

restricted in the United States to the small area from Pharr to Brownsville, it is abundant there at times. I have collected over a hundred specimens in the Pharr-Brownsville region, during the months of March to May and August to December, 1944-47. Apparently *Lerodea edata* is native to that region. Because of its small size and secluded habits, it doubtless had been overlooked by collectors before 1944.

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Transfer of Texas Species of *Petalostemum* to *Dalea* (Leguminosae)

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The genus *Dalea* (*Leguminosae-Psoraleae*) is usually characterized as having 10 stamens, while *Petalostemum*² has only 5. In Rydberg's comprehensive account (*N. Amer. Flora* 24, parts 1-2, 1919-1920), the two genera are distinguished as follows (p. 2) :

Wings and keel-petals distinctly clawed, inserted some distance below the mouth of the staminal tube, the keel-petals (if present) inserted higher up than the wings, the former usually united along the lower edge of the blades. DALEA.³

Wings and keel-petals alike, clawless or short-clawed, all distinct and inserted at the mouth of the staminal tube; spikes dense, with persistent bracts. PETALOSTEMON.

In a careful synopsis of *Dalea* and related genera in the Sonoran Desert by Wiggins, a similar separation is made (*Contrib. Dudley Herb.* 3: 43, 1940) :

Corolla distinctly papilionaceous; wing- and keel-petals inserted between the base and the middle of the staminal tube; claws one-fourth to one-half as long as the blades. DALEA.

Corolla faintly or not at all papilionaceous; wing- and keel-petals inserted at the mouth of the staminal tube, short-clawed. PETALOSTEMON.

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²In the list of *nomina conservanda* making up Appendix III of the International Rules of Botanical Nomenclature (*cf. Brittonia* 6: 67, 1947), this is altered to the etymologically proper form of *Petalostemon* — in flagrant violation of Article 59 of the same Rules, expressly forbidding such corrections!

³Rydberg used the name *Parosela* Cav. (1802), the name *Dalea* having been used several times prior to the publication of Jussieu's genus of that name in 1789. *Dalea* Jussieu has since been placed in the list of *nomina conservanda*, and must now be used instead of *Parosela*.

Both authors associate with *Petalostemum* the genus *Thornbera* (not found in Texas), which has 9 or 10 stamens, like *Dalea*, but clawless petals, like *Petalostemum*. In *Petalostemum multiflorum* Nutt., a common species of north-central Texas, the wing-petals are distinctly long-clawed, the claw being about $\frac{3}{4}$ as long as the blade, and the stamens may number 5 or 6. In *Dalea laxiflora* Pursh, the keel-petals are partly united, but are of about the same size and shape as the wing petals, and are attached near or slightly above the middle of the staminal tube. *Dalea* is a diverse genus, including some species (*D. rubescens* Wats., *D. oreophila* Cory, *D. aurea* Pursh) with the inflorescence and habit of most species of *Petalostemum*, while the species of *Petalostemum* show variation in petals, sepals, bracts, and inflorescence. As far as Texas is concerned, it is both more logical and more convenient to merge the two, and the intermediate genus *Thornbera* offers evidence of even closer relationship between them in other parts of their range. Even thus enlarged, *Dalea* is much less diverse than *Psoralea* or *Astragalus* in the broad sense.

Also closely related to *Dalea* are *Amorpha* and *Eysenhardtia*, two small genera of shrubs or semi-shrubs with flowers in slender spikes. The most satisfactory technical distinctions between the three genera may be shown in key form:

Mature pods 2-5 times as long as the calyx; calyx with 5 approximately equal, short, triangular teeth	
Petal 1; leaflets with stipels.....	<i>Amorpha</i>
Petals 5; leaflets without stipels.....	<i>Eysenhardtia</i>
Mature pods not or very little exceeding the calyx; calyx teeth slender and elongate, or else the calyx decidedly more deeply cleft on the upper side.....	<i>Dalea</i>

The species of *Petalostemum* found in or near Texas are listed below in the order followed by Rydberg (N. Amer. Fl. 24 pt. 2: 121-135, 1920), with the appropriate names under *Dalea*.

1. *D. multiflora* (Nutt.) Shinnery, comb. nov. *Petalostemon multiflorum* Nutt., Journ. Phila. Acad. 7:2. 1834.

2. *D. oligophylla* (Torr.) Shinnery, comb. nov. *Petalostemon gracile* var. *oligophyllum* Torr. in Emory, Notes of a Military Reconnaissance from Ft. Leavenworth, p. 139. 1848. *Petalostemon oligophyllum* (Torr.) Rydb., Mem. N. Y. Bot. Gard. 1: 237. 1800. *Kuhnistera occidentalis* (Gray) Heller, Trans. N. Y. Acad. Sci. 14: 33. 1895. *Petalostemum occiden-*

tale (Gray) Fernald, *Rhodora* 39: 28. 1937. [Not *Dalea occidentalis* (Rydb.) Riley, 1923.]

3. *D. CANDIDA* Willd. *Petalostemum candidum* (Willd.) Michx.

4. *D. sabinalis* (S Wats.) Shinnery, comb. nov. *Petalostemon sabinalis* Wats., Proc. Amer. Acad. 21: 448. 1886.

5. *D. glandulosa* (Coult. & Fisher) Shinnery, comb. nov. *Petalostemon glandulosus* Coulter & Fisher, Bot. Gaz. 18: 299. 1893.

6. *D. phleoides* (T. & G.) Shinnery, comb. nov. *Petalostemon phleoides* T. & G., Fl. N. A. 1: 310. 1838.

7. *D. Drummondiana* Shinnery, nom. nov. *Petalostemon phleoides* var. *microphyllus* T. & G., Fl. N. A. 1: 310. 1838. *Petalostemon microphyllus* (T. & G.) Heller, Bull. Torr. Bot. Club 26: 593. 1899. [Not *Dalea microphylla* HBK., 1824.]

8. *D. COMPACTA* Spreng., Syst. Veg. 3: 327. 1826. *Petalostemon compactus* (Spreng.) Swezey, Nebr. Fl. Pl., p. 6. 1891. (According to Rydberg; reference not seen.) ?*Petalostemon decumbens* Nutt., Journ. Phila. Acad. 7: 93. 1834. According to Rydberg, *D. compacta* Spreng. is the same as *Petalostemon macrostachyum* Torr., Ann. Lyc. N. Y. 2: 176-177, 1827. The original description of the former is too brief to be conclusive, but the type locality would indicate identity with Nuttall's rather than with Torrey's species. The original descriptions of the three follow:

Dalea compacta Spreng.

compacta * 4. *D. foliis* 3jugis lineari-lanceolatis punctatis, spica pedunculata compacta, bracteis calyce sericeo longioribus. Ad fl. Rio Roxo in ditione Arkansa Amer. bor. [Flower color not stated, but preceding species is *D. carnea*, following one is *D. violacea*.]

Petalostemon decumbens Nutt.

48. PETALOSTEMON **decumbens*. Parce pubescens, caule decumbente a basi ramoso, spicis cylindræis crassis, bracteis acuminatis calyce pubescente longioribus, floribus purpureis, foliolis latiusculis (7-9), cuneato-oblongis apiculatis.

... A very showy purple flowered species allied remotely to *P. violaceum*, but with larger, longer and denser spikes. ... The leaves about as broad as in *P. candidum*, the leaflets ... about a line wide (though sometimes narrower). Stipules small and setaceous. The calyx much less villous than in *P. violaceum*, only pubescent on the margins of the segments, which are short and scarcely acute. The bracts acuminate, setaceous, longer than the calyx. Petals violet purple, retaining their fine color in the herbarium like the other species.

Hab. On the plains of Red River, common. Flowering in June.

Petalostemon macrostachyum Torr.

79. PETALOSTEMON MACROSTACHYUM, spica cylindrica, compacta, longissima; bracteis lanceolatis, calycibusque sericeo-villosissimis; foliolis subtrijugis, lanceolata-oblongis, glabris.

... leaflets ... lanceolate-oblong, very smooth, mucronate, entire, slightly punctate beneath. *Spikes* ... on long naked peduncles, linear, dense, the central one about 6 inches in length and not half an inch in diameter. ... *Bracts* lanceolate, silky, as long as the calyx. *Flowers* small, white, sessile. *Calyx* 5-cleft, covered with silky hairs; segments acute. *Petals* with long claws; limb oblong. ...

HAB. About the Forks of the Platte.

9. *D. obovata* (T. & G.) Shinnery, comb. nov. *Petalostemon obovatus* T. & G., Fl. N. A. 1: 310. 1838.

10. *D. emarginata* (T. & G.) Shinnery, comb. nov. *Petalostemon emarginatus* T. & G., Fl. N. A. 1: 311. 1838.

11. *D. grisea* (T. & G.) Shinnery, comb. nov. *Petalostemon griseus* T. & G., Fl. N. A. 1: 310. 1838.

12. *D. VILLOSA* (Nutt.) Spreng. *Petalostemon villosum* Nutt.

13. *D. PURPUREA* Vent. *Petalostemon purpureus* (Vent.) Rydb. This species is assigned to Texas by a number of writers, but I have seen no specimens from the state. Our two common species of the *D. purpurea* complex are *D. tenuifolia*, in the Panhandle, and *D. Stanfieldii*, in limestone areas of central and north-central Texas. *D. tenuifolia* has more slender spikes than *D. purpurea*; the bracts are abruptly pointed, with long-acuminate tips exceeding the densely long-villous calyxes. *D. Stanfieldii* has thicker and often shorter spikes than *D. purpurea*; the bracts are shorter than the calyxes, as in *D. purpurea*, but the calyxes are densely silvery-canescens on and near the teeth (often glabrate toward the base), instead of pubescent throughout with looser, yellowish hairs.

14. *D. tenuifolia* (Gray) Shinnery, comb. nov. *Petalostemon tenuifolius* Gray, Proc. Amer. Acad. 11: 73. 1876. Including *P. Porterianus* Small, Fl. S.E. U.S. 631 and 1332. 1903. From the description, *P. molle* Rydb., Mem. N. Y. Bot. Gard. 1: 238, 1900, is very closely related to this species and perhaps not separable from it.

15. *D. tenuis* (Coulter) Shinnery, comb. nov. *Petalostemon violaceus* var. *tenuis* Coulter, Contrb. U.S. Nat. Herb. 1: 34. 1890. *P. tenuis* (Coulter) Heller, Bull. Torr. Bot. Club 26: 593. 1899.

16. *D. Reverchoni* (Wats.) Shinnery, comb. nov. *Petalostemon Reverchoni* Wats., Proc. Amer. Acad. 21: 449. 1886.

17. *D. Stanfieldii* (Small) Shinnery, comb. nov. *Petalostemon Stanfieldii* Small, Fl. S.E. U.S. 631 and 1332. 1903. *P. virgatus* Scheele, Linnaea 21: 461. 1848. [Not *Dalea vir-*

gata Lag., 1816.] *Kuhnistera pulcherrima* Heller, Bot. Explor. Texas (Contrib. Herb. Franklin & Marshall College 1) : 50. 1895. *Petalostemon pulcherrimus*, Heller, Bull. Torr. Bot. Club 26 : 593. 1899. [Not *Dalea pulcherrima* Sesse & Moc. ex G. Don, 1832.]

The Genus *Dalea* (Including *Petalostemum*) in North-Central Texas

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The following account relates only to those species definitely known to grow within one or more of the 13 counties surrounding Dallas and Fort Worth. These 13 counties include two of the smallest of the 254 in Texas, comprising only 3.7% of the area of the state, but even this limited area (9,600 square miles) is greater than that of such eastern states as New Jersey, Massachusetts, or Vermont. Geological formations, soils, and topography are varied, usually with very abrupt transitions which are sharply reflected in the plant life. Endemic species meet with others of eastern, western, or Mexican affinities, making an exceptionally rich native flora. Since the region is still poorly known botanically, it is most probable that in time other species will be added to the list here given. The key is for use with plants in flower. Remarks under each species are based on collections in the Herbarium of Southern Methodist University, and on personal observations.

Key to Species

- 1a. Flowers widely separated, in loose, slender, curved
or nodding spikes 1. *D. laxiflora*
- 1b. Flowers closely crowded, all touching or overlapping,
in dense heads or spikes
 - 2a. Flowers yellow
 - 3a. Leaflets 3 (only 1 or 2 in uppermost leaves), lance-linear,
acute 2. *D. Hallii*
 - 3b. Leaflets 5 (only 3 on uppermost leaves), oblong-elliptic,
obtuse, with midrib exerted as a short point..... 3. *D. aurea*
 - 2b. Flowers purple or rosy to white
 - 4a. Plant a dwarf shrub with much-branched woody stems;
flowering September-October 4. *D. frutescens*
 - 4b. Plant herbaceous; flowering May-July (sometimes again
in September, when fruiting spikes from earlier are present)
 - 5a. Leaflets 15 or more..... 5. *D. Drummondiana*
 - 5b. Leaflets 3-13
 - 6a. Flowers white; calyx glabrous except for the ciliate
margins of the teeth..... 6. *D. multiflora*

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