(Publ. Carnegie Inst., Wash. no. 484. 1937). *L. uncinata,* therefore, may be considered a primitive, relic species, representing a type ancestral to the other oriental species of *Lapsana.*

Lapsana communis, with its European and western Asiatic relatives, represents a different group of species, whose relationship to the oriental species on the basis of leaf shape, the character of the involucres, corollas, anthers and styles, and the general shape of the achenes, is undoubtedly fairly close, but which differ in their upright habit, the greater compression of their achenes, and certain details such as the pubescence of the corolla tube and the color of the anthers and the style branches. In their floral and achenial characteristics these species may be compared with the more reduced of the oriental species. Hence *L. uncinata* is in floral characteristics the most primitive species of its genus, and its type of pappus, probably the original one in *Lapsana,* has been lost in the other species through reduction. Therefore if the pappus is to be considered a primary criterion of classification in the Cichorieae, as it has by most students of the tribe, *Lapsana* must be considered to occupy a very isolated position in it. However, the resemblance of this genus, not only in habit but in involucral and floral characteristics as well, to two oriental genera of the Crepidinae, *Ixeris* and *Youngia,* is considerable, and strongly suggests an actual relationship between them.

University of California, Berkeley,
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TWO NEW SPECIES OF LINANTHUS FROM WESTERN NORTH AMERICA

Herbert L. Mason

In the progress of studies in the genus *Linanthus* of the family Polemoniaceae the following new species have been discovered. It will be noted in the descriptions that the term 'tube' as applied to the corolla is used in a somewhat restricted sense. The corolla in this genus varies from salverform through funnelform to campanulate. This variation is effected through difference in proportion of the tube, the throat and the lobes of the corolla. The term 'tube' is herein used to apply only to the essentially cylindrical portion of the corolla, whereas the term 'throat' designates that portion of the corolla expanding from the top of the tube to the base of the corolla lobes. The proportion of these three regions of the corolla to one another is often an important diagnostic character of species. Likewise the position of the stamens on the throat or on the tube is usually constant within the species.

In citing specimens, the following abbreviations are used for the various herbaria: University of California, Berkeley (UC),

Utah State Agricultural College, Logan (IU), State College of Washington, Pullman (WS), Willamette University, Salem, Oregon (WU).

Linanthus mohavensis sp. nov. Herba annua compacta nana 1-6 cm. alta; cotyledones oblongae; folia opposita, supra pilosa, subtus glabra, in tres lobos lineares acerosos palmatim divisa, lobis interdum pro parte connatis valde venosis, venis usque ad basin distinctis; flores nocturni; cymae dichotomae, floribus solitariis termalibus; calycis tubus interdum ad basin versus sparse pilosus infra sinus usque ad basin membranaceus post anthesin accrescens demum intra nervos propter capsulae dehiscentiam fissus; calycis lobi intus pilosi, aliter glabri, demum inaequales, apicibus acerosis; corolla lutea vel faucibus interdum purpureotinctis 5-7 mm. longa calycem aequans vel vix longior denique capsula accrescente expulsa; stamina circa 1 mm. longa faucium basi affixa; filamenta glabra; anthera orbicularia; stylus usque ad medium in tres lobos lineares divisus; capsula cylindrica trilocularis tubum calycis sub aequans; semina in quoque loculo plures reniformia apud hilum constricta sub aqua inmutata. (Pl. XXVIII, figs. k-p.)

Diminutive compact annual, 1-6 cm. high; cotyledons oblong, leaves opposite, pilose above, glabrous beneath, with prominent veins free to the base, palmately divided into 3 linear, sometimes partially united acerose lobes; anthesis nocturnal; inflorescence dichotomously cymose, flowers solitary in the forks of the cyme; calyx membranous to the base below the sinuses, the membrane growing with the calyx and at length splitting with the dehiscing capsule, lobes pilose within, calyx otherwise glabrous or with a few scattered hairs below, tips acerose, becoming unequal; corolla yellow, sometimes purple-tinted in the throat, 5-7 mm. long, equalling or barely exceeding the calyx, at length pushed out by the growing capsule; stamens included, about 1 mm. long, inserted at the base of the throat of the corolla, filaments glabrous, anthers orbicular; style included, divided to about the middle into 3 linear lobes; capsule cylindrical, about equalling the calyx tube, 3-celled; seeds several to each carpel, reniform, strongly constricted at the hilum, not mucilaginous when wetted.

West side of Searles Lake, one mile south of Trona, San Bernardino County, California, March 29, 1935, *H. L. Mason 8232* (type, U.C. Herb. 567794); Poison Canyon, San Bernardino County, California, April 30, 1935, *H. L. Mason 8294*.

Linanthus mohavensis Mason occurs on gravelly talus and mesas of the Searles Lake region, in association with *Linanthus Jonesii* (Gray) Greene, *Gilia latifolia* Gray, *Mohavea brevifolia* Cov., *Phacelia pachyphylla* Gray and *Atrichoseris platyphylla* Gray. Although growing in association with *Linanthus Jonesii* Gray and

being most closely related to it by virtue of several characters in common, it does not even superficially resemble it in field aspect. The low compact mode of growth, the smaller flowers, the stamen insertion, the nature of the pubescence, and the forked leaves readily distinguish it from that species. The following key will serve to point out the relationships of the four species in this section of the genus.

Testa of the seed bladdery, hyaline and membranous at least on the angles; seed ellipsoid, depression of the hilum not conspicuous; calyx glabrous; plants 5–30 cm. high; corolla usually white with brownish-purple patches on the back (occasionally yellow in no. 2).

- Filaments with a hairy pad at the base; leaves palmately divided ..... 1. *L. dichotomus* Benth.
- Filaments glabrous, leaves simple ..... 2. *L. Bigelovii* (Gray) Greene

Testa not bladdery nor hyaline, closely investing the seed; seed reniform or subreniform, deeply constricted at the hilum; calyx pubescent; plants 2–10 cm. high; corollas commonly yellow.

- Leaves simple; calyx glandular-pubescent externally; stamens inserted in the corolla-tube ... 3. *L. Jonesii* (Gray) Greene
- Leaves 3-lobed; calyx glabrous externally; stamens inserted at the base of the corolla-throat ..... 4. *L. mohavensis* Mason

Linanthus septentrionalis sp. nov. Herba annua erecta caulibus plerumque simplicibus, 5–30 cm. altis; folia opposita glabra vel pubescentia segmentis linearibus palmatim 5-7-partita; cymae paniculatae, pedicellis filiformibus 5-20 mm. longis; calycis tubus infra sinus usque ad basin membranaceus, lobis fere ad apices membranaceo-marginatis, cum calyce pari passu accrescentibus; corolla 1-4 mm. longa, calyce sesquilongior, lobis albis vel pallide coeruleis patente rotatis campanulatisve, faucibus tubo brevioribus, annulo piloso media parte vel rarius basi filamentorum instructis; stamina aequalia exserta basi faucium affixa; filamentis glabris vel basi sparse pilosis; stylus exsertus; stigma trilobum; capsula cylindrica trilocularis; semina in quoque loculo 2-4 sub aqua mucilaginosa. (Pl. XXVIII, figs. a-e.)

Erect annual, usually simple, 5-30 cm. high; leaves opposite, palmately divided into 5–7 linear segments, glabrous or pubescent, 5-20 mm. long; inflorescence cymose-paniculate; flowers solitary on filiform pedicels, 5-20 mm. long; calyx membranous to the base below the sinuses, the membrane flanking the lobes almost to the tips above the calyx-tube, growing with the calyx; corolla 1½ times the calyx, 1-4 mm. long, the lobes rotately or campanulately spreading, the throat shorter than the tube, with a hairy ring on the middle portion above the point of stamen-

insertion or more rarely only on the base of the filaments; lobes white or pale blue; stamens inserted at the base of the throat, equal in length, exserted, filaments glabrous or with a few hairs at the base; style exserted, stigma 3-lobed; capsule cylindric, 3-celled, each cell with 2-4 seeds; seeds producing mucilage when wetted.

Camp Roosevelt, Tower Junction, Yellowstone National Park, Wyoming, July 10, 1936, *H. L. Mason 3497* (type, U.C. Herb. 552425).

Linanthus septentrionalis Mason is a small flowered delicate annual of the Great Basin and Rocky Mountain region which superficially, closely resembles *L. Harknessii* Curran of the high Sierra Nevada, the Cascade Mountains and westward. In general it is more robust, has a larger corolla, with hairs on the inside as well as sometimes on the filaments and has many more seeds to the capsule than does *L. Harknessii.* These characters however place it in close relationship with *L. pharnaceoides* (Benth.) Greene rather than with *L. Harknessii.* The following key will bring out the characters that may serve to separate the three species.

Seeds 1 to each cell of the ovary; corolla glabrous within, barely exserted from the calyx; filament glabrous .. 1. *L. Harknessii* Curran

Seeds several to each cell of the ovary; corolla rarely glabrous within, usually with a hairy ring at or above the stamen insertion, or the base of the filaments hairy.

Corolla 2–4 mm. long, 1½–2 times the calyx; hairs dense to sparse in a ring on the throat of the corolla, rarely absent; filaments glabrous or with a few hairs; plants from east of the Sierra and Cascade axis to the Rocky Mountains ..... 2. *L. septentrionalis* Mason

Corolla 6–10 mm. long, 3–5 times the calyx; hairs dense, on the base of the filaments only; plants from the northern Great Basin and the valleys and foothills of California ..... 3. *L. pharnaceoides* (Benth.) Greene

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Explanation of the Figures. Plate XXVIII.

Plate XXVIII. Figs. a–e, *Linanthus septentrionalis* Mason: *a* flower; *b* habit; *c* opened corolla; *d* seeds; *e* capsule and calyx. Figs. f–j, *Linanthus Harknessii* Curran: *f* habit; *g* flower; *h* seeds; *i* capsule and calyx; *j* opened corolla. Figs. k–p, *Linanthus mohavensis* Mason: *k* habit; *l* flower; *m* capsule and calyx; *n* seeds; *o* opened corolla; *p* leaf. Figs. q–u, *Linanthus Jonesii* (Gray) Greene: *q* capsule and calyx; *r* habit; *s* flower; *t* seeds; *u* opened corolla.

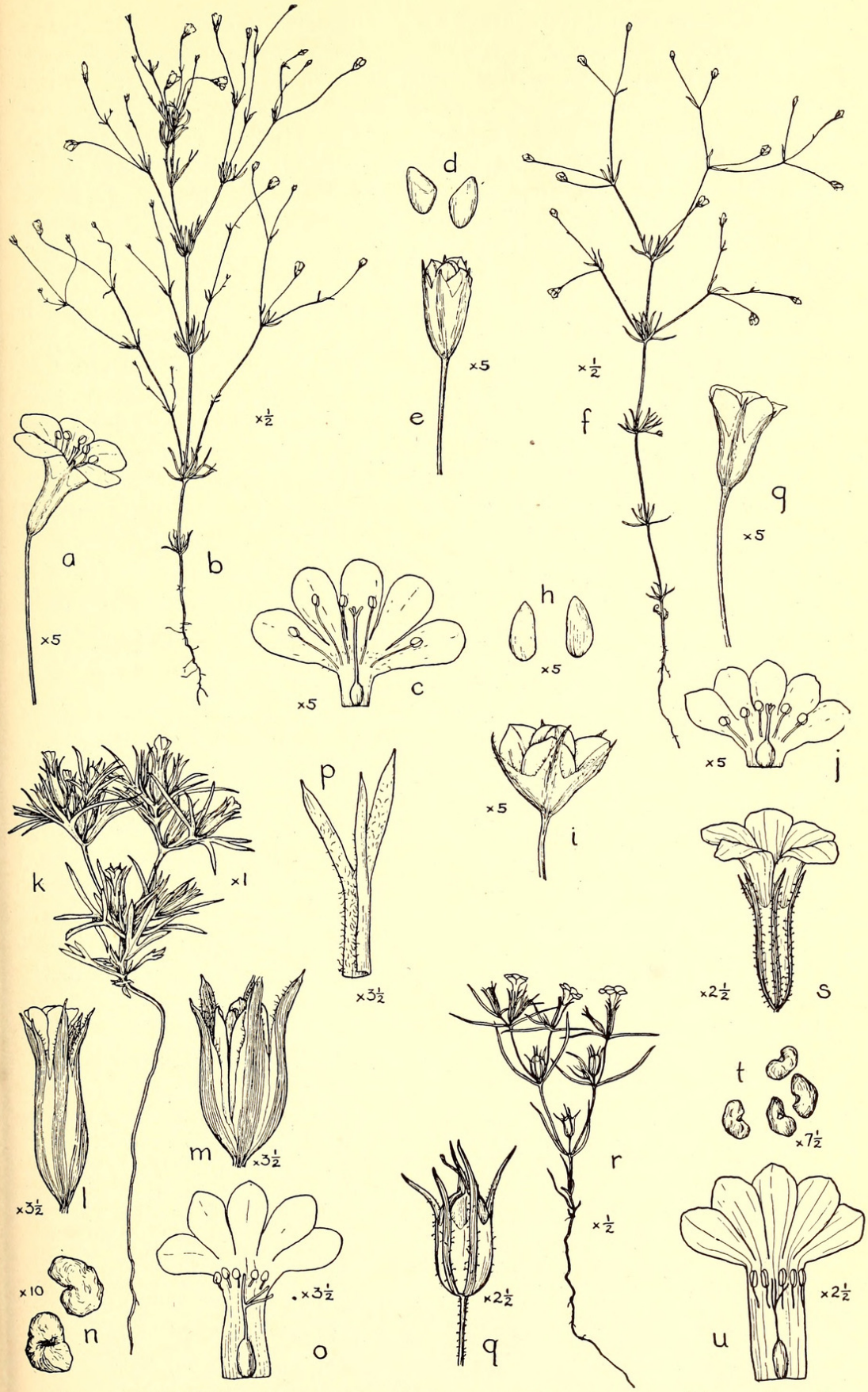

PLATE XXVIII. COMPARATIVE SKETCHES OF LINANTHUS. (See explanation of figures on page 160.)

Specimens examined. British Columbia. Nicola, 8 mile creek, 6000 ft. *G. V. Copley 68* (WS); Sophia Mountain, *J. M. Macoun 66,561* (WS); Lake Osoyoos, *J. M. Macoun 68,708* (WS). Washington. Columbia County: Blue Mountains, *C. V. Piper 2398* (WS). Lincoln County: Sprague, 1800 feet, *Sandberg and Leiberg 201* (WS, UC). Okanogan County: east of Omak, *C. B. Fiker 698* (WS). Whitman County: Kamiak Butte, *A. D. E. Elmer 803* (WS). Oregon. Deschutes County: 10 miles east of Bend, *M. E. Peck 19,742* (UC, WU). Harney County: east side of Harney Valley, *J. B. Leiberg 2376* (UC). Idaho. Blaine County: Camp Creek, *Macbride and Payson 2956* (UC); Tikura, *Nelson and Macbride 1291* (UC, WS). Boundary County: Snowy top Mountain, *F. A. Warren 311* (WS). Kootenai County: Dry Prairies, *J. H. Sandberg 7219* (WS). Nez Perce County: 3500 feet, *A. A. Heller 3432* (WS). Owyhee County: Silver City, 7000 feet, *J. F. Macbride 358* (WS). Shoshone County: Clarkia, along St. Maries River, *C. R. Quick 1095* (UC). Montana. Carbon County: Bridger, Bracket Creek divide, July 16, 1902, *J. W. Blankinship* (WS). Gallatin County: Bozeman, *J. W. Blankinship 357a* (WS); Spanish Basin, 6500 feet, *Rydberg and Bessey 4821* (WS); 15 miles south of West Yellowstone, *B. Maguire 1199* (IU). Jefferson County: Boulder Divide, Aug. 4, 1898, *E. N. Brandegee* (UC). Mineral County: Bitterroot Mountains, *H. L. Mason 10,050* (UC). Missoula County: Fort Missoula, *J. E. Kirkwood 1294* (UC). Park County: Big Mud Creek, *W. N. Suksdorf 376* (WS, UC). Powell County: Ovando, *J. E. Kirkwood 1424* (UC). Wyoming. Lincoln County: Headwaters of Hoback River, 9000 feet, *L. Williams 1281* (IU). Teton County: Snake River at mouth of Pacific Creek, 6500 feet, *L. Williams 1636* (WS). Yellowstone National Park: Camp Roosevelt, Tower Junction, *H. L. Mason 3497* (type, UC). Utah. Cache County: Intervale, Blacksmith Fork Canyon, 5700 feet, *B. Maguire 3670* (IU); Logan Canyon 20 miles above Logan, *H. L. Mason 10,039* (UC); Tony Grove, *J. B. Wann 3669* (IU). Wasatch County: American Fork Canyon 8000 feet, 1902, *M. E. Jones* (IU). Nevada. Esmeralda County: *W. H. Shockley 660* (UC). Nye County: Toyabe Mountains north of Twin Lakes, *Linsdale 758* (UC). California. Inyo County: White Mountains, *V. Duran 2756* (UC). Mono County: Conway Grade, between Mono Lake and Bridgeport, 7800 feet, *D. D. Keck 2914* (UC).

University of California,
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