# Which Boston Fern Is It? The Exotic *Nephrolepis cordifolia* (L.) Presl, or the Native *Nephrolepis exaltata* (L.) Schott[1]

Nancy C. Coile[2]

**INTRODUCTION:** 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," a mutant of *N. exaltata* (L.) Schott (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 cvs. 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).

Small (1938) indicates that *N. cordifolia* (L.) C. Presl (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 in 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 outliers in Columbia, Duval and Leon counties, but excludes Orange, Osceola, Manatee and DeSoto counties. Wunderlin *et al.* (1995) show *N. biserrata* from Broward, Collier, Dade, Highlands, Manatee, Martin, Monroe and Palm Beach cos. and *N. exaltata* as occurring throughout most of the state. Only *N. exaltata* and *N. biserrata* are considered to be native species (Small 1938; Nauman 1993).

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) 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), "adxial costae of central pinnae" (the upper surface veins of a blade segment from the center part of the blade), "sporangium" (tiny structure which contains spores), "sorus" (a group of sporangia; singular, 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 a hybrid as occurring in Florida: *N. cordifolia, N. exaltata, N. biserrata* (Swartz) Schott, *N. multiflora* (Roxb.) F. M. Jarrett ex C. V. Morton, and *N.* x *averyi* Nauman. 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. 1A), 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 abxial (lower surface) of the rachis (Fig. 1A), but those of *N. exaltata* occasionally will also overlap the rachis. The presence of bicolored scales on the upper surface of the rachis (Fig. 2) will distinguish *N. cordifolia* from all other *Nephrolepis* species which lack the strong color difference. However, while *N. biserrata* has constant color scales on the rachis, there may be bicolored scales on the petiole bases.

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1 Contribution No. 37, Bureau of Entomology, Nematology and Plant Pathology - Botany Section.

2 Botanist, FDACS, Division of Plant Industry, P.O. Box 147100, Gainesville, FL 32614-7100.

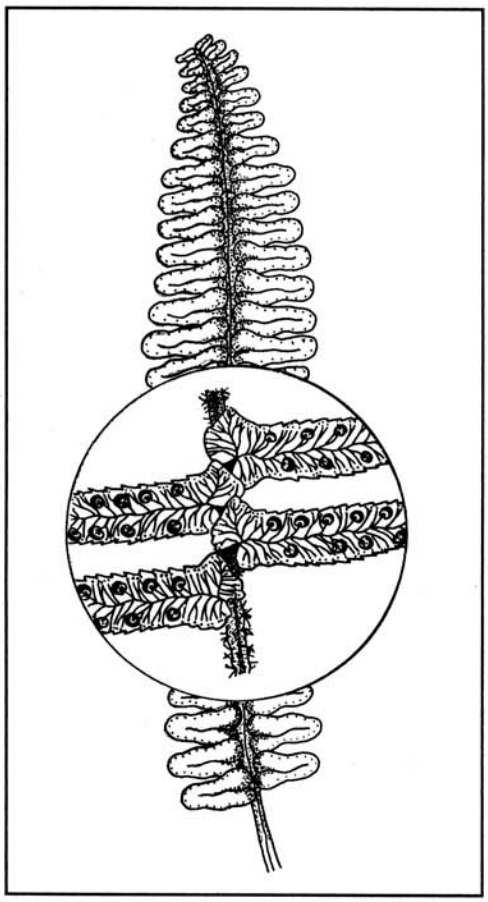

Fig. 1a.

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.

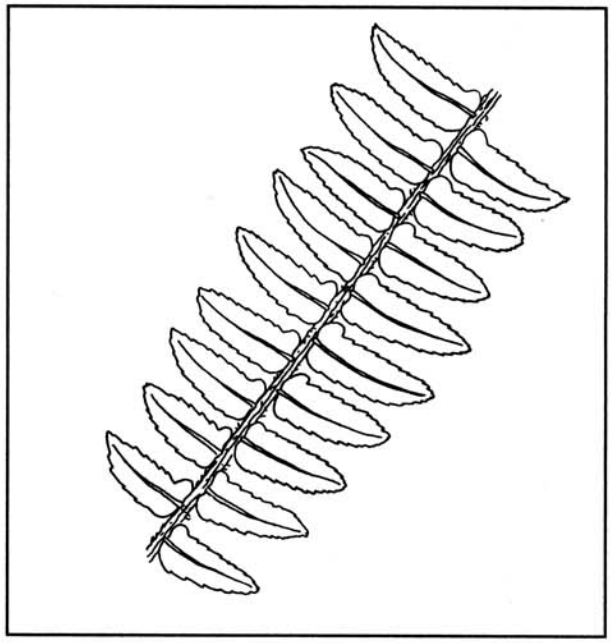

Fig. 1b.

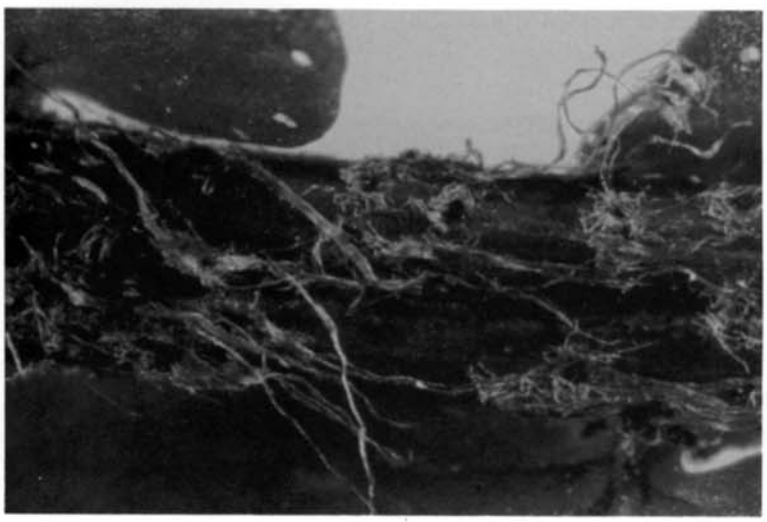

Fig. 2. Scales on upper surface of the rachis of *N. cordifolia*. Note that the attachment point of the scale is dark-colored and the surrounding scale tissue is pale. Use at least 10x magnifying lens to view. The leaf segments in the middle of the frond may be up to 9 cm long and 0.9 cm wide. Photography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

**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 with pale to dark brown scales which have a dark point of attachment.....*N. cordifolia*
Petioles with pale brown to reddish brown scales; rachis with pale to dark brown scales and same color throughout.....*N. exaltata*

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