

UNLOCKING THE BOTANICAL KEY

A Brief Overview

Introduction

Sooner or later, those of us who grow penstemons will be confronted with the need to identify a penstemon. Consulting a Key is one route to accurate identification; however keys can be difficult to use. One needs:

- some knowledge of **botanical terms** ([link](#)),
- a ruler which measures centimeters as well as inches,
- 10x magnifying glass and a **checklist of important aspects** ([link](#)) of the plant.

If you are identifying penstemons in the wild you are ahead of the game because knowing location narrows possibilities quickly. When the APS database is complete, it will be able to list for you penstemon locations, often with a degree of refinement including counties and roads. In the meantime, look over the lists of penstemons by state developed by [Lindgren and Wilde](#).¹ ([link](#))

Nothing replaces practice. Give yourself time to develop your eye and your system. Be patient with the process.

How to Use a Key^{2 3}

A key is like a questionnaire about your plant. It is made up of pairs (couplets) of opposite statements. Think of each statement as a question to be answered **YES** or **NO**.

The first couplet, numbered 1 and 1 (yes, one and one) is always at the left margin. It might state:

- 1 corolla red
- 1 corolla blue

If your plant has a red flower, the answer to the first #1 is **YES**. If so, so down to the next couplet numbered 2 and 2 (yes two and two) which is just below the first couplet, but indented one space to the right from the left margin.

This second couplet, numbered 2 and 2, might state:

- 2 leaves broad
- 2 leaves narrow

Let's say your red flower has broad leaves, so you answer **YES** to the first #2.

¹ Lindgren, D. and Wilde, Ellen. 2003. *Growing Penstemons: Species, Cultivars and Hybrids*. 519 West Lancaster Avenue, Haverford, PA 19041-1413.

² Lodewick, Robin and Kenneith. 1999. *Key to the Genus Penstemon and its related Genera in the Tribe Cheloneae (Scrophulariaceae)*. Available from Kenneth Lodewick 2526 University Street, Eugene, OR 97403.

³ See also Cultivation Reference Section, "Botanical Keys."

At this point those two answers, giving you a red flower with broad leaves, might be enough to identify your plant. If so the name of the species will be printed at the right margin on the same line.

If more description is needed, there will be another couplet, and so on until you reach the identity of your plant.

Now suppose your answer to the first statement in the #1 couplet was “no.” Then you ignore all the couplets indented below it (and there could be several). You go next, straight down to the second half of #1, which is 1, Corolla blue. And here the next couplet that pertains might be #7 and it might state:

- 7 Cyme many-flowered
- 7 Cyme few-flowered

One more thing to notice about couplets:

Couplets directly below any number (in this example the #2's and #7's), under the #1's) are the same distance from the left margin. Each new couplet gives you more choices about the statement just above it (the one it depends on), and is indented one space (but never more than one) farther to the right—at least, until all the couplets under a number have been answered, and you wind up below where you started. For example:

- 1 Corolla red
 - 2 Leaves broad
 - 3 Calyx 5-8 mm long
 - 3 Calyx 2-3 mm long
 - 4 Staminode long-exserted
 - 5 Cyme many-flowered
 - 6 Corolla large
 - 6 Corolla small
 - 5 Cyme few-flowered
 - 4 Staminode not exserted
 - 2 Leaves narrow
- 1 Corolla blue
 - 7 Cyme many-flowered
 - 7 Cyme few-flowered

STRUCTURE OF A BOTRANICAL KEY

I. INTRODUCTION

Each section of the key begins with an overall description of species found in the section. All species included in that section should have the overall characteristics as described in the

opening paragraph. Exceptions are noted.

II. DESCRIPTION OF DASANTHERA⁴⁵

DESCRIPTIVE KEY, GROUP III Subgenus Dasanthera (9 species)

Section III⁶, **Subgenus Dasanthera**⁷ (9 species) begins with the following description:

Anther sacs wooly-pubescent (open end-to-end but hidden in white fuzz).

Corolla glabrous, usually **large, expanded gradually**, moderately, **1-ridged on top, flattened and 2-ridged underneath**; **mouth** often partially closed, with **upper lobes projecting, lower lobes large**; **no guidelines**

Leaves toothed (in 3 species, sometimes **entire**), **broad** (in 1 species **narrow**, in 1 sometimes so), often **leathery**; **lower leaves** usually on **petiole**

Shrub or **subshrub**, often **matforming**, between **5 and 40 cm tall** (1 species a **herb**, to **80 cm**)

Cyme about **1 cm** long, & **1-flowered** (in 2 species, cyme longer &/or **several-flowered**); **inflorescence** often **short (3-4 nodes)**

Calyx lobes usually **narrow**.

Staminode short ($\frac{1}{2}$ to $\frac{2}{3}$ length of **stamens**), **slightly bearded** (in 3 species, not bearded, or often so)

III. DEFINITION OF TERMS FOUND IN DESCRIPTION OF DASANTHERA⁸

⁴ pp 16-17

⁵ terms highlighted for instructional purposes and do not appear this way in the “Key”

⁶ The key divides the 272 species of penstemons into 12 sections (III-IVX)

⁷ Dasanthera is labeled Section III

⁸ For a complete list of terms go to Library tab and consult “Glossary” or to “Botanical Terms” website.

TERM	DEFINITION
Classification Information	
Section III	The key divides the 272 species of penstemons into 12 sections (III-IVX)
Subgenus Dasanthera	Dasanthera is labeled Section III

Anther Information	
Anther sacs	Anther sacs contain <u>pollen</u> and are found at the end of a stamen. There are two pairs of stamens in penstemons. Once the anther sacs open to release their pollen it can be seen that anthers of the various sub-genera look quite different from one another (more). Botanists use this feature to aid in species identification. Descriptions of anther sacs are used throughout the Key. One needs only an inexpensive <u>10x magnifying glass</u> to see the anther sacs adequately.
wooly-pubescent	The open anther sac is surrounded by little hairs.
open end-to-end	Anther sacs of the various sub-genera uses have characteristic ways of opening (more)

Flower Information	
corolla	The penstemon flower has five sepals which comprise the calyx and the corolla which is commonly called the “flower”
glabrous	no hairs; not bearded
large	medium is defined as 15-25 mm
expanded gradually	the throat of the corolla may enlarge gradually or abruptly (more)
1-ridged on top	ridge found on the upper (dorsal) side of the throat
flattened and 2-ridged underneath	two ridges found on the lower (ventral) side of the throat
mouth	opening to the interior of the corolla
upper lobes projecting	corolla divided in to upper and lower lips; upper lip has two lobes and their appearance can be a distinguishing characteristic (more)
lower lobes large	corolla divided in to upper and lower lips; the lower lip has three lobes and also can be a distinguishing characteristic (more)
no guidelines	

PENSTEMON KEYS

AUTHOR(S)	CITATION	DESCRIPTION
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Bleakly, David	Bleakly, David. <i>A Key to the Penstemons of New Mexico</i> . 1998. "The New Mexico Botanist" no. 9. Cooperative Extension Service, College of Agriculture and Home Economics, New Mexico State University. Author's address: 3813 Monroe, NE Albuquerque, NM 87110	Article and Key. Useful tool for those botanizing in New Mexico. In addition to giving the species name, locations are given by country.
Chester, Tom	Chester, Tom. http://tchester.org/sgm/keys/index.html	User friendly key designed for hikers in the San Gabriel Mountains. Written so the user will not need to use magnification, measurement, nor a botanical dictionary. If you want to practice using a key, this and the Strickler key would be a good place to begin.
Cronquist, A. Holmgren, AH, Holmgren, NH, Reveal, JL and Holmgren, PK.	Cronquist, A. Holmgren, AH, Holmgren, NH, Reveal, JL and Holmgren, PK. 1984. <i>Intermountain Flora Vascular Plants of the Intermountain West, U.S.A.</i> Volume 4. Bronx, New York, New York Botanical Garden.	Two keys are offered: (a) an artificial key for the purpose of identification; and (b) a technical key which provides diagnostic characteristics for the subgenera and sections as well as a second source for species identification. The keys are limited to species found in the Intermountain region which includes Nevada, Utah and portions of Oregon, Idaho and Wyoming.
Lodewick, Robin and Kenneth	Lodewick, Robin and Kenneth. <i>Key to the Genus Penstemon and its related Genera in the Tribe Cheloneae (Scrophulariaceae)</i> . 1999. 10 th Avenue Press, Eugene, OR. Available from Kenneth Lodewick, 2526 University St., Eugene, OR 97403.	The only key covering all species of penstemons. It includes a quick key and more detailed descriptive key. Helpful botanical diagrams and a glossary are given at the back of the book. The introduction is useful, and includes a section describing how to use a key.
Jepson Manual		Not reviewed.
Strickler, Dee	Strickler, Dee. 1997. <i>Northwest Penstemons</i> . "Key to Northwest Penstemons" pp.10-23. 192 Larch Lane, Columbia Falls, MT 59912. Flower Press.	A key presented with great clarity. The genus is first divided into four groups within which species are identified. If you want to practice using a key, this and the Chester key would be a good place to begin.