

DESCRIPTION FORMAT

Descriptions are diagnostic and only characters important to gain a reasonable visual impression of the taxon should be included. Cite characters at the highest possible rank (e.g., if a trait is cited for a family, it should not be repeated for included genera.)

Write out authors' names in full or follow standard abbreviations from Draft Index of Author Abbreviations compiled at the Herbarium, Royal Botanic Gardens, Kew. Boldface should be used only for taxa given full descriptive treatment. Synonyms, minor variants, and other scientific names mentioned in the text should be underlined.

Use the metric system for measurement of plant parts (millimeters, centimeters, decimeters, meters). Elevations will be expressed in meters followed by the English (feet) equivalent in parentheses. Round elevation measurements to the nearest 100 ft and to the nearest 50 m.

Use only those abbreviations listed; symbols such as >, <, ±, ♂, ♀, are not acceptable in descriptions or keys. Use + and = in word derivations and chromosome numbers only.

Use parallel construction in descriptions of related taxa at all levels. Applicable characters in descriptions should follow the sequence given below:

General Habit

Underground Parts

Stems

Leaves

Inflorescences

Flowers

Fruits

Seeds

Chromosome Number

Specialized groups may have additional categories.

Begin each character phrase with a word in full capitals and end with a period. Do not use complete sentences. Commas and semicolons may separate entries within major character phrases. The following forms illustrate the proper (and improper) use of commas and semicolons:

"style 3-5 mm long, the stigma 1 mm wide"

or

"style 3-5 mm long; stigma 1 mm wide"

but not

"style 3-5 mm long, stigma 1 mm wide"

Be consistent in the type of information you provide. If, for example, style and stigma measurements are given for one species, be sure to include them for all species of the genus.

Be uniform in presenting information within major character phrases. For example, in describing "Leaves" use the same sequence in giving shape, length, width, apex, base, margin, etc., for each taxon within a group.

As stated, our goal is to produce a "single field-portable volume." This requires that special attention be given to length of treatments. We are well aware that descriptions will vary from one group to another depending on level of complexity and difficulty of taxa. However, the Committee has determined that the average values given below are reasonable. They are applicable to the description itself, excluding the supplementary information such as habitat, distribution, elevation, etc.

Taxonomic rank	Average number of lines
Family	12
Genus	12
Species	12
Infraspecific	8

FAMILY

Except where strong contrary arguments are brought to bear by experts, those families recognized by Cronquist (1981) will be used. Family names will all end in "aceae"; however, classical family names of Compositae, Cruciferae, Gramineae, Guttiferae, Labiatae, Leguminosae, Palmae and Umbelliferae will be alphabetized with reference to the alternate counterpart.

All families will be described, but the descriptions will be strictly diagnostic, providing only those characters essential for recognition and differentiation of the family rather than attempting to describe the entire range of variation within the family world-wide. If the description becomes complex and cumbersome, qualifying words such as "in ours", "mostly" and "usually" may be utilized. The description will be followed by a general statement of family size and distribution, examples of cultivated members and carefully selected references.

The family name will be centered in bold (wavy underline) upper case letters, followed by a common name(s) in upper case letters.

GENUS

The generic name will be centered in boldface (wavy underline) upper and lower case type followed by the author and

common name(s), if available.

All genera will be described. As far as possible, genera will be distinguished on gross morphological characters. The description should be broad enough to note the diversity of species worldwide, but will emphasize characters of those found in Arizona. However, in cases where the genus is extremely variable, the author will have the option of limiting the description to the AZ members of the group. If the description is not all-inclusive, it must begin with the phrase, "In AZ". A short statement should be included giving a brief account of size, distribution, examples of economically valuable members and, if known, derivation of the generic name. Cite important references. (Refer to sample treatment for format.)

SPECIES

All native and naturalized species occurring in Arizona will be described unless they are members of a monotypic group. In such cases, a diagnostic description of the family will be provided, followed by an expanded generic description which will be adequate to describe the species as well. (Refer to sample treatment Scleropogon).

Include those species documented for Arizona but not recently collected. A species known to be in areas adjacent to, but not yet collected in, Arizona may be treated in full or mentioned in a note, including key characters which distinguish it from other Arizona relatives. Where appropriate, a list of "doubtful and excluded species" may be added to account for those cases where errors were made in reporting a species for Arizona.

Species descriptions will typically be broad enough to include the overall range of variation. However, an author may choose to limit the description to the species as it appears in AZ. If the description is not all-inclusive, it must begin with the phrase, "In AZ". The modifying phrase "in ours" can also be conveniently used to simplify descriptions of variable species.

We hold a conservative view in the recognition of species and believe this is necessary in a broadly used manual. Specific rank is reserved for taxa that are readily characterized morphologically and show little intergradation with other taxa. A describable morphological discontinuity between species is essential. Members of complexes that intergrade considerably in morphology are considered in infraspecific rank, and those that have no consistently diagnostic morphological characters are not treated formally.

The species description will begin with the generic name (indented 2 spaces) in upper and lower case bold (wavy underline) letters, followed by the specific epithet in lower case bold (wavy underline) letters (no capitals) and the author. Common name(s) should be supplied and etymology of the epithet, if known. The description will not repeat generic characters. It will be diagnostic enough so that, in combination with the generic description, a mental picture can be developed. Synonyms (underlined) with authors should be enclosed in brackets and

placed at the end of the description. Synonymy need not be complete, but should be supplied if the name represents a deviation from Kearney & Peebles or other commonly available western manuals. After the description and synonymy the following sequence of topics may be included. Those marked with an asterisk (*) should be provided for each species.

*Habitat (AZ only).

*Distribution (AZ only) - by counties or restricted areas.

*Elevation (AZ only) - in meters, followed by English (feet) equivalent in parentheses.

*Flowering time (AZ only).

*Fruiting time (AZ only).

Origin, if introduced.

*Distribution overall - by states or regions outside of AZ.

Taxonomic Notes.

Economic or Ethnobotanical Notes.

Consult the sample treatment for proper format in presenting the above information.

INFRA-SPECIFIC TAXA

Except as directed by the International Code, we recognize no difference in dealing with subspecies and varieties and recommend using whichever is accepted by the contributor. Stability in nomenclature should be the primary criterion for choosing between subspecies and varieties. Nomenclatural changes will not be made in this book. Those infraspecific taxa that have no consistently diagnostic morphological characters should not be treated formally.

The infraspecific epithet preceded by rank (indented 2 spaces) will be in bold (wavy underline), lower case letters followed by the author, if applicable. Do not repeat the species name. Common name(s) and etymology of the epithet should be supplied, if known. Provide only enough diagnostic characters to separate the infraspecific taxa, including distribution, elevation, etc. Arrange infraspecific information in the same style as used for species.

KEYS

Particular care should be taken in the preparation of keys; it is here that the manual will succeed or fail for most users. Clarity is the primary criterion.

Key dichotomies must separate on the most obvious morphological level. (Taxa that require a microscopic preparation to differentiate are minor variants, for our

purposes.)

All keys will be in indented form. Leads will be of parallel construction beginning with the most important diagnostic character. The number of the first part of a couplet will be followed by a period; the number of the second part of a couplet will be followed by an apostrophe. Underline all scientific names.

Infraspecific taxa will not be separated in the key to species except in those special cases where a species conveniently keys out more than once because of its infraspecific taxa. A key may be included after the species description if two infraspecific taxa are recognized and must be included if three or more infraspecific taxa are recognized.

REFERENCES

To conserve space, references should be kept to a minimum. Normally they will represent recent revisions or monographs.

Citation of references will follow the discussion of the taxon to which the reference applies. Citation style should be consistent with that used in Systematic Botany, except that titles of articles will be omitted. Abbreviate titles of serial publications according to Botanico-Periodicum-Huntianum (Lawrence, G.H.M. et al. 1968. Pittsburgh. Hunt Botanical Library).

WORKING GLOSSARY OF SELECTED TERMS

The following glossary provides recommended terms as a means of standardizing usage and eliminating synonyms and near synonyms. Please examine carefully these preferred terms and their definitions, especially those listed under the category, "Hairs and Surface Coverings". Many more terms could, of course, have been included in the glossary, but were not selected because their definitions are less controversial or because synonymy was not a problem. Whenever possible, avoid use of excessively technical or obscure terminology. Contributors using terms specific for their group should define them where first introduced.

GENERAL SHAPE

- LINEAR - Many times longer than wide; margins nearly parallel.
- LANCEOLATE - At least 3 times longer than wide, tapering to apex, widest below the middle.
- OBLANCEOLATE - As lanceolate, but tapering to base and widest above the middle.
- OVATE - Less than three times as long as wide, tapering to apex and widest below the middle. [OVOID - same, but 3-dimensional.]
- OBOVATE - As ovate but tapering to base and widest above the middle. [OBOVOID - same, but 3-dimensional.]
- TRIANGULAR - (=deltoid, deltate) - Having the form of an equilateral triangle. [PYRAMIDAL - 3-dimensional equivalent.]
- CIRCULAR - (= orbicular, round) - Flat and round in outline. [SPHERICAL - 3-dimensional equivalent.]
- ELLIPTIC - Longer than broad, tapering equally at both ends; widest in the middle. [ELLIPSOID - same, but 3-dimensional.]
- OBLONG - Longer than broad, margins parallel; ends rounded.
- CORDATE - Heart-shaped - base rounded, prominently notched; sides tapering to a narrowed apex.
- OBCORDATE - As cordate, but attachment at narrowed end and notch at apex.
- SPATULATE - (= spathulate) - Similar to oblanceolate, but apex broadly rounded, not tapering.
- SUBULATE - Long narrow, tapering gradually to a rigid apex; awlshaped.
- NEEDLE-LIKE - (= acerose, acicular) - As linear, but rigid.
- PELTATE - With stalk attached to lower surface of leaf blade or scale inside the margin.

APEX

- ATTENUATE - (= acuminate) - Gradually narrowed and tapering to a point.
- ACUTE - Forming an angle of less than 90° .
- OBTUSE - Forming an angle of greater than 90° .
- TRUNCATE - Cut off squarely.
- RETUSE - Shallowly notched.

EMARGINATE - Deeply and broadly notched.

MUCRONATE - (= cuspidate) - With a short, abrupt, firm tip.

APICULATE - With a short flexible tip.

ARISTATE - With a much elongate, bristle-like tip.

BASE

ATTENUATE - See apex.

ACUTE - See apex.

OBTUSE - See apex.

TRUNCATE - See apex.

OBLIQUE - Asymmetrical; having unequal sides.

SAGITTATE - With basal lobes directed downward.

HASTATE - With basal lobes spreading.

MARGIN

ENTIRE - Smooth, not toothed, indented or lobed.

DENTATE - With sharp teeth pointing outward.

SERRATE - With sharp teeth pointing toward apex.

CRENATE - With broad rounded teeth; scalloped.

UNDULATE - Wavy in plane contrary to leaf surface.

SINUATE - Wavy in plane of leaf surface.

INCISED - Irregularly cut with sharp teeth.

EROSE - (= lacerate) - Irregularly indented as if gnawed.

LACINIATE - Slashed into numerous narrow lobes.

LOBED - (= indented, parted, divided). Leaf may be shallowly or deeply lobed, pinnately or palmately lobed (= pinnatifid & palmatifid).

DISSECTED - Leaf surface deeply cut into numerous fine divisions.

HAIRS & SURFACE COVERINGS

GLABROUS - Completely hairless and scaleless.

GLABRATE - Becoming hairless with age.

PUBESCENT - (= hairy) - Bearing hairs.

GLAUCOUS - (= pruinose) - With a waxy or powdery covering.

MEALY - (= farinose) - Covered with meal-like particles.

SCURFY - (= lepidote) - Covered with small scales.

SCABROUS - Rough to the touch.

CANESCENT - (includes cinereous, incanous) - With an overall grayish aspect due to hairs.

BRANCHED - (includes stellate, forked, dendritic, cruciform)

METAFIXED - (= dolabriform, malpighiaceus) - Hairs that are attached to a surface at or near their midpoint.

HIRSUTE - (includes hispid, bristly) - Stiff hairs that are ascending or spreading.

SHORT HIRSUTE - (= hirsutulous, hirtellous, hirtellate, hispidulous)

STRIGOSE - Stiff hairs that are closely appressed.

SHORT STRIGOSE - (= strigulose, strigillose)

WOOLLY - (includes floccose, tomentose, lanate, pannose) - Soft, dense, commonly matted hairs.

SHORT WOOLLY - (= tomentellous, tomentulose)

PILOSE - (includes villous, velutinous) - Soft, distinct, straight hairs that are ascending or spreading.

SHORT PILOSE - (= pilosulous, villosulous)

SILKY - (= sericeous) - Soft, distinct, straight hairs that are closely appressed.

CILIATE - With marginal hairs; fringed like an eyelash.

FLOWERS

- PERFECT - (= bisexual, hermaphrodite) - having both pistil(s) and stamen(s).
- IMPERFECT - (= unisexual) - having either pistil(s) or stamen(s), but not both.
- ACTINOMORPHIC - (= regular) - Flowers with series of parts radially symmetrical, all parts in each series alike; based on petals unless otherwise stated.
- ZYGOMORPHIC - (= irregular) - Flowers with series of parts bilaterally symmetrical, not all parts in each series alike; based on petals unless otherwise stated.

INFLORESCENCE

- CYME - Determinate inflorescence with central flowers opening first.
- COILED CYME - (= scorpioid, helicoid) - A determinate, coiled inflorescence.
- RACEME - Indeterminate inflorescence bearing several pedicelled solitary flowers along a central axis.
- SPIKE - Indeterminate inflorescence bearing sessile or subsessile, solitary flowers along a central axis.
- PANICLE - (includes thyse) - Compound or branched raceme.
- CORYMB - Nearly flat-topped indeterminate inflorescence; lower and outer pedicels longest; simple or compound.
- UMBEL - Indeterminate inflorescence with pedicels arising from one point, usually flat-topped; simple or compound.
- CATKIN - (= ament) - Spike-like, commonly pendulous, inflorescence of imperfect flowers.
- HEAD - (= capitulum) - Dense cluster of sessile or subsessile flowers on an expanded peduncle.

FRUITS

- AGGREGATE - Fruit formed from a cluster of pistils that were distinct in a single flower (as blackberry).
- MULTIPLE - Fruit formed from closely clustered ovaries of many flowers.
- ACHENE - (= akene, cypsela) - Small dry, 1-seeded, indehiscent fruit.
- BERRY - Fleshy, indehiscent fruit with no true stone (pit) or core; seed(s) embedded in pulp.

CAPSULE - Dry, dehiscent fruit of more than one carpel.

DRUPE - Stone fruit; usually fleshy and indehiscent with stony endocarp.

FOLLICLE - Dry, 1-carpelled fruit opening along one longitudinal suture.

SAMARA - Dry, indehiscent, winged fruit.

SCHIZOCARP - Dry fruit splitting into one- or few-seeded segments.

MERICARP - Segment of a schizocarp; commonly, 1/2 of the schizocarp of Umbelliferae.

PRICKLES, SPINES, THORNS

PRICKLES - Epidermal outgrowths, as in roses.

SPINES - Modified leaf or leaf parts (including stipules), as in cacti or mesquite.

THORNS - Modified stems, as in Condalia.

ABBREVIATIONS

STATES OF THE UNITED STATES

Alabama	AL	Montana	MT
Alaska	AK	Nebraska	NE
Arizona	AZ	Nevada	NV
Arkansas	AR	New Hampshire	NH
California	CA	New Jersey	NJ
Colorado	CO	New Mexico	NM
Connecticut	CT	New York	NY
Delaware	DE	North Carolina	NC
Florida	FL	North Dakota	ND
Georgia	GA	Ohio	OH
Hawaii	HI	Oklahoma	OK
Idaho	ID	Oregon	OR
Illinois	IL	Pennsylvania	PA
Indiana	IN	Rhode Island	RI
Iowa	IA	South Carolina	SC
Kansas	KS	South Dakota	SD
Kentucky	KY	Tennessee	TN
Louisiana	LA	Texas	TX
Maine	ME	Utah	UT
Maryland	MD	Vermont	VT
Massachusetts	MA	Virginia	VA
Michigan	MI	Washington	WA
Minnesota	MN	West Virginia	WV
Mississippi	MS	Wisconsin	WI
Missouri	MO	Wyoming	WY

STATES OF MEXICO

Aguascalientes	Ags.	Michoacan	Mich.
Baja California peninsula	Baja C.	Nayarit	Nay.
Baja California Norte	Baja C. Norte	Nuevo Leon	N.L.
Baja California Sur	Baja C. Sur	Oaxaca	Oax.
Campeche	Camp.	Puebla	Pue.
Chiapas	Chis.	Queretaro	Qro.
Chihuahua	Chih.	Quintana Roo	Q.R.
Coahuila	Coah.	San Luis Potosi	S.L.P.
Colima	Col.	Sinaloa	Sin.
Distrito Federal	D.F.	Sonora	Son.
Durango	Dgo.	Tabasco	Tab.
Guanajuato	Gto.	Tamaulipas	Tamps.
Guerrero	Gro.	Tlaxcala	Tlax.
Hidalgo	Hgo.	Veracruz	Ver.
Jalisco	Jal.	Yucatan	Yuc.
Mexico	Mex.	Zacatecas	Zac.

COUNTRIES, REGIONS, etc.

Africa	Afr.
Americas	Amer. (N. Amer., C. Amer., S. Amer.)
Canada	Can.
Europe	Eur.
Mediterranean	Medit.
Mexico	Mex.
United States	U.S.
West Indies	W. Ind.

DIRECTIONS

central	c	north (ern)	n
east (ern)	e	northeast (ern)	ne

northwest (ern)	nw	southwest (ern)	sw
south (ern)	s	west (ern)	w
southeast (ern)	se		

MEASUREMENTS

centimeters	cm	meters	m
decimeters	dm	millimeters	mm
feet	ft		

MONTHS OF THE YEAR

Jan	Apr	Jul	Oct
Feb	May	Aug	Nov
Mar	Jun	Sep	Dec

MISCELLANEOUS

about (Circa)	ca.
and	& (only between authors of epithets and between collectors' names)
compare	cf.
County, counties	Co., cos.
elevation	elev.
fruiting	fr. (for time of fruiting only)
Mount, Mountain(s)	Mt., Mts.
number of chromosomes	$2n = (x =)$
River	R.
section	sect.
species	sp., spp.
subspecies	subsp., subspp.
variety	var., vars.

REPRESENTATIVE TREATMENT

The following taxonomic treatments are presented as guides for contributors. They attempt to provide descriptions, keys, references, infraspecific taxa, abbreviations, and notes in the style we would like the contributors to use. Fewer editorial changes will be necessary if these models are followed closely.

RUTACEAE

RUE FAMILY

Small trees, shrubs, or herbs, usually strongly scented.

LEAVES dotted with pellucid glands, simple, pinnately or palmately compound. INFLORESCENCES cymes or racemes, or flowers solitary. FLOWERS perfect or imperfect, actinomorphic; sepals and petals commonly 4 or 5; stamens commonly 4 or 5 or 8-10, borne on a fleshy hypogynous disk; pistil in ours, 2-5-carpelled and 2-5-locular, with 1-5 styles, the ovary superior. FRUITS variable, in ours samaras or capsules. --150 genera, 1500 spp., chiefly of tropical and subtropical regions. Includes the genus Citrus.

1. Leaves palmately compound; petals spreading; fruits not deeply lobed; ovules 1 or 2 per carpel.
2. Plants small shrubs; herbage glandular-pustulate; leaves usually with more than 3 linear leaflets; petals white; fruits capsules; carpels 5 Choisya
- 2' Plants large shrubs or small trees; herbage glandular-punctate, not pustulate; leaves trifoliolate, the leaflets lanceolate or broader; petals greenish or yellowish; fruits flat, broadly-winged samaras; carpels 2 or 3 Ptelea
- 1' Leaves simple; petals erect; fruits deeply 2-lobed capsules; ovules 5 or more per carpel Thamnosma

Choisya Kunth Star-leaf

Shrubs, often prominently glandular and aromatic. LEAVES opposite or subopposite, palmately or apparently pinnately compound. INFLORESCENCES terminal or lateral panicles, or flowers solitary in axils of leaves; panicle branches and pedicels bracteate. FLOWERS perfect; sepals (4-)5, deciduous; petals (4-)5, white, glabrous; stamens (8-)10, in 2 series, the inner series much shorter than the outer; pistil 5-carpelled, the ovary hirsute, the style straight or twisted, the stigma capitate and 5-lobed. FRUITS capsules of (1-)2(-3) maturing carpels with glandular protuberances; persistent style base forming an apical point. SEEDS 1 or 2 per carpel; reniform or ovoid. --6 spp.; s U.S. and Mex. (for J. D. Choisy). Benson, L. and R. A. Darrow. 1981. Choisya Pp. 131-132 in Trees and Shrubs of the Southwestern Deserts. Tucson: Univ. of Arizona Press; Muller, C.H. 1940. Amer. Midl. Naturalist 24:729-742.

Choisya dumosa (Torrey) A. Gray (bushy). --Shrubs to 2 m tall; branchlets with appressed or spreading, sparse or dense hairs. LEAVES palmately compound; leaflets 3-13, 1-5 cm long, 1-5 mm wide; petioles pubescent, shorter than to as long as leaflets. FLOWERS solitary or rarely clustered; sepals 5; petals 5, 5-13 mm long; stamens 10; pistil glandular. FRUITS 6-7 mm long with warty abaxial projections or with long apical and abaxial points. SEEDS reticulate. --3 vars.; AZ, TX and n Mex.

Var. arizonica (Standley) L. Benson (of Arizona). --Herbage appressed-hairy; leaflets narrowly linear, 1-3 mm wide, strongly revolute; glands prominent. [C. arizonica Standley]. --Canyons and rocky slopes, usually on limestone: Cochise, Graham, Pima, Santa Cruz cos.; 900-1700 m (3000-5500 ft); Apr-Jul.

Var. mollis (Standley) L. Benson (soft-hairy). --Herbage spreading-hairy; leaflets broadly linear, 3-5 mm wide, slightly revolute; glands scarcely prominent. [C. mollis Standley].
--Mts. of Santa Cruz Co.; 1100-1550 m (3500-5000 ft); Mar-Oct.

Ptelea L. Hop-tree, Wafer-ash

Unarmed shrubs or small trees. LEAVES alternate, deciduous, estipulate, digitately 3-foliolate (rarely pinnately 5-foliolate). INFLORESCENCES terminal panicles on short leafy branches. FLOWERS mostly imperfect by abortion; sepals 4 or 5, soon deciduous; petals 4 or 5, oval or ovate to elliptic or linear-oblong; stamens as many as and opposite the sepals; pistil in both pistillate and staminate flowers on short disc-like gynophore, this often lobed under the aborted pistil in staminate flowers; ovary compressed, 2(-3)-locular with 2 ovules in each locule, only the upper one developing into a seed. FRUITS indehiscent samaras each surrounded more or less completely by a reticulately-veined wing. --3 spp.; U.S. and Mex. (Greek name of elm). Bailey, V. 1962. Brittonia 14:1-45.

Ptelea trifoliata L. (three leaves). Wafer-ash. --Shrubs or small trees to 6 m tall. LEAVES trifoliolate, glandular-punctate and usually strongly aromatic. FLOWERS actinomorphic, greenish white; sepals 1-2 mm long, pubescent or glabrous on outside, glabrous inside; petals distinct, 4-5 mm long, hirsute inside; stamens as long as the petals in staminate flowers, reduced to vestigial filaments in pistillate flowers, the filaments flattened and bearing long white hairs or glabrous. 2 \underline{n} = 42. --5 subspp.; e and s U.S. as far w as AZ and s into Mex.

1. Twigs orange to straw-colored, the older branches distinctively white; seed body oval to oblong, centered or below middle of wing subsp. pallida
- 1' Twigs greenish, becoming dark red-brown; seed body circular to oval, centered in wing.
2. Leaf blades flexibly herbaceous, bright green and somewhat glossy above, the margins serrulate to irregularly serrate-dentate subsp. angustifolia
- 2' Leaf blades firmly herbaceous to sub-coriaceous, dull dark green above, the margins crenate to nearly entire subsp. polyadenia

Subsp. angustifolia (Benth) V. Bailey (narrow-leaved).

--Twigs glabrous, greenish, becoming dark red-brown. LEAFLETS herbaceous, lanceolate to elliptic-lanceolate; upper surfaces bright green and often glossy; lower surfaces paler and greenish glaucous; margins serrate; terminal leaflet distinctly petioluled. FRUITS with seed bodies as wide or wider than wings. [P. angustifolia Benth]. --Mt. ranges of e and c AZ: Apache, Cochise, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz, Yavapai cos.; 900-3100 m (3000-10000 ft); May-Jun; AR, NM, TX and s throughout Mex.

Subsp. pallida (E. Greene) V. Bailey (pale). --Twigs glabrous or finely pubescent, orange to straw-colored, becoming white. LEAFLETS thickish and rigid, subsessile, dull to somewhat glossy; upper surfaces pale green, glabrous or finely hairy, especially on veins; lower surfaces paler and glabrous; margins minutely crenate-serrulate; terminal leaflet elliptic-lanceolate to narrowly obovate or oblanceolate; lateral leaflets ovate-lanceolate. FRUITS with seed bodies not as wide as wings;

carpels often 3. [P. pallida E. Greene]. --Infrequent in desert ranges of w AZ: Coconino, Mohave, Yavapai cos.; 1200-2000 m (3900-6500 ft); Apr-Jun; NM, UT.

Subsp. polyadenia (E. Greene) V. Bailey (many glands). --Twigs finely and densely hairy, dull brown becoming dark red-brown. LEAFLETS thickish, sessile; upper surfaces dark green, sparsely short pubescent, especially along veins, strongly gland-dotted; lower surfaces glaucous and densely woolly, especially along mid-vein; margins crenate to nearly entire; terminal leaflet linear-lanceolate to oblanceolate; lateral leaflets narrowly ovate-lanceolate to oblong-lanceolate. FRUITS with seed bodies not as wide as wings. --Steep sides of wooded canyons, arid or semi-arid mt. ranges: Cochise, Coconino, Mohave, Yavapai cos.; 1400-2750 m (4500-9000 ft); May-Jun; AR, CO, NM, OK, TX.

Thamnosma Torrey & Frémont Dutchman's Breeches

Shrubs, sub-shrubs, or nearly herbaceous, glandular-dotted and with a strong disagreeable odor. LEAVES alternate, simple, narrow, entire, persistent or soon deciduous. INFLORESCENCES racemes. FLOWERS perfect; sepals 4; petals 4, erect or slightly spreading; stamens 8, about as long as petals, the anthers apiculate; pistil 2-carpelled, subtended by an entire or crenate disk. FRUITS deeply 2-lobed capsules. --Ca. 6 spp.; sw U.S., n Mex, S. Afr. and Socotra Islands. (Greek: Thamnos = bush + osme = odor).

- 1. Plants more or less spinescent shrubs; herbage yellowish; petals dark blue or purple T. montana
- 1' Plants suffrutescent to nearly herbaceous; herbage glaucous, green; petals greenish yellow or white tinged with purple T. texana

Thamnosma montana Torrey & Fremont (of the mountains).

Turpentine-broom. --Erect shrubs to 8 dm tall with stoutish, yellow-green, spine-tipped branches. LEAVES linear to narrowly oblong, 5-15 mm long. FLOWERS with broadly ovate to triangular sepals, 2.5-3.5 mm long; petals almost erect, dark blue or purple, 8-14 mm long. CAPSULES 10-13 mm in greatest width, 6-9 mm high, on stipes 10 mm long. SEEDS 1-3 per locule, reniform, brown to black, 4-6 mm long. --Desert mesas and rocky slopes: Coconino, Gila, Maricopa, Mohave, Pinal, Yuma cos.; below 400 m (4500 ft); Feb-Apr; se CA, s NV, UT; Baja C. & Son., Mex.

Thamnosma texana (A. Gray) Torrey (of Texas). --Sub-shrubs to almost herbaceous, 1-5 dm tall, with light green stems. LEAVES filiform to linear-oblong, 5-15 mm long. FLOWERS with broadly ovate to rounded triangular sepals, 1-2 mm long; petals greenish yellow or white tinged with purple, 3-5 mm long. CAPSULES 3-7 mm wide and high, sessile or on stipes 1 mm long. SEEDS 4-6 per locule, reniform, buff to pale brown, 1.2-2 mm long. --Dry, rocky slopes and mesas: Coconino to Greenlee s to Cochise, Pima, Santa Cruz cos.; 600-1500 m (2000-5000 ft); Mar-Jun; CO, w TX; n Mex.

Model 2 - A monotypic genus.

Scleropogon Philippi Burrograss

Perennials, monoecious, or less frequently dioecious, bearing wiry, often arching stolons with internodes 5-15 cm long, sometimes weakly rhizomatous; flowering culms erect, (5-)10-20 cm tall. LEAVES mostly clustered at base of plant; sheaths short, strongly nerved, the basal ones commonly hispid or villous; ligule a row of hairs ca. 1 mm long; blades 2-8(-12) cm long, 1-2 mm wide, firm, flat or folded. INFLORESCENCES few-flowered spicate racemes or contracted panicles, strictly staminate or pistillate, or both kinds of florets in same inflorescence, sometimes in same spikelet with staminate below pistillate; perfect florets occasionally produced. STAMINATE SPIKELETS 2-3 cm long, with 5-10(-20) florets, the rachilla not disarticulating; glumes membranous, pale, 1-3-veined, acuminate; lemma 3-veined, similar to the glumes, awnless or with a short awn up to 3 mm long; palea shorter than the lemma, often conspicuously so. PISTILLATE SPIKELETS disarticulating above the glumes, the florets falling together; usually with 3-5 lower florets fertile, the lowest one with a bearded, sharp-pointed callus, the upper ones reduced to awns; glumes acuminate, strongly 3-veined, occasionally with a few fine accessory veins; lemma narrow, the body 2.5-3 cm long, 3-veined, the veins extending into awns (3-) 5-10(-15) cm long, spreading or reflexed at maturity. $\times = 10$.

--A monotypic American genus with disjunct distribution; in both hemispheres. (Greek skleros = hard + pogon = beard, in reference to the hard awns). Reeder, J. R. and L. J. Toolin. 1987. Phytologia 62:267-275.

Scleropogon brevifolius Phillipi (with short leaves). [S. longisetus Beetle]. $2n = 40$. --Forms large dense, but usually scattered, stands on flat plains and gentle slopes. Probably spreading in overgrazed areas: Cochise, Coconino, Mohave, Pima, Yavapai cos.; 750-1700 m (2400-5600 ft); Aug-Nov; CO, NM, NV, OK, TX; s to c Mex.; Argentina, Chile.

