

**Plant Propagation Protocol for *Adiantum capillus-veneris***  
 ESRM 412 – Native Plant Production



**TAXONOMY**

<b>Family Names</b>	
Family Scientific Name:	Pteridaceae
Family Common Name:	Maidenhair Fern
<b>Scientific Names</b>	
Genus:	<i>Adiantum</i> <a href="#">L.</a>
Species:	<i>Capillus-veneris</i>
Species Authority:	Linnaeus
Variety:	<i>Adiantum capillus-veneris</i> L. var. <i>modestum</i> (L. Underwood) Fernald <i>Adiantum capillus-veneris</i> L. var. <i>protrusum</i> Fernald <i>A. capillus-veneris</i> var. <i>rimicola</i> (Slosson) Fernald
Sub-species:	
Cultivar:	- 'Banksianum' - 'Fimbriatum' - 'Imbricatum' - 'Scintilla' (Jones.214)
Authority for Variety/Sub-species:	Fernal,Leo; Linnaeus, Carl von; Underwood, Lucien Marcus; Slosson, Margaret;
Common Synonym(s) (include full)	- <i>Adiantum capillus-veneris</i> L. var. <i>modestum</i> (Underw.) Fernald - <i>Adiantum capillus-veneris</i> L. var. <i>protrusum</i> Fernald - <i>Adiantum modestum</i> Underw.

scientific names (e.g., <i>Elymus glaucus</i> Buckley), including variety or subspecies information)	
Common Name(s):	Venus-hair Fern
Species Code (as per USDA Plants database):	ADCA

**GENERAL INFORMATION**

Geographical range (distribution maps for North America and Washington state)	
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Ecological distribution (ecosystems it occurs in, etc):	Widely distributed from warm temperate to tropical regions- may naturalize in green houses and bush-houses (Jones.214)
Climate and elevation range	Very hardy to frosts or snow (Jones.400)
Local habitat and	Moist calcareous cliffs, banks, and ledges along streams and rivers, walls of lime sinks, canyon walls (in the American southwest), around foundations, on

abundance; may include commonly associated species	mortar of storm drains (Flora of North America)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional )	Wetland Indicator (USDA)
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	Forb/Herb (USDA) Stems short-creeping; scales golden brown to medium brown, concolored, iridescent, margins entire or occasionally with single broad tooth near base. Leaves lax-arching or pendent, closely spaced, 15--75 cm. Petiole 0.5--1.5 mm diam., glabrous, occasionally glaucous. Blade lanceolate, pinnate, 10--45 × 4--15 cm, glabrous, gradually reduced distally; proximal pinnae 3(--4)-pinnate; rachis straight to flexuous, glabrous, not glaucous. Segment stalks 0.5--3.5 mm, dark color extending into segment base. Ultimate segments various, generally cuneate or fan-shaped to irregularly rhombic (plants in American southwest occasionally with segments nearly round), about as long as broad; base broadly to narrowly cuneate; margins shallowly to deeply lobed, incisions 0.5--7 mm, occasionally ± laciniate, sharply denticulate in sterile segments; apex rounded to acute. Indusia transversely oblong or crescent-shaped, 1--3(--7) mm, glabrous . Spores mostly 40--50 µm diam. 2 n = 120. (Flora of North America)
<b>PROPAGATION DETAILS</b>	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	N/A
Propagation Goal (Options:	-Bare Root -Seed (USDA) - Rhizome Pollination method ("Crescent Bloom")

Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	
Propagation Method (Options: Seed or Vegetative):	-Seed (USDA) -Vegetative (USDA) - Easy to raise from spores
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	-Bareroot -Container -Seeds (USDA)
Stock Type:	Container (plug)
Time to Grow (from seeding until plants are ready to be outplanted):	Moderate (USDA)
Target Specifications (size or characteristics of target plants to be produced):	1.7 foot high
Propagule Collection (how, when, etc):	-Easy to raise from spores and sporelings- spores are best sown on a coarse mixture with neutral to alkaline reaction (pH 7-8.5) (Jones.213)

Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	3.000.000 seeds per pound (USDA)
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	N/A
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	<p>-moist, well drained soils rich in organic matter and treated with lime on a regular basis</p> <p>-uses open fibrous mixture based on friable sandy loam</p> <p>-added materials like peat moss, milled pine bark or chopped fern fibre improve water holding capacity and lime or dolomite reduces acidity.</p> <p>-other materials that could be added to soil mix are: limestone or marble chips, shell grit or crushed coral</p> <p>-needs regular watering (almost daily) during the summer but requires much less or even none during the winter (Jones.212)</p>
Establishment Phase (from seeding to germination) :	3 months
Length of Establishment Phase:	N/A
Active Growth Phase (from germination until plants are no longer actively growing):	Spring and Summer (USDA)
Length of Active	6 months

Growth Phase:	
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	N/A
Length of Hardening Phase:	N/A
Harvesting, Storage and Shipping (of seedlings):	-Typical Time to harvest ("Crescent Bloom") - The spores were separated from sporangia by filtering through tissue paper, and were stored in glass jars under refrigeration at $7 \pm 1$ °C. (Maridass, Mahesh, Raju, and Muthuchelian 33-37)
Length of Storage (of seedlings, between nursery and outplanting):	-Fertile sporangia always present form January through December (Prigge, and Gibson)
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	-Damage can be avoided to new growth by trimming off all the old fronds in spring just before new growth uncoils. (Hoshizak and Moran,103) -This plant prefers filtered light (BackyardGardener.com)
Other Comments	- Medicinal properties: is used for chest complaints, Rheumatism, bites and

<p>(including collection restrictions or guidelines, if available):</p>	<p>stings (Jones.14)          -Used as substitute for tea in some countries (Jones.13)          -Can be used for house and garden décor and in hanging displays (Hoshizak and Moran,98)          -They reportedly do not grow well in the Seattle area (Zone 8), perhaps due to soil that is too acidic. (Hoshizak and Moran,161)          -Is one of the most widely spread ferns in the world, primarily in warm-temperate to subtropical areas. (Hoshizak and Moran,161)</p>
<p><b>INFORMATION SOURCES</b></p>	
<p>References (full citations):</p>	<ul style="list-style-type: none"> <li>- "1. Adiantum capillus-veneris Linnaeus, Sp. Pl. 2: 1096. 1753.." Flora of North America 2. n. pag. Web. 15 May 2011. &lt;<a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200003518">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200003518</a>&gt;.</li> <li>- "Adiantum capillus veneris." <i>BackyardGardener.com</i>. BackyardGardener.com, n.d. Web. 18 May 2011. &lt;<a href="http://www.backyardgardener.com/plantname/pda_5606.html">http://www.backyardgardener.com/plantname/pda_5606.html</a>&gt;.</li> <li>- "Adiantum capillus-veneris." <i>Crescent Bloom</i>. Crescent Bloom , n.d. Web. 18 May 2011.&lt;<a href="http://www.crescentbloom.com/Plants/Specimen/AA/Adiantum%20capillus%20veneris.htm">http://www.crescentbloom.com/Plants/Specimen/AA/Adiantum%20capillus%20veneris.htm</a>&gt;.</li> <li>- Jones, D L. Encyclopaedia of Ferns: An Introduction to Ferns, Their Structure, Biology, Economic Importance, Cultivation and Propagation. Port Melbourne, Vic: Lothian,13-14- 400. 1998. Print.</li> <li>- Hoshizaki, Barbara Joe., and Robbin Craig Moran. <i>Fern Grower's Manual</i>. Portland, Or.: Timber,98-161- 2001. Print.</li> <li>- Maridass, M., R. Mahesh, G. Raju, and K. Muthuchelian. "Clonal propagation of Adiantum capillus – veneris." <i>International Journal of Biological Technology</i> 1.1 (2010): 33-37. Web. 18 May 2011. &lt;<a href="http://ijbtjournal.com/Documents/Vol.No.1_1_mari%20TC%20PP%2033-37.pdf">http://ijbtjournal.com/Documents/Vol.No.1_1_mari%20TC%20PP%2033-37.pdf</a>&gt;.</li> <li>- Pojar, Jim, A MacKinnon, and Paul B. Alaback. <i>Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia &amp; Alaska</i>. Redmond, Wash: Lone Pine Pub, 1994. Print.</li> <li>- Prigge, B.A, and A.C Gibson. "Adiantum L. MAIDENHAIR,MAIDENHAIR FERN." <i>Adiantum L. MAIDENHAIR,MAIDENHAIR FERN</i>. N.p., n.d. Web. 18 May 2011. &lt;<a href="http://www.eeb.ucla.edu/Faculty/Gibson/Santa_Monica_Mountains_plants/Adiantum_capillus_veneris_UCLA_SantaMonicas.pdf">http://www.eeb.ucla.edu/Faculty/Gibson/Santa_Monica_Mountains_plants/Adiantum_capillus_veneris_UCLA_SantaMonicas.pdf</a>&gt;.</li> <li>- USDA- Natural Resources Conservation Service: Adiantum capillus-veneris L.common maidenhair- Accessed 05/15/2011 <a href="http://plants.usda.gov/java/profile?symbol=ADCA&amp;mapType=nativity&amp;photoID=adca_002_ahp.tif">http://plants.usda.gov/java/profile?symbol=ADCA&amp;mapType=nativity&amp;photoID=adca_002_ahp.tif</a></li> </ul>
<p>Other Sources Consulted (but that</p>	<ul style="list-style-type: none"> <li>- "Conservation Assessment for Southern Maidenhair Fern and Stream Orchid in the Black Hills National Forest South Dakota and Wyoming." Treeseach - Forest Service</li> </ul>

<p>contained no pertinent information) (full citations):</p>	<p>Research &amp; Development. US Forest Service - Research &amp; Development]. Web. 16 May 2011. &lt;<a href="http://www.treesearch.fs.fed.us/pubs/24016">http://www.treesearch.fs.fed.us/pubs/24016</a>&gt;.</p> <ul style="list-style-type: none"> <li>- Frye, Theodore C. <i>Ferns of the Northwest: Covering Washington, Oregon, Idaho, British Columbia, Montana, Wyoming, Central and Northern California</i>. Portland, Or: Metropolitan Press, 84.1934. Print.</li> <li>- Olson, Sue. <i>Encyclopedia of Garden Ferns</i>. Portland: Timber, 2007. Print.</li> <li>- Taylor, Thomas Mayne Cunninghame. <i>Pacific Northwest Ferns and Their Allies</i>. [Toronto]: Published in Association with the University of British Columbia by University of Toronto, 90. 1970. Print.</li> </ul>
<p>Protocol Author (First and last name):</p>	<p>R. Nelli Newport</p>
<p>Date Protocol Created or Updated (MM/DD/Y Y):</p>	<p>5/18/11</p>

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