FIELD & LABORATORY

Volume XXIV January, 1956 Number 1

A New Species of Tradescantia (Commelinaceae) from South Texas

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This taxon first came to the attention of the author as the result of a collection of two plants from the Edwards Plateau by C. M. Rowell. Both of these plants died shortly after being transplanted, due to the long exposure they had received, but not before a few morphological notes had been taken. Later, in the spring of 1950, I encountered a small population in the Edwards Plateau of Texas between Burnet and Llano, along the roadside of State Highway 29 near Buchanan Dam. This was approximately fifty miles from the locality of the collection made by Rowell. The population consisted of 25 to 30 quite distinct plants, and on the same general site there was a much larger population of *Tradescantia gigantea* Rose. Although both taxa were flowering prolifically there were no plants found that indicated hybridization between the two.

There appears to be little doubt that this taxon is the same material that was referred to by Anderson & Woodson (1935) as a putative hybrid between *T. humilis* and *T. occidentalis*. Both of these species are diploids in South Texas with 12 somatic chromosomes. However, in our material, plants with eglandular hairs on the sepals have not been found. It was mentioned by Anderson & Woodson that this taxon "appears difficult of solution," and they point out that B. C. Tharp feels that it seems to constitute a recognizable element of the flora, and that Anderson is inclined to agree on the basis of breeding and cytological data. However, Woodson feels that it is definitely intermediate between the two supposed parents.

It seems obvious from these statements that more experimental data were needed before the problem could be solved, and this report is the result of such a study.

In order to study the chromosome behavior of this taxon

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and also to test its genetic stability, ten plants were removed from their Buchanan Dam site and transferred to the Genetics Department greenhouse at the A. & M. College of Texas.

These plants were examined cytologically and found to have 12 somatic chromosomes. One plant had, in addition to the 12 chromosomes, a small chromosome fragment. At metaphase I, there were mostly six bivalents and completely regular divisions. However, there were occasional irregularities such as bridges, lagging chromosomes, etc. Pollen fertility was approximately similar to other diploid species — ranging from 85% to 95% stainable in aceto-carmine.

Therefore the cytological information suggests that this taxon is either a distinct species; or if it is a species hybrid, then segregation would be expected to be rather complete since there is little non-homology of the chromosomes, and appears to be approximately normal.

Crosses were made between the various individuals of this collection. They were highly fertile, an abundant seed crop was made, and germination was good. A segregating population of 93 plants, involving three crosses, were grown to maturity. The ten plants taken from the parent population were numbered 1–10, and the cross so designated. The segregating population consisted of 50 plants from the cross 2 x 1 and 10 from the reciprocal 1 x 2, 25 plants from the cross 3 x 2, and eight plants from the cross 3 x 4.

All of these plants were morphologically rather similar although there was segregation in flower color, amount and type of pubescence, size of leaves, etc.; and, in general, they displayed the same segregation pattern as seen in the parent population. Herbarium specimens were made from a random selection of 36 plants and the following description was derived from a detailed study of these specimens.

Tradescantia pedicellata sp. nov.[2]

Roots large and fleshy, usually interspersed with short tuberoid and longer, more slender roots in varying amounts; stems more or less diffuse and spreading, much branched, mostly from base, densely covered with short to long glandular or eglandular hairs or both types interspersed; nodes 2-5; internodes 3-10 cm. long; leaves membranaceous, dark

[2]Latin diagnosis written by L. H. Shinners.

green to light yellowish green, veins quite pronounced in lighter colored individuals, linear lanceolate, mostly from 20-30 cm. long, 0.5-1.0 cm. broad, recurved and somewhat lax, sparsely to densely covered with short-long hairs, either glandular, eglandular, or both, and mostly restricted to lower surface and margins; cymes umbellate, few–many flowered, terminal and usually accompanied by lateral pedunculate inflorescences; bracts foliaceous, somewhat recurved and lax as in the leaves, one of the pair usually much longer than the other, 4-15 cm. long, 0.3-0.6 cm. broad, sparsely to densely covered with glandular or eglandular hairs or, more frequently, the two types interspersed; pedicels very long and slender, 2.5-4.5 cm. long, densely pubescent with medium to long glandular hairs; sepals broadly elliptic, acute to acuminate, 0.6-1.1 cm. long, densely and uniformly covered with medium to long glandular hairs, not inflated; petals broadly ovate, pink to dark blue; filaments abundantly pilose, connective broadly trapezoid; ovary ovoid, terminal 1/3 of ovary with scattered glandular hairs, terminating with a dense tuft at base of style; seeds compressed-oblongoid, 0.2-0.4 cm. long, the funicular scar linear, about as long as the seed.[3]

The type was selected from one of the parents, No. 1, rocky outcrops along Highway 29, in Edwards Plateau, between Llano and Burnet, near Buchanan Dam, Burnet Co., Texas (*Celarier 501* in OKLA[4]). Paratypes were taken from the segregating population and are deposited in SMU, TEX, TAES, MO, NA, UC, GH, K, and PRE.

This species is readily distinguished from the other Texas Tradescantias by the following key:

A. Roots long and slender, not tuberoid.....Other species
A. Roots tuberoid
  1. Stems minutely pubescent or glabrous.....*T. humilis*
  1. Stems densely pubescent
    2. Pedicels and sepals with glandular and eglandular hairs interspersed; pedicels 2-3 cm. long.....*T. subacaulis*
    2. Pedicels and sepals densely covered with long glandular hairs; pedicels 2.5-4.5 cm. long.....*T. pedicellata*

[3]Radices crassae carnosae aliae tuberosae aliae tenues. Caules ramosi dense pilosi pilis glandulosis eglandulosis binisve. Folia membranacea laminis lineari-lanceolatis 20-30 cm. longis 0.5-1.0 cm. latis recurvatis pilosis. Pedicelli 2.5-4.5 cm. longi dense glanduloso-pilosi. Sepala 0.6--1.1 cm. longa lata-elliptica acuta vel acuminata dense glanduloso-pilosa. Petala lato-ovata.

[4]The symbol used here and for other herbaria are the international symbols proposed by Lanjouw and Stafleu (1952).

Thirty-five plants in this segregating population have been studied cytologically and the following types were found:

(1) Meiosis essentially regular with six bivalents at metaphase I and 6:6 distribution of the chromosomes to the daughter cells. Twenty-four plants were of this type and four others were similar, except that they had in addition a small chromosome fragment. One of these plants has been analyzed in detail and the results presented elsewhere (Celarier, 1955). Thus 28 of 35 plants are cytologically similar to the parents.

(2) Complete desynapsis. In one of the crosses (2 x 1) desynaptic plants were found (Celarier, 1955). Since this original report, another desynaptic plant has been found giving a total of four in 32 or a ratio of one to eight. No desynaptic plants have been recovered in the other crosses. This seems clearly to be a case of simple genetic control and is not considered as any indication of non-homology.

(3) Occasional quadrivalent. One plant was found with a high frequency of cells having one quadrivalent. This is probably due to a translocation and is commonly found in many species.

(4) Irregular meiosis. Two plants were found with very irregular meiotic behavior. Univalents (2-4) were usually found at metaphase I and a high percentage of the dyads and tetrads had micronuclei.

From this cytological survey only two plants were found whose chromosome behavior was sufficiently irregular as to suggest species hybridization.

That this taxon may have originated from a cross of *T. occidentalis* and *T. humilis* is not disputed. However, it does not seem compatible with the data to assume that it is an F_1 hybrid. Although most of the morphological characteristics may conceivably be viewed as the result of this hybrid, it also has certain characteristics of other species. Thus the stem- and leaf pubescence, being either glandular, eglandular or both types interspersed, is similar to that found in *T. subaspera* and *T. hirsutiflora* and the yellow green coloration that is often found in the leaves is very much like *T. bracteata*. It also has some characters that are definitely its own, such as the extreme length of the pedicel

and the dense coverage of the pedicel and sepals with long glandular hairs.

It appears that, regardless of what its origin may have been, natural selection has been actively operating on it for some time so that it is now a rather stable element of the flora and isolated from the other species, at least as well as they are isolated from one another.

The following facts will summarize the reasons for giving this taxon specific status:

(1) Morphological uniformity in the field and in progeny tests of controlled hybrids.

(2) High percentage of the population sufficiently regular cytologically so that it causes no great loss in fertility.

(3) Segregating population has no plants that demonstrate metabolic unbalance in growth rates. In several small F_2 populations produced by the author from artificial species hybrids, none has been found that did not have some plants with unbalanced growth rates.

(4) This taxon is a significant enough element in the Texas flora to require a name. It seems, in every way, to behave more like the other described species of the genus than known diploid species hybrids.

LITERATURE CITED

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POSTSCRIPTUM

Since this report was sent to press the author has had the opportunity to study, in some detail, the materials from the University of Texas herbarium. These were the same materials that were studied by Anderson and Woodson (1935) as the putative hybrid of *T. humilis* x *T. occidentalis*. There is no longer any doubt in the author's mind that this is the same taxon that is here described as *T. pedicellata*. The only apparent inconsistency is the occasional eglandular hairs on the sepals and pedicels of the TEX entries. On close examination these eglandular hairs appear to the author to be instances in which the glandular tip has been broken off.

According to the specimens at the University of Texas, it appears that this taxon was first collected in 1916 at Marble Falls, Burnet County, and that numerous later collections were made at, or near, Enchanted Rock, Llano County. Dr. B. C. Tharp made most of these collections and recognized their distinctness as early as 1931 when he wrote a typewritten description of it. This description has been maintained in the herbarium folder since that time.

At present this species is known only from Burnet and Llano counties but appears to be widely distributed in these counties.