Which Boston Fern Is It

– the exotic *Nephrolepis cordifolia* or the native *Nephrolepis exaltata*?

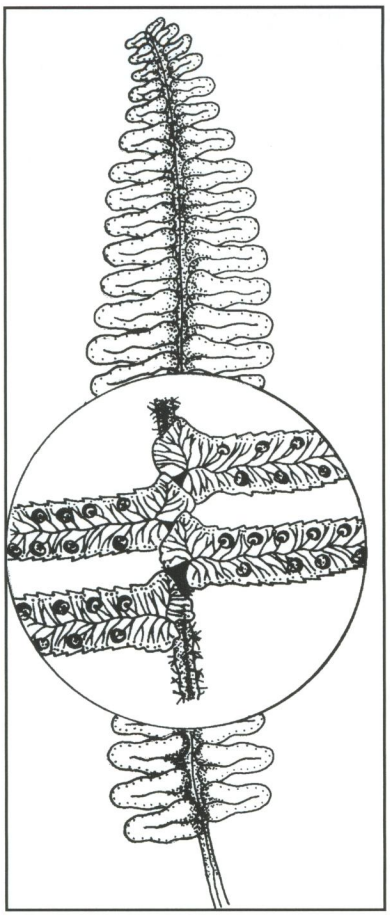
By Nancy C. Coile

Unfortunately, several species of *Nephrolepis* have been called Boston fern (Wunderlin 1982) and the general appearance of these species is very similar. The original "Boston fern" was a mutant of *N. exaltata* (recognized ca. 1870) was cultivated for its graceful, broader fronds (Jones 1987) and soon became the most cultivated fern. Numerous popular cultivars of *N. exaltata* are grown, including "Bostoniensis," "Rooseveltii," "Fluffy Ruffles," and "Whitmanii Compacta" (Huxley 1992). *Nephrolepis cordifolia* is widely grown, especially the cultivars "Petticoat," "Duffii," and "Plumosa" (Huxley 1992; Jones 1987).

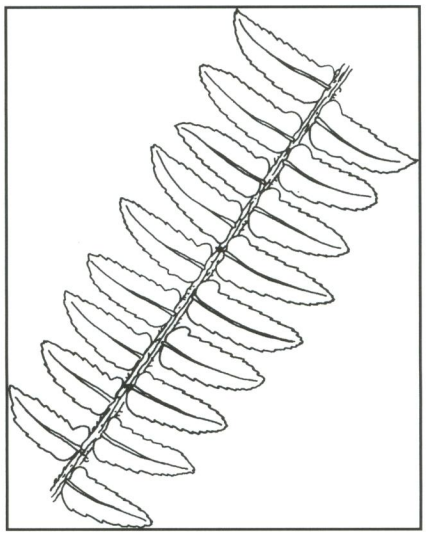
Only *N. exaltata* and *N. biserrata* are considered to be native species (Small 1938, Nauman 1993). Wunderlin *et al.* (1995) show *N. biserrata* from Broward, Collier, Dade, Highlands, Manatee, Martin, Monroe and Palm Beach counties, and *N. exaltata* as occurring throughout most of the state.

Small (1938) indicates that *N. cordifolia* (sword fern) is an escape from cultivation and persists especially in the crowns and boots of palm trees, in cypress swamps, around old homesteads, and rubbish heaps. Small (1938) gives the habitat for the native *N. exaltata* (wild Boston fern, Boston fern) as the hammocks of Lake County, FL and southward. Small's range agrees quite well with the distribution map of *N. exaltata* (Wunderlin *et al.* 1995) which documents *N. cordifolia* in Lake, Citrus, Seminole and Brevard counties southward and with out-liers in Columbia, Duval and Leon counties, but excludes Orange, Osceola, Manatee and DeSoto counties.

Recently, there has been much concern about whether cultivated Boston-type ferns are the native *N. exaltata* or one of the non-native *Nephrolepis* species. This confusion about the species identity can easily be cleared up by careful examination of Wunderlin (1982)



◀ *Fig. 1.* A. Upper surface of *N. cordifolia* blade, showing blunt tips for the pinnae. In the enlarged circle, the lower surface of the pinnae are shown. Note the kidney-shaped sori; the pinnae bases conceal the rachis of the lower surface.



▲ B. Life size pinnae of *N. exaltata*, showing attenuated tips.
Illustration credit: W. D. Ross McClain.

Key to the Native or Naturalized Species of Florida *Nephrolepis*

Tubers present ..... *N. cordifolia*
Tubers absent.
- Hairs present on the upper surface of the pinnae; indusia less than 1 mm wide and circular, horseshoe, or peltate.
  - Petioles have many dark scales with pale margins ..... *N. multiflora*
  - Petioles have a few light brown scales with reddish to light brown margins
    - Densely hairy ..... *N. biserrata*
    - Sparsely hairy ..... *N.* x *averyi*
- Hairs absent; indusia greater than 1 mm wide and shaped like kidneys, horseshoes, or half-moons.
  - Petioles with pale brown scales; rachis scales with pale to dark brown scales which have a dark point of attachment..... ..... *N. cordifolia*
  - Petioles with pale brown to reddish brown; rachis scales pale to dark brown and same color throughout ..... *N. exaltata*

and Nauman (1993) and by understanding the terms used. Fern morphological terms which are important in understanding *Nephrolepis* include "petiole" (as in flowering plants, the stem-like part of the leaf), "pinnae" (leafblade segments, or leaflets; pinna, singular), "adaxial costae of central pinnae" (the upper surface veins of a blade segment), "sporangium" (tiny structure which contains spores), "sorus" (a group of sporangia; plural, sori), "indusia" (the flap of tissue which covers several sporangia), "rachis" (the axis which bears the leafblade segments), and "frond" (leaf blade).

IDENTIFICATION: Nauman (1993) cites four species of *Nephrolepis* and one hybrid as occurring in Florida: *N. cordifolia, N. exaltata, N. biserrata, N. multiflora,* and *N.* x *averyi*. The hybrid is between *N. exaltata* and *N. biserrata* and has been found only where the two species occur together.

Wunderlin (1982) and Nauman (1993) report that while *N. cordifolia* may have tubers, the native *N. exaltata* never has tubers. *Nephrolepis exaltata* and *N. cordifolia* lack hairs on the upper surface of the pinnae, while *N. multiflora* and *N. biserrata* have short hairs on the upper surface of the pinnae. The leaflet tips of *N. cordifolia* are blunt (Fig. 1B), while those of *N. exaltata, N. biserrata* and *N. multiflora* are attenuated to long slender pointed tips (Fig. 1B). The pinnae bases of *N. cordifolia* overlap the abaxial (lower surface) of the rachis, but those of *N. exaltata* occasionally will also overlap the rachis. The presence of bicolored scales on the upper surface of the rachis is a way to distinguish *N. cordifolia* from all other *Nephrolepis* species (Fig. 2) which lack the strong color difference. However, while *N. biserrata*

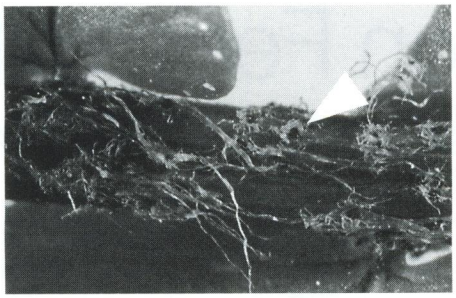


Fig. 2. Scales on upper surface of the rachis of *N. cordifolia*. Note that the attachment point of the scale is dark-colored and the surrounding scale tissue is pale. Use at least 10x magnifing lens to view. The leaf segments in the middle of the frond may be up to 9 cm long and 0.9 cm wide. Photography credit: Jeffrey W. Lotz.

has constant color scales on the rachis, there may be bicolored scales on the petiole bases. *(Nancy Coile is a Botanist with the Florida Department of Agriculture and Consumer Services, Division of Plant Industry. This article is a reprint of DACS Botany Circular No. 32.)*

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Internodes

XenoNET

*Let us hear about your favorite exotic websites! E-mail the locations of cool sites (preferably sites that focus on exotic **plants**) to aferrite@sfwmd.gov. Include a brief description of the site in your message.*

Everglades Information Network

http:/everglades.fiu.edu

The Everglades Information Network (a Florida International University/Everglades National Park partnership) site has an Everglades digital library and an Everglades online database. This "webliography" gives you access to both published literature and internet-based information about research, restoration and resource management of the South Florida environment.

Submitted by: Irvin P. Freely

The Hated Brazilian Pepper

http://stone.web.brevard.k12.fl.us/html/braz_pep.html

This webpage is included on Stone Junior High School's website. Students are involved in habitat restoration projects including Brevard county's "Pepper Busters."

Submitted by: Chuck Nohejl

Alien Ferns of Hawaii

http:/www.lam.mus.ca.us/lacmnh/departments/research/botany/wilsonferns/index.htm

This is a great site that details the naturalization of 29 exotic ferns on the Hawaiian islands. A main menu allows you to search on individual species. Familiar plants (*Lygodium japonicum*) and familiar themes (invasion of native forests and hybridization with native ferns) make you feel right at home.

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