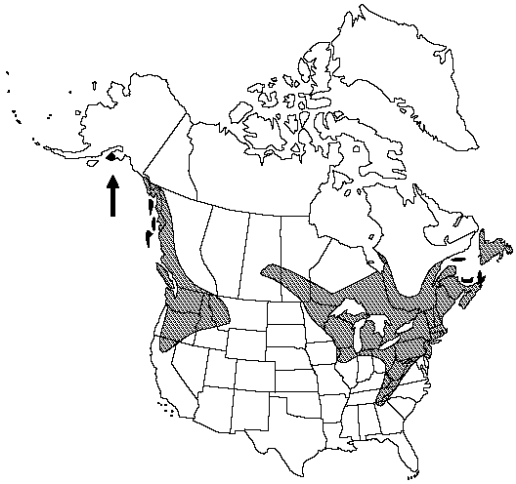
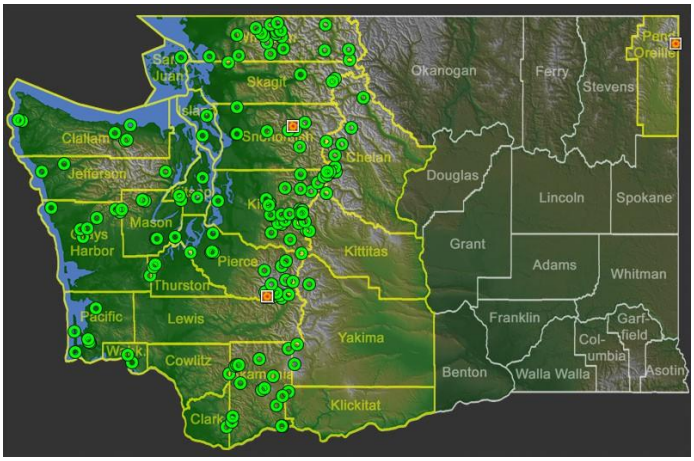
Plant Propagation Protocol for *Lycopodium clavatum*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2022*/LYCL.pdf

North America Distribution Washington State Distribution





Source: Flora of North America (left), Burke Herbarium Image Collection (right)

TAXONOMY	
Plant Family	
Scientific Name	Lycopodiaceae
Common Name	club mosses
Species Scientific Name	
Scientific Name	*Lycopodium clavatum*
Varieties	*Lycopodium clavatum* L. var. *laurentianum* Vict. *Lycopodium clavatum* L. var. *subremotum* Vict. *Lycopodium clavatum* L. var. *tristachyum* Hook. *Lycopodium clavatum* L. var. *brevispicatum* Peck *Lycopodium clavatum* L. var. *integerrimum* Spring *Lycopodium clavatum* L. var. *monostachyon* Hook. & Grev. *Lycopodium clavatum* L. var. *megatachyon* Fernald & Bissell
Sub-species	*Lycopodium clavatum* L. ssp. *megastachyon* (Fernald & Bissell) Selin *Lycopodium clavatum* L. ssp. *monostachyon* (Hook. & Grev.) Seland.
Cultivar	N/A
Common Synonym(s)	*Lepidotis ciliata* P. Beauv. *Lycopodium ciliatum* P. Beauv.
Common Name(s)	common club moss, running club moss,
Species Code (as per USDA Plants database)	LYCL
GENERAL INFORMATION	

Geographical range	Widespread species with almost global distribution. Can be found on all continents except for Australia and Antarctica.[3] See above for distribution in North America and Washington state.
Ecological distribution	Grows along the ground on substrate surface in fields and woods. [2] Can also be found growing on trees epiphytically in swamps [3]
Climate and elevation range	Found in cool and wet climates. Requires humid conditions and likes to be in shade. Only grows above 1300m in tropical conditions [4] However, elevation ranges from 100-1800m [2]
Local habitat and abundance	Forest floors, moist to dry, and shady environments with no direct sunlight. [1]
Plant strategy type / successional stage	Found to be a pioneer species that is often found on bare soil or recently burned patches [4]
Plant characteristics	Highly variable species with many forms, but generally is a main branch up to 1.5 meters long with erect shoots and leaves that are arranged in a spiral pattern. Shoots have cone-like structures on the end that produce spores. [4 9]  Source: California Academy of Sciences
PROPAGATION DETAILS: VEGETATIVE	
Ecotype	No literature found
Propagation Goal	Rhizome/ stem divisions
Propagation Method	Spores are generally produced but are near impossible to propagate after germination– propagation by cuttings is more common. [4 5]
Product Type	Cuttings with actively growing shoots and one or more undamaged roots. [5]
Stock Type	No literature found
Time to Grow	Atleast 5 months

Target Specifications	Established plants– indicated by shoot elongation or branching, new roots, and resistance to uprooting.
Propagule Collection Instructions	When making stem cuttings with roots, make sure to get whole root and not just the main root [6]
Propagule Processing/Propagule Characteristics	It is particularly important for there to be high humidity and constantly wet substrate when processing cuttings, as they are highly susceptible to desiccation. [5] This is because of their vascular system [10]
Pre-Planting Propagule Treatments	Cuttings are to be rinsed in cool tap water [5]
Growing Area Preparation / Annual Practices for Perennial Crops	For the first 2-3 weeks, cuttings are placed on wet paper towels in plastic ziplock bags under T-5 grow lights at 20-22 degrees celsius [5]
Establishment Phase Details	Cuttings in sealed ziplock bags had a photoperiod of 12 hours and were misted on a weekly basis. [5]
Length of Establishment Phase	2-3 weeks
Active Growth Phase	Plants were left in sealed ziplock bags. However, they were now being watered with diluted 7-8-6 NPK fertilizer every other week. Excess water pooling in the bags would be poured out. [5]
Length of Active Growth Phase	4 months
Hardening Phase	After plants are rooted, they are moved to 1020 greenhouse trays with a 3:1 perlite to sandy loam media. Shoot systems would remain above ground, while roots were buried into the medium. [5]
Length of Hardening Phase	2-3 years after establishment, *Lycopodium* was found to have a “climax stage”, where their growth covers the tray surface. [5]
Harvesting, Storage and Shipping	When shipping or transporting, it is very important to keep the root system moist and intact, otherwise mature tissue is unable to form new roots and keep plant alive. (*Lycopodium complanatum)* [6]
Length of Storage	No literature found
Guidelines for Outplanting / Performance on Typical Sites	No literature found
Other Comments	*Lycopodiun clavatum* does not have any successful mass production methods. 4 Propagation by spores is near impossible because once the spore germinates into the prothallus, it is noted that the prothallus lacks chlorophyll and is a saprophyte. Due to this, the prothallus relies on a symbiotic relationship with endophytic fungi as an energy source. [7] [8]
INFORMATION SOURCES	
References	1. WTU Herbarium, Burke Museum. *Burke Herbarium Image Collection*,

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Protocol Author	Jason Wong-Hua
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