

**KEYS TO THE FLORA OF FLORIDA - 31,
ARISAEMA (ARACEAE)**

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ABSTRACT

Arisaema (Araceae) is represented in Florida by 3 species, two of which are treated as of two varieties. The nomenclature of *Arisaema triphyllum* and its variants is discussed. *Arisaema triphyllum* var. *acuminatum* is justified as worthy of recognition. *Arisaema dracontium* var. *macrospatum* is recognized as a new combination. *Arisaema quinatum* is noted as distinct and rare. An amplified key is given to the Florida taxa. *Phytologia* 94(2): 151-158 (August 1, 2012).

KEY WORDS: *Arisaema*, Araceae, Florida flora.

Arisaema (Araceae) is a rather large genus (150 species - Mabberley, 1997), numerous in Africa and Asia and only nominally represented in North America. The eastern U. S. species have been addressed twice, by Donald G. Huttleston (M.S. and Ph.D. theses, Cornell Univ.) and by Miklos Treiber (Ph.D. thesis, Univ. North Carolina), but neither study has been published. The three species native to Florida present problems both in taxonomy and nomenclature.

ARISAEMA TRIPHYLLUM. Twice Huttleston (Bull. Torrey Bot. Club 76: 407-413. 1949; *ibid.* 108: 479-481. 1981) touched on his earlier, more comprehensive thesis, by publishing brief justification of his new combinations, *Arisaema triphyllum* ssp. *pusillum* (Peck) Huttleston, ssp. *stewardsonii* (Britt.) Huttleston, and ssp. *quinatum* (Nutt.) Huttleston. [It is noted that as a student under Dr. R. T. Clausen, Huttleston did not have the option of employing the rank of variety.] These three taxa as well as typical *A. triphyllum* are generally

recognized in eastern U. S. floras, at times at ranks other than subspecies.

To anchor further discussion, it is necessary to establish what is meant by "typical" *Arisaema triphyllum*. In the Northeast, three moderately well-defined, long-recognized variants of the plant known as the Jack-in-the-pulpit or Indian Turnip have been distinguished. In the early 20th century these were known as: *A. triphyllum* (L.) Schott, the most common and most widespread variant, with a wide spathe flange, of mesic woodlands; *A. pusillum* (Peck) Nash, also of wide distribution, with a narrow flange, a smaller plant of wetter soils; and *A. stewardsonii* Britton, northern, with fluted spathes, of acidic soils. [Distinguishing characters are summarized by Huttleston (1949).] *Arisaema triphyllum* was assumed to be the variant known to Linnaeus (1753: 965). [*Arisaema quinatum*, a similar but separate taxon, was also known, as was the quite different Green-dragon, *Arisaema dracontium*.] But this stable nomenclature was upended by M. L. Fernald (*Rhodora* 42: 247-254, 1940) who argued that Linnaeus' type was the variant known as *A. pusillum*. If this were the case, the three taxa would become *A. atrorubens*, *A. triphyllum* (incl. *A. pusillum*), and *A. stewardsonii*. Fernald continued with this interpretation in his influential *Manual* (1950), and has been followed by some (e.g., Steyermark, 1963 (Missouri); Scoggin, 1982 (Canada).

But Fernald's argument hinges on the identification of Linnaeus' type. Of the single herbarium specimen in the Linnaean herbarium and several references (with their associated specimens) that formed the original material of *Arum triphyllum* Linnaeus (Sp. Pl. 965), Fernald called Linnaeus' specimen (1079.2, LINN) the type. He believed it to be "exactly similar" to a John Clayton specimen from Virginia in the herbarium of Gronovius (BM), and perhaps assumed it to be from the same source. [Gronovius had two Clayton specimens. -- #66 and #539 -- and gave each of them its own phrase-name. Fernald apparently was referring to #66, but the photo he was using may have been of #539. The discrepancy is not consequential.] Fernald failed to note the specimen in the Linnaean herbarium was marked "HU," Linnaeus' abbreviation for "Horto Upsaliensi," the Uppsala botanical

garden; it was not a Clayton sheet from Virginia. But by his designation of the Linnaean specimen as the type, Fernald locked the meaning of *Arum triphyllum* (hence, *Arisaema triphyllum*) to the Uppsala garden plant. Thus the epithet "*triphyllum*" (at specific, subspecific, or varietal rank) must be applied to the form represented by the specimen in the herbarium of Linnaeus, not the specimens of Gronovius.

Fernald believed Linnaeus' specimen represented the variant then known as *Arisaema pusillum*. He then felt justified in applying "*triphyllum*" to that plant, with "*pusillum*" reduced to synonymy, and calling the former *A. triphyllum* by a later name, *A. atrorubens* (Ait.) Blume.

The Linnaean specimen of *Arum triphyllum* (1079.2, LINN) consists of a single three-parted leaf and two opened spathes, showing spadices. [It is shown in part by Fernald, 1940, and in full by Jarvis, 2007: 319.] Huttleston (1949), however, was unable to agree with Fernald's identification; he cited several characters that he had found useful, but none were conclusive. He then proceeded to use the epithet in the traditional way, as described above.

As part of the project to typify all Linnaean names, James L. Reveal, Charles E. Jarvis, and Fred R. Barrie (Taxon 39: 355-357. 1990) published a fully detailed proposal to conserve the name *Arum triphyllum* with a different type. Implicit in their argument -- though not quite stated -- is the belief that the Linnaean specimen is indeed *not* the "typical" form of *A. triphyllum*, and that another type must be chosen so as to avoid accepting Fernald's nomenclature. Their proposal was considered by the Committee for Spermatophyta; questions were raised as to the taxonomy of the species and the accuracy of the identifications of the potential types, and the proposal was not recommended (Brummitt, Taxon 42: 875. 1993).

Failure of the Reveal et al. proposal to re-typify Linnaeus' *Arum triphyllum* has left botanists with an inherently unstable nomenclature for the variations of the Jack-in-the-pulpit. Yes, it is

agreed that Linnaeus' specimen is the type of *A. triphyllum*. But no, there is no agreement as to which form of the species is represented by that specimen. Prudence, not nomenclatural edict, suggests that the assignment of names as used by Huttleston (though not necessarily their rank) be followed, as is done here. Other recent notable floristic treatments have done likewise (cf. S. A. Thompson, Fl. N. Amer. 22: 139-141. 2000).

With the variant represented by the name *Arisaema triphyllum* understood, the question arises as to which variants are present in Florida. Here, recent practice has been to report *A. triphyllum* only as a single undivided entity (cf. Clewell, 1985; Wunderlin, 1998; Wunderlin & Hansen, 2003), usually with *A. pusillum* and/or *A. acuminatum* in synonymy.

J. K. Small (1903, 1933) thought otherwise. He recognized *Arisaema acuminatum* Small as a Florida endemic, typified by a plant from mid-peninsula (Clearwater, Pinellas Co.). He distinguished it from *A. triphyllum* -- also a Florida plant -- on the basis of a wholly-green, proportionately narrow spathe hood ("over twice as long as broad") with long-acuminate tip (vs. purple or brown-striped, shorter, broader hood with acute to short-acuminate tip). He excluded *A. pusillum* from the Florida flora, giving it a range only south to northern Georgia. [*Arisaema stewardsonii*, still more northern in range, does not reach the Manual coverage.]

Huttleston (1981) found *Arisaema triphyllum* ssp. *triphyllum* to be tetraploid and described it as having leaflets glaucous beneath with pronounced spathe-tube flanges; its range extended into north Florida. He described typical ssp. *pusillum* as diploid with leaflets green beneath and modest spathe-tube flanges, and included within it most plants from the Florida peninsula. But, after repeated trips to Florida (and ca. 250 chromosome counts - Huttleston, pers. comm., Mar. 1981), he could not fully dismiss Small's Florida variant. He found a diploid population occurring throughout peninsular Florida and extending north along the Georgia coast that combined the

characteristics of the two taxa. He concluded these plants to be of hybrid origin.

The plants Huttleston considered of hybrid origin coincide with the plants Small treated as *Arisaema acuminatum*. The range they occupy is the same as many other Florida-Georgia species. They are uniform in morphology throughout the peninsula (though less so in the panhandle where typical *A. triphyllum* also occurs). They form stable, sexually reproducing populations. Hybridity seems improbable; uniform diploid counts are scarcely to expected between diploid and tetraploid taxa. It may be that the Florida population has been derived from typical *A. pusillum* (or vice versa). But its stable format and real but modest differences have made it worthy of retention at varietal rank.

A differentiating character noted by Huttleston but difficult to quantify is relative robustness of the two variants. *Arisaema pusillum* north of Florida is usually a small plant, often under 20 cm. tall, with a delicate, slender stem. *Arisaema acuminatum* in the Florida peninsula is commonly somewhat stout, the stem firm, not notably flexible, sometimes above 50 cm. J. K. Small (J. N.Y. Bot. Gard. 28: 39. 1927) reported *A. acuminatum* in the Turnbull Hammock, eastern Volusia County, as: "the plants...varied in height from waist high to as high as one's head." Small was not a large man; even so, this observation indicates a height above 1.5 m. However, neither later observations nor preserved materials are available for confirmation.

ARISAEMA DRACONTIUM. The distinctive Green-dragon, *Arisaema dracontium* (L.) Schott, scarcely varies throughout most of its broad range in eastern and central North America. But where it extends into Florida and through Texas into Mexico, differences in morphology are to be found. In some Florida populations, as in apparently all northern populations, the spathe is tightly furled around the lower portion of the spadix, leaving free only the long-extended sterile tip. In other Florida populations the distal portion of the spathe is more or less expanded and leaflike, often to a width of 20 mm. or more.

A similar variant with leaflike spathes is quite widespread in Mexico, and has been named *Arisaema macrospathum* Benth. Typical *Arisaema dracontium* is also present. The two have at times been held separate (cf. Conzatti, Fl. Tax. Mex. 1946); but the distinction has been limited to number of leaf segments (6 to 7 in *A. macrospathum*, 9 to 14 in *A. dracontium*). The wider spathe is very evident in isotypes of Hartweg's 1837 collections in Michoacan, as identified by Benth. (1840). [Each specimen seen has 7 leaf segments. But one must doubt the utility of this character in view of the Florida observation that number of segments increases with age and size of the plant and change in gender (from male to female), and that Benth. noted the plant to be "masculo," suggesting with time the number of segments might well increase.] Huttleston (thesis, 1953) doubted the two taxa were sufficiently different to be recognized as species, but did not publish the new combination (which would have been *A. dracontium* ssp. *macrospathum* (Benth.) Huttleston). That new combination at varietal level is provided here.

***Arisaema dracontium* (L.) Schott var. *macrospathum* (Benth.) D. G.**
Huttleston ex D. B. Ward, comb. et stat. nov. Basionym: *Arisaema macrospathum* Benth., Pl. Hartw. 52. 1840. TYPE: Mexico, Michoacan, Morelia, "in sylvis umbrosis," [1837], K. T. Hartweg 394 (holotype, BM (not seen); isotypes, E, G, L).

ARISAEMA QUINATUM. The least well known, most range-restricted species of *Arisaema* in the eastern states is *A. quinatum* (L.) Schott. In Florida it has been found only in the central panhandle; it is disjunct to Georgia and Louisiana. Though reduced to subspecific status by Huttleston (1981) and sometimes casually reduced to synonymy under *A. triphyllum*, its erect, blunt spathe and five-parted leaves are distinctive.

ARISAEMA Mart. Jack-in-the-pulpit, Green-dragon¹

1. Leaves usually solitary, with 8-12 leaflets; terminal portion of spadix filiform, long-extended beyond spathe, flexuous. Perennial herb. Rich woodlands. Summer.

GREEN-DRAGON.

***Arisaema dracontium* (L.) Schott**

- a. Spathe tightly inrolled around spadix, to 1.5 cm. broad when unfurled. Panhandle and north Florida (s. to Hernando Co.); infrequent. [*Muricauda draconitium* (L.) Small]
var. **dracontium**
- a. Spathe flared distally, forming a blade, to 2.5 cm. broad. North and central peninsula (Alachua Co., to Pasco, Orange cos.); frequent. [*Arisaema macrospatum* Benth.]
var. **macrospatum** (Benth.) D. B. Ward
1. Leaves 2 (in mature plants), each with 3 or 5 leaflets; terminal portion of spadix stout, blunt, enclosed within or extending scarcely beyond mouth of spathe.
2. Leaflets usually 5; blade of spathe obtuse to abruptly acute, ascending to erect. Perennial herb. Mesic woodlands. Central panhandle (Walton, Liberty, Leon, Jefferson cos.); rare. Spring-summer. [*Arisaema triphyllum* ssp. *quinatum* (Nutt.) Huttleston] PRESTER JOHN. **Arisaema quinatum** (L.) Schott
2. Leaflets usually 3; blade of spathe long-acute to acuminate, downcurved over mouth of spathe. Perennial herb. Spring-summer.
JACK-IN-THE-PULPIT. **Arisaema triphyllum** L.
- a. Leaflets glaucous beneath; spathes green or purple, the tip long-acute; plant to 0.4 m. tall. Mesic woodlands. Panhandle and north Florida (to Alachua Co.); infrequent. var. **triphyllum**
- a. Leaflets green beneath; spathes uniformly green, the tip acuminate; plant to 1.2 m. tall. Low woodlands. North Florida, south to lower peninsula (Collier Co.); frequent. [*Arisaema acuminatum* Small; *Arisaema pusillum*, misapplied]
var. **acuminatum** (Small) Engl.

¹ This paper is a continuation of a series begun in 1977. The "amplified key" format employed here is designed to present in compact form the basic morphological framework of a conventional dichotomous key, as well as data on habitat, range, and frequency. Amplified keys are being prepared for all genera of the Florida vascular flora; the present series is restricted to genera where a new combination is required or a special situation merits extended discussion.

Donald G. "Dutch" Huttleston (1928-2000) and I were graduate school contemporaries at Cornell University in the early 1950s, sharing the special guidance of our thesis advisor, Robert T. Clausen. I remember with fondness Dutch's quick wit and bottomless poetry repertoire. I only wish -- as must we all -- that his later career had given him incentive to publish the solid research of his two theses (*Arisaema*, 1948; Araceae, 1953). But by inserting his name in the authorship of the new combination published here, I can commemorate his scholarship and his incompleting study.

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