

## Appendix D: Glossary

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Baranyay and others (1971) provide a complete glossary of terms and special definitions that apply to mistletoes. Although most of our readers ought to be familiar with the concepts and terms of forestry, they may be less comfortable with a number of other terms used here. These are primarily botanical and plant pathology terms or words with a special application in this context.

**Abundance.** See incidence.

**Acuminate apex.** Tapering to a point with the sides more or less pinched in before reaching the tip.

**Adnate.** The union of unlike parts, as an inferior ovary to the calyx tube.

**Allozymes.** Similar proteins that provide a physiochemical trait for investigating the population genetics of groups of plants (hosts or parasites).

**Anamorph.** An imperfect stage of a fungus that is taxonomically described and provides a basis for identification and referral.

**Anthesis.** Period when the flower is open.

**Ascospore.** A spore of a fungus produced within an ascus, a saclike cell of ascomycetes in which, following meiosis, a specific number (usually eight) of ascospores is produced.

**Autocorrelation, spatial.** A quantification of a relation between two entities whereby the similarity of a feature depends on the distance between the entities. Because of mistletoe spread and intensification, the severities of mistletoe infection on two neighbor trees tend to be more or less similar, or spatially autocorrelated.

**Bark strand.** A structure that ramifies throughout the inner bark of the host and from which shoots and sinkers of the mistletoe are derived.

**Blight.** Rapid discoloration and death of all parts of a plant.

**Bootstrapping.** A statistical processing method using iteration and repeat calculation to estimate variation.

**Branch girdle, segment.** Girdle refers to a region on a vegetative branch or main stem of a conifer between two annual growth segments; segment refers to a single year's growth of a vegetative branch or main stem.

**Brooming.** See witches' broom.

**Callus.** Undifferentiated plant tissue, usually as grown in a laboratory with artificial media.

**Calyculus.** A floral structure of the Loranthaceae, a vestigial whorl of bracts of the suppressed flowers of a lateral branch inflorescence that have become adnate to the inferior ovary.

**Canker, mistletoe canker.** The structure and malformation of a host stem or branch caused by a disruption of the cambium and bark as a result of dwarf mistletoe infection.

**Cordate.** A shape of a leaf like a stylized heart.

**Cortex.** Ground-tissue region of a stem or root bounded externally by epidermis and internally by the vascular system; a primary-tissue region.

**Decussate.** Of leaves or scale-like leaves that are arranged in pairs that alternately cross each other.

**Disjunct.** Pertaining to a discontinuous range having two or more potentially interbreeding populations separated by a distance that precludes genetic exchange by pollination or dissemination.

**Dyads.** See monads.

**Endemic.** The kind of distribution for taxa that is geographically small.

**Endophytic system.** The root system parts of a dwarf mistletoe within host tissues. The endophytic system consists of bark strands within the inner bark and "sinkers" that are embedded in successively formed layers of xylem, referred to as haustorial root system or haustorium.

**Endosperm.** A tissue, containing stored food, that develops from the union of a sperm nucleus and the polar nuclei of the central cell; it is digested by the growing sporophyte either before or after the maturation of the seed; found only in angiosperms.

**Epigynous.** Growing, or appearing to grow, on the summit of the ovary.

**Flabellate branching.** Fan shaped, a branching pattern produced by the continued development of superposed axillary buds.

**Flowering, direct and indirect.** Indirect flowering is the result of an intervention of a rest period between initiation of a floral bud and anthesis, whereas direct flowering is the result of uninterrupted development of floral buds from initiation to anthesis.

**Frass.** Solid larval insect excrement.

**Fusiform.** Spindle-shaped; broadest at the middle and tapering at both ends.

**Glabrous.** Smooth, no hairs present.

**Glaucous.** Covered with a whitish or bluish waxy covering.

**Growth loss.** An expression of yield reduction that includes both lost annual production on still living trees and lost volume to tree death.

**Growth, primary and secondary.** The growth of shoots and roots from inception until completion of their expansion is primary growth. This growth is the result of apical meristems and their three primary derivative meristems (protoderm, ground meristem, and procambium). Secondary growth results from divisions of secondary meristems (typically the vascular cambium and phellogen) and adds circumference to the plant body.

**Haustorium, primary and secondary.** The primary haustorium is a wedge-like projection, arising from the circular attachment disc of the radicle, that penetrates the outer bark extending to the host xylem. Secondary haustoria are “sinkers” produced by bark strands that grow radially to the vascular cambium.

**Holdfast.** A disc-like swelling at the distal end of the radicle through which infection of the host occurs.

**Host susceptibility.** A subjective classification system based on the percentage of trees of the host species in question that are infected by dwarf mistletoe within 6 m of a principal host heavily infected with the same species of dwarf mistletoe.

**Hyphae.** Tubular threads of the mycelium of a fungus or similar organism.

**Hypocotyl.** Region of an embryo that is between the radicle and the attachment point of the cotyledons.

**Incidence, abundance, distribution, severity.** Incidence refers to the frequency of which host trees in a given stand are infected by a given species of mistletoe (usually measured as percent of trees infected). Abundance refers to the relative quantity of mistletoe in a stand or on a host (not usually quantified). Distribution describes the spatial extent and pattern of a mistletoe species or population within a given area. Severity is a qualitative term describing the disease situation (see infection class); high incidence along with large abundance would result in a severe disease situation.

**Incubation period.** That period from infection to production of first shoots. See latency.

**Infection class.** A measure (generally from 0 to 6) of the relative severity of dwarf mistletoe infection for individual trees, in contrast to host susceptibility class.

**Infection, secondary infection, localized and systemic infections.** Infection refers to that process in which dwarf mistletoes successfully penetrate host tissue and initiate establishment of the endophytic system; infection also refers to the mistletoe plant and the associated diseased host tissues. Secondary infection is reinfection by dwarf mistletoe of already infected tissue. Localized infections (anisophasic) are those in which the endophytic system is generally restricted to within or near (such as a few centimeters) the swollen portion of the host, whereas systemic infections (isophasic) are those in which the endophytic system occurs within the host terminal bud, and growth keeps pace with that of the host’s shoot apices.

**Infestation.** A condition in which one or more trees of a stand or group are infected.

**Intensification.** Increase in the number of dwarf mistletoe infections within a tree (see spread).

**Internode.** See node.

**Latency.** Phenomenon in which host tissues are infected by dwarf mistletoe but either visible symptoms of swelling or brooming are not apparent or shoots are not present. Infections are latent during the incubation period and when environmental conditions induce a cessation in production of shoots.

**Lenticel.** A group of loose corky cells formed beneath the epidermis of woody plants; allows gas exchange to occur across the periderm.

**Ligulate.** A property of a leaf, petal, or similar structure whereby the structure possesses a small membranous appendage.

**Meiosis.** The chromosome reduction stage in formation of gametes.

**-Merous.** A suffix indicating division into parts; a five-merous flowers would have five sepals, five petals, five stamens and a five-carpellate pistil (providing all these structures were present).

**Monads, dyads, triads.** Sets of flowers arising from a common peduncle, in singles (monads), pairs (dyads), or triples (triads).

**Mycelial stroma.** A mass of vegetative hyphae in or on which spores are produced.

**Mycoherbicide.** A plant-killing substance based on the action of live fungi that induce disease.

**Mycorrhizae.** Fungus-root, a symbiotic relation of a fungus and plant root.

**Node, internode.** A region of the stem where a leaf or leaves diverge; the region in between nodes is an internode.

**Obovate.** A shape of a leaf like an oval, wider at one end (stylized egg).

**Parasite, parasitism.** A parasite is an organism, such as a mistletoe, that obtains sustenance from another organism, and also completes all, or at least some, of its life cycle on that host organism. Parasitism is the typical mode of existence or behavior of a parasite.

**Pathosystem.** A biotic combination consisting of a host and a pathogen; the reference is to the pair of organisms rather than the nature of their relationship.

**Pedicel.** The stalk of an individual flower.

**Peduncle.** The stalk of an inflorescence (basal to a pedicel).

**Penetration wedge.** A structure in dwarf mistletoes that develops from the holdfast and initiates the infection process.

**Pericarp.** The wall of the ripened ovary (fruit); consists of three layers, the exocarp (outer), mesocarp (middle), and endocarp (inner).

**Periderm, necrophytatic.** A bark, cortex tissue that reacts to invasion by rapid, localized necrosis (isolating the potential pathogen).

**Phloem, primary and secondary.** The principal food-conducting tissue of a plant composed mainly of sieve elements, various kinds of parenchyma cells, fibers, and sclereids. Primary and secondary phloem are formed during primary and secondary growth, respectively.

**Phyllotaxy.** The morphological arrangement of leaves.

**Pistillate, stigma.** Referring to the female flower, which includes an ovary, pistil, style, and stigma (which receives the pollen).

**Primary growth.** See growth.

**Pubescence, trichomes, puberulent, papillate-hispid, stellate.** Hair-like structures on a plant surface are epidermal glands called trichomes. A surface that bears trichomes is pubescent or puberulent if the hairs are thin and sparse or papillate-hispid if it has "hairy bump." Stellate hairs have a stalk and three or more branches from a common point.

**Radicle.** See holdfast.

**Severity.** See incidence.

**Sessile.** Of a leaf that appears attached directly to the stem, without a petiole.

**Sinker.** A radially oriented structure, composed of tracheary and parenchymal elements, that originates from a dwarf mistletoe bark strand and grows centripetally to the cambium where it becomes embedded by successive layers of xylem.

**Source–sink.** In the context of the mistletoe–tree interaction, the tree is the source or supplier of water and nutrients to the mistletoe, and the mistletoe plays the role of sink or depository of water and nutrients taken up by the host tree.

**Spike, determinate, indeterminate spike.** The unbranched inflorescence of a mistletoe of indeterminate type when flowering proceeds from the base while younger flowers are formed as the spike continues to elongate or of determinate type otherwise.

**Sporodochia, conidial.** An asexual reproductive structure of a fungus that produces spores by a budding process.

**Spread, vertical spread.** Increase in the area of mistletoe infestation by infection of additional host trees. Vertical spread refers to the net result of dispersal of mistletoe seeds to higher portions of the host crown.

**Staminate.** Referring to the male flower, which produces pollen.

**Stigma.** See pistillate.

**Symbiont.** A member of a close biotic relation whereby both species benefit, such as in mycorrhizae, and in contrast to a pathogen that benefits to the harm of the host. The terms of these forms of mutualisms — symbiosis and parasitism — are relative and contextual.

**Sympatry.** The condition in which the distributions of two species overlap and hybridization between taxa would be possible if they were not reproductively isolated by factors other than spatial separation.

**Synonymy.** See taxonomy.

**Systematics.** See taxonomy.

**Systemic infection (isophasic).** Infection in which growth of the endophytic system keeps pace with the growth of the infected host branch. See infection.

**Taxon (plural, Taxa).** A taxonomic unit of any rank (order, family, genus, species, subspecies, and so forth).

**Taxonomy, systematics, synonymy.** Taxonomy refers to the valid assignment of names to organisms based on natural relations and rules of convention; systematics refers to the natural relations based on descent from a common ancestor. Several (taxonomic) names may be used for an individual plant or population of plants. One name will be preferred (for reasons dealing with the inferred relations and application of conventions); other names are synonyms.

**Terete.** Of a stem, approximately cylindrical but tapering at ends.

**Trichomes.** See pubescence.

**Triads.** See monads.

**Verticillate branching.** Whorled, a branch pattern produced by the continued development of superposed axillary buds.

**Vertical spread.** See intensification.

**Viscin.** Sticky material contained in the viscin cells of dwarf mistletoe fruit, which acts as the initial means of seed attachment to the host.

**Witches' broom.** An abnormally profuse, dense mass of host branches. This is a common symptom induced by dwarf mistletoe infection, as well as other parasites and abiotic agents.

**Woodrose.** An ornamental object composed of the host wood deformed by a mistletoe haustorium and exposed by removing the mistletoe tissue.