



Figure 1. View of Río Bavispe Valley from Cruz del Diablo. Photo by Luis Gutiérrez.

Preliminary Flora of the Lower Bavispe Valley, Sonora, Mexico

by Thomas R. Van Devender¹, Ana L. Reina-Guerrero¹, and José Jesús Sánchez-Escalante²

Abstract

The flora of the lower Río Bavispe Valley from the Huásabas area south to the Río Áros at 430 to 1,510 m. elevations (1,410 to 4,954 ft.) was studied from 1995 to 2016. A total of 401 plant taxa in 74 families and 274 genera were recorded in the lower Río Bavispe Valley study area, including 24 non-native species (6.0%). The families with the most species were Asteraceae (50), Fabaceae (50), Poaceae (42), Euphorbiaceae (20), Malvaceae (19), Cactaceae (13), Solanaceae (15), and Pteridaceae (11), representing 54.9% of the flora. The genera with the most species were *Acacia* (8), *Bouteloua* (7), *Euphorbia* (6), *Quercus* (6), *Boerhavia* (5), *Muhlenbergia* (5), and *Opuntia* (5).

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Introduction

Although the Tropic of Cancer is located at 23.4°N, just north of Mazatlán, Sinaloa, the northernmost tropical deciduous forest occurs in the Sierra San Javier, Sonora (28.6°N), 680 km. (422 mi.) to the north-northwest (Van Devender et al. 2013a). The northernmost tropical vegetation in Sonora is foothills thornscrub in the Ríos Bavispe and Sonora Valleys. In this paper, we summarize the flora of foothills thornscrub and adjacent desert grassland in the lower Río Bavispe Valley south of Huásabas, Sonora.

Study Area and Methods

The Río Bavispe begins in the northernmost Sierra Madre Occidental near Mesa Tres Ríos on the Chihuahua border. The river flows from Huachinera northward, west around the Sierra el Tigre, and then southward through Huásabas and

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Figure 2. View of Río Bavispe and foothills thornscrub on Rancho Pueblo Viejo. Photo by Thomas R. Van Devender.

Lower Bavispe Valley *continued*

Granados. The Río Yaqui proper begins where the Ríos Bavispe and Áros join. Plants were collected and observed in the lower Río Bavispe Valley as part of various projects. In May 1995, plants were collected at Cruz del Diablo, a spectacular overlook canyon east-northeast of Huásabas (Figure 1). Surprisingly, *Dalea tentaculoides*, a former candidate for listing under the U.S. Endangered Species Act, was found. This was the first record for Sonora and Mexico, 248 km. (154 mi.) southeast of the previously known population in Sycamore Canyon west of Nogales, Arizona. In June 2005, the area was extensively resurveyed as part of a U.S. Fish and Wildlife Service status survey. We made a few more collections in this area in March 2012. A few additional collections from the Cruz del Diablo area in the SEINet database were made by Gary P. Nabhan (December 1978, February 1988), Elayne Joyal (June 1992), and Wendy Hodgson (July 2003).

A Madrean Archipelago Biodiversity Assessment (MABA) Expedition to the Sierra la Madera near Moctezuma in August 2010 visited various areas, including Rancho Mesa Quemada in the foothills thornscrub-oak woodland transition just west of the present study area. Transects were done in various areas in foothills thornscrub and in the riparian deciduous forest along the Río Bavispe in the Municipality of Huásabas in June

2005 (Cajón de los Pilares), September 2010, March 2012, and May 2016. The latter date was on a Madrean Discovery Expedition (MDE) Education trip for the purpose of giving a natural history presentation for the *Secundaria Técnica* (a middle school) in Huásabas.

In July 2011 and March 2012, we visited additional thornscrub areas in the Municipality of Granados. In November 2015, **GreaterGood.org** began Project WILDCAT to protect predators in the lower Río Bavispe Valley in the Municipalities of Divisaderos and Granados (Van Devender et al., in press) (Figure 2). In March–April and November 2016, we inventoried plants in 12 wildlife camera study areas on Ranchos el Barragán, el Carricito, el Carrizal, las Gallinas, el Hoyo, Pueblo Viejo, and many areas between them. Voucher specimens are mostly deposited in the herbaria at the University of Arizona (ARIZ) and Universidad de Sonora (USON). Records and observations are available in databases in the SEINet network (<http://swbiodiversity.org/seinet/>), especially the MDE (madreandiscovery.org) and Red de Herbarios del Noroeste de México (<http://herbanwmex.net/>) databases. The MABA database is no longer active, but the records are accessible through a link in the MDE database. Simple biological observations from areas are in the MDE database.

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Lower Bavispe Valley *continued*

The study area in this paper is from Cajón del Diablo west through Huásabas to the foothills of the Sierra la Madera and south to the junction of the Ríos Bavispe Valley and Áros in the Municipalities of Divisaderos, Granados, and Huásabas (Figures 1 and 2). The dominant vegetation at lower elevations (430–1,000 m., 1,410–3,280 ft.) in this area is foothills thornscrub (FTS) (Figure 3). At higher elevations on Ranchos el Barragán (1,384–1,510 m. elevation, 4,540–4,954 ft.); 12.2 km. (7.5 mi.) SW of Granados and las Gallinas (1,004–1,283 m. elevation, 3,293–4,209 ft.); 16.0 km. (10 mi.) ESE of Divisaderos, and Cruz del Diablo (1,000–1,300 m. elevation, 3,280–4,265 ft.); 7.1 km. (4.5 mi.) ENE of Huásabas, FTS transitions into desert grassland. On the lower slopes of the Sierra la Madera, FTS transitions into oak woodland. Riparian deciduous forest is found along the Río Bavispe, Arroyo Bacadéhuachi, and larger arroyos.

Results and Discussion

Flora. A total of 401 plant taxa in 74 families and 274 genera has been recorded in the lower Rio Bavispe Valley study area. This includes 24 non-native species (6.0%). The families with the most species were Asteraceae (50), Fabaceae (50), Poaceae (42), Euphorbiaceae (20), Malvaceae (19), Cactaceae (13),

Solanaceae (15), and Pteridaceae (11), representing 54.9% of the flora. The genera with the most species were *Acacia* (8), *Bouteloua* (7), *Euphorbia* (6), *Quercus* (6), *Muhlenbergia* (5), *Boerhavia* (5), and *Opuntia* (5).

Tropical species typical of tropical deciduous forest (TDF) and foothills thornscrub (FTS) include *Alvaradoa amorphoides*, *Brahea brandegeei*, *Ceiba acuminata* (Figures 4A and B), *Diphysa suberosa*, *Ficus petiolaris*, *Fouquieria macdougalii*, *Haematoxylum brasiletto* (Figure 5), *Heliocarpus attenuatus*, *Lasiacis ruscifolia*, *Lysiloma divaricatum*, *Parkinsonia praecox*, *Parthenium tomentosum* var. *stramonium* (Figures 6A and B), *Rhynchosia precatória*, and *Solanum umbellatum*. Oak woodland species are *Lasianthaea podocephala*, *Quercus emoryi*, *Q. viminea*, and *Rhus virens*. Sonoran desertscrub species are *Cylindropuntia fulgida*, *Encelia farinosa*, and *Olneya tesota*. Isolated stands of *O. tesota* near Rancho el Hoyo (29.6425°N 109.2405°W) and Pueblo Viejo (109.2373°W, both Municipality of Divisaderos) and between Granados and Huásabas (29.8914°N 109.3131°W, Municipality of Huásabas) in FTS, and in Arroyo Palo Pinto southwest of San Nicolás (28.3758°N 109.2581°W, Municipality of Yécora) in TDF are the easternmost stands of

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Figure 3. Foothills thornscrub on Rancho el Hoyo. *Stenocereus thurberi* and *Hechtia montana* are visible. Photo by Thomas R. Van Devender.



Figure 4A and B. *Ceiba acuminata* thorns and fruit in the Sierra Mazatán. Photos by Robert A. Villa.

Figure 5. *Haematoxylum brasiletto* near Nácori Grande. Photo by Thomas R. Van Devender.

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this iconic desert tree. *Hibiscus acicularis* is an interesting species that is widespread in the Chihuahuan Desert in northeastern Mexico. It is a small woody shrub that resembles *H. coulteri*, except that the flower is canary yellow (Figure 7). Its presence in Sonora was only recognized in 1979 but it is presently known from 15 localities in Sonoran deserts scrub and FTS. It is not yet known for Arizona.



Riparian trees along the Río Bavispe include *Populus fremontii*, *Salix bonplandiana*, *S. gooddingii*, *Platanus wrightii*, *Fraxinus velutina*, and *Juglans major*. The latter has *Amenazada* (Threatened) protection status in the Mexican endangered species law (Diario Oficial de la Federación, NOM-059-SEMARNAT-2010), even though it is widespread and common in riparian habitats in many areas in northeastern Sonora. Tropical riparian trees in the flora include *Guazuma ulmifolia*, *Havardia mexicana*, *Sapindus saponaria*, and *Vitex mollis*. Previously, *S. saponaria* was thought to have varieties *drummondii* and *saponaria*. Felger et al. (2001) pointed out that the two taxa do not intergrade, and that *S. drummondii* of the southwestern United States is a

separate species. The two species are sympatric in Arroyo los Pavos on the Northern Jaguar Reserve. The population of *S. saponaria* on Rancho Pueblo Viejo is the northernmost locality for the species.

Noteworthy species include *Bernardia myricifolia* (Chihuahuan species known from three localities in Sonora), *Dalea tentaculoides* (see above), *Mabrya geniculata* (genus of two species in Chihuahua and Sonora), and *Metastelma mexicanum* (former U.S. Endangered Species Act candidate species as *Cynanchum wigginsii*). Noteworthy succulents

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Figure 6A and B. *Parthenium tomentosum* var. *stramonium* near Bacanora. Photos by Thomas R. Van Devender.



Figure 7. *Hibiscus acicularis* near Mazatán. Photo by Thomas R. Van Devender.

Figure 8. *Agave ocahui* in the Sierra Mazatán. Photo by Stephen F. Hale.



Lower Bavispe Valley

continued

include *Agave ocahui* (Sonoran endemic described by Howard S. Gentry, Figure 8), *A. parviflora*, *Nolina matapensis* (tree nolina in Sonora and adjacent Chihuahua and Sinaloa and Sonora; named for Mátape, Sonora, Figures 9A and B), *O. puberula* (small, brittle, spiny tropical *siviri* near its northern limits), and *Yucca grandiflora* (big tree yucca in Sonora and adjacent Chihuahua). The small Santa Cruz striped agave (*A. parviflora*) is a species of Special Concern in Arizona. The species has *Amenazada* (Threatened) protection status in the Mexican endangered species law (NOM 059 SEMARNAT 2010). There are three subspecies in Sonora: *A. p.* var. *parviflora* is in southern Arizona and adjacent Sonora. The *A. p.* ssp. *flexiflora* is endemic to eastern Sonora from the Mátape-Moctezuma area east to the Huásabas-Nácori Chico area. The *A. p.* ssp. *densiflora* in the Maycoba area in the Sierra Madre Occidental in eastern Sonora is a larger variety (Starr and Van Devender 2011). All are locally common and not in danger.

The flora of foothills thornscrub is an important part of the flora of Sonora and the transition from the New World tropics to the north temperate

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Figure 9A and B. *Nolina matapensis* on Ranchos Pueblo Viejo and las Gallinas. Photos by Thomas R. Van Devender.

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zone. The lower Río Bavispe Valley flora presented here is the first detailed thornscrub plant list to be published.

Acknowledgements

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An asterisk (*) denotes non-native status.

Lycophytes

SELAGINELLACEAE

Selaginella rupincola

Pteridophytes

ASPLENIACEAE

Asplenium palmeri Maxon

DRYOPTERACEAE

Phanerophlebia auriculata
Underwood

Woodsia plummerae Lemmon

PTERIDACEAE

Argyrochosma incana (C. Presl)
Windham

Argyrochosma limitanea (Maxon)
Windham

Astrolepis cochisensis (Goodding)
Benham & Windham

Astrolepis sinuata (Lag. ex Sw.)
Benham & Windham

Bommeria hispida (Mett. ex Kuhn)
Underwood

Myriopteris pringlei (Davenp.) Grusz &
Windham

Myriopteris wrightii (Hook.) Grusz &
Windham

Notholaena lemmonii D.C. Eaton var.
lemmonii

Pellaea intermedia Mett. ex Kuhn

Pellaea wrightiana Hook.

Gymnosperm

CUPRESSACEAE

Juniperus arizonica (R.P. Adams) R.P.
Adams

Eudicots

ACANTHACEAE

Anisacanthus thurberi (Torr.) A. Gray

Carlwrightia arizonica A. Gray

Dicliptera resupinata (Vahl) Juss.

Elytraria imbricata (Vahl) Pers.

Henrya insularis Nees ex Benth.

Justicia candicans (Nees) L.D. Benson

Justicia sonora Wasshausen

Ruellia nudiflora (Engelm. & A. Gray)
Urban

Tetramerium nervosum Nees

ACHATOCARPACEAE

Phaulothamnus spinescens A. Gray

AIZOACEAE

Trianthema portulacastrum L.

AMARANTHACEAE

Amaranthus palmeri S. Watson

Atriplex elegans (Moq.) D. Dietr

Chenopodium ambrosioides L.

Chenopodium neomexicanum Standl.

Froelichia interrupta (L.) Moq.

Gomphrena sonora Torr.

Iresine hartmanii Uline

Tidestromia lanuginosa (Nutt.) Standl.

ANACARDIACEAE

Rhus virens Lindh. ex A. Gray subsp.
choriophylla (Wooton & Standl.)
Young

APIACEAE

* *Bowlesia incana* Ruiz & Pav.

Daucus pusillus Michx.

Spermolepis lateriflora G.L. Nesom

APOCYNACEAE

Asclepias leptopus I.M. Johnst.

Asclepias linaria Cav.

Funastrum clausum Schltr.

Funastrum hartwegii (Vail) Schltr.

Gonolobus arizonicus (A. Gray) Woods.

Marsdenia edulis S. Watson

Metastelma mexicanum (Brandege) M.

Fishbein & R. Levin

Vallesia glabra Link

ARALIACEAE

Hydrocotyle umbellata L.

ARISTOLOCHIACEAE

Aristolochia watsonii Wooton & Standl.

ASTERACEAE

Acourtia thurberi (A. Gray) Reveal &
King

Ambrosia ambrosioides (Cav.) W.W.
Payne

Ambrosia confertiflora DC.

Ambrosia cordifolia (A. Gray) W.W.
Payne

Artemisia dracunculus L.

Artemisia ludoviciana Nutt.

Baccharis pteronioides DC.

Baccharis salicifolia (Ruiz & Pav.) Pers.

Baccharis sarothroides A. Gray

Baccharis thesioides Kunth

Bebbia juncea (Benth.) Greene

Brickellia coulteri A. Gray

Brickellia venosa (Wooton & Standl.)
B.L. Robins.

Calycoseris wrightii A. Gray

Carminatia tenuiflora DC.

Carphochaete bigelovii A. Gray

Coreocarpus arizonicus (A. Gray) Blake

Diaperia verna (Rafinesque) Morefield

Eclipta prostrata (L.) L.

Encelia farinosa A. Gray ex Torr.

Gamochoeta purpurea (L.) Cabrera

Gamochoeta stagnalis (I.M. Johnst.)
Anderb.

Helenium thurberi A. Gray

Hymenoclea monogyra Torr. & A. Gray
ex A. Gray

Lagascea decipiens Hemsl.

Lasiantha podocephala (A. Gray) K.
Becker

Malacothrix glabrata (A. Gray ex D.C.
Eat.) A. Gray

Parthenium hysterophorus L.

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Parthenium tomentosum DC. var.
stramonium (Greene) Rollins

Pectis filipes Harvey & A. Gray

Pectis prostrata Cav.

Perityle californica Benth.

Perityle cordifolia S.F. Blake

Perityle microcephala A. Gray

Perityle microglossa var. *saxosa*
(Brandege) A.M. Powell

Porophyllum gracile Benth.

Porophyllum macrocephalum DC.

Rafinesquia neomexicana A. Gray

* *Sonchus oleraceus* L.

Symphyotrichum expansum (Poepp.
ex Spreng.) G.L. Nesom

Thymophylla anomala Rydb.

Thymophylla concinna (A. Gray)
Strother

Tithonia thurberi A. Gray

Trixis californica Kellogg

Verbesina encelioides (Cav.) Benth. &
Hook. f. ex A. Gray subsp. *exauriculata*
(B.L. Rob. & Greenm.) J.R. Coleman

Viguiera dentata (Cav.) Spreng.

Xanthisma gracile (Nutt.) D.R. Morgan
& R.L. Hartm.

Xanthium strumarium L.

Zinnia peruviana (L.) L.

Zinnia zinnioides (Kunth) Olorode
& A.M. Torres

BIGNONIACEAE

Tecoma stans (L.) Juss. ex Kunth var.
angustatum Rehd.

BIXACEAE

Amoreuxia palmatifida Moc. & Sessé
ex DC.

BORAGINACEAE

Cordia sonora Rose

Cryptantha barbiger (A. Gray) Greene

Nama hispidum var. *sonora* C.L.
Hitchc.

Nama jamaicense L.

Phacelia affinis A. Gray

Phacelia gentryi Constance

Phacelia scariosa Brandege

BRASSICACEAE

* *Brassica tournefortii* Gouan

* *Nasturtium officinale* W.T. Aiton

* *Sisymbrium irio* L.

Descurainia pinnata (Walter) Britton

Erysimum capitatum (Douglas ex
Hook.) Greene

Lepidium lasiocarpum Nutt.

BURSERACEAE

Bursera fagaroides (Kunth) Engl. var.
elongata McVaugh & Rzed. McVaugh
& Rzed.

Bursera laxiflora S. Watson

CACTACEAE

Coryphantha recurvata (Engelm.)
Britton & Rose

Cylindropuntia fulgida (Engelm.)
Knuth

Cylindropuntia leptocaulis (DC.) Knuth

Cylindropuntia spinosior (Engelm.)
Knuth

Cylindropuntia thurberi (Engelm.) F.M.
Knuth in Backeb. & F.M. Knuth

Echinocereus rigidissimus (Engelm.)
Haage f.

Mammillaria grahamii Engelm. subsp.
grahamii

Mammillaria standleyi Orcutt.

Opuntia cf. *durangensis* Britton & Rose

Opuntia cf. *wilcoxii* Britton & Rose

Opuntia engelmannii Salm-Dyck

Opuntia gosseliniana A. Weber

Opuntia puberula Hort. Vindob. ex
Pfeiff.

Stenocereus thurberi (Engelm.)
Buxbaum

CANNABACEAE

Celtis pallida Torr.

Celtis reticulata Torr.

CONVOLVULACEAE

Evolvulus alsinoides L. var. *angustifolia*
Torr.

Evolvulus arizonicus A. Gray

Ipomoea arborescens (Humb. & Bonpl.)
G. Don var. *glabrata* (A. Gray) Gentry

Ipomoea hirsutula Jacq. f.

Ipomoea leptotoma Torr.

Jacquemontia pringlei A. Gray

CROSSOSOMATACEAE

Crossosoma bigelovii S. Watson

CUCURBITACEAE

Cucurbita digitata A. Gray

Echinopepon wrightii (A. Gray) S.
Watson

Schizocarpum palmeri Cogn. & Rose

EUPHORBIACEAE

Acalypha papillosa Rose

Argythamnia adenophora auct. non A.
Gray

Argythamnia serrata (Torr.) Müll. Arg.

Bernardia myricifolia (Scheele) S.
Watson

Cnidoscolus angustidens Torr.

Croton ciliatoglandulifer Ortega

Croton sonora Torr.

Croton texensis (Klotzsch) Müll. Arg.

Euphorbia cymosa Poir.

Euphorbia florida Engelm.

Euphorbia gracillima S. Watson

Euphorbia graminea Schlecht. & Cham.

Euphorbia hyssopifolia L.

Euphorbia setiloba Engelm. ex Torr.

Jatropha cardiophylla (Torr.) Müll. Arg.

Jatropha cordata Müll. Arg.

* *Ricinus communis* L.

Sebastiania bilocularis S. Watson

Tragia jonesii Radcl.-Sm. & Govaerts

Tragia nepetifolia Cav.

FABACEAE

Acacia angustissima (Mill.) Kuntze

Acacia cochliacantha Humb. & Bonpl. ex Willd.

Acacia constricta Benth.

Acacia crinita Brandegee

Acacia farnesiana (L.) Willd.

Acacia millefolia S. Watson

Acacia occidentalis Rose

Acacia russelliana (Britton & Rose) Lundell

Acmispon micranthus (Nutt. ex Torr. & A. Gray) Brouillet

Astragalus nuttalianus DC.

Caesalpinia caladenia Standl.

Caesalpinia pulcherrima (L.) Sw.

Calliandra eriophylla Benth.

Chamaecrista serpens Greene var. *wrightii* (A. Gray) H.S. Irwin & Barneby

Coursetia caribaea (Jacq.) Lavin var. *caribaea*

Coursetia glandulosa A. Gray

Dalea pringlei A. Gray var. *multijuga* Barneby

Dalea pulchra Gentry

Dalea tentaculoides Gentry

Desmanthus covillei (Britton & Rose) Wiggins ex B.L. Turner

Desmodium angustifolium (Kunth) DC.

Desmodium psilocarpum A. Gray

Diphysa suberosa S. Watson

Erythrina flabelliformis Kearney

Eysenhardtia orthocarpa (A. Gray) S. Watson

Galactia wrightii A. Gray

Haematoxylum brasiletto Karst.

Havardia mexicana Britton & Rose

* *Leucaena leucocephala* (Lam.) de Wit

Lupinus bicolor Lindl.

Lupinus sparsiflorus Benth.

Lysiloma divaricatum (Jacq.) J.F. Macbr.

Lysiloma watsonii Rose

Marina parryi (Torr. & A. Gray) Barneby

Mimosa biuncifera Benth.

Mimosa distachya Cav. var. *laxiflora* (Benth.) Barneby

Mimosa dysocarpa Benth.

Nissolia schottii (Torr.) A. Gray

Olneya tesota A. Gray

Parkinsonia aculeata L.

Parkinsonia praecox (Ruiz & Pav.) J.A. Hawkins

Piscidia mollis Rose

Prosopis velutina Wooton

Rhynchosia discolor M. Martens & Galeotti var. *discolor* Grear

Rhynchosia precatatoria DC.

Senna covesii (A. Gray) Irwin & Barneby

Senna pallida (Vahl) H.S. Irwin & Barneby var. *shreveana* H.S. Irwin & Barneby

Zapoteca formosa (Kunth) H.M. Hern. subsp. *rosei* (Wiggins) H.M. Hern.

Zapoteca formosa (Kunth) H.M. Hern. subsp. *schottii* (Torr. ex S. Watson) H.M. Hern.

Zornia reticulata Sm.

FAGACEAE

Quercus chihuahuensis Trel.

Quercus emoryi Torr.

Quercus oblongifolia Torr.

Quercus toumeyii Sarg.

Quercus tuberculata Liebm.

Quercus viminea Trel.

FOUQUIERIACEAE

Fouquieria macdougalii Nash

Fouquieria splendens Engelm.

JUGLANDACEAE

Juglans major (Torr.) Heller

KRAMERIACEAE

Krameria bicolor S. Watson

Krameria erecta Willd. ex J.A. Schultes

LAMIACEAE

Clerodendrum coulteri (A. Gray) Govaerts

Hedeoma nanum (Torr.) Briq.

Hyptis albida Kunth

* *Marrubium vulgare* L.

Salvia setosa Fernald

Stachys coccinea Ortega

Vitex mollis Kunth

LOASACEAE

Eucnide hypomalaca Standl.

Mentzelia multiflora (Nutt.) A. Gray

MALPIGHIACEAE

Callaeum macropterum (Moc. & Sessé ex DC.) D.M. Johnson

Cottisia californica (Benth.) W.R. Anderson & C. Davis

Cottisia linearis (Wiggins) W.R. Anderson

MALVACEAE

Abutilon abutiloides (Jacq.) Garcke ex Britton & Wilson

Abutilon incanum (Link) Sweet

Abutilon mollicomum (Willd.) Sweet

Abutilon reventum S. Watson

Ayenia filiformis S. Watson

Bastardiastrum cinctum (Brandegee) D.M. Bates

Ceiba acuminata Rose

Gossypium thurberi Todaro

Guazuma ulmifolia Lam.

Heliocarpus attenuatus S. Watson

Herissantia crispa (L.) Briz.

Hibiscus acicularis Standl.

Hibiscus coulteri Harvey ex A. Gray

CHECKLIST: Lower Bavispe Valley page 4 of 5

* *Malva parviflora* L.

Malvastrum bicuspidatum (S. Watson)
Rose

Malvastrum coromandelianum (L.)
Garcke

Sida abutifolia P. Mill.

Sida rhombifolia L.

Waltheria indica L.

MARTYNIACEAE

Proboscidea parviflora (Wooton)
Wooton & Standl.

MENISPERMACEAE

Cocculus diversifolius DC.

MORACEAE

Ficus petiolaris Kunth subsp. *petiolaris*

NYCTAGINACEAE

Allionia incarnata L.

Boerhavia coccinea P. Mill.

Boerhavia erecta L.

Boerhavia purpurascens A. Gray

Boerhavia triquetra S. Watson

Boerhavia xanti S. Watson

Commicarpus scandens (L.) Standl.

OLEACEAE

Fraxinus gooddingii Little

Fraxinus velutina Torr.

ONAGRACEAE

Oenothera curtiflora W.L. Wagner &
Hoch

Oenothera primiveris A. Gray

Oenothera rosea L'Hér. ex Ait.

OROBANCHACEAE

Castilleja tenuiflora Benth.

OXALIDACEAE

Oxalis corniculata L.

PAPAVERACEAE

Argemone ochroleuca Sweet

Eschscholzia californica Cham. subsp.
mexicana (Greene) C. Clark

PASSIFLORACEAE

Passiflora foetida L. var. *gossypiifolia*
(Desv. ex Ham.) Mast.

Turnera diffusa Willd. ex Schult.

PHRYMACEAE

Erythranthe guttata (Fisch. ex DC.) G.L.
Nesom

PICRAMIACEAE

Alvaradoa amorphoides Liebm.

PLANTAGINACEAE

* *Plantago major* L.

Mabrya geniculata (B.L. Rob. &
Fernald) Elisens

Maurandya antirrhiniflora Humb. &
Bonpl. ex Willd.

Penstemon parryi (A. Gray) A. Gray

Plantago patagonica Jacq.

Stemodia durantifolia (L.) Sw.

Veronica peregrina L. subsp. *xalapensis*
(Kunth) Pennell

PLATANACEAE

Platanus wrightii S. Watson

PLUMBAGINACEAE

Plumbago zeylanica L.

POLEMONIACEAE

Loeselia glandulosa (Cav.) G. Don

POLYGONACEAE

Antigonon leptopus Hook. & Arn.

Eriogonum abertianum Torr.

PORTULACACEAE

Portulaca oleracea L.

Portulaca suffrutescens Engelm.

Portulaca umbraticola Kunth

Talinum paniculatum (Jacq.) Gaertn.

PRIMULACEAE

Androsace occidentalis Pursh

RANUNCULACEAE

Clematis drummondii Torr. & A. Gray

Thalictrum fendleri Engelm. ex A. Gray

RHAMNACEAE

Condalia correllii M.C. Johnston

Condalia warnockii M.C. Johnston

Karwinskia humboldtiana Zucc.

Ziziphus obtusifolia (Hook. ex Torr. & A.
Gray) A. Gray

RUBIACEAE

Galium microphyllum A. Gray

Galium proliferum A. Gray

Hintonia latiflora Bullock

Randia laevigata Standl.

Randia sonorensis Wiggins

Randia thurberi S. Watson

RUTACEAE

Esenbeckia hartmanii B.L. Rob. &
Fernald

Zanthoxylum fagara Sargent

SALICACEAE

Populus fremontii S. Watson

Salix bonplandiana Kunth

Salix gooddingii Ball

SANTALACEAE

Phoradendron californicum Nutt.

Phoradendron serotinum (Raf.) M.C.
Johnst. subsp. *tomentosum* (DC.) Kuijt

SAPINDACEAE

Cardiospermum corindum L.

Dodonaea viscosa Jacq. var.
angustifolia (L. f.) Benth.

Sapindus saponaria L.

SAPOTACEAE

Sideroxylon occidentale (Hemsl.) T.D.
Penn.

SAURURACEAE

Anemopsis californica (Nutt.) Hook. &
Arn.

SCROPHULARIACEAE

Buddleja parviflora Kunth

Buddleja sessiliflora Kunth

CHECKLIST: Lower Bavispe Valley page 5 of 5

SOLANACEAE

- * *Nicotiana glauca* Graham
- Capsicum annuum* L. var. *glabriusculum* (Dunal) Heiser & Pickering
- Datura discolor* Bernh.
- Datura innoxia* P. Mill.
- Lycium andersonii* A. Gray
- Lycium berlandieri* Dunal
- Lycium exsertum* A. Gray
- Nicotiana obtusifolia* Mertens & Galeotti
- Petunia parviflora* Juss.
- Physalis acutifolia* (Miers) Sandw.
- Physalis wrightii* A. Gray
- Solanum americanum* P. Mill.
- Solanum houstonii* Martyn
- Solanum lumholtzianum* Bartlett
- Solanum umbellatum* Willd. ex Roem. & Schult.

TAMARICACEAE

- * *Tamarix aphylla* (L.) Karst.

URTICACEAE

- Parietaria hespera* Hinton

VERBENACEAE

- Aloysia gratissima* (Gillies & Hook.) Troncoso
- Glandularia pumila* (Rydb.) UMBER
- Lantana achyranthifolia* Desf.
- Lantana camara* L.
- Lantana urticifolia* Mill.
- Verbena neomexicana* (A. Gray) Small

ZYGOPHYLLACEAE

- Guaiaacum coulteri* A. Gray
- Kallstroemia grandiflora* Torr. ex A. Gray
- Kallstroemia parviflora* J.B.S. Norton

Monocots

ARECACEAE

- Brahea brandegeei* (C. Purpus) H. E. Moore

ASPARAGACEAE

- Agave angustifolia* Haw.
- Agave ocahui* Gentry
- Agave parviflora* Torr. subsp. *flexiflora* Gentry
- Agave shrevei* Gentry subsp. *matapensis* Gentry
- Dasyilirion gentryi* D.J. Bogler
- Nolina matapensis* Wiggins
- Yucca grandiflora* Gentry
- Yucca madrensis* Gentry

BROMELIACEAE

- Hechtia montana* Brandegee
- Tillandsia recurvata* (L.) L.

CYPERACEAE

- * *Cyperus rotundus* L.

POACEAE

- Aristida adscensionis* L.
- Aristida schiediana* Trin. & Rupr.
- Aristida ternipes* Cav. var. *gentilis* (Henrard) Allred
- Aristida ternipes* Cav. var. *ternipes*
- * *Arundo donax* L.
- * *Avena sativa* L.
- Bothriochloa barbinodis* (Lag.) Herter
- Bouteloua aristidoides* (Kunth) Griseb.
- Bouteloua barbata* Lag.
- Bouteloua curtipendula* (Michx.) Torr.
- Bouteloua diversispicula* J.T. Columbus
- Bouteloua hirsuta* Lag.
- Bouteloua radicata* (E. Fourn.) Griffiths
- Bouteloua repens* (Kunth) Scribn. & Merr.
- Brachiaria arizonica* (Scribn. & Merr.) S.T. Blake

- Chloris virgata* Sw.

- * *Cynodon dactylon* (L.) Pers.

- * *Dactyloctenium aegyptium* (L.) Willd.
- Digitaria californica* (Benth.) Henr.
- Dinebra panicea* (Retz.) P.M. Peterson & N. Snow subsp. *brachiata* (Steud.) P.M. Peterson & N. Snow

- Disakisperma dubium* (Kunth) P.M. Peterson & N. Snow

- * *Echinochloa colona* (L.) Link

- * *Eragrostis cilianensis* (All.) Vignolo ex Janch.

- Eragrostis intermedia* A.S. Hitchc.

- Eragrostis pectinacea* (Michx.) Nees var. *pectinacea*

- Heteropogon contortus* (L.) Beauv. ex Roemer & J.A. Schultes

- Lasiacis ruscifolia* (Kunth) Hitchc.

- * *Melinis repens* (Willd.) Zizka

- Muhlenbergia dumosa* Scribn. ex Vasey

- Muhlenbergia elongata* Scribn. ex Beal

- Muhlenbergia emersleyi* Vasey

- Muhlenbergia microsperma* (DC.) Trin.

- Muhlenbergia rigens* (Benth.) A.S. Hitchc.

- Panicum hirticaule* J. Presl

- Paspalum hartwegianum* E. Fourn. ex Hemsl.

- * *Pennisetum ciliare* (L.) Link

- * *Polypogon monspeliensis* (L.) Desf.

- * *Polypogon viridis* (Gouan) Breistr.

- Setaria liebmannii* E. Fourn.

- Setaria macrostachya* Kunth

- Setaria parviflora* (Poir.) Kerguelen

- * *Sorghum halepense* (L.) Pers.

- Tripsacum lanceolatum* Rupr. ex E. Fourn.

TYPHACEAE

- Typha domingensis* Pers.