

Technical glossary of lichen terminology

This extensive (53pp!!) glossary was amassed in many pieces by **Bruce D. Ryan** of Arizona State University, and has been compiled from files in his archives. It is highly technical but as far as can be determined it is complete as of approximately 2002. The multiple word forms that scientists sometimes use (conidium, conidiospore, conidiomata) may on occasion make it difficult to locate a desired term, but in most cases the first three or four letters are the same for all spellings. Some obsolete terminology (platygonidia etc.) is included, which may be useful and/or interesting to those working with historical records and documents.

- A-, AN-** (prefix) not having; not
- AB-** (prefix) position away from
- ABORTIVE** imperfect or poorly developed, as podetia in some Cladonias.
- ABRADED** of lichen thalli, having the surface worn, eroded.
- ACICULAR** long and needle-shaped, tapering at both ends, as in some kinds of spores.
- ACIDIC ROCK** quartzite, granite, basalt, sandstone or other rocks that produce no bubbling when a strong acid (usually 10% HCl) is applied; pH less than 7.
- ACIDOPHILE** a plant that occurs (preferentially) in acidic habitats or or acidic substrates.
- ACRO-** (prefix) at the end; apical, terminal.
- ACROGENOUS** developing at the apex; terminal; as applied to formation of pycnidiospores is a neutral term for exobasidial.
- ACROTON** a spinule in lichens bearing side branches.
- ACTINODISC** type of apothecia in *Umbilicaria*, with disc gyrose and having no proper margin
- ACTINOGYROSE** see actinodisc.
- ACTINOLICHEN** a lichen-like association between an alga and an actinomycete bacterium.
- ACUTE** sharply pointed, less than a right angle.
- ADHESIVE DISC** haptere--a type of holdfast.
- ADNATE** the whole underside closely attached and lying closely upon, the thallus close to the substrate, or the lower surface of the apothecium fused to the thallus; lying flat on and attached to the substrate; adnate foliose thalli are often not flattened but rather somewhat convex, with the lobe margins often straight and the rhizines minute to very short, often dense.
- ADRESSED** see appressed.
- ADVENTITIOUS** incidental, appearing casually; usually refers to production of lobes, branches, or other organs, not in the normal pattern, sometimes caused by regeneration after damage, but sometimes a good taxonomic character.
- AEROCYTE** thallus-warts, with a loose plectenchyma inside, sometimes with breathing pores (pseudocyphellae); can occur on the lower surface (e.g., *Omphalora arizonica*) or on the upper surface (e.g., *Melanelia exasperata*)
- AERUGINOSE** blue-green
- AGGLUTINATE** fixed together as if with glue; conglutinate
- AGGREGATE** group of closely related species of uncertain circumscription.
- AGGREGATED** grouped together, crowded.

ALATE..... winged.

A-LAYER thin, outermost solid layer of the outer ascus wall (usually inside a layer by gelatinous material)

ALGAE

ALGAL LAYER a thin layer of algae (or cyanobacteria) lying just below the upper cortex; hyphae generally thin-walled and loosely interwoven.

ALGAL SHEATH..... dead algal cell

ALLANTOID slightly curved, with rounded ends

ALLIANCE term used in phytosociology.

ALUTACEOUS..... the color of buff leather.

AMPHI- (prefix) the two (sorts, sides); surrounding

AMPHITHECIUM (usually), thalline margin of an apothecium; Hertel (*Calcifer Lecidea*) uses it for the part of the proper excipulum in the margin outside of the parathecium.

AMPLIARATE (of fruiting warts in *Pertusaria*), conical (but low, with sides gradually sloping towards the thallus surface).

AMYLOID..... staining blue or purple in iodine

ANAMORPH..... conidial state of a fungus

ANAPHYSIS a sterigmatoid thread in the apothecium of the lichen *Ephebeia*.

ANASTOMOSING with numerous cross-connections, forming a network; joining up, running into each other.

ANGIOCARPIC closed (of a sporocarp) at least until spores are mature.

ANGULAR with angles, as applied to outlines, or to cross sections (if due to ridges, see angulate).

ANGULATE..... having angles or corners as seen in cross section, due to sharp ridges running lengthwise on the outside (of a branch)

ANGUSTATE..... narrowed.

ANISOTOMIC, ANISOTOMOUS unequal branching, with a distinct main axis and smaller lateral side branches.

ANNULAR..... ringed, ring-shaped

ANNULATE ringed, referring to cracks or differentiated, often pigmented zones, in the cortex of *Usneas*.

ANNULUS of asci, the apical ring (anneau apicale in Fr.)

ANTICLINAL at right angles to the surface.

APICAL APPARATUS

APICAL CAP layer of (usually?) amyloid gelatin on the outside of the ascus apex, continuous with the "fuzzy coat" on the sides, but thickened

APICAL CUSHION..... non-amyloid zone running through an amyloid apical dome.

APICAL DOME..... tholus; thickened apical region of an ascus, inside the outer wall; often consisting of a non-amyloid inner part (dome in the strict sense according to some authors; apical cushion according to Purvis, et al., 1992) and an amyloid outer part.

APICAL NASSE

APICAL RING.....

APICAL situated at the tip or terminal part of a structure; as applied to the involucrellum of a perithecium, means that the involucrellum occurs only

- around the ostiole, but extends some distance laterally (in contrast to "imperfect").
- APICULATE** pointed
- APICULUS** a point or short projection at one end (of a spore).
- APOTHECIUM (APOTHECIA)** disk shaped (cup-shaped) fruiting body (ascocarp) of an ascomycetous fungus, whether lichenized or not; usually open above, with the disc exposed.
- APPENDAGE** a process (outgrowth) of any sort.
- APPENDIX ORGAN** thallus outgrowth lacking algae; can function for attachment or not.
- APPLANATE** flattened.
- APPRESSED** the whole underside closely pressed to the substrate or surface; lying flat on and firmly attached to it; 1) in appressed foliose thalli, the lobe tips are plane or turned down and the rhizines are very minute, or absent; 2) in appressed apothecia, the base is scarcely constricted.
- APUD** in (used where the primary author of a name published it in a work by another author).
- AQUATIC** growing in water or where periodically inundated.
- ARACHNOID** cobweb-like in structure, composed of or covered by parallel or more often irregularly oriented and loosely interwoven hyphae, appearing as fine strands; applied to ecorticate surfaces.
- ARBORICOLOUS** growing on trees.
- ARCHICARP** in Ascomycotina, the cell, hypha, or coil which later becomes the ascocarp or part of it.
- ARCUATE** arc-like, moderately curved in one direction.
- ARCUATE** bent, curved, or arched.
- ARDELLA** a small spot-like apothecium as in *Arthonia*.
- AREOLATE** consisting of or covered by areoles, island-like, sharply divided into areoles by separating cracks, usually resembling a mosaic or jigsaw puzzle; true areolation is formed by the isolated development of individual areoles, which may later coalesce; if areoles are formed by cracking of an originally continuous thallus or surface, then referred to as rimose, or rimose-areolate.
- AREOLE (AREOLA)** a small, usually rounded to polygonal or irregular area, appearing like an island or a tile in a mosaic; 1) a small, flattened part of a lichen thallus separated from the rest of the thallus by deep, narrow to wide cracks or more or less scattered on the substrate; 2) small discrete corticated patches on the thallus surface
- ARTICULATE, ARTICULATED** broken into jointed or segmented, often swollen, portions and so appearing rather like a crustacean's leg, as in branches of some Usneas; with reference to paraphyses means septate (and somewhat constricted at the septae?)
- ASCENDING, ASCENDENT** rising from the substrate, directed upwards at a rather narrow angle, or curving upwards.
- ASCIGEROUS CENTRUM** the special tissue which becomes the asci and paraphyses of a pyrenomycete.
- ASCIGEROUS** having asci.
- ASCOCARP** a "fruiting body" containing fungal ascospores.

ASCOGENOUS..... ascus-producing or -supporting.

ASCOGONIAL APPARATUS, ASCOGONIUM the cell or group of cells in Ascomycotina fertilised by a sexual act.

ASCOGONIUM cell or group of cells in Ascomycotina fertilised by a sexual process.

ASCOHYMENIAL Ascomycotina having asci and paraphyses arranged in a hymenium, as in pyrenomycetes and discomycetes.

ASCOLICHEN, ASCOMYCETE

ASCOLOCULAR Ascomycotina having asci in cavities, as in loculoascomycetes.

ASCOMA (-ATA) a sporocarp having asci.

ASCOMYCOTINA, ASCOMYCETES class of fungi in which spores are developed in asci.

ASCOPHORE 1) an ascus-producing hypha in an ascocarp; 2) apothecium (term used by Massee).

ASCOSPORE spore produced in an ascus (by "free cell formation").

ASCUS (ASCI) sac-like vessel or cell (20-100 um long) of the perfect state of an ascomycete, containing one or more (most often 8) sexually produced fungal spores

ASCYPHOUS without a cup

ASEPTATE lacking cross walls (septa).

ASPICILIOID (of lecanorine apothecia) more or less immersed in thallus, at least when young, as in the genus *Aspicilia*.

ASSIMILATIVE having to do with growth before reproduction; non-reproductive; vegetative.

ASSOCIATION term used in phytosociology; also used to refer to the lichen symbiosis.

ATTACHMENT ORGAN rhizine

ATTENUATED gradually tapering or narrowed.

ATYPICAL not normal.

AUSTRAL southern, especially referring to the Southern Hemisphere; corresponds to Boreal in the Northern Hemisphere.

AUTHENTIC (of specimens), identified by the author of the name of the taxon to which they were originally referred (but not necessarily part of the type collection).

AUTONOMOUS independent, separate (e.g., autonomous isidia are ones not produced from or associated with soredia or soralia).

AXIAL BODY, AXIAL MASS

AXIL notch (angle or point of divergence) between two branches or lobes, or between a branch and the axis from which it springs; in fruticose lichens the upper angle between branches, which may be closed (imperforate, sometimes cracked open due to age or handling) or open (perforate from the beginning); non-technically referred to (in dubious taste) as a "crotch".

AXIS (AXES) central longitudinal support; 1) the main trunk or stem of an abundantly branching thallus; 2) in *Usnea*, the cartilaginous (chondroid) central core running through the thallus filaments.

BACILLIFORM like a short rod; generally very small, with rounded ends.

BALL-TIPPED RHIZINE type having a swollen, globose tip

BARBATE having one or more groups of hairs; bearded (generally applied to growth forms of *Usnea* in which the thallus is pendulous, with abundant branches and usually also fibrils).

BARE 1) epruinose; 2) without hairs, tomentum, squamules, etc.

BASAL CELL conidiogenous cell (basidium) in a fulcrum (interpreted as producing conidia)

BASAL DISC, BASAL HOLDFAST the single disc-like basal part by which a thallus is attached to the substratum; see fixation disc

BASE

BASIC ROCKS rocks containing either calcium (calcareous rocks) or magnesium (ultramafic rocks).

BASIDIOCARP basidium-bearing organ of Basidiomycotina.

BASIDIOMA (BASIDIOMATA) basidium-containing structure.

BASIDIOMYCOTINGA, BASIDIOMYCETE, BASIDIOLICHEN class of fungi in which spores develop on basidia.

BASIDIOSPORE spores from a basidium.

BASIDIUM (BASIDIA) 1) inflated hyphal segment (microscopic clavate body) which, after karyogamy and meiosis, bears basidiospores at the tip; 2) also formerly applied to the basal cells of spore-bearing structures in pycnidia (intepreted as bearing conidia) in ascomycetous fungi or lichens

BASIONYM in nomenclature, the name- or epithet- bearing synonym on which a new transfer or new combination is based, generally the earliest name published for the taxon.

BASIPETAL development in the direction of the base, i.e., the apical part is oldest.

BAYONET-LIKE STERIGMA rather elongated and tapering or pointed spore-bearing process (in a pycnidium)

BEAK (of a perithecium or pycnidium), an elongated neck through which the spores are discharged.

BEARD LICHEN, BEARD MOSS species of *Alectoria*, *Bryoria*, or *Usnea*.

BI- usually, having or consisting of two of something

BIATORINE (of lichen apothecia) of lecideine type s. lato (lacking algae), but the disc (epihymenium) and margin (excipulum) pale or more or less colored, soft in consistency (not carbonized), and often strongly convex.

BICORNUTE curved and drawn into two points

BIFURCATE divided into two branches (also see FURCATE)

BIFUSIFORM rod-shaped with minute swellings near but at each end.

BIGUTTULATE containing two oil drops or droplets (usually of contents of a simple spore).

BILATERAL concerning both sides

BILOCULATE, BILOCULAR divided into two compartments, as a 2-celled spore.

BIPOLAR 1) occurring in both Arctic and Antarctic regions, but disjunct to various degrees between the polar regions; 2) at the two ends (poles) of a spore.

BISERIAL, BISERIATE.. arranged in two rows, as spores in an ascus.

BITUNICATE with two functional ascus wall layers (separating to show endoascus and exoascus); called fissitunicate by some authors; found in the Loculascmycetes.

BIVALVE DEHISCENCEa type found in *Pertusaria*, in which the ascus tip bursts open like a clam.

BLASTENIOSPORE a polarilocular (q.v.) lichen spore.

BLASTIC condition in which a pycnosporangium initial enlarge before a septum forms between it and the cell bearing it.

BLASTIDIUM (BLASTIDIA) 1) small subsidiary locule in a thick-walled spore; 2) vegetative propagule containing mycobiont and photobiont, produced by yeast-like

	"budding" (often in series of two or more, with each new one produced from the tip of the previous one)
B-LAYER	thin layer of the outer wall of an ascus, between the a- layer (to the outside) and c-layer (to the inside).
BOREAL	pertaining to the circumpolar bioclimatic zone, also called the northern coniferous zone or taiga, in the Northern Hemisphere.
BOTRYOID, BOTRYOSE	with rounded clusters like bunches of grapes
BRACHY- (prefix).....	short
BRANCHLET	
BREATHING PORE	a non-technical term used especially for a pseudocyphellum.
BROADLY ELLIPSOID/ELLIPSOIDAL	Length: width = 1.15-1.3
BRYOPHILOUS	growing on mosses and liverworts.
BULBATE	with a bulbous swelling; globose with a narrow, tapering neck, as in cilia in some Parmelioid lichens.
BULLA	a delimited convexity resembling a blister.
BULLATE	1) strongly convex and swollen, almost globular (applied to areoles, generally coarser and more constricted at the base than verrucae, and usually with a loose to almost hollow medulla); 2) with surface with bubble-like or blister-like swellings or puckerings, as in <i>Lasallia</i> ; 3) having a rounded projection at the center.
BUSHLIKE	non-technical term meaning in the form of a bush or shrub, i.e., (in the sense of Taylor) many axes of more or less equal size arising from a single base, or from the same spot on the substrate, usually without a distinct main axis; caespitose.
BYSSOID	cottony, composed of delicate threads, floccose.
CA.	abbreviation for circa, meaning approximately
CAESPITOSE	growing in dense low tufts, tufted; forming cushions; shrublike.
CALCAREOUS ROCK	limestone or other rocks containing calcium or lime (calcium carbonate), with pH over 7, vigorously bubbling when treated by a strong acid (usually 10% HCl); must be distinguished from non-calcareous rocks that have an external coating or calcareous material.
CALCICOLOUS	growing on calcareous substrates.
CALCIPHILE	a plant that grows (preferentially) on calcareous substrates
CALCIPHOB	a plant that does not occur on substrates containing or exposed to significant amounts of calcium.
CANALICULATE	longitudinally channelled or grooved.
CANALS	1) in some <i>Pertusaria</i> spores, fine lines or channels in or within the outer or inner spore walls, and communicating with the spore lumina; 2) in polarilocular spores, isthmus (pore or tube) connecting the locules.
CAPILLARY	hair-like.
CAPITATE	swollen like a head, knob-like, as in soralia, and tips of paraphyses.
CAPITULUM	the expanded head-like terminal part of the ascocarp on its stalk in the Caliciales.
CARBONACEOUS, CARBONIZED	black, opaque (usually matt), usually brittle, friable
CARIOSE	appearing decayed, usually with irregular fissures
CARPOCENTRUM	

CARTILAGINEOUS..... somewhat stiff, firm and tough but readily bent, gristly (as in gristle in meat); as applied to tissues, also implies translucent, and is referred to as chondroid.

CARTILAGINOUS LAYER sometimes applied to the stereome in *Cladonia* and the chondroid axis in *Usnea*.

CATENULATE..... linked together in a chain

CAULESCENT having or developing a stem

CAVERNOSE having hollows or cavities

CAVERNULA cavity, especially the cavities in the lower cortex of *Cavernularia*

CAVITY 1) a hollow area; 2) the inside of a pycnidium

CENTRIFUGAL from the center outwards

CENTRUM..... the structures within an ascocarp.

CEPHALODIUM (CEPHALODIA) small (to ca. 0.5-1 mm), delimited, gall-like thallus structure (or tiny thallus) containing a second photobiont, usually a cyanobacterium, on or within thalli containing a green photobiont; found in diverse genera, including *Peltigera*, *Lobaria*, *Stereocaulon*, and *Placopsis*.

CEREBRIFORM brain-like, convoluted.

CESPITOSE see caespitose

CF. abbreviation for *confrere*, literally meaning closely related, but often used loosely to express uncertainty about an identification.

CHAFFY.....

CHALKY

CHANNELED grooved, as in the lower surface of *Pseudevernia*

CHEMICAL RACE a group of chemically differentiated individuals or populations, not of any particular taxonomic rank.

CHEMICAL STRAIN an informal infraspecific rank used for populations distinguished only by chemical characters

CHEMODEME group of chemically differentiated individuals of a species, of unknown or of no taxonomic significance.

CHEMOSPECIES

CHEMOSYNDROME a biogenetically meaningful set of major and minor natural metabolic products produced by a species.

CHEMOTYPE a group of chemically differentiated individuals of a species of unknown or of no taxonomic significance (same as chemodeme).

CHINKY cracked and fissured; rimose.

CHIONOPHILOUS = nitrophilous

CHONDROID AXIS..... the elastic, cartilaginous central cord in the genus *Usnea*

CHONDROID STRANDS

CHONDROID like cartilage, tough and more or less translucent, often with a shiny cut surface.

CHROMATOGRAPHY... physico-chemical technique for the identification of metabolic and other chemical products.

CHRYSOGONIDIA photobiont cells of *Trentepohlia* (obsolete)

CILIATE..... having cilia (by either definition below).

CILIUM (CILIA) short, eyelash-like hair; 1) longish-acute hair-like outgrowth, from the margin or upper surface of lobes or on the margin of the apothecium,

consisting of compact strands of hyphae; 2) rhizine-like growth on the margin, visible with the naked eye (sometimes called marginal rhizines).

CINEREOUS..... ashy colored (gray)

CIRCUMPOLAR..... used of a species occurring in a broad latitudinal zone in Arctic and Subarctic, or Antarctic and Subantarctic regions.

CITRINE lemon yellow.

CLADONIFORM consisting of a crustose to squamulose primary thallus and an erect, stalked secondary thallus of podetia (as in *Cladonia*) or pseudopodetia (as in *Pilophorus*).

CLATHRATE like a network, latticed.

CLAVARIOID club-shaped to coralloid, having the appearance of a *Clavaria* (genus in the Basidiomycotina).

CLAVATE, CLAVIFORM club-shaped, with the further end larger than the nearer.

C-LAYER thick, inner layer of the outer wall of an ascus, inside the b-layer and outside the d-layer

CLYPEATE..... having a clypeus.

CLYPEUS..... a shield-like stromatic growth, composed of fungal hyphae and host tissue, around the ostiole of an ascocarp.

COALESCE..... fuse together, as several thalli merging into a single large colony.

COCCOID organized in small, more or less spherical groups

COCHLEATE shell-like, i.e., somewhat concave, shaped more or less like a mussel (but usually relatively broader)

COHERENT.....

COLE-, COLICOLOUS- . (suffix) living on; inhabiting

COLONY a group of lichen thalli of the same species growing together.

COLUMELLA a sterile central axis within a mature fruit body

COLUMNAR ISIDIA tall (over 5 mm) unbranched or furcate isidia in which compaction and lateral fusion may lead to loss of the usual cylindrical form; e.g., in *Pertusaria* spp.

COMMUNITY loosely used to refer to any phytosociological taxon, i.e. group of plant species in Nature

COMPLANATE..... flattened; may also imply smooth.

COMPLEX sometimes used to designated a group of closely related species, usually ones that are very difficult to distinguish from each other

COMPLICATE folded, bent upon itself.

COMPOUND..... made up of a number of parts

COMPRESSED..... (of a stipe) flattened transversely

CONCAVE hollowed out, basin-like.

CONCENTRIC arranged around a common center, often forming rings one outside the other.

CONCEPTACLE..... any hollow structure producing spores or spermatia

CONCEPTACULUM the wall of a pycnidium or spermogonium

CONCOLOROUS..... of the same color.

CONCRESCENT becoming joined.

CONE CORTEX.....

CONFLUENT running together, blending, united; as applied to rhizines, means that each rhizine is composed of groups of parallel, elongated hyphae, which are united but still somewhat distinct, giving a fibrous appearance to the outside.

CONGENERIC belongint to the same genus.

CONGESTED crowded.

CONGLOMERATE clustered.

CONGLUTINATE..... glued or stuck together, referring to fungal tissues, and especially to paraphyses.

CONIDANGE..... a small lichen pycnidium having "no stout wall" (des Abbayes)

CONIDANGIUM a pycnidium, interpreted as producing asexual spores (conidia).

CONIDIOGENOUS CELL any fungal cell from which, or within which, a conidium is directly produced; in ascomycetes, the term is generally synonymous with "basidium"; neutral terms are pycnide and sporogenous cell

CONIDIOMA (COMIDIOMATA) multi-hyphal, conidium-containing structure; another term for conidiangium

CONIDIOPHORE a simple or branched hypa bearing conidiogenous cells from which conidia are produced; the conidiogenous cell

CONIDIUM, CONIDIOSPORE asexual spore

CONSISTENCY..... the overall internal appearance and texture of the thallus, especially as related to its response to handling, sectioning, or moistening; reflects anatomical properties (e.g., relative thickness and fragility of the tissues, degree of gelatinization, or amount of inspersion with various kinds of granules); although subjective and relative, it is often a useful characteristic.

CONSPECIFIC belonging to the same species.

CONTEXTUAL of the tissue lying between the hymenial layer and the upper surface in a basidiocarp.

CONTIGUOUS touching or in close contact along most of the length, scarcely or not at all overlapping, "except for raised edges following the marginal lines" (Taylor); generally implying not fused or joined; applied to areoles, squamules, or lobes.

CONTINUOUS more or less unbroken, uninterrupted, as in a cortex without pores or cracks.

CONTORTED..... irregularly twisted or bent into irregular curves

CONVEX "equally rounded, broadly obtuse" (Galloway)

CONVOLUTE.....

COPROPHILOUS

CORALLIFORM.....

CORALLOID..... divided up into many short, irregular cylindrical branches, like coral; often brittle; a) having or being composed of such outgrowths; b) a type of isidium or phyllocladium having this form; in *Pertusaria*, they are tall (over 5 mm), dichotomous or monopodially branched, with numerous, short, esorediate ramifications that resemble the much small ecorticate isidioid soredia formed by soralia.

CORD..... a dense strand of hyphae, as in the center of branches of *Usnea*.

CORIACEOUS leathery and not easily broken or crumbled.

CORNICULATE.....

CORNUTE..... like a cow's horn.

CORONA..... crown-like radiating structure.

CORONATE crowned; of an apothecium; 1) bearing cilia on the thalline margin; 2) having the apothecium surrounded by lobes of thallus.

CORPUS.....

CORRUGATE, CORRUGATED wrinkled.

CORTEX outermost layer of the thallus (and of lecanorine apothecial margins) which, if present, in the true sense consists of compacted hyphae which may appear either fibrous or cellular, sometimes gelatinized; relatively hard and tough, protective in function; used loosely to include superficially similar outer layers; also used sometimes for the wall of a pycnidium.

CORTEX-RHIZINES.....

CORTICATE having a cortex (or cortex-like layer).

CORTICATED MEDULLA-RHIZINE

CORTICOLOUS..... growing on the bark of trees or shrubs.

CORYMBOSE clustered; arranged in clusters, with branches coming up to the same general level.

COSTATE veined or ribbed.

CRACKED breaking open in lines or chinks, sometimes exposing the medulla; often irregular and due to age, but sometimes regular and characteristic of a taxon.

CRATERIFORM..... cup- or crater-like in form

CRENATE of a wavy margin with rounded projections (or teeth) separated by notches (sinus acute); scalloped (as in the edge of a scallop shell).

CRENULATE diminutive of crenate.

CRETACEOUS..... chalky in consistency, due to abundant calcareous particles.

CRISPED..... of a margin crumpled or thrown into waves.

CROTTL Scottish term for many lichens (obsolete); often used collectively

CROWDED BACK.....

CROWDED having a great number of parts close together and usually overlapping or overgrowing each other; often (especially as applied to parts of areolate or placodioid thalli, or to apothecia), producing distortion of outline, surface, or orientation, or wrinkling and bunching up towards the center of the thallus or apothecium, because of growth pressures.

CROZIER..... the hook of an ascogenous hypha before ascus-development.

CRUSTACEOUS, CRUSTOSE thallus type forming a strongly adherent crust over the substrate (in intimate contact with the substrate), without a lower cortex, rhizines, or umbilicus; often without a distinct or true upper cortex; usually not removable intact (without tearing, or removing part of the substrate as well).

CRYPTOTHALLINE

CRYPTOLECANORINE. with a reduced or inapparent thalline margin (of an ascocarp).

CUCULATE forming an almost tubular structure opening along one side, as in *Cetraria cucullata*.

CUDBEAR..... *Ochrolechia tartarea*, used in dyeing yarn

CUFF-SHAPED SORALIUM

CUNEATE wedge shaped, thinner at one end than the other.

CUP scyphus in *Cladonia*

CUPULAR EXCIPULUM

CUPULAR, CUPULATE . like a cup.

CUSHION-FORMING.....

CYANOBACTERIUM an organism related to true bacteria and belonging to the Kingdom Monera (prokaryotes, lacking a nucleus and chloroplasts); formerly called Cyanophyta or blue-green algae.

CYANOLICHEN

CYANOPHILIC, CYANOPHILOUS

CYANOTROPHIC

CYLINDRICAL

CYMOSE in a sequence one above the other, the youngest at the top

CYPHELLA (CYPHELLAE) a pore recessed into the lower surface of the thallus (a break in the lower cortex), sharply bounded, concave, cup-like, rounded or ovate or effigurate, lined with a "pseudocortex" (of loosely connected, non-gelatinized hyphae, with frequently globular cells, formed from the medulla) distinct from the lower cortex, and surrounded by a pale ring; known only in the genus *Sticta* (or also *Oropogon* according to Ainsworth & Bisby, 6th ed.).

DACRYOID teardrop-like

DACTYL a nodular to cylindrical or clavate body, somewhat resembling a swollen isidium, bounded by a cortex, often opening at the apex to expose the medulla, sometimes producing soredia from the inner surface.

DACTYLIDIA finger-like structures that develop from parasoredia, e.g., in *Hypogymnia farinacea* (Poelt, 1992--talk at IAL meetings, Lund).

DACTYLIFORM, DACTYLOID finger-like

DECORTICATE, DECORTICATED with cortex or bark removed (fallen away or decomposed).

DECUMBENT resting flat on the substratum, usually with the ends turned up.

DECURRENT descending the stem.

DECUSSATE (of lichen thalli) having the surface divided and crossed by dark lines

DEFLEXED bent sharply downward.

DEHISCENCE the mechanism or process of opening when mature, in lichens applied only to asci

DELIMITED having a distinct restricting edge, margin, or boundary.

DELIQUESCENT shrublike branching (e.g., in *Usnea*), in which a main stem exists towards the base of the thallus but loses itself towards the apex by repeated branching

DENDRITIC, DENDROID irregularly branched in all directions from a central trunk, like a tree.

DENDROMORPHIC tree-like, applied to the branching of rhizines

DENSE set close together, compact, often closely interwoven; having the branches or hyphae massed and crowded, (as opposed to diffuse, or loose)

DENTATE an appearance of projecting teeth; a toothed edge.

DENTICULATE diminutive of dentate.

DEPAUPERATE poorly developed

DEPENDENT hanging down

DEPRESSED having the middle lower than the edge

DEPSIDE a type of lichen product

DEPSIDONE a type of lichen product

DERMIS the limiting layer of a thallus (i.e., the cortex) (obsol.)

DETERMINATE having a distinct, defined form.

DIAGNOSIS a usually rather brief account, usually the first, of the essential distinguishing characteristics of a taxon

DIASPORE	any propagule for dissemination (sexual or asexual); in lichens particularly applied to vegetative propagules.
DICARPOUS	with two ascocarps; usually refers to two apothecia per fruit wart in <i>Pertusaria</i> .
DICHOTOMOUS	branched or divided in pairs, usually into two more or less equal portions as in the letter "Y", sometimes repeatedly; forked.
DIFFRACT	cracked or broken into small areas, areolate; usually implies that the areoles are angular and sharp-edged, with the cracks deep and distinct.
DIFFUSE	scattered and without any definite pattern, as in diffuse soredia; widely and loosely spreading, with no distinct margin.
DIGITATE	shaped like or arranged like fingers.
DILACERATE	appearing torn
DIMIDIATE	1) applied to a perithecium when excipulum or (more frequently) the outer wall (involucrellum) covers only the upper portion of the ascocarp (in section the wall appears as two dark lateral areas in the upper part); 2) appearing to lack one half or having one half very much smaller than the other (of a compound ascocarp).
DIMORPHIC	having two forms.
DIMPLE	
DISC, DISK	exposed upper surface of the hymenium in an apothecium, concave to plane or convex, usually pigmented in a characteristic way, often surrounded by a margin or rim; visible by the unaided eye or under low magnification (e.g., 20X).
DISCIFORM	round and flat, e.g., as applied to apothecia in <i>Pertusaria</i> spp.
DISCOCARP	apothecium; ascocarp in which hymenium is uncovered when asci and ascospores are mature.
DISCOID	flat and more or less circular, disc-like or plate-like.
DISCOMYCETE, DISCOLICHEN	
DISCOPODIAN STAGE..	
DISCOPODIUM	
DISCOSTROMIUM	
DISCRETE	separate and distinct, not joined, as lobes or thalli, or loose, as in paraphyses.
DISJUNCT	not joined, set apart; of a population, of a species widely separated geographically or otherwise from other populations of the same species.
DISPERSED	pertaining to a thallus which consists of scattered small subunits.
DISSECTED	deeply and finely (relative to the overall width) divided or cut up, into many lobes or lobules.
DISTAL	situated away from the center of a body, or from the point of origin; terminal.
DISTICHOUS	1) (of spores) having a large oil drop in each half of the cell, giving the spore the appearance of being two-celled; 2) in two lines
DIVARICATE	divergent at right angles
DIVERGENT	growing away from each other, spreading apart, usually at a rather wide angle; generally applied to lobes or branches.
D-LAYER	layer of the ascus just inside the C-layer
DORSAL	back or upper surface; surface facing away from the axis; frequently applied to the upper surface of foliose lichens.

DORSIVENTRAL having distinct upper and lower surfaces that are different from each other.

DOWNY

DRUSE a stellate cluster of large crystals in a lichen thallus

DULL = matt

E-, EX- (prefix) from; out of; without; not having. See ex.

ECCENTRIC one-sided; (of a stipe), at one side or not in the center.

ECHINATE (especially of spores), having sharply pointed spines.

ECHINULATE diminutive of echinate

ECILIATE lacking cilia.

ECORTICATE without a cortex or bark, and never having one; appearing fibrous or
cobwebby.

ECOTYPE part of a population of a species showing morphological, chemical, or
physiological characteristics which appear to be genetically determined and
correlated with particular ecological conditions, but which are not considered
of taxonomic significance.

ECTAL EXCIPULUM

EDGE David Howell Evans

EFFIGURATE 1) without a defined form, grossly irregular (for example not ovoid)
(Rogers); 2) having a definite form or figure, not effuse (Galloway;
Swinscow & Krog); 3) radiating at the periphery; used by some authors to
include obscurely or even distinctly rosulate or lobate crustose (placodioid)
thalli, with elongated marginal lobes. Fig.: Ahmadjian & Hale p. 22

EFFLORESCENT bursting out of

EFFUSE pertaining to a thallus having no definite boundaries; stretched out flat,
especially as a film-like growth.

ELLIPSOID, ELLIPSOIDAL of a solid object (e.g., a spore) appearing approximately elliptical in
longitudinal section (L:W = 1.3-1.6).

ELLIPTICAL oval or oblong narrowed at each end.

ELONGATE considerably longer than wide

EMACULATE without spots or dots.

EMBROWN darken from exposure to the sun

EMERGENT of ascocarps, projecting partly above the substrate; semi-immersed

EMERSED of perithecia, having only the lower third immersed in the thallus or
substrate.

ENDEMIC occurring only in (and indigenous to) a single, usually small, geographic
area.

ENDO- (prefix) inside.

ENDOASCUS inner layer of a bitunicate ascus

ENDOBASIDIAL fulcrum type normally with short cells and producing lateral (pleurogenous,
intercalary) pycnosporos (interpreted as conidia), usually from short
projections or secondary branches (Steiner); usually producing bacilliform
pycnosporos.

ENDOCARPINOID (of perithecia) sunk into the tissues of the thallus, as in *Endocarpon*

ENDOGONIDIUM a gonidium (photobiont) "having its development inside a receptacle or
gonidangium"

- ENDOLITHIC**..... growing "within" rocks, i.e., under and around the rock crystals, often with little or no thallus visible on the outer rock surface.
- ENDOPHLOEDAL, ENDOPHLOIC** within bark.
- ENDOSPORE**..... inner wall of a spore
- ENDOSUBSTRATIC** growing within the substrate.
- ENDOTUNICA** inner layer of a bitunicate ascus
- ENTEROBLASTIC** conidia in the formation of which the existing inner or neither wall layer of the conidiogenous cells is not directly involved; formed from the inside.
- ENTIRE** smooth and unbroken, continuous, without notches, lobes or teeth, as in margins of lobes or apothecia; in apothecial margins also implies that the apothecia are rounded (i.e., the margin is not flexuous or sinuous); in perithecia, the term means that the excipulum or involucrellum completely surrounds the perithecium.
- ENVELOPE**.....
- EPI-** (prefix) upon
- EPIGEAL, EPIGEAN** growing on the ground; Ainsworth & Bisby (sixth edition) state that in lichen the term means not attached to any substrate but blowing about on the surface of the ground (i.e., vagrant or wandering)
- EPIHYMENIUM** indistinctly delimited uppermost portion of the hymenium, where this differs in appearance from lower part; usually pigmented (often on the swollen tips of the paraphyses) and sometimes interspersed with tiny granules; not a distinct tissue; generally narrow (3-15 µm), but sometimes with granules penetrating much deeper into the hymenium. Some authors (e.g., Corner, 1950) use the term for a thin layer of interwoven hyphae on the surface of the hymenium (i.e., the same definition given below for epithecium).
- EPIILITHIC** on surface of rock, with little or no penetration between and under the rock particles.
- EPINECRAL LAYER**..... a layer of dead, decomposing hyphae, usually appearing hyaline, gelatinous and amorphous, on top of the cortex or pseudocortex
- EPINECRAL LAYER**..... horny dead fungal hyphae with indistinct lumina (see discussion under NECRAL LAYER); also referred to as the amorphous layer.
- EPIPHLOEDAL, EPIPHLOIC** on surface of bark, with little or no penetration below the outermost layer.
- EPIPHYLLOUS**..... on surface (usually upper) of leaves of vascular plants, the mycobiont not penetrating the leaf surface.
- EPIPHYTE** a plant growing on another (usually living) but not organically connected to it (i.e., not parasitic or saprophytic on it, but deriving its moisture and nutrients from the air and precipitation).
- EPIPLASM**..... the main inside part of an ascus, where the spores develop.
- EPIPSAMMA**..... 1) granular material associated with the epihymenium (on top of it, within it, or both); 2) granular zone (usually pigmented) permeating upper parts of hymenium but more or less distinct from epithecium, especially in *Rhizocarpon*
- EPISPORE**..... a transparent gelatinous outer covering, often irregular in thickness, generally thin, surrounding the ascospores of many lichens; often called a "halo"; some authors use it to refer to an outer layer of the spore wall; Purvis, et al define it

- as the fundamental and often outer wall of a spore which determines its shape. Compare with PERISPORE.
- EPISUBSTRATIC** growing upon substrate.
- EPITHECIUM** the layer above the asci, formed by the tips of the paraphyses; in the strict sense (according to Poelt, pers. comm.), a distinct tissue (plectenchyma) of interwoven hyphae on top of hymenium; often (e.g., by Purvis, et al.) confused with or used interchangeably with epihymenium; according to Ainsworth & Bisby, can also mean "the surface of the disc in some discomycetes". In my keys and descriptions I have generally used epihymenium, except in the few cases where I know that the strict sense applies, but I have not been entirely consistent about this.
- EPITHET** the second (specific) part of a Latin binomial of a plant species (= the "trivial" name of the zoologist); also the third or fourth (varietal, etc.) term.
- EPIXYLIC, EPIXYLOUS** living on the surface of wood.
- EPRUINOSE** without pruina.
- ERECT** rising vertically from the substrate or surface (straight, not curved up); as applied to overall growth form, the thallus and lobes grow away from the substrate tending towards the perpendiclar; attached only by a few, more or less centered, contact points; rhizines, if present, only at contact points or along margins.
- ERODED**
- EROSE** 1) eroded; 2) delicate, usually irregular, tooth-like projections from the edge (appearing as if bitten or gnawed)
- ERRATIC** not fixed to the substratum; epigaeic; used by some authors in a more restricted sense, to refer to individuals or populations growing (or at least lying) loosely on the ground but belonging to species that are normally firmly attached to solid substrates, and not evolved into distinct taxa.
- ERUMPENT** bursting through surface; applied to soredia or ascocarps.
- ESEPTATE** = aseptate
- ESOREDIAE** lacking soredia.
- EU-** (prefix) true
- EUAMYLOID** thin outermost layer of the ascus I+ blue
- EUCARPIC** having only part of the thallus used for the fructification (sporocarp).
- EUCORTEX** a true cortex, formed of "well differentiated tissue" (Ainsworth & Bisby); in the sense of Poelt (1958), a tissue composed entirely of fungal cells, without dead algae, and formed from a cambium-like layer within or just above the algal layer.
- EUGONIDIUM** a bright green lichen photobiont (e.g., *Trebouxia*) (obsol.)
- EULECANORINE**
- EUPERTUSARIATE** in *Pertusaria*, pertaining to fruit warts which are more or less constricted at the base.
- EUTHYPLECTENCHYMA** hyphal tissue having no "cellular" structure (i.e., not composed of conglutinate cells) (Degelius); with the hyphae more or less parallel to the surface; see prosoplectenchyma
- EUTROPHIC** nutrient-enriched (correctly applied to water, but often applied by lichenologists to bark or other substrates).

- EVANESCENT** disappearing at maturity, as in the primary thallus of some Cladonias; usually applies soon disappearing, lasting a short time.
- EVERSIBLE APICAL RING**
- EVERSION-TYPE DEHISCENCE**
- EX**..... 1) in citations of authors (e.g., Pers. *ex* Fr.), from, i.e., first validly published by the second author; 2) (prefix), see e-.
- EXCAVATE** hollowed out; concave.
- EXCIPLE, EXCIPULUM** 1) the cup-shaped or ring-shaped layer surrounding the hymenium which sometimes develops into a distinct margin (used by many authors in describing the external margin as well as internal structure); in the broadest sense includes the parathecium and hypothecium; 2) an area in an apothecium external to and below the hypothecium in lecideine or biatorine apothecia and internal to the amphithecium in lecanorine or zeorine apothecia; in this narrow sense is more or less equivalent to "parathecium"; restricted by some authors to the lateral part; 3) the inner (or only) wall of a perithecium, lirella, or pycnidium, generally circular in cross section; can be hyaline, pigmented, or carbonaceous.
- EXCIPULOID TISSUE**.... tissue forming the walls or margins of ascolocular ascocarps (especially in *Micarea* and *Arthonia*), similar in appearance and position to the true exciple of lecideine apothecia.
- EXCIPULUM PROPRIUM** see proper exciple
- EXCIPULUM THALLINUM** see thalline exciple
- EXCLUDED** shut out, eliminated; applied to proper or thalline margin of a discocarp when the disc swells, causing the margin to be obliterated; crowded back.
- EXCURRENT** treelike branching (e.g., in *Usnea*), in which the main axis runs through to the apex
- EXFOLIATING** losing outer cortex through peeling or cracking; also used to describe rock surfaces.
- EXO-** (prefix) outside.
- EXOBASIDIAL**..... fulcrum type normally with long cells producing terminal (acrogenous) pycnospores (interpreted as conidia), not on secondary branches (Steiner); often producing filiform pycnospores
- EXOSPORE; EXOSPORIUM** a coat outside the spore proper, often thick and hyaline, sometimes of irregular shape or ornamented.
- EXOTIC**..... of another country; not native.
- EXOTUNICA** outer layer of a bitunicate ascus
- EXPANDED** broadened or extended; spread out, as the thallus of large foliose lichens, or the discs of apothecia.
- EXPANSIBLE INNER LAYER** endoascus sensu Luttrell (1951).
- EXSICCATA (-AE)** a set of dried specimens (usually with a number for each member of the set), with multiples of the set distributed to major herbaria and generally cited in taxonomic revisions; preferred abbreviation, Exsicc. (according to Ainsworth & Bisby); usually (and preferably), all the multiple specimens of a particular number are collected at the same place and time, and ideally are very similar to each other.

EXSICCATUM (-A) a dried specimen, usually part of a set (see *exsiccata*, below). The spelling "exsiccati" is often used to refer either to the specimens within a set, or to two or more sets, but is grammatically incorrect. "Exsiccat" is an Anglicized form of the original Latin-derived word.

FABIFORM..... bean-shaped (like kidney-beans, curved).

FACULTATIVE sometimes; not necessarily; not obligate (q.v.).

FALCATE, FALCIFORM bending in one direction, scythe- or sickle-shaped.

FALSE ISIDIA as used by Taylor, isidia-like structures arising primarily as regeneration structures after damage to the thallus; sometimes called "regeneration squamules or lobes"; in this sense not necessarily the same as pseudoisidia.

FARINACEOUS, FARINOSE mealy, finely powdery, like flour, usually referring to very minute and "soft" soredia, but sometimes applied to densely pruinose surfaces.

FASCICLE a close bundle or cluster

FASICULATE growing in fascicles.

FASTIGIATE having parallel, massed upright branches; of lichen cortex, made up of parallel hyphae at right angles to axis of thallus surface; cf. fibrous cortex

FAVEOLATE, FAVEOLOSE honeycombed; alveolate. Compare FOVEOLATE.

FEDERATION a term used in phytosociology.

FENESTRATE 1) with small perforations; with open areas or slits; with "windows" 2) (of spores), muriform

FERTILE HYPHA see conidiophore

FERTILIZATION the fusion of sex nuclei

FESTOONING hanging or draping from

FIBRIL 1) in *Usnea*, a short, slender, fully grown lateral branch, usually over 3 mm long but seldom over 1 cm long, more or less perpendicular to the branch on which it grows; distinct from a branchlet, which is a small juvenile branch (also see "spinule"); 2) a slender filament, consisting of united hyphae using occurring on the margin of the thallus (cf. cilium).

FIBRILLOSE 1) having fibrils; 2) covered with silk-like fibers

FIBROSE

FIBROUS composed of fibers, loosely woven distinct hyphae which run more or less parallel to the long axis of the lobe or branch, as in the cortex of *Anaptychia*, best seen under a microscope; cf. fastigiate cortex; sometimes also applied to an ecorticate surface with randomly oriented hyphae (see arachnoid).

FILAMENTOUS 1) hair- or thread-like; a growth form composed of thin hair-like strands of mycobiont and photobiont, as in *Coenogonium* and *Ephebe*; usually the photobiont gives most of the bulk and shape to the lichen, and is surrounded by hyphae or cells of the mycobiont; 2) vinelike branching (e.g., in *Usnea*), in which a short main stem is soon divided into subsymmetrical branches, from which secondary branches are grown by further dichotomy, becoming parallel to each other and often equipped with fibrils.

FILIFORM threadlike

FIMBRIATE fringed, edged, delicately toothed.

FIMBRILLATE diminutive of fimbriate.

FINE STRUCTURE = ultrastructure.

FISSITUNICATE ascus discharge involving the separation of wall layers (in bitunicate asci)

FISSURAL SORALIA..... soralia opening up by splits in the thallus, forming discrete, more or less oblong fusiform areas with the long axis parallel to the branch, e.g., in some *Bryoria* spp.

FISSURED..... cracked, split.

FISTULAR, FISTULOSE hollow, like a pipe

FIXATION DISC a flattened disc by which the base of a fruticose thallus is attached; if there is only one per thallus it is often called basal holdfast or basal disc.

FLABELLATE, FLABELLIFORM fan shaped, in the form of a semicircle.

FLACCID limp, flabby

FLAGELLIFORM..... like the lash of a whip, applied to very narrow and non-fibrillose branches of a fruticose lichen

FLEXUOSE, FLEXUOUS bending or curving in alternate directions, i.e., "zig-zag", but the bends more or less gradual and rounded, not angular; with a wavy outline, but in a horizontal plane (contrasted with undulate); applied to margins of thallus or its parts, or to apothecial margins (in the latter case often due to crowding).

FOLIACEOUS PHYLLOCLADIA flattened, usually somewhat crenate phyllocladia.

FOLIICOLOUS growing on leaves of vascular plants

FOLIOLE a small, dorsiventral, leaf-like appendage, usually on the upper surface of a foliose lichen.

FOLIOSE, FOLIACEOUS thallus form usually with upper and lower cortices, dorsiventral, flat and somewhat leaf-like; larger than the arbitrarily distinguished squamulose lobes (which are up to 5 mm long and wide); varying in its attachment to the substrate from almost completely adnate to umbilicate; removable intact from the substrate (but sometimes only with great difficulty)

FOOT

FORKED furcate

FORMICIFORM SORALIA soredia produced inside raised helmet-shaped structures on the tips of lobes, as in *Physcia adscendens*

FOVEATE pitted, usually of the upper surface of the thallus; honeycombed, with shallow depressions or lacunae separated by interconnecting ridges.

FOVEOLATE diminutive of foveate. Purvis, et al. define it as delicately pitted, whereas they define FAVEOLATE as honeycombed.

FRAGMENTATION REGIONS small sections of branches (e.g., in *Bryoria capillaris*) which are narrow, devoid of algae, and either colorless or blackened, and are weak points easily broken by twig movements or strong winds.

FRAGMENTATION vegetative reproduction of the thallus by the breaking off of bits of dry, fragile pieces

FREE CELL FORMATION the process by which the 8 nuclei, each with some adjacent cytoplasm, are cut off by walls in the immature ascus to become ascospores.

FRIABLE..... readily powdered, crumbling.

FRUIT WART..... a thalline wart (verruca) which contains one or more ascocarps, as in *Pertusaria*.

FRUIT, FRUIT BODY, FRUITING BODY, FRUCTIFICATION structure in which spores are produced by sexual means (meiosis and fertilization); sporocarp; see ascocarp and basidiocarp.

FRUTICOLOUS living on shrubs.

FRUTICOSE thallus form which is usually erect and stalked to rather bushy, shrub-like or tree-like, pendent and beard-like, or sometimes prostrate or irregularly oriented and becoming tangled; commonly terete and radially symmetrical but sometimes flattened and dorsiventral; stalks simple to richly branched, the branches of any length, filamentous to strap-like, attached to the substrate at a single point, or unattached; centers of branches hollow to dense. If developing from a primary thallus, referred to as cladoniiform. For lack of a better term, fruticose is also applied to globular to tubular vagrant thalli derived from crustose to foliose taxa.

FRUTICULOSE..... having a minutely shrubby habit (e.g., *Ephebe*, *Polychidium*)

FULCRUM specialized hyphal structure (sporophore) giving rise to pycnospores; Ainsworth & Bisby refer to it as a "conidiophore within a pycnidium", but it is a neutral term, which could mean either conidiophore or spermatophore depending on how the spores are interpreted.

FUNGAL, FUNGOUS having to do with fungi

FUNGUS a non-green (non-photosynthetic), non-vascular, non-flowering plant consisting of threadlike structures (hyphae)

FURCATE 1) regularly forked (often dichotomously, sometimes repeatedly), referring to branching patterns of lobes, podetia, rhizines, etc.; in foliose lichens the margins of the lobe tips are broadly V-shaped; 2) forked once or twice near the apex, in paraphyses.

FURFURACEOUS minutely chaffy or scurfy

FUSCOCAPITATE with a brown, inflated, usually rounded apex (usually of paraphyses)

FUSCOUS..... dusky, smoky, dark brown or gray-brown

FUSIFORM spindle-shaped (ellipsoid but more or less pointed or tapering at both ends), usually referring to spores.

FUZZY COAT layer of (often) amyloid gelatin on the outside of the sides of an ascus; where it thickens at the apex it is called the apical cap.

GELATIN

GELATINIZED, GELATINOUS like a jelly, rubbery, slimy, translucent, swelling when wet; in the gelatinous growth form the thallus is homeomerous (unstratified), and the distinctions among crustose, foliose and fruticose are often blurred.

GENICULATE..... bent like a knee joint (of branches), often with a subtending spur

GLABROUS 1) having a more or less smooth, shiny surface; 2) with no trace of tomentum or hairs.

GLAUDESCENT of a bluish green color

GLAUCOUS..... having a bluish gray (to whitish or grayish) color or overcast (resembling the waxy bloom of a plum)

GLEBOSE more or less rounded elevations of thallus surface.

GLEBULOSE..... having superficial rounded processes or cushion-like areoles.

GLOBOID, GLOBOSE, GLOBULAR, GLOBULOSE approximately spherical ($L:W = 1-1.05$).

GLOBULAR ISIDIA..... irregularly roundish, isodiametric isidia, e.g., in *Neofuscelia verruculifera*

GLOMERULATE.....

GLOMERULE, GLOMERULUS a clump or cluster (usually very dense); frequently used of clusters of photobiont cells.

GLYPHOLECINE..... having particularly labyrinth-like lirella, as in *Glypholecia*

GONIDIAL LAYER..... photobiont layer (obsolete)

GONIDIMIUM hymenial photobiont (obsolete)

GONIDIUM..... photobiont (obsolete)

GONIOCYST, GONIOCYSTULA 1) small aggregations of photobiont cells surrounded by hyphae forming a roundish structure which is not a soredium (because the photobiont is completely enclosed), e.g., the vegetative thallus of *Botrydina* spp., or structures produced in goniocystangia in some tropical foliicolous lichens; 2) discrete, more or less globular structures c. 12-40 µm diam., ecorticate granules consisting of photobiont cells intertwined and surrounded by short-celled hyphae, never protected by an amorphous covering layer (in *Micarea*);

GONIOCYSTANGIA.....

GRANULAR, GRANULATE, GRANULOSE 1) having, composed of, or covered by small particles (granules or granule-like particles); 2) pertaining to soredia, composed of particles large enough to be distinguished under a dissecting microscope, presenting a coarse appearance, not powdery; 3) of isidia (in *Pertusaria*), small (under 1 mm tall), soon eroding apically to become sorediate; basally corticate, secondarily developing as papillate to coralloid ecorticate isidoid soredia similar to those formed by soralia; contrast with globular isidia.

GRANULE..... rough, irregularly rounded grain-like structure; 1) in thalli, a spherical or nearly spherical particle, usually corticate (often indistinctly so); b) pertaining to chemical materials, any small regular or irregular particle, opaque or hyaline, found associated with various lichen tissues.

GRANULIFORM PHYLLOCLADIA roundish, granule-like, entire to weakly crenate phyllocladia

GRAPHIDIAN APOTHECIUM term used by Letrouit-Galinou (19 , Bryologist 71) for the kind of ascocarps found in the Graphidiales or Arthoniales, whether lirelliform or not.

GROSS coarse

GROWTH FORM habit

GUTTULATE (of spores) having one or more oil droplets inside.

GUTTULE small drop or drop-like spot in spores

GYMNOCARPIC, GYMNOCARPOUS (of a sporocarp) having the primordium and mature hymenium exposed (uncovered).

GYRATE, GYROSE..... curved to the back and to the front and to the front in turn (as in the top of a cinnamon bun); folded and wavy; convoluted like a brain; formed in a more or less circular or spiral pattern, appearing to be composed of concentric rings, or tightly spiralled; having a folded or ridged surface; usually referring to apothecia, particularly in *Umbilicaria*, which show the invasion of concentric (or radiating?) rows of sterile excipular tissue into the hymenium.

GYRI rolled ridges between grooves.

GYRODISC an apothecial disc which is furrowed (as though recently plowed).

HABIT growth form; overall appearance

HABITAT natural place of occurrence of an organism.

HAFTER..... flat attachment organs of some fruticose and foliose lichens (e.g., *Hypogymnia*)

HAIR fine multicellular outgrowths from the cortex, as in species of *Phaeophyscia*

HALINE..... found near the seashore.

HALO.....

HALONATE..... having a transparent coat (perispore) around it (of the outer layer of spores).

HAMATHECIUM a neutral term for all kinds of hyphae or other tissues between asci, or projecting into the locule or ostiole of an ascoma.

HAPTER, HAPTERON ... an aerial organ of attachment formed by the thallus in response to its contact with the substrate; formed in some fruticose lichens (*Alectoria*, *Bryoria*, *Usnea*) where a secondary branch becomes attached to substrate.

HAUSTORIUM..... a special hyphal branch, especially one within a living cell of the host, for absorption of nutrients.

HELICOID a type of anisotomous branching (e.g., in *Cladina*) in which branches arise on the undersides of the main lateral branches, and all lateral branches curve downward; differs from scorpioid in that the main lateral branches arise alternately from different sides of the main stem.

HELMET-SHAPED SORALIUM

HELOTISM..... the physiologic relation of photobiont to mycobiont

HEMIAMYLOID..... thin outermost layer of the ascus I+ red

HEMIANGIOCARPIC, HEMIOANGIOCARPOUS (of a sporocarp) opening before quite mature, and having an excipulum plus a pseudoexcipulum formed from thallus tissue during ontogeny; characteristic of Peltigeraceae and Stictaceae.

HEPATICOLOUS On liverworts.

HETEROCYST.....

HETEROMEROUS..... stratified; thallus form in which more or less distinct tissues (especially a definite algal layer) are present; having the mycobiont and photobiont components in well-marked layers, with photobiont in a more or less distinct zone between upper cortex and medulla. Note: this term has a different meaning in other branches of botany.

HETEROTYPIC SYNONYMS synonyms based on different nomenclatural types (taxonomic synonyms)

HIRSUTE hairy.

HISPID..... hairy

HOARY..... whitish or grayish; pruinose

HOLDFAST..... an expanded, sometimes disc-like, attachment of thallus to substrate; also used in a general sense to include rhizines or other rootlike structures which are not specialized for absorption.

HOLOBLASTIC..... conidia in the formation of which the existing wall layer of the conidiogenous cell is directly involved; formed from the whole.

HOLOTYPE..... the one single specimen or other single element used by an author or designated by him as the nomenclatural type of a taxon.

HOMIOMEROUS thallus form in which the photobiont (a cyanobacterium, usually *Nostoc*) and mycobiont components are uniformly dispersed or intermixed through most of the thallus, except for sometimes a thin cortex; hyphae mostly loosely woven, and photobiont cells more or less densely packed.

HOMOBIMUM..... a self-supporting association of a fungus and an alga, as in lichens.

HOMONYM..... a validly published name spelt exactly like another validly published name in the same rank but based on a different nomenclatural type.

HOMOTYPIC SYNONYM nomenclatural synonym.

- HORIZONTAL THALLUS** = crustose primary thallus
- HORMOCYST** a propagule or diospore composed of a few photobiont cells and fungal hyphae growing together in a chain-like manner and breaking into clumps, which arise in special hormocystangia; produced by a few gelatinous lichens, e.g., some species of *Lempholemma*. (See Degelius, 1945, Svensk bot. Tidskr. 39: 419; Henssen, 1969, Lichenologist 4: 99).
- HORMOCYSTANGIUM**. structure producing hormocysts.
- HUMICOLOUS** growing on soil (humus).
- HYALINE**..... + transparent (or at least translucent), like glass; frequently used in the sense of colorless.
- HYGROPHANOUS**..... having a water-soaked appearance when wet.
- HYGROSCOPIC** changing position or shape with a change in humidity.
- HYMENIAL ALGAE**..... (or gonidia) photobiont cells in the hymenium, e.g., in *Endocarpon* and *Staurothele*.
- HYMENIAL** pertaining to the hymenium.
- HYMENIUM**..... that part of the ascocarp composed of asci and paraphyses (or paraphysoid tissue) in a close arrangement; non-technically referred to as the "spore layer", or "spore-bearing layer".
- HYPHA** a microscopic filament of fungal cells, usually multicellular, making up the body of a fungus or fungal part of a lichen; usually with elongated cells and often with very thick, gelatinized walls which can be hyaline, pigmented, or sometimes carbonized.
- HYPHAL NET ("HYPHENFILZ")** organ of attachment in some squamulose or placodioid lichens (e.g., *Psora decipiens*) where a delicately branched, reticulate net penetrates the substrate. (see Poelt & Baumgärtner, 1964, Österr. bot. Z. 111: 1).
Compare with rhizinose strand.
- HYPHAL RHIZOID**..... a hypha acting as a rhizoid; also called rhizoidal hypha.
- HYPHOPHORE**..... erect stalked or peltate asexual sporophore (see section 3.6 of Hawksworth, The Lichen-forming Fungi); sometimes forming dual propagules composed of photobiont and mycobiont.
- HYPO-** (prefix) under
- HYPOPHLOEDAL, HYPOPHLOEDIC** with most or all of the thalline tissues occurring below one or more layers of bark or cork; endophloedal.
- HYPOTHALLUS**..... 1) a growth of undifferentiated purely fungal mycelium (the first hyphae of the thallus to grow), sometimes present as a distinct layer below (or on the underside of) the thallus, and often projecting beyond it; white to darkly colored; sometimes thick; usually in crustose lichens; sometimes vestigial, visible only by blackened margins on crustose to lobate or umbilicate thalli; if occurring at the periphery, usually called a prothallus (prothallus); 2) in some genera (e.g., *Anzia*, *Pannaria*, *Pannoparmelia*), it refers to a special differentiated, often dense and more or less woolly or spongy, often black or dark brown, hyphal tissue on the lower surface and at margins. Purvis, et al. use it in this second sense, and use prothallus for the first sense.
- HYPOTHECIUM** area of hyaline to pigmented or carbonized tissue in the apothecium immediately below the subhymenium (generative or ascogenous layer), often expanded into a bowl or cone (as seen in median section); often strongly

gelatinized, and often difficult to distinguish from the excipulum, of which some authors consider it a part; the term has often been misapplied such that it includes or consists of the subhymenium.

- HYPOTRACHNOID** having rhizines growing over the entire lower thallus surface, as in *Hypotrachyna*.
- HYSTERIOTHECIUM** an oblong to linear, simple to branched, ascocarp in some ascolocular genera, e.g., *Opegrapha*.
- ICONES** pictures, figures, plates.
- ILLEGITIMATE** opposite of legitimate (q.v.).
- IMBRICATE** overlapping, partly covering each other, as tiles on a roof, as applied to squamules, lobes, or lobules.
- IMMACULATE** not spotted.
- IMMARGINATE** without a margin or well-defined edge.
- IMMERSED** sunken into the thallus or substrate.
- IMPERFECT** in perithecia, having the involucrellum developed only immediately around the ostiole
- IMPERFORATE** lacking holes or openings, as in closed axils of branches or discs of apothecia.
- IMPRESSED** pressed in.
- INCISED** deeply notched, or with cuts or tears, as the margins of lobes, squamules, or occasionally apothecia.
- INCRASSATE** made thick.
- INCRUSTED** (of hyphae), having matter excreted on the walls.
- INDEFINITE** not sharply limited.
- INDEPENDENT** separate, distinct from one another along most of the length, branched and divergent; applied to the long linear lobes of some foliose or lobate lichens which often grow away from the substrate and can be intertwined but not crowded.
- INDETERMINATE** indefinite, vague, effuse; generally indicates that the lichen growth is a confused mass of confluent thalli, extending indefinitely, and developing no consistent outline or well-defined margin.
- INDIGENOUS** natural to a country or region, native.
- INFLATED** swollen, distended, blown up, often hollow; in foliose lichens (e.g., *Hypogymnia* and *Menegazzia*) and to a much lesser extent some placodioid lichens (*Lecanora garovaglii* complex) the lower cortex is often separated by a space from the upper cortex and medulla, especially at the puffed out tips.
- INFLEXED** turned or bent strongly inwards (inrolled), used of a margin of a fruiting body.
- INFUNDIBULIFORM** funnel-shaped.
- INNATE** sunken, immersed.
- INSPERSED** interpenetrated or sprinkled with granules; applied to tissues, as seen in section under a compound microscope.
- INTER-** (prefix) between; among
- INTERASCAL (INTERASCICULAR)** = INTERTHECIAL
- INTERCALARY** lateral (pleurogenous) production of pycnospores; a neutral term for endobasidial

INTERTHECIAL between the asci

INTRA- (prefix) within, inside

INTRAPARIETAL with a wall or walls.

INTRICATE (at least as applied to the cortex) means the hyphae are "twisted together" (Ainsworth & Bisby)

INTUMESCENCE a swelling

INVOLUCRELLUM upper, often exposed covering or cap external to the excipulum and usually distinct from it, present on many perithecia or pseudothecia; usually carbonaceous, but in some species may be colorless or even contain algae (?); upper part of ascocarps (often pigmented) of some lichenised Ascomycotina. [Not considered to be part of the perithecium \(see Nash, 2002, p. 64, dichotomy 1\).](#)

INVOLUTE with margins rolled inward (upward or downward?)

IRREGULAR uneven, as in lobe margins of foliose lichens.

ISABELLINE dirty brownish gray, yellowish or tawny.

ISIDATE (ISIDIOSE) SOREDIA soredia occurring in discrete rounded patches (soralia) that also give rise to isidia (usually cylindrical and pointed), as in some *Usnea* spp.; contrast with sorediate isidia.

ISIDOID GRANULES very tiny, elongated granular outgrowths from the thallus which have the appearance of isidia but not the structure (i.e., _____)

ISIDOID PARASOREDIA parasoredia that develop into erect, isidia-like structures, e.g. in *Hypogymnia austerodes* (Poelt, 1992--talk at IAL meetings, Lund).

ISIDOID SOREDIA soredia resembling isidia, often darkened and rather solid looking, but ecorticate and often arising from distinct soralia

ISIDOID TIPS very fine, cylindrical tips of tapering thallus branches, resembling isidia.

ISIDIOSE isidia-like

ISIDIUM (ISIDIA) an minute (mostly to 0.5-1 mm) outgrowth of the thallus which has a cortex, contains both mycobiont and photobiont (organized as in the thallus), and serves as a vegetative dispersal unit, usually granular, warty, finger-shaped, club-shaped, or coral-like, less often becoming compressed and spatulate, squamule-like, or peltate. Often used broadly, to include dactyls.

ISO- (prefix) equal

ISODIAMETRIC having equal diameters in all directions.

ISOLATERAL the same on each side

ISOTOMIC branching into two or more sub-branches of equal size (diameter), resulting in a thallus having no distinguishable main axis.; the dichotomous (to tetrachotomous) branching is visible even in the older parts of the thalli.

ISOTYPE a duplicate of a holotype, i.e., part of the single collection which includes the holotype.

ISTHMUS the narrow canal between the two locules of a polarilocular spore; according to Ainsworth & Bisby it is the "thickened medial perforated septum" (rather than the canal).

JUGA minute carbonaceous structures in or on the thallus (e.g., in *Verrucaria*), which can be round and dot-like or form elongated to irregularly branched ridges; visible with a lens, especially when the thallus is wet.

LABIA lateral lip-like structures.

- LABIATE, LABRIFORM, LABROSE** lip shaped, usually referring to apical or marginal soralia of foliose lichens, which form on the undersides but curve backwards onto the upper surface.
- LACERATE** irregularly incised to form elongated strips, for instance finely lobed; with the appearance of having been irregularly torn; with jagged edges or tips.
- LACINIATE** deeply, usually irregularly, divided into more or less numerous narrow, often more or less pointed, segments or lobes.
- LACINIUM (-A)** a long, slender, linear-elongate thallus lobe, as in *Pseudevernia* and *Ramalina*.
- LACUNA** a hole, deep depression, or gap (hollow) in the thallus.
- LACUNOSE** having lacunae.
- LAGENIFORM** swollen at the base, narrowed at the top, like a Florence flask (bottle)
- LAMELLA** thin sheets or plates, 1) referring to acid crystals; 2) a trabecula on the underside of an *Umbilicaria* thallus.
- LAMELLATE** in thin sheets or plates.
- LAMINA** a thin, flat organ or part, usually the main part or main upper surface of a foliose or squamulose thallus, the blade in contrast to the margin; used by Hertel (Calceger *Lecidea*) to refer to the combination of hymenium, epihymenium and subhymenium.
- LAMINAL** superficial on the surface (as opposed to the margins or tips), as in soralia or apothecia.
- LANCEOLATE** shaped like the head of a lance, broadest at the base and narrowed to the apex.
- LATERAL** at or near the side or edge, especially side or secondary branches; as applied to production of pycnospores, means pleurogenous or intercalary, and is a neutral term for endobasidial.
- LAX** loose, loosely woven, not compact.
- LECANORATE** (in fruiting warts of *Pertusaria*), having an open disc (with fertile hymenium) at least when mature.
- LECANORINE, LECANOROID** pertaining to an apothecium containing algae at least below the hypothecium and usually having a distinct amphithecium that often also contains algae, as in the genus *Lecanora*; often used in a broad sense that includes zeorine, cryptolecanorine, etc.
- LECIDEINE, LECIDEOID** pertaining to an apothecium which lacks algae and lacks an amphithecium, and therefore in which the exciple forms the apothecial margin (i.e., the proper margin), as in the genus *Lecidea*; in the strict sense refers to apothecia having a black, often carbonaceous exciple and blackish disc (dark epihymenium); often used in the broad sense to include biatorine.
- LECTOTYPE** a type selected from the original elements (specimens or names) on which a taxon was based when the holotype was not designated at the time of publication or for so long as it is missing.
- LEGITIMATE** (of names or epithets), in accordance with the Code of Botanical Nomenclature.
- LEIODISC** (of an apothecium), having a smooth disc, without folds or central umbo.
- LENGTH OF LOBES** the maximum is from the tip to the end of the deepest "incision"
- LENTICULAR** shaped like a more or less circular biconvex (double convex) lens.

LEPROSE..... 1) composed more or less entirely of a loosely organized powdery (to finely granular) mass of algal cells and fungal hyphae (Rogers); 2) irregular patches of erose tissue appearing white and granular (Swinscow & Krog); having the surface dissolved into soredia, loose, powdery.

LEPTODERMATOUS (of hyphae), having the outer wall thinner than the lumen.

LEPTODERMOUS..... with wall thickness less than half the radius of the hypha (Scutari, 1992).

LICHEN.....

LICHEN ACIDS, LICHEN SUBSTANCES

LICHENICOLOUS growing on or in lichens (usually implies parasitic, but is a neutral term that can include parasymbionts and frequently occurring saprophytes or epiphytes)

LIGNEOUS, LIGNOSE ... wood-like

LIGNICOLOUS..... growing on decorticate wood.

LIGNUM..... decorticate wood.

LIGULATE, LIGULIFORM flat and narrow; strap-like in form.

LIMBIFORM bordered; applied to soralia.

LIMITING..... surrounding or setting a limit to; often used of surrounding prothallus.

LINE..... (as a measure of length, obsolete), 2.1167 mm (1/12 inch).

LINEAR..... very narrow, elongate and uniform in width (i.e., with parallel margins), as lobes or soralia; as applied to lobes, usually refers to a lobe of greater width than "strap-shaped", with ends that are more rounded and dissected rather than forked or squarish.

LINGULATE..... tongue shaped.

LIRELLA (LIRELLAE) .. oblong to linear, often branched or more or less stellate, ascocarp, as in *Graphis*; can be interpreted as a discocarp or pyrenocarp; also used (at least in a broad sense) for hysterothecia of ascolocular lichens;

LIRELLATE, LIRELLIFORM in the shape of a lirella; having a shape rather like the characters of Chinese writing, or of hieroglyphics.

LITMUS..... an amphoteric lichen dye (used for determining acidity or alkalinity of a liquid), obtained from depside-containing lichens, e.g. *Ochrolechia tartarea* and *Roccella* spp.

LITTORAL growing on the shore of seas or lakes; in the strict sense, implies frequent immersion in water.

LOBATE..... lobed; most often applied in a broad sense to mean placodioid crustose; defined more specifically by Poelt (1958).

LOBE a rounded to linear division of a thallus, usually applied to foliose or squamulose forms; occasionally also applied to irregular protrusions from the outside of thalline exciples.

LOBULATE having small lobes.

LOBULE..... a small lobe; (usually juvenile?) extending the growth of the thallus by proliferating from the tips, margins, or surface of larger lobes, or a small lobe projecting out from the thalline exciple; a subdivision of a lobe; flattened and usually corticate on upper and lower surfaces.

LOCULE..... a cell, cavity, chamber or "room", as in a spore or a stroma.

LONGITUDINAL..... running in the direction of the long axis of the spore or other structure.

- LOOSE**..... lax, lightly attached to more or less free; 1) as applied to paraphyses means easily freed in water; 2) as applied to foliose thalli means the thallus grows almost parallel to and above the substrate but often partly free of it, at least tips of the lobes often ascend or curl upward, and rhizines are minute to very short (1-2.5 mm), few or many; this condition is sometimes difficult to identify, as when an adnate or appressed thallus is covered by loose lobules.
- LORIFORM** ribbon shaped.
- LOWER CELL** the cell at the very base of the fulcrum in a pycnidium, which gives rise to the sporogenous cells.
- LUMEN (LUMINA)** the inside of a cell (hypha or spore), usually occupied by the protoplast when alive.
- MACAEDIUM** see mazaedium.
- MACORCONIDIUM** the larger, generally more diagnostic, conidium of a fungus which has more than one kind of conidia.
- MACRO-** (prefix) long, but commonly used in the sense of mega (q.v.), i.e., large.
- MACROGONIDIUM** (obsolete), a large photobiont cell.
- MACROLICHEN** larger lichen of squamulose, foliose, or fruticose habit.
- MACRONEMATOUS** (of conidiophores), morphologically different from the vegetative hyphae.
- MACROPHYLLINE** (of foliose lichens), having large lobes
- MACROSCOPIC** visible without a lens.
- MACULA**..... a small pale spot or blotch on the upper or outer surface of a thallus, often due to uneven distribution of photobiont cells below the thalline cortex (or unevenly thickened cortex), representing a locally discolored or alga-less area, not associated with any break in the cortex; usually whitish or pale; usually visible only with a lens
- MACULATE** having maculae.
- MACULIFORM**..... 1) like a spot; 2) referring to a type of small, rounded, flattened, laminal soralium, as in *Phaeophyscia orbicularis*.
- MALACEOID** pattern on the underside of *Peltigera*, in which venation is only faintly indicated by a few whitish interstices.
- MANICIFORM**..... cuff-shaped, curving back away from an opening at the tip of a hollow lobe, as in *Hypogymnia tubulosa*
- MANNA** sometimes considered to be the lichen *Aspicilia esculenta*.
- MANUBRIUM**
- MARGIN** 1) edge or rim, when applied to lobes or squamules; occasionally also used for the region at the periphery of a zonate to radiately lobed thallus; 2) exciple of an apothecium
- MARGINAL**..... located on the edge or margin rather than on the upper or lower surface or the tips
- MARGINATE** with a well defined edge or margin.
- MARGO**..... margin or excipulum of an apothecium; can be proprius (proper margin) or thallinus (thalline margin).
- MARKINGS** whitish reticulate or spotted outlines on the surface of lobes; a loose term that includes maculae and some types of pseudocyphellae.

MATRIX..... 1) the material or organism in or on which a lichen is living; most lichenologists prefer the term substrate or substratum; 2) a gelatinous substance, e.g., inside a perithecium or pycnidium.

MATT with a dull, opaque surface, i.e., not shiny, oily, or waxy

MATTED closely tangled; having the branches or lobes densely intertwined; used by Taylor to also mean cushion-forming.

MAZAEDIUM (MAZAEDIA) a disc-like to globose (or, in *Sphaerophorus*, enclosed) fruiting body in which ascus walls break down to leave a dry, loose, amorphous, powdery, often dark, mass of spores together with disintegrating asci and paraphyses.

MEALY..... non-technical term for farinose.

MECHANICAL HYBRID thallus formed by the fusion of vegetative parts of two or more thalli

MEDULLA an internal layer of fungal hyphae, below the algal layer, in the thallus or in a lecanorine apothecium; hyphae often more or less loosely interwoven and weakly gelatinized, but sometimes anticlinally arranged, densely packed, or strongly gelatinized; sometimes more or less densely filled with granules or crystals, which can be calcium oxalate, silicates, or lichen substances.

MEDULLA-RHIZINE

MEDULLARY CAVITY..

MEDULLARY EXCIPULUM

MEDULLARY PLECTENCHYMA undifferentiated tissue in the medulla (Scutari, 1992)

MEGA- (prefix)..... large

MEGALOGONIDIUM..... see macrogonidium.

MELANIZED containing dark brown pigments.

MEMBRANACEOUS thin, more or less pliant, like a membrane

MEMBRANE a thin covering over the cup shaped podetia of *Cladonia*.

MESIC of moist habitat, neither wet nor very dry

MESOCONIDIUM (MESOCONIDIA) an intermediate-sized conidium in a species with three conidium types.

MESODERMATUOUS.... (of hyphae), having the outer wall and lumen of about the same thickness.

MESODERMOUS with wall thickness half the radius of the hypha (Scutari, 1992).

METATHALLUS assimilative part of a thallus containing photobiont cells; usually = algal layer.

MICAREOID

MICRO- (prefix)..... small

MICROCONIDIA..... very tiny uninucleate bacilliform cells produced in pycnidia of a fungus that produces more than one kind of conidium.

MICROGONIDIUM..... (obsolete), very small photobiont cells

MICROLICHEN..... crustose lichen, usually small.

MICROMETER, MICRON one thousandth of a millimeter (0.001 mm); 1 μ m or 1 μ .

MICROPHYLLINE with minute leaflets or leafy scales.

MISCHOBLASTIOMORPHIC pertaining to a specialized spore found in *Rinodina*, with very unevenly thickened walls and two funnel-shaped locules (the two locules appearing like an hourglass in section); a type of polarilocular spore.

MOLARIFORM shaped like a short, blunt tooth

MONILLIFORM, MONILLIOID beadlike; regularly constricted, composed of globose cells, joined together like a string or chain of beads; applies to hyphae and paraphyses.

MONO- (prefix) one

MONOBLASTIC producing a blastic conidium at one point.

MONOCARPOUS containing one apothecium.

MONOPHYLLOUS of a thallus consisting of a single more or less orbicular foliose lobe; can be undulate or folded, or sometimes divided, but then always with a single attachment area.

MONOPODIAL of a stem in which growth is continued by the same apical growing point; a type of branching in which a persistent main axis gives off branches, one at a time and frequently in alternate or spiral series.

MONOSPOROUS (of asci), 1-spored.

MONOTYPIC having only one representative, i.e., a genus with only one species or a family with only one genus.

MORPH, MORPHODEME, MORPHOTYPE a group of individuals of a taxon differentiated by having a particular shape or form, of undetermined or no taxonomic significance.

MORPHOLOGY external shape or form

MOTTLED variegated white and black or brown, as on the lower surface of some foliose lichens.

MUCILAGINOUS sticky when wet; slimy.

MUCRONATE pointed; ended in a short, sharp point.

MULTI- (prefix) many; much

MULTIPERFORATE SEPTUM septum with many perforations, with the hyphae strongly swollen at the septum (e.g., in *Teloschistes*) or not swollen (e.g., in *Caloplaca*)

MULTISEPTATE with many septa

MULTISPOROUS having numerous spores (usually 16 or more) per ascus; polysporous.

MURALE muriform.

MURIFORM with transverse and longitudinal (or oblique) walls, dividing the spore into more or less numerous (usually 10 or more) chambers, thus appearing like a brick wall.

MUSCICOLOUS growing on or among bryophytes (mosses or liverworts).

MUTUALISM a form of symbiosis in which both partners benefit more or less equally.

MYC-, MYCET-, MYCETO-, MYCO- (prefix) having to do with fungi

MYCELIAL made up of intertwined strands of hyphae.

MYCELIUM a mass of hyphae; the thallus of a fungus.

MYCETAL (obsolete), a fungus or lichen.

MYCOBIONT fungal partner in the symbiosis that constitutes a lichen.

MYCOLECANORINE of an apothecium with the margin lacking algae but having the cortex continuous with that of the thallus, with algae present below the hypothecium, and with the parathecium deeply pigmented

NAKED 1) lacking rhizines; 2) epruinose.

NARROWLY ELLIPSOID

NASSACRE, NASSE the finger-like protrusion of the inner part of a bitunicate ascus into the inner tunicle.

NAVEL see umbilicus.

NECRAL LAYER..... a thin to thick, horny, transparent layer of dead or dying fungal tissue, with indistinct lumina, overlying the thalline cortex or pseudocortex; usually on the upper surface (above the algal layer) and called epinecral layer (if below the algal layer, called hyponecral layer); often gives the surface a white, granular appearance, or a glossy or waxy appearance, and when thick frequently becomes cracked (rimose) in a characteristic way.

NECROSIS death of cells, especially when resulting in the tissue becoming dark in color.

NIGRESCENT turning black.

NIPPLE-SHAPED, NIPPLE-LIKE resembling a nipple; non-technical terms for a growth form such as that of *Pycnothelia papillaria*

NITID smooth and clear; lustrous.

NITROPHILOUS having a preference for habitats rich in nitrogen; chionophilous; often used interchangeably with ornithocoprophilous.

NITROPHOBIOUS having a preference for habitats poor in nitrogen.

NODOSE..... with rounding thickenings at intervals

NODULAR, NODULOSE having nodules (sense 2).

NODULE 1) a small, broad-based, blunt, rounded, wart-like lump or excrescence on the surface (as of a spore or thallus); 2) knot (rounded thickening) in a branch.

NODUM..... a phytosociological term.

NOMEN (Latin) name; --- **AMBIGUUM**, one used in different senses; --- **CONFUSUM**, one of a taxonomic group based on two or more different elements; --- **CONSERVANDUM**, one made valid by a decision of an International Botanical Congress; --- **PROPOSITUM**, one put up for conservation; --- **DUBIUM**, one of uncertain sense; --- **MONSTROSITATIS**, one based on an abnormality; --- **NOVUM**, a new name, a replacement; --- **NUDUM**, one for a taxon having no diagnosis; --- **PROVISIUM**, one proposed provisionally; --- **REJICIENDUM**, one rejected (e.g., officially by a Botanical Congress). A generic name may be a nomen ambiguum (etc.), but a binomial under such a name may be without ambiguity.

NON- (prefix) not

NUBILATED..... cloudy and semi-opaque as viewed by transmitted light.

NUCLEUS

OB- inverted or inversely (in combinations such as obovate)

OBLIGATE necessary, essential; restricted to a particular host, substratum, or mode of nutrition.

OBLIQUE..... 1) an angle between 45° and 90°; 2) "with sides unequal" (Galloway)

OBLONG..... (of spores), twice as long as wide and with rounded or truncate ends, margins parallel; almost rectangular but with rounded corners.

OBLONG-ELLIPSOID... (of spores), rounded-oblong; having sides parallel and ends almost hemispherical.

OBOVOID, OBOVATE ... (of spores), generally ovoid, but broader to the distal end; inversely ovate (narrowest at base).

OBSOLETE..... 1) (of organs or parts) rudimentary or absent; 2) (of terms) no longer in use (however, some obsolete terms were used in references that are still widely used).

OBTRIANGULAR triangular but with base uppermost.

OBTUSE rounded or blunt.

OCHRACEOUS of a dull yellow color, usually with a brownish tinge

OCTOSPOROUS having eight spores per ascus.

OCULAR CHAMBER the narrow, fingerlike protrusion of the epiplasm (spore-containing part of the ascus) into the apical region (inner tunica) in a bitunicate ascus

-OID (suffix)..... resembling, like; having the form of; most of the terms using this suffix are not given separate entries in this glossary.

OILY

OMBRO- (prefix) referring to precipitation, especially rain

OMPHALODISC apothecial disc with central column of sterile tissue (appearing as a knob on the surface), in *Umbilicaria*.

ONTOGENY developmental processes or stages during the formation and maturation of a structure

OPAQUE 1) not transparent or translucent; 2) matt.

ORBICULAR circular in outline, usually flattened; used by some authors (Swinscow & Krog) to also mean globose.

ORCHIL, ORCHILL a kind of dye made from certain lichens.

ORCULIFORM see polarilocular.

ORIENTED turned in one direction.

ORNITHOCOPROPHILOUS preferring habitats rich in bird droppings.

ORTHOGRAPHIC VARIANT a variant spelling of a name

OSTIOLE, OSTIOLUM... in the strict sense, the schizogenous, paraphysis-covered cavity, ending in a pore, in the papilla or neck of a perithecium (Miller, 1928, Mycol.), usually develops through the simple opening up of an already constricted place, usually round, often pigmented; in a looser sense, the narrow, usually apical, pore-like opening (orifice) of a perithecium or pycnidium, through which the spores escape; also used in a loose sense for the pores in the fruit warts of *Pertusaria*.

OVAL broadly elliptic, narrowing somewhat from middle to rounded ends

OVATE (of a surface [or sometimes a solid]), **OVOID** (of a solid), egg shaped, with the further end narrower or smaller in diameter than the nearer (basal) end.

PACHYDERMATOUS (of hyphae), having the outer wall thicker than the lumen.

PACHYDERMOUS with wall thickness over half the radius of the hypha (Scutari, 1992).

PACHYOSPORE an ascospore with uniformly thickened walls and spherical lumina.

PALISADE PLECTENCHYMA (in the cortex), a tissue composed of hyphae arranged perpendicular (anticlinal) to the surface, usually conglomerate.

PALLID light-colored, pale

PALMATE hand-shaped, radiately lobed or divided; having lobes radiating from a common center but not extending to the point of insertion.

PAPILLA a small (visible only with a lens), domelike to hemispherical, conical, pimple-like or nipple-like (sometimes wartlike) bump (process or protuberance) on the thallus, on the lower surface of some foliose lichens

(e.g., some *Nephroma* spp.), or on the outer surface of fruticose lichens (e.g., in *Usnea*, globose or short-cylindrical, concolorous with the surface or paler at the tip, distinguished from "tubercle" by being smaller and having an unbroken cortical covering--without a pore and not becoming sorediate), or on the upper surface of some foliose lichens (e.g., in *Melanelia*, in which it is tipped with a pseudocyphellum when young and develops into an isidium).

PAPILLATE..... having or shaped like a papilla or papillae; as applied to isidia in *Pertusaria*, means short (2-4 mm tall), with the apex frequently knob-forming and dissimilar in color to the stalk; resembles immature stages of columnar or coralloid isidia.

PAPILLOSE..... covered with pimple-like or blister-like structures.

PARAPHYSIS (PARAPHYSES) a specialized sterile hypha in the hymenium, threadlike, simple or branched, basally attached, usually more or less vertical (anticlinal); usually relatively thick (1.5 μ m or more), regularly septate, and at most rather weakly branched, rarely anastomosing, often with somewhat enlarged apices.

Paraphyses provide support and packing between the asci in fruiting bodies. The term is often used in a broad sense to cover various structures similar to true paraphyses.

PARAPHYSOID TISSUE (NET, THREADS OR FILAMENTS) the remains of stromatic tissue in ascolocular ascocarps; often highly branched, forming a network of hyphal tissue similar in function to true paraphyses.

PARAPHYSOID pseudoparaphyses (q.v.), but as also used of interthecial tissue, is indefinite in meaning, fide Luttrell (1955); According to Hawksworth (*The Lichen-Forming Fungi*), it refers to structures that form from the stretching of tissues present before the asci develop, and they are usually thin, sparsely septate, and anastomosing. Purvis, et al. define it as interascal or pre-ascal tissue stretching and coming to resemble pseudoparaphyses, very often remotely septate, anastomosing and very narrow. It has a different meaning in Basidiomycotina

PARAPLECTENCHYMA a fungal tissue with a cellular structure superficially like parenchyma of vascular plants; composed of more or less isodiametric thin-walled fungal cells, with hyphae densely coherent but with large lumina and a cellular appearance.

PARASITE an organism living on or in, and obtaining food from, its host, another living organism.

PARASOREDIA propagules starting as budlike structures with hyphae on upper side and algae on lower side, then developing into blastidia (e.g., in *Hypogymnia bitteri*) (Poelt, 1992--talk at IAL meeting in Lund)

PARASYMBIONT..... an organism symbiotic with a pre-existing symbiosis (e.g., a lichenioclous fungus) not damaging its host, commensalistic.

PARATHECIAN STAGE

PARATHECIUM..... (of apothecia) the outside hyphal layer, (especially if?) darker in color, outside of the hypothecium and inside the amphithegium sensu lato (the main part of the exciple in the margin, whether containing algae or not); often used to refer to the proper exciple (the exciple in a narrow sense).

PARATYPE..... any specimen cited in the protologue other than the holotype or isotypes when those are cited (or lectotype or neotype, when such is chosen); generally considered less important and often not included when "types" are treated specially in herbaria.

PARMULIFORM shield-shaped with the margins slightly upturned.

PATELLIFORM..... like a round plate having a well-marked edge.

PATTERNED..... suggesting a design or order; low ridges, tiny cracks, white spots or lines give the suggestion of a design on the surface, often netlike; best observed at the periphery, where it is not obscured by wrinkling or various kinds of growths.

PECTINATE comb-like, toothed.

PEDICEL..... a small stalk.

PEDICELLATE having a pedicel.

PELLICLE a delicate outside membrane.

PELLUCID..... clear, translucent or almost transparent

PELTATE..... like a shield or plate attached on the lower surface at a single central point (often on a short stalk), with the edges free.; umbilicate.

PENDENT, PENDULOUS, PENDULOSE hanging down, supported from above, with little or no horizontal or erect growth; implies a freedom to swing or sway (like a pendulum).

PENICILLATE..... tufted, like a paint brush.

PERFORATE..... with holes (visible at least with a lens) through the thallus or into a central cavity.

PERI-..... around, surrounding.

PERIAXIAL around the axis (in *Usnea*).

PERIBASE lateral meristematic zone within a developing apothecium

PERICENTRAL ENVELOPE

PERICENTRAL FLOOR

PERICENTRAL MUFF (COLLAR)

PERICENTRAL ROOF ...

PERICLINAL parallel to (in the same plane as) the surface or circumference; can be straight or curved.

PERIFULCRUM (obsolete) the wall of a pycnidium.

PERIFULCRUM..... wall of a pycnidium; pseudoparenchymatous and usually not sharply delimited from the sporophore layer

PERIHYMENIAL MUFF (COLLAR)

PERIPHERY

PERIPHYSIS, -ES a hair-like projection from, or near, the ostiole of a perithecioid ascocarp or pycnidium, usually oriented **downwards**, between the asci when in a perithecioid ascocarp.

PERIPHYSOID..... periphysis-like structures that develop from above the asci (or fulcra) and grow down a short distance.

PERISPORE..... a colorless, often gelatinous layer enveloping a spore outside the main spore wall; when gelatinous also called a "halo".

PERITHECIAL WALL ... excipulum of a perithecium; also applied by some authors to the perifulcrum of a pycnidium

- PERITHECIUM (PERITHECIA)** a more or less globose or flask-shaped fungal fruiting body (ascocarp) sessile or more often at least partly immersed in the thallus or in thalline warts, with a single, terminal (central, or rarely eccentric) opening (ostiole) and otherwise completely enclosed by a wall; [does not include the involucrellum \(see Nash 2002, p. 64, key dichotomy 1, where dark & light perithecia are distinguished, but involucrella are dealt with separately\)](#) now limited by some workers to the "thin-walled, light-colored struture resulting from the development of an ascogonium, and having a hymenium of thin-walled (unitunicate?) asci and paraphyses" (Ainsworth & Bisby); some authors state that the wall (and ostiole) must be darkened (in contrast to that in *Pertusaria* or similar taxa); often used in the broad sense for perithecia-like structures; characteristic of pyrenocarpous and angiocarpic Ascomycotina.
- PERSISTENT**..... as used by lichenologists, describes apothecial margins that remain visible from above as the apothecium ages.
- PERTUSARIATE** of an apothecium opening by one or more pores and constricted at the base, as in many species of *Pertusaria*
- PETROPHILOUS**..... = saxicolous
- PHAEO-** (prefix)..... dark-colored or swarthy, usually brownish; crustose genera with this prefix have brown spores; foliose genera with this prefix usually have a dark upper surface of the thallus and lack atranorin in the cortex.
- PHENOCORTEX** pseudocortex sensu Poelt (1958).
- PHIALIDE**..... conidiogenous cell producing conidia in basipetal succession (i.e., the apical part is oldest) through one or several openings; also applied by some authors to the sporogenous cell (pycnide) in a pycnidium.
- PHILIC** (suffix), "loving", preferring, as applied to particular ecological or substrate factors
- PHOBIC** (suffix), "fearing", avoiding, as applied to particular ecological or substrate factors
- PHOROPHYTE** the tree or shrub upon which a corticolous lichen is growing; used instead of the more general term substrate.
- PHOTOBIONT** the photosynthesizing (algal or cyanobacterial) component of a lichen.
- PHOTOPHILOUS** light loving; preferring well-illuminated habitats.
- PHOTOPHOBOUS**..... light fearing; preferring shaded habitats.
- PHOTOSYMBIODEME**.. either of one or two morphologically different structures formed by the interaction of a single mycobiont with two different photobionts.
- PHYCOBIONT** the "algal" component of a lichen; now replaced by photobiont, to include cyanobacteria.
- PHYCOLICHENS** lichens in which the vegetative thallus morphology is determined by the photobiont and which are of uncertain systematic position as the fungal sporocarps are unknown (e.g., *Cystocoleus*, *Racodium*).
- PHYCOPHILOUS** growing with or on algae; used for basidiomycetes (esp. *Multiclavula*) in which the fungal sporocarps are always associated with surfaces covered by algae, but do not form a distinct vegetative thallus that can be recognized as a lichen.

- PHYLLIDIUM** a vegetative propagule with distinct upper and under sides and in its structure resembling in miniature that of the parent thallus; small corticate, scale-like, dorsiventral structure developed at margins or on upper surface of thallus.
- PHYLLOCLADIUM** literally "leaf-branch", a corticate outgrowth from pseudopodetia of *Stereocaulon*, granular to coralloid, digitate, or complanate and lobe-like.
- PHYLOGENY** the history of the evolution of a group.
- PILEMA** pad-like medulla on the lower surface with an especially loose texture.
- PINNATE** compound, with the parts arranged on either side of an axis, as in a feather.
- PIPECLEANER-RHIZINE** squarrose rhizine in which the lateral branches are very fine and dense, as in some *Peltigera* spp.
- PIPELIKE** non-technical term for resembling a tube or a cylindrical, hollow body
- PITTED** having depressions or concavities in the thallus surface; usually because of irregular variations in the thickness of the thallus; often the negative effect of ridges, wrinkles, or vein-like thickenings.
- PLACODIOID, PLACIOID** of a thallus, crustose at the center and lobed (and sometimes plicate) at the periphery; in the broadest sense also includes some genera that are umbilicate (*Rhizoplaca*) or squamulose (*Squamarina*).
- PLACODIOMORPH** a 2-celled spore with a thickened septum which may or may not have a pore, cf. polarilocular.
- PLAIN** unadorned, smooth; margins without isidia, soredia, or other such growth, but may be wavy, dissected, or ciliate.
- PLANE** flat (and generally more or less smooth), referring to the surface of lobes or apothecial discs.
- PLAQUE** a structure like a small disc or plate.
- PLATE** flattened rhizine-like structure on the lower surface of some Umbilicarias; technically called trabeculae.
- PLATYGONIDIA** (obsolete) phycobionts occurring in stellately or orbicular spreading colonies (e.g., *Cephaleuros*)
- PLATYSMOID** a tissue which consists of "densely agglutinated thick-walled hyphae with very narrow lumina" (Dahl, 1952, p. 129), as in *Cetraria* subg. *Platysma* (= ? the genus *Platismatia*).
- PLECTENCHYMA** a tissue, generally thick, formed of more or less tightly packed hyphae becoming interwoven or twisted and fused together.
- PLETHOMORPHIC** having rather short, irregular rhizine-like protrusions from the underside of a foliose thallus
- PLEURICELLULAR**
- PLEUROGENOUS** formed on the side (lateral, intercalary); a neutral term for endobasidial
- PLEXUS** the very earliest stage in the ontogeny of an apothecium, while it is still in the medulla and the ascogonial apparatus is just beginning to develop
- PLIABLE, PLIANT** capable of being bent without breaking.
- PLICA** a fold of skin, membrane or lamella.
- PLICATE** folded (longitudinally) into pleats.
- PLURILOCULAR** many celled, usually applied to spores.
- PODETIOID** having the general appearance of a podetium.
- PODETIIUM (-IA)** a stalk (more or less elongated, erect, terete portion) of a thallus derived from tissue of apothecial origin (usually the hypothecium and stipe), usually rising

from a primary thallus and often bearing apothecia or pycnidia, (usually?) hollow; usually becoming secondarily invested with an algal layer and cortex (as in *Cladonia*); can vary from being short and unbranched to quite tall and richly branched; lichenized, stem-like portion (stipe, or discopodium) bearing the hymenial discs and sometimes conidiomata in a fruticose apothecium (Ahti, Lichenologist 14: 109 (1982)).

POLARILOCULAR dividing the cell into two polar components (locules), the insides of which are connected by a narrow canal (isthmus); characteristic of many members of the Teloschistaceae; placodiomorph; non-technically described as "dumbbell-shaped within".

POLARILOCULAR, POLARIBILOCULAR referring to spores which are non septate, but in which the wall thickens (interpreted by some authors as being a thick, centrally perforated septum), almost

POLY- (prefix) many

POLYBLASTIC (of conidiogenous cells), producing blastic conidia at several points.

POLYCARPOUS two or more apothecia per fruit wart (in *Pertusaria*).

POLYCHOTOMOUS having an apex dividing simultaneously into more than two branches; polytomic.

POLYDACTYLOID VENATION (of veins on underside of *Peltigera*), low, often rather indistinct

POLYMORPHIC having several forms; as applied to a taxon, in the strict sense implies that the forms have some genetic basis (rather than being due to environmental modification); as applied to components of a thallus (e.g., rhizines), means that various forms can occur side by side on the same thallus.

POLYPHYLLOUS of a thallus consisting of several to many lobes.

POLYSPOROUS more than eight spores per ascus.

POLYTOMIC, POLYTOMOUS divided into many branches, usually at one node (at the same level, equal in size)

PORE a small opening.

PORIFORM pore-like.

PORUS the part of each cell in a **Pyxinaceae** (Physciaceae) spore that protrudes towards the center (narrowest part) of the septum (somewhat like the canal in a polarilocular spore, but not penetrating the septum) (?)

PREPARATHECIAN STAGE

PRIMARY CORPUS

PRIMARY SPECIES species reproducing by sexual means.

PRIMARY SQUAMULE . The scale-like component of the primary thallus of a *Cladonia*.

PRIMARY THALLUS the first formed, crustose to squamulose, thallus which may later give rise to secondary structures (podetia or pseudopodetia).

PRIMORDIUM earliest stage of development of an organ (e.g., of an apothecium)

PROCESS projection from a sporogenous cell in a pycnidium, on which the pycnosporangium is borne; sterigma, style

PROLIFERATE to produce parts in succession, as the cups in certain *Cladonias*.

PROPAGULE a reproductive body, whether sexual or asexual; restricted by some authors (e.g., Galloway) to thallus fragments capable of propagating the plant (i.e., isidia, soredia, phylidia, phyllocladia).

PROPER EXCIPLE see proper margin, and exciple.

PROPER MARGIN apothecial margin lacking algae and derived from apothecial tissue; usually similar to the disc in color, or darker.

PROSENCHYMA, PROSOPECTENCHYMA a fungal tissue with a structure superficially like collenchyma of vascular plants, in which the hyphal elements appear elongated and recognizable as hyphae; usually with thick-walled hyphae having very minute, longish lumina.

PROSTRATE lying + flat (parallel to the substrate).

PROTHALLUS the first, purely fungal layer upon which an algae-containing thallus may develop, usually forming a black rim or extending beyond the periphery of crustose thalli, sometimes appearing as radiating, branched hyphae or hyphal bundles; weft of fungal hyphae (white, reddish or blue-black) at margins of thallus, devoid of photobiont, often projecting beyond thallus onto substrate. Compare HYPOTHALLUS.

PROTOLOGUE everything associated with a name on its first publication, i.e., diagnosis, description, references, synonymy, geographical data, citation of specimens, discussion, illustrations.

PROTOPARATHECIAN STAGE

PROXIMAL

PRUINA a powdery, wooly, frost-like or chalky deposit (coating) or "bloom", usually white, gray, or bluish to yellowish, on the surface of a lichen or its ascocarps, usually crystalline; whitish thallus pruina is most often calcium oxalate (soluble in strong acid, insoluble in KOH); other kinds of pruina can consist of organic substances produced by the lichen (insoluble in acid, often soluble in KOH) or occasionally of dead or dying hyphal tissues.

PRUINOSE having a hoary (frosted) appearance (usually white or pale).

PSEUDO- false, spurious, looking like.

PSEUDOCORTEX a thalline boundary layer in which the hyphae are distinct but not organized into a tissue showing a regular cellular or fibrous structure. Until recently the term was often used in a special sense, now called phenocortex.

PSEUDOCYPHELLA (-AE) small orbicular to linear or irregular areas ("simple pores") of the thallus where the upper or lower cortex is missing and medullary hyphae extend to the surface or soredia erupt; lacking a clearly defined lining and pale rim; can be plane to slightly convex, or fissural; sometimes pigmented.

PSEUDOISIDIUM vegetative propagule, nodular to cylindrical and sometimes branched, containing both photobiont and mycobiont, resembling an isidium but bounded by an at most ill defined, often discontinuous, cortex.

PSEUDOLECANORATE of apothecia in *Pertusaria*, in which several pertusariate (pored) apothecia fuse and thus appear to form a lecanorate apothecium.

PSEUDOLECANORINE of apothecia with algae absent from the margins but present below the hypothecium, with a more or less hyaline parathecium (and without a cortex on the margin?)

PSEUDOPARAPHYSIS ... distinct, down-growing, vertical, paraphysis-like hypha in the locule or perithecial cavity before ascus-formation; according to Hawksworth (*The Lichen-Forming Fungi*), pseudoparaphyses form from above the level of the asci, grow downwards, and finally become attached to the base; **according to Purvis, et al., they originate below the level of the [+ developed] asci,**

grow downwards between the developing asci, finally becoming attached to the base of the cavity and often also then free in the upper part; often regularly septate, branched and anastomosing and broader.

PSEUDOPARATHECIAL

PSEUDOPARENCHYMA, PSEUDOPARAPLECTENCHYMA a tissue having the appearance of parenchyma, that is, isodiametric cells; hyphal elements not recognizable as hyphae.

PSEUDOPODETIUM (-A) podetium-like structure (stalk) that has its origin in vegetative rather than reproductive tissue; erect or ascending, not dorsiventral; (usually?) solid; (often?) containing only fungal tissue; often bearing one or more apothecia; can be simple (as in *Pycnothelia*, and usually *Baeomyces* or *Pilophorus*) or highly branched (as in *Stereocaulon*).

PSEUDOSEPTUM..... an apparent division in the contents of a spore (protoplasmic or vacuolar membrane) which is not a true wall continuous with the cell wall and can usually be dispersed in 5% (or 10%) KOH.

PSEUDOSTROMATA a stroma in which fungal cells and remnants of host tissue are mixed.

PSEUDOTHALLINE MARGIN a margin of thalline origin external to the amphithecium in lecanorine apothecia, and external to the exciple in lecideine or biatorine apothecia; 1) a border formed by the thallus around an apothecium that is immersed in the thallus or between the areoles (as in *Rhizocarpon lecanorinum* or *Diplotomma* species); 2) a pale margin resembling a thalline margin but lacking algae (as in *Trapelia*).

PSEUDOTHECIUM..... the fruiting structure of an ascolocular (ascostromatic) ascomycete, superficially resembling a perithecium, but having asci in numerous unwallled locules.

PUBESCENT..... with a downy nap of soft hairs.

PULVERULENT powdery; as if powdered over

PULVINATE cushion-like; growing in small cushions.

PUNCTA..... small spots

PUNCTATE..... marked with very small dots or hollows

PUNCTIFORM..... dot-like and very minute (barely visible with a low power lens), as in tiny orbicular soralia or young ascocarps.

PUSTULAR..... of soralia, where the thalline cortex forms a swelling and then cracks open to form a sorolium with jagged and sometimes everted (lifted up or bent back) edges.

PUSTULATE..... covered with blister-like protuberances, each blister on the upper surface having a corresponding depression or pit on the lower surface, as in the thallus of *Lasallia*.

PUSTULE..... 1) pimple-like or blister-like elevation on the thallus; definite; often eroding; 2) more or less isolated, cup-shaped eruptions on the surface, usually filled with soredia.

PYCNIDE term for the cell bearing the pycnospore (either directly or on the tip of a sterigma); sporogenous cell; phialide; neutral equivalent of spermatogenous or conidiogenous cell (basidium)

PYCNIDIAL JELLY a hyaline to red gelatinous substance found in the pycnidial cavity of some species of *Cladonia* and *Cladina*.

- PYCNIDIOSPORE, PYCNIOSPORE, PYCNOSPORE** the spore type produced in a pycnidium, by budding off from the sides or tips of specialized hyphae; minute, generally rod-shaped, fusiform, or thread-like, produced in large numbers, which might function either as asexual propagules (pycnoconidia) or as male gametes (spermatia).
- PYCNIDIUM (PYCNIDIA)** neutral term for a minute globose to flask-shaped (pear-shaped) structure, resembling a perithecium and usually immersed in the medulla; opening to the surface by a tiny (often visible only under a dissecting microscope), often darkened, pore; containing a cavity lined with specialized hyphal structures (fulcra) producing pycnospores (small spores of unknown function, which might function either as spermatia or conidia); sometimes branched or chambered. Referred to as a spermagonium when the spores are believed to function as spermatia.
- PYCNOASCOCARP** ascoma arising from a pycnidium
- PYCNOCONIDIUM** a pycnospore that functions in asexual reproduction; includes microconidia (and macroconidia?).
- PYRENIUM** the inner (or only) wall (excipulum) of a perithecium; a sporocarp of the Sphaeriales (obsolete).
- PYRENOCARP** perithecium of pyrenomycete lichens (e.g., *Verrucaria*)
- PYRENOCARPOUS, PYRENOCARPIC** of a lichen or fungus that bears perithecia; also used in a broader sense for taxa with perithecium-like ascocarps.
- PYRENOID**
- PYRENOLICHEN, PYRENOMYCETE** lichens or fungi producing perithecia; often used loosely to include taxa with pseudothecia.
- PYRIFORM** pear shaped
- RADIAL** (of lichen thalli), radially symmetrical in transverse section (e.g., *Alectoria*, *Usnea*)
- RADIATE** spreading from a center
- RADIATING** spreading from a central point.
- RANDOMLY ORIENTED**
- RECEPTACLE** any hymenium-supporting structure
- RECURVED** bent back (upwards or downwards); used of branch tips which turn back upon themselves, often exposing the medulla and/or a sorediate undersurface.
- REFLEXED** (of an edge), turned up or back
- REGULAR** uniform, even, repeating
- RELICT** a persistent remnant of an otherwise extinct flora or fauna or kind of organism
- RENIFORM** kidney shaped.
- RETICULATE** a network or netlike pattern; 1) with a network pattern (of ridges, lines, cracks, or pigmentation) on the surface; 2) like a net, anastomosing (applied to paraphyses)
- RETICULUM** a network
- REVOLUTE** rolled backwards from the direction ordinarily assumed by similar structures in other cases; rolled outwards or downwards [back or up according to Ainsworth & Bisby; back and under according to Vitt, et al.], as in tips of sorediate lobes.

RHEOPHYTE a plant that is associated with swiftly flowing water.

RHIZINAE FASCIULATAE rhizines intertwined into strands

RHIZINAE FIBRILLOSAE wooly-hirsute rhizines

RHIZINAE PAPPOSAE .. rhizines with brush-like tips

RHIZINAE SIMPLICES . rhizines consisting of simple robust hyphae

RHIZINE(-S), RHIZINA(-AE) a short branch or extension of the underside of a foliose thallus, resembling a root, usually thread-like to intricately branched, usually more or less numerous, attaching a foliose lichen to its substrate; composed entirely of a compact cord of fungal hyphae, with limited (determinate) growth taking place mainly apically; usually an extension of the lower cortex; of various lengths, thicknesses, colors, and degrees and kinds of branching; usually smooth and solid appearing, but sometimes (e.g., *Peltigera*, fibrous or tomentose). Often used in a broad, loose sense for any elongated, rootlike structure visible at least under hand lens or dissecting scope, on the lower surface or margins of the thallus or the thalline margin of an apothecia.

RHIZINOMORPH rhizine-like organ not attaching thallus to its substrate, in peltate lichens (e.g., some species of *Umbilicaria* and *Dermatocarpon*)

RHIZINOSE STRAND ("RHIZINENSTRÄNGE") a rhizine-like organ of attachment on the lower sides of diverse squamulose lichens (e.g., *Toninia*, *Squamarina*) or some fruticose lichens, which is tough and usually much branched; more or less compact strands of hyphae (sometimes with a loose hyphae-felt at the ends or on the surface); differing from rhizines by having a nearly unlimited growth which can be apical or intercalary, an irregularly branched shape (much more like a true root), and a rather deep penetration into the substratum.

RHIZOHYPHAE more or less elongated single-row hyphae on the lower surface, for attachment

RHIZOHYPHAE-FELT .. loose "brushes" of long rhizophyphae which go deep into the substratum, occurring in placodioid soil- and cleft-dwelling lichens

RHIZOID hyphal structures on the lower surface anchoring the thallus.

RHIZOMORPH

RHIZOPTE loose (not compact) bundle of hyphae, otherwise like a rhizine

RIBBED having rib-like ridges; veined, either parallel or in a network pattern.

RIDGED having sharply embossed lines on the surface; ridges are independent of growth pressure, more or less uniform in width, and often form a network, which frequently is more distinct towards the periphery of the thallus

RIM margin

RIMIFORM of soralia, in the form of elongated crevices, as in *Parmelia sulcata*.

RIMOSE chinked or fissured, with the cracks mostly incomplete and often rather narrow and shallow, extending in all directions.

RIMOSE-AREOLATE with areoles formed secondarily from an originally continuous thallus, by cracking.

RIMULOSE diminutive of rimose.

ROBUST large, both in overall size and in coarseness of the component parts

ROSETTE orbicular thallus radiating from a center, usually with distinct lobes

ROSETTIFORM

ROSTRUM

ROSULATE..... in a rosette; a more restricted definition is given by Poelt (1958)

ROTUND rounded in outline, as the tips of lobes; lobes can be narrow or broad but the length-width ratio is low; usually crowded or contiguous towards center of thallus, more distinct at periphery.

ROUNDED curved in outline or form; non-technical term for rotund

RUGA..... wrinkle or low, rounded ridge.

RUGOSE..... having rugae; **Purvis, et al. use it to mean roughened, but most other authors use it to mean wrinkled.**

RUGULOSE diminutive of rugose.

SAC pouch-like structure; also used (usually as "spore sac") as a non-technical term for ascus

SACCATE sac-like

SACCULATE (PARTIAL DEF) In Stereocaulon, not botryose.

SALMON PINK vivid pale orange pink.

SAXICOLOUS growing on (or in) rock (used loosely to include man-made rock-like substrates).

SCABRID, SCABROUS... rough, having fine scales or delicate and irregular projections on the (usually upper) surface; scurfy.

SCALE a general popular term for squamules or other small, flattened, not distinctly lobe-like structures (e.g., schizidia, peltate areoles, etc.)

SCHEDA, SCHEDULA.... specimen labels, especially of exsiccata.

SCHIZIDIUM a lichen propagule formed by part of the thallus becoming constricted and splitting off from the main thallus (e.g., the lobule-like structures in *Fulgensia bracteata* and in the cups of *Cladonia pyxidata*)

SCHIZOBIONT bacteria once considered to be additional symbionts of lichens.

SCHIZOGENOUS formed by cracking or splitting

SCLEROPLECTNCHYMA plectenchyma composed of very thick-walled conglomerate cells.

SCLEROTISED hardened.

SCORPIOID..... a type of anisotomous branching in which the laterals are curved downward and all appear to arise from one side of the main stem, as in *Cladina arbuscula*.

SCREENING..... routine testing of organisms or chemical substances for a particular property.

SCROBICULATE..... marked by shallow depressions, pitted or irregularly furrowed; coarsely pitted, foveolate.

SCULPTURED

SCURFY having a fine powdery or scaly surface (not synonymous with sorediate)

SCYPHIFEROUS bearing scyphi

SCYPHUS..... a cup (usually of the cup shaped expanded apex of a podetium in *Cladonia*); some authors (e.g., Hammer) prefer this term to cup, and use it in a somewhat different sense.

SECONDARY AREOLES

SECONDARY SPECIES.. taxon reproducing mainly, or only, by vegetative means, derived from extinct or extant species reproducing mainly, or only, by sexual means (primary species).

SEGREGATE..... (in taxonomy), a group which is based on part of an earlier group; especially used for newly named or newly revived genera split out from large well known genera.

SEMI-IMMERSED..... halfway immersed

SENSU AMPL...... in an expanded, very broad sense

SENSU LATO in a broad sense

SENSU STRICTO..... in a narrow sense

SEPARATE not joined or in close contact, referring to patterns of lobing of the thallus.

SEPTATE divided by one or more septa.

SEPTUM..... a wall making a cellular division in a spore or hypha.

SERiate arranged in a seires

SERPENTINE

SERPENTINE ROCK.....

SESSILE without a stem, stalk, or stipe of any kind, sitting closely on the surface, attached directly to the thallus. The term has been used rather loosely, with slightly different meanings, by different authors; some distinguish it from adnate.

SEXUAL involving meiosis

SHAGREEN-LIKE.....

SHIELD LICHENS (obsolete), formerly applied to lichens having large apothecia; more properly applied to umbilicate lichens.

SHINY.....

SIGMOID shaped like an "S"

SILICEOUS..... refers to rock composed mainly of silicon compounds, producing no (or few) bubbles upon application of 10% HCl; examples include quartz, granite, and basalt; often used interchangeably with "acidic rock", but primarily siliceous rocks sometimes do contain some calcium (or magnesium)

SIMPLE 1) unbranched, undivided; 2) non-septate (unicellular, lacking a true septum).
Contrasted with compound.

SINUATE, SINUOUS wavy, having rounded angles (of a margin)

SINUS..... curved or rounded junction between two projecting lobes of a thallus.

SKIOPHILOUS..... showing a strong association with shaded habitats.

SOLEIFORM shaped like the sole of a [human] shoe or foot.

SORALIUM (-IA)..... an decorticate area or body of the thallus where soredia are produced; a conspicuous clump of soredia, usually "limited" with a definite boundary or margin and occurring in constant patterns on the thallus; can be in many forms. [See Du Rietz's classification, given by Ainsworth & Bisby]

SORDID 1) dark; 2) appearing "dirty", not a pure color.

SOREDiate APOTHECIUM a structure, in some *Pertusaria* spp., resembling a eulecanorine apothecium but with the hymenial area becoming replaced by soredia.

SOREDiate ISIDIUM.... an isidium bearing or erupting into soredia, usually at the tips; contrast with isidiate soredia.

SOREDium (-IA)..... a microscopic group of algal cells and loosely woven hyphae, without a cortex or pseudocortex, which erupt from cracks or pores in the thallus, appear finely powdery to coarsely granular, and function as a vegetative reproductive unit; generally produced in localized masses (soralia) or

- covering large diffuse areas of thallus; can be greenish or variously pigmented.
- SPATHULATE** with a gradually widened and flattened blunt end, as a spatula.
- SPATULA**..... a broadly rounded, flat, spoon-like structure tapering to a narrow "handle"
- SPATULATE**..... spatula shaped.
- SPECIES**
- SPERMATIA**..... pycnosporangium that functions as a male gamete.
- SPERMATIOGENOUS CELL** sporogenous cell giving rise to spermatia
- SPERMATIOPHORE** a spermatia-producing or -supporting structure
- SPERMOGONIUM** (-AGONE, AGONIUM) a pycnidium (walled, usually flask-shape, structure) in which the spores function as gametes (spermatia).
- SPILODIUM** a minute round blackish structure on the thallus of *Dirina stenhammari*, composed of compacted dark-colored hyphae.
- SPINE**..... a stout process with a sharp point.
- SPINOSE** with spines
- SPINULATE, SPINULOSE** having spinules.
- SPINULE** diminutive of spine; a stiff, pointed, fibrillary appendage up to 3 mm long (arbitrarily but usefully distinguished from a fibril in *Usnea*); Purvis, et al. specify that it is constricted at the base.
- SPONGIOSTRATUM** layer of net-like anastomosing hyphae (not functioning for attachment), on the lower surface of *Anzia* and *Pannoparmelia* (the spongiostratum in these two genera is not homologous)
- SPORE** microscopic reproductive unit (one-celled to many-celled); with lichens, when used without a prefix usually refers to ascospore (or basidiospore), which is haploid and the result of meiosis.
- SPOROCARP** spore-producing organ; fruiting body.
- SPORODOCHIUM**..... a discrete tuft of conidiophores (usually visible on the surface of the thallus?).
- SPOROPHORE**..... a spore-producing or -supporting structure, especially a conidiophore; in pycnidia it is equivalent to the fulcrum; also used in the sense of sporocarp.
- SPOROPHYTIC APPARATUS**
- SPREADING** extending in length and breadth in all directions, or in breadth only; flattening out; used of fruticose thalli which tend to grow broadly along a more or less horizontal plane more than upwards (in contrast to erect or pendent).
- SQUAMIFORM, SQUAMULIFORM** scale-shaped or scale-like, as in flattened but more or less isodiametrical isidia or phyllocladia; sometimes use to mean squamulose
- SQUAMULATE, SQUAMOSE** provided with squamules, as the podetia of *Cladonia*.
- SQUAMULE** a small (to 5 mm long and wide, or larger in basal squamules of *Cladonia*), complanate, scale-like thallus or thallus segment (lobe, foliole), usually more or less isodiametric (or at least short), with an entire to flexuous or crenate margin, with or without a lower cortex; intermediate between crustose and foliose, usually more leaf-like than an areole (i.e., with a distinct lower side, often partly ascending or lifted off the substrate, sometimes removable intact). Many authors (e.g., Hale, Purvis, et al., Rogers, Taylor) restrict the term to structures lacking a lower cortex and rhizines; others (Galloway)

describe a squamule as usually being corticate on both sides. Squamules usually lack a distinct stipe or umbilicus, but there is a continuum from peltate or stipitate areoles to umbilicate or subfruticose thalli.

- SQUAMULOSE** growth form composed of squamules; frequently forming extensive mats; also used interchangeably with squamulate.
- SQUARROSE** 1) having numerous short, more or less perpendicular lateral branches, as in some rhizines, sometimes densely and finely branched, appearing like a pipe-cleaner or test-tube brush, sometimes with only a few branches; 2) rough with projecting scales (this second sense is used more in referring to the caps of certain agaric mushrooms).
- STALK** general popular term for elongated structures bearing other structures; can be applied to podetia or similar structures, or to the stipes or elongated basal portions of thalli or sporocarps,
- STELLATE** star-like, star-shaped.
- STEREOME** scleroplectenchyma which forms the main supporting tissue of the thallus, as in *Cladonia* and *Alectoria*
- STERIGMA (STERIGMATA)** spine on a basidium (bearing a basidiospore) or a projection from a sporogenous cell bearing a pycnospor; used by Nylander in the sense of spermatophore (i.e., the whole multicellular structure on which the spermatia are borne?).
- STERILE** not producing spores or a sporocarp (at least not by sexual reproduction; pycnidia and pycnosporos may be present).
- STIFF** inflexible
- STIPE** stalk that supports a fruiting body, thallus, or part of a thallus; many authors (e.g., Hale, Purvis, et al., Swinscow & Krog, Taylor) restrict the term to structures supporting ascocarps (or basidiocarps) and consisting of extensions of the exciple, without algae.
- STIPITATE** elevated on a stalk or stipe.
- STRAMINEOUS** straw colored, more or less pale yellowish brown.
- STRAP-SHAPED** as applied to lobes, means very narrow and elongate, with the width about the same from center to tip, and the tips are often blunt, squarish and forked (dichotomous).
- STRATIFIED, STRATOSE** consisting of horizontal layers, referring to the internal structure of lichens which have a distinct cortex (or corticoid layer), algal layer, and medulla, and frequently a lower cortex and rhizines; heteromorous.
- STRIA (-AE)** a fine line or narrow band, oblong-ellipsoid to linear; usually used for minute (0.1-1.0 mm long) groove, channel, crack, or whitish ridge, usually parallel to the length of the axis, in the cortex of *Alectoria* and *Ramalina* (resembling elongated pseudocyphellae and treated as such by many authors).
- STRIATE, STRIATED** with parallel stripes or lines (or grooves or ridges).
- STRIATION** a stria; the condition of being striated.
- STRICT** very straight (as of lobes, or especially paraphyses); an older term rarely used today.
- STRIGOSE** bearing dense, short, hair-like projections or branches.
- STROMA (PL. STROMATA)** a compact mass or matrix of vegetative fungal tissue (with or without tissue of the host or substrate), sometimes *Sclerotium*-like in form, usually in

or on which fruits are formed; often covering a group of several ascocarps; often blackish or carbonaceous. Often used loosely to include any structure that contains + numerous ascocarps, especially perithecioid ones.

STYLE see sterigma

STYLOSPORE..... a large spore produced in a pycnidium or in a similar structure.

SUB- 1) partially; 2) incompletely; 3) approaching or almost; 4) under.

Frequently used in the sense of approximating the condition qualified.

SUBCANALICULATE with shallow channels or furrows.

SUBCAPITATE

SUBCRUSTOSE growth form intermediate between crustose and foliose, usually with a typically crustose central part and a lobed thallus margin; placodioid.

SUBERECT ascending toward the edges of the thallus but prostrate and broadly attached at the center; lobes are free for about 1/3 of their length; rhizines of intermediate length, if present - often sparse towards periphery, or marginal; subfruticose

SUBFOLIATE, SUBFOLIOSE pertaining to crustose species with marginal lobes, showing some tendency towards becoming ascending; similar to subcrustose but more leaflike, and with the medulla of the lobes becoming very loose to almost hollow, as in *Lecanora garovaglii*.

SUBFRUTICOSE a growth form intermediate between foliose and fruticose.

SUBGELATINOUS almost gelatinous, somewhat gelatinous

SUBGLOBOSE

SUBHYMENIUM ascogenous tissue immediately below the hymenium; sometimes used as equivalent to hypothecium; Ainsworth & Bisby use it for "tissue below the hypothecium" (this may be a mistake!)

SUBIMMERSED with ca. three fourths of the structure immersed

SUBISIDIATE..... sparsely or imperfectly isidiate, often with intermingled soredia.

SUBLAGENIFORM..... rod shaped with a minute swelling near but not at one end (of pycnospores).

SUBMURIFORM not quite muriform; used to describe spores which have a few (usually 3) transverse septa but only one, complete or incomplete, transverse septum.

SUBPARAPLECTENCHYMA hyphae with mostly isodiametric cells, but also some prosoplectenchyma, either a) interrupting the paraplectenchyma, or b) in a layer above it (Scutari, 1992).

SUBPROSOPLECTENCHYMA hyphae with cylindrical cells, parallel and periclinal, plus some paraplectenchyma, either a) interrupting the prosoplectenchyma, or b) in a layer below it (Scutari, 1992).

SUBSQUAMULOSE sparsely or imperfectly squamulose.

SUBSTIPITATE supported on a low, hardly distinguishable stipe.

SUBSTRATE, SUBSTRATUM the medium (soil, rock, bark, wood, etc.) on which a lichen grows or is attached; the underlying layer.

SUBULATE elongate, and gradually tapering from a wide base to a point, more or less circular in cross-section; awl-shaped.

SULCA groove, channel, or fluting

SULCATE..... grooved, channelled, fluted; having sulcae

SUPERFICIAL on the surface

SUPERLECIDEINE of a lecideine apothecium in which the outer part of the excipulum (i.e., the cortex) is pale, but the rest of the excipulum is dark.

SUPPORTING TISSUE ... tissue below or around the hymenium in an apothecium

SYMBIONT an organism that is associated with another, unrelated one, in a close relationship; often used in a narrow sense, implying that the relationship is mutually beneficial.

SYMBIOSIS the living together of unlike organisms (usually in a close, long-lasting association); in the broad sense includes parasitism, but most frequently it is used for mutualistic or non-antagonistic associations.

SYMPODIAL having a main branch with lateral branches arising from it

SYMPODIUM

SYNONYM another name for a taxon, especially a later or illegitimate name.

SYNTYPE one of two or more elements cited by an author in the original place of publication of a taxon when no holotype was designated.

SYSTEMATICS

TARTAREOUS having a thick, rough, crumbling surface

TAXON a taxonomic group of any rank, e.g., family, genus, species, etc.

TAXONOMY the theory and practice of describing organisms and ordering them into a system of classification.

TECTUM roof of a developing apothecium

TENTLIKE non-technical term for dimidiate.

TERATUM an abnormal modification, usually produced by response to grazing or infection.

TERETE more or less circular in cross-section (as applied to an elongated structure), either narrowly cylindrical or tapering (Purvis, et al. imply that it must be tapering).

TERMINAL ending the structure; borne at the end.

TERRESTRIAL on or of the land or earth.

TERRICOLOUS growing on the ground (strictly speaking, on soil).

TESTACEOUS brownish yellow, as of unglazed earthenware.

TETRACHOTOMY 4-branched.

TETRACHOTOMY group of four branches

TEXTURA INTRICATA . a tissue of interwoven non-gelatinized hyphae.

THALLIC with the pycnosporangia enlarging after the septum forms; contrast with blastic

THALLINE ENVELOPE tissue covering a perithecium or similar structure, similar in structure and appearance to the thallus and usually continuous with it.

THALLINE EXCIPLE..... see thalline margin.

THALLINE MARGIN apothecial margin containing algae and derived from the vegetative thallus; usually similar in color and consistency (and sometimes structure) to the thallus, often paler than the disc.

THALLINE pertaining to the lichen thallus, usually containing both mycobiont and photobiont; also see thalloid

THALLOCONIDIA Conidia arising from the surface of a thallus or prothallus. Also see thallospore

THALLOID similar to the thallus in structure or appearance.

THALLOSPORE	a vegetative (asexual) propagule, granular in appearance, composed of one to several pigmented, thick walled fungal cells, borne on the underside or edges of lobate to umbilicate thalli; the term is also applied in other ways (at least in non-lichenized fungi).
THALLUS FLAKES	dorsiventral, crenate structures that flake off the surface, e.g., in <i>Hypogymnia hypotropella</i> (Poelt, 1992--talk at IAL meeting in Lund)
THALLUS	in lichens, the vegetative and assimilative body, both mycobiont and photobiont; equivalent to the mycelium of nonlichenized fungi; relatively undifferentiated compared to the body of bryophytes and vascular plants.
THALLYLE	
THECA	ascus (obsolete)
THECASPORE	ascospore (obsolete)
THECIUM	the part of an apothecium containing the asci between the epithecium and hypothecium; sometimes used for the whole sporocarp or as equivalent to hymenium
THELOTREMOID	having the appearance of <i>Thelotrema</i> , especially the fruiting bodies.
THOLUS	the (usually?) thickened inner part of the apex of an ascus, forming a thick cap beyond the spore-producing part and [usually?] at least partly amyloid (IKI+ blue); Ainsworth and Bisby used it as a synonym for nassace, (the finger-like protrusion of the inner part of a bitunicate ascus into the inner tunicle, which = ocular chamber)
THYRSOID	densely branched
TIER	a platform-like expansion on the podetia of several taxa of <i>Cladonia</i> (e.g., <i>Cladonia cervicornis</i> ssp. <i>verticillata</i>) at which point one or more new branches arise; verticil.
TOMENTOSE	having a tomentum.
TOMENTUM	an external covering of hairs (projecting hyphae), often rather dense, felt-like, downy, lint-like, cobwebby or wooly, on the upper or lower surface of the thallus, usually forming a soft mat.
TONINIFORM	
TORTUOUS	irregularly bending, twisting and turning
TORULOSE, TORULOUS	cylindrical but having swellings at intervals; moniliform.
TORUS	a thickening or swelling around the septum in certain thick-walled spores in <i>Rinodina</i> , appearing as a tiny dot on both sides of the septum.
TRABECULA	plate-like (flattened; often appearing shredded) structures (extensions from the lower cortex) on the underside of <i>Umbilicaria</i> thalli; used in quite different senses in non-lichenized fungi.
TRABECULAR	a term applied to paraphysoids
TRABECULATE	having trabeculae
TRAMA	the layer of hyphae in the central part of a lamella (gill) of an agaric basidiomycete
TRANSLUCENT	not quite transparent
TRANSVERSE	across the width
TRAUMA	what a lichenologist undergoes when trying to identify a taxonomically difficult specimen, or when trying to find enough time, money or space to do

- his or her work, or when trying to translate something from an unfamiliar foreign language, etc., etc., etc.
- TREBOUXIOID**..... globose unicellular green algae
- TREELIKE**..... non-technical term for dendroid; as used by Taylor it refers to having a single more or less readily distinguishable main axis or trunk like a tree.
- TRENTEPOHLOID** filamentous, multicellular green algae with a yellow to orange color and elongate cylindrical cells.
- TRICHOGYNE**..... "the receptive hypha of the female organ" (Ainsworth & Bisby"; in lichens there is no "female organ" as such (?), but the ascocarp forms on a part of the thallus where a trichogyne protrudes, after fertilization by a spermatium.
- TRICHOTOMOUS**..... branching (usually more or less equally) into three, in clusters, sometimes repeatedly.
- TRICHOTOMY** group of 3 branches
- TRIMMED**
- TRUE EXCIPLE**..... an exciple which lacks algal cells, usually of a different color than the thallus; a synonym of proper exciple, used by some authors (e.g., Purvis, et al.) to avoid the connotation of "propriety", as though having algae is somehow immoral or undignified or something.
- TRUNCATE** ending abruptly, as though cut short at the end, such that the tip is blunt and more or less squared off.
- TUBERCLE, TUBERCULE** a minute, wart-like or knoblike, thalline protuberance; in *Usnea* limited to superficial structures which are coarser than a papilla (but irregular in form and size) and in which the cortex is generally broken at the apex.
- TUBERCULAR, TUBERCULATE** warty or knob-like.
- TUBULAR**..... elongated and hollow
- TUFTED** non-technical term for caespitose; having a small cluster of elongated parts arising close together or attached at the base, but free above; usually the lichen is small in size (under 10 cm long), rather stiff, and more or less erect (perpendicular to the substrate).
- TUMID**..... swollen; often implies "inflated", but not as applied to apothecial margins
- TUNICLE** layer or wall of an ascus.
- TURBINATE**..... top-shaped
- TURGID** swollen, implying distended through internal pressure; sometimes used loosely to simply mean thick or wide.
- TYPE SPECIES** the species on which the genus is based.
- TYPE SPECIMEN**..... the single specimen to which the name of a species or a taxon below the rank of species is permanently attached.
- TYPE**..... a nomenclatural type or that constituent element of a taxon to which the name of the taxon is permanently attached.
- ULCEROSE**..... ulcer-like (the condition of a lichenologist's stomach while undergoing TRAUMA (q.v.)
- ULTIMATE SEGMENT**.. the smallest main division of a branched or divided main lobe; a term useful in reducing the ambiguity in giving the dimensions of lobes (some authors give the measurements of the ultimate segments as the dimensions of the lobes)
- ULTRABASIC (ULTRAMAFIC) ROCK**

- UMBILICATE** a foliose growth form attached at a single point, usually by a short stalk (umbilicus) at or near the center of a more or less orbicular thallus; generally with the lower cortex better developed than the upper one (giving the main structural support to the thallus), a loose to hollow medulla, and algae distributed in areas of optimum light regardless of relation to the morphological upper side; when strongly polyphyllous (often with the upper part swollen), sometimes difficult to distinguish from squamulose, toniniiform, or placodioid.
- UMBILICUS** a solitary, usually short, thick, stem-like organ more or less centrally located on the underside of an orbicular thallus in genera such as *Umbilicaria*, *Dermatocarpon* and *Rhizoplaca*; a single compact strand of fused hyphae or rhizines, functioning for attachment to a hard substratum (mostly rock).
- UMBO** a protuberance, like the central boss of a shield 1) sunken into a depression (like a "belly button") on the upper side of an umbilicate thallus (corresponding to the umbilicus on the underside), or 2) on the disc of an apothecium (often consisting of sterile tissue).
- UMBONATE** having an umbo
- UNCIFORM** rod shaped with one end hook shaped (of pycnospores).
- UNDER CORTEX** = lower cortex
- UNDULATE** wavy, bent or curved alternately up and down (or also in and out), wavy, as applied to a surface, or to a "crisped" margin of the thallus or lobes, which are often lifted off the substrate and appear as a series of more or less regular arcs, as in many species of *Parmotrema* or cetrarioid lichens; often, but not always, associated with being crenate; can also be applied to apothecia (discs or margins).
- UNION** a phytosociological term.
- UNIPERFORATE SEPTUM** septum with one perforation, and with the hypha swollen around the septum.
- UNISERIATE** arranged in a single row, as spores in an ascus.
- UNITUNICATE** (of asci) ascus wall with one functional layer, without an inner wall, not developing a distinct and separate endoascus and exoascus, not splitting apart at discharge; called non-fissitunicate by some authors; usually thin-walled and somewhat elongated.
- UNORIENTED** not arranged in any particular direction.
- UNSTRATIFIED** lacking distinct layers, referring to the internal structure of gelatinous lichens which lack separate algal and medullary layers; homiomorous.
- UPPER CELL** in complex fulcra, the cell between the "lower cell" and the sporogenous cells
- URCEOLATE** deeply cup-shaped, strongly concave, hollow, like an urn or pitcher
- URN-SHAPED**
- VAGRANT** growing loose on soil, easily picked up by wind or animals; wandering, epigaeic; in the strict sense, applies to taxa that consist of large populations of thalli (usually sterile) that have this lifestyle and are permanently separated from the ancestral attached taxa
- VALID** (of names), in accord with the Code of Nomenclature
- VALIDLY PUBLISHED**..

VARIETY	
VEGETATIVE	assimilative; not involved with sexual reproduction
VEIL	a protective layer over the surface of an immature disciform apothecium in <i>Pertusaria</i> , formed by the incorporation of the tectum with the overriding thalline tissues
VEIN	strand of conducting or strengthening tissue, broad or narrow, often more or less raised, branched and sometimes anastomosing, often pigmented, rib-like or ridge-like structure on the lower surface of <i>Peltigera</i> and <i>Solorina</i> , perhaps functioning instead of a lower cortex. Can be caninoid, malaceoid, or polydactyloid (see Ainsworth & Bisby).
VEIN-STRAND	a single, central strand built by veins, penetrating into the soil like a rhizomorph strand; found in <i>Peltigera venosa</i>
VENTRAL	front or lower surface; the surface facing the axis
VENTRICOSE	swelling out in the middle or at one side; inflated.
VERMIFORM	like a worm, elongate with parallel sides and rounded ends (usually of spores); elongated and sinuous (of wrinkles on a thallus).
VERRUCA	1) a (+) conspicuous, small, rounded wart-like protuberance, process, or swelling; 2) a convex to subglobose areole
VERRUCIFORM	wart-like, wart-shaped
VERRUCOSE	warty; composed of or covered with wart-like growths.
VERRUCULE	diminutive of verruca; in <i>Usnea</i> , refers to minute pimple-like structures gradually raised from the surface, with the tips becoming perforated, budding a fibril or soredium.
VERRUCULOSE	diminutive of verrucose.
VERTICILLATE	having parts in rings (verticils); whorled.
VESICLE	a more or less circumscribed circular to elliptical swelling
VESICULAR, VESICULATE	having vesicles.
VESICULIFORM	urn-shaped
VILLOSE, VILLOUS	covered with long, soft hairs, which are not matted.
VINELIKE	non-technical term for fruticose thalli resembling a plant whose stems require support; trailing and entwined.
VINESCENT	turning wine-red.
VIRESCENT	turning green
VITELLINE	yellow like egg yolk
WANDERING	vagrant; epigeic
WARTY	having hardened protuberances (minute, rounded, corticate outgrowths from the surface, like mounds rather than fingers) non-technical term for verrucose (as applied to a surface or the thallus as a whole); also used loosely to mean papillate or tuberculate
WAVY	non-technical term for flexuous or undulate
WAXY	
WEBBY	non-technical term for arachnoid.
WHITE-RETICULATE	having a netlike pattern of white lines (visible at least with a lens), as the surface of lobe tips in certain foliose lichens.
WHITE-SPOTTED	having numerous tiny white spots on the upper surface (visible with a lens).
WHORL	several structures arising at the same level on an axis

- WIDTH OF LOBES** width of the main ultimate segments
- WINGED** expanded along the sides to form a thin angular ridge, sometimes giving a two-sided or four-sided appearance to the branches of a fruticose species (e.g., in *Usnea*).
- WRINKLED** non technical term for rugose; having irregular corrugations; the surface of the thallus responds to growth pressures by forming non-patterned, non uniform rolls and low folds, especially towards the center of the thallus, lifting sections of the thallus off the substrate.
- XERIC** very dry.
- XEROPHYTIC** a plant occurring in dry habitats.
- ZEORINE** [an apothecium in which a proper exciple is enclosed in the thalline exciple.](#)
- ZONATE** ringed (especially at thallus margins) in circular lines forming pale and dark zones.

LITERATURE CITED -- LICHEN GLOSSARY

- Abbeyes, H. des. 19__ . Traite de Bot
- Ainsworth, G. C., P. W. James & D. L. Hawksworth. 1971. Ainsworth & Bisby's Dictionary of the Fungi. 6th Ed. Commonwealth Mycological Institute, Kew, Surrey.
- Asahina, . 19__ . *Usnea*
- Bellemere, A. and M.-A. Letrouit-Galinou. 1981. The Lecanoralean ascus: An ultrastructural preliminary study. Pages 54-70 in: Reynolds, D. R. (ed.), *Ascomycete Systematics: The Lutrellian Concept*. Springer Verlag.
- Bellemere, A. and M.-A. Letrouit-Galinou. 198 . Asci, ascospores and ascomata. Pages 161-179 in: *CRC Handbook of Lichenology*, Vol. I.
- Beltman, H. 1978. Vegetativ Strukturen der Parmeliaceae und ihre Entwicklung. *Bibl. Lich.* 11: 1-193. Cramer, Lehre.
- Dibben, M. J. 1980. Chemosystematics of the Lichen Genus *Pertusaria* in North America North of Mexico. Milwaukee Museum.
- Du Rietz, G. E. 1924. Die Soredien und Isiden der Flechten. *Sv. Bot. Tidskr.* 18: 371-396.
- Eigler, G. 19 .
- Esslinger, T. L. A chemoystematic revision of the brown Parmeliae. *Journal Hattori Bot. Lab.* 42: 1-211.
- Filson, R. B. and R. W. Rogers. 1979. *Lichens of South Australia*. D. Woolman, Government Printer, S. Australia.
- Fink, B. 1935. *The Lichen Flora of the United States*. U. of Michigan Press, Ann Arbor.
- Gallé, L. 1972. Flechtenterata in Herbarien zu Szeged. *Acta Biologica Szeged* 18(1-4): 27-41.
- Galloway, D. J. 1985. *Flora of New Zealand Lichens*. P. D. Hasselberg, Wellington.
- Geesteranus, Maas. 1947.
- Glück, . 18 .
- Hafellner, J. 1984. Studien in Richtung einer natürlichen Gliederung der Sammelfamilien Lecanoraceae und Lecideaceae. *Beih. f. Nova Hedwigia* 79: 241-371.
- Hafellner, J., H. Mayrhofer and J. Poelt. 1979. Die Gattungen der Flechtenfamilie Physciaceae. *Herzogia* 5: 39-79.
- Hale, M. E. Jr. 1974. *The Biology of Lichens*. Edward Arnold, London.

- Hale, M. E. Jr. 1976. Lichen structure viewed with scanning electron microscope. Pages 1-15 in: Brown, D. H., et al. (eds.), *Lichenology: Progress and Problems*. Academic Press, New York.
- Hale, M. E. Jr. 1979. *How to Know the Lichens*. Wm. C. Brown Co., Dubuque, Iowa.
- Hale, M. E. Jr. 1981. Pseudocyphellae and pored epicortex in the Parmeliaceae: their delimitation and evolutionary significance. *Lichenologist* 13: 1-10.
- Hanneman, B. 1973. Anhangsorganen der Flechten, ihre Strukturen und ihre systematische Verteilung. *Bibl. Lich.* 1. J. Cramer, Lehre.
- Hawksworth, D. L. 19 . *Mycologist's Handbook*. Commonwealth Mycological Institute, Kew
- Hawksworth, D. L. 1988. Conidiomata, conidiogenesis, and conidia. Pages 181-193 in: *CRC Handbook of Lichenology*. Vol. I.
- Hawksworth, D. L. and D. H. Hill. 1984. *The Lichen-Forming Fungi*. Blackie Co., Glasgow & London.
- Henssen, A. and H. M. Jahns. 1973. *Lichenes. Ein Einführung in die Flechtenkunde*. G. Thieme, Stuttgart.
- Hertel, H. 1967. Revision einiger calciphiler Formenkreis der Flechtengattung *Lecidea*. *Beih. f. Nova Hedwigia* 24: 155.
- Hillmann, J. and V. J. Grumann. 1957. *Kryptogamenflora von Mark Brandenburg und angrenzender Gebiete*. Flechten. Borntraeger, Berlin.
- Honegger, R. 1978. The ascus apex in lichenized fungi. I. The *Lecanora*, *Peltigera*, and *Teloschistes* types. *Lichenologist* 10: 47-68.
- Honegger, R. 1982. Ascus structure and function, ascospore delimitation, and phycobiont cell wall types associated with the Lecanorales (lichenized Ascomycetes). *Journ. Hattori Bot. Lab.* 52: 417-429.
- Honegger, R. 1987. *Lichenology: Progress and Problems in the Eighties*.
- Jahns, H. M. 1974. Anatomy, morphology and development. Pages 3-58 in: Ahmadjian, V. and M. E. Hale Jr. (eds.), *The Lichens*. Academic Press, London.
- James, P. W. 1976. The morphological and taxonomical significance of cephalodia. Pages 27-78 in: Brown, D. H., et al. (eds.), *Lichenology: Progress and Problems*. Academic Press, London.
- Jordan, W. P. 1972. Erumpent cephalodia, an apparent case of phycobiont influence on lichen morphology. *J. Phycol.* 8: 112-117.
- Kilius, H. 1981. Revision gestinsbewohnender Sippen der Flechtengattung *Catillaria* Mass. in Europa (Lecanorales, Lecideaceae). *Herzogia* 5(3-4): 209-448.
- Kopazevsckaja, et al. 19 .
- Lamb, I. M. 1951. On the morphology, phylogeny and taxonomy of the lichen genus *Stereocaulon*. *Can. J. Bot.* 29: 522-584.
- Letrouit-Galinou, M.-A. 1968. Apothecia of the Discolichens. *The Bryologist* 71: .
- Letrouit-Galinou, M.-A. 1974. Sexual reproduction. Pages 59-90 in: Ahmadjian, V. and M. E. Hale Jr. (eds.), *The Lichens*. Academic Press, New York.
- Lindahl, P.-O. 1960. The different types of isidia found in the lichen genus *Peltigera*. *Svensk. Bot. Tidskr.* 54: 565-570.
- Lindsay, W. L. 1861. Memoir on the spermagones and pycnides of filamentous, fruticulose and foliaceous lichens. *Trans. Roy. Soc. Edin.* 22: 101-103.
- Mayrhofer, H. and J. Poelt. 1979. Die saxicolen Arten der Flechtengattung *Rinodina* in Europa. *Bibl. Lich.* 12. J. Cramer, Vaduz.
- Morgan-Jones, G. 1972. Studies on lichen asci. II. Further examples of the bitunicate type. *Lichenologist* 5: 275-282.
- Nash, T. H. III. 1986. Handout for lichenology class, Arizona State University. (unpublished).

- Nienburg, W. 1926. Anatomie der Flechten. Pages 1-136 in: Linsbauer, K. (ed.), Handbuch der Pflanzenanatomie. Vol. 6, Sect. 2, Part 1. Borntraeger, Berlin.
- Ozenda, P. and G. Clauzade. 1970. Les Lichens.
- Poelt, J. 1958. Die lobaten Arten der Flechtengattung *Lecanora* Ach. sensu ampl. in der Holarktis. Mitt. Bot. Staatssaml. München 19-20: 411-589.
- Poelt, J. 1969. Bestimmungsschlüssel europaischer Flechten. J. Cramer, Lehre. (English translation by D. Anderegg).
- Poelt, J. 1974. Systematic evaluation of morphological characters. Pages 91-115 in: Ahmadjian, V. and M. E. Hale Jr. (eds.), The Lichens. Academic Press, New York.
- Poelt, J. 1980. *Physcia opuntiella*, spec. nov. und die Lebensform der Sprossenden Flechten. Flora 169: 23-31.
- Poelt, J. 1986. Morphologie der Flechten: Fortschritte und Probleme. [Ber.?] Deutsch. Bot. Ges. 99: 3-29.
- Poelt, J. and H. Baumgärtner. 19 . Über Rhizinenstränge bei placodialen Flechten.
- Poelt, J. and H. Wunder. 1967. Berandung von Flechtenapothecien
- Pyatt, F. B. 1974. Lichen propagules. Pages 117-145 in: Ahmadjian, V. and M. E. Hale Jr. (eds.), The Lichens. Academic Press, New York.
- Richardson, D. H. S. and G. Morgan-Jones. 1964. Studies on lichen asci. Lichenologist 2: 205-224.
- Rogers, R. W. 1981. The Genera of Australian Lichens. University of Queensland Press, St. Lucia.
- Servit, M. 1954. Československé Lisejníky celedi. Verrucariaceae. Československá Akademie Ved, Prague.
- Sheard, J. W. 1967. A revision of the lichen genus *Rinodina* (Ach.) Gray in the British Isles. Lichenologist 3: 328-367.
- Swinscow & Krog. 19 . Macrolichens of East Africa.
- Taylor, C. J. 1967. Lichens of Ohio. I. Foliose Lichens. Ohio State University, Columbus.
- Taylor, C. J. 1968. Lichens of Ohio. II. Fruticose and Cladoniaform Lichens. Ohio State University, Columbus.
- Thomson, J. W. 1979. Lichens of the Alaskan Arctic Slope. University of Toronto Press, Toronto.
- Vitt, D. H., J. E. Marsh & R. B. Bovey. 1988. Mosses, Lichens, and Ferns of Northwest North America. Lone Pine Publishing, Edmonton, Alberta.
- Vobis, G. 1980. Bau und Entwicklung der Flechten-Pycnidien und ihrer Conidien. Bibl. Lich. 14. J. Cramer, Vaduz.
- Yoshimura, . and R. Shimada. 1980. Fine structures of lichen plectenchymas viewed with the scanning electron microscope. Bull. Kochi Gakuen J. College 11: 13-28.