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By CHARLES V. PIPER *in com.*



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9. *Phacelia glandulifera*, sp. nov.

Annual, branched from the base, 5 to 30 cm. high, hispid, and glandular throughout; leaves oblong, pinnately parted into 11 to 15 narrow divisions, these acutish and mostly 2 to 6-lobed; calyx lobes spatulate-oblongate, obtuse, entire or rarely bearing a single lobe, hispid and glandular, about 6 mm. long in flower, becoming twice as long and remaining erect in fruit; corolla pale violet, campanulate-funnelform, 6 mm. long, barely exceeding the calyx, 15-nerved, its rounded lobes 1.5 mm. long, the crests very obscure or wanting; stamens included, the slender filaments subulate, unequally inserted toward the base, the white anthers cordate-reniform; style 2-cleft at apex; stigmas capitate; capsule oblong, 5 to 6 mm. long, obtuse, sparsely hispidulous; seeds about 12, angular, lanceolate-oblong, beautifully tuberculate in transverse rows, 1.7 mm. long.

This plant has long been confused with *P. ivesiana* Torr. of the Great Basin region southward, though attention was called to its distinctness long since.^a *P. ivesiana* differs in having its herbage more hispid and nearly glandless, and in having broader, obtuse, mostly entire leaf lobes, glandless calyx, and more deeply corrugated seeds.

SPECIMENS EXAMINED: Washington—Junction Crab and Wilson creeks, Douglas County, *Sandberg & Leiberg* 306, June, 1893; Pasco, *Piper* 2954, May 25, 1899 (type); same locality, *Henderson* 2540; Morgan's Ferry, Yakima County, *Suksdorf* 398. Oregon—Sage Plains, *Howell*, June 16, 1885; Ontario, *Leiberg* 2015; Guano Ranch, *Coville & Leiberg* 5, July 24, 1896; eastern Oregon, *Cusick* 1670. Idaho—without locality, *Hayden* in 1872; Big Butte Station, *Palmer* 590; Blue Lakes, *Palmer* 65.

ZONAL DISTRIBUTION: Upper Sonoran.

CONANTHUS.**1. *Conanthus parviflorus* Greenman, *Erythea* 7: 117. 1899.**

Gilia hispida Piper, *Erythea* 6: 30. 1898, not *Conanthus hispidus* Heller nor *Nama hispida* A. Gray. 1862.

TYPE LOCALITY: "Oregon in sandy soil of the Malheur." Collected by Cusick.

RANGE: Eastern Washington and eastern Oregon.

SPECIMENS EXAMINED: Near Morgan's Ferry, *Suksdorf* 390; Wallula, *Brandege* 978; Pasco, *Piper* 2968; *Hindshaw*, May 25, 1896; *Henderson* 2402; *Piper*, July 10, 1897.

ZONAL DISTRIBUTION: Upper Sonoran.

Washington specimens referred to *Nama demissum* A. Gray and *Conanthus aretioides* Wats. belong to this species.

BORAGINACEAE. BORAGE FAMILY.

Ovary undivided, sometimes 2 to 4-grooved; style terminal.

Style entire; stigma peltate..... HELIOTROPIUM (p. 473).

Style 2-cleft; stigmas capitate..... COLDENIA (p. 474).

Ovary 4-parted; the style arising from between the parts.

Nutlets armed with barbed prickles.

Nutlets erect, prickly on the margins and sometimes on the back..... LAPPULA (p. 474).

Nutlets spreading, prickly all over..... CYNOGLOSSUM (p. 476).

Nutlets not armed with barbed prickles,

Calyx much enlarged and membranous in fruit..... ASPERUGO (p. 476).

Calyx not much enlarged nor membranous in fruit.

Corolla tubular or tubular-funnelform, blue MERTENSIA (p. 476).

Corolla funnelform or rotate.

Nutlets erect attached by the very base,

Racemes bractless; corolla rotate; roots

slender..... MYOSOTIS (p. 486).

^a Coville, *Contr. Nat. Herb.* 4: 159. 1893.

- Racemes bracteate; corolla funnellform;
 roots thick..... LITHOSPERMUM (p. 486).
 Nutlets erect or oblique, attached above the
 base, a more or less prominent fruiting
 receptacle (gynobase).
 Corolla yellow or orange, with naked
 open throat..... AMSINCKIA (p. 480).
 Corolla white or blue with throat more
 or less fornicate—that is, bearing
 prominent swellings.
 Nutlets very flat and thin, attached
 above the middle, the margins
 spinulose..... PECTOCARYA (p. 482).
 Nutlets thick, attached at or below
 the middle.
 Perennials.
 Corolla blue; nutlets ob-
 lique, the dorsal surface
 with an acute, entire or
 spiny margin..... ERITRICHIUM (p. 480).
 Corolla white or whitish;
 nutlets ovate-trigonus. OREOCARYA (p. 481).
 Annuals.
 Calyx circumscissile..... PIPTOCALYX (p. 481).
 Calyx not circumscissile.
 Gynobase elongate,
 the nutlets attached
 by one-third their
 length or more.... CRYPTANTHE (p. 483).
 Gynobase low.
 Nutlets oblique
 or incurved, at-
 tached about
 the middle by
 a caruncle-like
 process; leaves
 all alternate.. PLAGIOBOTHRYA (p. 482).
 Nutlets attached
 just inside the
 base; lower
 leaves opposite ALLOCARYA (p. 485).

HELIOTROPIUM.

1. **Heliotropium curassavicum** L. Sp. Pl. 1: 130. 1753.
 ? *Heliotropium chenopodioides* Willd. Enum. Hort. Berol. 175. 1809.
 TYPE LOCALITY: "In Americae calidioris maritimis."
 RANGE: Washington to Virginia and southward.
 SPECIMENS EXAMINED: Junction Crab and Wilson creeks, *Sandberg & Leiberg* 339; Walla
 Walla, *Lyall*, June, 1860; Waitsburg, *Horner* 379; without locality, *Vasey* in 1889; Wallula,
Cotton 1074a.
 ZONAL DISTRIBUTION: Upper Sonoran.

COLDENIA.

1. *Coldenia nuttallii* Hook. Journ. Bot. & Kew Misc. 3: 296. 1851.

Tiquilia parvifolia Nutt.; Hook. loc. cit. as synonym.

TYPE LOCALITY: "Rocky Mountains." Collected by Nuttall.

RANGE: Washington to Wyoming, Arizona, and California.

SPECIMENS EXAMINED: Egbert Springs, *Sandberg & Leiberg* 343; Kennewick, *Piper*, July 10, 1897; Pasco, *Elmer* 1061; *Henderson*, June, 1892; without locality, *Brandeggee* 982.

ZONAL DISTRIBUTION: Upper Sonoran.

LAPPULA.

Annuals; scar of the nutlets linear.

Lateral prickles of the fruit free..... 8. *L. occidentalis*.

Lateral prickles of the fruit united..... 9. *L. cupulata*.

Perennials; scar of nutlets triangular or ovate.

Lateral prickles united for about half their length.

Corolla greenish, the lobes broadest at base..... 6. *L. hispida*.

Corolla blue, the lobes narrowest at base..... 7. *L. ciliata*.

Lateral prickles of the fruit free to the base or nearly so.

Swellings in throat of corolla pubescent.

Flowers white; pubescence, harsh, appressed..... 1. *L. arida*.

Flowers blue; pubescence soft, not appressed..... 2. *L. saxatilis*.

Swellings in throat of corolla not pubescent.

Flowers white; swellings as long as broad..... 5. *L. hendersoni*.

Flowers blue; swellings broader than long.

Corolla 4 to 6 mm. broad..... 3. *L. floribunda*.

Corolla 8 to 10 mm. broad..... 4. *L. diffusa*.

1. *Lappula arida* Piper, Bull. Torr. Club 28: 44. 1901.

Lappula cottoni Piper, Bull. Torr. Club 29: 549. 1902.

TYPE LOCALITY: Ellensburg, Washington.

RANGE: Washington and Oregon.

SPECIMENS EXAMINED: Wenache, *Whited*, June, 1896 and 1047; Ellensburg, *Elmer* 385; *Whited* 324; *Piper* 2676; Peshastin, *Sandberg & Leiberg* 595; Douglas County, *Spillman*, May 27, 1896; junction Crab and Wilson creeks, *Sandberg & Leiberg* 277; Coulee City, *Piper* 3840; without locality, *Vasey* in 1889; Chelan Butte, *Griffiths & Cotton* 173; Wenache Mountains, *Griffiths & Cotton* 126; Rattlesnake Mountains, *Cotton* 360, 579, 650.

ZONAL DISTRIBUTION: Upper Sonoran.

2. *Lappula saxatilis* Piper, Bull. Torr. Club 29: 541. 1902.

TYPE LOCALITY: "Rocky sides of canons, Klickitat River, Wash." Collected by *Suksdorf*. Not otherwise known.

3. *Lappula floribunda* (Lehm.) Greene, Pittonia 2: 182. 1891.

Echinosperrum floribundum Lehm. Pug. 2: 24. 1830.

TYPE LOCALITY: "Lake Pentanguishene to the Rocky Mountains," collected by *Drummond*, according to *Hooker*.

RANGE: Washington to Saskatchewan, Colorado, and California.

SPECIMENS EXAMINED: Yakima Region, *Brandeggee* 986.

4. *Lappula diffusa* (Lehm.) Greene, Pittonia 2: 182. 1891.

Echinosperrum diffusum Lehm. Pug. 2: 23. 1830.

TYPE LOCALITY: "N. W. America," collected by *Douglas*, according to *Hooker*.

RANGE: British Columbia to California, Montana, and Utah.

SPECIMENS EXAMINED: Wenache Mountains, *Whited* 1258; mountains near Ellensburg, *Piper* 2669; upper Yakima River, *Lyall* in 1860; Klickitat River, *Suksdorf* 592; *Flett* 1011; Blue Mountains, *Horner* 121, 341; without locality, *Vasey* in 1889.

ZONAL DISTRIBUTION: Canadian.

5. **Lappula hendersoni** Piper, Bull. Torr. Club **29**: 539. 1902.

TYPE LOCALITY: "Clemens Mountains, Yakima County, Washington." Collected by Henderson.

RANGE: Eastern slope of the Cascade Mountains in Washington and Oregon.

SPECIMENS EXAMINED: Klickitat County, *Suksdorf*, June, 1881; Upper Yakima, *Lyall* in 1860; Cleman Mountain, *Henderson*, June 14, 1892.

6. **Lappula hispida** (A. Gray) Greene, Pittonia **2**: 182. 1891.

Echinospermum diffusum hispidum A. Gray, Proc. Am. Acad. **17**: 225. 1882.

Echinospermum hispidum A. Gray, Syn. Fl. ed. 2. **2**¹: 422, 1886.

TYPE LOCALITY: Rocky hillsides of Pine Creek near the mouth, Union County, Oregon. Collected by Cusick.

RANGE: Northeastern Oregon and adjacent Washington.

SPECIMENS EXAMINED: Asotin County, *Sheldon* in 1897.

7. **Lappula ciliata** (Dougl.) Greene, Pittonia **2**: 182. 1891.

Cynoglossum ciliatum Dougl.; Lehm. Pug. **2**: 24. 1830.

Echinospermum ciliatum A. Gray, Proc. Am. Acad. **17**: 225. 1882.

TYPE LOCALITY: "Kettle Falls and Spokane River, Washington." Collected by Douglas.

RANGE: Spokane and Stevens counties, Washington.

SPECIMENS EXAMINED: Chewelah, *John K. Ely* 55; Spokane, *Dewart*, May 6, 1901; *Piper* 2292; *Henderson*, June, 1892; Spokane and Kettle Falls, *Douglas* in 1826; Clarks Springs, *Kreager* 95.

ZONAL DISTRIBUTION: Arid Transition.

8. **Lappula occidentalis** (S. Wats.) Rydberg, Mem. N. Y. Bot. Gard. **1**: 329. 1900.

Echinospermum redowskii occidentale S. Wats. Bot. King Explor. 246. 1871.

Lappula fremontii Howell, Fl. N. W. Am. 480. 1901.

TYPE LOCALITY: "In the valleys and on the mountains from the Sierras to the Wahsatch."

RANGE: Alaska to Minnesota and Arizona.

SPECIMENS EXAMINED: Berne, *Piper*, July 7, 1895; Wenache, *Whited* 32, 1048, 1226; Ellensburg, *Elmer* 430; *Whited* 342, 389; Douglas County, *Spillman*, May 27, 1896; North Yakima, *Mrs. Steinweg* in 1894; *Flett* 1034; Pasco, *Hindshaw* 17; *Piper* 2952; Spokane, *Piper* 2691; Sprague, *Sandberg & Leiberg* 174; Rattlesnake Mountains, *Cotton* 407; Kalispel Lake, *Kreager* 441; Meyers Falls, *Kreager* 502; North Yakima, *Henderson*, May 25, 1892; Moxee to North Yakima, *Griffiths & Cotton* 35; Davis Lake, *Kreager* 441; Meyers Falls, *Kreager* 502; Wenache, *Whited*, April 15, 1902; Rattlesnake Mountains, *Cotton* 407.

ZONAL DISTRIBUTION: Upper Sonoran and Arid Transition.

A specimen collected at Spokane (*Sandberg, Heller, & MacDougal* 928) was erroneously determined and listed as *Lappula lappula* (L.) Karst. ^a

9. **Lappula cupulata** (A. Gray) Rydberg, Bull. Torr. Club **28**: 31. 1901.

Echinospermum redowskii cupulatum A. Gray, Bot. Cal. **1**: 530. 1876.

Lappula columbiana A. Nelson, Bot. Gaz. **34**: 28. 1902.

TYPE LOCALITY: Trinity Mountains, Nevada. Collected by Watson.

RANGE: Washington and Idaho to Nevada and Colorado.

SPECIMENS EXAMINED: Almoda, *Piper* 1703.

ZONAL DISTRIBUTION: Upper Sonoran.

Our plant is identical with the type of *L. cupulata*.

^a Contr. Nat. Herb. **3**: 242, 1895.

CYNOGLOSSUM.

1. *Cynoglossum grande* Dougl.: Lehm. Pug. 2: 25. 1830.

TYPE LOCALITY: "Shady Woods, N. W. Coast." Collected by Douglas.

RANGE: Washington to California in the coast region.

SPECIMENS EXAMINED: West Klickitat County, *Suksdorf* 92; Fort Vancouver, *Tolmie*.

ASPERUGO.

1. *Asperugo procumbens* L. Sp. Pl. 1: 138. 1753.

TYPE LOCALITY: European.

SPECIMENS EXAMINED: Spokane, *Piper* 2721.

MERTENSIA.

Plants tall and leafy, 50 to 100 cm. high, the leaves thin and broad.

Leaves glabrous on both sides or merely papillose above; calyx smooth on the back.

Calyx lobes elongate, acute, much longer than the fruit.

Leaves few, green, oblong-lanceolate, obtuse or acutish

1. *M. infirma*.

Leaves many, pallid, ovate, acuminate

2. *M. laevigata*.

Calyx lobes short and obtuse, or triangular and acute, not longer than the fruit.

Leaves acute, mostly sessile; calyx lobes obtuse ...

3. *M. ambigua*.

Leaves acuminate, short-petioled; calyx lobes acute.

4. *M. brachycalyx*.

Leaves pilose beneath.

Upper leaf surface strigose.

Calyx lobes canescent

5. *M. membranacea*.

Calyx lobes not canescent.

Dorsal surface of calyx lobes glabrous

6. *M. paniculata*.

Dorsal surface of calyx lobes pubescent

7. *M. platyphylla*.

Upper leaf surface smooth or merely papillose.

Calyx lobes pubescent on back

8. *M. subcordata*.

Calyx lobes glabrous on back

9. *M. leptophylla*.

Plants low, 15 to 40 cm. high, the leaves narrow or thickish.

Roots tuberous or fasciculate-tuberous, shallow-seated; basal leaves, none.

Leaves glabrous or merely papillose above.

Herbage not glaucous

10. *M. pulchella*.

Herbage glaucous

10a. *M. pulchella glauca*.

Leaves strigose above.

Corolla tube 3 or 4 times as long as the limb

11. *M. oblongifolia*.

Corolla tube once or twice as long as the limb

12. *M. horneri*.

Roots not tuberous, vertical; basal leaves numerous, their dry bases persistent on the crown.

Leaves pubescent on both sides

13. *M. pubescens*.

Leaves not pubescent on both sides.

Leaves glabrous on both sides

14. *M. nutans*.

Leaves strigillose above

14a. *M. nutans subcalva*.1. *Mertensia infirma* sp. nov.

Glabrous throughout except the ciliate margins of the leaves and calyx lobes; stems weak, erect or nearly so, 50 to 60 cm. high; basal and lower cauline leaves oblanceolate,

obtuse, the blades 5 to 7 cm. long, shorter than the margined petioles; middle and upper cauline leaves lanceolate, acute or acutish, 5 to 10 cm. long, narrowed toward the base, sessile or short-petioled; inflorescence rather open, the bracts foliaceous; petioles slender, papillate near the calyx; calyx divided nearly to the base, the lance-oblong lobes smooth excepting the appressed-ciliate margin, about one-third as long as the corolla-tube; corolla bright blue, about 18 mm. long, the ampliate limb distinctly shorter than the tube; filaments dilated, longer than the anthers; fruit not seen.

In damp thickets, Ellensburg, April 25, 1897, *Kirk Whited* 307.

This species is allied to *M. intermedia* Rydberg, but is at once distinguished by the larger corolla with relatively longer tube. The type is in the U. S. National Herbarium (sheet no. 366088).

2. *Mertensia laevigata* sp. nov.

Stems stout, erect, more or less glaucous, 40 to 90 cm. high; leaves pale or glaucescent, numerous, the cauline ovate, acuminate, glabrous or somewhat papillate above, glabrous beneath, ciliate on the margin, 5 to 7 cm. long, short-petioled; inflorescence loose, the pedicels appressed-pubescent or muriculate; calyx divided nearly to the base, its lobes lance-oblong, acute, ciliate, smooth on the back, over half as long as the corolla tube; corolla blue, 14 mm. long, the somewhat ampliate limb as long as the tube; filaments dilated, shorter than the anthers; nutlets finely muriculate, pale, the scar of attachment central.

The following specimens are referred here: Goat Mountains, *O. D. Allen*, no. 231, July 22, 1896; Mount Rainier, *Piper* 2116, altitude 2,000 m., August 15, 1895; type sheet no. 33691 in U. S. National Herbarium; Klickitat River, *Flett* 1199, June 27, 1899; Mount Stuart, *Elmer* 1195, August, 1898; "California Bob" Peak, Olympic Mountains, *Lamb* 1383, August 4, 1897; Simcoe Mountains, *Howell*, June 6, 1899; Mount Rainier, *Piper* 2116.

3. *Mertensia ambigua* sp. nov.

Stems glabrous and leafy, about 60 cm. high; leaves thin, acute, more or less papillose above, sparsely scabrous-ciliate on the margins, the lower cauline lanceolate or lance-ovate, 8 or 10 cm. long, on petioles of nearly equal length, the middle and upper cauline oblong or oblong-ovate, or the uppermost ovate and sessile; inflorescence loose and open; pedicels muriculate; calyx short, its lobes oblong, scarcely broader at base, mostly obtuse, smooth on the back, ciliate, only one-fifth as long as the corolla tube, and in fruit exceeded by the nutlets; corolla blue, 12 mm. long, the tube about twice as long as the slightly enlarged throat; filaments dilated, shorter than the anthers; nutlets pale, distinctly keeled on the back, slightly tuberculate, the triangular scar central.

Collected by G. R. Vasey in the Cascade Mountains of central Washington in 1889. The type sheet is in the U. S. National Herbarium, no. 296759.

4. *Mertensia brachycalyx* sp. nov.

Whole plant glabrous except the ciliate margins of the leaves and calyx lobes; stems stout, erect, leafy, a meter or more high; leaves bright green, lance-ovate, or the lower cauline lanceolate, smooth beneath, usually papillose above, 5 to 10 cm. long, the lower ones petioled; inflorescence leafy and open, the flowers in small clusters subtended by a pair of leafy bracts on slender branches; calyx small, glabrous, the short triangular acute lobes often unequal; corolla blue, about 12 mm. long, the tube as long as the strongly ampliate throat; filaments dilated, much shorter than the anthers; fruit whitish, nearly smooth, convex on back.

Collected near Nason Creek, Chelan County, at an altitude of 1,400 meters by Sandberg & Leiberg, no. 678, August 14, 1893, the type in the U. S. National Herbarium.

5. *Mertensia membranacea* Rydberg, Bull. Torr. Club 28: 33. 1901.

TYPE LOCALITY: Priest River, Idaho.

RANGE: Idaho and adjacent Washington and Oregon.

SPECIMENS EXAMINED: Davis Ranch near Mount Carlton, *Kreager* 202, 216.

6. *Mertensia paniculata* (Ait.) G. Don, Hist. Diehl. Pl. 4: 318. 1838.*Pulmonaria paniculata* Ait. Hort. Kew. 1: 181. 1789.

TYPE LOCALITY: Hudson Bay.

RANGE: Alaska to Hudson Bay, Minnesota and Washington.

SPECIMENS EXAMINED: Mount Carlton, *Kreager* 190.**7. *Mertensia platyphylla*** Heller, Bull. Torr. Club 26: 548. 1899.? *Lithospermum denticulatum* Lehm. Asper. 2: 294. 1818.

TYPE LOCALITY: Montesano, Washington. Collected by Heller.

RANGE: Western Washington.

SPECIMENS EXAMINED: Montesano, *Heller* 3872; New London, *Lamb* 1168; Skokomish River, *Kincaid*, May 16, 1892.

ZONAL DISTRIBUTION: Humid Transition.

According to Hooker the type of *Lithospermum denticulatum* Lehm. was collected in "Shady woods near the confluence of the Columbia with the sea. Douglas. Mr. Tolmie." It has usually been considered a synonym of *Mertensia sibirica* L., but it probably will prove it to be *M. platyphylla* Heller.

8. *Mertensia subcordata* Greene, Pittonia 4: 89. 1899.

TYPE LOCALITY: Roseburg, Oregon.

RANGE: Washington and Oregon.

SPECIMENS EXAMINED: Cascade Mountains, *Henderson* 2259; Mount Stuart, *Whited* 796; Blue Mountains, *Horner* 367; *Lake & Hull* 639; *Piper*, July 17, 1896.

ZONAL DISTRIBUTION: Canadian.

9. *Mertensia leptophylla* sp. nov.

Stems glabrous, stout, erect, a meter or more high; leaves ovate, acute, pilose beneath, glabrous above, ciliate, very thin, the blades 6 to 10 cm. long, all on margined petioles 1 to 3 cm. long; inflorescence loose; pedicels with spreading pubescence; calyx parted nearly to base, the lobes narrowly triangular-lanceolate, acute, ciliate, smooth on the back; corolla blue, about 12 mm. long, the slightly enlarged throat as long as the tube; filaments dilated, shorter than the anthers.

Known only from the Olympic Mountains of Clallam County, the type collected by Elmer, no. 2826, July 1900, sheet no. 402139 in the U. S. National Herbarium. The plant was also collected on Mount Storm King by Lawrence, no. 359, July 23, 1904.

10. *Mertensia pulchella* sp. nov.

Stems erect, solitary or rarely two, glabrous, 15 to 20 cm. high; tubers shallow-seated, simple or fasciculate-branched, black; leaves green, elliptic or ovate, mostly obtuse, thickish, glabrous beneath, more or less papillose above, scabrous-ciliate, the lower narrowed at base and short-petioled, the middle and upper ones ovate, sessile, often half-clasping, 2 to 10 cm. long; lowest leaves much reduced, scarious; flowers in a close cluster, usually 10 to 15; calyx parted nearly to the base, the lobes oblong-lanceolate very acute, denticulate; corolla blue, its tube three to four times as long as the calyx and nearly as broad as the ampliate limb; filaments dilated, as long as the anthers; nutlets small, dark gray, finely muriculate, attached by a pale and prominent scar, inclosed in the tube of the much enlarged fruiting calyx.

The following collections have been examined:

Idaho: On the lower Clearwater River, *Sandberg, Heller, & MacDougal*, 75 and 75a, April 30, 1892 (type sheet in U. S. National Herbarium, no. 213037); without locality, *Rev. G. Ainslee* in 1874; *Henderson*, April 21, 1894; Lake Waha, Nez Perces County, *Heller*, June 2, 1896; Lewiston, *Byron Hunter*, 11, March 31, 1900.

All the above specimens are from Idaho, close to the Washington line, so that the species doubtless occurs within our limits.

10a. *Mertensia pulchella glauca* subsp. nov.

Herbage slightly glaucous throughout; leaves narrower, usually elliptic, mostly narrowed at base; stems often 2 to 4 from the same tuber; corolla tube more slender.

SPECIMENS EXAMINED: Hills west of Wenache, *Whited* 1010, March 31, 1899; type sheet no. 366511 in the U. S. National Herbarium; Badger Mountain, *Whited*, May 24, 1900.

This may well prove a distinct species, but in the light of rather scanty material is considered too close to *M. pulchella*.

11. *Mertensia oblongifolia* (Nutt.) G. Don, Hist. Dichl. Pl. 4: 372. 1838.

Pulmonaria oblongifolia Nutt. Journ. Acad. Phila. 7: 43. 1834.

Mertensia longiflora Greene, Pittonia 3: 261. 1898.

TYPE LOCALITY: "Towards the sources of the Columbia River." Collected by Wyeth.

RANGE: Washington, Idaho, Montana.

SPECIMENS EXAMINED: Fort Colville, *Lyall* in 1861; Upper Columbia, *Geyer* 316; Cheney, *Mrs. Susan Tucker* in 1890; Hangman Creek, *Sandberg & Leiberg* 48; Spokane, *Lyall* in 1861; *Henderson* in 1892; Wenache, *Whited* 1010; Pullman, *Piper* 1875; Almota, *Piper*, April 7, 1894; without locality, *Vasey* in 1883.

12. *Mertensia horneri* sp. nov.

Stems 8 to 15 cm. high, glabrous, solitary or rarely 2 or 3, erect from a shallow-seated oblong, black tuber; basal leaves none; cauline 2 to 5, oblong, obtuse, pale and somewhat glaucous, appressed puberulent above, glabrous beneath, sessile, or the lower ones short-petioled, 2 to 3 cm. long; lowest leaves reduced and scarious; inflorescence close; calyx glaucous, parted nearly to the base, its lobes oblong-lanceolate, very acute, denticulate-ciliate on the margin; corolla blue, 10 to 12 mm. long, its tube about twice as long as the calyx; filaments dilated, as long as the anthers.

SPECIMENS EXAMINED: Waitsburg, Washington, *Prof. R. M. Horner* 366, April 3, 1897, the type in the U. S. National Herbarium, sheet no. 318875; Union County, Oregon, *Cusick*, 1830, April 13, 1898.

13. *Mertensia pubescens* sp. nov.

Tufted from a stout vertical caudex covered with the dead bases of old leaves; stems 10 to 15 cm. high, leafy to the top; leaves numerous, the cauline inclined to be secund, linear or linear-lanceolate, obtuse or acutish, only the midrib evident, 3 to 6 cm. long, mostly about 5 mm. wide, pubescent on both surfaces, the basal ones attenuate into margined petioles about as long as the blades, the cauline sessile and but little reduced upwards; panicle short, dense, nodding; calyx lobes lanceolate, acute, coarsely ciliate, glabrous on the back, a third to a fourth as long as the corolla tube; corolla blue, the narrow tube 6 to 8 mm. long, one-half longer than the campanulate limb; filaments dilated, as long as the anthers.

Collected near Waterville, Douglas County, by *Kirk Whited*, 1214, April 23, 1900, the type sheet in the U. S. National Herbarium no. 370326.

Closely allied to *M. amoena* A. Nelson and *M. bakeri* Greene, but distinguished by its narrow more pubescent leaves and longer corollas.

14. *Mertensia nutans* Howell, Fl. N. W. Am. 491. 1901.

TYPE LOCALITY: "On the north side of high ridges, eastern Oregon and Washington." The type specimen is from Klickitat County, Washington.

RANGE: Washington and Oregon to Idaho and ? Colorado.

SPECIMENS EXAMINED: Near Granddalles, *Gorman*, April 20, 1892; Klickitat County, *Howell*, May, 1880; Wenache, *Whited* 1034; Ellensburg, *Whited*, April 18, 1897.

ZONAL DISTRIBUTION: Arid Transition.

14a. *Mertensia nutans subcalva* subsp. nov.

Leaves minutely strigose above; otherwise as in *M. nutans*.

SPECIMENS EXAMINED: Rattlesnake Mountains, *J. S. Cotton*, 328, April 29, 1901.

MERTENSIA MARITIMA (L.) S. F. Gray, Nat. Arr. Br. Pl. 2: 354. 1821. (*Pulmonaria maritima* L. Sp. Pl. 1: 136. 1753.)

This species is said by A. Gray ^a to occur on the coast of Washington, and it is included in Suksdorf's list. There are, however, no specimens in any of the American herbaria to substantiate the statement.

ERITRICHIUM.

1. **Eritrichium howardi** (A. Gray) Rydberg, Mem. N. Y. Bot. Gard. 1: 327. 1900.

Omphalodes howardi A. Gray, Proc. Am. Acad. 20: 263. 1885.

Cynoglossum howardi A. Gray, Syn. Fl. 2¹: 188. 1878.

TYPE LOCALITY: Rocky Mountains in Montana.

RANGE: Washington to Montana and Wyoming.

SPECIMENS EXAMINED: Cascade Mountains, *Tweedy* 130.

AMSINCKIA.

Nutlets not muriculate, the projections smooth and pavement-like; calyx

lobes oblong, obtuse..... 1. *A. tessellata*.

Nutlets muriculate-scabrous.

Erect; calyx lobes linear..... 2. *A. intermedia*.

Spreading; calyx lobes lanceolate or ovate, two or three of them

often united..... 3. *A. lycopsoides*.

1. **Amsinckia tessellata** A. Gray, Proc. Am. Acad. 10: 54. 1874.

TYPE LOCALITY: "Contra Costa mountains near Monte Diablo," California.

RANGE: Washington to Utah and California.

SPECIMENS EXAMINED: Wenache, *Whited*, June, 1896 and 44; Ellensburg, *Piper*, May 20, 1897; North Yakima, *Piper* 2785; *Henderson* 2558; Pasco, *Piper* 2971, 2977; *Hindshaw* 20; Snipes Mountain, *Cotton* 312; Coulee City, *Piper* 3847; Ephrata to Ritzville, *Griffiths & Cotton* 489.

ZONAL DISTRIBUTION: Upper Sonoran.

2. **Amsinckia intermedia** Fisch. & Mey. Ind. Sem. Hort. Petrop. 2: 26. 1835.

Eutoca menziesii Lehm. Pug. 2: 29. 1830, not R. Br. 1823.

TYPE LOCALITY: "Hab. cum sequente specie circa coloniam ruthenorum Ross in portu Bodega Novae Californiae."

RANGE: Washington and Idaho to California and Nevada.

SPECIMENS EXAMINED: San Juan Island, *Lyall*, May 10, 1858; Fairhaven, *Piper*, July 2, 1897; Port Ludlow, *Binns*; Ellensburg, *Piper* 2699; west Klickitat County, *Suksdorf* 994, 2007, 390, 995; Rock Lake, *Sandberg & Leiberg* 120; Douglas County, *Spillman*; Waitsburg, *Horner* 146, 147; Blue Mountains, *Piper*; Pullman, *Hull* 638; *Elmer*; Almoda *Piper* 2786; Wawawai, *Piper* 1838; Colfax, *Piper*; without locality, *Vasey* in 1889; Meyers Falls, *Kreager* 479.

ZONAL DISTRIBUTION: Upper Sonoran and Arid Transition.

An exceedingly troublesome weed in grain fields of southeastern Washington, locally known as "tarweed." The species is extremely variable and Suksdorf segregates from it three proposed new species, *A. arenaria*,^b *A. retrorsa*,^c and *A. micrantha*.^c The characters relied upon seem very slight and we question their value.

3. **Amsinckia lycopsoides** Lehm.; DC. Prod. 10: 117. 1846.

Lithospermum lycopsoides Lehm. Pug. 2: 28. 1830.

Amsinckia lycopsoides bracteosa A. Gray, Syn. Fl. 2¹: 198. 1878.

TYPE LOCALITY: "Straits of De Fuca, Scouler" according to Hooker.

^a Syn. Fl. 2: 200, 1878. ^b Deutsch. Bot. Monatss. 18: 133. 1900. ^c Op. cit. 134.

RANGE: Vancouver Island to California.

SPECIMENS EXAMINED: Fairhaven, *Suksdorf* 996; Puget Sound, *Suckley*; Port Ludlow, *Binns*, September 25, 1890; Clallam County, *Elmer* 2754; Fairhaven, *Piper*, July 3, 1897; Spokane, *Piper* 2275; without locality, *Cooper* in 1854.

ZONAL DISTRIBUTION: Humid Transition.

The two forms distinguished by Doctor Gray are probably worthy of recognition, but unfortunately his subspecies *bracteosa* is clearly based on the original *Lithospermum lycopsoides*.

PIPTOCALYX.

1. **Piptocalyx circumscissus** (Hook. & Arn.) Torr. Bot. Wilkes Exped. 17: 414. 1874.

Lithospermum? circumscissum Hook. & Arn. Bot. Beech. Voy. 370. 1840.

Echinospermum circumscissum A. Gray, Proc. Am. Acad. 10: 58. 1875.

TYPE LOCALITY: "Snake Fort, Snake Country," Idaho. Collected by Tolmie.

RANGE: Washington to Wyoming, Utah, and California.

SPECIMENS EXAMINED: Morgans Ferry, *Suksdorf* 404; Sunnyside, *Cotton* 351; North Yakima, *Henderson*, May 26, 1892; Pasco, *Piper* 2966; *Hindshaw* 30; Ainsworth, *Brandegge* 991; Wilson Creek, *Sandberg & Leiberg* 228.

ZONAL DISTRIBUTION: Upper Sonoran.

OREOCARYA.

Corolla tube exceeding the calyx..... 1. *O. leucophaea*.

Corolla tube not exceeding the calyx.

Herbage not very hispid, but decidedly canescent and the inflorescence fulvescent..... 4. *O. sericea*.

Herbage very hispid; inflorescence not fulvescent.

Inflorescence very dense; leaves obtuse..... 2. *O. celosioides*.

Inflorescence not very dense; leaves acute..... 3. *O. spiculifera*.

1. **Oreocarya leucophaea** (Dougl.) Greene, Pittonia 1: 58. 1887.

Myosotis leucophaea Dougl.; Lehm. Pug. 2: 22. 1830.

Eritrichium leucophaeum A. DC. Prod. 10: 129. 1846.

Krynitskia leucophaea A. Gray, Syn. Fl. ed. 2. 2¹: 430. 1886.

TYPE LOCALITY: "Arid barrens of the Columbia, and of its northern and southern tributaries." Collected by Douglas.

RANGE: British Columbia to California and Utah.

SPECIMENS EXAMINED: Columbia River, latitude 46° to 49°, *Lyall* in 1860; Morgans Ferry, *Suksdorf* 407; arid barrens of the Columbia, *Douglas*; Egbert Springs, *Sandberg & Leiberg* 93, 373; Scott, *Leckenby*, May 16, 1898; Pasco, *Piper*, July 11, 1897; *Hindshaw* 2; *Elmer* 1056; *Piper* 2987; Walla Walla region, *Brandegge* 997; Wallula, *Cotton* 1027.

ZONAL DISTRIBUTION: Upper Sonoran.

2. **Oreocarya celosioides** Eastwood, Bull. Torr. Club 30: 240. 1903.

TYPE LOCALITY: "From the banks of the Columbia, eastern Washington." Collected by Howell.

RANGE: Eastern Washington.

SPECIMENS EXAMINED: Rock Island, *Sandberg & Leiberg* 440; Rattlesnake Mountains, *Cotton* 359; near Columbus, *Suksdorf*, June 10, 1886; Klickitat, *Howell*, June, 1879; without locality, *Brandegge* 996.

ZONAL DISTRIBUTION: Arid Transition.

This species has been confused with *O. glomerata* (Pursh) Greene.

3. **Oreocarya spiculifera** sp. nov.

Tufted from a stout woody caudex, the whole plant pallid; basal leaves numerous, crowded, spatulate-oblongate, acute, only the midnerve evident, densely pubescent on

both sides with fine appressed hairs, scattered among these and on the margins tout hyaline bristles; blades 1.5 to 2 cm. long, exceeding the margined petioles; cauline leaves few, similar to the basal ones, but with shorter petioles; flowering stems erect, simple, 20 to 30 cm. high, angled, pubescent like the leaves; inflorescence of 8 to 12 alternate, subequal, false racemes, floriferous to their bases, the bracts and calyx pubescent like the leaves, but the bristles more abundant; bracts linear-lanceolate, obtuse, shorter than the calyx; pedicels short, soft-hairy; calyx lobes lanceolate, in flower 5 to 6 mm., in fruit 8 mm. long; corolla white, salver-form, its tube 5 mm. long, its limb 8 mm. broad; appendages triangular-ovate, obtuse, short; nutlets pale brown, dull, ovate, obtuse, 3 mm. long, each with a smooth, narrow margin, the back bluntly tuberculate, the ventral side rugose, the groove reaching nearly to the apex; gynobase longer than the nutlets.

Type in the National Herbarium, collected at Ritzville, Adams County, by Sandberg & Leiberg (no. 164), June 6, 1893.

4. Oreocarya sericea (A. Gray) Greene, *Pittonia* **1**: 58. 1887.

Krynitskia sericea A. Gray, *Proc. Am. Acad.* **20**: 279. 1885.

TYPE LOCALITY: "Alpine and subalpine on the mountains from Colorado and Utah to Oregon and Montana and probably in the British Possessions."

RANGE: Washington to Montana, Colorado, and California.

SPECIMENS EXAMINED: Wenache, *Whited* 1099; Spokane, *Piper* 2294; *Henderson* 2563.

ZONAL DISTRIBUTION: Arid Transition.

PECTOCARYA.

Nutlets oblong, the wings undulate..... 1. *P. penicillata*.

Nutlets obovate, the wings entire or wanting.

Nutlets with a thin scarious wing..... 2. *P. setosa*.

Nutlets wingless..... 3. *P. pusilla*.

1. Pectocarya penicillata (Hook. & Arn.) A. DC. *Prod.* **10**: 120. 1846.

Cynoglossum penicillatum Hook. & Arn. *Bot. Beech. Voy.* 371. 1840.

TYPE LOCALITY: California.

RANGE: British Columbia to California and Nevada.

SPECIMENS EXAMINED: Wenache, *Whited* 86; North Yakima, *Henderson*, May 27, 1892; Pasco, *Piper* 2967; Douglas County, *Spillman*, May 27, 1896; Harrington, *Sandberg & Leiberg* 223; Coulee City, *Piper* 3869; Walla Walla region, *Brandegge* 984; Rattlesnake Mountains, *Griffiths & Cotton* 22.

ZONAL DISTRIBUTION: Upper Sonoran and Arid Transition.

2. Pectocarya setosa A. Gray, *Proc. Am. Acad.* **12**: 81. 1877.

TYPE LOCALITY: "On the desert plains of the upper Mohave River," California.

RANGE: Washington to California.

SPECIMENS EXAMINED: Yakima County, *Brandegge* 985; North Yakima, *Henderson* 2560.

ZONAL DISTRIBUTION: Upper Sonoran.

3. Pectocarya pusilla (A. DC.) A. Gray, *Proc. Am. Acad.* **12**: 81. 1877.

Gruvelia pusilla A. DC. *Prod.* **10**: 119. 1846.

TYPE LOCALITY: "In Chili prope Valparaiso et montem la Leona."

RANGE: Washington to California. Chile.

SPECIMENS EXAMINED: West Klickitat County, *Suksdorf* 410.

PLAGIOBOTHRYS.

Nutlets somewhat cruciform, muriculate..... 1. *P. tenellus*.

Nutlets ovate, carinate, dull, roughened..... 2. *P. nothofulvus*.

1. Plagiobothrys tenellus (Nutt.) A. Gray, *Proc. Am. Acad.* **20**: 283. 1885.

Myosotis tenella Nutt.; Hook. *Kew. Journ. Bot.* **3**: 295. 1851.

Plagiobothrys asper Greene, Pittonia 3: 262. 1898.

TYPE LOCALITY: "Sunny rocky slopes of the mountains along the Coeur d'Alene River," Idaho. Collected by Geyer.

RANGE: British Columbia to Idaho and California.

SPECIMENS EXAMINED: San Juan Island, *Lyall* in 1858; Orcas Island, *Lyall* in 1858; Fort Vancouver, *Tolmie*; Wenache, *Whited* 1046; Spokane Valley, *Lyall* in 1861; Spokane, *Piper*; *Henderson*; *Sandberg & Leiberg* 10; Walla Walla region, *Brandege* 990; near Waitsburg, *Horner* 160; Wawawai, *Piper*; *Elmer* 767; without locality, *Vasey* in 1889.

ZONAL DISTRIBUTION: Upper Sonoran and Arid Transition.

2. *Plagiobothrys nothofulvus* A. Gray, Proc. Am. Acad. 20: 285. 1885.

Eritrichium nothofulvum A. Gray, Proc. Am. Acad. 17: 227. 1882.

TYPE LOCALITY: California.

RANGE: Washington to California.

SPECIMENS EXAMINED: West Klickitat County, *Suksdorf* 37.

CRYPTANTHE.

Nutlets with scarious crenate wings 1. *C. pterocarya*.

Nutlets not winged.

Surface of nutlets smooth and shining.

Nutlets solitary or rarely two, narrow, attenuate-acuminate.

Ventral groove simple, elongated at base 2. *C. flaccida*.

Ventral groove bifurcate at base 3. *C. suksdorfii*.

Nutlets four, ovate, acute or short-acuminate.

Ventral groove simple to the base 4. *C. affinis*.

Ventral groove forked at base.

Pubescence setose, spreading 5. *C. ramulosissima*.

Pubescence somewhat appressed 6. *C. torreyana*.

Surface of nutlet rough.

Calyx twice as long as the acuminate nutlets 7. *C. ambigua*.

Calyx little longer than the acute nutlets 8. *C. muriculata*.

1. *Cryptanthe pterocarya* (Torr.) Greene, Pittonia 1: 120. 1887.

Eritrichium pterocaryum Torr. Bot. Mex. Bound. 142. 1859.

Krynitskia pterocarya A. Gray, Proc. Am. Acad. 20: 276. 1885.

TYPE LOCALITY: "Near El Paso," Texas.

RANGE: Washington to California and Texas.

SPECIMENS EXAMINED: Ellensburg, *Hindshaw*, May, 1896; Yakima, *Henderson* in 1892; Pasco, *Hindshaw*, May 25, 1896 and no. 41; *Piper* 2961; Coulee City, *Piper* 3881; Wilson Creek, *Sandberg & Leiberg* 260; Walla Walla region, *Brandege* 995; without locality, *Vasey* in 1889.

ZONAL DISTRIBUTION: Upper Sonoran.

2. *Cryptanthe flaccida* (Lehm.) Greene, Pittonia 1: 115. 1887.

Mysotis flaccida Lehm. Pug. 2: 22. 1830.

Eritrichium oxycaryum A. Gray, Proc. Am. Acad. 10: 58. 1874.

Krynitskia oxycarya A. Gray, Syn. Fl. 2¹: 425. 1878.

TYPE LOCALITY: "N. W. Coast in dry plains." Collected by Douglas.

RANGE: Washington and Idaho to California.

SPECIMENS EXAMINED: Yakima, *Henderson* in 1892; Coulee City, *Piper* 3887; Crab and Wilson creeks, *Sandberg & Leiberg* 304; Sprague, *Sandberg & Leiberg* 173; without locality, *Brandege* 992; Almota, *Piper* 1702; Waitsburg, *Horner* 602, 144; Wawawai, *Lake & Hull* 820; *Elmer* 766.

ZONAL DISTRIBUTION: Upper Sonoran.

3. *Cryptanthe suksdorfii* (Greenman).*Krynitzkia suksdorfii* Greenman, Bot. Gaz. **40**: 146. 1905.

TYPE LOCALITY: "On dry hillsides near Rockland, Klickitat County," Washington. Collected by Suksdorf.

RANGE: Washington and Oregon.

SPECIMENS EXAMINED: Rockland, *Suksdorf*, June 8, 1904.**4. *Cryptanthe affinis* (A. Gray) Greene, Pittonia 1: 119. 1887.***Krynitzkia affinis* A. Gray, Proc. Am. Acad. **20**: 270. 1885.

TYPE LOCALITY: "E. side of the Cascades near Lat. 49°." Collected by Lyall in 1860.

RANGE: Washington and Idaho to California.

SPECIMENS EXAMINED: Cascade Mountains, latitude 49°, *Lyall* in 1860; Falcon Valley, *Suksdorf* 455; Klickitat River, *Flett* 1197; Cascade Mountains, Yakima County, *Henderson*; Kamiak Butte, *Piper* 3092; Blue Mountains, *Piper*, July 15, 1896; Waitsburg, *Horner* 603; along Touchet River, *Horner* 381.

ZONAL DISTRIBUTION: Arid Transition.

5. *Cryptanthe ramulosissima* A. Nelson, Erythea 7: 68. 1899.

TYPE LOCALITY: Laramie, Wyoming.

RANGE: Washington and Wyoming.

SPECIMENS EXAMINED: Pasco, *Elmer* 1054; *Piper* 2750 and 2951; *Henderson* 2562; Rattlesnake Mountains, *Griffiths & Cotton* 24.

ZONAL DISTRIBUTION: Upper Sonoran.

6. *Cryptanthe torreyana* Greene, Pittonia 1: 118. 1887.*Krynitzkia torreyana* A. Gray, Proc. Am. Acad. **20**: 271. 1885.*Krynitzkia leiocarpa* Fisch. & Mey. err. det. Torr. Bot. Mex. Bound. 142. 1859.

TYPE LOCALITY: Grassy hills near San Luis Rey, California, according to label on type specimen.

RANGE: Washington to Nevada and California.

SPECIMENS EXAMINED: Coulee City, *Piper* 3882.**6a. *Cryptanthe torreyana calycosa* Greene, Pittonia 1: 119. 1887.***Krynitzkia torreyana calycosa* A. Gray, Proc. Am. Acad. **20**: 271. 1885.

TYPE LOCALITY: "E. Humboldt Mountains, Nevada." Collected by Watson.

RANGE: Washington and Montana to California and Nevada.

SPECIMENS EXAMINED: Ellensburg, *Whited* 506; *Piper*, July 9, 1897; North Yakima, *Henderson*, May 29, 1892; Falcon Valley, *Suksdorf* 593; Crab and Wilson creeks, *Sandberg & Leiberg* 249; Spangle, *Piper*, June 24, 1899; Spokane, *Piper*, July 6, 1895, 1943; *Henderson*, June 1, 1892; Pullman, *Piper* 1942, 1945; Wawawai, *Lake*, June 4, 1892; *Piper*, 1944, 3813, 1941; along Tukanon River, *Lake & Hull* 821; Kamiak Butte, *Piper* 3091.

ZONAL DISTRIBUTION: Arid Transition and Upper Sonoran.

There are two forms of this subspecies, one with small corollas and one with large. No other character seems to be associated with this difference, however.

7. *Cryptanthe ambigua* (A. Gray) Greene, Pittonia 1: 113. 1887.*Krynitzkia ambigua* A. Gray, Proc. Am. Acad. **20**: 273. 1885.*Eritrichium muriculatum* Torr. Bot. Wilkes. Exped. **17**: 416. pl. 13. 1874.*Cryptanthe monosperma* Greene, Pittonia **5**: 53. 1902.

TYPE LOCALITY: Nisqually, Washington.

RANGE: Washington to Montana and California.

SPECIMENS EXAMINED: Klickitat *Howell* 337; north of Bickleton, *Suksdorf* 406; without locality, *Brandegge* 994; Falcon Valley, *Suksdorf* 46, 595.**8. *Cryptanthe muriculata* (A. DC.) Greene, Pittonia 1: 113. 1887.***Eritrichium muriculatum* A. DC. Prod. **10**: 132. 1846.*Krynitzkia muriculata* A. Gray, Proc. Am. Acad. **20**: 273. 1885.

Myosotis muricata Hook. & Arn. Bot. Beech. Voy. 369. 1840, not *Lithospermum muricatum* Ruiz & Pavon, 1799.

Allocarya hendersoni A. Nelson, Erythea 7: 69. 1899.

TYPE LOCALITY: California.

RANGE: Washington and Idaho to California.

SPECIMENS EXAMINED: Mason County, *Kincaid*, May 16, 1892; Tacoma, *Flett* 896; Olympia, — July 4, 1896; Steilacoom, *Piper*, May 27, 1888; Fourth Plain, *Piper* 3083; Vancouver, *Tolmie*; Falcon Valley, *Suksdorf* 456; Clealum, *Henderson*, June 11, 1892; Palouse, *Cloud*, June, 1895; Goat Mountains, *Flett* 2156; Cape Horn, *Piper* 5018; Pullman, *Elmer* 155.

Suksdorf lists under *Krynitskia* two additional species, *Cryptanthe leiocarpa* (Fisch. & Mey.) Greene and *C. fendleri* (A. Gray) Greene. There is no evidence in the Gray Herbarium that the former occurs in Washington, though Doctor Gray included this State in its range, nor have we seen specimens elsewhere. The Wilkes Expedition plant referred to *C. leiocarpa* by Torrey is *C. torreyana calycosa*, collected near Spokane. Suksdorf's specimen on the basis of which *C. fendleri* is included in his list seems to be *C. ambigua*.

ALLOCARYA.

Corolla small, 1 to 2 lines broad; branches prostrate.

Nutlets transversely rugose, not bristly..... 1. *A. hispidula*.

Nutlets transversely rugose and bristly..... 2. *A. subglochidiata*.

Corolla large, 3 to 5 lines broad; stems erect or ascending.

Nutlets rugulose, granulate, not stipitate..... 3. *A. scouleri*.

Nutlets rugulose, granulate, stipitate..... 4. *A. stipitata*.

1. *Allocarya hispidula* Greene, Pittonia 1: 17. 1887.

TYPE LOCALITY: San Bernardino Mountains, California.

RANGE: Washington and Idaho to California.

SPECIMENS EXAMINED: Klickitat County, *Howell* 295; near Mount Adams, *Henderson*; Falcon Valley, *Suksdorf* 2113; Ellensburg, *Whited* 863; Bingen, *Suksdorf* 2207; Kettle Falls, *Watson* 284; Crab Creek, *Suksdorf* 403; Harrington, *Sandberg & Leberg* 217; Spokane, *Savage* 20; Waitsburg, *Horner* 138; without locality, *Vasey* in 1889; Pullman, *Piper*, July 20, 1894, 1701, 3022.

ZONAL DISTRIBUTION: Arid Transition.

A close ally of *A. californica*, with which it has often been included.

2. *Allocarya subglochidiata* (A. Gray).

Allocarya humistrata Greene, Pittonia 1: 16. 1887.

Eritrichium californicum subglochidiatum A. Gray, Bot. Cal. 1: 526. 1876.

TYPE LOCALITY: "Placer to Sierra Co.," California.

RANGE: Washington to California.

SPECIMENS EXAMINED: North Yakima, *Henderson*, June 13, 1892; Wilson Creek, *Lake & Hull*, August 6, 1892.

ZONAL DISTRIBUTION: Upper Sonoran.

3. *Allocarya scouleri* (Hook. & Arn.) Greene, Pittonia 1: 18. 1887.

Myosotis scouleri Hook. & Arn. Bot. Beech. Voy. 370. 1840.

Eritrichium ? scouleri A. DC. in DC. Prod. 10: 130. 1846.

Krynitskia scouleri A. Gray, Proc. Am. Acad. 20: 267. 1885.

TYPE LOCALITY: "Columbia River."

RANGE: Washington to California in the coast region.

SPECIMENS EXAMINED: Succotash Valley, *Piper* in 1895; Klickitat County, *Suksdorf* 45; *Howell* 336; Seattle, *E. S. Meany* 531; Clallam County, *Elmer* 2753, 2756.

ZONAL DISTRIBUTION: Humid Transition.

A specimen collected by Suksdorf May 26, 1881, in Western Klickitat County I would refer to *A. scouleri*, but Professor Greene regards it as belonging to his *Allocarya hirta*.^a

4. **Allocarya stipitata** Greene, Pittonia 1: 19. 1887.

TYPE LOCALITY: "In the central part of California."

RANGE: Washington to California in the coast region.

SPECIMENS EXAMINED: Clallam County, *Elmer* 2755; Tacoma, *Flett* 2, 879; Mason County, *Piper* 1053.

ZONAL DISTRIBUTION: Humid Transition.

MYOSOTIS. FORGET-ME-NOT.

Perennial; calyx hairs straight; corolla blue..... 1. *M. laxa*.

Annual; calyx hairs hooked; corolla white..... 2. *M. macrosperma*.

1. **Myosotis laxa** Lehm. Asper. 83. 1818.

TYPE LOCALITY: "Habitat in America septentrionale."

RANGE: Canada to Virginia and Tennessee; Washington and Oregon.

SPECIMENS EXAMINED: Whatcom, *Gardner* 415; Walla Walla, *Savage* 3; Wenache, *Whited* 1362.

ZONAL DISTRIBUTION: Transition.

2. **Myosotis macrosperma** Engelm. Am. Journ. Sci. I. 46: 98. 1844.

TYPE LOCALITY: Texas.

RANGE: Washington to New England, southward to California, Texas, and Florida.

SPECIMENS EXAMINED: Whidby Island, *Gardner* 215; Seattle, *Piper* 618; White Salmon, *Suksdorf* 295; Spokane, *Henderson*, May 31, 1892; Walla Walla Region, *Brandegge* 1000; Copper River, *Horner* 149; Waitsburg, *Horner* 600; Mount Carlton, *Kreager* 158.

ZONAL DISTRIBUTION: Transition.

This species seems amply distinct from *M. verna* Nutt., to which it is commonly referred.

LITHOSPERMUM.

1. **Lithospermum ruderale** Dougl.; Lehm. Pug. 2: 28. 1830.

? *Lithospermum pilosum* Nutt. Journ. Acad. Phil. 7: 43. 1834.

Lithospermum lanceolatum Rydberg, Mem. N. Y. Bot. Gard. 1: 333. 1900.

TYPE LOCALITY: "Gravelly banks of the Columbia and Multnomah Rivers." Collected by Douglas.

RANGE: British Columbia to Montana, Utah, and California.

SPECIMENS EXAMINED. Wenache, *Whited* 1060; Rattlesnake Mountains, *Cotton* 358; North Yakima, *Leckenby*, May, 1898; *Flett* 1035, Whidby Island, *Gardner* 213, west Klickitat County, *Suksdorf* 166; Ritzville, *Sandberg & Leiberger*, June, 1893, Rock Creek, *Sandberg & Leiberger* 128; Colville, *Lyall* in 1861; Walla Walla, *Lyall* in 1860, without locality, *Vasey* in 1889; Pullman, *Elmer* 212; *Hull* 640; *Piper* 1700, 1699, Wawawai, *Lake & Hull* 640, Clarks Springs, *Kreager* 69; Ione, *Kreager* 402, Colville Reservation, *Griffiths & Cotton* 406.

ZONAL DISTRIBUTION: Arid Transition.

MENTHACEAE. MINT FAMILY.

Ovary 4-lobed.

Corolla nearly regular, 5-cleft TRICHOSTEMA (p. 487).

Corolla very irregular, apparently 1-lipped TEUCRIUM (p. 487).

Ovary 4-parted.

Corolla distinctly bilabiate, the upper lip concave.

Antheriferous stamens 2 RAMONA (p. 488).

Antheriferous stamens 4.

Calyx with a protuberance on the upper side..... SCUTELLARIA (p. 488).

Calyx without protuberance.