



Figure 1. View from the summit of the Sierra La Púrica. Photo by Charles Hedgcock.

Preliminary Flora of the Sierra La Púrica, Sonora, Mexico

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Abstract

The Sierra La Púrica is a Sky Island mountain range north-northwest of Nacozari de García (municipality of the same name), Sonora, Mexico, in the Área de Protección de Flora y Fauna Bavispe in the Comisión Nacional de Áreas Naturales Protegidas. The Madrean Archipelago Biodiversity Assessment Expedition Sierra La Púrica took place in July and September 2013. The preliminary flora contains 306 plant taxa in 215 genera and 71 families. Families with the most taxa were Poaceae (49 taxa), Asteraceae (43 taxa), and Fabaceae (32 taxa). Genera with the most species were *Bouteloua* (9), *Quercus* (8), *Muhlenbergia* (7), *Eragrostis* (6), *Euphorbia* (6), *Ipomoea* (5), and *Solanum* (5). Sixteen species (5.2%) are non-native. *Stevia puricana*, described by Billie L. Turner in 2015, is only known from the Sierra La Púrica.

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Introduction

There are 55 isolated mountain ranges or complexes of several ranges connected by oak woodland corridors in the Madrean Archipelago (= Sky Island Region) between the Sierra Madre Occidental in eastern Sonora and the Mogollon Rim in central Arizona (Van Devender et al. 2013). These Sky Islands are crowned with oak woodland or pine-oak forest. The lowland “seas” below them are Sonoran and Chihuahuan desertscrub, desert grassland, foothills thornscrub, or tropical deciduous forest. In this paper, we present the preliminary vascular flora of the Sierra La Púrica, a Sky Island mountain range located north-northwest of Nacozari de García in northeastern Sonora, Mexico.

Study Area

The Sierra La Púrica is part of a federally protected area managed by the Comisión Nacional de Áreas Naturales Protegidas (CONANP; Figure 1). It was designated the Reserva Forestal Nacional y Refugio de la Fauna Silvestre “Bavispe” in 1939 (Diario Oficial de la Federación 1939) and

continued next page



Figure 2. A. Pine-oak forest in the Sierra La Púrica. B. Arizona pine (*Pinus arizonica*). Photos by Ana L. Reina-G.

Sierra La Púrica *continued*

reorganized as the Área de Protección de Flora y Fauna “Bavispe” in 2017 (Diario Oficial de la Federación, 2017). The Comisión Nacional para el Uso y Conocimiento de la Biodiversidad en México (CONABIO) included the Sierra La Púrica within the Región Terrestre Prioritaria RTP-42 (Arriaga 2000).

The Sierra La Púrica is part of a Sky Island complex in northeastern Sonora with the Sierras la Buenos Aires and de los Ajos to the north and Sierra Nacozari to the south. The east side of the Sierra La Púrica drains into the Río Cabullona, an upper tributary of the Río Bavispe-Yaqui drainage. The western slopes drain into the Río Sonora. The southeastern edge of the Sierra La Púrica and the connecting Sierra Nacozari drain into the Río Santa Rosa to the Río Moctezuma, and eventually the Río Yaqui.

The Sierra La Púrica study area is in the municipalities of Bacoachi and Nacozari, Sonora, in the CONANP APFF Bavispe and several nearby localities outside the reserve in an area delimited by the coordinates 30.6378°N 109.7778°W and 30.5142°N 109.66°W. The elevation is 1,435–2,450 m. (4,708–8,038 ft.), an elevational range of 1,015 m. (3,330 ft.).

Plant Collections

Historically, there have not been many records of plants in the Sierra La Púrica. In 2010, Aaron D. Flesch made observation of trees along breeding bird transects. Most of the collections and observations in this paper were made by the authors and Stephen F. Hale as part of the Sky Island Alliance’s Madrean Archipelago Biodiversity Assessment (MABA) Expedition Sierra La Púrica on July 16–18 (scouting trip) and September 7–11, 2013. Nearly 500 species of animals and plants were

recorded by 46 participants. The flora was documented by 945 botanical specimens deposited in the Universidad de Sonora, University of Arizona, and University of Texas herbaria. Herbarium records and field observations are available in the MABA database (accessible online through the Madrean Discovery Expedition [MDE, madreandiscovery.org] and Red de Herbarios del Noroeste de México [herbanwmex.net] databases).

Results

Vegetation. The vegetative communities of this Sky Island include desert grassland at the lowest elevations, oak woodland on the slopes, and pine-oak forest at the highest elevations (Figures 2A and B).

Desert Grassland. Grasses are common with several species of *Aristida*, *Bouteloua*, *Eragrostis*, and *Muhlenbergia*. Pinyon ricegrass (*Piptochaetium fimbriatum*), Pringle needlegrass (*P. pringlei*), yellow foxtail (*Setaria pumila*), liverseed grass (*Urochloa panicoides*), and bulb panicgrass (*Zuloagaea bulbosa*) are also present. Trees and shrubs include Arizona juniper (*Juniperus arizonica*), velvet mesquite (*Prosopis velutina*), and mimosas (*M. biuncifera*, *M. dysocarpa*). Succulents include cane cholla (*Cylindropuntia spinosior*) (Figure 3A), dark-spined pricklypear (*Opuntia phaeacantha*), and banana yucca (*Yucca baccata*). Tufted milkweed (*Asclepias nummularia*) (Figure 3B) is an unusual, tiny milkweed.

Oak Woodland. The slopes support Arizona white oak (*Quercus arizonica*), blue oak (*Q. oblongifolia*), Emory oak/bellota (*Q. emoryi*), Toumey oak (*Q. toumeyii*), willowleaf oak (*Q. viminea*), and alligator juniper (*J. deppeana*). Shrubs

continued next page



Figure 3. Desert grassland plants. A. Cane cholla (*Cylindropuntia spinosior*). Photo by Doug Danforth. B. Tufted milkweed (*Asclepias nummularia*). Photo by Thomas R. Van Devender.

Sierra La Púrica *continued*

include point-leaf manzanita (*Arctostaphylos pungens*), silk tassel (*Garrya wrightii*), evergreen sumac (*Rhus virens*), and lemonade berry (*R. aromatica*). Succulents are Arizona rainbow cactus (*Echinocereus rigidissimus*) (Figure 4a), scarlet hedgehog cactus (*E. santaritensis*), pancake pricklypear (*O. chlorotica*), mountain yucca (*Yucca madrensis*), and Huachuca century plant (*Agave parryi* var. *huachuensis*) (Figure 4B).

Pine-oak Forest. Plants in the higher elevations include Arizona pine (*Pinus arizonica*) (Figure 2B), Chihuahuan pine (*P. chihuahuana*), quaking aspen (*Populus tremuloides*), Arizona madrone (*Arbutus arizonica*), creambush (*Holodiscus discolor*), Gambel oak (*Q. gambelii*) (Figure 5A), netleaf oak (*Q. rugosa*), silverleaf oak (*Q. hypoleucoides*), buckbrush (*Ceanothus buxifolius*), Cardinal catchfly (*Silene laciniata*) (Figure 5B), Arizona sage (*Salvia arizonica*) (Figure 6A), Chiricahua mountain eryngo (*Eryngium lemmonii*) (Figure 6B), green death camas (*Zigadenus virescens*) (Figure 6C), five-nerve helianthella (*Helianthella quinquenervis*), alpine wood sorrel (*Oxalis alpina*), tenleaf wood sorrel (*O. decaphylla*), and hairy brackenfern (*Pteridium aquilinum* var. *pubescens*).

Riparian Deciduous Forest. In areas with riparian forest and tributary streams, Fremont cottonwood (*Populus fremontii*), huérigo (*P. monticola*), Goodding willow (*Salix gooddingii*), Arizona walnut (*Juglans major*), Arizona sycamore (*Platanus wrightii*), bigtooth maple (*Acer grandidentatum*), black cherry (*Prunus serotina* subsp. *virens*), poison ivy (*Toxicodendron radicans*), and junco (*Adolphia infesta*) are present.

Flora. A total of 306 plant taxa in 215 genera and 71 families was recorded. Families with the most species are Poaceae (49 taxa, 12 non-native), Asteraceae (43 taxa), and Fabaceae (32 taxa). Genera with the most species are *Bouteloua* (9), *Quercus* (8), *Muhlenbergia* (7), *Eragrostis* (6), *Euphorbia* (6), *Ipomoea* (5), and *Solanum* (5). Sixteen species (5.2%) are non-native. Noteworthy species include green death camas (*Zigadenus virescens*), elusive grama (*Bouteloua eludens*), five-nerve helianthella, Sonoran bird's-foot trefoil (*Hosackia alamosana*), hierba del piojo (*Mandevilla stans*), Pringle needlegrass (*Piptochaetium pringlei*), quaking aspen (*Populus tremuloides*), Gambel oak (*Quercus gambelii*), and *Stevia puricana*. Species protected in the Mexican endangered species law NOM 059-2010 (Diario Oficial de la Federación, 2010) include saya (*Amoreuxia palmatifida*, *Protegida* – Protected), *Zigadenus virescens* (*Protegida* – Protected), and Arizona walnut (*Juglans major*, *Amenazada* –Threatened). Although *J. major* is listed as a protected species, it is widespread and common in riparian habitats in many areas in northeastern Sonora. *Stevia puricana* was recently described from a specimen collected in the Sierra La Púrica (Turner 2015).

Discussion

Although this flora is just a beginning, it serves as an instrument for conservation, land management, research, and education. This preliminary plant checklist, including several rare and protected species, will support continued federal protection of the lands and furthering conservation of wildlife in the area.

continued next page



Figure 4. Oak woodland plants. A. Rainbow hedgehog cactus (*Echinocereus rigidissimus*). Photo by Thomas R. Van Devender. B. Huachuca century plant (*Agave parryi* var. *huachuensis*). Photo by Charles Hedgcock.

Sierra La Púrica *continued*

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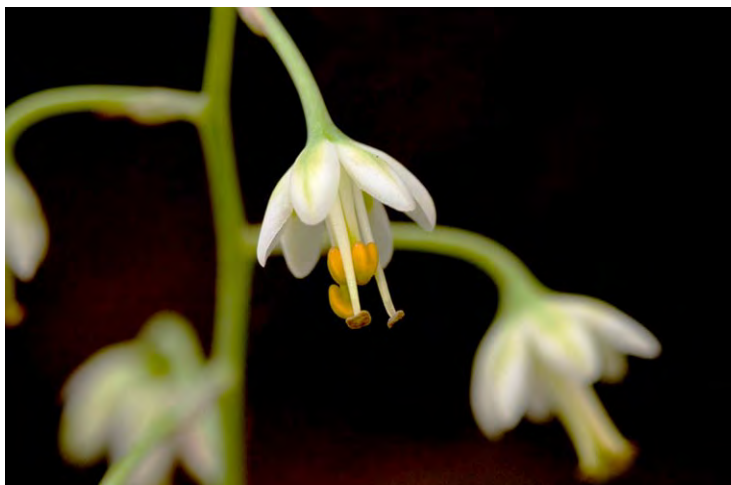
(APFF Bavispe) helped organize the Expedition. We thank Noah Horton and **GreaterGood.org** for funding the Expedition.



continued next page



Figure 5. Pine-oak forest plants. A. Gambel oak (*Quercus gambelii*). Photo by Thomas R. Van Devender. B. Cardinal catchfly (*Silene laciniata*). Photo by Michael McNulty.



Sierra La Púrica *continued*

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Figure 6. Pine-oak forest plants.

A. Arizona sage (*Salvia arizonica*). Photo by J. Jesús Sánchez-E.

B. Chiricahua mountain eryngo (*Eryngium lemmonii*). Photo by Chris Roll.

C. Death camas (*Zigadenus virens*). Photo by Patrick Alexander.

CHECKLIST: Sierra La Púrica

page 1 of 4

An asterisk (*) denotes non-native status.

Pteridophytes

DENNSTAEDTIACEAE

Pteridium aquilinum (L.) Kuhn var. *pubescens* Underwood

PTERIDACEAE

Adiantum patens Willd.

Argyrochosma limitanea (Maxon) Windham

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

Bommeria hispida (Mett. ex Kuhn) Underwood

Myriopteris aurea (Poir.) Grusz & Windham

Myriopteris lindheimeri (Hook.) J. Sm.

Myriopteris wrightii (Hook.) Grusz & Windham

Pellaea ternifolia (Cav.) Link subsp. *ternifolia*

Gymnosperms

CUPRESSACEAE

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

Juniperus deppeana Steud.

PINACEAE

Pinus arizonica Engelm.

Pinus chihuahuana Engelm.

Pinus engelmannii Carr.

Eudicots

ACANTHACEAE

Elytraria imbricata (Vahl) Pers.

Tetramerium nervosum Nees

AMARANTHACEAE

Alternanthera caracasana Kunth

Amaranthus palmeri S. Watson

Amaranthus powellii S. Watson

Chenopodium neomexicanum Standl.

Dysphania graveolens (Willdenow)

Mosyakin & Clemants

Gomphrena nitida Rothrock

Gomphrena sonora Torr.

Guilleminea densa (Humb. & Bonpl. ex Willd.) Moq.

ANACARDIACEAE

Rhus aromatica Aiton

Rhus virens Lindh. subsp. *choriophylla* (Wooton & Standl.) Young

Toxicodendron radicans (L.) Kuntze

APIACEAE

Eryngium lemmonii Coult. & Rose

APOCYNACEAE

Asclepias elata Benth.

Asclepias hypoleuca (A. Gray) Woods.

Asclepias nummularia Torr.

Asclepias nyctaginifolia A. Gray

Mandevilla stans (A. Gray) J.K. Williams

ARALIACEAE

Aralia humilis Cav.

ARISTOLOCHIACEAE

Aristolochia watsonii Wooton & Standl.

ASTERACEAE

Acourtia thurberi (A. Gray) Reveal & King

Adenophyllum cancellatum (Cass.) Villareal

Adenophyllum porophylloides (A. Gray) Strother

Ambrosia confertiflora Dc.

Artemisia ludoviciana Nutt.

Baccharis pteronioides Dc.

Baccharis salicifolia (Ruiz & Pav.) Pers.

Baccharis thesioides Kunth

Bidens bigelovii A. Gray

Bidens pilosa L.

Brickellia betonicifolia A. Gray

Brickellia californica (Torr. & A. Gray) A. Gray

Carminatia tenuiflora DC.

Cirsium arizonicum (A. Gray) Petrak

Cirsium neomexicanum A. Gray

Cosmos parviflorus (Jacq.) Pers.

Erigeron arisoli G.L. Nesom

Gutierrezia wrightii A. Gray

Gymnosperma glutinosum (Spreng.) Less.

Helianthella quinquenervis (Hook.) A. Gray

Heterosperma pinnatum Cav.

Hieracium albiflorum Hook.

Hieracium fendleri Schultz-Bip.

Lasianthaea podocephala (A. Gray) K. Becker

Machaeranthera tagetina Greene

Melampodium appendiculatum B.L. Robins.

Melampodium longicorne A. Gray

Pectis prostrata Cav.

Porophyllum macrocephalum DC.

Schkuhria pinnata (Lam.) Kuntze ex Thell.

Senecio wootonii Greene

Simsia amplexicaulis Pers.

Stephanomeria pauciflora (Torr.) A. Nels.

Stevia palmeri A. Gray var. *palmeri*

Stevia puricana B.L. Turner

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

Tagetes lemmonii A. Gray

Tithonia thurberi A. Gray

Verbesina longifolia (A. Gray) A. Gray

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

Xanthium strumarium L.

Xanthocephalum gymnospermoides (A. Gray) Benth. & Hook. f.

Zinnia peruviana (L.) L.

CHECKLIST: Sierra La Púrica page 2 of 4

BIGNONIACEAE

Chilopsis linearis (Cav.) Sweet
Tecoma stans (L.) Juss. ex Kunth

BIXACEAE

Amoreuxia palmatifida Moc. & Sessé ex DC.

BORAGINACEAE

Lithospermum cobrense Greene

BRASSICACEAE

Hesperidanthus linearifolius (A. Gray) Rydb.

Lepidium thurberi Wooton

* *Nasturtium officinale* R. Br.

Pennellia longifolia (Benth.) Rollins

CACTACEAE

Coryphantha recurvata (Engelm.) Britt. & Rose

Cylindropuntia spinosior (Engelm.) Knuth

Echinocereus rigidissimus (Engelm.) Hort.

Echinocereus santaritensis W. Blum & Rutow

Opuntia chlorotica Engelm. & Bigelow

Opuntia phaeacantha Engelm.

CAMPANULACEAE

Lobelia anatina F. Wimmer

CANNABACEAE

Celtis reticulata Torr.

CARYOPHYLLACEAE

Drymaria leptophylla (Cham. & Schlecht.) Fenzl ex Rohrb.

Silene laciniata Cav. var. *greggii* (Gray) S. Watson

Silene thurberi S. Watson

CONVOLVULACEAE

Evolvulus alsinoides L. var. *angustifolia* Torr.

Evolvulus arizonicus A. Gray

Ipomoea costellata Torr.

Ipomoea cristulata Hallier f.

Ipomoea longifolia Benth.

Ipomoea purpurea (L.) Roth

Ipomoea thurberi A. Gray

CRASSULACEAE

Graptopetalum rusbyi (Greene) Rose

CUCURBITACEAE

Apodanthera undulata A. Gray

Cucurbita digitata A. Gray

Cucurbita foetidissima Kunth

Echinopepon wrightii (A. Gray) S. Watson

ERICACEAE

Arbutus arizonica (A. Gray) Sarg.

Arctostaphylos pungens Kunth

EUPHORBIACEAE

Acalypha neomexicana Muell.-Arg.

Cnidoscolus angustidens Torr.

Euphorbia dioica Hieron.

Euphorbia heterophylla L.

Euphorbia hirta L.

Euphorbia hyssopifolia L.

Euphorbia indivisa (Engelm.) Tidestrom

Euphorbia lurida Engelm.

Jatropha macrorrhiza Benth.

Manihot angustiloba (Torr.) Muell. Arg.

Tragia laciniata (Torr.) Muell. Arg.

Tragia nepetifolia Cav. var. *dissecta* Muell. Arg.

FABACEAE

Acacia farnesiana (L.) Willd.

Acaciella tequilana (S. Watson) Britton & Rose

Acmispon greenei (Wooton & Standl.) Brouillet

Acmispon oroboides (Kunth) Brouillet

Aeschynomene villosa Poir.

Amorpha fruticosa L.

Calliandra humilis Benth. var. *humilis*

Calliandra humilis Benth. var. *reticulata* (A. Gray) L. Benson

Chamaecrista absus (L.) H.S. Irwin & Barneby var. *meonandra* (Irwin & Barneby) Irwin & Barneby

Chamaecrista nictitans (L.) Moench

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

Cologania angustifolia Kunth

Coursetia caribaea (Jacq.) Lavin

Crotalaria pumila Ortega

Dalea versicolor Zucc.

Desmodium hartwegianum Hemsl.

Desmodium retinens Schlecht.

Desmodium rosei Schub.

Erythrina flabelliformis Kearney

Eysenhardtia orthocarpa (A. Gray) S. Watson

Hosackia alamosana Rose

Lupinus sparsiflorus Benth.

Macroptilium gibbosifolium (Ortega) A. Delgado

Mimosa biuncifera Benth.

Mimosa dysocarpa Benth.

Mimosa grahamii A. Gray

Parkinsonia aculeata L.

Phaseolus acutifolius A. Gray

Prosopis velutina Wooton

Robinia neomexicana A. Gray

Vicia pulchella Kunth

Zornia reticulata Sm.

FAGACEAE

Quercus arizonica Sarg.

Quercus emoryi Torr.

Quercus gambelii Nutt.

Quercus hypoleucoides A. Camus

Quercus oblongifolia Torr.

Quercus rugosa Née

Quercus toumeyi Sarg.

CHECKLIST: Sierra La Púrica

page 3 of 4

Quercus viminea Trel.

FOUQUIERIACEAE

Fouquieria splendens Engelm.

GARRYACEAE

Garrya wrightii Torr.

JUGLANDACEAE

Juglans major (Torr.) Heller

LAMIACEAE

Agastache pallida (Lindl.) Cory var.
coriacea R.W. Sanders

Hedeoma hyssopifolia A. Gray

Hedeoma oblongifolia A. Heller

Monarda citriodora Cerv. var.
austromontana (Epling) B.L. Turner

Salvia arizonica A. Gray

Salvia setosa Fernald

Salvia subincisa Benth.

Stachys coccinea Ortega

Trichostema arizonicum A. Gray

LOASACEAE

Mentzelia isolata Gentry

LYTHRACEAE

Cuphea wrightii A. Gray

MALPIGHIACEAE

Aspicarpa hirtella L.C. Rich.

MALVACEAE

Anoda cristata (L.) Schlecht.

Gossypium thurberi Todaro

* *Malva parviflora* L.

Sida procumbens Sw.

MARTYNIACEAE

Proboscidea parviflora (Wooton)
Wooton & Standl.

MELANTHIACEAE

Zigadenus virens (Kunth) J.F. Macbr.

MOLLUGINACEAE

Mollugo verticillata L.

MONTIACEAE

Phemeranthus aurantiacus (Engelm.)
Kiger

NYCTAGINACEAE

Boerhavia coccinea P. Mill.

Boerhavia erecta L.

Mirabilis longiflora L.

ONAGRACEAE

Epilobium canum (Greene) P.H. Raven
subsp. *latifolium* (Hook.) Raven

Oenothera podocarpa (Wooton &
Standl.) Krakos & W.L. Wagner

OXALIDACEAE

Oxalis alpina (Rose) Rose ex R. Knuth

Oxalis decaphylla Kunth

PAPAVERACEAE

Argemone pleiacantha Greene

PHRYMACEAE

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

PLANTAGINACEAE

Penstemon campanulatus (Cav.) Willd.

Schistophragma intermedia (A. Gray)
Pennell

PLATANACEAE

Platanus wrightii S. Watson

POLEMONIACEAE

Ipomopsis macombii (Torr. ex A. Gray)
V. Grant

POLYGALACEAE

Monnina wrightii A. Gray

Polygala obscura Benth.

POLYGONACEAE

Eriogonum abertianum Torr.

PORTULACACEAE

Portulaca oleracea L.

Portulaca suffrutescens Engelm.

Portulaca umbraticola Kunth

RANUNCULACEAE

Clematis ligusticifolia Nutt.

Delphinium andesicola Ewan

Thalictrum fendleri Engelm. ex A. Gray

RHAMNACEAE

Adolphia infesta (Kunth) Meisn.

Ceanothus buxifolius Willd. ex Schult. f.

Sageretia wrightii S. Watson

ROSACEAE

Holodiscus discolor (Pursh) Maxim.

Prunus serotina Ehrh. var. *virens*
(Wooton & Standl.) McVaugh

RUBIACEAE

Bouvardia ternifolia (Cav.) Schlecht.

Crusea hispida (Mill.) B.L. Rob.

Houstonia wrightii A. Gray

Mitracarpus hirtus (L.) DC.

SALICACEAE

Populus fremontii S. Watson

Populus monticola Mert. ex Loud.

Populus tremuloides Michx.

Salix gooddingii Ball

SAPINDACEAE

Acer grandidentatum Nutt.

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

SAXIFRAGACEAE

Heuchera sanguinea Engelm.

SCROPHULARIACEAE

Buddleja sessiliflora Kunth

SOLANACEAE

Datura inoxia P. Mill.

Datura quercifolia Kunth

Physalis angulata L.

Solanum elaeagnifolium Cav.

Solanum houstonii Martyn

Solanum lumholtzianum Bartlett

CHECKLIST: Sierra La Púrica

page 4 of 4

Solanum nigrescens M. Martens & Galeotti

Solanum stoloniferum Schltld. & Bouché

TALINACEAE

Talinum paniculatum (Jacq.) Gaertn.

ULMACEAE

* *Ulmus pumila* L.

VERBENACEAE

Glandularia latilobata (L.M. Perry) G.L. Nesom

VIOLACEAE

Viola nephrophylla Greene

VITACEAE

Vitis arizonica Engelm.

ZYGOPHYLLACEAE

* *Tribulus terrestris* L.

Monocots

AMARYLLIDACEAE

Allium plummerae S. Watson

ASPARAGACEAE

Agave palmeri Engelm.

Agave parryi Engelm. var. *huachucensis* (Baker) Little ex L. Benson

Dasyllirion wheeleri S. Watson

Echeandia flavescens (J.A. & J.H. Schultes) Cruden

Milla biflora Cav.

Nolina microcarpa S. Watson

Yucca baccata Torr.

Yucca madrensis Gentry

COMMELINACEAE

Commelina tuberosa L.

Commelina erecta L.

CYPERACEAE

Carex leucodonta Holm

Cyperus elegans L.

Cyperus pallidicolor (Kük.) G.C. Tucker

ORCHIDACEAE

Malaxis soulei L.O. Williams

POACEAE

Aristida adscensionis L.

Aristida ternipes var. *ternipes* Cav.

Bothriochloa barbinodis (Lag.) Herter

Bouteloua aristidoides (Kunth) Griseb.

Bouteloua chondrosioides (Kunth) Benth. ex S. Watson

Bouteloua curtipendula (Michx.) Torr.

Bouteloua eludens Griffiths

Bouteloua hirsuta Lag.

Bouteloua radicata (E. Fourn.) Griffiths

Bouteloua repens (Kunth) Scribn. & Merr.

Bromus frondosus (Shear) Wooton & Standl.

Bromus richardsonii Link

Cenchrus spinifex Cav.

Chloris virgata Sw.

* *Cynodon dactylon* (L.) Pers.

* *Dactyloctenium aegyptium* (L.) Willd.

* *Digitaria sanguinalis* (L.) Scop.

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

* *Echinochloa colona* (L.) Link

* *Echinochloa crus-galli* (L.) Beauv.

* *Eleusine indica* (L.) Gaertn.

Elymus arizonicus (Scribn. & J.G. Sm.) Gould

* *Eragrostis cilianensis* (All.) Vign. ex Janchen

Eragrostis intermedia A.S. Hitchc.

Eragrostis mexicana (Hornem.) Link

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

Eriochloa acuminata (J. Presl) Kunth var. *minor* (Vasey) R.B. Shaw

Eriochloa lemmonii Vasey & Scribn.

* *Hackelochloa granularis* (L.) Kuntze

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

Heteropogon melanocarpus (Ell.) Ell. ex Benth.

Hilaria belangeri (Steud.) Nash

Hopia obtusa (Kunth) Zuloaga & Morrone

Koeleria macrantha (Ledeb.) J.A. Schultes

* *Lolium perenne* L.

* *Melinis repens* subsp. *repens* (Willd.) Zizka

Muhlenbergia alopecuroides (Griseb.) P.M. Peterson & Columbus

Muhlenbergia arizonica Scribn.

Muhlenbergia emersleyi Vasey

Muhlenbergia fragilis Swallen

Muhlenbergia longiligula A.S. Hitchc.

Muhlenbergia montana (Nutt.) A.S. Hitchc.

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

Panicum hirticaule J. Presl

Piptochaetium fimbriatum (Kunth) A.S. Hitchc.

Piptochaetium pringlei (Beal) Parodi

* *Setaria pumila* (Poir.) Roemer & J.A. Schultes

* *Urochloa panicoides* Beauv.

Zuloagaea bulbosa (Kunth) Bess