Native Plant Protocol

Oplopanax horridus: Devils Club

USDA Forest Service-Smithsonian Institute[11]

Taxonomy

Family Scientific Name: Araliaceae [,9,10]

Family Common Name: Ginseng [9,10]

Genus: oplopanax [9,10]

Genus Authority: (Torr.& A. Gray) Miq [9,10]

Species: horridus [9,10]

Common Name: Devil's Club

Species Authority: (Smith) Miq. [9]

Common Synonym 1

Genus: Echinopanax [9]

Species: horridus [9]

Species Authority: (Smith) Decne. & Planch. ex. Harms [9]

Common Synonym 2

Genus: Fatsia [9]

Species: horrida[9]

Species Authority: (Smith) Benth. & Hook. F ex W.H. Brewer & S.Watson [8]

Species Code as per USDA Plants Database: OPHO[9,10]

Other Common Names: tlingit aspirin, devil's walking stick, cukilanarpak, echinopanax horridus, fatsia horrida, panax horridum, alaskan ginseng[2]

General Information

General Distribution: Range covers US- AK,ID,MI,MT,OR,WA. Canada- BC,ON,YT. South Alaska in coastal forests to southern Oregon, east to the cascade range including Idaho Montana, Michigan and Ontario. [2,3,8]

Climate and Elevation Range: Prefers sun to shade in wet conditions. Found in moist forests, near streams or drainage beds at all elevations between sea level and 1525 m. [3]

Local Habitat and Abundance: O. horridus is indicative of late seral, climax or old growth forests. Tree associations in typical distributions include Sitka spruce, Pacific silver fir, mountain hemlock, western red cedar, Alaska-cedar, and Douglas-fir. Understory associations include salmonberry, vine maple, deerfoot, vanillaleaf, western trillium, lady fern, bedstraw and Alaska

huckleberry. It is shade-tolerant and grows in well-drained to poorly-drained silty, sandy, and loamy soils.[1,2]

Plant Chacteristics: Perrenial, wetland shrub. Leaves are large and palmately lobed. They have large spines on the undersides and along the petioles. The flowers are white to green to brown in July. They are clustered and arranged on a pyramidal spike. The berries are red and slightly flat. The stems are covered with yellow spines. [1]

Additional Comments: O. horridus is an important to plant to Pacific Northwest native Americans for medicine and natural deodorant. Its an incredibly important source of food for bears and birds. [2,4]

General Information obtained from: http://nativeplantspnw.com/devils-club-oplopanax-horridus/, www.wildflower.org,

Propagation Details

General Propagation Notes: O. horridus reproduces readily by forming clonal colonies through a layering process. In nature, the clones detach themselves after becoming established by laying down roots. Which leads to the assumption that devils club can be propagated by dividing, layering, root cuttings and seed.

Ecotype: Wetland Restoration site

Propagation Goal 1: Plants

Propagation Method 1: Vegetative

Product Type: Container plugs

Stock Type: 3 L containers

Time to Grow: 18 months

Target Specifications: Height: 10cm; Caliper: 1.5cm; Root system: firm plug in 3L container[2]

Propagule Collection: The following protocol data is taken directly from O. horridus propagation trials conducted at Glacier National Park, Montana as reported on the Native Plant Network website. Semi-softwood stem cuttings were collected at bud break in early June. Cuttings averaged 20cm in length and were 1.5cm in diameter.

Propagule Processing and Characteristics: Cuttings were kept under moist refrigeration prior to pre-treatment.

Pre-Planting Propagule Treatments: The cuttings were treated with Fungicide rinse for 3 minutes to pre treatment. They were then re-cut at the base to 20cm lengths. Stem cuttings were treated with 3000ppm IBA rooting powder and were stuck, with at least 2 nodes below the surface of the rooting media, in a mistbed. The rooting media should be moist, rich soils preferred. Well to poorly drained with sandy, silty, or loamy textures ok.

Growing Area Preparation/Annual Practices for Perennial Crops: Outdoor mistbed and shade house[1,3]

Establishment Phase: To reach 100% rooting, cuttings were in the mistbed for 8 weeks. During this time they produced multiple roots that emerged from the nodes. These roots averaged 4cm in length at the time of lifting from the mistbed. There was no callus formation at the base of the cutting.

Length of Establishment Phase: 8 weeks

Active Growth Phase: Cuttings were up-potted to 3L containers and were kept in the shadehouse throughout the active growth phase. [1]

Length of Active Growth Phase: 10 weeks[1]

Hardening Phase: One final irrigation is applied before overwintering.

Length of Hardening Phase: 8 weeks[1]

Harvesting, Storage and Shipping: The total time to harvest in 3L containers was 1.5 [1] years. The plants were harvested in September of the second year and overwintered in an outdoor nursery under an insulating foam cover and snow. [1]

Length of Storage: 5 months[1]

Guidelines for Outplanting/Performance on Typical Sites: Shaded moist areas[2]

Other Comments: O. horridus regenerates well after stem damage. [1]

Picture of Vegetative Cuttings of O. horridus[4]

Propagation Goal 2: Plants

Propagation Method 2: Seed

Product Type: Container plugs

Stock Type: 490 ml containers

Time to Grow: 2 years[7]

Target Specifications: Height: 10cm; Caliper: 7mm; Root System: Firm plug in 490mL container[8]

Propagule Collection: Collect tan seeds from mature dark red fruits, usually in late August.[8] Fruit usually ripens 4 weeks after flowering and then persists throughout the winter.Fruits can be collected by hand (with gloves to avoid spines) or with a pole pruner. [8]

Propagule Processing and Characteristics: The following protocol data is taken directly from O. horridus propagation trials conducted at Glacier National Park, Montana as reported on the Native Plant Network website. Seeds are placed under aerated running water soak to remove impurities and inhibitors. Then the seeds must endure stratification for 400 days. The stratification process alternates from 100 days of moist-warm (20°C-68°F) to moist-cold (1 ˚C -34 ˚F) beginning with moist-warm. Seeds typically germinate after the second moist-cold stratification at a slow rate. Seed dormancy is classified as morphophysiological dormancy for the related genera Panax, which occupies a similar habitat. [3,8]

Seeds/kg: unknown

% Purity: 100%

% Germination: 80-90%

Growing Area Preparation/Annual Practices for Perennial Crops: Outdoor nursery growing facility. Sowing Method: direct seeding. Seeds were covered with planting media of 50% milled sphagnum peat, perlite and vermiculite.

Establishment Phase: Germination occurred in June of the second year when daytime temperatures were 22C and nighttime temperatures were 16C. True leaves appear 2 weeks after germination. Plants had developed 2 to 4 true leaves 1 month following germination.
The initial establishment was slow.[8]

Length of Establishment Phase: 4 to 8 weeks [8]

Active Growth Phase: Seedlings grew at a moderate rate following establishment. Plants were fertilized during the growing season. Plants averaged 3.5cm in height/3mm in caliper at the end of the first growing season. Root development also occurred at a moderate rate. Seedlings were not root tight at the end of the first growing season. [8]

Length of Active Growth Phase: 10 weeks[8]

Hardening Phase: Plants were fertilized in the fall. The pots were leached with clear water and one final irrigation was applied before overwintering. [8]

Length of Hardening Phase: 8 weeks [8]

Harvesting, Storage and Shipping: Total time to harvest was 2 years. The plants overwintered in an outdoor nursery under an insulating foam cover and snow. [8]

Length of Storage: 5 months [7]

Guidelines for Outplanting/Performance on Typical Sites:

Other Comments: According to the Native Plant Network, “O. horridus has a shallow rhizomatous root system and requires shade during seedling production and on out planting sites. Seedling production is a 2 to 3 year process. Cuttings are more expedient.” [8]

Edited and Compiled by: Jessica Chandler 2019

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Plant Data Sheet

Oplopanax horridus

Sherry Ballard © California Academy of Sciences

Taxonomy

Family Scientific Name: Araliaceae

Family Common Name: Ginseng

Genus: *Oplopanax*

Species: *horridum*

Common Name: Devil's Club

Species Authority: (Smith) Miq.

Common Synonym 1

Genus: *Echinopanax*

Species: *horridus*

Species Authority: (Smith) Dcne. & Planch. ex. H.A.T. Harms

Common Synonym 2

Genus: *Oplopanax*

Species: *horridus*

Species Authority: Miq.

Species Code as per USDA Plants Database: OPLHOR

General Information

General Distribution: Range covers Alaska to southwest Oregon to western Montana and northern Idaho. Stands of *O. horridus* have been found on islands in northern Lake Superior and in Ontario, Canada.

Climate and Elevation Range: Found in moist forests, near streams or drainage beds at all elevations between sea level and 1525 m.[4,5]

Local Habitat and Abundance: *O. horridus* is indicative of late seral, climax or old growth forests. Tree associations in typical distributions include Sitka spruce, Pacific silver fir, mountain hemlock, western red cedar, Alaska-cedar, and Douglas-fir. Understory

associations include salmonberry, vine maple, deerfoot, vanillaleaf, western trillium, lady fern, bedstraw and Alaska huckleberry. It is shade-tolerant and grows in well-drained to poorly-drained silty, sandy, and loamy soils.[4, 5]

Plant Strategy Type: Mid to late successional; will fill in alluvial openings.[4]

Propagation Details

Ecotype: Cedar/Devil's Club habitat, 1000m, Avalanche, Glacier National Park [1,2]

Propagation Goal 1: Plants

Propagation Method 1: Seed[1]

Product Type: Container plugs[1]

Stock Type: 490 ml containers[1]

Time to Grow: 2 years[1]

Target Specifications: Height: 10cm; Caliper: 7mm; Root System: Firm plug in 490mL container[1]

Propagule Collection: Collect tan seeds from mature dark red fruits, usually in late August. Fruit usually ripens 4 weeks after flowering and then persists throughout the winter.[3, 5] Fruits can be collected by hand (with gloves to avoid spines) or with a pole pruner.

Propagule Processing and Characteristics: The following protocol data is taken directly from *O. horridus* propagation trials conducted at Glacier National Park, Montana as reported on the Native Plant Network website. Seeds were cleaned with a Dybvig seed cleaner and extracted seeds were then screened. Seed dormancy is classified as morpho-physiological dormancy for the related genera *Panax*, which occupies a similar habitat.[1]

Seeds/kg: unknown

% Purity: 100%

% Germination: 80-90%

Pre-Planting Propagule Treatments: 72 hour running water soak, followed by a minimum of a 100 day cold moist stratification/100 day warm moist stratification/100 day cold moist stratification. Seed germination occurred in the second year.[1]

Growing Area Preparation/Annual Practices for Perennial Crops: Outdoor nursery growing facility. Sowing Method: direct seeding. Seeds were covered with planting media of 50% milled sphagnum peat, perlite and vermiculite. Each 490ml container was fertilized with 1

gram Osmocote controlled release fertilizer and 0.20 gram Micromax fertilizer. The containers were filled and sown in late fall and irrigated thoroughly prior to winter stratification. [1]

Establishment Phase: Germination occurred in June of the second year when daytime temperatures were 22C and nighttime temperatures were 16C. True leaves appear 2 weeks after germination. Plants had developed 2 to 4 true leaves 1 month following germination. The initial establishment was slow.[1]

Length of Establishment Phase: 4 to 8 weeks[1]

Active Growth Phase: Seedlings grew at a moderate rate following establishment. Plants were fertilized with a 13-13-13 fertilizer during the growing season. Plants averaged 3.5cm in height/3mm in caliper at the end of the first growing season. Root development also occurred at a moderate rate. Seedlings were not root tight at the end of the first growing season. [1]

Length of Active Growth Phase: 10 weeks[1]

Hardening Phase: Plants were fertilized with 10-20-20 NPK liquid fertilizer in the fall. The pots were leached with clear water and one final irrigation was applied before overwintering. [1]

Length of Hardening Phase: 8 weeks[1]

Harvesting, Storage and Shipping: Total time to harvest was 2 years. The plants overwintered in an outdoor nursery under an insulating foam cover and snow. [1]

Length of Storage: 5 months[1]

Guidelines for Outplanting/Performance on Typical Sites:

Other Comments: According to the Native Plant Network, "*O. horridus* has a shallow rhizomatous root system and requires shade during seedling production and on outplanting sites. Seedling production is a 2 to 3 year process. Cuttings are more expedient."

Propagation Goal 2: Plants

Propagation Method 2: Vegetative[2]

Product Type: Container plugs[2]

Stock Type: 3 L containers[2]

Time to Grow: 18 months[2]

Target Specifications: Height: 10cm; Caliper: 1.5cm; Root system: firm plug in 3L container[2]

Propagule Collection: The following protocol data is taken directly from *O. horridus* propagation trials conducted at Glacier National Park, Montana as reported on the Native Plant Network website. Semi-softwood stem cuttings were collected at bud break in early June. Cuttings averaged 20cm in length and were 1.5cm in diameter. [2]

Propagule Processing and Characteristics: Cuttings were kept under moist refrigeration prior to pre-treatment. [2]

Pre-Planting Propagule Treatments: The cuttings were treated with Domain Fungicide rinse for 3 minutes to pre treatment. They were then re-cut at the base to 20cm lengths. Stem cuttings were treated with 3000ppm IBA rooting powder and were stuck, with at least 2 nodes below the surface of the rooting media, in a mistbed. The rooting media was 50% perlite/50% sand with bottom heat of 22C and intermittent mist. [2]

Growing Area Preparation/Annual Practices for Perennial Crops: Outdoor mistbed and shadehouse[2]

Establishment Phase: To reach 100% rooting, cuttings were in the mistbed for 8 weeks. During this time they produced multiple roots that emerged from the nodes. These roots averaged 4cm in length at the time of lifting from the mistbed. There was no callus formation at the base of the cutting. [2]

Length of Establishment Phase: 8 weeks[2]

Active Growth Phase: Cuttings were up-potted to 3L containers and were kept in the shadehouse throughout the active growth phase. [2]

Length of Active Growth Phase: 10 weeks[2]

Hardening Phase: One final irrigation is applied before overwintering. [2]

Length of Hardening Phase: 8 weeks[2]

Harvesting, Storage and Shipping: The total time to harvest in 3L containers was 1.5 years. The plants were harvested in September of the second year and overwintered in an outdoor nursery under an insulating foam cover and snow. [2]

Length of Storage: 5 months[2]

Guidelines for Outplanting/Performance on Typical Sites: not specified

Other Comments: *O. horridus* regenerates well after stem damage.[4]

Compiled by: Deanna Goldy on April 25, 2007

Information Sources

Works Cited

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Appendix

Plant Data Sheet
Data compiled by: Marlo Mytty, 13 May 2003

Oplopanax horridus Miq./ Devil's Club
(there are no subspecies, varieties or forms)
Range

From south-central Alaska southward along the coast on the west side of the Cascades to southern Oregon, and east to southwestern Yukon territory, Idaho and western Montana. Disjunct populations also occur on several islands in Michigan and Ontario.

Climate, Elevation

Climate varies from maritime, submarine, to continental types. Elevation ranges from sea level to 5000 feet.

Local occurrence (where, how common)

Roadside ditches. A dominant component of understories of various Pacific Northwest (and boreal) forests with moist to wet soil conditions. Seems to occur more often in mature to older forests (personal observation).

Habitat preferences

Moist forests; wet ravines,drainage, or bottom areas; areas associated with hillside seeps and springs, stream corridors, or roadside ditches. Prefers shade and nitrogen-rich soils. A wet-site indicator.

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)

Primarily found in moist understories of late seral, climax, and old-growth forests. Best growth is attained in climax (mature) forests.

Associated species

Western hemlock, western redcedar, red alder, salmonberry, Vaccinium spp., ladyfern, mosses, foamflower and many other forbs.

May be collected as: (seed, layered, divisions, etc.)

Seed or cuttings.

Collection restrictions or guidelines

Threatened in Michigan.

Seeds:

Flowers in late spring to midsummer, depending upon location. Fruits ripen approximately 4 weeks after flowering and persist through winter. Collect seeds when fruit turns dark red, usually late summer. Seeds are tan at maturity. Hand strip fruits from plants and collect in plastic bags.

Cuttings:

Take semi-softwood cuttings at budbreak, in late spring to early summer. Cut long stems from sprawling horizontal branches. Place in paper bags and keep moist.

Seed germination (needs dormancy breaking?)

Similar Asian species have morpho-physiological dormancy. Suggested 72 hour running water soak, followed by a minimum of a 100 day cold moist stratification/100 day warm moist stratification/100 day cold moist stratification. Germinates the second year.

Seed life (can be stored, short shelf-life, long shelf-life) No information.

Recommended seed storage conditions

No information.

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)

Propagation is slow, either by seed or cuttings.

Seeds: Extract and clean seeds. Stratify as described above, or sow in late fall and irrigate thoroughly prior to winter stratification. Should germinate the 2nd year.

Cuttings: Cut stems into 13 cm sections containing at least one bud scale scar. Place in well-drained potting mix with perlite, with one half of the diameter above the soil. Keep cuttings

outside in shade but irrigate. Can start in mistbed if available and then pot up and put in shadehouse. End distal to budscar usually roots. Harden over winter. Takes 1.5 years - outplant in 2nd September.

Soil or medium requirements (inoculum necessary?)

Moist, rich soils preferred. Well to poorly drained with sandy, silty, or loamy textures ok.

Installation form (form, potential for successful outcomes, cost)

Both methods are slow, but seeds can be collected more easily. Outcome of each unknown.

Recommended planting density

6-8 feet apart (Dave's Garden)

Care requirements after installed (water weekly, water once, never water, etc.)

Shade required during seedling production and on ouplanting sites. Moist soils probably best.

Normal rate of growth or spread; lifespan

Information on devil's club regeneration is scant. Seedling growth is slow to moderate. Devil's club reproduces vegetatively, but the method is uncertain - possibly by rhizomes or layering. Initial establishment is slow.

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