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Legumes of the Texas Rio Grande Region

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Legumes are well represented in the flora of the southwestern United States. Herbaceous taxa are widespread, and woody taxa become abundant and often dominant elements of the vegetation in the warmer, southern regions that receive summerrainfall. Legume diversity reaches its highest level in the Southwest in the Sonoran Desert of central and southern Arizona, and along the Rio Grande which forms the southwest border of Texas. Thirteen counties border the Texas portion of the Rio Grande. Extending from the Gulf of Mexico at Boca Chica, to Anthony, a short distance north of El Paso, this region encompasses extensive areas of xeric plant communities including the Chihuahuan Desert and subtropical **Tamaulipan thornscrub** as well as grasslands. Other, less extensive plant communities include areas of oak/juniper/pinyon woodland in parts of the Edwards Plateau and mountains of the Big Bend Region, and coastal prairie and subtropical semi-evergreen forest in the Lower Rio Grande Valley.

More than 150 species of legumes in 54 genera are reported to occur in counties bordering the Rio Grande in Texas. This is

approximately 40% of the total number of legume species reported for the state of Texas by Correll and Johnston (1970). The largest genera include *Dalea* (16 species), *Astragalus* (13 species), *Acacia* (10 species), *Mimosa* (10 species), and *Senna* (10 species). At least a dozen non-native species of legumes have become established in the Rio Grande Region.

This region includes many plants that are well-suited to low water-use landscapes in the Southwest. Among the more widely grown native legume landscape trees and shrubs from this region are *Acacia berlandieri*, *A. constricta*,

A. farnesiana, *A. greggii*, *A. rigidula*, *A. schaffneri*, *Bauhinia lunarioides*, *Caesalpinia mexicana*, *Cercis canadensis*, *Ebenopsis ebano*, *Leucaena retusa*, *Prosopis glandulosa*, and *Sophora secundiflora*. Many others have horticultural merit and are cultivated to some extent. Texas bluebonnet, *Lupinus texensis*, is the state flower of Texas and is widely planted by the Texas Highway Department along highways in the state. It is a popular wildflower with gardeners as well. *Lupinus havardii* also has considerable horticultural potential (Davis *et. al.* 2002).



Tamaulipan Thornscrub, north of Lake Amistad, Texas. July 1990. (MBJ)



Lupinus havardii. (MBJ)

Legumes in the Rio Grande Region are important for many other purposes. Honey mesquite, *Prosopis glandulosa*, is widely cut for fuelwood and is gaining popularity for wood flooring. Mesquite also has potential as a food crop for dry regions. A variety of legumes, especially *Acacia* and *Prosopis* are valuable forage plants for bees in honey production. Numerous species are browsed by livestock and serve as important browse plants for wildlife. Toxic compounds are reported to occur in plants of various genera including *Astragalus*, *Chamaecrista*, *Erythrina*, *Mimosa*, *Psoralidium*, *Senna*, *Sesbania*, *Sophora*, and *Tephrosia*, and some of these have caused livestock losses and poisoning in humans (Diggs *et. al.* 1999). Other species have been used in folk medicine to treat various ailments.

Acacia is well-represented in the Rio Grande region of Texas with twelve taxa. Particularly in southern Texas, acacias are often dominant elements of the vegetation. Berlandier's acacia or guajillo, *Acacia berlandieri*, is a common

and widespread shrub that grows 1-4 m tall, with fern-like foliage and fragrant, creamy colored flower heads. It is considered an excellent honey plant. Seeds of Berlandier's acacia are toxic to livestock, affecting the nervous system (Bailey 1978). Other acacias that are important for honey production include *A. greggii*, *A. farnesiana*, and *A. roemeriana* (Vines 1960). Blackbrush acacia or chaparro prieto, *Acacia rigidula*, is one of the most ubiquitous shrubs of the Tamaulipan thornscrub of

southern Texas. Typically growing 2-4 m tall, this plant has dark green foliage and spiny twigs. Cream colored flower spikes are produced in the spring. The plant is considered to be a good source of honey (Vines 1960). Schott acacia, *Acacia schottii*, is a shrub less than 2 m tall, with small, viscid leaves, spiny stems, and small, yellow flower heads. The species is primarily found in the Chihuahuan Desert of northern Mexico, entering the United States



Prosopis glandulosa. Southwest of Carrizo Springs, Texas. August 1990. (MBJ)



Acacia berlandieri (MBJ)

only in a small area of the lower Big Bend Region of Texas.

Trailing indigo bush, *Dalea greggii*, is a low, trailing plant with silvery green foliage and small purple flowers in short inflorescences. In habitat, it grows on rocky slopes and has a sparse appearance. With adequate irrigation, it makes a dense groundcover and has become popular as a drought resistant landscape plant. Several species of *Dalea* including *D. candida*, *D. emarginata*, *D. formosa*, and *D. lanata* are considered excellent browse for livestock as well as being utilized by wildlife (Stubbeniek and Conrad 1989). Formerly placed in *Dalea*, the genus *Psorothamnus* has one representative in the area. Broom dalea, *Psorothamnus scoparius*, is a shrubby plant with numerous blue gray stems bearing glands containing aromatic oils. It is found in sandy soils of extreme western Texas, and adjacent southern New Mexico and Chihuahua.

Great lead tree or tepeguaje, *Leucaena pulverulenta*, can grow to 15 m tall and is found along the Rio Grande in extreme southern Texas where it is grown as a shade tree. The much smaller golden-ball lead tree, *Leucaena retusa*, is found northward in the Edwards Plateau and Big Bend Region. Named for its showy spring flower heads, this species is considered good browse for livestock (Vines 1960). White lead tree, *Leucaena leucocephala*, a native of tropical Mexico, has become naturalized in southern Texas. This fast growing tree is widely planted for agroforestry purposes and shade in tropical climates around the world where it often escapes to become a serious weed.

Texas ebony or ébano, *Ebenopsis ebano*, is a distinctive tree of southern Texas. Commonly 5-



Acacia roemeriana. Burro Mesa, Big Bend National Park, Texas. April 1996. (MBJ)



Acacia schottii. Terlingua Creek, Texas. July 1990. (MBJ)



Ebenopsis ebano. West of Boca Chica, Texas. July 1990. (MBJ)

12 m tall, with spiny, zig-zag twigs, dense, dark green foliage, and cream colored flowers, it is highly regarded as a landscape and wildlife plant. The woody pods were formerly used as a substitute for coffee (Vines 1960). Ape's earring or tenaza, *Havardia pallens*, is a Mexican species that is also found in extreme southern Texas. Growing to 10 m tall, the stems are armed with painfully sharp, paired spines. Masses of fragrant white

flower heads are produced in the warm months.

Two species of *Parkinsonia* are found in Texas. Texas palo verde, *Parkinsonia texana* var. *texana*, is typically shrubby, while Border palo verde or Tamaulipan palo verde, *P. texana* var. *macra* can develop into a tree to 7 m tall. Mexican palo verde or retama, *Parkinsonia aculeata*, is often abundant in moist habitats and disturbed areas. The original natural distribution of this species is obscure.

It is now widely naturalized in warm dry regions around the world. Texas honey mesquite, *Prosopis glandulosa* var. *glandulosa*, and western honey mesquite, *P. glandulosa* var. *torreyana*, which replaces Texas honey mesquite from the Big Bend region westward, are both loved and cursed. The trees provide valuable fuelwood and are especially popular for mesquite barbecue, the pods provide food for livestock and wildlife, the trees are valued for honey production.



Parkinsonia texana var. *macra* (MBJ)



Sophora secundiflora. Val Verde County, Texas. October 1996. (MBJ)



Flowering *Sophora secundiflora*. (MBJ)

However, ranchers often consider it to be a pest, as livestock spread the seeds widely and mesquite can take over rangeland in the absence of fire. Vast sums of money have been spent to control mesquite in the Southwest.

Mescalbean or Texas mountain laurel, *Sophora secundiflora*, is popular in landscaping as an evergreen shrub or small tree. Wisteria-like clusters of purple flowers are produced in the spring, with an aroma similar to grape soda pop. All parts of this species are poisonous. Livestock losses have been reported from animals that browsed the foliage. The seeds are especially toxic and have caused human poisoning.

The following list, while not all-inclusive, provides an idea of the legume diversity of the Rio Grande Region of Texas.

Caesalpinioideae

Bauhinia lunarioides
Caesalpinia caudata
 **Caesalpinia gilliesii*
Caesalpinia mexicana
Cercis canadensis var. *mexicana*
Chamaecrista calycioides
Chamaecrista fasciculata
Chamaecrista flexuosa var. *texana*
Chamaecrista nictitans var. *mensalis*
Hoffmannseggia drepanocarpa
Hoffmannseggia glauca
Hoffmannseggia oxycarpa
Parkinsonia aculeata
Parkinsonia texana var. *macra*
Parkinsonia texana var. *texana*
Pomaria brachycarpa
Pomaria jamesii
Pomaria melanosticta
Senna bauhinioides
Senna durangensis
Senna lindheimeriana
 **Senna pendula*
 **Senna obtusifolia*
 **Senna occidentalis*
Senna orcuttii
Senna pumilio
Senna roemeriana
Senna wislizenii

Mimosoideae

Acacia angustissima var. *hirta*
Acacia angustissima var. *texensis*
Acacia berlandieri
Acacia constricta
Acacia farnesiana
Acacia greggii var. *greggii*
Acacia greggii var. *wrightii*
Acacia neovernicosa
Acacia rigidula
Acacia roemeriana
Acacia schaffneri
Acacia schottii
Calliandra conferta
Calliandra humilis var. *humilis*
Desmanthus cooleyi
Desmanthus obtusus
Desmanthus velutinus
Desmanthus virgatus
Ebenopsis ebano
Havardia pallens
 **Leucaena leucocephala*
Leucaena pulverulenta
Leucaena retusa
Mimosa aculeaticarpa var. *biuncifera*
Mimosa asperata
Mimosa borealis
Mimosa dysocarpa
Mimosa emoryana
Mimosa malacocarpa
Mimosa strigillosa
Mimosa texana
Mimosa turneri
Mimosa wherryana
Neptunia pubescens var. *pubescens*
Prosopis glandulosa var. *glandulosa*
Prosopis glandulosa var. *torreyana*
Prosopis pubescens
Prosopis reptans var. *cinerascens*
Schrankia latidens
Schrankia roemeriana
Zapoteca media

Papilionoideae

**Aeschynomene indica*
 **Alhagi camelorum*
Amorpha fruticosa
Astragalus allochorus
Astragalus amphioxys
Astragalus brazoensis
Astragalus crassicaarpus var. *crassicaarpus*
Astragalus emoryanus var. *emoryanus*
Astragalus emoryanus var. *terlinguensis*
Astragalus giganteus
Astragalus leptocarpus
Astragalus mollisimus var. *bigelovii*
Astragalus mollisimus var. *earlei*
Astragalus mollisimus var. *marcidus*
Astragalus nuttallianus var. *austrinus*
Astragalus nuttallianus var. *macilentus*

Astragalus nuttallianus var. *nuttallianus*
Astragalus nuttallianus var. *trichocarpus*
Astragalus nuttallianus var. *zapatensis*
Astragalus pictiformis
Astragalus reflexus
Astragalus waterfallii
Astragalus wootonii var. *wootonii*
Baptisia bracteata var. *laevicaulis*
Brongniartia minutifolia
Canavalia maritima
Centrosema virginiana
Cologania angustifolia
Crotalaria incana
Crotalaria pumila
Coursetia axilaris
Dalea argyrea
Dalea aurea
Dalea candida var. *oligophylla*
Dalea emarginata
Dalea formosa
Dalea frutescens
Dalea greggii
Dalea lachnostachya
Dalea lanata var. *lanata*
Dalea lanata var. *terminalis*
Dalea lasiathera
Dalea nana var. *nana*
Dalea neomexicana var. *neomexicana*
Dalea neomexicana var. *longipila*
Dalea obovata
Dalea pogonathera
Dalea scandens var. *paucifolia*
Dalea wrightii
Desmodium grahamii
Desmodium neomexicanum
Desmodium psilophyllum
Erythrina herbacea
Eysenhardtia spinosa
Eysenhardtia texana
Galactia canescens
Galactia texana
Galactia volubilis
Galactia wrightii
Genistidium dumosum
Indigofera lindheimeriana
Indigofera miniata
 **Indigofera suffruticosa*
Lespedeza texana
Lotus oroboides
Lupinus concinnus
Lupinus havardii
Lupinus texensis
Macroptilium atropurpureum
 **Medicago polymorpha*
 **Medicago sativa*
 **Melilotus albus*
 **Melilotus indicus*
Pediomelum cuspidatum
Pediomelum humile
Pediomelum rhombifolium

Peteria scoparia
Phaseolus angustissimus
Phaseolus filiformis
Phaseolus grayanus
Phaseolus maculatus subsp. *ritensis*
Psoralidium tenuiflorum
Psorothamnus scoparius
Robinia neomexicana
Rynchosia americana
Rynchosia minima
Rynchosia senna var. *texana*
Sesbania drummondii
Sesbania macrocarpa
Sophora nuttalliana
Sophora secundiflora
Sophora tomentosa
Tephrosia lindheimeri
Tephrosia tenella
Vicia ludoviciana subsp. *ludoviciana*
Vigna luteola
Zornia bracteata

*=introduced taxa reported to have become established.

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Staff and Volunteers in Action

Volunteers Work Winter into Spring

Winter volunteer sessions have been well-attended, averaging 23 participants each month. We've had a variety of work activities during the past few months, and a highlight of many sessions has been an informative and colorful slide presentation by Matt Johnson.

In November, I invited the group to join me for a visit to our Tucson "tree evaluation" field. Nearly 200 specimens (2 or 3 plants, per species) have been successfully grown at that location since 1998. Many trees have become seed-productive during the past few years. Fifteen of us carpooled across town, and I explained some of that field's history as well as specific information about the species planted there.

Dr. Norem and UA Plant Science Professor Dr. Ursula Schuch compiled growth phenology information for several species at that field over the past few years. I am currently working on the flower phenology study there and in DELEP's other Tucson fields. While the group was in the field I discussed the opportunity for volunteers to help us care for those plants, as well as inviting their participation in creating a photographic record of these and other local field specimens. George Girard agreed to assist with that project, and we are beginning a new schedule for photography, during the spring months. These photos will be available for archiving, for use on the DELEP website and in our publications. They will also be uploaded on the photo database which volunteer Dan Sims and Dr. Norem have created.

At our December session, volunteers had the opportunity to meet new Boyce Thompson Arboretum and Desert Legume Program Director Mark Bierner. This was a great chance for him to see one of DELEP's volunteer sessions "in action" and for him to share some of his visions for DELEP and BTSA with our group. During November and December of 2005, we appreciated extra volunteer help from Adrian, Leandra, Sandra and Chris Marshall. Adrian and Chris helped me with specific field chores at our Campus Ag Center location. Leandra and Sandra offered assistance in seed bank maintenance, with specific attention to *Astragalus* collections. Bill Kendall has joined Matt on a number of plant inventorying trips in southeast Arizona this winter.

Tree
Logo
Here

Opportunities for Participation

DELEP's bulletin Aridus, is published three times annually to stimulate interest in desert legumes, to inform our readers of DELEP's activities, and to encourage support for DELEP's programs. Manuscripts related to legumes are welcome and should be mailed to the editor for review. Subscriptions are complimentary and are available by contacting the DELEP office. Aridus is published by The University of Arizona on behalf of The Desert Legume Program.

Financial support for DELEP comes from contracts, grants and contributions from private industries, government agencies and individuals.

To Contribute: Send a check, payable to U of A Foundation/ DELEP, or call the DELEP Office concerning a pledge, a restricted gift, or estate planning.

The Desert Legume Program
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Dedicated volunteer work is an integral component of DELEP. Our volunteers come from many backgrounds and work on a variety of projects including wild seed collecting, seed processing, organization of special events, and office work.

To Volunteer: Or just to explore the possibilities, telephone our office (520) 318-7047) or drop us a note or email: kcoppola@ag.arizona.edu.

Five volunteers joined Matt in Yuma on December 5th, 6th and 7th. Thanks to Gail Culver, Pam Honaker, Glen Branham, Terry Donovan, and Jamie Wahl for assistance with seed collections, plant and field care jobs. Glen Branham and Terry Donovan spent a day helping me in those Yuma fields, on March 14th, of this year. Thanks to Wayne MacGowan, who has again attended to greenhouse and nursery care for us on weekends and at other times, this winter. The DELEP Advisory board met on March 3rd. We thank our board members and “substitutes” Jennifer Johnson and Dawn Edwards (who attended in place of Kathy Rice) from Desert Botanical Garden, for their participation.

Upcoming Spring sessions are **Wednesday April 12th and May 10th**. Fall 2006 sessions are *tentatively* scheduled for **September 13, October 11, November 8 and December 13**.

Please call us at (520) 318-7047 or send me an email (kcoppola@ag.arizona.edu) if you are interested in learning more about volunteering with DELEP. Even if you are not in southern Arizona, there may be ways that you can volunteer and help DELEP to achieve its missions. We will be happy to discuss this with you, and thank you for considering this opportunity.

Flowering *Acacia schottii*. (MBJ)

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