

A Comparative Study of Lady Ferns and Japanese Painted Ferns (*A. ad-nigrum* spp.)



A. ad-nigrum - *a*

Lady ferns and Japanese painted ferns (*A. ad-nigrum* spp.) are among the most elegant yet utilitarian plants for the shade garden. Their lacy fronds arch and twist in a graceful manner, being both structural and ethereal at the same time. Ferns stand on their foliar merits alone, having no flowers to overshadow their feathery foliage. The lush green fronds of lady ferns are in marked contrast to the sage green, silver, and burgundy tones of the colorful Japanese painted ferns. The delicate quality of their fronds belies their stoutness—they are durable and hardy garden plants that can be broadly cultivated successfully throughout North America.

Lady ferns (*A. ad-nigrum* - *a*, *A. ad-nigrum*, and *A. ad-nigrum*) and Japanese painted fern (*A. ad-nigrum* var. *a*) are members

of the wood fern family (Dryopteridaceae) and just a few of the nearly 200 species native to temperate and tropical regions worldwide. The common lady fern (*A. ad-nigrum* - *a*) is a circumglobal species found in moist woodlands, meadows, and ravines throughout North America, Europe, and Asia, and is represented in (*A. ad-nigrum*) and Japanese lady fern (*A. ad-nigrum*) are woodland natives in Japan, Korea, and China. Likewise, Japanese painted fern is native to moist shady sites in Japan, China, and Korea. *A. ad-nigrum* -

features green foliage, whereas the naturally occurring variant offers up grayish-green fronds with purple midribs. In the past decade, the popularity of

Japanese painted ferns has spawned an array of new colorful cultivars as well as a few exceptional hybrids with the common lady fern.

While common botanical terms such as leaf, stem, and midrib can be used to describe fern foliage, specialized terminology further defines fern morphology. The fern leaf or frond is composed of the stipe (stem), blade (leaf), rachis (midrib), and pinna (leaflet). Crosier or fiddlehead describes the 14.8(l)-14.9(e)-iee) the frond into mul as bi- or tripinnate-pinnatifid, which means

two to three times divided. Ferns are non-flowering plants that reproduce asexually by spores, which are contained in capsules called sporangia that are often located on the undersides of the fronds. Clusters of sporangia are called sori; the shape and position of sori on the frond is important for fern identification.

Adiantum spp. has lance-shaped green fronds with green to reddish stipes and rachises. The bipinnate-pinnatifid blades have 20-30 pairs of pinnae, which accentuates the feathery texture of the foliage. Cultivars of lady fern are commonly grouped by enhanced foliar traits such as crested (*Cristatum*), crossed (*Cruciatum*), and feathery (*Plumosum*). Crested types feature fan-shaped tufts or tassels at the tips of the pinnae. The pinnae of the *Cruciatum* group crisscross along the rachis forming an X-pattern, while the pinnae of the feathery types are more finely divided giving the fronds a plumed look. Japanese

painted ferns feature lance-shaped, bipinnate blades with purple rachises. Cultivars have been selected for their frond color, which ranges from silvery to gray-green and is often suffused with purple or burgundy. Much like seed-grown plants, spore-grown ferns are variable in foliage coloration and character. The delicateness of the fronds of *A* spp. is not just about their





T E S

The Chicago Botanic Garden (USDA Hardiness Zone 5b, AHS Plant Heat-Zone 5) evaluated 26 taxa of *A. japonicum* from 2002 to 2014. The comparative study included *D. a. a.*, which was received as *A. japonicum*, the previous name for this taxon. Each taxon was evaluated for a minimum of four years but due to the protracted trial period, many were grown for up to 12 years. The goal of the project was to identify outstanding lady ferns and Japanese painted ferns for upper midwestern gardens. In addition,

the study compared the named cultivars of *A. japonicum* var. *var.* to determine the similarities of their foliar traits.

Three plants of each taxon were planted side-by-side for easy comparison of ornamental traits and landscape performance. Initially, the naturally shaded trial beds received either no sunlight or varying

droughty periods, affecting anywhere from several taxa up to 65 percent of the plants at any time. Irrigation or rainfall during these dry periods alleviated stress and promoted the production of new fronds.

Ath ri m 'B R' was essentially the opposite of 'Branford Beauty', with the spreading habit of Japanese painted fern and the green foliage of lady fern. The bright green leaves had a purple rachis and purple venation in the lower pinnae. Its irregular branching rhizome formed a large mass over time. 'Branford Rambler' remained fairly compact until the third summer when it began spreading. In August, lush growth created a two-tiered effect as erect new fronds stood above the horizontal older fronds. Although it was periodically affected by drought, it was noted as being the best looking fern in late August 2010 after a period of severely dry weather. Significant rabbit browsing was noted in 2002 and 2003.

The shuttlecock habit of *Ath ri m* 'G' comes from the lady fern, while its foliage color is akin to Japanese painted fern. The silvery green fronds were similar to but lighter in color than 'Branford Beauty'. The fiddleheads emerged purple but only the rachis and some veins held the purple coloration when the fronds were unfurled.

'Ghost' had a strong vase-shape with distinctly upright fronds. This hybrid fern was slower to emerge in the spring than Japanese painted ferns. 'Ghost' was generally not as affected by heat or drought as other ferns, but suffered severe rabbit browsing in 2003.

The description of *Ath ri m* 'O F'—silver-leaved with a red rachis—did not match the yellow-green fronds with reddish bronze rachises that we observed. The leaf color was consistent every year and was likely influenced by the amount of sunlight received—it was grown in morning sun and afternoon shade after 1 p.m. 'Ocean's Fury' had a frothy texture because of the tasseled tips of the pinnae and fronds. Its robust bushy habit was the largest in the trial at 37 inches tall and 40 inches wide. Minor foliar burn and heat stress was observed in some years.

Ath ri m li -femina—lady fern—featured bright green leaves with a feathery appearance due to the tripinnate division of the frond. The clump-forming habit of lady

fern resembled a shuttlecock with graceful upright fronds arising from a short, vertical rhizome. Lady fern was slow to establish the first year in the garden but was vigorous the second summer. Although it was occasionally stressed by heat and drought in midsummer, it showed good heat resistance in 2007 during an especially hot, dry period. Lady fern prefers moist, shady locations protected from wind and sun, and produces new fronds throughout the growing season.

Ath ri m li -femina 'D' 'D' is purportedly a sport and dwarf version of 'Victoriae', but was not significantly smaller in size than it in the trial. The fronds had crested tips and the p4.1(i)-8(e p4.1(i)-10-i)0.5(fi)2.1

***Athri m li -femina* 'E** was one of the top performers in the trial. All pinnae were tasseled or crested at the tips, giving the light green fronds a frilly look. Slow to develop the first summer, 'Encourage' had a robust, vase-shaped habit by the second year and was particularly densely robust in the fourth year. Plants were in full sun by 3 p.m. so some leaf scorching was occasionally observed in July and August. 'Encourage' is a selection of 'Vernoniae Cristatum'.

***Athri m li -femina* 'F**, commonly called tatting fern, had a unique foliar structure compared to other cultivars. Rounded green pinnae with toothed margins were borne along the green rachis, somewhat reminiscent of a string of beads. 'Frizelliae' is a dwarf form with slender fronds and an arching vase-shaped habit. Plants remained small and open until the third year in the trial. Following the loss of the river birch in 2006, these plants went from growing in full shade to receiving full afternoon sun. Minor foliar desiccation was noted in 2006 and 2008. Although reputedly prone to reversion, 'Frizelliae' remained true to type throughout the trial.

The broad, lacy lime-green leaves of ***Athri m li -femina* 'P A** gave it a softer appearance compared to the species, and its vase-shaped habit was consistently good. 'Plumosum Axminster' was grown in two test sites—full shade or morning shade and afternoon sun. The plants in full shade did not exhibit any leaf scorching or desiccation during hot weather, although they suffered significant losses in the winters of 2008-09 and 2009-10. Plants in morning shade and afternoon sun were occasionally scorched in late summer.

***Athri m li -femina* 'V C** had bright green leaves and a broadly vase-shaped habit like the species, but each plant contained a mix of tasseled fronds and regular unadorned fronds. Due to the two foliage types, the plants were not as lacy overall as other crested forms such as 'Encourage'. It was typically one of the earliest lady ferns to emerge in the spring. Unfortunately, plants were consistently stressed by heat and afternoon sunlight, resulting in desiccated foliage during the summer in most years from 2006 onward. 'Vernoniae Cristatum' originated in England in the late 1800s.

***Athri m li -femina* 'V** is another Victorian-era selection of lady fern. Victoria fern's similarity to 'Dre's Dagger' was

often tattered in late summer but new fronds were produced throughout the season. Grown in afternoon sun, plants had minor scorch in midsummer during droughty periods. Given that western lady fern grows naturally in wet, shady habitats where it can get up to 6 feet tall, the plants in our trial performed admirably well under less than ideal conditions.

Ath ri m niponic m 'P R' is a name of no botanical standing but was in the trial because it is commercially available. Foliar color was variable among the plants but its traits were closest to 'Ursula's Red'. Fronds emerged purple and aged to silvery sage green with a darker green to purple-tinged zone near the base of the pinnae along the purple rachis. Like other taxa in the trial, plants suffered periodically from heat and drought stress but rebounded quickly after being watered.

In our trial, the three plants of *Ath ri m niponic m* .*pict m*—Japanese painted fern—were variable in their foliage color but were especially colorful compared to the cultivars. Young fronds were mostly deep red with silvery green tips that eventually faded to silvery green with hints of red in

the veins and along the rachis. Browning fronds within the plants were not uncommon, especially later in the season and in droughty periods. New fronds were produced all season, which helped maintain dense habits. In midsummer 2010, all plants were flattened due to heat stress and drought but rebounded well in September during a period of heavy rainfall.

Ath ri m niponic m .*pict m* 'A C' featured the same silvery sage green and purple coloration of var. but with tasseled and forked frond tips and crested pinnae. The fronds became greener by late July but the rachis remained purple. 'Apple Court' had a bushy upright habit in all years. The plants grew well in full shade during the early years; some leaf scorch was occasionally noted after 2006 despite no change in light exposure. Most fronds were browsed by deer in early July 2009.

The leaves of *Ath ri m niponic m* .*pict m* 'B L' were the darkest purple and remained purple longer than other cultivars. New fronds emerged completely purple before developing silvery tips and finally fading to light silvery green with a purple-flushed green zone at the base of

the pinnae. Plants were unaffected by heat stress or scorch until 2007 when the plot was exposed to more sunlight. Minor heat stress and leaf scorch issues were noted in 2007 and 2008 but were a moderate to severe problem in 2010.

Ath ri m niponic m .*pict m* 'P L' was closest in foliar coloration to 'Burgundy Lace' in the early season. The new fronds emerged purple but aged silver-green with purple highlights on the lower portion of the pinnae along the purple rachis. The irregularly arched fronds and mounded habit were comparable to other cultivars. No rabbit damage, drought stress, or scorch was observed during the trial.

The fronds of *Ath ri m niponic m* .*pict m* 'R B' emerged green with a purple rachis and developed a silvery overlay with a reddish cast on the lower third of each pinna. Some green fronds were always present within each plant, although one plant was predominately green. 'Red Beauty' had the typical mounded habit with irregularly arching fronds. Like 'Pewter Lace', there was no rabbit

L210.5(t d)-11-10i

Ath ri m niponic m . pict m 'R

R ' featured light sage green fronds with a purple rachis and a red-purple zone along the rachis; the fronds emerged deep purple. The contrast between the red-purple at the

caption 15 12 Tc 13 12 (e 2 F) 10s (f th)-i5(d l)D(c)-v5(r3)12.8(e)-14.49(t)y5.5.2(3)-8.96(n)-2.9(t)12.8(e)-15.8(e n)-019() Tf0 Tc 0(T) 4.789 0-Td0J-0.019 14

S