



Literature cited & Glossary

Literature cited

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Glossary

ADAPTIVE VARIATION: Differences in **GENES** which improve the fitness of an individual or species, and are influenced by selection. Compare **NEUTRAL VARIATION**.

ALLELE: One of the different forms of a **GENE** or **DNA** sequence that can exist at a single **LOCUS**. Most cells, except the **OVULE** and **POLLEN**, have two alleles at each locus. If both alleles are the same (or indistinguishable), the locus is homozygous, if the alleles differ, it is heterozygous.

ALLELIC RICHNESS: A measure of **GENETIC DIVERSITY**, specifically the number of **ALLELES** observed across all **MARKERS** in a population, corrected for differences in sample size across populations.

ANDRODIOECY: A rare sexual system of plants where male and **HERMAPHRODITE** flowers occur on separate individuals, thus making the trees either purely male or hermaphrodite. Only the hermaphrodite has a female function but its male function is questioned. Compare **ANDROMONOECY** (*F. angustifolia*) and **SUBDIOECY** (*F. excelsior*).

ANDROMONOECY: A sexual system of plants where male and **HERMAPHRODITE** flowers occur on the same individual (making all individuals functionally both male and female). Compare **ANDRODIOECY** (*F. ornus*) and **SUBDIOECY** (*F. excelsior*).

ANTHER: The part of a **STAMEN** that contains the **POLLEN** grains. In ash it consists of two pollen sacs that split and open up (dehisce) to release the pollen grains.

AUTOCHTHONOUS: Native or indigenous; not introduced. Often used to refer to a population or stand of trees.

CHLOROPLAST: Part of a cell containing most of the genetic information necessary for photosynthesis, and the site of photosynthesis in the cell.

CHLOROPLAST DNA: The genetic information (**DNA**) located in the **CHLOROPLAST**. Compare **NUCLEAR DNA**.

CHLOROPLAST MARKER: See **GENETIC MARKER**.

DNA: Deoxyribonucleic acid (**DNA**) molecules carry the genetic information necessary for the organization and functioning of most living cells and control the inheritance of characteristics.

FRAGMENTED: Isolated or detached. For example a “fragmented population” is a stand of trees which is physically isolated from other stands of the same species.

GENDER: Sexual function, either male or female. Also used as meaning ‘sex’, which may be male, female or **HERMAPHRODITE**.

GENES: Units of hereditary information.

GENE FLOW: The movement of **GENES** from one population to another via the movement of **POLLEN** or seed.

GENETIC DIFFERENTIATION: Variation among populations or species that is attributable to differences in **GENES**. See also **GENETIC DIVERSITY**.

GENETIC DIVERSITY: Variation within a population or species that is attributable to differences in **GENES**. See also **GENETIC DIFFERENTIATION**.

GENETIC DRIFT: A force that reduces **HETEROZYGOSITY** by the random loss of **ALLELES**. The effect of drift is greater in small populations.

GENETIC MARKER: **ALLELES** or **GENES** or **DNA** variants whose pattern of inheritance can be monitored to keep track of an individual, trace inheritance in families, or reveal **GENETIC DIVERSITY**. There can be genetic markers in the **NUCLEAR** or **CHLOROPLAST DNA**.

GENOME: The total genetic information (**DNA**) of an individual.

GENOTYPE: The genetic characteristics of an individual. Compare **PHENOTYPE**.

GROWING DEGREE HOURS (GDH): Sum of mean hourly temperatures above 5°C. Hourly mean temperatures below 5°C add nothing to GDH. Temperatures above 5°C add to GDH by their numerical value. Summed across days or months GDH is a strong indicator of biological activity and used in calculations for predictions of start of flowering and leafing.

HAPLOTYPE: A group of **GENES** inherited together as one unit. Usually used to refer to the **CHLOROPLAST GENOTYPE** of an individual.

HERMAPHRODITE: A flower having both male and female parts or function, or an individual with both sexual functions.

HETEROZYGOSITY: A measure of **GENETIC DIVERSITY**, specifically the mean probability, across markers, that two randomly chosen alleles in a population are different.

HYBRIDISATION: Mating between individuals of distinct **TAXA**. Usually refers to crosses between two different species.

INBREEDING: Mating between individuals which are more closely related than pairs chosen at random from within the population. Includes **SELFING**. Compare **OUTCROSSING**.

INBREEDING DEPRESSION: Reduction in fitness due to increase in number of homozygous loci (see **ALLELE**) in offspring from closely related adults.

INFLORESCENCE: The structure bearing the flowers. In ash, two types of inflorescences occur: panicles (*F. excelsior* and *F. ornus*) and racemes (*F. angustifolia*). Panicles have many branches from the main axis whereas racemes consist of a single axis with flowers.

LOCUS (PLURAL: LOCI): The position in the **GENOME** of a **GENE** or other **GENETIC MARKER**. For example, a 'MICROSATELLITE locus' is a stretch of **DNA** being analyzed for variability.

MARKER: See **GENETIC MARKER**.

MASTING: Synchronized mass production of flowers or fruits/seeds.

MAST YEAR: Years in which flowers or fruits/seeds are produced in large quantities.

MATING SYSTEM: Description of the patterns of mating in a population or species, for example which individuals mate with each other and under what circumstances. Often used in plants to refer to the degree to which a species is **SELF FERTILISING** or **OUTCROSSING**.

MICROSATELLITES: Repetitive stretches of short **DNA** sequences used as **GENETIC MARKERS** to trace inheritance in families.

NEUTRAL MARKERS: **DNA** variants or **GENETIC MARKERS** which do not affect fitness. See also **NEUTRAL VARIATION**.

NEUTRAL VARIATION: Differences in **GENES** which have little or no effect on the fitness of an individual or species, and are influenced by gene flow. Compare **ADAPTIVE VARIATION**.

NUCLEAR DNA: The genetic information (**DNA**) located in the **NUCLEUS**. Compare **CHLOROPLAST DNA**.

NUCLEAR MARKER: See **GENETIC MARKER**.

NUCLEUS: Part of the cell containing the genetic information (**DNA**).

OUTCROSSING: Mating to a random sample of the population. Compare **INBREEDING**.

OVULE: An ovule contains the egg cell where fertilization with the sperm cell from the **POLLEN** grain takes place.

PHENOLOGY: Study of the timing of recurring biological phases, the causes of their timing with regard to biotic and abiotic forces, and the interrelation among phases of the same or different species

PHENOTYPE: The observable characteristics of an individual, the result of interaction between genotype and environment. Compare **GENOTYPE**.

PISTIL: The female part of a flower. It consists of an ovary, where the **OVULES** are borne, and a style the top of which is called the stigma. **POLLEN** grains landing on the stigma when it is receptive may germinate and grow down the style to fertilize the egg in the ovule.

PISTILLATE: A collective term for female and **HERMAPHRODITE** flowers, since both types contain functional **PISTILS**. May also be used to describe **INFLORESCENCES** containing female and hermaphrodite flowers or trees bearing such flowers.

POLLEN: Grains produced by the **ANTHERS**, which contain the sperm cell.

PROTOGYNOUS: A characteristic of **HERMAPHRODITES**, when the female phase occurs before the male phase.

RECIPROCAL TRANSPLANT EXPERIMENT: Network of field trials designed to investigate localised adaptation and the scale over which it operates. See detailed explanation on page 26.

SAMARA: A type of fruit with a wing that facilitates wind-dispersal. The samaras on ash trees usually contain only one seed each (even though there are four **OVULES**) and therefore the fruit is sometimes referred to as a seed.

SELF-FERTILIZATION: See **SELFING**.

SELFING: Fertilization of an **OVULE** with **POLLEN** from the same plant or clone. Compare **OUTCROSSING**.

STAMEN: The male part of a flower, consisting of a filament bearing the **ANTHER**.

SUBDIOECY: A **MATING SYSTEM** of plants where male and female flowers may occur on the same or different individuals. Most individuals are either male or female but there are **HERMAPHRODITES** or intermediates that specialize either as males or females. Compare **ANDRODIOECY** (*F. ornus*) and **ANDROMONOECY** (*F. angustifolia*).

TAXON (PL. TAXA): A name of any rank used in plant taxonomy, e.g. species, subspecies, variety, form, etc.

TRAIT: Inherited characteristics.