Flowers and Flower Terminology

Biology 205, Spring 2006

A flower is a terminal cluster of sporophylls, and, technically, a strobilus.

A flower is composed of 4 whorls of sporophylls
- 2 sterile (sepals and petals)
- 2 fertile (stamens and carpels)

Collective Terms

All sepals = calyx
All petals = corolla
All sepals and petals together = perianth

If you can't tell between sepals and petals, use the term tepals (e.g., *Magnolia* flowers)

All stamens = androecium
All carpels = gynoecium

Stamens are made up of the filament (sporophyll remnant) and anthers (containing pollen)

Carpels are made up of the stigma (receptive surface), style (neck) and ovary (containing ovules)

The placenta is the tissue in the ovary that takes nutrition to ovules/developing embryo Placentation is the arrangement of ovules along the placental tissue

A primitive stamen with a pronounced filament is called a laminar stamen (not found in more advanced flowers)
A primitive carpel that is not fully fused is called a conduplicate megasporophyll (not found in more advanced flowers)

The two major trends of advanced flowers are reduction and fusion

Reduction: in the # of parts or in the loss of whole parts (whorls)

Fusion: of like parts (connation) or unlike parts (adnation)

Fusion of calyx and corolla is usually into a tube

Asepalous (free sepals)	synsepalous (fused sepals)
Apetalous (free petals)	synpetalous (fused petals)

(the prefix A- means free parts, Syn- means fusion of like parts)

Stamens can be fused together by their filaments (as in many legumes) or by their anthers (as in Asteraceae, which are synantherous). They can also be fused to the petals = *epipetalous* (as in Asteraceae and Ericaceae)

If sepals, petals and stamens are all fused together (for at least part of their length), we get a hypanthium (or floral tube), as in many of the rose family (like *Malus*, the apples)

Fusion of Carpels

Ovary position

If the ovary is inserted (on the floral axis, or receptacle) above all the other parts (the more primitive version), it is called an superior ovary

If the ovary is inserted below all the other parts (often fused down into the receptacle), it is called an inferior ovary (more advanced condition)

The terms epigynous, hypogynous and perigynous also apply to where the ovary is situated, but refers to the placement of the other floral parts

A hypogynous flower is one where the floral parts are inserted below the ovary (i.e., the ovary is superior)

An epigynous flower is one where the floral parts are inserted above the ovary (i.e., the ovary is inferior)

A perigynous flower is one where the floral parts are inserted around the ovary. This is a special case for flowers with a hypanthium. Technically, the ovary is superior for these flowers

Pistil

A simple pistil is composed of a single, free carpel

A compound pistil is composed of 2 or more fused carpels

A locule is a chamber: in a simple carpel, there is one locule (and 1 carpel). In a compound pistil, the number of carpels and the number of locules may or may not be the same.

Placentation types that we covered in class were: parietal (ovules at the ovary wall), axile (ovules coming off a central axis of placental tissue and the carpels separated by walls, or septa, i.e., multiple locules), and free central (ovules coming off a central axis of placental tissue and the carpels *not* separated by septa, i.e., only 1 locule for multiple carpels)

Flower Sexuality

Bisexual: male and female components on same flower
Monoecious: separate male and female flowers present on same plant
Dioecious: separate male and female plants

Perfect flowers: contain male and female parts
Imperfect flowers: are missing either the male or the female parts
Sterile flowers: no functional male or female components to flowers (e.g., *Hydrangea*)

Complete flowers: contain all 4 whorls
Incomplete: are missing at least 1 whorl (but can still, technically, be complete flowers: they may be just missing the sepals or petals)