

## Key to the subulate-leaved acrocarpous mosses in Central California

Plants included in this key have leaf apices filled, or almost filled, by the costa., and have leaves that are at least very long lanceolate, linear, or subulate from a broader base.

- 1a. Plants forming dense cushions, crispate when dry (see also some forms of *Didymodon vinealis*) ..... 2
- 1b. Plants forming cushions or not, not crispate when dry ..... 3
  
- 2a. Leaf margins toothed in a remote stair-stepped pattern. Cuticular papillosity present on laminal cells. Capsules rare and immersed. On rock or soil ..... *Amphidium californicum*
- 2b. Leaf margins entire. Cells smooth. Capsules common and long exserted. On wood or bark.....*Dicranoweisia cirrata*
  
- 3a. Leaf cells at least somewhat papillose.....*Didymodon* 4
- 3b. Leaf cells smooth ..... 5
  
- 4a. Leaf margins bistratose, and with some form of irregularity (wavy, or stair-stepped) .....*Didymodon eckeliae*
- 4b. Leaf margins 1 cell thick, usually entire, occasionally irregular..... some forms of *Didymodon vinealis*
  
- 5a. Capsules almost always present on short setae, cleistocarpous. Small ephemeral plants of grasslands..... 6
- 5b. Plants larger, capsules when present on elongate setae, operculum present. Habitat various..... 8
  
- 6a. Capsules without a distinct neck, calyptrae cucullate ..... *Pleuridium* 7
- 6b. Capsules with a distinct neck, calyptra mitrate ..... *Bruchia flexuosa*
  
- 7a. Lamina of perichaetial leaf shoulder unistratose, plants autoicous, antheridia enclosed in an axillary bud.....*Pleuridium subulatum*
- 7b. Lamina of perichaetial leaf shoulder bistratose, plants paroicous, antheridia naked in the axils of upper stem leaves .....*Pleuridium acuminatum*
  
- 8a. Plants growing on wood or bark with the leaf apices caducous. Dry leaves rigidly erect .....*Dicranum tauricum*
- 8b. Substrate various, leaf tips persistent ..... 9
  
- 9a. Alar cells bistratose and at least somewhat inflated..... *Dicranum* 10
- 9b. Alar cells unistratose and not inflated, if enlarged, then with thick colored walls..... 12
  
- 10a. Median and upper cells elongate, costa angled or faintly ridged ..... *Dicranum howellii*
- 10b. Median cells at most 2-3:1, costa smooth ..... 11
  
- 11a. Both stereid bands about 2 cells thick, medial and upper cells mostly isodiametric ..... *Dicranum fuscescens*
- 11b. Both stereid bands about 4 cells thick, medial and upper cells 2-3:1.....*Dicranum sulcatum* ‡
  
- 12a. Alar regions auriculate, usually with reddish, thick-walled cells. Costa without stereids. Leaf margins entire .....*Blindia acuta*

12b. Leaf base not auriculate or red. Costa with or without stereids .....	13
13a. Upper leaf cells linear (see also <i>Dicranella heteromalla</i> ) .....	14
13b. Upper leaf cells isodiametric to 5-6:1 .....	15
14a. Costa ~1/2 of immediate leaf base <b>with 2 stereid bands</b> ; stem with thick walled epidermis. Leaves setaceous and flexuose, never secund, medial cells long rectangular or trapezoidal. Capsules, nodding, pyriform. On soil.....	<i>Leptobryum pyriforme</i>
14b. Costa narrower, <b>without stereids</b> , plants sometimes secund, medial cells long hexagonal or vermiform; stem with large, thin-walled outer cells. Capsule erect. On tree trunks or rotting wood. Dried leaves have a faint “crinkly” appearance.....	<i>Orthodontium gracile</i>
15a. Costa narrow, 1/5 or 1/6 of limb at insertion. Leaf margins recurved and bistratose.....	16
15b. Costa very broad and sometimes poorly defined, 1/4-4/5 the width of the limb at insertion. Leaf margins plane or incurved.....	17
16a. Costa mostly filling the subula. Capsule strongly curved with very large, flat peristome teeth split at most halfway.....	<i>Dicranella varia</i> *
16b. Costa not filling leaf apex. Leaves more very long triangular than subulate. Capsule erect, with narrow, terete teeth split almost to the base .....	<i>Ditrichum ambiguum</i>
17a. Costa 35-80% the width of the leaf at insertion, costa without a ventral stereid band.....	18
17b. Costa 1/4-1/3 the width of the leaf at insertion, costa with or without ventral stereid band.....	19
18a. Leaves with reflexed hyaline awns, abaxial costal surface usually ribbed.....	<i>Campylopus introflexus</i>
18b. Leaves without awns, abaxial costal surface smooth.....	<i>Campylopus pyriformis</i>
19a. Capsules cylindrical, peristome teeth cribose or split to near the base into terete filaments. Seta yellow. Leaves 3-7 mm; alar cells thin, appearing compressed, basal cells slightly wider than cells of limb; costa usually with 2 stereid bands, often the ventral band thin or rarely wanting; limb ¼ of leaf length or shorter .....	<i>Ditrichum schimperi</i>
19b. Capsules short, strongly curved, peristome teeth split, but not usually to the base, thus the basal portion usually somewhat triangular and flattened. Leaves 2-4 mm, costa variable.....	20
20a. Capsule zygomorphic, without stomata; seta yellow. Leaves usually falcate-secund; alar cells poorly defined; costa with 2 stereid bands. ....	<i>Dicranella heteromallum</i>
20b. Capsule curved but symmetrical, with stomata; seta reddish at maturity. Leaves usually not falcate-secund. Costa without ventral stereid band and with guide cells on the ventral surface. Alar cells 1-2:1 .....	<i>Dicranella howei</i> *

\**Dicranella howei* and *D. varia* intergrade to the point that Crum (Crum & Anderson 1981, BFNA) synonymized them. The vast majority of California plants fit the description of *D. howei*, but recently plants perfectly fitting the description of *D. varia* have been found. *D. howei* has a broader, poorly defined costa, distally bistratose leaves, margins plane or recurved only proximally, Exothelial cells slightly sinuose, and uniformly thickened. The costa has only one row of guide cells, and they form the ventral surface. *D. varia* has a narrower, well defined costa, distally unistratose leaves with bistratose margins. Margins recurved for most of its length, and the exothelial cell walls are straight with the

longitudinal walls are much thicker than the cross walls. The costa in *D. varia* has scattered ventral stereids, and has the guide cells in two rows.

‡ Most eastern authorities do not recognize *D. sulcatum*, synonymizing it with *D. fuscens*.