

Plant Propagation Protocol for *Achlys triphylla*

ESRM 412 – Native Plant Production



Image 1: Seed Drawing (Flavon)

Image 2: Complete Plant (Lady)

TAXONOMY	
Family Names	
Family Scientific Name:	<p>Taxonomy: <i>Plantae</i> – Plants</p> <p>Kingdom</p> <p>Subkingdom <i>Tracheobionta</i> – Vascular plants</p> <p>Superdivision <i>Spermatophyta</i> – Seed plants</p> <p>Division <i>Magnoliophyta</i> – Flowering plants</p> <p>Class <i>Magnoliopsida</i> – Dicotyledons</p> <p>Subclass <i>Magnoliidae</i></p> <p>Order <i>Ranunculales</i></p> <p>Family <i>Berberidaceae</i> – Barberry family</p> <p>Genus <i>Achlys</i> <u>DC.</u> – achlys</p> <p>Species <i>Achlys triphylla</i> (<u>Sm.</u>) <u>DC.</u> – sweet after death</p> <p>(USDA)</p>
Family Common Name:	Barberry family
Scientific Names	<p>Kingdom <i>Plantae</i> – Plants</p> <p>Subkingdom <i>Tracheobionta</i> – Vascular plants</p> <p>Superdivision <i>Spermatophyta</i> – Seed plants</p> <p>Division <i>Magnoliophyta</i> – Flowering plants</p> <p>Class <i>Magnoliopsida</i> – Dicotyledons</p> <p>Subclass <i>Magnoliidae</i></p>

Order *Ranunculales*
 Family *Berberidaceae* – Barberry family

Genus:	<i>Achlys</i> DC. - achlys
Species:	<i>Achlys triphylla</i> (Sm.) DC. ssp. <i>triphylla</i>
Species Authority:	Candolle, Augustin Pyramus de
Variety:	
Sub-species:	<i>triphylla</i>
Cultivar:	N/A
Authority for Variety/Sub-species:	
Common Synonym(s)	<i>Achlys japonica</i> Berberidaceae, <i>Achlys californica</i> Berberidaceae
Common Name(s):	Vanilla Leaf, Deer Foot, Sweet-After-Death
Species Code	ACTR

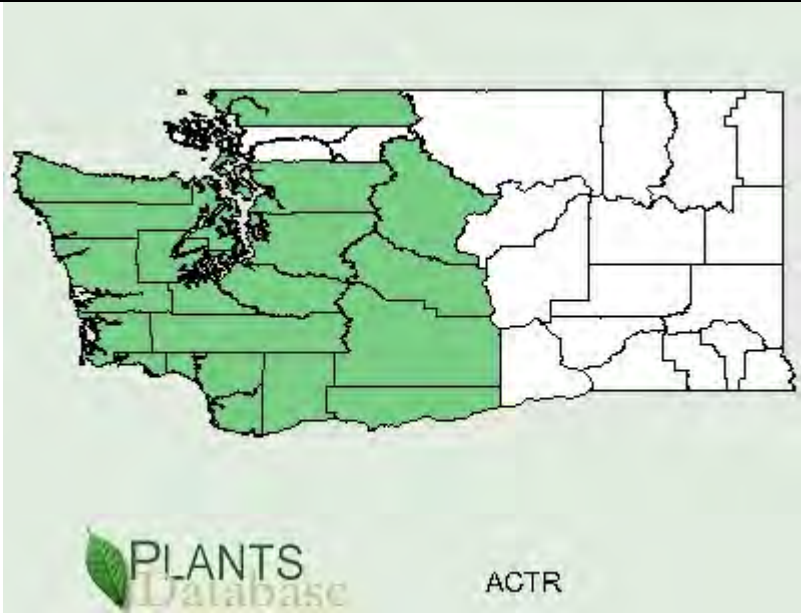
GENERAL INFORMATION

Geographical range

Distribution:
Achlys triphylla (Sm.) DC.



Image 3 (USDA)

	 <p>Image 4 (USDA)</p>
Ecological distribution	Moist, shady forests, glades, openings and forest edges, especially along stream banks, at low to middle elevations; common and locally abundant. (Pojar)
Climate and elevation range	In Washington State, <i>A. triphylla</i> is found between sea level and 1500 meters in the counties marked with green. (USDA)
Commonly Associated Species	<p>The following table, an excerpt of a larger reference available at CNPLX2, identifies the percentage of time a species was found in the vicinity of <i>Achlys triphylla</i>. The # sources indicates how many individuals contributed information. <i>A. triphylla</i> scores as 1, or 100%. Other species usually score lower. Pacific rhododendron, for example, with a score of .66, was found in association with <i>A. triphylla</i> 66% of the time by 12 different sources. The reader is given the number of sources that contributed to the survey in order to judge how comprehensively each percentage has been researched. Presumably an associate such as <i>P. menziesii</i>, with a percentage of 65% backed by 40 sources is more accurate than one with only 2 sources, such as <i>Melica subulata</i>. This table, which comes from a California website, should only be used as a guide to other plant species that may share propagation needs.</p>

Associated Species (Continued)	Scientific Name	Common Name	Life form	Score	#Sources
	• Achlys triphylla	sweet after death	Perennial herb	1.000	12
	Rhododendron macrophyllum	Pacific rhododendron, California rose bay, Coast rhododendron	Shrub	0.660	12
	Pseudotsuga menziesii	Douglas-fir	Tree	0.658	40
	Adenocaulon bicolor	American trailplant, Trail Plant	Perennial Herb	0.655	3
	Arbutus menziesii	madrone, madrono	Tree	0.611	43
	Festuca californica	California fescue	Perennial herb	0.608	49
	Hieracium albiflorum	white hawkweed, White Flowered Hawkweed	Perennial herb	0.606	1
	Melica subulata	Alaska onion grass, Alaska Melic, Alaska oniongrass	Perennial herb	0.606	2
Plant strategy type	It is possible that <i>Achlys triphylla</i> survives by forming not a seed bank, but a “seedling bank” (Lindh). In her study of under story herbaceous plants, Lindh notes that the germination rate for <i>A. triphylla</i> was low (11%) when seeded in the wild and those that did germinate remained seedlings without reproductive capability for the 7 years of her study. It may be when destruction of the forest canopy occurs these seedlings are available to mature with the additional light resources of the clearing edge provided by fallen trees.				
Plant characteristics	A perennial, spreading widely by slender rhizomes, hairless, without leafy aerial stems but sends up single leaves at intervals along the rhizomes, with a vanilla-like fragrance. (Pojar)				
PROPAGATION DETAILS: By Seed					
Ecotype	The H. J. Andrews Experimental Forest, located on the west slope of the Cascade Range in Oregon, along roadsides in old-growth stands where reproduction was common. (Lindh)				
Propagation Goal	Re-seeding in native habitat. In the Lindh study seeds were collected by hand in from mid-July to mid-August 2000. Seeds were stored at room temperature, and sown in the wild in late September on forest litter, with no protection from predation. This method produced 11% germination. (Lindh)				
Propagation Method	Sown Seed (Lindh)				
Product Type	N/A				
Stock Type:	N/A				

Time to Grow	Seeds sown in fall germinated in spring. Plants left in ground. (Lindh) Seeds should be sown fresh (Navage)
Target Specifications:	Adult plants capable of reproduction by seed. In the 7 years of Lind's study, this was not achieved
Propagule Collection (how, when, etc):	Seeds were collected by hand from plants in wild from mid-July to mid-August. (Lindh)
Propagule Processing:	
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Seeds stored at room temperature until Fall (Lindh) Seeds should be sown when fresh. Once dried, germination rates drop drastically. (Navage) Seeds treated with cycles of 40-70 degree temperatures show 17% germination in 3-5 weeks. (Deno2) An interpretation of Deno's recommendation: Sow at 18-22°C (64-71°F) for 2-4 wks, move to -6 to -7°C (19-21°F) for 4-6 wks, move to 5-12°C (41-53°F) for germination (Clothier 1)
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Four test areas selected, two in lowland areas and two at higher elevation. At each elevation, there was a test plot under newer growth canopy (40-year) and under old growth canopy. Lind concluded that the age of the canopy was not as much a limiting factor as the slow growth and sparse seeds of the species itself. (Lindh)
Establishment Phase (from seeding to germination):	Seeds sown in fall sprouted in Spring. (Lindh)
Length of Establishment Phase:	Unknown, can be up to 7 years (Lindh)
Active Growth Phase:	Unknown
Length of Active Growth Phase:	Unknown
Hardening Phase	Unknown
Length of Hardening Phase:	Unknown
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting :	N/A
Other Comments	It is recommended that propagation protocols for other herbaceous members of the Berberidaceae family be consulted for clues as to propagation protocols.

	(Navage)
PROPAGATION DETAILS: Rhizomes (Wood)	
Ecotype	
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Rhizomes
Propagation Method (Options: Seed or Vegetative):	Vegetative
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	Unknown
Target Specifications (size or characteristics of target plants to be produced):	Unknown
Propagule Collection (how, when, etc):	Dig clumps of plant with roots and soil during dormancy period from late fall to early spring (Woods)
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments:	Unknown
Growing Area Preparation / Annual Practices	Unknown

for Perennial Crops	
Establishment Phase (from seeding to germination):	Unknown
Length of Establishment Phase:	Unknown
Active Growth Phase	
Length of Active Growth Phase:	
Hardening Phase	
Length of Hardening Phase:	
Harvesting, Storage and Shipping	
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	It is recommended that propagation protocols for other herbaceous members of the Berberidaceae family be consulted for clues as to propagation protocols. (Navage)

INFORMATION SOURCES

References	<p>Clothier, Tom. <i>Tom Clothier's Garden Walk & Talk</i></p> <p>http://tomclothier.hort.net/index.html?</p> <p>Clothier, Tom, 1. Page with seed sowing info</p> <p>http://tomclothier.hort.net/page02.html</p> <p>CNPLX1, California Native Plant Exchange, Achlys Triphylla Page</p>
------------	---

<http://www.cnplx.info/nplx/species?taxon=Achlys+triphylla>

CNPLX2 California Plant Exchange, Plants That Grow With Achlys Triphylla

<http://www.cnplx.info/nplx/nplx?page=coincident&taxon=Achlys+triphylla&availab>

Deno, Norman C. *Seed Germination Theory and Practice, 2nd Edition*. Norman C. De

Deno2, Norman C. *Second Supplement to Seed Germination Theory and Practice*. N
1998.

FNA Flora of North America

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500013

ITIS Website that verifies Taxonomy:

http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=1

(JHUD) J. Hudson Seed Catalog

<http://www.jlhudsonseeds.net/SeedlistA-AK.htm>

(LADY) Lady Bird Johnson Wildflower Center

http://www.wildflower.org/plants/result.php?id_plant=ACTR

(LIND) Lindh, Briana C. *Herb establishment in a Young Pseudotsuga menziesii fore*

experiment.

The Journal of the Torrey Botanical Society, Oct 2010: Vol. 137, Issue 4, pg(s) 410-4

<http://www.bioone.org/doi/abs/10.3159/09-RA-044.1>

blindh@willamette.edu 503 370 6507

Navage, Andy. Email response to propagation questions, May 9, 2011. See Appendix

PFAF, Plants For a Future Web Site, *Achlys triphylla* page:

<http://www.pfaf.org/user/Plant.aspx?LatinName=Achlys%20triphylla>

Pacific Rim Plant Nursery

<http://www.hillkeep.ca/per%20achlys.htm>

Pojar, Jim & Andy MacKinnon. *Plants of The Pacific Northwest Coast Washington*, Lone Pine Publishing, Vancouver, BC 2004.

Schweitzer, Maddie, Plant Data Sheet For *Achlys triphylla*, Vanilla Leaf.

<http://depts.washington.edu/proplnt/Plants/ACTR.htm>

Compiled 4-20-2005.

For complete document see Appendix A

USDA Plant Database, *Achlys triphylla*, April 15,

2011 <http://plants.usda.gov/java/nameSearch?keywordquery=Achlys+triphylla&mode>

	<p>WNPS: Washington Native Plant Society Web Page for Achlys triphylla, Vanilla Leaf http://www.wnps.org/plants/achlys_triphylla.html http://www.wnps.org/landscaping/herbarium/pages/achlys-triphylla.html</p> <p>Woodbrook Native Plant Nursery. Owner: Ingrid Wachtler woodbrk@harbornet.com http://woodbrooknativeplantnursery.com/plants/</p> <p>Images:</p> <p>1: Drawing from Flavon's Art Gallery: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=1</p> <p>2: Bransford, Mrs. WD, September 21, 1988, unrestricted access from Lady Bird Johnson Botanical Garden http://www.wildflower.org/gallery/result.php?id_image=2990</p> <p>3: Range Map, USDA http://plants.usda.gov/java/nameSearch?keywordquery=achlys+triphylla&mode=science</p> <p>4: Washington Range Map, USDA http://plants.usda.gov/java/county?state_name=Washington&statefips=53&symbol=1</p>
Other Sources Consulted	<p>Deno, Norman C. <i>First Supplement to Seed Germination Theory and Practice</i>. Norman C. Deno, 1954.</p> <p>Schweitzer, Maddie, Plant Data Sheet For Achlys triphylla, Vanilla Leaf. http://depts.washington.edu/proplnt/Plants/ACTR.htm</p>

	Compiled 4-20-2005. For complete document see Appendix A
Protocol Author	Helen J. Wilson
Date Protocol Created or Updated	05/15/2011

Appendix A: Previous Plant Protocol, Sweitzer, 2005

Plant Data Sheet for *Achlys triphylla*, Vanilla leaf



Species

***Achlys triphylla*, Vanilla Leaf**

Range

Southern British Columbia, Washington, Oregon from eastern base of Cascades to coast; hardy from USDA zones 7-9

Climate, elevation

Low to mid elevation

Local occurrence (where, how common)

Common and locally abundant

Habitat preferences

Most commonly found in deep undisturbed forest, but may also be found in the open along stream banks

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

Information not found

Associated species

Excellent companion to Lady Fern (*Athyrium filix-femina*), and in the understory of Thimbleberry or Salmonberry (*Rubus parvifloris* or *spectabilis*) or Western Azalea (*Rhododendron occidentale*)

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

Divisions or seed

Collection restrictions or guidelines

Flowers (late spring: May-June) followed by mahogany-colored seeds in shape of a half moon

Seed germination (needs dormancy breaking?)

Unknown

Seed life (can be stored, short shelf-life, long shelf-life)

Unknown

Recommended seed storage conditions

Unknown

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

Propagate via rhizome or seed

Soil or medium requirements (inoculum necessary?)

Likes fertile soil that is well drained; acidic and highly organic soil

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

Unknown

Recommended planting density

Unknown

Care requirements after installed (water weekly, water once etc.)

Unknown

Normal rate of growth or spread; lifespan

Rate unknown, but spreads nicely to cover forest floor in patches

Sources cited

<http://ghs.gresham.k12.or.us/science/ps/nature/basin/3petal/bar/achlys.htm>

<http://www.nwplants.com/business/catalog/perennials.html>

<http://www.hillkeep.ca/per%20achlys.htm>

Data compiled by

Maddi Schweitzer on April 20, 2005

Appendix B: Email from Andy Navage

Navage, Andy to me show details May 9 (6 days ago)

Good Morning Helen,

Sorry to be slow in replying I was on vacation. As to your inquiry we do not propagate Achlys on any regular basis I have done divisions with little trouble. I have never sown seed but I have sown a large amount of different Epimedium and would suspect like many of the herbaceous Berberidaceae that seed sown fresh is of the utmost importance. In the case of Epimedium germination of fresh moist seed is very good but once it is dried the germination rate drops dramatically. I will collect seed this year and see what happens. Thank you for the paper I will read it and write you if I have some insight. Sorry I could not be of more help.

-

--

Andy Navage
Director of Horticulture

The Bloedel Reserve
7571 NE. Dolphin Drive
Bainbridge Island WA. 98110
[360-265-5639](tel:360-265-5639)

Note: This template was modified by J.D. Bakker from that available at:
<http://www.nativeplantnetwork.org/network/SampleBlankForm.asp>