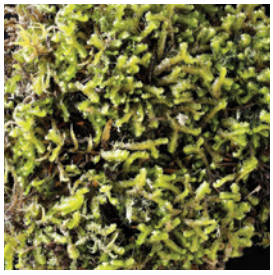
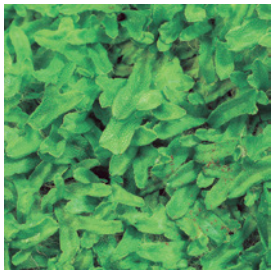
Mosses, Liverworts, and Ferns

Sphagnum



Leafy Liverwort

Marchantia



Conocephalum

Polytrichum

Woodland Moss

Woodland Ferns

Boston Fern

Equisetum

Sphagnum
Species: *magellanicum* and/or *papillosum*
Genus: *Sphagnum*
Family: Sphagnaceae
Order: Sphagnales
Class: Bryopsida (Musci)
Phylum: Bryophyta
Kingdom: Plantae

Leafy Liverwort (470179-988)
Species: *trilobata*
Genus: *Bazzania*
Family: Lepidoziaceae
Order: Jungermanniales
Class: Hepaticae
Phylum: Bryophyta
Kingdom: Plantae

***Marchantia* (470176-338)**
Species: *polymorpha*
Genus: *Marchantia*
Family: Marchantiaceae
Order: Marchantiales
Class: Hepaticae
Phylum: Bryophyta
Kingdom: Plantae

***Conocephalum* (470191-762)**
Species: *conicum*
Genus: *Conocephalum*
Family: Conocephalaceae
Order: Marchantiales
Class: Hepaticae
Phylum: Bryophyta
Kingdom: Plantae

Riccia
Species: *fluitans*
Genus: *Riccia*
Family: Ricciaceae
Order: Marchantiales
Class: Hepaticae
Phylum: Bryophyta
Kingdom: Plantae

***Polytrichum* (470176-476)**
Species: *commune*
Genus: *Polytrichum*
Family: Polytrichaceae
Order: Polytrichales
Class: Bryopsida (Musci)
Phylum: Bryophyta
Kingdom: Plantae

Woodland Moss (470176-740) (contains two species)
Species: *schreberi*
Genus: *Pleurozium*
Family: Entodontaceae
Order: Hypnobryales
Class: Bryopsida (Musci)
Phylum: Bryophyta
Kingdom: Plantae

Species: *polysetum*
Genus: *Dicranum*
Family: Dicranaceae
Order: Dicranales
Class: Bryopsida (Musci)
Phylum: Bryophyta
Kingdom: Plantae

Woodland Ferns (470176-280)
Genus and species vary with availability
Family: *Dryopteridaceae*
Order: *Polypodiales*
Class: Polypodiopsida (Pteridopsida)
Phylum: Pterophyta
Kingdom: Plantae

Boston Fern (470176-222)
Species: *exalta*
Genus: *Nephrolepis*
Family: Nephrolepidaceae
Order: Polypodiales
Class: Polypodiopsida (Pteridopsida)
Phylum: Pterophyta
Kingdom: Plantae

***Equisetum* (470176-288)**
Species: *hiemale* may vary depending on availability
Genus: *Equisetum*
Family: Equisetaceae
Order: Equisetales
Class: Equisetopsida
Phylum: Pterophyta
Kingdom: Plantae

Selaginella
Species: *apoda*
Genus: *Selaginella*
Family: Selaginellaceae
Order: Selaginellales
Class: Lycopodiopsida
Phylum: Lycopodiophyta
Kingdom: Plantae

Conditions for Customer Ownership

We are a USDA compliant facility and hold all necessary permits to transport our organisms. Each state is assisted by the USDA to determine which organisms can be transported across state lines. Some organisms may require end-user permits. Please contact your local regulatory authorities with questions or concerns. To access permit conditions, click here.

Never purchase living specimens without having a disposition strategy in place. Live specimens should not be released into the wild! Please dispose of any unwanted organisms using the guidelines below.

Primary Hazard Considerations

None.

Availability

- Mosses, liverworts, and ferns are generally available year round. Liverwort shortages may occur during the winter months, as they are wild-collected.
- Fruiting bodies on mosses and liverworts are rare during the winter months as they are wild collected.
- Equisetum shortages may occur during the winter months, as it is wild collected.
- Individual mosses and liverworts are shipped in plastic bags in 7.5 x 10 cm portions. Upon receipt remove the plant from the bag.
- Mosses and *Bazzania trilobata* can be stored in the freezer for 3–6 months prior to use.
- *Marchantia* and *Conocephalum* can be stored in the fridge for 1–2 weeks prior to use.
- Ferns, Woodland and Boston, are shipped in plastic pots with peat moss. For shipping purposes a cardboard disc is used to hold the plant and peat moss in place. The potted fern is sealed in a plastic bag and wrapped in corrugated cardboard. Upon receipt remove the potted plant from the bag, remove the cardboard disc and water immediately.
- *Equisetum* is shipped wrapped in moist newsprint. The plant should be removed from the newsprint upon receipt and can be stored in a bucket of water for temporary storage at room temperature. Roots of *Equisetum* should be below the waterline.

Care

- Mosses and liverworts will survive for long periods of time if kept in moist chambers. Covering a large fingerbowl with a square piece of glass makes a very successful type. The bottom of the bowl is lined with paper toweling, thoroughly moistened. The specimens are placed in the bowl with a good portion of their substratum still attached and the container is covered. Relative humidity and moisture may be regulated by the degree to which the fingerbowl may be left uncovered by the square glass. Mosses that produce spore capsules in early spring may be brought into the laboratory and placed in such containers, where development will proceed normally.
- For larger scale culture, a terrarium is satisfactory. Here the liverwort *Conocephalum* grows very well on a substratum of woodland soil and peat, with normal light. *Marchantia* may be grown on a substratum of sandy soil to which wood ashes or powdered charcoal is added. Since *Marchantia* requires rather full light, the use of a fluorescent light attachment is recommended.
- *Equisetum* is easily grown in standard potting soil. It should be planted in a 22 centimeter or larger pot without a drainage hole. It is not affected by poor drainage and needs to be watered only every 2 weeks. Full sunlight is best and the plant may be kept outdoors all summer.
- Some species of *Selaginella* are cultivated as ornamentals. Potted in sandy soil and fertilized periodically with bone meal, they do very well in a terrarium or indoor greenhouses.

Life Cycle

- Ferns lack flowers or seeds. The life cycle, like all other vascular plants, is referred to as alternation of generations. This is characterized by a diploid sporophytic and a haploid gametophytic phase. The ferns' gametophyte is a free-living organism (gymnosperms and angiosperms are not).
- In liverworts and mosses, germination of a haploid spore to produce a protonema (mass of thread-like filaments or a flattened thallus) occurs. A mature gametophore plant that produces the sex organs grows from the protonema, a short-lived stage of the plant.
- The male organ, known as the antheridia, is protected by the perigonium.
- The female organ, known as the archegonia, is protected by the perichaetum.
- Liverworts and mosses are either monoicous or dioicous.
- In monoicous mosses and liverworts, male and female sex organs are borne on different branches of the same plant.
- In dioicous mosses and liverworts the organs are borne on different and separate gametophyte plants.
- Aided by the presence of water, sperm swim from the antheridia to the archegonium. The sperm would not be able to complete the journey without the assistance of water.
- After fertilization, the immature sporophyte develops a foot, a capsule, and a seta. The seta will force its way out of the archegonium. Capsules are forced out by the seta and the foot acts as an anchor. Elater cells and spore producing cells are produced in the capsule. The elater cells push open the wall of the capsule to spread themselves. The spore producing cells will undergo meiosis to form haploid spores. These spores are dispersed, commencing the life cycle once again.

Wild Habitat

- Ferns prefer shady, moist conditions of woodlands but some have adapted to dry habitats.
- Mosses and liverworts are usually found in a damp environment with low light. They are common in wooded areas and at the edges of streams.

Disposition

We do not recommend releasing any laboratory specimen into the wild, and especially not specimens that are not native to the environment. When finished with your plant please dispose of it by incineration in a well-ventilated area.

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