

NOTES ON TRADESCANTIA IV (COMMELINACEAE)

THE DISTINCTION BETWEEN T. virginiana AND T. hirsutiflora

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Abstract: The old question of the distinction between T. virginiana L. and T. hirsutiflora Bush is decided: Bush's taxon is a legitimate species, separated from T. virginiana primarily by the root structure. Previous descriptions of T. hirsutiflora are incorrect.

Whether T. hirsutiflora is a species distinct from T. virginiana is a question that was first raised by Bush (1904) himself: "Probably is the southern representative of T. virginiana." Anderson (1941) considered T. hirsutiflora to be ". . so similar to T. virginiana that it might be considered a geographically localized variety of that species." Fernald (1944) expressed a similar opinion: ". . may be only a southern representative of a variable species."

That the question remained unanswered for so long is at least partly due to the almost complete cessation of work on the genus after the publication of the monograph by Anderson and Woodson (1935) and partly because of the ambiguous descriptions and errors in that work. But, in addition, Small (1897, 1903, 1933) throughout his publications on the southeastern flora, ignored the species entirely. Radford, Ahles & Bell (1968) did not find the species in the Carolinas. Thus the two major texts on the southeastern flora fail to mention one of the most common species of the area. The result has been that three generations of southern botanists have been rather consistently identifying T. hirsutiflora as either T. virginiana or T. hirsuticaulis Small.

As I was preparing a study of the Louisiana Tradescantia it became necessary to either separate or combine these two species, both having been reported from the state. After examining all the specimens of the genus in the five major herbaria of the state and in our own collection, with examples of T. virginiana from Vanderbilt and Ohio State, it was clear that the southern specimens, i.e., those found south of the northern borders of Mississippi, Alabama and Georgia, presumably T. hirsutiflora, differed significantly from those found north of that line, presumably T. virginiana.

It was also evident that the descriptions of T. hirsutiflora in the Anderson & Woodson (1935) monograph and in the few manuals which included the species certainly did not fit the southern specimens which had been called by that name. In fact, there was

no southern species which they did fit. Was Bush's T. hirsutiflora simply another of the supposed Texas endemics and the widespread southern species another taxon entirely?

Anderson & Woodson's (1935) description of T. hirsutiflora and T. virginiana differ so little that it would be quite impossible to separate them except for one significant point: T. hirsutiflora is said to have ". . . eglandular or mixed glandular and eglandular pubescence" in the inflorescence while T. virginiana is always eglandular. The authors do not stress this difference but instead emphasize the "turgid" calyces of T. virginiana. The term "turgid" has no specific taxonomic meaning, to my knowledge, and must be taken in its usual sense of "swollen, bloated, or inflated from within." In this sense it will apply to many species of Tradescantia, certainly to T. hirsutiflora. The existence of glandular pubescence, however, is one of the most important diagnostics within the genus.

Anderson & Woodson (1935) included a photograph (Fig. 7 of Plate VI) of the calycine pubescence of T. hirsutiflora which certainly shows glandular trichomes. But it was totally unlike any specimen of T. hirsutiflora, collected from central Texas to Florida which I had examined. Not one, of over 300 specimens showed any glandular pubescence whatever.

Leaving this matter for later discussion, T. virginiana is described as usually glabrous, sometimes pubescent, between the lower sheaths and the inflorescence while T. hirsutiflora is usually pubescent in these areas, but sometimes glabrous. As a description of a statistical distribution, this is correct, but it provides no criterion for the identification of any individual specimen. Pubescence of the stems, leaves and bracts was recorded for each specimen in one of the categories: glabrous, ciliate, lightly pubescent, moderately pubescent and densely pubescent. These observations were converted into numerical values, ranging from zero for glabrous to four for densely pubescent and an "index" of pubescence was obtained by summing the three numerical values for the stems, leaves and bracts. The numbers themselves are simply names of categories and have no quantitative significance.

The normalized distribution of the pubescence index is given in Table 1. While the southern specimens are obviously more hirsute than those from northern states the overlap is so great that it tells nothing about an individual specimen.

The root size was tabulated for all specimens which had them, a gratifying number for recent collections, not for older. The roots of these two species are nearly uniform throughout their

length and can be classified even when only fragments are collected. Diameters, when measured, were taken at a point about 3 cm from the crown; most determinations were made from observations, the difference being readily apparent as is evident in Figure 1. The categories chosen; very large, large, medium, medium small, small and very small are, of course, in terms of *Tradescantia* roots. Thus "very large" represents those of *T. reverchonii* Bush which may be 1 cm in diameter, while "very small" corresponds to most of the *T. hirsutiflora* specimens with roots 1 mm or less in diameter.

The root-size distribution (Table 2) was very different from that of the pubescence index. There was a minimum of overlap. Moreover, the populations were geographically distinct. The small rooted plants were found up to about the northern boundaries of Alabama and Georgia; the large rooted ones north of that line. There were no intermediates, no zone of transition and no indication of clinal variation.

The descriptions in Anderson & Woodson (1935) do not fit the southern specimens:

T. virginiana: ". . roots relatively slender, only slightly fleshy."

T. hirsutiflora: ". . roots . . . relatively fleshy."

Thus the southern plants, heretofore thought to be *T. hirsutiflora*, are distinct from the northern *T. virginiana* by the root diagnostic but they are still not the species as described by Anderson & Woodson.

To resolve the matter I examined the types of *T. hirsutiflora* and *T. australis* Bush (considered to be synonymous by Anderson & Woodson) and the specimen used by these authors as an illustration of the calycine pubescence of *T. hirsutiflora*.

Bush's types (*T. hirsutiflora*, Reverchon 2480 (2 sheets), Van Zandt Co., Texas, April 10, 1901; *T. australis*, Reverchon 4052, Angelina Co., Texas, May 7, 1903; (MO!)) are typical of *T. hirsutiflora* throughout the south. They have many small roots and eglandular pubescence. The specimens exhibited two of the morphological patterns common to the species. Reverchon 4052 was slender, 2.5 dm tall, unbranched. Reverchon 2480 was pseudo-acauliscent, rather coarse, 1.2 dm tall, with strongly arcuate leaves which exceeded the inflorescence. Reverchon had identified 2480 as that catch-all for pseudo-acauliscent specimens: *T. brevicaulis* Raf. Bush's types were identical with the southern species known as *T. hirsutiflora* but they did not conform to the Anderson & Woodson (1935) description.

The plant photographed to illustrate *T. hirsutiflora* pubescence (Stevens 1381, LeFlore Co., Oklahoma, April 20, 1913 (MO!)) was a

puzzle. Why was it selected? The authors cite 23 other specimens from the normal range of T. hirsutiflora in their own herbarium (MO). Yet they present, as typical, a plant from the very boundary of the range as they understood it. Even so, the plant is totally unsuitable for the purpose since it consists only of the upper node and inflorescence and cannot be identified with any certainty as any particular species, certainly not as T. hirsutiflora.

The pubescence of this specimen appears to be eglandular but under high power, using transmitted light, some trichomes of the capitate type can be seen. Figure 1 of Plate VI in Anderson & Woodson (1935) is labeled T. bracteata and bears a strong resemblance to Stevens 1381. Comparison with other specimens of T. bracteata, using transmitted light and high powers confirms this resemblance and Stevens 1381 is probably that species. Anderson & Woodson confined T. bracteata to a range north of the Oklahoma-Kansas border but it is reported by Barkley (1977) from Sequoyah Co., Okla. and I have examined specimens from TAES and DUR from McCurtain Co., Okla.

I have collected specimens from central Texas which, based on the capitate trichomes and orange roots, would be classified as T. bracteata. In other respects they so closely resemble T. hirsutiflora that they have undoubtedly been identified as that species. Anderson (1941) observed that "... the extreme plants of type B [of T. bracteata] are morphologically very similar to Tradescantia hirsutiflora of the Gulf Coast, a species which is today completely unknown within the range of T. bracteata." Mohlenbrock (1970) in describing T. virginiana, said "This and the following species [T. bracteata] are very similar, differing mainly in the presence or absence of glandular hairs on the pedicels and sepals." While Mohlenbrock did not include T. hirsutiflora in the flora of Illinois, there is every possibility that it is to be found in the southernmost counties which are part of the Coastal Plain.

It may well be that T. virginiana, T. hirsutiflora and T. bracteata form a "virginiana" complex but until a satisfactory revision of the genus is made no conclusion is possible.

There may be still another reason for the confusion in the description of T. hirsutiflora. The trichomes of T. hirsutiflora are essentially identical to those of T. virginiana as illustrated by Fig. 5 of Plate VI in Anderson & Woodson (1935). They arise from a pustular base, are uniseriate, the cells separated by visible septa, and taper to a point. Not uncommonly cytoplasm will exude at the septa and accumulate in a ovoid drop surrounding the septum. If the hair is broken at a septum, as frequently happens, the drop and stump residue may appear to be a glandular trichome.

The various descriptions of *T. hirsutiflora* and *T. australis* by Bush (1904) are fairly accurate but do not mention the root structure. The description by Anderson & Woodson (1935) is misleading. A more accurate and complete description is:

Tradescantia hirsutiflora Bush, in Trans. Acad. Sci. St. Louis 14:181-193, 1904.

T. australis Bush, op. cit.

T. eglandulosa Bush, op. cit.

Type: Reverchon 2480 (2 sheets), Van Zandt Co., Texas, April 10 1901 (MO).

Plants highly variable in form, from .7 to 6.0 dm tall, slender to sturdy, frequently cespitose, sometimes acaulescent or nearly so, arising from a cluster of many small to very small (c. 1 mm) roots. Leaves firm, linear lanceolate, .6 to 2.0 cm broad, up to 30 cm long. Bracts much as leaves, but shorter. Sheaths long ciliate to densely pubescent, pubescence of stems, leaves and bracts highly variable, from glabrous to densely hirsute. Pedicels and sepals almost invariably pubescent, usually moderate to dense. Cymes umbellate, few to many flowered, the petals large, up to 3 cm long, quickly ephemeral, blue, rose or white. Pubescence eglandular throughout, the trichomes uniseriate, arising from a pustular base, tapered to an acute tip, the cells separated by visible septa. Chromosome number, $n = 6, 12$.

Waste land, roadsides, woods margins in various soils, sometimes in moderate shade but usually in full sun. Common and conspicuous throughout the southern United States from central Texas east to Florida, north at least to Tennessee and central Arkansas. Extremes of range unknown due to confusion with other species such as *T. virginiana* and *T. hirsuticaulis* in the east and *T. bracteata*, *T. tharpaii* Anderson & Woodson and *T. reverchonii* in the west.

T. hirsutiflora differs from *T. virginiana* in the small, numerous roots, generally heavier pubescence and geographical distribution. Since it has been established as a species for 75 years there appears to be no reason to change that status.

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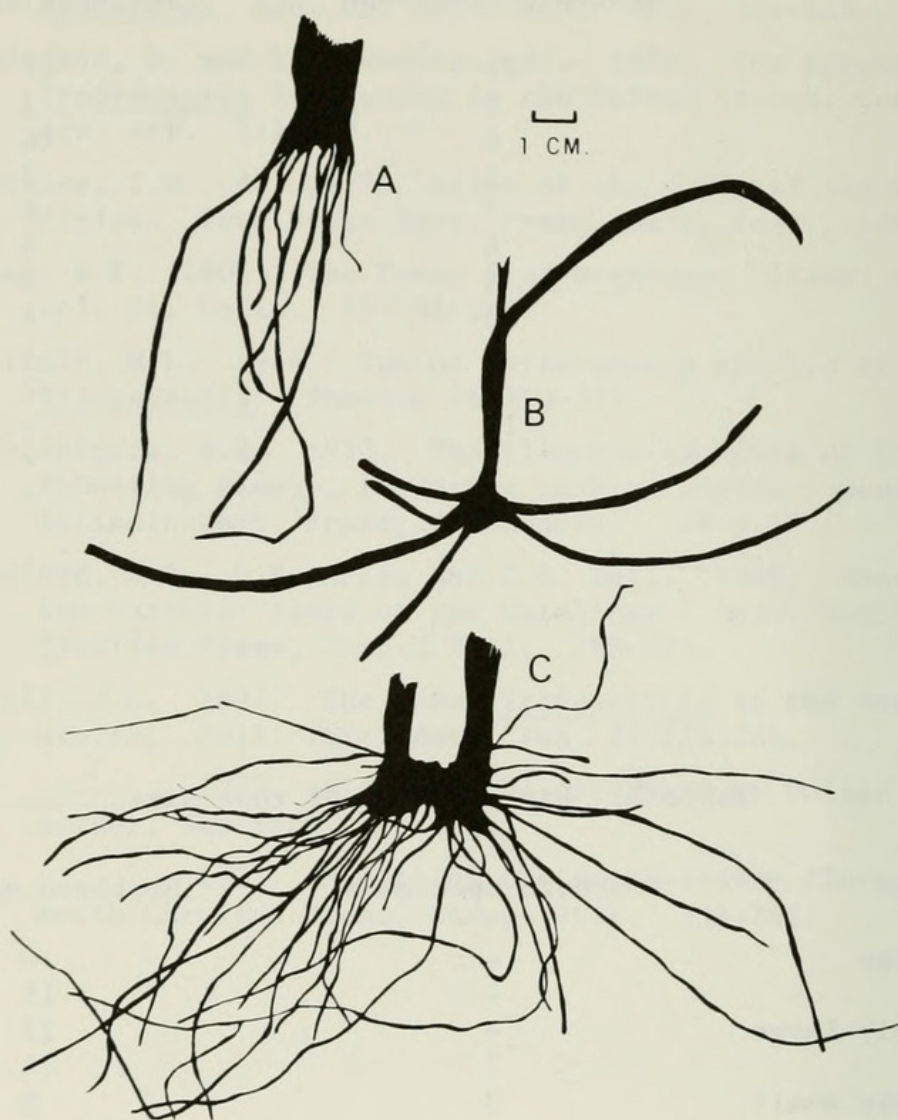
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Table 1: Distribution of pubescence index

Index	Southern specimens	Northern specimens
0	26	47
1	5	3
2	6	16
3	5	2
4	3	8
5	6	4
6	8	8
7	10	4
8	6	1
9	7	7
10	12	-
11	1	-
12	5	-

Table 2: Distribution of root size

Root size	Southern specimens	Northern specimens
Very large	-	-
Large	-	15
Moderately large	-	27
Medium	2	44
Moderately small	3	8
Small	31	6
Very small	64	-



Root structures. A, *T. hirsutiflora* (type).
B. *T. virginiana* (Ohio)
C. *T. hirsutiflora* (Louisiana)



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