

**KEYS TO THE FLORA OF FLORIDA:
15, *TYPHA* (TYPHACEAE)**

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ABSTRACT

Typha (Typhaceae) is represented in Florida by 3 species and 1 hybrid. *Typha latifolia* and *T. domingensis* are widespread and common. *Typha angustifolia* is very infrequent and is believed to be of recent introduction. *Typha glauca*, the hybrid of *T. latifolia* and *T. angustifolia*, is present but is excluded from the flora in belief that its colonies do not persist. Putative hybrids between *T. latifolia* and *T. domingensis* have been reported but were not observed. An amplified key is given to the Florida taxa.

KEY WORDS: *Typha*, Typhaceae, Florida flora.

The cat-tails (*Typha*, Typhaceae) are among the easiest of plants to identify correctly to genus. To identify *Typha* correctly to *species* is another story.

An excellent, compendious treatment of *Typha* in the Southeast has been prepared by John W. Thieret and James O. Luken (Harvard Papers in Botany 1:27-56. 1996). Highly competent treatments (though they differ in some interesting ways) of the North American species have been presented by Neil Hotchkiss and Herbert L. Dozier (Amer. Midland Nat. 41:237-254. 1949) and by S. Galen Smith (Fl. N. Amer. 22:278-285. 2000). Hotchkiss had the opportunity to collect and study cat-tails to the southernmost limit of their Florida range, and is the source of much original data. Smith, though limited in examination of the more southern populations, had the advantage of greater specimen access and incorporation of recent observations by other authors. His earlier work (Smith, Amer. Midland Nat. 78:257-287. 1967) is the basis

for present understanding of hybrids among the North American species.

It is agreed that in eastern North America there are three species and one common hybrid of *Typha*. The most widespread of these, and formerly the most abundant, is *T. latifolia* L., the Common Cat-tail. Once restricted to eastern provinces and now increasingly far-ranging is *T. angustifolia* L., the Narrowleaf Cat-tail. Mostly limited to coastal areas but frequent in peninsular Florida is *T. domingensis* Pers., the Southern Cat-tail. A fourth entity, *T. glauca* Godron, the hybrid of *T. angustifolia* and *T. latifolia*, is often locally abundant, even dominant, wherever its two parents occur together.

It is this hybrid that causes most taxonomic uncertainty and misidentifications. Within Florida, the hybrid was first observed and collected in 1948 along a tributary of the St. Johns River, Duval County (Hotchkiss 7266 - FLAS). It was found again at the same location in 1963 (Ward 3505 - FLAS) and has been intermittently monitored to the present.

Though hybrids of *Typha domingensis* and *T. latifolia* are known elsewhere (Smith, 1967), and have been reported for Florida (Smith, 2000), they seem wholly unknown by Florida botanists (E. West, R. K. Godfrey, pers. comm., ca. 1965; D. W. Hall, July 2005). Specimens annotated as "most probably" *T. domingensis* - *T. latifolia* hybrids (G. Smith, 1984 - FLAS) were recognized in the field by their collectors either as *T. angustifolia* (Ward 3508 - FLAS) or as *T. glauca* (Hotchkiss 7266, Ward 3505 - FLAS).

The characters used in keying specimens of the three species and their hybrid are, in part, difficult to see in the laboratory and of little utility in the field. The stigmas of fertile flowers may be linear (as in *T. domingensis* and *T. angustifolia*), or lance-ovate, broader than the styles (much broader in *T. latifolia*, less so but clearly widened in *T. glauca*). Care must be taken it is the stigmas that are observed, and not the numerous intermixed clavate-tipped sterile flowers. Observation is further impeded by the innumerable long hairs borne on the pedicels of

both fertile and sterile flowers. The pollen of *T. latifolia*, the grains cohering in tetrads, is unique in North American species, but requires microscopic examination.

A more satisfying, readily observed character is the absence of a gap between the pistillate and staminate spikes of *Typha latifolia*. This trait, confirmed by the clearly broadened stigmas, is usually sufficient for confident identification of the Common Cat-tail.

Typha domingensis and *T. angustifolia* invariably have a prominent gap, usually of more than 1 cm., between the pistillate and the staminate portions of their inflorescence; this trait remains still visible as a length of smooth shaft even after the male flowers have fallen, leaving their rough bases on the upper axis. *Typha glauca* also characteristically shows this pistillate-staminate gap, though it is sometimes quite small, at times no more than a few millimeters in width.

The overall dimensions of the mature pistillate spikes, and particularly their length/width ratios, is of high diagnostic value. *Typha latifolia* pistillate spikes are chubby, above 1.5 cm. in thickness, with a l/w ratio of 4 to 5. *Typha angustifolia* pistillate spikes are strikingly slender, usually less than 1 cm. thick, with a ratio of 20 to 25. *Typha domingensis* and *T. glauca* are intermediate both in thickness and in l/w ratio. Immature inflorescences are more slender, thus deceptively imply a larger ratio than will be present with maturity. Young inflorescences of *T. domingensis* are especially subject to misidentification as *T. angustifolia*, an error that can be avoided by noting the lighter color and usually greater length of *T. domingensis* spikes.

In addition to the differences employed in the accompanying key, the taxa of *Typha* are distinguishable in the field by gross characteristics that do not survive transfer to the herbarium. *Typha domingensis* is a tall plant, regularly above one's head and frequently to 3 m. or more. Its mature pistillate spikes are a rich cinnamon brown, a hue not found in any of the other taxa. *Typha latifolia* is of medium

height as compared with the other species. Its leaves are medium green, and its pistillate spikes are dark "chocolate" to blackish brown. *Typha angustifolia* is by far the smallest, seldom reaching above 1.5 m. Its leaves have a blue-green cast, while its pistillate spikes are dark brown, identical in color with those of *T. latifolia*. *Typha glauca* is intermediate to the characteristics of *T. angustifolia* and *T. latifolia*. Its leaves are dark green, and its pistillate spikes are similar in their dark brown color to that of its parents.

The present distribution of *Typha angustifolia*, throughout North America and into Florida, is not fully understood; nor is its nativity established. Though its distribution has been mapped (Hotchkiss & Dozier, 1949), its range is continuing to expand, as is that of the hybrid, *T. glauca* (Smith, 2000). Recent observation in northern Indiana, across New York state and into Ontario (D.B.W. obs., 2002, 2005), found *T. glauca* to be the common form. Only in northern Ontario (Bruce Peninsula) was *T. latifolia* present in any numbers. The Montezuma Marshes of upstate New York, emphasized by Hotchkiss and Dozier (1949) as holding *T. latifolia*, *T. angustifolia* and their hybrid, now appears to be a uniform stand of *T. glauca*. Other than a brief abstract characterizing *T. angustifolia* as a "foreigner" (R. L. Stuckey & D. P. Salamon, Ohio J. Sci. 87 (abs.):4. 1987) and references to that note, there is no published expression of a likely non-native status of this species. In Florida, though not always seen in former years, *T. angustifolia* is marginally present at its original station in Duval County. *Typha glauca* appears no longer present, and there is little evidence of either taxon's presence elsewhere. Whatever the status of the species to the north, the absence of *Typha angustifolia* from Georgia (Hotchkiss & Dozier, 1949; S. B. Jones & N. C. Coile, Distr. Vasc. Flora of Georgia, 1988) and its disjunct presence in Florida only in a single long-disturbed coastal marsh justifies its treatment here as an introduction.

The observations of this study, though limited, suggest that when *Typha angustifolia* arrives at a site and comes in contact with *T. latifolia*, hybridization quickly follows. The hybrid, *T. glauca*, expands vigorously by vegetative reproduction, out-competing and soon

displacing the native species. With adverse conditions, possibly drought or high water, the plants are adversely impacted (S. G. Smith, Arch. Hydrobiol. 27:129-138. 1987), with the genus perhaps even locally eliminated. But when conditions again become suitable, *T. latifolia* from nearby sources re-enters the site, while *T. glauca* remains absent until fertile *T. angustifolia* can be re-introduced from farther-away sources, forming the hybrid anew, and repeating the cycle.

The name "*Typha angustifolia*" as used in Florida far antedates the 1948 discovery of the species in Duval County. Early misapplication of this name to the native *T. domingensis* has filled the nation's herbaria and older literature (e.g., J. K. Small, Man. S.E. Flora, 1933) with reports of its seemingly widespread distribution. Only with the work of Hotchkiss and Dalziel (1949) was the error noted and corrected.

The word "Typha" is of ancient usage, apparently consistently applying to the genus as presently known. That the name may have come from the Greek, *typhain*, has been suggested. But the ascribed meaning, "to smoke or emit dense smoke," probably suffers from a too-rigid translation. The proposed "allusion either to the use of these plants for maintaining smoky fires or to the smoky-brown color of the fruiting spikes" (Thieret & Luken, 1996) is conjectural and surely incorrect. Perhaps the translation may also be read as "cloud" and is in reference to the pollen itself, released in profuse quantities, sufficient to be gathered and once employed as a food (D. F. Austin, Florida Ethnobotany, 2004). Still more likely is the simple derivation of the Greek, *typhos*, "of marshes."

Though in recent years the name *Typha domingensis* has uniformly been used for the Southern Cat-tail, a shadow has overlain the correctness of its epithet. This cat-tail was first named by C. H. Persoon (Synopsis Plantarum 2:532. 1807), but at an ambiguous rank. In his listing of the plants of the West Indies and their descriptions, Persoon routinely numbered his species. But under *Typha*, after "*latifolia*" which he numbered "1", and before "*media*" which he numbered "2", Persoon inserted his new "*domingensis*" marked only by a marginal asterisk. Since Persoon inserted undoubted varieties in an

identical fashion (though marked with Greek letters), the rank he intended by an asterisk was unclear. The monographer K. Graebner (Das Pflanzenreich IV. 8:14. 1900), though he recognized *T. domingensis* at specific level, indicated that Persoon had treated it as a "subsp." of *T. latifolia*. M. L. Fernald (Rhodora 37:385. 1935) went further, acknowledging Persoon's epithet only as a trinomial, and employed *T. truxillensis* HBK. (1815) for the species. Hotchkiss and Dozier (1949) returned to *T. domingensis*, citing a footnote reference to Persoon's introduction. There, Persoon, stating "speciebus obscuris" are indicated by an "asteriscum" placed alongside, confirms his intention of specific rank.

The accompanying amplified key omits *Typha glauca* in the belief that, if included, its present rarity (or absence) in Florida and its intermediate morphology will cause an unacceptable number of misidentifications. The descriptive comments above are judged less susceptible to error. However, if such a key is desired, Smith (2000) is offered.

I am grateful to my friends Erdman West and Robert K. Godfrey, years ago, regarding their knowledge of cat-tails, to his wife, Suzanne, for her patient help in obtaining the 1963 collections, and to Robert W. Simons for his assistance in recent observations.

TYPHA L. Cat-tails ⁱ

1. Staminate and pistillate parts of spike contiguous, usually wholly concealing axis of spike; pistillate portion of spike dark brown at maturity, 2-3 cm. thick, relatively short and thick (length 5.5-6.0 times width); leaves 8-16 mm. broad, without visible mucilage glands on inside of upper sheath; stigmas of fertile flowers lance-ovate (intermixed with clavate-tipped sterile flowers); pollen grains cohering in 4s. Emergent aquatic perennial herb. Freshwater marshes, stream bottoms, lake shores. Throughout; common, locally forming dense monospecific stands. Spring-summer.

COMMON CAT-TAIL.

***Typha latifolia* L.**

1. Staminate and pistillate portions of spike separated, showing 1-4 cm. of axis of spike; pistillate portion of spike light to dark brown, 1.3-2.2 cm. thick, relatively long and slender (length 6-10 times width); leaves 5-12 mm. broad, with small brownish longitudinally-oriented mucilage glands on inside surface of upper sheath; stigmas of fertile flowers linear (intermixed with clavate-tipped sterile flowers); pollen grains not cohering.

2. Pistillate portion of spike light brown, 15-25 cm. long, 1.5-2.5 cm. thick; leaves 8-12 mm. broad; plants tall, often to 3 m. Emergent aquatic perennial herb. Brackish marshes, less often in freshwater. Throughout peninsula, extending west along panhandle shores (to Gulf County); common in coastal areas, less so inland, absent in western panhandle. Spring-summer. [*Typha angustifolia*, misapplied; *Typha truxillensis* HBK.]
SOUTHERN CAT-TAIL. ***Typha domingensis*** Pers.

2. Pistillate portion of spike dark brown, 8-18 cm. long, 1.2-1.8 cm. thick; leaves 5-10 mm. broad; plants relatively small, rarely above 1.5 m. Emergent aquatic perennial herb. Brackish or freshwater marshes. Northeast coastline (Duval, St Johns counties); rare. Spring. Plants of *T. domingensis* with immature spikes are commonly identified as this. An aggressive invader in northeast and midwestern states where now displacing the native *T. latifolia*, but thus far showing no such behavior in Florida.
NARROWLEAF CAT-TAIL. * ***Typha angustifolia*** L.

Excluded names: ***Typha glauca*** Godron

A hybrid between *T. angustifolia* and *T. latifolia* (Hotchkiss & Dozier, 1949), and known in Florida only from Duval Co. where these species occur together. Plants are essentially sterile and do not appear to form self-sustaining populations.

i. 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. This paper is a continuation of a series begun in the 1970s (*vide* *Phytologia* 35:404-413. 1977). Keys are being prepared for all genera of the Florida vascular flora, but the present "amplified" series is restricted to genera where a new combination is required or a special situation merits extended discussion.