

*Taxus brevifolia* Nutt.

## Pacific yew

Taxaceae

TABR2

**Ecology**

**Description:** Native. Small dioecious evergreen tree, 5-10 m tall; bark light red brown, thin, and papery; needles flat, yellow green, pale below, sharply pointed, and attached to twigs by short-ridged stalks in two rows forming flat sprays; both male and female “flowers” (strobili) inconspicuous; fruit fleshy, red aril, attached on lower side of branches.

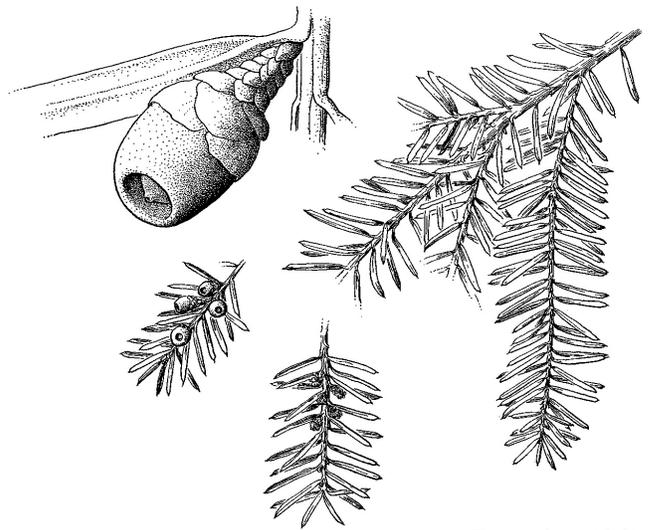
**Range and distribution:** Pacific Northwest, north and central California to Alaska, to western Montana; from sea level to 1500 m; widely, but variably distributed from scattered individuals to thick understory patches.

**Associations:** Sitka spruce, western hemlock, Pacific silver fir, grand fir and mixed-conifer zones. Douglas-fir, grand fir, white fir, Pacific silver fir, and western hemlock; vine maple, dwarf Oregon grape, deerfoot vanilla-leaf, queencup beadlely, wild ginger, and western sword fern.

**Habitat:** Dense, moist, mature, mixed-evergreen forest, and mid to lower slopes or canyon bottoms. Seedlings found in open forests or after management activity or fires remove canopy and expose bare mineral soil.

**Successional stage:** Common component of old-growth Douglas-fir, grand fir, and western redcedar communities. Shade tolerant, but reproduces from seed in openings.

**Ecological relations:** Birds and small mammals eat fruit and disperse seed. Moose, deer, and elk browse foliage in winter. Browsed heavily in western Montana and northern Idaho; retains shrubby form. Pacific yew snags are habitat for cavity-nesting birds. In mountainous riparian areas, an important streambank stabilizer.

*Taxus brevifolia*

Susceptible to heat damage; can resprout after mechanical or some fire damage, but because of thin bark, it rarely survives major fires. After fire, generally re-establishes by means of bird-dispersed offsite seed or seed bank as the overstory canopy develops.

**Biology**

**Flowering and fruiting:** Flowers from April to June; arils ripen from September to October; fruit and seed production increases with openness of canopy but predation by birds and animals also increases.

**Seed:** Seeds are mature when fleshy aril turns red. Fruits should be picked as soon as they are ripe to avoid losses to predation. If used for seedling production, seeds are extracted from fruit, put immediately into prechilling treatments, and stored at recommended temperatures. Warm stratification followed by chilling can break dormancy of yew seeds. Seeds from freshly collected fruit and sown directly in bed may not germinate until second spring. Stored seeds can be pretreated and seeded in spring. Seeds are high in fat content; dry to low moisture content to retain viability during long-term freezer storage.

**Vegetative reproduction:** Easily propagated from cuttings. In many areas, layering is the primary means of reproduction in the wild. Branch-tip cuttings collected fall and winter after current growth has stopped.

**Cultivation:** Can be cultivated; under cultivation, susceptible to root weevil. Plants and seeds are commercially available.

**Transplant viability:** Good for small saplings or seedlings; seedling establishment usually better in some shade.

## Collection

**Part harvested:** Bark and foliage.

**Harvest techniques:** Bark peeled with knives in vertical strips from cut stem or standing tree. If bark is peeled from circumference of trunk, tree will die. Foliage: bough tips are clipped with sharp clippers up to point where stem begins to become woody (about 15-20 cm).

**Harvest season:** Bark is harvested in spring and early summer when sap flow makes it easier to peel off. Bough tips are harvested in summer and early fall.

**Regeneration after harvest:** Cut trees may resprout if sufficient stump is left, but not always. Bark will not regenerate. When foliage harvested by clipping bough tips, new sprouting and growth will occur from secondary buds. New growth will replace removed material in about 3 to 4 years.

## Uses and Products

**Common uses:** Bark source of phytopharmaceutical used for chemotherapy on certain forms of cancer. Foliage used as herbal medicine for boosting immune system, and externally for skin problems. Occasionally used as an ornamental plant. Wood used for crafts.

**Indigenous uses:** Wood is highly prized by the west coast Native Americans because it is strong and dense. Used for making bows, other tools, and carvings.

**Common products:** Pharmaceutical products from bark of *Taxus brevifolia* and foliage of other *Taxus* species. Foliage: salves, tinctures, and teas. Wood: carved specialty products; landscape plant.

**Types of markets:** All parts, international and domestic; whole plant, domestic landscape nursery. Foliage, domestic; international bulk export medicinal markets.

## Comments and Areas of Concern

Although foliar plant parts are low in toxic alkaloids, seeds may have higher levels. Other species in this genus are toxic so use caution in harvesting and know precisely the species. Yew bark harvest and past timber harvest practices have resulted in losses or reductions in populations, which have not yet recovered. Yew is traditionally used by Alaskan tribes; Alaska Natives have requested limited commercial use.

## References

Antos et al. (1996), Cooke (1997), DiFazio et al. (1998), Hortus West (1998), Tirmenstein (1990e), USDA Forest Service (1963, 1974), Walters-Vertucci et al. (1996)

## *Thuja plicata* Donn ex D. Don

### Western redcedar

Cupressaceae

THPL

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#### Ecology

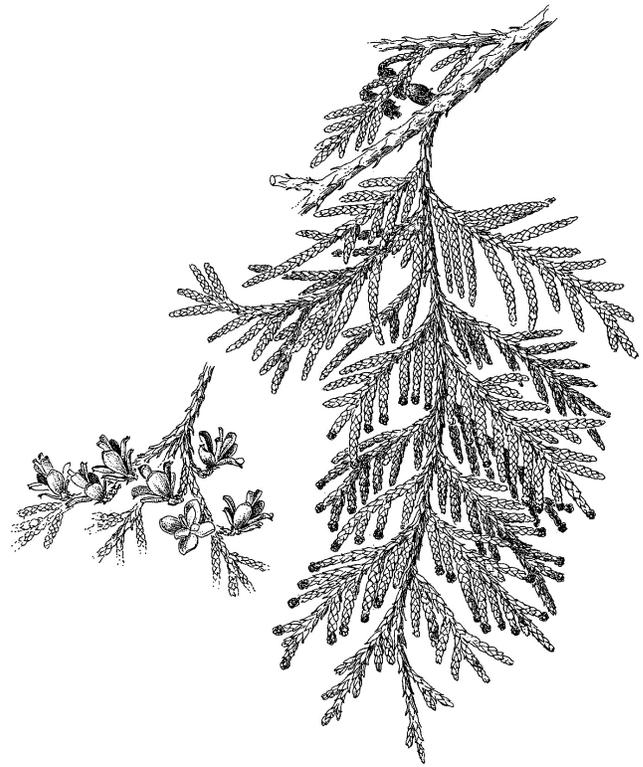
**Description:** Native. Evergreen tree, 30-70 m, tapering trunk 0.6-1.2 m in diameter, occasionally to 1.8 m or more; bark 1-2 cm thick, gray to reddish brown, tearing off in long fibrous strips, aromatic wood; mature trees fluted and buttressed at base; many have forked tops; branches tend to spread or droop slightly then turn upward, J-shaped; branchlets spraylike, strongly flattened horizontally; leaves scalelike, opposite pairs in four rows, the leaves in one pair folded, in the other pair, unfolded, closely pressed to stem in overlapping shingled arrangement, 1.5-3 mm long; cones are clustered near the ends of twigs and become turned up on short stalks; pollen cones 1.5-2 mm, numerous; seed cones green, becoming brown, 10-19 mm; winged seeds, three to six per cone, 4-6 mm, narrow, light brown.

**Range and distribution:** Pacific coast, Alaska to northern California, Cascade Range from central Oregon to British Columbia to western Montana. Pure stands cover some small areas, but it is usually associated with other tree species.

**Associations:** Western hemlock, Pacific silver fir, grand fir zones. Western hemlock, Douglas-fir, red alder, Devil's club, salal, false box, black huckleberry, raspberry, western sword fern, maidenhair fern, and prince's pine.

**Habitat:** Wet soils, shady forests, best on seepage and alluvial sites, also in drier habitats in richer soils; low to mid elevations; below 1800 m.

**Successional stage:** Late successional in most forests, but can be found in all stages of forest succession. Shade tolerant.



*Thuja plicata*

**Ecological relations:** Deer, elk, and rodent browse; black bears remove bark feed on exposed sapwood; hiding and thermal cover for several wildlife species, mammal dens, and nest trees for cavity nesting birds; host for several damaging insect species, such as the gall midge (*Mayetiola thujae* Hedlin) and western redcedar borer (*Trachykele blondeli* Marseul), fungi host, leaf blight (*Didymascella thujina* (E.J. Durand) Maire) and trunk and root rots (*Poria asiatica* (Pilát) Overholt) and (*Phellinus weirii* (Murrill) R.L. Gilbertson), respectively; erosion control and long-term revegetation potential.

#### Biology

**Flowering and fruiting:** Reproductive cycle over 16 months; flowers in late May to early June, cones ripen in early August, seedfall in October to November.

**Seed:** Seeds germinate well without stratification; generally in fall or spring. Seedling survival is low in the wild.

**Vegetative reproduction:** Layering, rooting of fallen branches, and rooting of stem cuttings all successful.

**Cultivation:** Can be cultivated. Plants and seeds are commercially available.

**Transplant viability:** Young seedlings transplant well.

## Collection

**Part harvested:** Branches, cones, bark, small roots, and wood.

**Harvest techniques:** Foliage is clipped; roots are dug and pulled; bark is scored and pulled; wood, usually downed wood with splitting wedge and maul. Live branches with healthy green foliage are clipped in lengths from 30-75 cm. Branches in 40- to 60-lb bundles kept wet, shaded, and cool until used. Branches should be free of dirt, leaf spot, insect damage, or mechanical damage.

**Harvest season:** Branches of younger trees are gathered in summer or fall for highest oil content; cones collected when they turn from yellow to brown; bark in spring when sap runs and bark can be peeled; foliage for Christmas greens in fall after cool temperatures harden off foliage; roots and wood all year. Holiday greenery is harvested typically from late September until two weeks before Christmas for wholesale raw materials. For local finished decorations, the harvest season runs until the week before Christmas.

**Regeneration after harvest:** Foliage branches can sprout laterally after branch tip is clipped. Bark does not regenerate. Taking bark leaves permanent scar. The tree and its branches will recover to its original mass within 3 to 5 years depending on the health of the tree. If side limbs are removed leaving small green growth on each limb, the new growth will replace the removed material in 3 years when fertilized and 5 years under natural conditions.

## Uses and Products

**Common uses:** Boughs used as an antifungal, antibacterial, mild diuretic, for toothaches, oil for warts, and fungus infections; aromatic oil and incense, embalming fluids, salves, liniments; industrial cleaners; ornamental and floral. Tree bole and branches used for building material, shingles, shakes, siding, utility poles, fence posts, interior finishing, closets, chests, boxes, etc.; perfumes and deodorants; insecticides; medicinal preparations; veterinary soaps; extractives and residues in lead refining and glue extenders.

**Indigenous uses:** The most valuable tree to Native Americans on the Pacific Northwest coast up through Alaska and in the Cascade Range, providing wood to make canoes, house planks, totem poles, tools and implements, baskets, and clothing. Foliage or bark used to treat various ailments; tea of boughs for coughs and colds, and diarrhea.

**Common products:** Ornamental boughs, oil, and herbal tinctures.

**Types of markets:** International and domestic. Medicinal, herbal, floral, crafts, and wood products.

## Comments and Areas of Concern

Oil of leaves can be toxic, causing low blood pressure and convulsion. Redcedar is traditionally used by Native American tribes, and Alaska Natives have requested limited commercial use. Bark and root harvest stress the tree; best to collect from trees being felled for legitimate purposes.

## References

British Columbia Ministry of Forests (1995), Burns and Honkala (1990), Cooke (1997), Davis (2000), Franklin and Dyrness (1973), Freed (2000), Hickman (1993), Hitchcock and Cronquist (1978), Hortus West (1998), Kruckeberg (1993), Moore (1993), Pojar and MacKinnon (1994), Rose et al. (1998), Tesky (1992), Thomas and Schumann (1993), Willard (1992)

*Trillium ovatum* Pursh  
 Western trillium, wake-robin  
 Melanthiaceae  
 TROV2

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### Ecology

**Description:** Native. Perennial, erect unbranched herb to 45 cm; single stalk from short, fleshy rhizome; three stemless leaves, 4-20 cm at end of the stalk; flowers erect to nodding, solitary, erect, with three green sepals 0.5-6 cm long and three white pink or purple (with age) petals 0.5-7 cm long; fruits oval, berrylike capsule with many seeds.

**Range and distribution:** Common. British Columbia to California from coast inland to Montana; lowland forest and montane forest zones; 10-2000 m. Widespread.

**Associations:** Western hemlock/western sword fern, Pacific silver fir/rosy twisted stalk associates; white fir, grand fir, Alaska huckleberry, starry false Solomon seal, prince's pine, queencup beadlily, and salal.

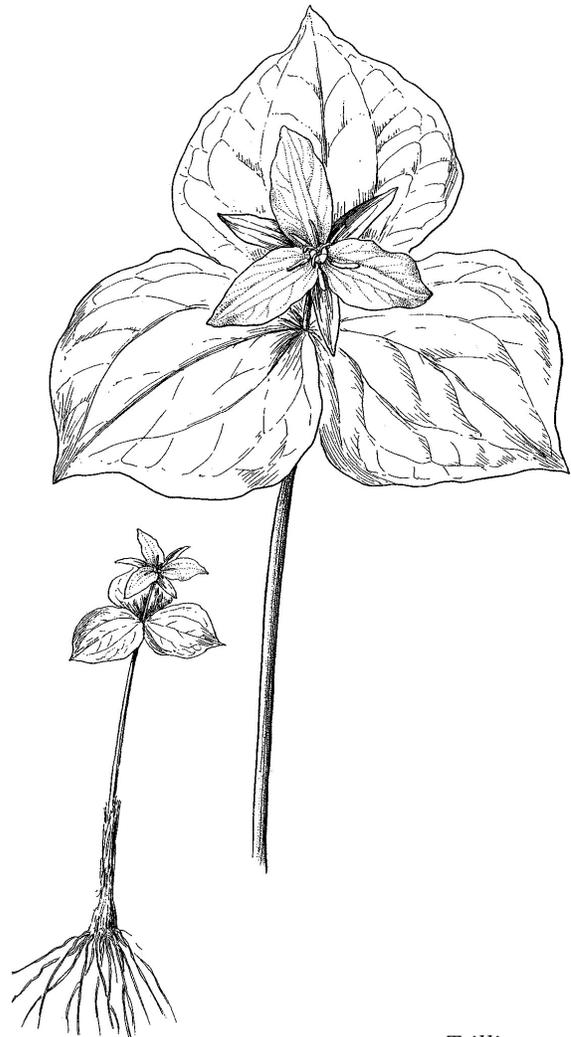
**Habitat:** Mixed evergreen forest on moist wooded slopes, damp meadows, streambanks, and often boggy in spring.

**Successional stage:** Mid to late successional. Shade tolerant but also found in small openings.

**Ecological relations:** The oil-rich appendage of the seed is eaten by ants.

### Biology

**Flowering and fruiting:** From March through June; one flower for each plant annually.



*Trillium ovatum*

**Seed:** Grows readily from seed. Seed requires cold stratification, 15 °C is recommended, may take from 1 month to 3 years. Care taken not to keep conditions too moist as seedlings prone to damping off.

**Vegetative reproduction:** Cultivated plants may be propagated from rhizome division.

**Cultivation:** Can be cultivated. Plants and seeds are commercially available.

**Transplant viability:** Does not survive transplanting, seed propagation more successful.

## Collection

**Part harvested:** Leaves, stems, and roots.

**Harvest techniques:** Has small roots; do not encourage collection from wild. Leaves and stems are collected late in the season (just as they are about to turn yellow) so the roots will have already stored adequate nutrients for winter and can produce new growth. Plants should be collected in small quantities. Plant patches are easily reduced by harvest. Gathering leaves in early summer or during bloom will harm and may kill plant.

**Harvest season:** Late fall.

**Regeneration after harvest:** None. If leaves collected just before they yellow late in season, plant may not be harmed and will produce new aerial stem and leaves the following season.

## Uses and Products

**Common uses:** Cut flowers for fresh floral bouquets. Stems, leaves, and roots, for medicinal purposes, uterine bleeding, bladder irritation, and nosebleeds. Whole plant, landscaping and as shade plant.

**Indigenous uses:** Roots used as an eye wash for sore eyes, childbirth aid, and sometimes cooked for greens.

**Common products:** Fresh floral, herbal, and landscape plant.

**Types of markets:** International and domestic. Florist, herbal, landscape nursery, and horticultural.

## Comments and Areas of Concern

Large amounts reported removed from east coast forest for use abroad. In California, collecting and habitat loss have reduced populations. One of the seven wild medicinal plants under a moratorium on harvest or removal from Montana State lands. Harvest prohibited on national forests in the Northern and Intermountain Regions (Montana and Idaho), and no permits are being issued. Ensure that harvest is not locally restricted before collecting. On United Plant Savers North American medicinal plants “At Risk” list. Siskiyou trillium (*Trillium angustipetalum*) is listed in Oregon as “critically imperiled” and on Forest Service Northern Region sensitive species list.

## References

Craighead et al. (1991), Franklin and Dyrness (1973), Gardenbed (2000), Hickman (1993), Hitchcock and Cronquist (1978), Hortus West (1998), Kruckeberg (1993), Logan et al. (1987), Mizerak (1998), Moerman (1998b), Moore (1993), Pojar and MacKinnon (1994), Ross and Chambers (1988), Stewart (1988), Toogood (1993), United Plant Savers (2000)

*Urtica dioica* L.

## Stinging nettle

Urticaceae

URDI

**Ecology**

**Description:** Native. Erect, perennial, rhizomatous herb, 1-3 m tall; four-angled stems; stems, leaves, and flowers sparsely to moderately covered with stinging hairs; leaves opposite, lance shaped to oval, 7-15 cm, coarsely toothed, prominent stipules 5-15 mm; panicle-like inflorescence, 1-7 cm; flowers greenish in dense drooping clusters in the leaf axils and at stem tips; fruits flattened, ovate achenes. *Urtica dioica* ssp. *dioica* introduced from Eurasia.

**Range and distribution:** Much of United States and southern Canada; lowlands to subalpine elevations, under 3000 m. Dense colonial patches can dominate large areas.

**Associations:** Mixed-conifer/hardwood forests; most coniferous zones in the Pacific Northwest. Common understory component of riparian communities, such as in black hawthorn/cow-parsnip associations; and wet meadow grasses, sedges, and rushes.

**Habitat:** Moist, forested riparian areas; in and adjacent to marshes and meadows, thickets, streambanks; grows in deep, rich, and undisturbed soils.

**Successional stage:** Colonizes following disturbance, also part of stable riparian communities. Low to intermediate in shade tolerance.

**Ecological relations:** Cover for small animals and birds; may have value for rehabilitation of disturbed sites as it may be tolerant of metal-contaminated soil; replenishes the soil through rapid decomposition; protects riparian habitats from human encroachment. Impenetrable stands may be used to keep livestock out of

*Urtica dioica*

streams. Stinging nettle regenerates from buried rhizomes and seed after fire. Stinging nettle is a common early species on burned sites. Frequent fires during the growing season, however, may negatively impact the plants.

**Biology**

**Flowering and fruiting:** Coastal plants bloom in spring, mountain plants in early summer; seeds are mature by mid to late summer.

**Seed:** Produces abundant seed, have germinated after 10 years of storage.

**Seedling production:** Initiate vegetative spread in first growing season.

**Vegetative reproduction:** By rhizomes.

**Cultivation:** Can be cultivated. Seeds are commercially available.

**Transplant viability:** Can transplant seedlings and rhizomatous cuttings.

## Collection

**Part harvested:** Whole plant, leaves, and root.

**Harvest techniques:** Gathered before it begins to bloom in early spring; stems are cut at an angle, at least 5 cm above ground level; roots are dug conservatively from the periphery of a patch.

**Harvest season:** Spring, leaves and stems; spring-summer, new growth at end of stems; late summer, seeds; fall to spring, rootstalks.

**Regeneration after harvest:** If aerial parts harvested, will resprout from root stalk and rhizomes. If whole plant removed but root and rhizome system fairly intact, can grow new stems.

## Uses and Products

**Common uses:** The leaves can be steamed and eaten as a potherb, vegetable. As a diuretic, antispasmodic, antiallergenic, for rheumatic complaints, and urinary tract inflammation; as treatment for benign prostatic hyperplasia; as a supplement in shampoos and hair conditioners, for skin care; for vitamin and mineral content.

**Indigenous uses:** Young leaves and stems eaten; general spring tonic, analgesic, gastrointestinal, dermatological, and gynecological aid; fiber is used for fishnets and snares.

**Common products:** Skin care and cosmetic, beverage supplement, herbal teas, tablets, and nutritional supplement.

**Types of markets:** Dietary supplement, specialty foods, cosmetic, and health care.

## Comments and Areas of Concern

The stems and leaves are covered in stinging hairs that cause contact dermatitis until dried. Once it begins to bloom, older leaves can develop particles that can be irritating to the kidneys; thrives in easily damaged moist habitats; on grazing lands considered a weedy pest; may have been sprayed with herbicides; absorbs compounds from industrial and agribusiness areas. Traditionally used by Native American tribes, and Alaska Natives have requested limited commercial harvest of nettle.

## References

Burrill et al. (1996), Carey (1995), Cooke (1997), Franklin and Dyrness (1973), Hickman (1993), Hitchcock and Cronquist (1978), Hortus West (1998), Leung and Foster (1996), Moerman (1998b), Moore (1993), Pojar and MacKinnon (1994), Russell (1994), Schofield (1989), Tilford (1998), Vance and Thomas (1997)

***Usnea* Dill. ex Adans. spp.****Old man's beard**

Parmeliaceae

USNEA2

*U. longissima* Ach., Beard lichen-USLO50*U. wirthii* P. Clerc, Blood spattered beard-USWI**Ecology**

**Description:** Native. General: fruticose, hanging lichen, brown, greenish yellow, and whitish gray. *Usnea wirthii* tufted, multiple, stiff branches two to four long, pale yellow central cord, sparse red spotting. *Usnea longissima* hairlike, 15 to more than 35 cm long, single unbranched central strand with short lateral branchlets; inside strand a white central cord.

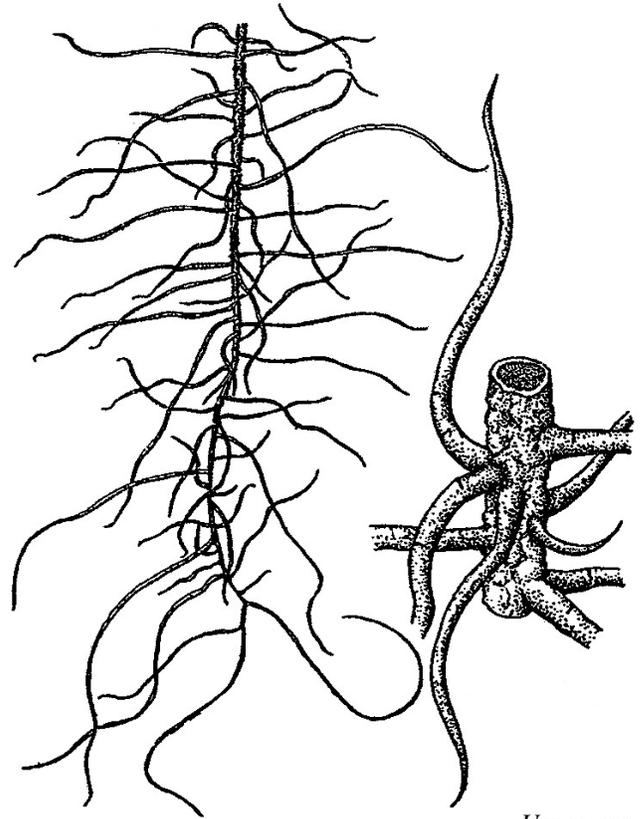
**Range and distribution:** Widespread. Forested areas of temperate North America; at least four species of *Usnea* are abundant throughout the Western United States, Canada to southeast coastal Alaska. *Usnea longissima* infrequent but locally abundant. *Usnea wirthii* frequent.

**Associations:** Sitka spruce, western hemlock zones. Mixed-conifer/hardwood forests. Oregon white oak, red alder, and big-leaf maple, other lichens.

**Habitat:** *Usnea wirthii* grows on conifers in open lowland. *Usnea longissima* grows on various trees and shrubs, in open, well-ventilated deciduous and mixed-conifer/deciduous forests; rare on conifer branches; common in trees along beach and riparian areas.

**Successional stage:** Mid to late successional. Moderately shade tolerant.

**Ecological relations:** Browsed by deer and food for invertebrates; natural antifungal, may serve that role for trees. Because of sensitivity to SO<sub>2</sub>, good index of air quality.

*Usnea* spp.**Biology**

**Flowering and fruiting:** Does not flower.

**Seed:** Not applicable.

**Vegetative reproduction:** Reproduces from detached tissue that falls from one tree branch and reestablishes on another branch.

**Cultivation:** Not cultivated.

**Transplant viability:** Can be transplanted within its forest habitat to other host trees.

**Collection**

**Part harvested:** Whole plant.

**Harvest techniques:** It is not known how long it takes *Usnea* to regrow. The lichen is gently removed from tree branches. Because regrowth and recovery not known, care is taken to leave sufficient lichen to maintain growth and to recover. Generally what is easily reached from ground or collected from fallen trees is taken.

**Harvest season:** No special time; however, in summer it is often too dry and disintegrates easily.

**Regeneration after harvest:** Unknown; regrowth thought to be slow and recovery takes years. Monitoring needed.

## Uses and Products

**Common uses:** As an immunostimulant, antifungal, antimicrobial, and antitumor. Lab studies and clinical trials suggest *Usnea* may be used to inhibit gram-positive bacteria, for dried floral arrangements, and as a decorative.

**Indigenous uses:** In bags as pillows when feathers are unavailable; to wipe slime when cleaning salmon; wound dressing material and bandages; baby diapers and female sanitary napkins; source of yellow dye; antifungal.

**Common products:** Craft material, floral filler, nutraceutical, teas, and tinctures.

**Types of markets:** Primarily domestic for floral and crafts. International and domestic for medicinal and herbal.

## Comments and Areas of Concern

Has threatened or extinct status in most of its European range owing to air pollution and habitat destruction. Does not occur in young forests because it generally spreads from tall older trees to younger trees. Can be confused with witch's hair (*Alectoria sarmentosa*); however, *A. sarmentosa* lacks a central cord inside strand. Loss of old-growth habitat and harvest threatens species. Has already disappeared throughout much of its range.

## References

Franklin and Dyrness (1973), Geiser et al. (1994), Hale and Cole (1988), Mizerak (1998), Moerman (1998b), Moore (1993), Pojar and MacKinnon (1994), Tilford (1998)

***Vaccinium* L. spp.**  
**Huckleberry, blueberry, bilberry**  
 Ericaceae  
 VACCI

*V. membranaceum* Dougl. ex Torr., Black huckleberry-VAME

*V. deliciosum* Piper., Cascade bilberry-VADE

*V. ovatum* Pursh., Evergreen huckleberry-VAOV2

### Ecology

**Description:** Native. *Vaccinium* leaves are deciduous, ovate, simple, and alternate; *V. ovatum*, evergreen, shiny, and toothed. Flowers are pink to red and are usually bell shaped, typical of the heath family in clusters of 3-10. *Vaccinium deliciosum*, low mat-forming shrub; fruits dusk blue. *Vaccinium membranaceum* is an upright spreading shrub; fruits, purple to reddish black; *V. ovatum* fruit usually shiny and purplish black.

**Range and distribution:** *Vaccinium ovatum*, British Columbia south, west side of Cascade Range to coast to northwest California. *Vaccinium membranaceum*, British Columbia south through Oregon mountains to California east to Idaho and western Montana. *Vaccinium deliciosum*, British Columbia south to northern Oregon Cascade Range and Olympic Mountains.

**Associations:** *Vaccinium membranaceum*, *V. deliciosum*: Pacific silver fir zone. Mountain hemlock, beargrass; *V. deliciosum*, mountain heather communities. *Vaccinium ovatum*: Sitka spruce zone. Salal and rhododendron.

**Habitat:** *Vaccinium ovatum*: Edges and openings of coniferous forests near coastal areas; *V. membranaceum* and *V. deliciosum*, high-elevation forests mid to alpine; *V. deliciosum*, subalpine parklands, heaths, and edges of wet meadows.

**Successional stage:** Early to late successional. Shade tolerant but flowering, fruiting, and reproduction increase in openings, or after fire.



*Vaccinium ovatum*    *V. deliciosum*    *V. membranaceum*

**Ecological relations:** Browse for deer, elk, and sheep. Fruits are eaten by various birds and mammals. Huckleberry can resprout from root crowns, but seedling establishment is rare. New shoots tend to produce more fruit, so burning can help berry production. Fire suppression and canopy closure has reduced productive huckleberry areas. High-intensity fire, however, also has been shown to delay berry production for 5 to 20 years.

### Biology

**Flowering and fruiting:** Flowers from May through July depending on elevation; fruits from July through September. Fruit may contain several dozen seeds. *Vaccinium ovatum* flowers and fruits earlier than other species, but fruits remain on plant up to December.

**Seed:** Seeds are collected from macerated fruit and dried. Seed may germinate without stratification, but stratification may aid germination; overwintering outside is helpful. Light is essential for the germination of *Vaccinium* seeds. Seedlings can be reared in a mixture of peat and sand, are small, and must be transplanted several times before being established outside.

**Vegetative reproduction:** Primary means of natural regeneration. Can be started from layering or rhizome and stem cuttings.

**Cultivation:** *Vaccinium membranaceum*, *V. ovatum*, and *V. deliciosum* can be cultivated. Plants and seeds are commercially available for various *Vaccinium* species.

**Transplant viability:** Possible for seedlings but may not become established if soil conditions are not favorable. Transplant should have a large root ball with minimum root exposure.

## Collection

**Part harvested:** *Vaccinium membranaceum* and *V. deliciosum*: berries. *Vaccinium ovatum*: branches with foliage and leaves. Leaves and stems for floral markets, berries for food markets, and the total plant of *V. ovatum* for landscape market.

**Harvest techniques:** For *V. ovatum* (floral greens), branches are snapped off by hand, or clipped, flat branches, deep green in color without flowers or berries are desired. Desirable growth and color characteristics are found under partial shade. Older plants with heavy stems are pruned back heavily to encourage new growth. This method produces the most attractive sprays. Large sprays of dark-green foliage, 60-75 cm long, and sprays 30-50 cm long for tips are harvested from understory plants. New growths spikes 45-60 cm long are harvested from plants grown in open areas for the red-huck markets. All foliage is free of dirt, insect damage, and black leaf spots. Transplants: small plants from rhizome sprouts are dug carefully so as not to disturb other plants, and must be placed in transplant bed for 1 year to be sold in the commercial nursery market. Food: berries picked by hand or with small hand rake. Large rakes that strip foliage with berries not recommended. Berries are cooled to below 5 °C within 1 hour of picking to maintain freshness and salability.

**Harvest season:** Berries when ripe, in late summer and early fall. *Vaccinium ovatum* is harvested for its greens in late summer through fall after new growth hardens off, up until new growth begins in spring. For transplants, plants are dug after buds are dormant (late fall to winter).

**Regeneration after harvest:** New growth sprouts from buds below harvested branch. Floral: healthy plants under favorable growing conditions have been observed replacing removed foliage within 2 to 3 years. Good response is expected if less than 40 percent of the green leaf areas of the plant are removed.

## Uses and Products

**Common uses:** Huckleberry leaves combined with raspberry, rose hips, and hibiscus flowers in teas. *Vaccinium membranaceum* and *V. deliciosum*: berries used in various processed foods and condiments, eaten fresh, as a natural food coloring, source of vitamins, antioxidant, juice as a beverage and to make wine, fruits and leaves, astringent, and diuretic; leaves (Europe) for diabetes, gastrointestinal, kidney, and urinary tract disorder; fruits for diarrhea, mucous membrane inflammation of mouth and throat, and improved vision; for food, beverage, and wine coloring. *Vaccinium ovatum*: foliage is used in fresh and preserved floral arrangements; many horticultural uses including as a hedge plant or ground cover.

**Indigenous uses:** Fruit of the evergreen huckleberry was traditionally used by many indigenous peoples of the west coast and interior as a fresh or dried staple. The Capella Indians reportedly traveled up to 30 to 50 km annually to harvest the fruit. Berries were eaten fresh, mashed, or dried and made into cakes. Preserved berries provided essential vitamin C during winter.

**Common products:** *Vaccinium deliciosum* and *V. membranaceum*: fresh and frozen berries, jams, syrups, candies, beverages, and other food items. *Vaccinium ovatum*: dried and fresh floral greens, landscaping, and restoration material.

**Types of markets:** International and domestic markets for all food and crafts products. Specialty and dessert food, and floral. Domestic markets for nursery stock.

### Comments and Areas of Concern

*Vaccinium* species are traditionally used by American tribes, and Alaska Natives have requested limited commercial use for several species. Poor berry crops in the interior to northern Rocky Mountains are of concern as berries are a substantial part of the diet of some wildlife including grizzly bear (*Ursus arctos* L.). Illegal harvest is an increasing problem, and some areas are being heavily impacted by harvesters. Bog cranberry (*V. oxycoccos*) is listed as imperiled in Idaho. Velvetleaf huckleberry (*V. myrtilloides*) is listed in Oregon.

### References

Antos et al. (1996), Franklin and Dyrness (1973), Gardened (2000), Hitchcock and Cronquist (1978), Hortus West (1998), Kruckeberg (1993), Leung and Foster (1996), Minore (1972), Pojar and MacKinnon (1994), Rose et al. (1998), Thomas and Schumann (1993), Tilford (1998), Tirmenstein (1990f), USDA Forest Service (1965), Vance and Thomas (1997), Young and Young (1992)



*Valeriana* L. spp.

## Valerian

## Valerianaceae

## VALER

*V. sitchensis* Bong., Sitka valerian-VASI*V. occidentalis* Heller, Western valerian-VAOC2*V. scouleri* Rydb., Scouler's valerian-VASC2**Ecology**

**Description:** Native. About 200 species: perennial herb from rhizomes. *Valeriana sitchensis*: erect stems 30-120 cm; short, hairy leaves, mostly undivided basal leaves, one or more sets of opposite, dissected stem leaves; clustered inflorescence; flowers white or pink; fruit generally compressed, veined achene. *Valeriana occidentalis*: commonly 30-90 cm. *Valeriana scouleri*: 15-70 cm tall; fibrous rooted from a stout branched rhizome; crenate leaves.

**Range and distribution:** Genus worldwide in temperate zone, over a dozen species in Western States, fewer species in California; moderate to high elevations, 1500-3000 m. Often found in small, dense colonies but generally widely dispersed.

**Associations:** Pacific silver fir, mountain hemlock, white fir zones. *Valeriana sitchensis*: American false hellebore, sedge, black huckleberry, lupine, and arnica. *Valeriana scouleri*: Western hemlock zone. Douglas-fir and sedge.

**Habitat:** Moist sites in coniferous forests, subalpine meadows, cliffs and streambanks, open or shaded soils.

**Successional stage:** Early to late successional in meadow communities. Shade intolerant.

**Ecological relations:** Common browse for deer, elk, bear, moose, and smaller animals; indicates cool, moist sites with heavy winter snow pack; cats and rats attracted to root odor.

*Valeriana scouleri**V. columbiana**V. sitchensis***Biology**

**Flowering and fruiting:** Flowers from June to August; fruit is small, hard ribbed with feathery plumes.

**Seed:** Timing is critical when collecting seed as it can fall in a few days after mature. Seed is small. Easily established from seed; establishes well in rich, moist soil, but can survive drought.

**Vegetative reproduction:** Can reproduce from rhizomes. In cultivation, clumps can be divided to get new plants.

**Cultivation:** Can be cultivated. Seeds are commercially available for *Valeriana officinalis*. Plants are commercially available for *V. scouleri* (Scouler's valerian).

**Transplant viability:** Can be transplanted, but because plants are easily established from seed and populations are small, do not recommend.

## Collection

**Part harvested:** Roots.

**Harvest techniques:** Sitka valerian (*Valeriana sitchensis*) is the most popular commercially wildcrafted species but is not being cultivated as much as other species. It is easier to grow in commercial quantities. For fall and winter collecting, patches are located when the plants are flowering.

**Harvest season:** Late summer through fall; in fall, roots have higher medicinal potency.

**Regeneration after harvest:** Low; entire root is collected; if seeds are present, spread them at time of harvest or wait until seeds have dispersed before harvesting.

## Uses and Products

**Common uses:** As an antispasmodic and hypotensive; skin softener; flavoring in beverages and desserts; to relieve anxiety and promote sleep.

**Indigenous uses:** Rubbed on sore muscles; pounded roots rubbed on rheumatism and for swelling, root as a tapeworm medicine, raw root poisonous and cooked root for food; plant for stomach troubles; dried roots as incense; leaves mixed with tobacco as flavoring.

**Common products:** Tea, tinctures, capsules, ingredient in health care as specialty products.

**Types of markets:** International and domestic. Medicinal, herbal, and health care.

## Comments and Areas of Concern

Check for signs of browse before harvesting; gather conservatively from dense, healthy patches; avoid gathering on fragile, steep slopes and when the soil is wet and prone to compaction; moist sites susceptible to disturbance. Not always well-tolerated, use cautiously at first.

## References

Brevoort (1998), Craighead et al. (1991), Elias and Dykeman (1990), Hartmann et al. (1990), Hickman (1993), Hitchcock and Cronquist (1978), Hortus West (1998), Leung and Foster (1996), Mizerak (1998), Moerman (1998b), Moore (1993), Pojar and MacKinnon (1994), Thomas and Schumann (1993), Tilford (1993,1998), USDA Forest Service (1988)

*Verbascum thapsus* L.  
**Mullein, common mullein, woolly mullein**  
 Scrophulariaceae  
 VETH

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### Ecology

**Description:** Exotic. Biennial herb, densely covered with woolly hairs; first year producing rosette of woolly basal leaves; second year producing single erect stem 30 cm-2 m tall; basal leaves 8-50 cm long, wider at end; stem leaves alternate, 30-40 cm long, smaller up the stem; raceme inflorescence; flowers yellow, circular, 15-30 mm wide, five stamens, upper three hairy, yellow, lower two hairless; seeds in ovoid capsule, 8 mm long.

**Range and distribution:** Throughout temperate North America; below 2200 m. Widespread and common.

**Associations:** Herbs of open fields, dock, burdock, common dandelion, chickweed, and common yarrow.

**Habitat:** Common on roadsides, along river bottoms, fields, and dry open waste places or disturbed areas in rocky mineral soil.

**Successional stage:** Early successional; colonizes following disturbance, frequently in bare mineral soil. Shade intolerant.

**Ecological relations:** Important for soil stabilization, breaking up compacted soil; reintroducing pollinators and first source of small animal habitat in disturbed areas; seeds are a source of winter food for small birds; elk will eat the dry leaves and stems on overused winter ranges.



*Verbascum thapsus*

### Biology

**Flowering and fruiting:** From June to September; fruits are capsules.

**Seed:** Seeds numerous and wingless, complex germination requirements, best temperature, 30 °C, slow to germinate, but establishes easily.

**Vegetative reproduction:** Can be propagated by root cuttings taken in early spring.

**Cultivation:** Can be cultivated. Plants are commercially available.

**Transplant viability:** Easily transplanted in rosette stage.

## Collection

**Part harvested:** Leaves and flowers.

**Harvest techniques:** Best product when harvested in spring of the first year of growth. Second year is still usable. Leaves and flowers are harvested to minimize environmental consequences of reducing shade and microsites that the plant may be providing.

**Harvest season:** Leaves in summer, May to August best condition; flowers when buds are half open.

**Regeneration after harvest:** Biennial plant will not regenerate if flowering head is removed. If small percentage of leaves are removed from rosette, the plant will produce plant stem the following year.

## Uses and Products

**Common uses:** Medicinal, as an expectorant, mild diuretic, sedative, astringent, and herbal cough remedy; to treat bronchitis and asthma; dyes; oil as skin emollient.

**Indigenous uses:** Medicinal, roots worn as necklace by teething babies, decoction of leaf taken for colds, cough, and fever. Leaf poultice applied to cuts; scalded leaves used on swollen glands; plant smoked as cure for people not in their right mind; powdered root for skin infections; smoking mixture base.

**Common products:** Tea, tincture, oil, cough syrup, eardrops, and eyewash.

**Types of markets:** Domestic. Medicinal, herbal, and health care.

## Comments and Areas of Concern

May be used for restoration purposes in harsh degraded areas. Harvest with caution in areas where it may be important for slope stabilization. Although nonnative, is generally not invasive and not considered noxious in Pacific Northwest states.

## References

Abrams and Ferris (1960), Brill and Dean (1994), Burdill et al. (1996), Craighead et al. (1991), Hartmann et al. (1990), Hickman (1993), Hortus West (1998), Mizerak (1998), Munz and Keck (1959), Moerman (1998b), Ody (1993), Pojar and MacKinnon (1994), Rice (1997), Thomas and Schumann (1993), Tilford (1993, 1998), Young and Young (1986)

***Xerophyllum tenax* (Pursh) Nutt.**  
**Beargrass, Indian basket grass**  
 Melanthiaceae  
 XETE

### Ecology

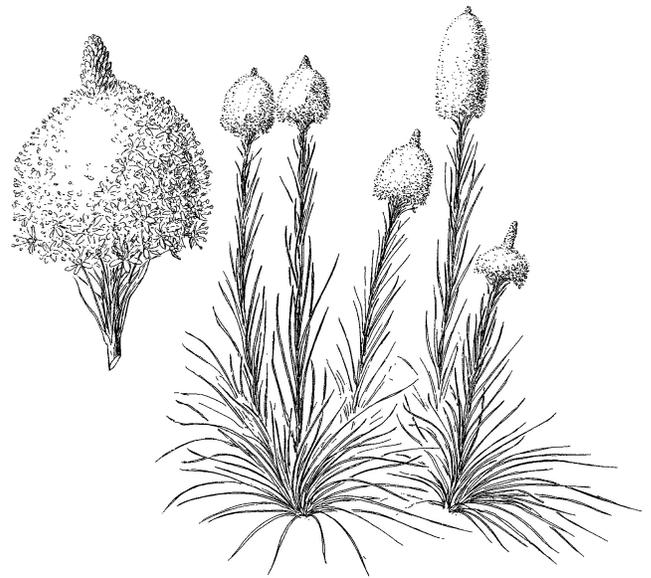
**Description:** Native. Perennial herb; grows from 1-2 cm thick woody rhizome; stem 15 cm-1.5 m; basal leaves 30-100 cm long, 2-6 mm wide, grasslike, rough edged, tough, and wiry in large clumps; stem leaves shorter farther up the stem, green on upper, pale gray below; many white flowers, 5-10 mm on long stalk in a dense, conical, terminal cluster; fruits 5-7 mm three-lobed capsules; seeds 4 mm.

**Range and distribution:** British Columbia to California to Rocky Mountains; near sea level to over 2600 m, primarily in higher elevations. In Washington, from near sea level to subalpine. In patches, can be abundant in certain areas (drier subalpine meadows and understory), but not common.

**Associations:** Western hemlock and Pacific silver fir zones. Also, understory dominant on cool upper slopes in western spruce-fir forests; Douglas-fir, mountain hemlock, subalpine fir, noble fir; black huckleberry, rhododendron, whortleberry, bearberry, and sedges.

**Habitat:** Open woods, clearings, meadows, slopes, ridges, coniferous forests, well-drained soils, and non-forested talus slopes; serpentine soils in Siskiyou Mountains. Can grow well on shallow or rocky soils. Grows well on serpentine soils, but does not tolerate limestone-based soils.

**Successional stage:** Early to late successional; pioneer species and highly tolerant of disturbance; regenerates or resprouts well after fire. Persistent, long-lived species, but rarely blooms under a dense forest canopy. Moderately shade tolerant.



*Xerophyllum tenax*

**Ecological relations:** The fleshy leaf bases or root-stock is food for bears in spring, as well as mice and pocket gophers; elk and deer eat the more tender leaves year-around; the leaves remain over winter, providing food for the mountain goat in cold weather. Fair cover for small mammals. Long-term revegetation and erosion control is provided from the roots. The primary fire adaptation of beargrass is its ability to sprout from rhizomes following fire. Beargrass is a survivor species that is present before a fire and regrows in place after the fire. Meristematic region of the rhizome, however, is near the soil surface so plant may be killed by high-intensity fires.

### Biology

**Flowering and fruiting:** From May to August; stalks of white flowers bloom in mid summer; perennial, nonflowering for several years. Tends to bloom in multiple-year cycles, possibly based on environmental conditions.

**Seed:** Needs cold stratification for germination. Good germination rates have been obtained.

**Vegetative reproduction:** Will sprout from rhizomes more frequently than flowering.

**Cultivation:** Can be cultivated, but difficult. Has been successfully cultivated at the University of British Columbia Botanical Garden. Plants and seeds are commercially available.

**Transplant viability:** Mature plants do not transplant well. Seedling can be transplanted. Strongly mycorrhizal; may need appropriate soil to grow.

## Collection

**Part harvested:** Leaves and flowers.

**Harvest techniques:** Leaves of current year's growth gently are pulled or cut at base of plant. All stems must be free of dirt and brown tips removed. Leaves commercially harvested are collected into about ½-lb bunches.

**Harvest season:** Late fall and winter.

**Regeneration after harvest:** Good, after growing season if rhizome left intact. Cutting into or tearing out rhizome to collect leaves is detrimental to the plant.

## Uses and Products

**Common uses:** Filler in floral arrangements; basket weaving; fresh flower arrangements.

**Indigenous uses:** Baskets; garments; for decoration; poultice of chewed roots applied to wounds; grated roots used to stop bleeding.

**Common products:** Floral greens, fresh, dried, dyed, and preserved; basket weaving materials.

**Types of markets:** International and domestic. Dried and fresh floral, and crafts; export primarily to Japan and Europe.

## Comments and Areas of Concern

Clearcutting and soil scarification may severely reduce beargrass (Montana) or increase density (Oregon). After a disturbance that opens canopy, beargrass increases in size and number; declines under canopy closure. Because of high level of harvest taking place on high-elevation sites, there is concern for degradation of habitat.

## References

Craighead et al. (1991), Crane (1990b), Franklin and Dyrness (1973), Hickman (1993), Hitchcock and Cronquist (1978), Hortus West (1998), Pojar and MacKinnon (1994), Ross and Chambers (1988), Smart and Minore (1977), Thomas and Schumann (1993), USDA Forest Service (1988), Vance and Thomas (1997), Whitney (1997)

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