

APPENDIX 1

PLANT DESCRIPTION

WRITING A PLANT DESCRIPTION

The following list of characters can serve as the basis for a detailed plant description. The basic form of the description is to list the plant organ (noted in **bold** in the character list below), followed by a listing of all character states that apply for that plant organ, with each character state separated by commas. Note that, for any particular species, not all characters will apply; these are simply omitted. Also note that some characters are listed with multiple character names, e.g., “**Sepal/Calyx lobes/Outer tepals**.” This is designed as a guide, with the intention that only one of these three will be used, depending on whether the outer whorl of the perianth consists of distinct sepals (**Sepal** used), of fused sepals (**Calyx lobes** used), or of tepals (**Outer tepals** used).

There are different styles in writing a detailed plant description. Some use a telegraphic style, e.g., “Leaves simple, sessile, whorled, ovate, entire, glabrous.” This style is common in floras, where space for text may be at a premium. Other descriptions use complete sentences, e.g., “Leaves are simple, sessile, whorled, ovate, entire, and glabrous.” The use of “the” at the beginning of a sentence is optional, as in “The leaves are simple, sessile, whorled, ovate, entire, and glabrous.”

Some general suggestions are as follows:

1. Be sure to *only* list the plant organs (and list only once), followed by the character states that apply to that plant organ. The major plant organs are sometimes placed in **bold** text to highlight them. *Do not* list the specific character names, unless a clarification is needed. Examples:
Do write: “**Flowers** are bisexual, actinomorphic, pedicellate, 1.5–2.2 cm long (including pedicel) . . .” [“Flowers” refers to the plant organ; all other terms are character states.]

Do not write: “**Flower sex** is bisexual, **symmetry** is actinomorphic, **attachment** is pedicellate, **length** is 1.5–2.2 cm . . .” [“Sex,” “symmetry,” “attachment,” and “length” are characters and should not be listed.]

However, *do* write: “**Leaf blades** are elliptic, serrate, rounded at base, obtuse at apex.” [“Rounded” and “obtuse” could refer to either of the characters base or apex, so these characters should be listed for clarification.]

2. Description of the major organs may be written in the singular or plural form, but the latter should be used only if more than one such organ occurs in an individual. If only one organ occurs per individual, the singular should be used.
Do write: “**Leaves** are trifoliolate, alternate, . . .” or “**The leaf** is trifoliolate, alternate, . . .” if there are multiple leaves.
Do write: “**The inflorescence** is a solitary raceme, . . .” if there is a single raceme per individual.
3. Always use metric for plant or plant organ heights, lengths, and widths. Always abbreviate these: “mm” for millimeters, “cm” for centimeters, “dm” for decimeters, “m” for meters. Use mm and cm for smaller structures, dm or m for larger. Use the appropriate unit of measure to avoid values less than 1, if possible. (E.g., write “2–5 mm” instead of “0.2–0.5 cm”.) Always place a “0” before a decimal point, as in “0.5 mm.” Be clear about what you’re describing. Examples:
Do write: “**Flowers** are 0.5–1.3 mm long (excluding pedicel), 2–3 mm wide when fully opened.”
Do not write: “**Flowers** are .5–1.3 mm.”
4. For characters that are variable, either list the range of variation (e.g., “**Leaves** oblanceolate to narrowly elliptic, crenate to dentate . . .”) or list the most common morphology and in brackets list the exceptions (e.g., “**Leaves** trifoliolate [rarely pinnate with 5 leaflets]” or “**Leaves** 4–7 [2.5–10] cm long . . .”).

COMPLETE MORPHOLOGICAL CHARACTER LIST

[Available as download from companion web site <http://www.elsevierdirect.com/companions/9780123743800> or <http://www.sci.sdsu.edu/plants/plantsystematics>; Note: Not all characters apply to a given taxon; add characters for specialized structures.]

Species/Infraspecies Name (with authorship) [Common Name]: _____

Family: _____ **Native locality:** _____

Plant Habitat: _____

Plant Duration: _____

Plant Sex if not hermaphroditic: _____

Plant Habit: _____

Plant Height: _____

Root Type: _____

Root Origin (e.g., primary, adventitious): _____

Underground Stem Type if specialized: _____

Underground Stem Branching Pattern: _____

Underground Stem Size: _____

Aerial Stem Habit: _____

Aerial Stem Branching Pattern: _____

Bark Type: _____

Bark Lenticels presence/shape: _____

Twig Surface/Shape: _____

Twig Lenticel presence/shape: _____

Twig Shape/Cross-Sectional Outline: _____

Pith Type: _____

Pith Cross-Sectional Outline: _____

Fruit Scar presence/shape: _____

Leaf Scar Size/Shape: _____

Vascular Bundle Scar Number/Pattern: _____

Stipule Scar presence: _____

Stipule Scar Position/Shape if present: _____

Terminal Bud Scale Scars presence/absence: _____

Bud Type: _____

Bud Orientation: _____

Bud Shape/Size: _____

Bud Position: _____

Bud Scale Arrangement: _____

Bud Scale Surface/Texture: _____

Thorns if present: _____

Spines if present: _____

Prickles if present: _____

Spur Shoot if present: _____

Leaves/Leaf Number if unusual: _____

Leaf Type: _____

Leaf Length/Width: _____

Leaf Attachment: _____

Leaf stipule presence: _____

Leaf Duration: _____

Leaf Position if not cauline: _____

Leaf Arrangement: _____

Leaf Orientation if discrete: _____

Leaf Posture if discrete: _____

Petiole Shape: _____

Petiole Color: _____

Petiole Length: _____

Petiole Orientation: _____

Stipule Shape: _____

Stipule Surface adaxial: _____

Stipule Surface abaxial: _____

Stipule Length: _____

IF LEAVES SIMPLE:

Leaf Blade Color if unusual: _____

Leaf Blade Shape: _____

Leaf Blade Length: _____

Leaf Blade Width: _____

Leaf Blade Base: _____

Leaf Blade Margin: _____

Leaf Blade Apex: _____

Leaf Blade Apical Process: _____

Leaf Blade Division: _____

Leaf Blade Venation: _____

Leaf Blade Surface adaxial: _____

Leaf Blade Surface abaxial: _____

Leaf Blade Texture: _____

IF LEAVES COMPOUND:

Leaf Outline Shape: _____

Rachillae Number if decompound: _____

Leaflets Number if not very large: _____

Leaflet Arrangement: _____

Leaflet Blade Shape: _____

Leaflet Blade Attachment: _____

Leaflet Blade Color if unusual: _____

Leaflet Blade Length: _____

Leaflet Blade Width: _____

Leaflet Blade Base: _____

Leaflet Blade Margin: _____

Leaflet Blade Apex: _____

Leaflet Blade Apical Process: _____

Leaflet Blade Division: _____

Leaflet Blade Venation: _____

Leaflet Blade Surface adaxial: _____

Leaflet Blade Surface abaxial: _____

Leaflet Blade Texture: _____
Petiolule Shape: _____
 Petiolule Color: _____
 Petiolule Length: _____
Stipel presence: _____
 Stipel Shape: _____
 Stipel Surface adaxial: _____
 Stipel Surface abaxial: _____
 Stipel Length: _____

Inflorescence Position: _____
 Inflorescence Bract presence: _____
 Inflorescence Type: _____
 Inflorescence Length: _____
 Inflorescence Width: _____
 Inflorescence Branch Orientation: _____
 Inflorescence Sex: _____
 Inflorescence Axis Surface: _____
Flower Sex: _____
 Flower Bract presence: _____
 Flower Length minus pedicel: _____
 Flower Width minus pedicel: _____
 Flower Arrangement: _____
 Flower Orientation: _____
 Flower Posture: _____
 Flower Symmetry overall: _____
 Flower Attachment: _____
Pedicel if present Length: _____
 Pedicel if present Shape if unusual: _____
Bracts/Bractlets No (note inflorescence vs. flower): _____
 Bracts Position: _____
 Bracts Length: _____
 Bracts Color if unusual: _____
 Bracts Attachment: _____
 Bracts Shape: _____
 Bracts Base: _____
 Bracts Margin: _____
 Bracts Apex: _____
 Bracts Apical Process: _____
 Bracts Division: _____
 Bracts Venation if unusual: _____
 Bracts Texture if unusual: _____
 Bracts Surface adaxial: _____
 Bracts Surface abaxial: _____
Receptacle Size if unusual: _____
 Receptacle Shape if evident: _____
Hypanthium presence: _____
Hypanthium Shape: _____
 Hypanthium Length: _____
 Hypanthium Width: _____
Perianth Cyclly: _____

Perianth Arrangement if not whorled: _____
 Perianth Type (if homochlamydeous): _____
Calyx/Outer Tepals Aestivation: _____
 Calyx/Outer Tepals Fusion: _____
 Calyx/Outer Tepals Symmetry: _____
 Calyx/Outer Tepals Length: _____
 Calyx/Outer Tepals Color if not green: _____
 Calyx/Outer Tepals Surface adaxial: _____
 Calyx/Outer Tepals Surface abaxial: _____
 Calyx/Outer Tepals Venation if unusual: _____
 Calyx/Outer Tepals Texture if unusual: _____
Sepal/Calyx Lobes/Outer Tepals Merosity: _____
 Sepal/Calyx Lobes/O.T. Length: _____
 Sepal/Calyx Lobes/O.T. Shape: _____
 Sepal/Calyx Lobes/O.T. Base: _____
 Sepal/Calyx Lobes/O.T. Margin: _____
 Sepal/Calyx Lobes/O.T. Apex: _____
 Sepal/Calyx Lobes/O.T. Apical Process: _____
Corolla Type (if dichlamydeous): _____
Corolla/Inner Tepals Aestivation: _____
 Corolla/Inner Tepals Fusion: _____
 Corolla/Inner Tepals Cyclly if not uniseriate: _____
 Corolla/Inner Tepals Color: _____
 Corolla/Inner Tepals Symmetry: _____
 Corolla/Inner Tepals Length: _____
 Corolla/Inner Tepals Surface: _____
 Corolla/Inner Tepals Venation if unusual: _____
 Corolla/Inner Tepals Texture if unusual: _____
Petal/Corolla Lobes/Inner Tepals Merosity: _____
 Petal/Corolla Lobe/I.T. Shape: _____
 Petal/Corolla Lobe/I.T. Base: _____
 Petal/Corolla Lobe/I.T. Margin: _____
 Petal/Corolla Lobe/I.T. Apex: _____
 Petal/Corolla Lobe/I.T. Length: _____
 Petal/Corolla Lobe/I.T. Orientation: _____
 Petal/Corolla Lobe/I.T. Posture: _____
Stamens (Androecium) Cyclly: _____
 Stamens (Androecium) Merosity: _____
 Stamen Type: _____
 Stamen Attachment: _____
 Stamen Arrangement: _____
 Stamen Position: _____
 Stamen Insertion if applicable: _____
 Stamen Fusion: _____
 Staminodes if present No: _____
 Staminodes if present Pos: _____
 Staminodes if present Size: _____
 Staminodes if present Shape: _____
Filament Shape/Color: _____
 Filament Length: _____
Anthers Attachment: _____

Anther Type: _____
 Anther Dehiscence Type: _____
 Anther Dehiscence Direction: _____
 Anther Color: _____
 Anther Length: _____
 Anther Shape: _____
 Anther Thecae Arrangement: _____
Connective Morphology if unusual: _____
Pollen color: _____
Gynoecium Fusion: _____
Perianth Androecial Position: _____
Ovary Position: _____
 Ovary Attachment if not sessile: _____
 Ovary Color: _____
 Ovary Length: _____
 Ovary Shape: _____
 Ovary Surface: _____
Styles Number per pistil: _____
 Style Position: _____
 Style Shape/Color: _____
 Style Disposition/Length: _____
Stigmas Number: _____
 Stigmas Position: _____
 Stigmas Shape: _____
 Stigmas Surface: _____
Nectaries presence/absence: _____
 Nectary Type/Position: _____
Carpels Number: _____
 Median Carpel Position relative to stem axis: _____
Locules Number: _____
Placentation: _____
Placenta Shape/Position if unusual: _____
Ovules Number per carpel: _____
 Ovule Type: _____
 Ovule Position: _____
Fruit Type: _____
 Fruit Color: _____
 Fruit Shape: _____
 Fruit Length/Width: _____
 Fruit Surface: _____

Seed Color: _____
 Seed Shape: _____
 Seed Length: _____
 Seed Surface: _____
Funiculus Length: _____
 Funiculus Shape: _____
Aril presence: _____
 Aril Size: _____
 Aril Shape: _____
 Aril Position: _____
Seeds Nutritive Tissue: _____
Embryo Type Size/Shape/Position: _____
Cotyledon Position: _____
Radicle Position: _____
Seedling Type: _____

FLORAL FORMULA:

P _____ A _____ G
 or K _____ C _____ A _____ G

Note: List number of parts after each symbol:

P = # perianth parts or tepals (outer + inner whorls)
 or **K** = # sepals or calyx lobes **C** = # petals or corolla lobes
A = # stamens of androecium (outer + inner whorls)
G = # carpels of gynoecium (add ovary position)
 () = fusion of parts [] = rare numbers of parts

Optional:

K_z = zygomorphic calyx; **C_z** = zygomorphic corolla; etc.

E.g., **K** (5) **C_z** (5) **A** 5 [4] **G** (2), inferior

= calyx synsepalous with 5 lobes
 corolla zygomorphic, sympetalous with 5 lobes
 stamens 5, rarely 4, distinct, in one whorl
 gynoecium syncarpous, carpels 2, ovary inferior

E.g., **P** 3+3 **A** 3+3 **G** 3, superior

= perianth apotepalous with 3 outer and 3 inner tepals
 stamens 6, distinct, in two whorls: 3 outer + 3 inner
 gynoecium apocarpous, carpels (pistils) 3, ovaries superior

PLANT DESCRIPTION EXAMPLE

Tecomaria capensis (Thunb.) Spach, Cape-Honeysuckle (native to S. Africa). Bignoniaceae.

Plant a shrub, up to ca. 5 m tall. **Root** a woody taproot with numerous lateral roots. **Stems** (aerial) highly and sympodially branched by abortion of terminal inflorescence meristems, branches basally inclined. **Bark** brown, smooth to minutely furrowed, lenticels orbicular to vertically elliptic with raised borders, ca. 1–2 mm wide. **Twigs** terete, minutely puberulent. **Pith** solid, circular in outline. **Fruit scars** (of infructescence) raised, circular, typically at junction of two, lateral branches. **Leaf scars** slightly raised below, orbicular with truncate apex. **Vascular bundle scar** U-shaped. **Buds** in leaf axils small (ca. 2 mm long), with outer two scales in a plane tangential to stem axis, scales valvate, lance-ovate and strongly cup-shaped, densely pubescent; terminal buds naked, elongate, to 5 mm long. **Leaves** 10–12 cm long, imparipinnate, petiolate, exstipulate, evergreen, cauline, opposite-decussate, divergent to inclined, and planar to recurved. **Petiole** green, terete to canaliculate, 1–3 cm long. **Leaf outline** elliptic. **Leaflets** 9 [11], opposite. Lateral leaflets elliptic to widely elliptic, subsessile, 15–17 mm long, 10–14 mm wide, base attenuate to obtuse, sometimes oblique, margin usually proximally entire and serrate to crenate distally, apex acuminate (caudate), tip minutely mucronulate, Apical leaflet widely elliptic, usually petiolulate (**petiolule** green, narrowly winged, 3–13 mm long) 24–30 mm long, 15–20 mm wide, cuneate, entire at base and distally serrate to crenate, acute to acuminate, mucronulate. All leaflets pinnate-netted, midvein and secondary veins sunken above and raised below, mostly glabrous but with arachnose trichomes near abaxial vein junctions, mesophyllous. **Inflorescence** a terminal thyrse with several bracteate units of simple dichasia or of solitary flowers, the latter often with two abortive, lateral flower buds or with two sub-basal bracts (indicative of a vestigial dichasium). **Flowers** perfect, ca. 50 mm long, ca. 25 mm wide, opposite, appressed, recurved, zygomorphic, pedicellate. **Pedicel** ca. 7 mm long, terete. **Bract** 1 subtending each unit of inflorescence, 1–5 mm long, lanceolate, mucronulate. **Bractlets** 2, sub-basal, subtending lateral flowers if simple dichasium present. **Perianth** biseriolate, dichlamydeous. **Calyx** synsepalous, actinomorphic, ca. 5 mm long. **Calyx lobes** acute, mucronulate, ca. 1 mm long. **Corolla** sympetalous, orange, zygomorphic, salverform-bilabiate with enlarged throat, ca. 45 mm long, recurved, inner surface pubescent. **Corolla lobes** 5 (2 posterior, 2 lateral, and 1 anterior), oblong to elliptic, apices rounded to emarginate, 7–12 mm long, 5–7 mm wide, inclined to divergent and recurved relative to floral axis. **Stamens** 4 fertile, uniseriate, filamentous, epipetalous, didynamous, alternipetalous, exerted, apostemonous. **Staminodium** 1, medio-posterior, reduced, up to ca. 10 mm long. Filaments (of fertile stamens) terete, yellow-orange, 35–40 mm long. **Anthers** versatile, basifixed, longitudinally and introrsely dehiscent (downwardly dehiscent at maturity), ca. 3 mm long, thecae divergent. **Pollen** orange. **Gynoecium** syncarpous. **Perianth/Androecial position** hypogynous. **Ovary** superior, green, 4–5 mm long, narrowly obloid, glabrous. **Carpels** 2. **Locules** 2. **Placentation** parietal-axile. **Ovules** many. **Styles** 1, terminal, apically recurved, purple-brown. **Stigmas** 2, ovate, divergent to appressed. **Nectary** dark maroon, doughnut-shaped, surrounding ovary base. **Fruit** a brown loculicidal capsule (with persistent replum), narrowly oblong, up to ca. 1 cm wide and 6 cm long. **Seeds** flat, with surrounding, yellowish, translucent wing, ca. 15 mm long and 8 mm wide (including wing), seed body roughly orbicular, ca. 6 mm in diameter.

FLORAL FORMULA: K (5) C (5) A 2+2+1_{staminode} G (2), superior.

