

Woody Plants at Jasper Ridge, by Toni Corelli

An overview of the Jasper Ridge (JR) vegetation communities map (2012) shows a majority of the landscape dominated by woody plant communities including chaparral (Birch leaf mountain mahogany, California sagebrush scrub, Chamise chaparral, Coyote brush scrub, Leather oak chaparral, Poison oak scrub), and woodland (Blue oak woodland, California buckeye groves, Coast live oak woodland, Douglas fir forest, redwood forest, Riparian scrub and forest, Shining willow groves, Valley oak).

Our non-woodland communities take up less space on the vegetation map and include the California annual and perennial grassland, and Cattail marsh. The herbaceous plant life forms include annuals, biennials, and herbaceous perennials (non-woody).

JR woody plant life forms can be grouped into trees, shrubs, subshrubs, woody vines:

- trees have one erect trunk and have a height of 4 meters (~13 feet) or more
- shrubs are multitemmed at the base and are mostly shorter than 4 meters
- subshrubs are shrub-like, the lower stems are somewhat woody, the upper stems and twigs are less woody; the plant may die back seasonally (e.g. blue witch, golden-yarrow, sticky monkeyflower)
- vines are trailing or climbing woody plants (e.g. *Clematis* spp. and hairy honeysuckle)

The total number of vouchered plants classified as woody plants at JR is 126. This represents 16% of the 787 vouchered plants that are listed in the JR vascular plant list. However, the number of vouchered herbaceous plant species, 661, or 84% far outnumbers the woody plant species at JR. As shown in the table the percentages for the Santa Cruz Mts. (SCR Mts.) of woody plants and herbaceous plants is similar to that of JR.

| Plant Life Forms | JR # species | % JR | SCR Mts. # species | % SCR Mts. |
|---------------------------------------|--------------|-------------|--------------------|-------------|
| tree | 57 | 7% | | |
| shrub/subshrub/woody vine and bramble | 69 | 9% | | |
| Total woody plant species | 126 | 16% | 206 | 11% |
| Total herbaceous plant species | 661 | 84% | 1,669 | 89% |
| Total vascular plant species | 787 | 100% | 1,875 | 100% |

The herbaceous plants are much more diverse than the woody plants and are well represented in the grassland and lake habitats and in the herbaceous understory layer of the woody plant communities.

JR woody plants and area compared to the SCR Mts.:

| | # Woody Plants | % Woody Plants SCR Mts. | # Square Miles | % Square Miles |
|----------|----------------|-------------------------|----------------|----------------|
| SCR Mts. | 206 | 100% | 1,386 | 100% |
| JR | 126 | 61% | 1.86 | 0.13% |

JR has 61% of the total woody plant species that occur in the SCR Mts. This is high since JR only represents approximately 0.13% of the total land within the SCR Mts.

Non-native vs. Native woody plants at JR

| | # woody plants JR | % woody plants JR | # woody plants SCR Mts. | % woody plants SCR Mts. |
|-----------------|-------------------|-------------------|-------------------------|-------------------------|
| non-native | 31 | 25% | 31 | 15% |
| *non-indigenous | 3 | 2% | 4 | 2% |
| native | 92 | 73% | 171 | 83% |
| Total | 126 | 100% | 206 | 100% |

The JR vascular plant list indicates that 25% of the woody plants at JR are non-native. The percentage of non-native woody plants for the SCR Mts. is approximately 15%.

*Non-indigenous woody plants found at JR are California native plants that do not occur naturally in our area. They may have been planted in the preserve or escaped from adjacent private property. These include:

| | | |
|--------------------------|----------------|---|
| <i>Pinus radiata</i> | Monterey pine | planted and invasive |
| <i>Rhus integrifolia</i> | lemonade berry | planted as an ornamental on adjacent property |

Keckiella antirrhinoides chaparral beardtongue may have escaped from adjacent property
var. *antirrhinoides*

The 7 most invasive woody plants at JR are:

| | |
|------------------------------|----------------|
| <i>Acacia</i> spp. | wattle |
| <i>Ailanthus altissima</i> | tree of heaven |
| <i>Cotoneaster</i> species | cotoneaster |
| <i>Crataegus</i> species | hawthorn |
| <i>Genista monspessulana</i> | French broom |
| <i>Pinus radiata</i> | Monterey pine |
| <i>Pyracantha</i> species | firethorn |

Therefore, the bottom line is that the woody plants are not as diverse as the herbaceous plants at JR and in the SCR Mts., although the woody plant communities represent a larger visual component when looked at on a vegetation map.

References:

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Porter, R., Corelli, T. (2002) Vascular Plant List. Jasper Ridge Biological Preserve, Stanford University, California.

Stuart, J.D., Sawyer, J.O. (2001) *Trees and Shrubs of California*; Illustrated by Andrea J. Pickart. University of California Press, Berkeley, California.

Thomas, J.H. (1961) *Flora of the Santa Cruz Mountains of California*. Stanford University Press, Stanford, California.

web page:

<http://jrpb.stanford.edu/>

<http://www.stanford.edu/dept/JRBP/plants/PlantLis.htm>

Woody plants at Jasper Ridge Biological Preserve (JRBP)

List compiled by Toni Corelli, October 2012

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Jasper Ridge Biological Preserve Plant List: <http://www.stanford.edu/dept/JRBP/plants/PlantLis.htm>

*indicates non-native to California

**indicates native to California but not occurring naturally in our area

indicates rare plant

| | | | | |
|---|--|------------------------------|-------------------|------------------------------|
| Adoxaceae - Muskroot (Caprifoli.) (S. mexicana) | Sambucus nigra ssp. caerulea | BLUE ELDERBERRY | shrub, small tree | drupe, berry-like |
| Anacardiaceae - Sumac/Cashew | *Pistacia atlantica | PISTACHIO | tree | drupe-like |
| Anacardiaceae - Sumac/Cashew | **Rhus integrifolia | LEMONADE BERRY | shrub, small tree | drupe-like |
| Anacardiaceae - Sumac/Cashew | Toxicodendron diversilobum | WESTERN POISON OAK | shrub, vine-like | drupe-like |
| Apocynaceae - Dogbane | *Nerium oleander | COMMON OLEANDER | shrub, small tree | capsule |
| Apocynaceae - Dogbane | *Vinca major | GREATER PERIWINKLE | shrub | follicles |
| Araliaceae - Ginseng | *Hedera helix | ENGLISH IVY | woody vine | berry |
| Asteraceae - Sunflower | Artemisia californica | CALIFORNIA SAGEBRUSH | shrub | achene also called a cypsela |
| Asteraceae - Sunflower | Baccharis pilularis ssp. consanguinea (B. pilularis) | COYOTE BRUSH | shrub | achene also called a cypsela |
| Asteraceae - Sunflower | Eriophyllum confertiflorum var. c. | GOLDEN OR YELLOW-YARROW | subshrub, shrub | achene also called a cypsela |
| Asteraceae - Sunflower | Eriophyllum lanatum var. arachnoideum | WOOLLY SUNFLOWER | subshrub | achene also called a cypsela |
| Asteraceae - Sunflower | *Santolina chamaecyparissus | LAVENDER-COTTON | shrub | achene also called a cypsela |
| Berberidaceae - Barberry | Berberis pinnata ssp. pinnata | CALIFORNIA BARBERRY | shrub | berry |
| Betulaceae - Birch | Alnus rhombifolia | WHITE ALDER | tree | catkin, cone-like |
| Betulaceae - Birch | Corylus cornuta ssp. californica | CALIFORNIA HAZEL | shrub, small tree | nut |
| Boraginaceae - Borage/Waterleaf Family (Hydrophyll.) | Eriodictyon californicum | CALIFORNIA YERBA SANTA | shrub | capsule |
| Caprifoliaceae - Honeysuckle | Lonicera hispidula (L. h. var. vacillans) | HAIRY HONEYSUCKLE | woody vine, shrub | berry |
| Caprifoliaceae - Honeysuckle | Symphoricarpos albus var. laevigatus | SNOWBERRY | shrub | drupe |
| Caprifoliaceae - Honeysuckle | Symphoricarpos mollis | CREeping SNOWBERRY | shrub, sprawling | drupe |
| Celastraceae - Staff-Tree | Euonymus occidentalis var. o. | WESTERN BURNING BUSH | shrub, small tree | capsule |
| Cistaceae - Rock-Rose | *Cistus incanus (C. creticus) | ROCK-ROSE | shrub | capsule |
| Cistaceae - Rock-Rose | Helianthemum scoparium | PEAK RUSH-ROSE | subshrub | capsule |
| Convolvulaceae - Morning-Glory | Calystegia purpurata ssp. purpurata | WESTERN MORNING-GLORY | subshrub | capsule |
| Cornaceae - Dogwood | Cornus glabrata | BROWN DOGWOOD | shrub, small tree | drupe |
| Cornaceae - Dogwood | Cornus glabrata x Cornus sericea ssp. s. | HYBRID DOGWOOD | shrub | drupe |
| Cornaceae - Dogwood | Cornus sericea ssp. sericea | AMERICAN DOGWOOD | shrub | drupe |
| Cupressaceae - Cypress | *Cupressus species | CYPRESS | tree | cone |
| Cupressaceae - Cypress (Taxodi.) | Sequoia sempervirens | REDWOOD | tree | cone |
| Ericaceae - Heath | Arbutus menziesii | PACIFIC MADRONE | tree | berry |
| Ericaceae - Heath | Arctostaphylos crustacea ssp. c. (A. tomentosa ssp. c.) | BRITTLE-LEAVED MANZANITA | shrub | drupe |
| Ericaceae - Heath | Arctostaphylos species | MANZANITA | shrub | drupe |
| Fabaceae - Legume | *Acacia dealbata | SILVER WATTLE | tree | legume |
| Fabaceae - Legume | *Acacia melanoxylon | BLACKWOOD ACACIA | tree | legume |
| Fabaceae - Legume | Acmispon glaber var. glaber (Lotus scoparius var. s.) | CALIFORNIA BROOM | subshrub | legume |
| Fabaceae - Legume | *Genista maderensis | MADEIRA BROOM | shrub | legume |
| Fabaceae - Legume | *Genista monspessulana | FRENCH BROOM | shrub | legume |
| Fabaceae - Legume | Pickeringia montana var. montana | CHAPARRAL PEA | shrub | legume |
| Fabaceae - Legume | *Robinia pseudoacacia | BLACK LOCUST | tree | legume |
| Fabaceae - Legume | *Spartium junceum | SPANISH BROOM | shrub | legume |
| Fagaceae - Oak | Notholithocarpus densiflorus var. d. (Lithocarpus d. var. d.) | TAN OR TANBARK OAK | tree | nut (acorn) |
| Fagaceae - Oak | Quercus agrifolia var. a. x Q. kelloggii | HYBRID LIVE & BLACK OAK | tree | nut (acorn) |
| Fagaceae - Oak | Quercus agrifolia var. agrifolia | COAST LIVE OAK/ENCINA | tree | nut (acorn) |
| Fagaceae - Oak | Quercus berberidifolia x Q. lobata | HYBRID SCRUB & VALLEY OAK | tree | nut (acorn) |
| Fagaceae - Oak | Quercus berberidifolia | SCRUB OAK | shrub | nut (acorn) |
| Fagaceae - Oak | Quercus chrysolepis | MAUL OAK/ | tree | nut (acorn) |

| CANYON LIVE OAK | | | | |
|---|--|-------------------------------------|-------------------|--|
| Fagaceae - Oak | <i>Quercus douglasii</i> | BLUE OAK | tree | nut (acorn) |
| Fagaceae - Oak | <i>Quercus douglasii</i> x <i>Q. lobata</i> | HYBRID BLUE & VALLEY OAK | tree | nut (acorn) |
| Fagaceae - Oak | <i>Quercus douglasii</i> x <i>Q. durata</i> | HYBRID BLUE & LEATHER OAK | tree | nut (acorn) |
| Fagaceae - Oak | <i>Quercus durata</i> var. <i>durata</i> | LEATHER OAK | shrub | nut (acorn) |
| Fagaceae - Oak | <i>Quercus kelloggii</i> | CALIFORNIA BLACK OAK | tree | nut (acorn) |
| Fagaceae - Oak | <i>Quercus kelloggii</i> x <i>Q. wislizeni</i> | ORACLE OAK | tree | nut (acorn) |
| Fagaceae - Oak | <i>Quercus lobata</i> | VALLEY OAK/ROBLE | tree | nut (acorn) |
| Fagaceae - Oak | <i>Quercus wislizeni</i> var. <i>frutescens</i> | DWARF INTERIOR LIVE OAK | shrub | nut (acorn) |
| Garryaceae - Silk Tassel | <i>Garrya elliptica</i> | SILK TASSEL BUSH | shrub, small tree | berry |
| Grossulariaceae - Gooseberry | <i>Ribes aureum</i> var. <i>gracillimum</i> | GOLDEN CURRANT | shrub | berry |
| Grossulariaceae - Gooseberry | <i>Ribes californicum</i> var. <i>californicum</i> | HILLSIDE GOOSEBERRY | shrub | berry |
| Grossulariaceae - Gooseberry | <i>Ribes divaricatum</i> var. <i>pubiflorum</i> | STRAGGLE BUSH/ GOOSEBERRY | shrub | berry |
| Grossulariaceae - Gooseberry | <i>Ribes malvaceum</i> var. <i>malvaceum</i> | CHAPARRAL CURRANT | shrub | berry |
| Grossulariaceae - Gooseberry | <i>Ribes menziesii</i> var. <i>menziesii</i> | CANYON GOOSEBERRY | shrub | berry |
| Grossulariaceae - Gooseberry | <i>Ribes sanguineum</i> var. <i>glutinosum</i> | RED-FLOWERING CURRANT | shrub | berry |
| Hydrangeaceae - Hydrangea (Philadelph.) | <i>Whipplea modesta</i> | MODESTY | subshrub | capsule |
| Hypericaceae - St. John's Wort | * <i>Hypericum calycinum</i> | AARON'S BEARD | subshrub | capsule |
| Juglandaceae - Walnut | <i>Juglans hindsii</i> (<i>J. californica</i> var. <i>hindsii</i>) | NORTHERN CALIFORNIA BLACK WALNUT | tree | nut |
| Lamiaceae - Mint | <i>Lepechinia calycina</i> | PITCHER SAGE | shrub | nutlets |
| Lamiaceae - Mint | <i>Monardella villosa</i> ssp. <i>villosa</i> | COYOTE-MINT | subshrub | nutlets |
| Lamiaceae - Mint | * <i>Rosmarinus officinalis</i> | ROSEMARY | shrub | nutlets |
| Lauraceae - Laurel | <i>Umbellularia californica</i> | CALIFORNIA BAY | tree, large shrub | berry |
| Malvaceae - Mallow | <i>Malacothamnus fasciculatus</i> | CHAPARRAL MALLOW | shrub | capsule |
| Moraceae - Mulberry | * <i>Ficus carica</i> | EDIBLE FIG | tree | achenes many within fleshy sepals surrounded by fleshy receptacle |
| Myrtaceae - Myrtle | * <i>Eucalyptus globulus</i> | BLUE GUM | tree | capsule |
| Myrtaceae - Myrtle | * <i>Myrtus communis</i> | MYRTLE | shrub | berry |
| Oleaceae - Olive | * <i>Ligustrum lucidum</i> | CHINESE PRIVET | shrub, small tree | drupe, berry-like |
| Oleaceae - Olive | * <i>Ligustrum vulgare</i> | COMMON PRIVET | shrub | drupe, berry-like |
| Oleaceae - Olive | * <i>Olea europaea</i> | OLIVE | tree | drupe |
| Phrymaceae - Lopseed (Scrophulari.) | <i>Mimulus aurantiacus</i> var. <i>a.</i> | STICKY MONKEYFLOWER | subshrub, shrub | capsule |
| Pinaceae - Pine | ** <i>Pinus radiata</i> | MONTEREY PINE | tree | cone |
| Pinaceae - Pine | * <i>Pinus sylvestris</i> | SCOTCH PINE | tree | cone |
| Pinaceae - Pine | <i>Pseudotsuga menziesii</i> var. <i>menziesii</i> | DOUGLAS-FIR | tree | cone |
| Plantaginaceae - Plantain (Scrophulari.) | ** <i>Keckiella antirrhinoides</i> var. <i>a.</i> | CHAPARRAL BEARDTONGUE | shrub | capsule |
| Ranunculaceae - Buttercup | <i>Clematis lasiantha</i> | CHAPARRAL OR PIPESTEM CLEMATIS | woody vine | achene |
| Ranunculaceae - Buttercup | <i>Clematis ligusticifolia</i> | WESTERN VIRGIN'S BOWER | woody vine | achene |
| Rhamnaceae - Buckthorn | <i>Ceanothus cuneatus</i> var. <i>c.</i> | BUCK BRUSH | shrub | capsule |
| Rhamnaceae - Buckthorn | <i>Ceanothus oliganthus</i> var. <i>sorediatus</i> | JIM BRUSH | shrub | capsule |
| Rhamnaceae - Buckthorn | <i>Frangula californica</i> ssp. <i>californica</i> (<i>Rhamnus c.</i> ssp. <i>c.</i>) | CALIFORNIA COFFEE BERRY | shrub, small tree | drupe |
| Rhamnaceae - Buckthorn | <i>Frangula californica</i> ssp. <i>tomentella</i> (<i>Rhamnus tomentella</i> ssp. <i>t.</i>) | HOARY COFFEE BERRY | shrub | drupe |
| Rhamnaceae - Buckthorn | <i>Rhamnus crocea</i> | SPINY REDBERRY | shrub | drupe |
| Rosaceae - Rose | <i>Adenostoma fasciculatum</i> var. <i>f.</i> | CHAMISE | shrub | achene-like |
| Rosaceae - Rose | <i>Amelanchier utahensis</i> | UTAH SERVICE-BERRY | shrub, small tree | pome, berry-like |
| Rosaceae - Rose | <i>Cercocarpus betuloides</i> var. <i>b.</i> | BIRCH-LEAF MOUNTAIN-MAHOGANY | shrub | achene |
| Rosaceae - Rose | * <i>Cotoneaster pannosus</i> (<i>C. pannosa</i>) | SILVERLEAF COTONEASTER | shrub | pome, drupe-like |
| Rosaceae - Rose | * <i>Crataegus laevigata</i> | SMOOTH HAWTHORN | tree | pome, drupe-like |
| Rosaceae - Rose | * <i>Crataegus monogyna</i> | HAWTHORN | tree | pome, drupe-like |
| Rosaceae - Rose | <i>Heteromeles arbutifolia</i> | CHRISTMAS BERRY/TOYON | shrub, small tree | pome |
| Rosaceae - Rose | <i>Holodiscus discolor</i> var. <i>discolor</i> | OCEANSPRAY | shrub | achene |
| Rosaceae - Rose | <i>Oemleria cerasiformis</i> | OSO BERRY | shrub, small tree | drupe |
| Rosaceae - Rose | <i>Physocarpus capitatus</i> | PACIFIC NINEBARK | shrub | follicle |
| Rosaceae - Rose | <i>Prunus emarginata</i> | BITTER CHERRY | shrub, tree | drupe |
| Rosaceae - Rose | <i>Prunus ilicifolia</i> ssp. <i>ilicifolia</i> | ISLAY/ HOLLY-LEAFED CHERRY | shrub, tree | drupe |

| | | | | |
|---|--|-----------------------------------|-------------------|---|
| Rosaceae - Rose | *Prunus species | ORNAMENTAL PRUNUS | tree | drupe |
| Rosaceae - Rose | Prunus subcordata | PACIFIC OR SIERRA PLUM | shrub | drupe |
| Rosaceae - Rose | Prunus virginiana var. demissa | WESTERN CHOKE CHERRY | shrub, small tree | drupe |
| Rosaceae - Rose | *Pyracantha species | FIRETHORN | shrub | pome, drupe-like |
| Rosaceae - Rose | *Rosa banksiae | LADY BANKS' ROSE | woody vine | achenes enclosed in fleshy, hypanthium |
| Rosaceae - Rose | Rosa californica | CALIFORNIA ROSE | shrub | achenes enclosed in fleshy, hypanthium |
| Rosaceae - Rose | Rosa gymnocarpa var. gymnocarpa | WOOD ROSE | shrub | achenes enclosed in fleshy, hypanthium |
| Rosaceae - Rose | *Rosa laevigata | CHEROKEE CLIMBING ROSE | shrub | achenes enclosed in fleshy, hypanthium |
| Rosaceae - Rose | Rosa spithamea | COAST GROUND ROSE | shrub | achenes enclosed in fleshy, hypanthium |
| Rosaceae - Rose | *Rubus armeniacus (R. discolor) | HIMALAYAN BLACKBERRY | shrub | achenes, aggregate (blackberry-type) |
| Rosaceae - Rose | Rubus parviflorus | THIMBLEBERRY | shrub | achenes, aggregate (blackberry-type) |
| Rosaceae - Rose | Rubus ursinus | CALIFORNIA BLACKBERRY | shrub | achenes, aggregate (blackberry-type) |
| Salicaceae - Willow | Populus trichocarpa (P. balsamifera ssp. t.) | BLACK COTTONWOOD | tree | capsule |
| Salicaceae - Willow | Salix exigua var. hindsiana (S. exigua) | HINDS' OR NARROW-LEAVED WILLOW | shrub or tree | capsule |
| Salicaceae - Willow | Salix laevigata | RED WILLOW | tree | capsule |
| Salicaceae - Willow | Salix lasiandra var. lasiandra (S. lucida ssp. lasiandra) | PACIFIC WILLOW | shrub to tree | capsule |
| Salicaceae - Willow | Salix lasiolepis | ARROYO WILLOW | shrub, small tree | capsule |
| Sapindaceae - Soapberry (Acer.) | Acer macrophyllum | BIG-LEAF MAPLE | tree | 2-mericarps (samara) |
| Sapindaceae - Soapberry (Acer.) | Acer negundo (A. n. var. californicum) | BOX ELDER | tree | 2-mericarps (samara) |
| Sapindaceae - Soapberry (Acer.) | *Acer palmatum | JAPANESE MAPLE | shrub, tree | 2-mericarps (samara) |
| Sapindaceae - Soapberry (Hippocastan.) | Aesculus californica | CALIFORNIA BUCKEYE | tree, large shrub | capsule, 1-seeded |
| Simaroubaceae - Quassia/Simarouba | *Ailanthus altissima | TREE OF HEAVEN | tree | achene, winged |
| Solanaceae - Nightshade | Solanum americanum | SMALL-FLOWERED NIGHTSHADE | subshrub | berry |
| Solanaceae - Nightshade | Solanum umbelliferum | BLUE WITCH | subshrub | berry |
| Thymelaeaceae - Daphne | #Dirca occidentalis | WESTERN LEATHERWOOD | shrub | berry [capsule] |
| Ulmaceae - Elm | *Ulmus minor | ENGLISH ELM | tree | nutlet (two-winged) |
| Viscaceae - Mistletoe | Phoradendron serotinum ssp. tomentosum (P. villosum) | OAK MISTLETOE | shrub | berry |
| Vitaceae - Grape | *Vitis species | GRAPE | woody vine | berry |

CARPEL - the female reproductive organ in plants consisting of the ovary chamber, placenta and stigma. The number of carpels often is equal to the number of stigmas, styles, or chambers of the ovary.

ENDOCARP - the inside layer of the pericarp (or fruit), which directly surrounds the seeds

EXOPCARP - the outermost layer of the pericarp (or fruit)

MESOCARP - the succulent and fleshy middle layer of the pericarp of drupaceous fruit, between the exocarp and the endocarp; it is usually the part of the fruit that is eaten.

PERICARP - the outer and often edible layer is the pericarp, which is the tissue that develops from the ovary wall of the flower and surrounds the seeds

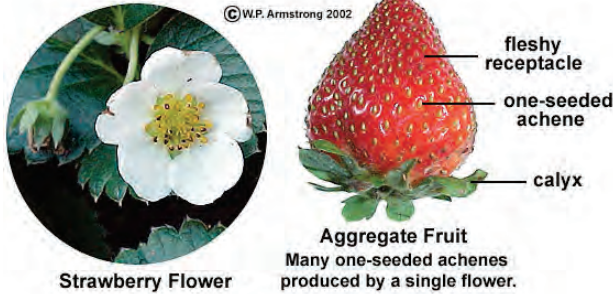
RECEPTACLE - the thickened part of a stem from which the flower organs grow. In some accessory fruits, for example the pome and strawberry, the receptacle gives rise to the edible part of the fruit.

SUPERIOR OVARY- the ovary (ripened fruit) is above the sepals, petals (or both)

INFERIOR OVARY - the ovary is below the sepals, petals (or both)

INDEHISCENT - fruit that opens as the ovary breaks down by naturally occurring conditions

DEHISCENT - fruit that opens by a valve or suture



Strawberry Flower

Hybrid Strawberry (*Fragaria ananassa*)

Aggregate Fruit: Many ovaries derived from a single flower

Accessory fruits - a fruit in which some of the flesh is derived NOT from the ovary but from the adjacent tissue, e.g. the hypanthium (fusion of sepals and pistils) in these examples.



male flowers with many stamen on a separate plant so the blackberry is dioecious (two-houses), male and female flowers on separate plants

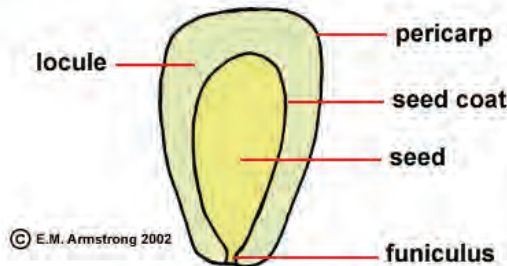
female flower - multiple pistils develop into an aggregate fruit - many one-seeded ACHENES - shown here in the blackberry



Follicle - a dry many-seeded fruit dehiscent by an opening along one side to release seeds, such as in larkspur, magnolia, peony and milkweed.

1. Achene: Small, one-seeded fruit; pericarp free from seed coat.

Note: In the grain or caryopsis, the pericarp is fused with the seed coat.

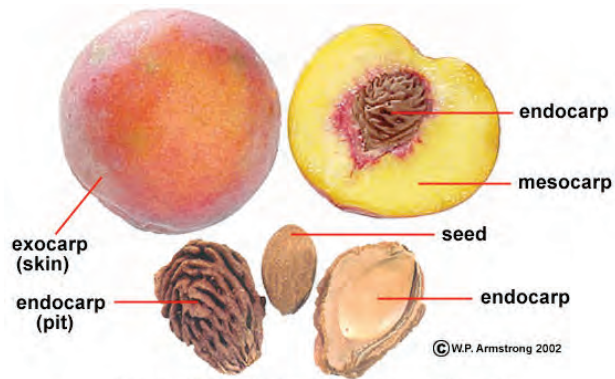


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Achene (e.g. fruit of a sunflower)

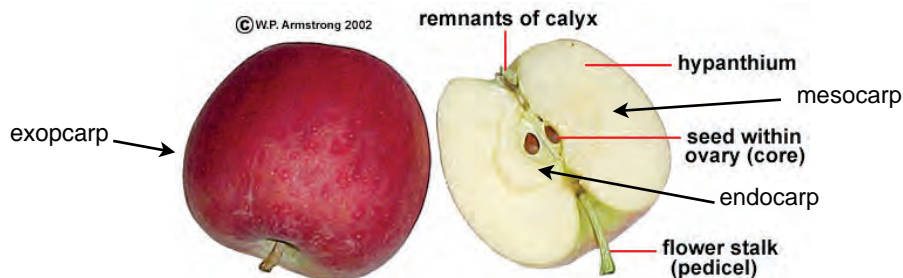


Nutlets - dry fruit produced from one flower with an ovary with more than one chamber (often 4 chambers), common in the Lamiaceae (Mint) and Boraginaceae (Borage) families.



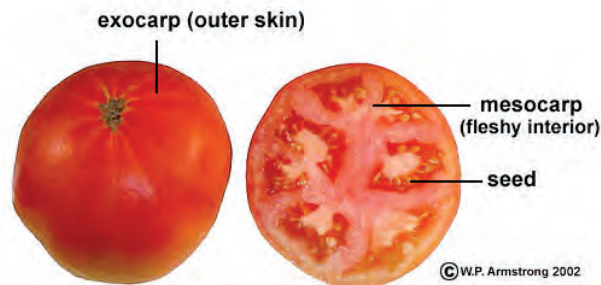
Drupe (fleshy fruit with a stony endocarp)

DRUPE - a drupe is a fruit in which an outer fleshy part (exocarp, or skin; and mesocarp, or flesh) surrounds a shell (the pit or stone) of a hardened endocarp with a seed inside (see illustration). These fruits develop from a single carpel and mostly from flowers with superior ovaries. The definitive characteristic of a drupe is that the hard, lignified stone (or pit) is derived from the ovary wall of the flower. Some examples are: coffee, mango, olive, almond, apricot, cherry, nectarine, peach, pistachio, plum, most palms (including date, coconut and oil palms). See the attached list for woody plants at JRBP that produce drupes.



**Pome (ovary surrounded by fleshy hypanthium)
e.g. apple (*Malus domestica* cv. 'gala')**

POME - (after the Latin word for fruit "pomum") is a type of fruit produced by many flowering plants, but especially plants in the Rosaceae (Rose) family. A pome is an accessory fruit (a fruit in which some of the flesh is derived not from the ovary but from some adjacent tissue, e.g. hypanthium (composed of the fusion of the stamens, sepals and petals). The endocarp forms a leathery or stony case around the seed, and corresponds to what is commonly called the core (e.g. in apples (*Malus*). The shriveled remains of the sepals, style and stamens can sometimes be seen at the end of a pome, and the ovary is often described as inferior in these flowers. Examples are: cotoneaster, hawthorn, loquat, medlar, pear, pyracantha, toyon, quince. See the attached list for woody plants at JRBP that produce pome fruit.



**Berry (All of most of pericarp is fleshy)
e.g. tomato (*Lycopersicon esculentum*)**

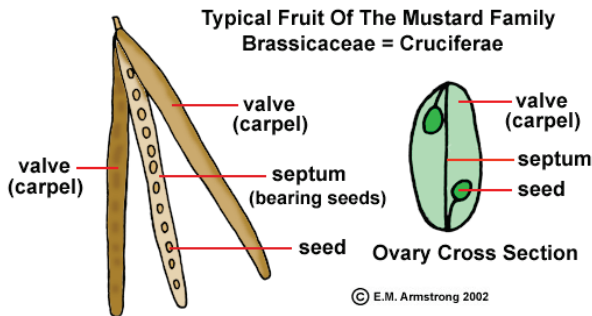
BERRY - The botanical definition of a berry is a fleshy fruit produced from a single ovary. The berry is the most common type of fleshy fruit in which the entire ovary wall ripens into an edible pericarp (endocarp, mesocarp and exocarp). They may have a thin covering and fleshy interiors, and don't have a stone or pit, although many seeds may be present. The seeds are usually embedded in the flesh of the ovary. Some examples: tomato, grapes, persimmon, gooseberries, currants. See the attached list for woody plants at JRBP that produce berry fruits.



2- Mericarps (Samara) in Acer (maple) - splits into two seeds with a wing, enables the wind to carry the seed. Mericarp is a dry, indehiscent 1-seeded fruit.

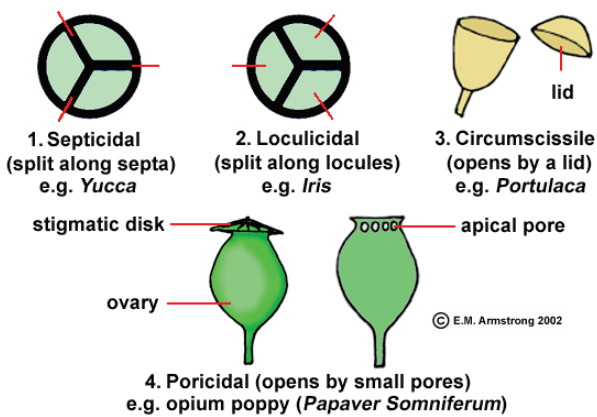
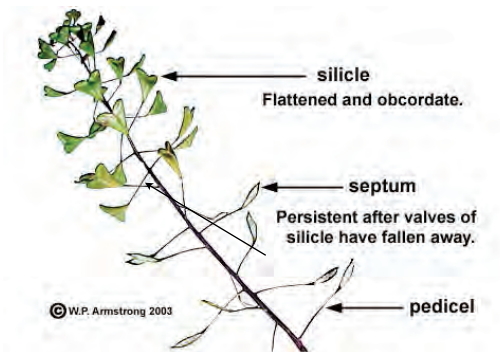


Cone - in the pine tree, showing scales, seeds are enclosed within the scales



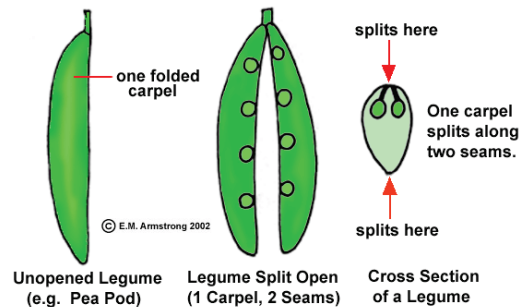
Silique (composed of two carpels)

The silique is an elongate fruit composed of two carpels separated by a seed-bearing partition. The silicle is very similar except it is much shorter (less than twice as long as broad). Siliques and silicles are the characteristic fruits of the mustard family (Brassicaceae).



CAPSULE - a dry dehiscent fruit with more than one chamber, and usually many seeds.

Legume or Pod: Composed of one carpel.



LEGUME - a simple dry fruit that develops from a simple carpel and usually dehisces (opens along a seam) on two sides, common in the Fabaceae (Legume) family.

NUTS



male flowers - catkins



female flowers - a single flower in the leaf axil

nut - in hazelnut - seed encased in a hard shell, surrounded by bracts

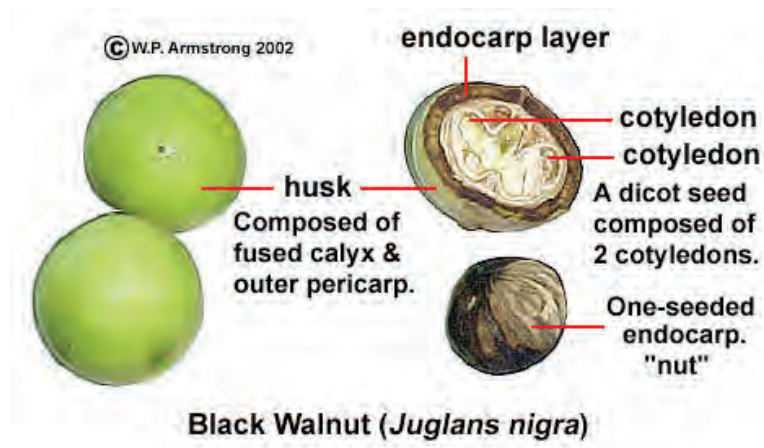


male flowers - catkins

female flowers - a single flower in the leaf axil



ACORN OR NUT or NUTLET - The acorn, or oak nut, is the nut of the oaks. It usually contains a single seed, enclosed in a tough, leathery shell, and often has in a cup-shaped cap.



Reference for illustrations of Strawberry, Achene, Drupe, Pome, Berry, Silique, Silicle, Capsule, Legume and Black Walnut - Waynesword fruit terminology url: <http://waynesword.palomar.edu/termfr1.htm>