



Fern leaves come rolled up in bud, at Lums Pond State Park in Bear last week, as seen in these fern "fiddleheads" week.

Delaware State University/Susan Yost

A few fun facts about those fabulous ferns

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It's said to be the state vegetable of Vermont, it resembles the end of a violin or fiddle, it's called a crozier after the ceremonial staff of a bishop, and it unrolls like a coiled spring when it opens. It's a fern fiddlehead!

Most young fern leaves start out rolled up into coils called fiddleheads or croziers; technically this is called circinate vernation. The fiddleheads of a few fern species are edible, such as the ostrich fern (*Matteuccia struthiopteris*) native to northern regions, and the vegetable-fern (*Diplazium esculentum*) of Asia. However, some other species are considered to be carcinogenic, so don't eat fern fiddleheads unless you are certain of the species. The mature fern leaf, or frond, is often divided into leaflets (pinnae), creating that well-known lacy appearance of many ferns.

An odd fact about ferns is that their life cycle has two entirely separate plants — named the sporophyte and the gametophyte. The familiar fern plant is the sporophyte, and it produces spores. These spores land on the ground, where they typically grow into separate, tiny, green, heart-shaped plants, which are hard to see and are usually overlooked.

This gametophyte plant then produces gametes, the eggs and sperm. Amazingly, these sperm cells swim to fertilize the eggs. This produces an embryo, which then grows into the familiar, much larger, fern plant, and the cycle is complete! Swimming

sperm cells are considered to be primitive, and occur in the mosses and ferns, only among the most primitive of the non-flowering seed plants like the cycads and ginkgos, and not at all in the flowering plants.

People sometimes ask whether the dark spots on the underside of a fern leaf are insects or a plant disease. These spots are actually clusters (sori) of tiny sporangia (sacs) containing the even tinier, microscopic spores.

The sori come in different shapes, like circles, lines, and kidney-bean shapes, which help to identify the species. In a few species, like the sensitive fern (*Onoclea sensibilis*) and the ostrich fern (*Matteuccia struthiopteris*), the spores are on a special leaf which looks different from the sterile non-spore-bearing leaf.

Another odd fern fact is the mechanism that has evolved in ferns to throw the spores away from the parent plant. The sporangia (spore sacs) have a ring of cells called an annulus, which contracts as the sporangium dries, and eventually fling the spores forward.

In the tropics, "tree ferns" have tall upright trunks. However, in Delaware's ferns, the leaves arise directly from the ground from underground stems (rhizomes).

Many ferns make good garden plants, especially in moist shady places. Christmas

See Garden — Page 35

Capital Daily

Garden

Continued From Page 34

fern (*Polystichum acrostichoides*) is an attractive native evergreen fern. One of my favorites is the maidenhair fern (*Adiantum pedatum*), with its delicate foliage, and shiny black stems (resembling the hair of a maiden).

Delaware has approximately 45 different species of ferns, some of which are rare ("Flora of Delaware," by McAvoy and Bennett, 2001). Right now is a great time to get outside and look for those unrolling fiddleheads!

Editor's note: On the campus of Delaware State University, the Claude E. Phillips Herbarium is Delaware's center for research, education, and outreach about plant identifications, locations, and uses. Call 857-6452 (Dr. Susan Yost, Herbarium Educator) to arrange a tour of the herbarium, or for more information about this article.

35



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The large leaf of this tropical tree fern clearly shows how the leaf and leaflets of the fiddlehead unroll as they open.