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Chromosome Complements in *Desmanthus* (Leguminosae)

B. L. Turner & J. H. Beaman

Desmanthus, a genus of the subfamily Mimosoideae of the Leguminosae, is represented in the United States by ten species, one of which has two varieties. Nine species are found in Texas (Turner, 1950b). The genus has its greatest concentration in Mexico where sixteen species occur (Turner, 1950a). In the present paper chromosome studies on *Desmanthus acuminatus*, *D. brevipes*, *D. leptolobus*, *D. velutinus* and *D. virgatus* var. *depressus* are reported. These five species occur in Texas.

The counts were made from root tips which were killed in Belling's modified Navashin fluid, embedded in paraffin, and stained with crystal violet. Root tips were cut from the primary root of germinating seedlings when 4-8 mm. in length. Attempts to obtain satisfactory acetocarmine root-tip squashes were unsuccessful.

The $2n$ number was found to be 28 in all the species examined. In addition tetraploid cells with $2n = 56$ were observed in the cortical regions of the root tip of each species. Tetraploid cells were never found in the region of the root tip where the cortical tissue was undifferentiated (i.e., near or in the promeristem).

Below is listed the source of material, and corresponding $2n$ chromosome numbers of the species examined.¹ Numbers

SPECIES	SOURCE	$2n$
<i>D. acuminatus</i> Benth.	TEXAS. Caldwell Co.: Square in Luling. Aug. 26, 1951. Turner	28 (56)
<i>D. brevipes</i> Turner	TEXAS. Galveston Co.: Bay front, 0.5 miles north Texas City. July 15, 1951. Turner 2898	28 (56)
<i>D. leptolobus</i> T.&G.	TEXAS. Dallas Co.: Dallas, S.M.U. Campus. Nov. 22, 1951. L. H. Shinnars	28 (56)
<i>D. velutinus</i> Scheele	TEXAS. Kerr Co.: Mountain Home. Aug. 26, 1951. Turner	28 (56)
<i>D. virgatus</i> var. <i>depressus</i> (H.&B.) Turner	TEXAS. Galveston Co.: Texas City. Aug. 24, 1951. Turner D5	28 (56)

¹Voucher specimens have been deposited in the Southern Methodist University Herbarium, Dallas, Texas, except in those collections not assigned a collection number.

in parentheses indicate the presence of tetraploid cells.

Somatic polyploidy has been reported for the Mimosoideae by other workers: Ghimpu (1929); Tjio (1948); Berger & Witkus (1950). Tetraploid cells may be found with ease among the large cells of the cortex, though they are fewer in number than the diploid cells of the same region. Indeed, Berger & Witkus reported a maximum number of 200 tetraploid metaphase plates in a root tip from *Albizzia julibrissin* (Mimosoideae).

The chromosome number for this genus has not been reported previously. The number $2n = 28$ has been reported once before in the tribe Eumimoseae of which *Desmanthus*



FIGURES. Camera Lucida Drawings of the Somatic Chromosomes in *Desmanthus*. 1. *D. acuminatus*. 1a. Tetraploid metaphase plate from same root tip as (1). 2. *D. brevipes*. 3. *D. leptolobus*. 4. *D. velutinus*. 5. *D. virgatus* var. *depressus*. ($\times 3400$.)

is a member. This number was found by Covas & Schnack (1946) in *Mimosa ephedroides*. The base number for the genus *Mimosa* (based on *M. pudica*)² has been listed by Darlington and Janaki-Ammal (1945) as $x = 12$, but Covas & Schnack (1947) have reported *M. bimucronata* with $2n = 26$, and Tjio has reported *M. biuncifera* with $2n = 52$, and *M. invisiva* with $2n = 26$.

Besides *Desmanthus* and *Mimosa* the tribe Eumimoseae contains two additional genera, *Leucaena* and *Schrankia*. Atchison (1949) reports $2n = 16$ for *Schrankia angustata*. Turner (unpubl.) has found the number $2n = 24$ in *S. occidentalis*. From these the base chromosome number of $x = 8$ may be inferred. Tjio has reported *Leucaena glauca* with $2n = 104$.

²The count was first reported by Kawakami (1930). Witkus & Berger (1947) likewise reported $2n = 48$. Tjio (1948) reported $2n = 52$ for this species.

In summary the following counts have been reported for the genera composing the Eumimosae:

<i>Desmanthus</i>	$2n = 28$	(5 species)
<i>Leucaena</i>	$2n = 104$	(1 species)
<i>Mimosa</i>	$2n = 26, 28, 52$ (48?)	(5 species)
<i>Schrankia</i>	$2n = 16, 24$	(2 species)

Except for *Desmanthus* and the one species of *Mimosa* the number $2n = 28$ has been found in the Mimosoideae only in the tribe Adenanthereae which is separated from the Eumimoseae on the basis of a single technical character. The Adenanthereae have a small stipitate gland on the anthers. This gland is lacking in the Eumimoseae. Species of the following genera of the tribe Adenanthereae have been counted:

<i>Prosopis</i> ³	(8 species)	$2n = 28, 56$	(Castronova, 1945; Covas & Schnack, 1947; Schnack & Covas, 1947; Atchison, 1951)
<i>Dichrostachys</i>	(1 species)	$2n = 28$	(Atchison, 1951)
<i>Neptunia</i>	(2 species, 1 variety)	$2n = 28$	(Turner & Beaman, unpubl.)

Desmanthus, morphologically, is close to *Dichrostachys*, though the two are conventionally placed in different tribes. Many of the species now assigned to *Dichrostachys* were originally described as members of *Desmanthus* (De Candolle, 1825). *Dichrostachys* has a center of distribution in southern Africa and the neighboring island of Madagascar. Taubert in Engler & Prantl (1894) lists one species of *Desmanthus* as occurring in Madagascar. It is apparently a species of *Dichrostachys* which lacks the gland on its anthers.

It seems possible that the closest relationship of *Desmanthus* is with *Dichrostachys* and genera within the Adenanthereae rather than to members of the Eumimoseae. The authors believe that the chromosome number, $2n = 28$, for five species of *Desmanthus* lends support to this view, though it is realized that the evidence is inconclusive. Additional counts in the large genus *Mimosa* will do much to clarify the problem.

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³Ramanathan (1950) has listed $2n = 26$ for *P. glandulosa* (included in *P. chilensis* (Mol.) Stuntz emend., Burkart, 1940), but Covas & Schnack found *P. chilensis* to have $2n = 28$.

SUMMARY

Chromosome counts of $2n = 28$ for five species of *Desmanthus* are reported; *D. acuminatus*, *D. brevipes*, *D. leptolobus*, *D. velutinus* and *D. virgatus* var. *depressus*. Tetraploid cells with $2n = 56$ were also observed in the root tip of each of these species. In addition, $2n = 24$ has been reported for *Schrankia occidentalis* and $2n = 28$ for two species and a variety of *Neptunia*. The counts in *Desmanthus* and *Neptunia* are first reports for the genera. From the evidence offered by chromosome numbers it is suggested that the closest relationship of *Desmanthus* is not with genera included in the tribe Eumimoseae, but with members of the tribe Adenanthereae.

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