

two Central American specimens³ in the American Museum of Natural History, one was collected at Limon, Costa Rica (X-5-15), and the other at Belzie, British Honduras (VII-06), indicating that in its southern range *Calpodes evansi* is double brooded. Even though no specimens have been collected in Mexico, I am certain that this species occurs all along the Gulf coast from Reynosa east and south to Panama. In this area, very little collecting has been done, as is shown by the "spotty" reports from Mexico and Central America.

When I placed my types in the American Museum of Natural History, Mr. Cyril F. dos Passos of Mendham, New Jersey, made photographs of them, and kindly sent me copies of the upper and lower surfaces of each. The specimen figured ($\times 2$) shows the upper and lower surfaces of the *Holotype* male, which was collected at Pharr, Texas (X-21-44), by the present writer.

³Freeman, H. A. Notes on some tropical American skippers. *Field & Laboratory*, Vol. XVII, No. 3, June, 1949. p. 80.

The Texas Species of *Thelesperma* (Compositae)¹

Lloyd H. Shinnars²

Seven genera of *Compositae-Heliantheae-Coreopsidinae* as delimited by Hoffman (1894) are found in Texas. The first of these, *Calyptocarpus* (see Blake, 1930, for orthography), differs from the others in having a simple involucre; it contains the single species *C. vialis* Less., a trailing weed of the Rio Grande Plain, extending west and north to Val Verde, Kerr, and Bell counties, and eastward near the coast to Jefferson County. The remaining genera have a double involucre, the inner phyllaries more or less united at base and with distinct subscarious margins, anomalous in the tribe *Heliantheae*. *Coreopsis*, *Bidens*, and *Cosmos* have recently been reviewed by Sherff (in 1936, 1937, and 1932, respectively); *Dahlia* is found only in cultivation; and *Heterosperma* is represented by the single species *H. pinna-*

¹Grateful acknowledgment is made to Dr. J. F. Davidson, Curator of the Herbarium, University of Nebraska, for the loan of *Thelesperma* collections; and to the Lloyd Library, Cincinnati, for photostats of the original descriptions and plates of *Coreopsis filifolia* and *C. trifida*. When not otherwise indicated, cited specimens are in the Herbarium of Southern Methodist University, and distributional notes are based on the collections deposited there (139 sheets at the time of writing).

²Director of the University Herbarium, and Assistant Professor of Biology, Southern Methodist University.

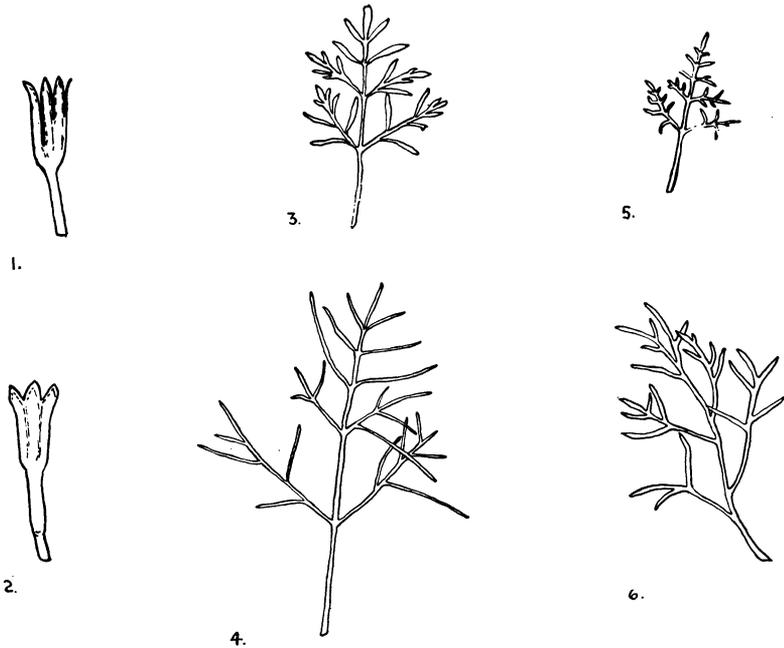
tum Cav. in the Trans-Pecos. *Thelesperma* has been the subject of partial synopses and extended notes (Gray, 1884; Rydberg, 1900; Blake, 1928), but has never been revised. The genus reaches its greatest development in Texas and northern Mexico; seven of the thirteen known species are included in the following synopsis. The remaining six are listed at the end for the convenience of those interested.

KEY TO TEXAS SPECIES OF THELESPERMA

- 1a. Longer (outer) lobes of disk corollas much longer than the limb (fig. 1)
 - 2a. Outer phyllaries 3.5-7.0 mm. long, about $\frac{1}{3}$ - $\frac{3}{4}$ as long as the inner; plants annual or winter annual from a taproot
 - 3a. Rays yellow, sometimes with a red-brown spot at base; involucre glabrous
 - 4a. Lower leaves with numerous, relatively short, lanceolate divisions (fig. 3); plants of the interior
 - 5a. Disk corollas yellow or yellow-brown. 1a. *T. intermedium*
 - 5b. Disk corollas red-brown. 1b. *T. intermedium* var. *rubrodiscum*
 - 4b. Lower leaves with few, elongate, narrowly linear divisions (fig. 4); plants of lower Gulf Coast counties. 2. *T. filifolium*
 - 3b. Rays red-brown, sometimes yellow at tip; involucre usually scabrous-pubescent, occasionally glabrous. 3. *T. Burridgeanum*
 - 2b. Outer phyllaries 1-2 mm. long, $\frac{1}{2}$ or less as long as the inner; plants perennial from a vertical or oblique simple or forking root stock, the nodes marked by vestigial branchlets or leaf bases
 - 6a. Disk corollas red-brown; divisions of basal and lower stem leaves less than 0.5 mm. wide (fig. 5); plants of Frio Co., Rio Grande Plain. 4. *T. fraternum*
 - 6b. Disk corollas dark yellow or yellow-brown; divisions of basal and lower stem leaves more than 5 mm. wide (fig. 6); plants of Trans-Pecos, Edwards Plateau, and northward
 - 7a. Rays absent. 5a. *T. megapotamicum*
 - 7b. Rays present. 5b. *T. megapotamicum* var. *ambiguum*
- 1b. Longer (outer) lobes of disk corollas about as long as the limb or shorter (fig. 2)
 - 8a. Rays present; stem leaves few and distributed well up the stem. 6. *T. simplicifolium*
 - 8b. Rays absent; leaves numerous and crowded in the basal half of the stem. 7. *T. longipes*

1a. *T. INTERMEDIUM* Rydb., Bull. Torr. Bot. Club 27: 631-632. 1900. TYPE: Banner Co., Nebraska, *Rydberg 192*, in 1890 (evident isotypes in Herb. University of Nebraska examined, lacking collector's number, and with month August added). *T. formosum* Greene, Pittonia 5: 56. 1902. TYPE: "Heller's n. 3747 from near Santa Fe, New Mexico, June, 1897" (isotype in Herb. University of Nebraska examined: A. A. & E. Gertrude Heller, 3747, between Santa Fe and Canoncito; the same collection was cited by Rydberg

in the original description of *T. intermedium*). *T. trifidum* of authors in large part, not *Coreopsis trifida* Poir. (see excluded species at end). A weedy annual or winter annual of gravelly or sandy soils, commonest in the Panhandle, extending south and southeast on the Edwards Plateau to Reagan and Burnet counties. Found also in Oklahoma, Kansas, Nebraska, Wyoming, Colorado, and New Mexico. Some specimens from Nebraska and Colorado have a stout taproot, several stems, and abundant remains of dead basal leaves. The last I suspect are merely the residue of a winter rosette on a robust plant which is at most winter annual. Rydberg considered the plant biennial or perennial.



THELESERMA. Fig. 1. *T. intermedium*, disk corolla. Fig. 2. *T. simplicifolium*, disk corolla. Fig. 3. *T. intermedium* var. *rubrodiscum*, basal leaf blade. Fig. 6. *T. megapoticum*, basal leaf blade. (Middle or upper stem leaves of all species have blades similar to fig. 4 but with fewer divisions.)

1b. *T. INTERMEDIUM* var. *rubrodiscum* Shinnery, var. nov. A specie differt corollis disci atro-rubris, phyllariis exterioribus paulum longioribus. TYPE: 3 miles south of Georgetown, Williamson Co., Texas, *Shinnery 7438*, April 22, 1945 (in Herb. Southern Methodist University); "clay loam, roadside, very common; rays yellow, disk red-brown." This

has generally been known as *T. trifidum*, but is not the same as *Coreopsis trifida* Poir. (see excluded species at end). An abundant weed of roadsides, old fields, and vacant lots, Black- and Grand Prairies from the Red River southward, and westward on the Edwards Plateau to Scurry, Tom Green, and Uvalde counties. *Lindheimer exs.* 264, from "prairies west of the Brazos" [probably in Austin Co.], May-June, 1844, apparently belongs to this variety, and represents an extension of range southeastward, presumably on one of the belts of calcareous soil which make up a minor portion of the Texas Gulf Coastal Plain. The specimen at hand is in poor condition, past flowering and with mostly broken or disintegrating heads. *Thelesperma intermedium* var. *rubrodiscum* differs from the species not only in the handsomely contrasting darkly colored disk corollas, but also in the consistently longer outer phyllaries, sometimes as much as $\frac{3}{4}$ as long as the inner, instead of a third to half as long or rarely slightly more.

2. *T. FILIFOLIUM* (Hook) Gray, "Kew Jour. Bot. i. 252," 1849 (*fidè* Gray, 1884; reference not seen). *Coreopsis filifolia* Hook., Curtis's Bot. Mag. t. 3505. 1836. "Its seeds were sent by Mr. Drummond to this country from Texas, in the spring of 1835, and the plants flowered in the open air in August and September. The same species is distributed to the friends of Mr. DRUMMOND'S Expedition, marked 'Texas, II. n. 101.'" This was erroneously supposed by Gray to be the same as *Coreopsis trifida* Poir. (the species later transferred to *Thelesperma* by Britton), and was not distinguished from the later-described *T. intermedium* Rydb. and its var. *rubrodiscum*. Hooker's plate shows the upper part of a plant only, and it is almost impossible to tell definitely whether the present species or *T. intermedium* var. *rubrodiscum* is shown. The emphasis in the description on "very narrow-linear, almost filiform, entire" leaf segments would fit all the leaves of the former plant, but only the upper leaves of the latter. While in nature the lower leaves may be withered long before the plant has ceased to flower, I should expect that a garden plant in England flowering in August from seed planted the spring of the same year would exhibit most of the lower leaves. Drummond's collecting trips took him into the areas of distribution of both plants (see Geiser, 1948). Since he left Texas in December,

1834, the seeds sent Hooker "in the spring of 1835" (Drummond died at Havana, Cuba, in March of that year) were presumably collected in 1834, probably late in the year. Herbarium specimens may have been collected at some earlier date, and would not necessarily represent the same plant grown by Hooker. In September, 1834, Drummond wrote from San Felipe, Austin Co., complaining of poor collecting, observing that the prairies in the interior had been burned over and that "the whole country, from the Rio Colorado to the Guadalupe, a distance of eighty or ninety miles, is as destitute of verdure as the streets of Glasgow" (quoted by Geiser, *l.c.*). His whereabouts during the next two months are not known, but he left Galveston for New Orleans in December. If the seeds received by Hooker were obtained shortly before Drummond's departure, they would probably have been of the plant here called *Thelesperma filifolium*. It must be admitted that this identification is largely a guess. *T. intermedium*, *T. intermedium* var. *rubro-discum*, and *T. filifolium* (the last two both with red-brown disk corollas) are extremely closely allied, and could very justifiably be treated as varieties of a single species, for which the last name has priority. The following collections of *T. filifolium* have been seen, all from the Gulf Coastal area. ARANSAS Co.: Highway 35, ¼ mile east of Copano Bay, V. L. Cory 51235, Nov. 26, 1945. Near cemetery at Rockport, sandy prairie, Eula Whitehouse 18328, April 28, 1947. KENEDY Co.: 27½ miles north of Raymondville, frequent at roadside in sandy soil, Cory 51498, Dec. 2, 1945. MATAGORDA Co.: 2 miles west of Palacios, burnt-over area along the road, Cory 51119, Nov. 23, 1945 (dwarf plants, apparently sprouts from injured plant, with broad leaf segments).

3. *T. BURRIDGEANUM* (Regel) Blake, Proc. Biol. Soc., Wash. 41: 146. 1928. *Cosmidium Burridgeanum* Hort. An endemic of the northern part of the Rio Grande Plain, in Frio, Jim Hogg, and Live Oak counties; listed by Blake also from Atascosa and Bexar counties. Phyllaries usually scabrous-pubescent, as noted by Blake, but one collection (*Whitehouse 18391*, 1 mile south of George West, Live Oak Co., April 30, 1947) shows a completely glabrous involucre.

4. *T. fraternum* Shinnery, sp. nov. Perennis, caulibus 32-47 cm. altis glabris inferne praecipue foliosis, foliis caulinis

inferioribus pinnatifidis vel bipinnatifidis segmentis linearibus angustissimis ad 0.3 mm. latis 3 cm. longis, supremis simplicibus filiformibus; pedunculis 8-14 cm. longis; involucri 5-7 mm. altis, phyllariis exterioribus 1-2 mm. longis oblongis vel oblongo-ovatis obtusis, interioribus 2.2-3.2 mm. latis ovato-lanceolatis subacutis vel obtusis; ligulis luteis lato-oblongis 6.2 mm. latis 9 mm. longis subtrilobatis, disci corollis rubro-brunneis inaeque profundeque lobatis 1.5-2.5 mm. longis limbo 0.5-1.3 mm. tubo 2.6 mm.; achaeniis linearibus 4.6 mm. longis sive nudis glabrisque sive grosse obtuseque muriculatis, pappi dentibus 1.8 mm. longis.

Perennial, rootstock vertical, with distinct nodes marked by vestigial branchlets or leaf bases as in *T. megapotamicum*. Stems erect, 32-47 cm. high, glabrous, densely leafy below, larger ones freely branch above the middle. Basal and lower stem leaves bipinnatifid, 4.5-11.0 cm. long, petiole about half the total length, blade triangular-ovate in outline; ultimate segments of basal leaves linear-lanceolate, the larger 0.3 mm. wide, 3 mm. long; of lower stem leaves narrowly linear, almost filiform, the terminal ones 0.3 mm. wide, 3 cm. long; uppermost leaves simple, sessile, filiform. Peduncles naked, 8-14 cm. long. Involucres 5-7 mm. high; outer phyllaries oblong or oblong-ovate, obtuse, 1-2 mm. long, narrowly white-margined, spreading-ascending; inner phyllaries ovate-lanceolate, subacute or obtuse, 2.2-3.2 mm. broad at the middle, with prominent white scarious margins 0.5-0.8 mm. broad above, united in the basal half. Chaff scales 6.5 mm. long, scarious, white with double red-brown midvein, obtuse, the outer ones broadly oblong-ovate and nearly plane, the inner oblong and more strongly clasping the achenes. Rays yellow, the ligules broadly oblong, 6.2 mm. wide by 9 mm. long, shallowly 3-lobed, lobes broad, blunt, entire or nearly so, central one 1.3 mm. long; tube 2 mm. long. Disk corollas red-brown, unequally lobed, inner lobes shorter, 1.5 mm. long, outer lobes longer, 2.5 mm. long; limb 1.3 mm. long on inner side, 0.5 mm. on outer; tube 2.6 mm. long. Achenes somewhat polymorphic; linear, varying from lenticular and somewhat 2-edged to subtriangular or somewhat compressed in section, completely smooth or coarsely, densely, and bluntly muriculate, 4.6 mm. long. Pappus of two stout, narrowly triangular, dorsally and marginally hispid, ventrally concave teeth 1.8 mm.

long; these at first erect, ultimately divergent. TYPE: 1 mile north of Dilley, Frio Co., Texas, *Shinners 7418*, April 21, 1945 (in Herb. Southern Methodist University). "Red sandy loam, growing with *T. Burridgeanum*; rays yellow, disk red-brown." Known only from the type collection.

5a. *T. MEGAPOTAMICUM* (Spreng.) Kuntze. *T. gracile* (Torr.) Gray. (See Blake, 1928, and Cabrera, 1941, for full synonymy.) A common and widespread, rayless, perennial weed of the Panhandle and Trans-Pecos, extending south-eastward to Wichita, Archer, Taylor, Coke, Crockett, and Terrell counties.

5b. *T. MEGAPOTAMICUM* var. **ambiguum** (Gray) Shinners, comb. nov. *T. ambiguum* Gray, Proc. Amer. Acad. 19: 16-17. 1883. "This name is assigned to the radiate species which replaces *T. filifolium* in the western part of Texas and adjacent parts of New Mexico and Colorado." No specimens named by Gray have been examined, but the description in the Synoptical Flora leaves little doubt as to the identity of his plant. His repeated statement that it is most like *T. filifolium* (meaning chiefly the *T. intermedium* of the present treatment) is rather strange, for in its perennial rootstock, coarser leaf segments, and short outer phyllaries it is much closer to *T. megapotamicum*. The only significant difference is the presence of rays in *ambiguum*, which would seem to warrant varietal rather than specific distinction. The variety is apparently rather uncommon, and in Texas restricted to the southwestern Edwards Plateau (rarely north to Mitchell Co.) and Trans-Pecos. Specimens have been seen from Brewster, Mitchell, Pecos, Terrell, and Val Verde counties.

6. *T. SIMPLICIFOLIUM* Gray. *T. subsimplicifolium* Gray, a later form of the name. (See Blake, 1928.) A showy perennial from a somewhat woody root, found on limestone outcrops chiefly along the southeastern and southwestern borders of the Edwards Plateau, but found rarely north to the Red River on the Austin Chalk, and in the Trans-Pecos at least as far west as Brewster County.

7. *T. LONGIPES* Gray. Pl. Wright. 1 (Smithsonian Contrib. vol. 3 art. 5) : 109. 1852. TYPE: "Hills and dry banks of the San Pedro or Devil's River; July," *Wright 344* (not examined). Perennial from a vertical woody root, older plants

with several or many stems often much divided near base, forming bushy clumps. Found chiefly in the Trans-Pecos, rarely eastward to Taylor and Tom Green counties.

EXCLUDED SPECIES

T. TRIFIDUM (Poir.) Britton, Trans. N.Y. Acad. Sci. 9: 182. 1890. *Coreopsis trifida* Poir. in Lam., Encyclop. Meth. Bot. Suppl. 2: 353. 1811. Gray was apparently the first to mistake Poirét's plant for a *Thelesperma*, listing *Coreopsis trifida* as a synonym of *T. filifolium* in the Synoptical Flora. Britton, following the American Code requirement to take the earliest specific name regardless of genus (since incorporated into the International Rules), took up Poirét's name, apparently not troubling to check Gray's identification. The description calls for a plant with leaves "simplement trifides, . . . alternes," stems "presque filiformes," inner phyllaries of the involucre, "droites, ovales, obtuses," outer "petites, en forme d'écaillés," and ligules terminating in "trois lobes inégaux, obtus." The plant is depicted on Plate 704, as *Coreopsis* fig. 2, in a separate volume. The description adds the further information that "cette plante croit dans l'Amerique septentrionale, à en jüger d'après la phrase de Ray, que M. de Lamarck y a rapportée dans son Herbar: *Chrysanthemum marilandicum, coeruleum, monanthos*." Alternate leaves of course would exclude the plant from the genus *Thelesperma* at once. The involucre figured in the plate is nto the cup-like one of *Thelesperma*, and the very short outer phyllaries are not like those of any of the plants which have passed as *T. trifidum*. The word *coeruleum* in the phrase quoted from Ray suggests that there was some mixup of plants in cultivation. I do not know the identity of Poirét's plant (of which a specimen is said to exist in the Lamarck herbarium), but it is certainly not a *Thelesperma*.

EXTRA-LIMITAL SPECIES

T. MARGINATUM Rydb., Fl. Mont. (Mem. N.Y. Bot. Gard. 1): 421. 1900. "Sask.-Mont." according to Rydb., Fl. Rocky Mts. 937. 1917 and 1922. Allied to *T. subnudum*; see Blake, 1928.

T. RAMOSIUS Blake, Proc. Biol. Soc. Wash. 54: 20. 1941. Coahuila. Related to *T. simplicifolium*.

T. SCABRIDULUM Blake, Journ. Wash. Acad. Sci. 25: 317. 1935. Coahuila. Unique in the whole plant's being scabrous-pubescent and dwarf (5-10 cm. high).

T. SUBAEQUALE Blake, Proc. Biol. Soc. Wash. 41: 145-146. 1928. Nuevo Leon. Related to *T. simplicifolium*.

T. SUBNUDUM Gray, Proc. Amer. Acad. 10: 72. "New Mexico, S. Utah, and N. Arizona" (Syn. Fl. 1 pt. 2: 302, 1884). Either discoid or radiate, according to Blake (1928). Related to *T. simplicifolium*.

T. TENUE Rldb., Bull. Torr. Bot. Club 27: 631. 1900. Colorado. Very closely related to *T. intermedium*, but distinctly perennial.

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