***Psorothamnus scoparius* (Gray) Rydb.** broom dalea
FABACEAE

Synonyms: *Dalea scoparia* Gray
Parosela scoparia (A. Gray) Heller

General Description.—Broom dalea is also known as broom indigobush and purple sage (Dick-Peddie 1993, Ivey 1995). This is a highly branched shrub with slender twigs and small leaves. Its overall growth form gives it a broom-like appearance. It may reach heights of 1.5 m or more, but is typically about 1 m when mature. Horizontal spread is likewise about 1 m but in older plants may be as much as 2 m or more. Leaves are alternate, linear to linear-spatulate, from 1 to 2 mm in width and 0.5 to 1.9 cm in length, sometimes trifoliate, and gland-dotted (Carter 1997, Martin and Hutchins 1980-81). Populations in New Mexico are actually much more frequently trifoliate than some floras would indicate. Flowers are pealike, dark blue, grouped in semi-spherical clusters, and fragrant.

Range.—Broom dalea occurs from far western Texas through central and southern New Mexico into eastern Arizona and northern Mexico (Kearney and others 1951, Martin and Hutchins 1980-81, Warnock 1974). It occurs at elevations from about 915 m to 1,830 m in upland desert scrub habitat, usually in sandy soils.

Ecology.—This species is common in Plains-Mesa Sand Scrub habitats and can be one of the dominant shrubs in this vegetation type. It is a deep-sand tolerant or deep-sand adapted shrub. It may occur on gypsum sands as well as quartz sands. More specifically it occurs in a mixed shrub series in association with *Artemisia filifolia* Torr., *Atriplex canescens* (Pursh) Nutt., *Oryzopsis hymenoides* (Roem. & Schult.) Ricker ex Piper, *Sporobolus* spp., and other mixed grasses and forbs (Dick-Peddie 1993).

Reproduction.—Broom dalea often appears relatively dormant, with little new growth, until summer monsoon rains begin, whereupon it rapidly enters the blooming stage. The dark blue flowers are grouped in semi-spherical spikes, of a few to several flowers, the clusters 1 to 2 cm in diameter (Carter 1997, Martin and Hutchins 1980-81). The fragrant blooms attract numerous pollinating bees. Fruits are short, egg shaped pods with hairs and glands. Under proper moisture conditions seeds may germinate the following year. New plants may reach reproductive status in as little as 3 to 6 years depending on local environmental conditions.

Pollination.—Numerous species of bees are attracted to the blue flowers and collect pollen from broom dalea. The plant emits a noticeable sweet, aromatic scent when in bloom. During the peak of summer blooming, these shrubs are often focal points for bee foraging activity. Some bees visiting broom dalea include crepuscular (twilight active) bees of the family Colletidae (yellow-faced and plasterer bees), subfamily Diphaglossinae, species C*aupolicana ocellata* Michener; and family Anthophoridae (cuckoo, digger, and carpenter bees), subfamily Anthophorinae, Tribe Eucerini, species *Martinapis luteicornis* (Cockerell) (Rozen and Rozen 1986). These bee species were observed in southeastern Arizona. Both groups of bees nest in the ground, in crevices in rocks or walls, in plant stalks or other cavities. Both groups use the pollen, or pollen mixed with nectar as a food source.

Growth and Management.—This species grows relatively quickly and can reach 1 m in height or diameter within 4 to 7 years depending on local environmental conditions. The sandy Plains-Mesa Sand Scrub habitats in which this shrub may be a dominant are by nature poor rangelands for livestock.

Benefits.—Broom dalea is an important natural stabilizer of dune and other sandy soils. Its relatively

rapid growth rate allows for reasonably quick establishment in situations of shifting and disturbed soils. Like many members of the legume family, it is a nitrogen fixer and forms rhizobial root nodules (Allen and Allen 1981). In fact, this species has been documented to transmit the rhizobial bacteria to another genus within the legume family, *Crotalaria* (Wilson 1939). Broom dalea is not an important range or browse plant for livestock and may increase under grazing. It is not substantially browsed, likely due to oils contained within the glands (Warnock 1974). Very little, until recently, has been known about the volatile oil composition of this species. Sixty-four volatile compounds have been identified (Lucero and others 2002). The three most abundant compounds were gamma-terpinene (22.3 percent), p-cymene (14.0 percent), and alpha-pinene (9.0 percent). Some of these are known deterrents to herbivore browsing in other plant species and may serve the same function in broom dalea.

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