

# SCHIZAEACEAE IN FLORIDA

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Several status changes have occurred for the Florida members of the Schizaeaceae. The following account brings that information together along with keys and updated distributional information on each taxon. This article is intended to subject that information to public critique prior to its inclusion in the pteridophyte treatment for the Flora of Florida. I openly solicit comments, suggestions, and additional information on these taxa.

## KEY TO THE FLORIDA GENERA

1. Fronds vine-like, twining, of indeterminate growth; secondary pinnae arising in pairs from short stalks on the rachis . . . . . *Lygodium*
1. Fronds not vine-like and twining; secondary pinnae not arising in pairs from short stalks on the rachis, or absent . . . . . 2
  2. Sterile fronds simple, linear and appearing grasslike; lamina essentially wanting or present as mere wings; sporangia borne on distal, linear, apparently digitate segments . . . . . *Actinostachys*
  2. Sterile fronds compound, not appearing grasslike; lamina obviously present; sporangia borne on distinctly pinnately divided segments . . . . . *Anemia*

## ACTINOSTACHYS PENNULA (Swartz) Hooker

The species was first discovered in Florida in 1903, by A.A. Eaton (1906) in Dade County, and again found sometime after 1914 at Royal Palm Hammock in Dade County (Small 1938), in Pinellas County in 1952 (Beckner 1953), and in Palm Beach County in 1972 (Alexander 1974). The species is apparently extirpated from the Dade and Pinellas county locations, but is extant in Palm Beach County. *Actinostachys pennula* is widely distributed and common in continental tropical America from Costa Rica to Uruguay and less common to rare, but widespread in the Caribbean. Previous authors on the ferns of Florida have reported the species as very rare, or at least inconspicuous and overlooked; the latter is more likely. Recent searches at the Palm Beach County location have turned up numerous plants (R. Moyroud pers. comm.). Notably, the plants were entirely restricted to rotting *Persea* stumps and logs.

The form of this species known for Florida as well as the Lesser Antilles and Central America formerly went under the name *Actinostachys germanii*

Fée or *Schizaea germanii* (Fée) Prantl. The "*A. germanii*" form had been distinguished from the more common continental South American *A. pennula* by its smaller stature and the presence of what authors have described as "hairy tubers." These "tubers" have recently been shown to be gametophytes (Wagner & Guevedo 1985). Morphological differences between the two taxa are apparently due to the neotenic nature of the "*A. germanii*" form. The neotenic form is widespread throughout the range of the species and generally occurs in shaded pockets of humus or rotting wood at low elevations. The robust form differs in the habitat types in which it occurs; that of sandy savannas and dry rock outcrops, presumably conditions unfavorable to persistence of the gametophyte. The robust form is not usually found along with its gametophyte. It is still uncertain why the robust form has not been found in Florida.

KEY TO THE FLORIDA SPECIES OF ANEMIA SWARTZ.

1. Fronds partially dimorphic with a basal pair of fertile pinnae, mostly more than 1 dm tall . . . . . *A. adiantifolia*  
 1. Fronds completely dimorphic, mostly less than 1 dm tall . . . . . *A. wrightii*

ANEMIA ADIANTIFOLIA (L.) Swartz

The species was first collected in Florida by J.L. Blodgett in 1838 in Monroe County (Small 1938). It occurs in the four southernmost counties and extends northward on the east coast to Palm Beach and Martin counties where it is rare. The species is disjunct to Levy, Citrus, and Sumter counties. Its distribution outside of Florida ranges from the West Indies to Mexico and south through Central America to northern South America.

The distribution of *A. adiantifolia* in Florida appears limited by both the availability of limestone substrates and cold intolerance. The plants occur in pinelands, hammocks, or other habitats with rocky limestone substrates and exhibit a high (perhaps 100%) occurrence on exposed limestone. The absence of *A. adiantifolia* in apparently suitable limestone habitats farther northward in the state is probably due to its cold intolerance. Several other tropical species of "limestone-loving" ferns are disjunct to the Levy-Citrus-Sumter county area (notably several species of *Asplenium*). The reason for these disjunct populations is still enigmatic, representing perhaps either refugial remnants of former more widespread distributions or anomalous local ecological conditions. Regardless of the reason for these disjunctions, it is noteworthy that *A. adiantifolia* has not spread to neighboring areas with apparently suitable substrate conditions. This further suggests that cold intolerance is a limiting factor in the species' distribution in Florida.

## ANEMIA WRIGHTII Baker

*Anemia wrightii* was first found in Florida by C.V. Delchamps and G. Avery in Dade County near Homestead (Delchamps 1977). Outside of Florida it occurs in Cuba and the Bahamas. Throughout its range the species occurs on moist edges and walls of bare limestone ("pinnacle rock") in open habitats.

Lellinger (1985) reported the plants to be under threat from "expanding agricultural lands." The original Homestead population is adjacent to an airport where this threat is real. However, the species is now known from a second site within the protective confines of the Everglades National Park. The discovery of this second site and its location within the park suggests that the species may not only persist in Florida, but may possibly spread to other areas.

## KEY TO THE FLORIDA SPECIES OF LYGODIUM SWARTZ

1. Members of the lateral pairs of pinnules generally 1-pinnate with each primary division a mostly undivided, triangular to lanceolate-oblong segment, generally without basal lobes, if present the lobes are rounded, auriculate and do not point toward the apex; ultimate segments appearing to be articulate, leaving a wiry petiolule after falling off; lamina tissue glabrous abaxially . . . . . *L. microphyllum*
1. Members of the lateral pairs of pinnules generally more than 1-pinnate, with each primary division a pinnately to subpalmately divided segment, or if undivided, with distinct basal lobes directed at an angle toward the apex; ultimate segments not apparently articulate to their petiolules; lamina tissue sparsely to moderately pubescent abaxially . . . . . *L. japonicum*

## LYGODIUM JAPONICUM (Thunb.) Swartz

*Lygodium japonicum* is widespread in northern and north central peninsular Florida from Escambia to Duval counties and south to Highlands County. Outside of Florida the species ranges from the Carolinas and Georgia west to Alabama, Mississippi, Louisiana, and Texas. A native of Japan, *L. japonicum* is commonly naturalized, and occurs in wet woods, marshes, roadside ditches, riverbanks, and other wet disturbed sites in circumneutral (*vide* Wherry 1964) soil. The species may be locally abundant. Where naturalized in the greatest numbers, it appears to be following natural river systems in its spread, notably the Suwannee and Apalachicola rivers.

*Lygodium japonicum* was first collected in Florida in 1932 by Kurtz and E.T. Wherry (Small 1938), but is also known from a 1932 Diddell collection. The Diddell collection (*Diddell s.n.* FLAS!) reported the species as escaped in vacant lots in Miami, but the plants were probably only

persistent from cultivation (cf. Beckner 1968; Nauman & Austin 1978). The species has also been collected in Collier and Broward counties. The Collier County collection (*Scull s.n.* 1935, FLAS!) was of a plant in cultivation and the Broward County collection (*Burch s.n.*, 1986, FAU!) was of a plant only recently escaped. No naturalized populations are known south of Highlands County. To my knowledge, this species is restricted to temperate/warm temperate regions. Intolerance to warm temperatures may explain its absence in the more distinctly tropical and subtropical portions of the state.

#### LYGODIUM MICROPHYLLUM (Cav.) R. Brown

A native of southeast Asia, *L. microphyllum* is recently naturalized in the United States and is continuing to spread. The earliest collection record of *L. microphyllum* for Florida is 1958; the species seems to have been introduced in the 1940's or 50's (Nauman & Austin 1978). By 1968 it was known from three isolated colonies in Martin and Palm Beach counties (Beckner 1968) and by 1978 it had spread throughout those two counties (Nauman & Austin 1978). It is now known from Broward, Collier, Highlands, Martin, Palm Beach, and Polk counties, Florida. Unlike *L. japonicum*, this species is primarily tropical in its distribution outside of Florida and whether it will remain restricted to tropical portions of the state is uncertain.

*Lygodium microphyllum* occurs on riverbanks, swamps (especially Cypress swamps), cabbage palm hammocks, and other wet disturbed sites. The species may be very locally abundant, climb to 9 m heights in nearby trees, and form thick mats at the ground level covering considerable areas (Beckner 1968; Nauman & Austin 1978).

Ecological observations on both *L. japonicum* and *L. microphyllum* may prove valuable to population biologists. Both species occur in essentially the same habitat types but, at this writing there are no single sites in which the species have been reported to co-occur. Both, however, are sympatric in Highlands and Polk counties and searches for sites with both species should be directed in those areas. Mixed populations of these species may provide an excellent opportunity to test various theories regarding principles of competitive exclusion with both sporophyte and gametophyte generations.

#### EXCLUDED SPECIES

ANEMIA CICUTARIA Kunze—A number of herbarium sheets of *A. wrightii* have been misidentified as *A. cicutaria* and the species has been reported to occur in Florida (Correll & Correll 1982; Mickel 1979). The

fact that these two species often co-occur in sympatric portions of their ranges outside of Florida (Correll & Correll 1982) is probably responsible for the error. *Anemia cicutaria* differs from *A. wrightii* in being more densely pubescent, 2–3 times rather than 1–2 times pinnate, has fertile fronds with several pairs of distinctly petiolulate rather than sessile pinnae, and ovate to rhombic, broad-based ultimate segments with shallowly crenate rather than lobed margins (Correll & Correll 1982; Mickel 1979). *Anemia cicutaria* may eventually be found in Florida.

LYGODIUM PALMATUM (Bernh.) Swartz—Nearly every author on the Florida fern flora has followed Chapman (1883) in reporting this species for the state. Despite this high number of reports, no populations or specimens exist to document the species' occurrence with the exception of a single collection from Lemon City, Dade County made in 1895 (no collector, FLAS P87!). Wherry (1964) suspected that this specimen represented a cultivated plant, and Correll (1938) seemed to have reservations about accepting the species' occurrence in Dade County. I agree with Wherry (1964) that the specimen probably represents a cultivated plant; suitable habitat is not present in Dade County, nor was it likely to have been present when the Lemon City collection was made. The species' requirements for relatively acid substrates precludes it from many southern Florida habitats that would otherwise seem favorable. Even though locally rare, its wide geographic range and occurrence in the southern Coastal Plain makes Chapman's report of the species seem reasonable, and may be why subsequent authors continued to report the species for Florida. If the species does occur in Florida, it is most likely to be in the panhandle region. Yet, recent studies of that region by Clewell (1985), Wilhelm (1984), and Freeman, et al. (1979) have failed to turn up populations of *L. palmatum*. Additionally, young, sterile, and incompletely unfurled fronds of *L. japonicum* (widespread in northern Florida) superficially resemble *L. palmatum*. The resemblance between these two species makes misdetermination likely, especially if the presence of the Asian *L. japonicum* was unknown to the person identifying the plants. It is unlikely Chapman would have made such a mistake. Chapman's source for the record however, is unknown and he did not cite a specimen. The apparent absence of current populations, herbarium specimens for confirmed former populations, and the possibility of misdetermination have convinced me to exclude the species from the Florida flora.

#### ACKNOWLEDGMENTS

I thank Dr. R. P. Wunderlin (USF) and Dr. A. M. Evans (TENN) for their criticisms and comments on the manuscript.

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