## THE LICHEN FLORA OF LUNDY: I THE SPECIES

By

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## INTRODUCTION

The first lists of lichens on Lundy are those of Gliddon (1948, 1949) which include twenty-four species. Cox (1960), in a survey of cryptogams on the island, recorded twenty-seven lichens, seventeen of which were new records. Subsequently, these records were reassessed and discussed by Noon and Hawksworth (1972) in a compilation which incorporated further collections, mainly those of visiting algologists and mycologists, which had been determined by the present author, P. W. James. Noon and Hawksworth listed 142 taxa, nine of which they rejected as errors of identification. In their conclusions they observe that the lichen flora of Lundy comprises "at least 130 species" although overall it is "limited" by comparison with that of the adjacent north Devon coast and hinterland.

Following some promising preliminary visits, the survey by the present authors, undertaken between 3-10 June 1995, recorded 315 taxa. These include six taxa - Bryoria fuscescens, Haematomma ochroleucum var. ochroleucum, Peltigera horizontalis, Pertusaria lactea, P. multipuncta and Pseudevernia furfuracea - not refound during the present survey, but considered valid earlier records.

The richness of the Lundy lichen flora, representing 21% of the British flora, in such a restricted area, reflects the unpolluted oceanic position of the island and the considerable diversity of relatively undisturbed habitats suitable for colonisation. Although most of the lichens are saxicolous, there are also interesting corticolous and terricolous communities.

The rugged coastline with sheltered eastern and contrasting, exposed western seaboards, has a very well developed, specifically maritime, lichen component. Its diversity is further enhanced by natural outcrops of different rock type - granite or slate (see Fig. 1) - and nutrient enrichment due to birds' perching rocks. Longstanding walls, the cemetery, inhabited and derelict buildings, often with calcareous mortar or cement facing, are important sites for several rarer species.

Whilst much of the south of the island is managed pastureland, the north, especially North End, is predominantly an undulating granite plateau partly covered with a thin layer of *Calluna*-dominated humus, rich in *Cladonia* species. This area, now grazed by a small flock of Soay sheep, was extensively damaged by the severe fire of 1933. Around Pondsbury the lichen flora of the well-developed damp *Calluna-Erica* heathland is strikingly rich<sup>1</sup> with, notably, *Cladonia azorica* and fertile *C. uncialis*.

The corticolous flora is chiefly confined to trees around Millcombe House. The most important bark substrates are those of *Acer pseudoplatanus*, *Quercus pubescens*, *Q. ilex*, *Fraxinus excelsior*, *Malus sp.* and *Pinus radiata*. The windswept ridge around the flagpole has well-colonised *Prunus spinosa*. Otherwise the most interesting small trees on the island are isolated *Sambucus niger* and *Salix caprea*, especially above Quarry Beach.

The following complete list includes collections by the authors plus a few additional records of previous collectors. Voucher specimens of rarer or critical species are lodged at The Natural History Museum (BM).

A more recent brief visit in December 1995 by Allen and Hilton confirmed that this lichen community suffered stress during the hot dry summer of 1995 subsequent to this survey.

## **LUNDY LICHEN LOCALITIES**

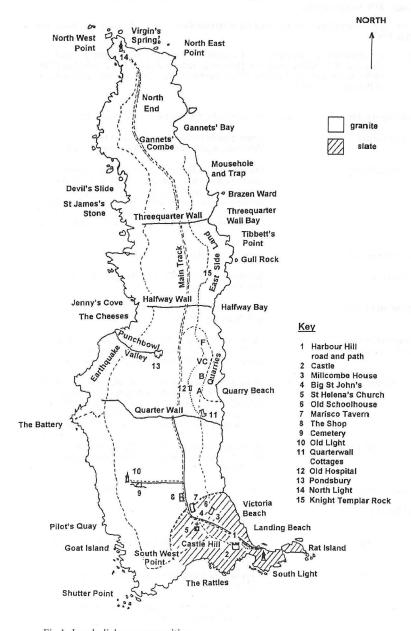


Fig.1 Lundy lichen communities

## LUNDY LICHEN LIST: FREQUENCIES AND DISTRIBUTION

# Total: 315 accepted taxa

Thin layer chromatography was used for determination of critical taxa. (See White and James 1987.)

**Key:** a = abundant, c = common, f = frequent, l = local, o = occasional, r = rare, s = scattered, w = widespread, \* = previously recorded (Cox 1960; Gliddon 1948, 1949; Noon and Hawksworth 1972). Nomenclature and authority follow those of Purvis *et al.* 1994.

Acarospora fuscata*	w o	sunny granite rock outcrops and wall tops
Acar ospora Tuscata	w, 0	sumy granite rock outerops and wan tops
A. impressula	1	sunny exposed slate, top of wall of Harbour Hill road; outcrops by path to Landing Beach
A. smaragdula*	W	mainly slate rock, more rarely on low granite outcrops and walls; <u>special note</u> : Amy Ruth and Felix Gade gravestones, run off from copper inscription plate, a mixed colony with yellow thalli (indicating copper uptake) with thalli with usual brown colour and wider apothecial discs (plate 1, at rear)
Acrocordia gemmata	r	mature Acer, above Millcombe House
A. salweyi	r	decaying mortar, walls; near Marisco Tavern; The Shop
Agonomia tristicula	0	decaying mortar of walls, Quarterwall Cottages; near Marisco Tavern
Anaptychia ciliaris subsp. mamillata	1	exposed rock, low cliffs above Virgin's Spring, North West Point; also ? in moist crevice, Quarry Beach (Gliddon 1948) (plate 2, at rear)
A. runcinata*	w, a	all uncultivated areas of island, especially dry wall bases, low rock outcrops, tolerant of moderate eutrophication; decaying <i>Armeria</i> tufts and loose on soil, Virgin's Spring, North West Point; occasionally corticolous on <i>Acer</i> , Millcombe House
Anisomeridium biforme	0	Acer and Sambucus, Millcombe House and by Marisco Tavern; exposed Polypodium rhizome, Quarterwall Cottages
A. nyssaegenum	r	single Sambucus, near St John's Well
Arthonia impolita	r	dominant, dry side of single mature Quercus, Millcombe House
A. lapidicola	r	granite sill below copper window grill, west side of St Helena's Church
A. muscigena	r	abundant on branches of Sambucus below Old Hospital
A. punctiformis	r	$\underline{\textit{Quercus}}$ twigs and moribund $\textit{Malus},$ near St John's Well, Millcombe House

A. radiata	1	Sambucus and Acer twigs, Millcombe House; below Old Hospital
A. varians	w	parasymbiont causing blackening of the apothecia of <i>Lecanora rupestris</i>
Arthopyrenia punctiformis	r	smooth bark of dying <i>Malus</i> , St John's Well, below Millcombe House
Aspicilia caesiocinerea	1	nutrient-enriched seepage track on small outcrop above The Battery
A. epiglypta	Ī	sunny, low, slate outcrop below Castle; above steps leading to North Light
A. grisea	r	small granite boulder, near North West Point
A. leprosescens	s, 1	predominately coastal and there frequently fertile, Virgin's Spring at North West Point; Brazen Ward; inland on tops of granite road markers, central track; wall to The Battery
A. sp.	l, r	slate beside Harbour Hill path (K-, with fatty acids)
Bacidia arceutina	r	Sambucus below Old Hospital; decaying wall, Quarterwall Cottages
B. arnoldiana	Î	shaded slate underhang, road above Victoria Beach (pycnidia only)
B. bagliettoana	r	crumbling mortar, Quarterwall Cottages
B. delicata	1	top of iron anchor near The Shop (sterile); horizontal <i>Salix</i> in heligoland above Quarry Beach (sterile); on mosses on old mortar, Quarterwall Cottages (fertile)
B. friesiana	r	exposed <i>Polypodium</i> rhizome, Quarterwall Cottages
B. herbarum	r	exposed <i>Polypodium</i> rhizome, Quarterwall Cottages
B. laurocerasi	r	Sambucus, below Old Hospital; near St John's Well, below Millcombe House
B. naegelii	r	Sambucus, below Old Hospital; Acer, below Millcombe House
B. phacodes	r	base of Acer, in deep shade, near Millcombe House
B. sabuletorum*	l, r	decaying mortar and associated mosses, with Toninia lobulata, Quarterwall Cottages; also below South Light (Noon and Hawksworth 1972)
B. scopulicola*	l, r	sheltered, vertical, granite rock face behind The Battery buildings (sterile); also above Landing Beach (below South Light) (Noon and Hawksworth 1972)

B. viridifarinosa	l, r	small stone shaded by <i>Rhododendron</i> by path leading to Quarry Beach (uv+ orange- pink)
Baeomyces rufus	1	+/- consolidated, shaded soil and muddy, slate pebbles by Harbour Hill road, above Victoria Beach (sparingly fertile)
Bryoria fuscescens*	-	recorded on bare quartz-granite rocks, Threequarter Wall (Noon and Hawksworth 1972)
Buellia aethalea	w, a	outcrops, especially those of slate, and wall tops; boulders beside Harbour Hill path
B. coniops	1	birds' perching rocks by track to North End, above Gannets' Combe
B. ocellata	r	slate rocks in wall, above Landing Beach
B. punctata*	w, f	+/- nutrient-enriched rocks, especially birds' perching sites, and standing stones; tops of gravestones, walls
B. saxorum	r	sheltered recesses in slate above The Rattles, Castle Hill
B. stellulata*	0	walls and isolated slate outcrops, especially near and above Landing Beach
B. subdisciformis*	s, o	locally abundant, often near the coast, on sunny, often +/- vertical rocks, often forming extensive mosaics (plate 2, at rear)
<b>B.</b> sp.	w, c	sheltered, dry, vertical recesses, above and within the densest <i>Ramalina siliquosa</i> zone, mainly west coast (mauve-grey thallus, resembling <i>Rinodina lecideina</i> , but with smaller, <i>Buellia</i> -like spores)
Caloplaca britannica	r	sheltered and nutrient-enriched, vertical rock faces behind The Battery buildings, with <i>Bacidia</i> scopulicola and <i>Opegrapha cesareensis</i>
C. ceracea*	1	low outcrops of slate, below Castle
C. cerina	r	single Sambucus, below Old Hospital
C. citrina*	w, c	mortar, cement, also associated bricks and boulders of faced walls and buildings
C. crenularia*	w, c	exposed granite wall tops and slate outcrops
C. dalmatica	С	cement and other calcareous, man-made substrates, especially in south-east of island
C. flavescens*	w, c	cement and other calcareous, man-made substrates
C. granulosa*	-	recorded in error for <i>C. verruculifera</i> by Noon and Hawksworth (1972)
C. holocarpa str.	r	brick and associated mortar of trackside wall, just north of the village

C. holocarpa lat.	w, o	mortar, village area; Sambucus below Millcombe House
C. littorea	w, 1	mesic-supralittoral zone in sheltered, +/- vertical aspects; walls of The Battery; at North West Point; below Tibbett's Point
C. marina str. *	w, a	dominant in mesic-supralittoral zone, especially on well-lit, south-facing rock faces
C. marina lat.	f	granite walls in more inland sites (see Purvis et al. 1992, 155)
C. microthallina*	С	on <i>Verrucaria maura</i> , particularly in more sheltered aspects, Harbour Hill above Landing Beach; Brazen Ward
C. thallincola*	0	mesic-supralittoral zone, preferring more sheltered aspects than <i>C. marina</i> , and there often replacing this species
C. verruculifera	r	markedly nutrient-enriched rocks at North West Point; Brazen Ward (dominant). As C. granulosa in Noon and Hawksworth (1972)
Candelariella aurella	r	cement at base of a gravestone, cemetery
C. reflexa	r	Sambucus, below Old Hospital
C. vitellina	w, f	+/- nutrient-enriched seepage tracks and birds' perching rocks
Catillaria chalybeia*	C	slate outcrops, rare on granite
C. lenticularis	l, r	concrete wall leading to The Battery; walls of St Helena's Church
C. pulverea	r	horizontal trunk of a <i>Salix</i> , in boggy heligoland below Quarterwall Cottages
Chiodecton myrticola	r	small quantity, shaded recess on north-facing side of granite bluff, north of Tibbett's Point (sterile; with protocetraric and trace of norstictic acids)
Chromatochlamys muscore	um 1	overgrowing moribund mosses, top of old walls near Marisco Tavern; Big St John's
Chrysothrix candelaris	r	dry side of mature Quercus, by Millcombe House
C. chrysophthalma	r	dry side of mature <i>Pinus</i> and <i>Quercus</i> , by Millcombe House (sterile, sorediate taxon, see Purvis <i>et al.</i> 1992, 188)
Cladonia arbuscula*	-	probably recorded in error for <i>C. portentosa</i> or <i>C. ciliata</i> var. <i>tenuis</i> by Noon and Hawksworth (1972)
C. azorica	r	single record, with <i>C. portentosa</i> , in heathland, Pondsbury, Punchbowl Valley (with fumarprotocetraric and perlatolic acids)

C. caespiticia	r	by path, shaded by <i>Rhododendron</i> , to Quarry Beach (fertile)
C. cervicornis*	w, c	coastal and inland heathlands throughout; subsp. verticillata occasional under old Calluna in more inland sites
C. chlorophaea*	0	with heather and on humus by path sides, especially at North End (including chemical strains C. merochlorophaea and C. cryptochlorophaea)
C. ciliata var. tenuis*	w, a	inland damp <i>Calluna</i> communities and humus on low exposed granite outcrops; heathland around Pondsbury (fertile)
C. coniocraea*	l, o	bases of trees, particularly <i>Acer</i> , below and above Millcombe House
C. crispata var. cetrariiform	is* r	very sparingly amongst inland damp Calluna communities, near Pondsbury
C. diversa* (C. coccifera aggr.)	s, o	humus, Gannets' Bay; above The Battery (with usnic and +/- porphyrilic acids and zeorin)
C. fimbriata*	l, r	+/- basic soil by north wall of Quarterwall Cottages
C. firma	1	predominantly coastal, in areas of higher pH, there often associated with <i>C. rangiformis</i> , particularly in south-east of island
C. floerkeana*	w	humus in short Calluna heathland
C. foliacea*	1	predominantly more acid coastal sites than <i>C. firma</i> , often with <i>C. cervicornis</i> and <i>C. furcata</i>
C. furcata*	w	more acid sites and in coastal communities, especially fine in south-east; Pondsbury; North End
C. gracilis	r	damp heathland, near Pondsbury (fertile)
C. humilis	l, r	recently disturbed soil, top of wall of building ruins, The Battery
C. macilenta*	W, 0	amongst short Calluna, heathland, particularly North End
C. polydactyla*	w, o	humus, in similar sites as <i>C. macilenta</i> and not easily distinguished from this species
C. portentosa*		
e. porteniosa	1	shallow declivities in damp Calluna heath and by edges of tracks, Pondsbury and Punchbowl Valley, with C. furcata, C. gracilis, C. squamosa var. squamosa; North End; Gannets' Bay
C. pyxidata*	l r	edges of tracks, Pondsbury and Punchbowl Valley, with C. furcata, C. gracilis, C. squamosa var.

C. rangiformis*	1	coastal communities in areas of higher pH, often in associations with <i>C. firma</i>
C. squamosa var. squamosa	l, r	heathland, Pondsbury
C. squamosa var. subsquamosa	0	by path sides amongst short Calluna, Pondsbury
C. strepsilis	1	humus in shallow, moisture-retaining depressions in granite; east-facing slope near Gannets' Bay; more extensive colonies, North End
C. subcervicornis*	f	humus in thin cracks and depressions in granite, especially North End, widely scattered; elsewhere in pockets of humus on granite outcrops, especially on eastern side of island
C. subulata	1	peaty sides of path to Quarry Beach
C. uncialis*	l, c	damp, moisture-retaining hollows on quartzite and moister parts of heathland; especially near Pondsbury (fertile)
Clauzadea monticola	l, o	cement on walls around Old Light; on mortar of walls to The Battery
Cliostomum griffithii*	w, c	trees and <i>Calluna</i> stems (rarely fertile); Millcombe House; East Side Land; above Mousehole and Trap
Coelocaulon aculeatum*	l, o	open, very exposed heathland, South West Point; near Earthquake; Punchbowl Valley; Gannets' Bay; North End
C. muricatum	l, r	Calluna community, Pondsbury; near Quarter Wall (west end); Shutter Point; The Battery
Collema auriforme	l, r	mortar, top of wall, Quarterwall Cottages
C. crispum	l, o	decaying mortar of walls, near Marisco Tavern; Old Light; Quarterwall Cottages; wall up from Landing Beach
C. tenax	l, o	decaying mortar of walls, near Marisco Tavern; Old Light; wall by roadside above Landing Beach
Dermatocarpon miniatum*	-	slope at Goat Island (Gliddon 1949). Suggested as an erroneous record by Noon and Hawksworth (1972). Occasionally occurs on +/- neutral to
		calcareous rocks above sea level and its possible occurrence on Lundy should not be ruled out
Diploicia canescens	w, c	sheltered walls; on trees (fertile on Acer); sheltered east-facing sides of rock buttresses
Diploschistes caesioplumbeus	s, o	south-east-facing, sunny, slate outcrop below Castle; sunny, granite rocks, Tibbett's Point; North West Point
Diplotomma alboatrum	S	mortar in old walls, below Millcombe House; near The Shop

D. chlorophaeum*	1	near Landing Beach; walls in derelict garden, below Millcombe House (with norstictic acid)
Dirina massiliensis f. sorediata	1 ==	dry, north- or east-facing recesses of bluffs overlooking The Rattles and Tibbett's Point; walls of store house for calor gas, Millcombe House (with Enterographa zonata and Opegrapha gyrocarpa)
Enterographa crassa*	1	mature Acer, forming extensive mosaics on sheltered sides of trunks, Millcombe House
E. hutchinsiae	l, r	moist underhangs by Harbour Hill road below Millcombe House (with <i>Lecania hutchinsiae</i> )
E. zonata	1	shaded wall of calor gas storehouse by roadside to Millcombe House (with <i>Opegrapha gyrocarpa</i> ); unusually absent from shaded sides of granite bluffs elsewhere
Evernia prunastri*	S	windswept trees and <i>Prunus</i> around Millcombe House; on <i>Salix</i> , Quarry B; old <i>Calluna</i> stems; Tibbett's Point; near North West Point
Fuscidea cyathoides*	w, c	forming intricate mosaics on rock, especially nutrient-deficient granite in and around Quarries; wide ecological amplitude in shade to highly exposed situations on walls
F. lightfootii*	r	single moribund <i>Malus</i> near St John's Well, below Millcombe House
F. lygaea	l, r	wall by Old Schoolhouse, north of Millcombe House
Graphina anguina	r	young Acer, above Millcombe House
Gyalecta jenensis	l, r	sheltered granite associated with mortar, on wall opposite The Shop
Haematomma ochroleucum var. ochroleucum*	1	granite rock walls near Quarter Wall (Noon and Hawksworth 1972)
var. porphyrium*	s, o	shaded, mainly east-facing sides of granite rock bluffs, Tibbett's Point; bluff near Jenny's Cove; Earthquake
Hyperphyscia adglutinata	w, 1	Sambucus near and by St John's Well, near Big St John's; below St Helena's Church; above Quarry Beach; on moribund Malus near St John's Well, below Millcombe House
Hypogymnia physodes*	w, s	with, and on, decumbent <i>Calluna</i> and on rock outcrops; most frequent at North End and on the west of the island
H. tubulosa*	w, s	with, and on, decumbent <i>Calluna</i> and on rock outcrops; most frequent at North End and on the west of the island

Lecania aipospila*	1	underhangs near Virgin's Spring, North West Point; on E-facing sheltered rock outcrop, Tibbett's Point; prolific on nutrient-enriched, mesic-supralittoral rocks at Brazen Ward; rare on west, Jenny's Cove
L. atrynoides	1, r	sheltered rocks, near Landing Beach
L. cyrtella	0	+/- eutrophicated branches of <i>Sambucus</i> below Old Hospital; near St John's Well, below Millcombe House
L. cyrtellina	r	Quercus, near Millcombe House
L. erysibe*	0	mortar of old walls near buildings; cemetery; on brick-concrete wall towards The Battery (frequently sterile)
L. hutchinsiae	1	shaded sedimentary rocks, by roadside leading to Millcombe House (under Acer); boulder on wall top below St Helena's Church; dry underhang by Harbour Hill road below Millcombe House; wall opposite The Shop
L. rabenhorstii	1	mortar of walls and buildings; near Landing Beach and on roadside walls of Harbour Hill road; on mortar of field wall to The Battery
L. turicensis	1	mortar-brickwork at cave entrance below Castle and at The Battery
Lecanora actophila*	S	sunny rocks in mesic-supralittoral zone by the sea on both west and east coasts
L. albescens	1	cement of old buildings and on mortar; Old Hospital and Old Light walls; on sedimentary rock outcrops below Castle
L. campestris*	w	walls as well as sedimentary and granite outcrops; thallus often much reduced and apothecia then predominant
L. cenisea var. atrynea	r	slate, birds' perching rock between Rat Island and main island
L. chlarotera*	С	mainly on Salix, Acer, Prunus, Quercus, especially around Millcombe House
L. confusa*	w, c	twigs and branches of Acer, Malus, Prunus, Salix, Sambucus, Calluna and Rhododendron
L. conizaeoides	l, r	old dead Calluna stems, above Halfway Bay (fertile)
L. dispersa*	w, c	mortar, granite and asbestos-cement
L. expallens*	w	frequent on trees and wood (occasionally fertile); rarely on rock - but rather frequent at Cheeses
L. fugiens	1	granite walls, around Old Light; wall outside The Shop

L. gangaleoides*	w, a	rocks throughout; very shade tolerant and of wide ecological amplitude
L. hageni (L. dispersa aggr	.)r	decorticated Sambucus, below the Old Hospital
L. helicopis*	w	sheltered rocks in mesic-supralittoral zone throughout, especially south-east; frequent above Landing Beach
L. jamesii	r	single Salix, in heligoland below Quarterwall Cottages
L. orosthea*	w, f	granite outcrops in sheltered recesses as well as more exposed situations
L. poliophaea	1	sparingly between dominant Lecania aipospila in damp, shaded, nutrient-enriched rocks at Brazen Ward
L. polytropa*	l, o	summit of gravestone and on wall tops
L. praepostera	r	sunny granite bluff, above Tibbett's Point (with norstictic acid)
L. rupicola*	w, f	sunny granite and slate rocks; apothecia mostly infected with Arthonia varians
L. sambuci	r	Sambucus twigs, above Quarry Beach; St John's Well, below Millcombe House
L. sulphurea*	r	sunny exposed boulders and outcrops below Castle (slate rock) and at Tibbett's Point (granite); seeming intermediates noted between <i>L. orosthea</i> and this species
L. symmicta*	r	twigs of <i>Acer, Quercus</i> , near Millcombe House; recorded from small trees alongside track to Landing Beach by Millcombe House (Noon and Hawksworth 1972)
L. tenera*	w	sheltered, often shaded, +/- vertical rock, especially on east- and north-facing aspects (often sterile)
L. umbrina (L. dispersa agg	gr.) r	cement of outhouse near Millcombe House
Lecidea diducens	r	granite gravestone in cemetery; granite wall by Harbour Hill road (apothecia with 2'-o-methylanziac acid)
L. fuscoatra	r	slate outcrop above Landing Beach (C+, with gyrophoric acid)
L. lactea	r	single boulder by Harbour Hill path (K+ red (crystals), with norstictic acid)
Lecidella asema* (L. subincongrua aggr.)	W	coastal granite and slate; locally common on rock outcrops and buttresses, especially on west coast where co-dominant with <i>Ramalina siliquosa</i> ; variable species with wide ecological amplitude

L. elaeochroma*	w	broad-leaved trees, shrubs and old <i>Calluna</i> stems, especially above and around Millcombe House
L. elaeochroma f. sorediata	r	single Acer, above Millcombe House
L. prasinula	r	sunny, vertical, west-facing granite face above Jenny's Cove
L. scabra*	w, f	+/- nutrient-enriched granite and slate rock outcrops and on walls (occasionally fertile)
L. stigmatea	f	mortar and cement of walls throughout
Lepraria caesioalba	r	mossy granite boulder below Tibbett's Point (with atranorin, fumarprotocetraric and rangi formic acids)
L. incana*	w, o	shaded boles of trees, below Millcombe House; sheltered walls and rock faces throughout (with divaricatic acid, zeorin and occasionally atranorin)
L. lobificans	w, o	shaded side of large boulders and rock outcrops (with atranorin, stictic acid, zeorin)
Leprocaulon microscopicus	n I	small, erratic sandstone outcrop at The Battery; damp, sheltered granite recess, Cheeses (with atranorin, zeorin, 2 fatty acids)
Leproloma membranaceum	0	sheltered, often north-facing, sides of bluffs at Tibbett's Point (with pannaric and roccellic acids)
L. vouauxii	r	sheltered, dry rock face behind Millcombe House
Leptogium schraderi	r	among mosses on crumbling mortar on summit of walls at Quarterwall Cottages
L. teretiusculum	1	decaying mortar of derelict buildings, Old Hospital; Quarterwall Cottages; near Marisco Tavern
Lichina confinis*	1	mesic-supralittoral zone with Caloplaca marina at Landing Beach; Brazen Ward
L. pygmaea*	l, o	below $L$ . $confinis$ , exposed, well-lit littoral rock at Landing Beach; Brazen Ward
Lithographa tesserata var. petraea	1	widespread on flat granitic exposures with intersecting heathland, North End; field wall by roadside, by Quarterwall (cf. <i>Polysporina dubia</i> , see Purvis <i>et al.</i> 1992, 361)
Macentina stigonemoides	r	sheltered main trunk of old <i>Sambucus</i> , near St John's Well, below Millcombe House (sterile)
Micarea bauschiana*	r	sheltered crevice of iron/copper-rich intrusion at Earthquake; small grotto in deep shade, Quarry F
M. denigrata	r	top rail of fence and gate leading to Big St John's house (pycnidia and apothecia)
M. prasina	f	with decaying <i>Armeria</i> tufts and consolidated soil at cliff edges, especially abundant at Virgin's Spring, North West Point; also peaty soils near Mousehole and Trap; above Quarry Beach;

		Gannets' Bay (mostly sterile); inside hollow Salix below Quarterwall Cottages (fertile) (all with methyloxymicareic acid)
Mycoporum quercus	r	twigs of Quercus, by Millcombe House
Normandina pulchella	l, r	amongst mosses near base of Acer, by Millcombe House
Ochrolechia androgyna*	w, o	thinly dispersed on exposed sides of granite outcrops and bluffs, especially above Virgin's Spring, North West Point; abundant at Tibbett's Point and Brazen Ward
O. parella*	w, a	abundant on exposed granite and slate rocks; rarely on <i>Acer</i> , near Millcombe House
O. tartarea	r	north-facing rock outcrop, North East Point
Opegrapha areniseda	r	minor sandstone intrusion in granite at Earthquake (pycnidia only)
O. atra*	f	corticolous substrates, including Fraxinus, Malus, Hedera and Sambucus; decaying Polypodium rhizomes on wall, Quarterwall Cottage ruins
O. cesareensis*	l, r	vertical, shaded rock-face behind buildings at The Battery (with Caloplaca britannica, Bacidia scopulicola)
O. conferta*	l, a	sheltered to exposed coastal rock and walls, above Landing Beach; above The Rattles (slate rock); above Tibbett's Point; above Pilot's Quay
O. gyrocarpa	1	shaded wall of calor gas storehouse, near Millcombe House (with <i>Opegrapha zonata</i> ); unexpectedly absent from shaded recesses of granite bluffs elsewhere
O. herbarum	r	decaying wall and dead <i>Polypodium</i> rhizomes, Quarterwall Cottages
O. lithyrga	r	shaded slate of wall in walled garden above St John's Well, below Millcombe House
O. ochrocheila	r	Polypodium rhizomes, Quarterwall Cottages
O. saxatilis (including O. chevallieri)	r	sandstone intrusion in granite, Earthquake; on mortar-granite doorpost, Old Hospital
O. sorediifera	r	branches of Acer, by Millcombe House (fertile)
O. varia	r	mature Acer, by Millcombe House
O. varia aggr.	l, r	Salix, below Quarterwall Cottages; on dead Dryopteris haulm in small grotto, in deep shade, Quarry F. Note: These gatherings refer to an unnamed species related to O. varia with smaller ascospores and a K+ green apothecial pigment (see Purvis et al. 1992, 414 under O. varia)

O. vulgata	1	Quercus; on shaded aspects of Acer, by Millcombe House; on Salix in heligoland, below Quarterwall Cottages
Parmelia borreri	r	overhanging branch of <i>Acer</i> , near Millcombe House; on sheltered <i>Salix</i> near Quarry B
P. britannica	1	sunny, sloping, granite boulders with slight nutrient enrichment and +/- under <i>Pteridium</i> ; below Tibbett's Point; Gannets' Bay
P. caperata*	w, a	rocky outcrops and wall tops throughout; also tree boles and branches (fertile near Millcombe House)
P. conspersa	Ī	abundant in north on flat, granite rocks, in +/- nutrient-enriched, seepage tracks and margins of transient, water-holding declivities in granite; occasional, east side; also Pilot's Quay
P. endochlora	l, r	low down on sheltered sides of large, embedded boulders, adjacent to third major outcrop near Tibbett's Point enroute to Threequarter Wall Bay (with <i>P. laevigata</i> )
P. exasperata	r	twigs of Sambucus below Quarterwall Cottages
P. glabratula*	r	trees near Millcombe House
P. glabratula subsp. fuligine	osa w	sunny exposed rocks, particularly on west side of island
P. laevigata*	1	low down on sheltered sides of embedded boulders adjacent to north side of third major outcrop near
		Tibbett's Point, enroute to Threequarter Wall Bay (with <i>P. endochlora</i> ); also granite rocks at The Battery on west side (Noon and Hawksworth 1972)
P. loxodes	w, 1	(with P. endochlora); also granite rocks at The
P. loxodes P. omphalodes*	w, 1 w, a	(with <i>P. endochlora</i> ); also granite rocks at The Battery on west side (Noon and Hawksworth 1972) flat, sunny rocks, in seepage tracks and margins of temporary water pans on granite; often locally
		(with <i>P. endochlora</i> ); also granite rocks at The Battery on west side (Noon and Hawksworth 1972) flat, sunny rocks, in seepage tracks and margins of temporary water pans on granite; often locally dominant, especially North End low, granite outcrops, especially North End and west of island; also on decaying <i>Armeria</i> and gently sloping rocks; often in bare patches between
P. omphalodes*	w, a	(with <i>P. endochlora</i> ); also granite rocks at The Battery on west side (Noon and Hawksworth 1972) flat, sunny rocks, in seepage tracks and margins of temporary water pans on granite; often locally dominant, especially North End low, granite outcrops, especially North End and west of island; also on decaying <i>Armeria</i> and gently sloping rocks; often in bare patches between <i>Cladonia</i> communities, North End rocks and trees in more sheltered sites, often on
P. omphalodes* P. perlata*	w, a	(with <i>P. endochlora</i> ); also granite rocks at The Battery on west side (Noon and Hawksworth 1972) flat, sunny rocks, in seepage tracks and margins of temporary water pans on granite; often locally dominant, especially North End low, granite outcrops, especially North End and west of island; also on decaying <i>Armeria</i> and gently sloping rocks; often in bare patches between <i>Cladonia</i> communities, North End rocks and trees in more sheltered sites, often on boulders under <i>Pteridium</i> , especially on east side rocks between St James's Stone and Jenny's Cove;
<ul><li>P. omphalodes*</li><li>P. perlata*</li><li>P. pulla*</li></ul>	w, a w	(with <i>P. endochlora</i> ); also granite rocks at The Battery on west side (Noon and Hawksworth 1972) flat, sunny rocks, in seepage tracks and margins of temporary water pans on granite; often locally dominant, especially North End low, granite outcrops, especially North End and west of island; also on decaying <i>Armeria</i> and gently sloping rocks; often in bare patches between <i>Cladonia</i> communities, North End rocks and trees in more sheltered sites, often on boulders under <i>Pteridium</i> , especially on east side rocks between St James's Stone and Jenny's Cove; North West Point gently sloping, sunny rocks, particularly between

P. subaurifera	1	Acer near Millcombe House and below on Malus, near St John's Well; sparingly on Calluna above Halfway Bay; very rare on rocks, standing stones near Halfway Wall
P. subrudecta	1	sheltered bole of <i>Salix</i> by temporary stream north of heligoland, Quarry B
P. sulcata*	0	mainly on trees around Millcombe House; only occasional on low rock outcrops
P. verruculifera	w	flat, sunny rocks near temporary water pans on granite, often locally dominant, especially at North End
Peltigera horizontalis*	-	recorded on banks of pool, Quarry A (Cox 1960)
P. lactucifolia*	1	recently disturbed soil above Landing Beach; Quarries; Quarry Beach; Virgin's Spring, North West Point; earlier records of <i>P. polydactyla</i> probably refer to this species
P. membranacea*	l, r	path side, near Earthquake; earlier records of <i>P. canina</i> probably refer to this species
P. rufescens	l, r	mortar and soil on wall top of The Battery buildings
Pertusaria albescens	r	unmarked gravestone, cemetery
P. amara*	0	granite rock on east side, above Brazen Ward; Tibbett's Point; North West Point; granite wall blocks, Quarterwall Cottages; rare on <i>Acer</i> , by Millcombe House
P. aspergilla (P. dealbescens)	r	shaded, north-facing side of granite outcrop, north of Tibbett's Point
P. corallina*	1	exposed and occasionally more sheltered rock outcrops, from The Battery to Earthquake; on slate rock, by Harbour Hill path
P. flavicans	1	exposed rock and occasionally more sheltered, granite rock, from The Battery to Earthquake; below Tibbett's Point
P. hymenea*	l, r	Acer, near Big St John's, below Millcombe House
P. lactea*	-	recorded as on granite at Knight Templar Rock area (Noon and Hawksworth 1972)
P. leioplaca	0	smooth bark of young Acer, near Millcombe House
P. multipuncta*	-	recorded on trees along Harbour Hill road, by Millcombe House (Noon and Hawksworth 1972)
P. pertusa	f	corticolous substrates, particularly <i>Acer</i> , Millcombe House
P. pseudocorallina*	w, a	walls and granite outcrops throughout (sometimes fertile = <i>P. microstictica</i> )

Phaeographis dendritica	1, r	young Acer (two trees), near Millcombe House
Phaeophyscia orbicularis	1	nutrient-enriched walls near Landing Beach; on flat, damp, sheltered, nutrient-enriched granite outcrop, between dominant <i>Lecania aipospila</i> , Brazen Ward
Phlyctis argena	1	boles and branches of <i>Acer</i> ; more rarely on <i>Quercus</i> , near Millcombe House
Physcia adscendens*	w, f	wide range of tree species, including <i>Acer</i> , <i>Fraxinus</i> , <i>Sambucus</i> ; occasionally on rock, especially associated with summits of standing stones along main central track (occasionally fertile)
P. aipolia*	W	Acer, Fraxinus, Sambucus, Salix, Malus, occasionally on Ulex
P. caesia*	r	in small quantity, top of gravestone, cemetery
P. semipinnata	l, r	moribund <i>Malus</i> , St John's Well, below Millcombe House; <i>Acer</i> , by and above Millcombe House
P. tenella	0	tops of birds' perching stones and occasionally on nutrient-enriched branches of <i>Acer</i> (less frequent than <i>Physcia adscendens</i> )
Physconia distorta	r	single mature <i>Quercus</i> , overlooking Millcombe House, near Harbour Hill road
Placynthiella icmalea*	1	peaty soil, by path on east side, near recently eradicated <i>Rhododendron</i>
P. uliginosa*	1	peaty soil, by path on east side, near recently eradicated <i>Rhododendron</i>
Placynthium nigrum	l, r	mortar on wall leading to The Battery
Platismatia glauca*	I	abundant on vertical, granite rock face at VC Quarry entrance; sparingly in short heathland, Earthquake; in heathland at North End
Polyblastia gelatinosa	1	among mosses, summits of wall, near St Helena's Church
Polysporina simplex	w, o	very exposed slate and granite of walls; also slates and tiles in village
Porina aenea	r	boles of young <i>Acer</i> in sheltered situations, by Millcombe House
P. chlorotica	r	on heavily shaded rocks, near Millcombe House; on shaded slate outcrop of Harbour Hill road
Porpidia cinereoatra*	W	old walls and low granite and slate outcrops (with confluentic acid); earlier records of <i>Lecidea</i> albocaerulescens are probably this species
P. platycarpoides	1, o	low granite boulder in cemetery; wall along Harbour Hill road; on outcrops, Earthquake (apothecia with norstictic acid); earlier records of

		Lecidea macrocarpa probably, in part, refer to this species
P. tuberculosa* ( <i>Lecidea tumida</i> )	1	sandstone and slate gravestones; frequently on cut granite surfaces in all Quarries
Protoblastenia rupestris*	l, r	asbestos-cement of window sill of derelict house, near Millcombe House
Pseudevernia furfuracea*	-	recorded from south face of Threequarter Wall (Noon and Hawksworth 1972)
Psilolechia leprosa	r	in small quantity below copper flashing on west face of Old Light tower
P. lucida	1	grotto by Quarry F; walls, underhangs along Harbour Hill road
Pyrenocollema halodytes*	f	barnacles and other mollusc shells, probably common in the sublittoral
Pyrenula macrospora*	1	wide range of smooth-barked, broad-leaved trees, near Millcombe House (often with <i>P. chlorospila</i> )
P. chlorospila*	1	wide range of smooth-barked, broad-leaved trees, near Millcombe House (often with <i>P. macrospora</i> )
Pyrrhospora quernea	r	mature Acer, rarely Quercus, near Millcombe House
Ramalina calicaris	l, r	twigs of Acer, near Millcombe House
R. canariensis	l, r	side of small cave entrance below Castle
R. cuspidata*	w	most abundant near sea, but also occurs inland, eg. walls of St Helena's Church
R. farinacea	f	trees around Millcombe House; also on old <i>Calluna</i> stems; on granite of bluffs
R. fastigiata*	1, r	twigs of Acer, near Millcombe House
R. lacera	l, r	Halfway Wall, east end, north-facing, near central track
R. portuensis	1	walls, dead <i>Calluna</i> , with <i>R. subfarinacea</i> at and above The Battery; also on <i>Calluna</i> and rock at Earthquake
R. siliquosa*	w, a	ubiquitous and polymorphic; most abundant on vertical cliffs facing the sea and buttresses
R. subfarinacea*	w	old walls and exposed bluffs, especially in more inland situations
Rhizocarpon concentricum	1, r	walls of dressed slate rock with mortar, such as wall of calor gas storage house, near Millcombe House
R. geographicum*	0	most frequently on slate rock on southeast above Landing Beach; in small quantity on gravestones, in cemetery; granite walls near Old Light; Cheeses (plate 2, at rear)

R. obscuratum*	w, o	mainly confined to sheltered outcrops and wall dressings of slate rock
R. richardii*	w, a	all rock types, frequently dominant on more sheltered, but sunny, sites along east coast
Rinodina atrocinerea	w, a	throughout, on +/-, slightly sloping, sunny, exposed rocks
R. confragosa	r	low slate outcrop below Castle
R. gennarii	0	nutrient-enriched summits of standing stones by central track
R. luridescens	l, f	sunny, exposed, smooth, sloping rocks near the sea
R. orculariopsis	1, r	nutrient-enriched, granite standing stone, by central track above Old Hospital; on old granite gravestone in cemetery
R. sophodes	r	smooth bark of twigs of Acer, Fraxinus and Malus, around Millcombe House
R. subglaucescens	1, o	vertical, sheltered east- and north-facing aspects of rock bluffs in shade or underhangs, especially on east side; shaded underhang, Jenny's Cove
Roccella phycopsis	1 .	under shallow underhangs at The Rattles; above Virgin's Spring, North West Point; above Jenny's Cove
Sarcogyne privigna	w, o	tops of sunny, exposed walls and more rarely on low granite exposures, opposite The Shop; walls of Old Hospital; near Devil's Slide (west coast); approach to Pilot's Quay
Schismatomma decolorans	1	dry sides of mature Acer and Quercus, around Millcombe House
Sclerophyton circumscriptum 1, r		sheltered underhang on north-facing side of bluff at Tibbett's Point
Scoliciosporum chlorococcum l, r		eutrophicated twigs of a moribund <i>Malus</i> , below Millcombe House
S. umbrinum*	w, o	highly nutrient-enriched rock surfaces and habitats influenced by heavy metal run-off
Solenospora vulturiensis*	w, o	soil amongst slate rocks; very rarely on granite outcrops as at North West Point
Sphaerophorus globosus*	1, c	flat rocks associated with broken, thin, humus layer covering quartz plateaux, especially at North End; on vertical rock face, VC Quarry
Teloschistes flavicans*	w, 1	restricted to western side of island, widely dispersed in small quantity, from Virgin's Spring in north to Jenny's Cove and Halfway Wall; frequent above The Battery (see Gilbert 1995) (plate 1, at rear)

Tephromela atra*	w, o	sunny, exposed granite outcrops and occasionally on slate rock, as below the Castle; <i>Acer</i> , near Millcombe House
Toninia aromatica	l, o	decaying mortar on old walls, and ruins; St Helena's Church; walls around Marisco Tavern; walls of Old Light; on calcareous slate above Landing Beach
T. lobulata	l, r	top of wall, near St Helena's Church, Big St John's; Quarterwall Cottage ruins
T. sedifolia	r	wall by Big St John's
Trapelia involuta	l, r	dusty slate rock, at base of Harbour Hill path adjacent to Harbour Hill road
Trapeliopsis granulosa	l, r	rotting wood and humus, associated with ancient <i>Salix</i> below Quarterwall Cottages
T. wallrothii	l, r	soil between slate rocks, below the Castle (fertile)
Usnea cornuta*	o, l	trees around Millcombe House and occasionally on rocky outcrops (salazinic acid race); as <i>U. fragilescens</i> in Noon and Hawksworth (1972). much rarer than <i>U. flammea</i>
U. flammea*	w, f	trees around Millcombe House and occasionally on outcrops and old Calluna in windy, exposed sites on bluffs, especially on east side (stictic and lobaric acids)
U. rubicunda	r	single Quercus bole, near Millcombe House
U. subfloridana	r	single <i>Salix</i> by small temporary stream north of heligoland, Quarry B (with thamnolic acid)
Verrucaria aethiobola	l, r	in temporary, seepage track leading to small stream, above Gannets' Bay
V. fusconigrescens *	w, c	shaded to sunny rocks, especially on the east side; also on slate rock
V. glaucina	w, 1	mortar associated with old walls, especially around the village
V. halizoa*	w, c	with <i>V. mucosa</i> , shore-line rocks; as <i>V. microspora</i> in Noon and Hawksworth (1972)
V. hochstetteri	w, 1	frequent in old mortar of old walls, especially around Marisco Tavern; derelict wall, Brazen Ward
V. macrostoma (cf. V. viridula)	1	frequent on crumbling mortar of old walls, village area; Quarterwall Cottages
V. maura*	w, a	universally on all rocky shores (splash zone) and spreading inland, in sheltered gorges and seepage tracks on rocks, especially on the western side
V. mucosa*	w, c	shore-line rocks at high water mean tide level

V. muralis	w, 1	frequently on old mortar of old walls; around Marisco Tavern; The Battery
V. nigrescens	l, r	sheltered walls of an old outhouse, near Millcombe House
V. prominula*	.1	rocks at high water mark, Landing Beach; also intertidal and splash zones and cliff areas 40'-70' above sea level (Noon and Hawksworth 1972)
V. rheitrophila	r	small pebbles in permanent freshwater stream running through garden of Millcombe House
V. striatula	w, o	shore-line rocks at high water mean tide level
V. viridula	w, 1	mortar of walls, concrete, with intermediates approaching $V$ . $macrostoma$
Vezdaea leprosa	l, r	decayed mosses on bluff overlooking Gull Rock (before Tibbett's Point) on east side (sterile)
Xanthoria candelaria	l, o	standing stones by trackside to North End; birds' perch at Jenny's Cove
X. ectaneoides	w, c	coastal rock, sometimes dominant on sites with some increased nutrient status
X. parietina*	w, o	isolated boulder tops and in <i>Ramalina</i> zone; more rarely on trees, as moribund <i>Malus</i> , below Millcombe House
X. polycarpa*	r	twigs of Quercus ilex, near Millcombe House

## CONCLUSION

A total of 315 lichen species is recorded for Lundy, representing considerable richness and diversity for such a small area. Among these taxa are some which are now rare in the British flora, but well represented, although local, on Lundy. Many species on the island are only known from single records or are confined to very restricted habitats; a careful conservation policy is therefore of paramount importance for their continued survival.

Most communities were surveyed in detail and will be reported on in a second paper. The maritime cliffs and shoreline require further study, especially for crustose lichens.

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## REFERENCES

Cox, R. M. 1960. Mosses, Liverworts and Lichens. *Annual Report of the Lundy Field Society* 13, 49-53.

Gilbert, O. L. 1995. Audit of *Teloschistes flavicans* in South-west England. Report to English Nature, p.67.

Gliddon, W. A. 1948. Land Flora. Annual Report of the Lundy Field Society 2, 34-38.

Gliddon, W. A. 1949. Miscellaneous Notes - Terrestrial and Marine. *Annual Report of the Lundy Field Society* 3, 29-31.

- Noon, R. A. and Hawksworth, D. L. 1972. The Lichen Flora of Lundy. *Annual Report of the Lundy Field Society* 23, 52-58.
- Purvis, O.W., Coppins, B. J., Hawksworth, D. L., James, P. W., and Moore, D. M. 1992. *The Lichen Flora of Great Britain and Ireland.* Natural History Museum Publications in association with The British Lichen Society.
- Purvis, O.W., Coppins, B. J., and James, P. W. 1994. Checklist of Lichens of Great Britain and Ireland. *British Lichen Society Bulletin* 72 (Supplement, amended reprint), 1-79.
- White, F. W. and James, P. W. 1987. A new guide to microchemical techniques for the identification of lichen substances. *British Lichen Society Bulletin* 57 (Supplement), 1-41.