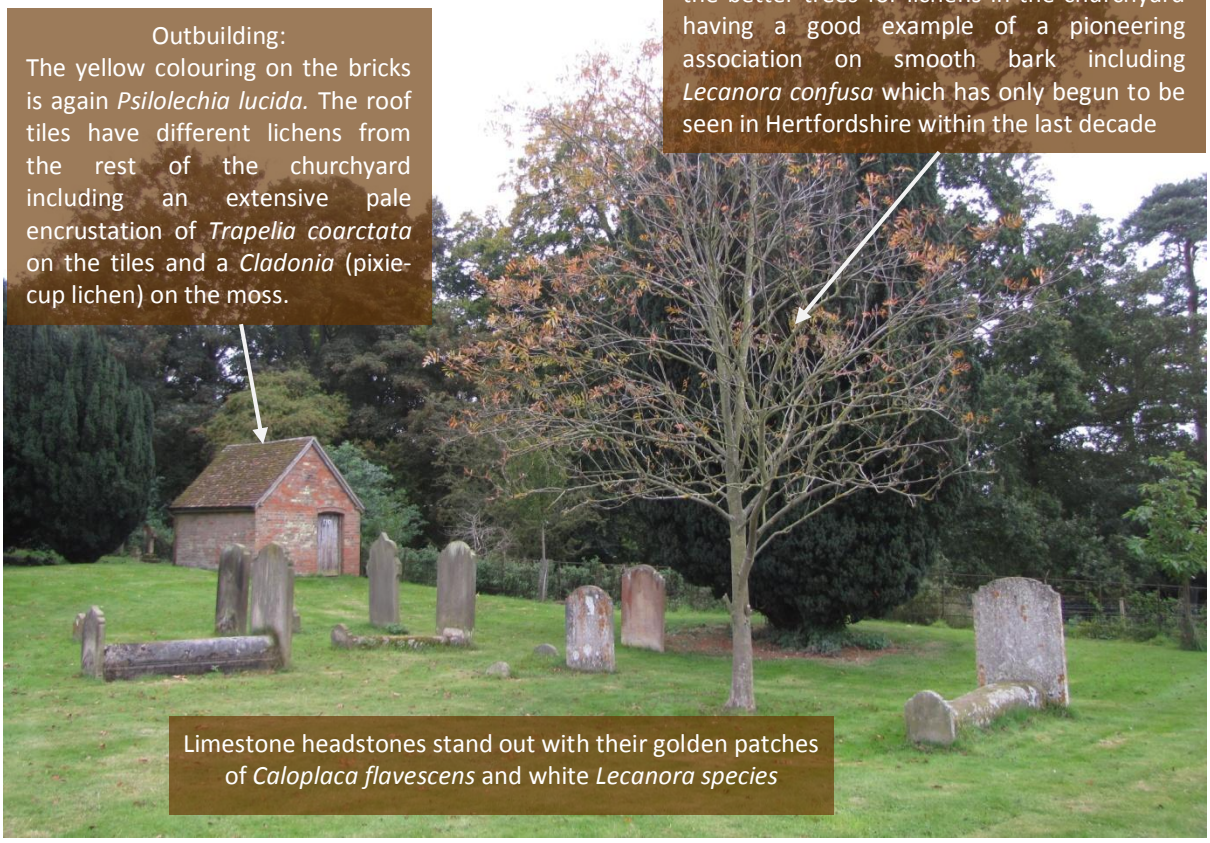

Figure 6 – close up of area

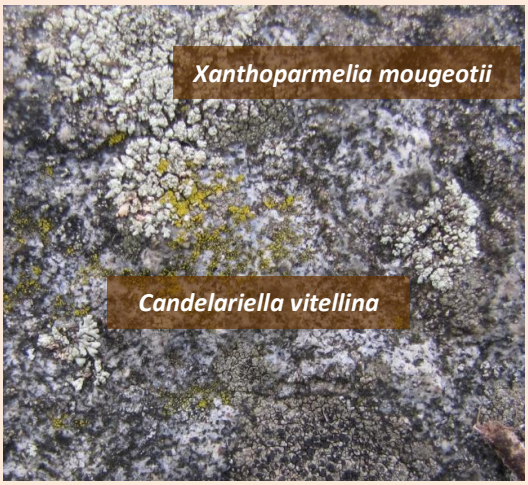

Figure 7: The south-east side of the churchyard.
Many of these more recent memorials are hard-grained sandstone or crystalline granites which are favoured by the minutely dissected foliose species *Xanthoparmelia mougeotii* and the crustose species *Rhizocarpon reductum* which has a cracked areolate thallus reminiscent of crazy-paving and fruiting bodies which seem to develop rather attractively in concentric circles. The sundial is of a more iron-rich stone but does not have anything remarkable the most interesting being *Phaeophyscia nigricans*

Figure 8: Wooden seat

Large foliose 'leafy' *Parmelia sulcata* and intricate yellow patches of *Xanthoria candelaria* are among several lichens

Figure 9: Northern entrance

Peltigera hymenina – termed a dog lichen because of the appearance of the root-like structures (rhizinae)

Conclusion

Churchyards are fascinating places to look for lichens. The mix of species can explain much about the nature and history of their surroundings. This makes the study of the churchyard all the more rewarding providing examples of the many ways in which these humble dual organisms adapt to the challenges of the environment and how they have a special place in the churchyard ecosystem.

Some species found at St. Ippolyts were either 'Nationally Rare' (NR) recorded from 1–15 hectads or 'Nationally Scarce' (NS) recorded from 16–100 hectads (BLS Rare and Threatened Lichens List; Woods and Coppins 2012). This is however largely as a result of under-recording and some of these species have an IUCN category of 'Least Concern'. *Caloplaca arcis* and *Caloplaca dichroa* are in fact very widespread in churchyards, but have only recently been recognised as individual entities originally being recorded with other species as an aggregate *Caloplaca citrina* (Powell and Vondrák 2011). As mentioned *Lecanora horiza* and *Verrucaria ochrostoma* have been overlooked until very recently. It is similar with *Verrucaria calciseda* which had been confused with *Verrucaria baldensis*. This does underlie the fact that where lichens are concerned, discoveries and advances in knowledge are not only made it exotic and remote places, the humble Hertfordshire churchyard tells a story that is still unfolding and there is still much to be learnt about lichens and their place in the environment at places such as St. Ippolyts.

Also, though nothing of exceptional rarity was found, this does not detract from the species-richness of the churchyard, or from the collective significance of particular species associations, most notably on stone and lignum. Churchyards such as St. Ippolyts are of county importance for locally uncommon species including those with very restricted and specific habitat associations such as *Aspicilia calcarea* requiring limestone of some antiquity and found here on the chancel windowsill. There is further potential for the future, both as a result of growing knowledge of what is already present and through the continuing colonisation of churchyard trees, mirroring the changing fortunes of Hertfordshire lichens.

For further information the British Lichen Society publishes leaflets on lichen conservation and management etc which are listed among the references below.

TABLE 1: A list of the lichens recorded at St. Ippolyts Churchyard

BLS no	Lichen Taxa	Status	Substrate	C	Y	Small scale habitat
0010	*Acarospora fuscata*	LC	Sax		√	Sandstone coffin tomb
0038	*Agonimia tristicula*	LC	Bry	√		Moss on buttress north side
0212	*Amandinea punctata*	LC	Sax		√	Top of sandstone headstones
0064	*Arthonia lapidicola*	LC	Sax	√		Iron stained stonework on north side
0069	*Arthonia radiata*	LC	Cort		√	Rowan twig
0103	*Aspicilia calcarea*	LC	Sax	√		Limestone windowsill eastern end of chancel
0107	*Aspicilia contorta subsp. contorta*	LC	Sax	√	√	Brick-lined gutter, sandstone coffin tomb
0165	*Bilimbia sabuletorum*	LC	Bry	√		Moss on mortar, chamfered plinth N side of tower
0200	*Buellia aethalea*	LC	Sax	√	√	Sandstone cobble eastern end, granite headstone
0219	*Buellia ocellata*	LC	Sax		√	Sandstone footstone
2442	*Caloplaca arcis*	LC NS	Sax	√		Limestone: Chamfered plinth south side
2613	*Caloplaca austrocitrina*	LC	Sax	√		Widespread on mortar
0242	*Caloplaca cerinella*	LC	Cort		√	Elder twig
0263	*Caloplaca chlorina*	LC	Sax		√	Sandstone coffin tomb
0249	*Caloplaca crenulatella*	LC	Sax	√		Brick-lined gutter at base of south side of church
0250	*Caloplaca decipiens*	LC	Sax	√		Limestone: Chamfered plinth S side of chancel
2443	*Caloplaca dichroa*	LC NS	Sax	√	√	Limestone: Chamfered plinth and headstones
0259	*Caloplaca flavescens*	LC	Sax	√	√	Widespread on limestone: Chamfered plinth, windowsills, headstones and coffin tomb
2315	*Caloplaca flavocitrina*	LC	Sax	√		Mortar: Chamfered plinth on E side of south porch
2607	*Caloplaca limonia*	LC	Sax	√		Mortar at base of tower
2461	*Caloplaca oasis*	LC	Sax	√		Mortar in south wall
0277	*Caloplaca saxicola*	LC	Sax	√		South facing mortar and limestone
0281	*Caloplaca teicholyta*	LC	Sax	√		Limestone chamfered plinth and brick gutter S side
0291	*Candelariella aurella f. aurella*	LC	Sax	√		Mortar in south wall
0297	*Candelariella reflexa*	LC	Cort		√	Rowan bough
0298	*Candelariella vitellina f. vitellina*	LC	Sax	√	√	Widespread on sandstone cobble in north wall, headstones and coffin tomb
0306	*Catillaria chalybeia var. chalybeia*	LC	Sax	√		Brick-lined gutter at base of south side of church
0311	*Catillaria lenticularis*	LC	Sax	√		Limestone: Chamfered plinth
0371	*Cladonia chlorophaea s. lat.*	LC	Bry		√	Mossy roof tiles of outbuilding
0384	*Cladonia fimbriata*	LC	Lig		√	Wooden gate at northern entrance
0491	*Diploicia canescens*	LC	Sax	√		Limestone chamfered plinth on south and west side of tower
0496	*Diplotomma alboatrum*	LC	Sax	√		South facing mortar and limestone
0511	*Evernia prunastri*	LC	Cort+Lig		√	Rowan twig and wooden bench
0987	*Flavoparmelia caperata*	LC	Cort		√	Rowan bough
0582	*Hypogymnia physodes*	LC	Lig		√	Wooden bench
2577	*Hypotrachyna revoluta s. str.*	LC	Lig		√	Wooden bench
0613	*Lecania cyrtella*	LC	Cort		√	Rowan bough
0616	*Lecania erysibe s. str.*	LC	Sax	√		Limestone slab attached to north side of church
1625	*Lecania hutchinsiae*	LC	Sax	√		Mortar: East facing side of buttress on south porch

1708	*Lecania rabenhorstii*	LC	Sax	√		Mortar: Base of chamfered plinth south chancel wall
0627	*Lecanora albescens*	LC	Sax	√	√	Limestone of chamfered plinth, marble headstones
0635	*Lecanora campestris subsp. campestris*	LC	Sax	√	√	Buttress slopes and chamfered plinth, brick-lined gutter and sandstone coffin tomb
0639	*Lecanora chlarotera*	LC	Cort		√	Rowan and cherry twigs
0641	*Lecanora confusa*	LC	Cort		√	Rowan bough
0643	*Lecanora conizaeoides f. conizaeoides*	LC	Lig		√	Wooden bench
0644	*Lecanora crenulata*	LC	Sax	√		Mortar on south side of chancel
0646	*Lecanora dispersa*	LC	Sax	√	√	Mortar and sandstone headstone
0649	*Lecanora expallens*	LC	Sax		√	Sandstone coffle in north wall, Rowan trunk
0621	*Lecanora hagenii*	NE	Cort		√	Elder twig
1764	*Lecanora horiza*	NT NS	Sax	√		Vertical face of limestone ashlar on buttress
0661	*Lecanora muralis*	LC	Sax	√	√	Limestone on chamfered plinth, brick-lined gutter and sandstone coffin tomb
0757	*Lecanora orosthea*	LC	Sax		√	Sandstone coffin tomb
0667	*Lecanora polytropa*	LC	Sax	√	√	Sandstone cobble at west end, granite memorials
0672	*Lecanora pulicaris*	LC	Lig		√	Wooden bench
0688	*Lecanora symmicta*	LC	Lig		√	Wooden bench
0797	*Lecidella elaeochroma f. elaeochroma*	LC	Cort		√	Rowan boughs
0802	*Lecidella scabra*	LC	Sax		√	Crusts of flint in retaining wall on northern edge and sandstone memorials
0803	*Lecidella stigmatea*	LC	Sax	√	√	South facing buttress and chamfered plinth and sandstone headstones
1974	*Lepraria incana s. str.*	LC	Cort+Sax	√	√	Sandstone cobbles & headstones, *Crataegus* trunk
1604	*Lepraria vouauxii*	LC	Sax	√		Limestone: Buttress slope on north side
1020	*Melanelixia subaurifera*	LC	Lig		√	Wooden bench
N/A	*Opegrapha cf. herbarum**	N/A	Cort		√	Small thallus on shaded trunk SW corner
1022	*Parmelia sulcata*	LC	Sax		√	Top of sandstone headstone and wooden bench
1043	*Peltigera hymenina*	LC	Terr		√	On soil in short turf at top of wall northern edge
1106	*Phaeophyscia nigricans*	LC	Sax		√	Ironstone sundial in southern part of churchyard
1107	*Phaeophyscia orbicularis*	LC	Sax		√	Sandstone headstone
1112	*Physcia adscendens*	LC	Sax	√	√	Limestone: Chamfered plinth and headstones
1114	*Physcia caesia*	LC	Sax	√	√	Limestone: Chamfered plinth north side; sandstone headstones and granite of war memorial
1120	*Physcia tenella*	LC	Cort+Lig		√	Twigs of churchyard shrubs and wooden bench
1127	*Physconia grisea*	LC	Sax	√	√	Limestone: Chamfered plinth, sandstone headstone
1492	*Placopyrenium fuscellum*	LC	Sax	√		Limestone: Buttress slope on south side
0732	*Placynthiella icmalea*	LC	Lig		√	Wooden bench
1167	*Polysporina simplex*	LC	Sax		√	Granite: Kerb and war memorial
1690	*Porpidia soredizodes*	LC	Sax		√	Sandstone footstone and headstones
0572	*Porpidia tuberculosa*	LC	Sax		√	Sandstone coffin tomb and headstones
1189	*Protoblastenia rupestris*	LC	Sax	√	√	Limestone: Buttress and coffin tomb
N/A	*Protoparmelia cf. oleagina**	N/A	Lig		√	Wooden bench
1200	*Psilolechia lucida*	LC	Sax	√	√	Mortar encircling cobbles in north wall, sandstone headstones and brick wall of outbuilding
1989	*Punctelia jeckeri*	LC	Lig		√	Wooden bench

2070	*Punctelia subrudecta s. str.*	LC	Lig		√	Wooden bench
1235	*Ramalina fastigiata*	LC	Cort		√	Cherry twig
1266	*Rhizocarpon reductum*	LC	Sax		√	Sandstone coffin tomb and other memorials
1289	*Rinodina oleae*	LC	Sax	√		Outer crust of flints in south wall
1300	*Rinodina teichophila*	LC	Sax		√	Sandstone headstone SW of church
1307	*Sarcopyrenia gibba var. geisleri*	LC	Sax		√	Limestone coffin tomb
1322	*Scoliciosporum umbrinum*	LC	Sax		√	Top of sandstone headstone
0630	*Tephromela atra var. atra*	LC	Sax	√	√	Cobble E end of chancel; sandstone coffin tomb
1415	*Toninia aromatica*	LC	Sax	√		Mortar on west side of tower
1431	*Trapelia coarctata*	LC	Sax		√	Extensive patches on roof tiles of outbuilding
1595	*Trapelia placodioides*	LC	Sax		√	Sandstone coffin tomb
0692	*Trapeliopsis flexuosa*	LC	Lig		√	Wooden bench
1480	*Verrucaria calciseda*	LC NS	Sax		√	Limestone kerb
1495	*Verrucaria hochstetteri*	LC	Sax	√		Limestone of chamfered plinth on south side
N/A	*Verrucaria hochstetteri s. lat*	N/A	Sax		√	Limestone cross
1519	*Verrucaria macrostoma f. furfuracea*	LC	Sax	√		Limestone on chamfered plinth, mortar on buttress
1510	*Verrucaria nigrescens f. nigrescens*	LC	Sax	√	√	Limestone chamfered plinth, buttress, headstones
2514	*Verrucaria nigrescens f. tectorum*	LC	Sax	√	√	Limestone: buttress slope north porch, marble monuments
1511	*Verrucaria ochrostoma*	DD NR	Sax	√		Render on buttress slope and chamfered plinth Limestone windowsill
1518	*Verrucaria viridula*	LC	Sax	√	√	Mortar chancel end, Limestone windowsill and north step, limestone coffin tomb
1005	*Xanthoparmelia mougeotii*	LC	Sax		√	Granite headstone
1526	*Xanthoria calcicola*	LC	Sax	√	√	Limestone: Chamfered plinth of south wall and memorials; roof tiles of south porch
1527	*Xanthoria candelaria s. lat. ('nowakii')*	LC	Sax	√		Flints in south wall
2364	*Xanthoria candelaria s. str.*	LC	Lig		√	Wooden bench
1530	*Xanthoria parietina*	LC	Cort+Sax	√	√	Rowan and Elder twigs and sandstone headstone
1531	*Xanthoria polycarpa*	LC	Cort+Sax	√	√	Cherry twig and sandstone headstone

* 'cf' = tentative identification

TABLE 2: ABBREVIATIONS and TOTALS		Substrate		Definition	Total
		Bry	Bryicolous	On moss	3
		Cort	Corticolous	On Bark	16
Total taxa recorded	104	**Lig**	Lignicolous	On lignum (timber)	15
		Met	Metal	On Metal	0
C On church	55	**Sax**	Saxicolous	On stone, brick, mortar etc	74
Y In churchyard	74	**Terr**	Terricolous	On ground/soil	1

LC = Least concern	NS = Nationally scarce	NS = Nationally rare	NT = Near threatened	DD = data deficient	NE = Not evaluated

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British Lichens Website species gallery: http://www.britishlichens.co.uk/speciesgallery.html
British Lichen Society Website: http://www.britishlichensociety.org.uk/

Available from the British Lichen Society website:
BLS Churchyard Lichens factsheet: *CHURCHYARD LICHENS: A factsheet – your questions answered* (pdf –updated September 2012) British Lichen Society

Chester, T. and Palmer, K. (1994); Chester, T. (2001); Revised: Pedley, I. (BLS Churchyards Project Co-ordinator) (2009) Churchyard Lichens, Green_cfga_article_IP_final

BLS rare and threatened lichens list:
http://www.britishlichensociety.org.uk/sites/default/files/recording-mapping-downloads/BLS%20Rare%20and%20Threatened%20Lichens%20list%20Oct%202011.pdf