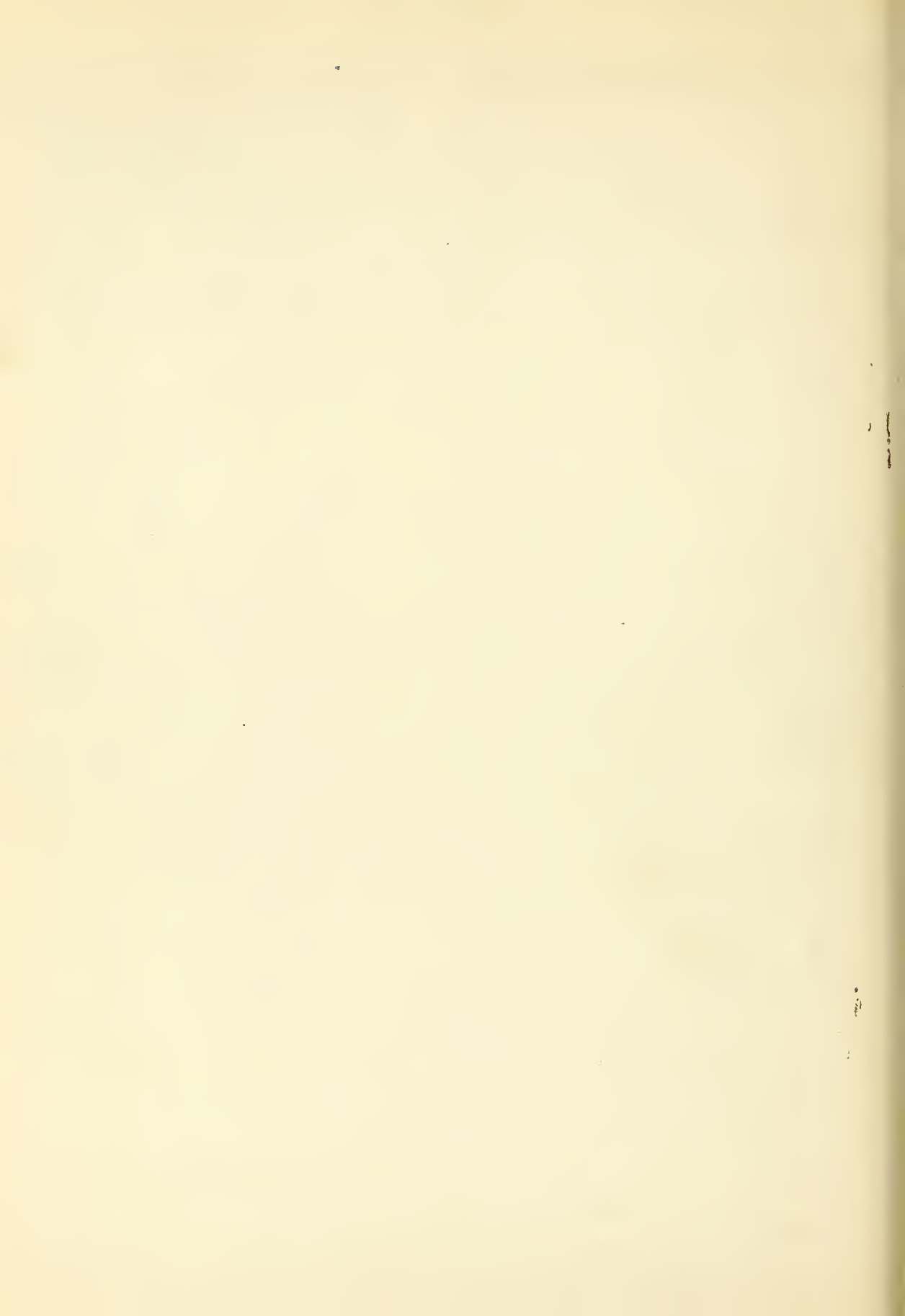


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CONTRIBUTIONS TOWARD A FLORA OF NEVADA

NO. 39

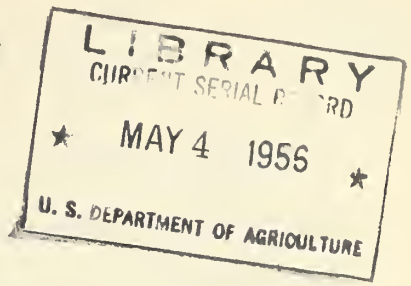
Y LEGUMINOSAE OF NEVADA,

PART II - LUPINUS Y

by

DAVID B. DUNN

April 6, 1956



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A series prepared through the cooperation of  
the National Arboretum and the Section of Plant Introduction  
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Plant Industry Station  
Beltsville, Md.

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DIAGNOSTIC CHARACTERS IN THE LUPINUS FLOWER

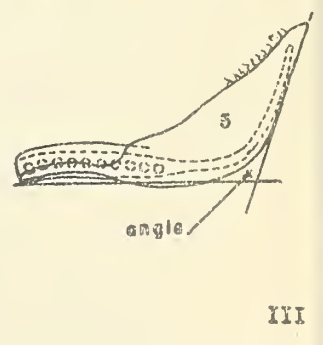
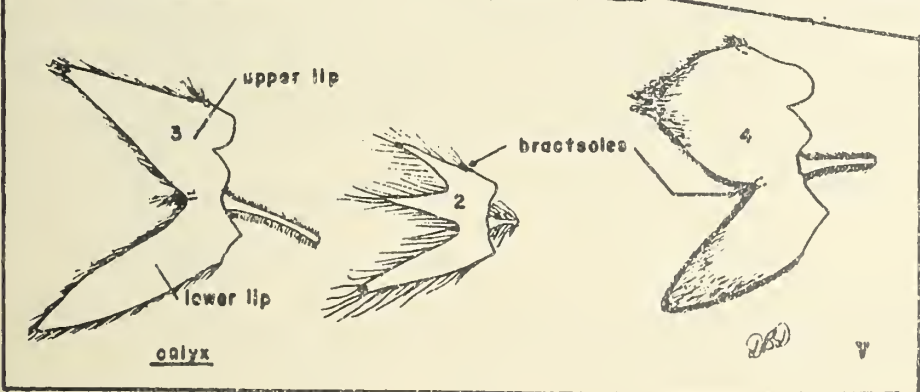
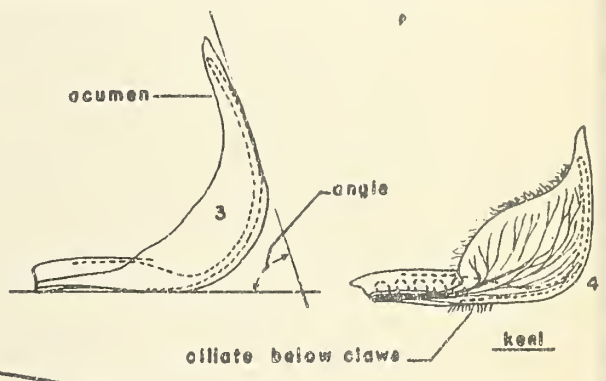
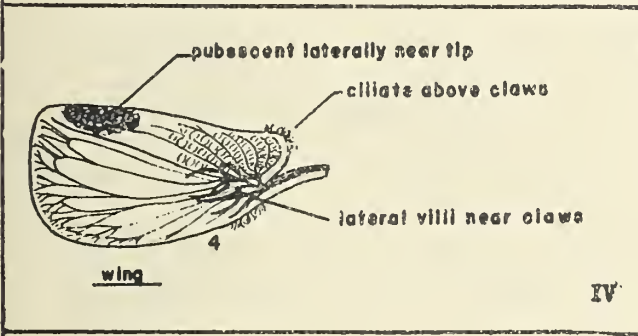
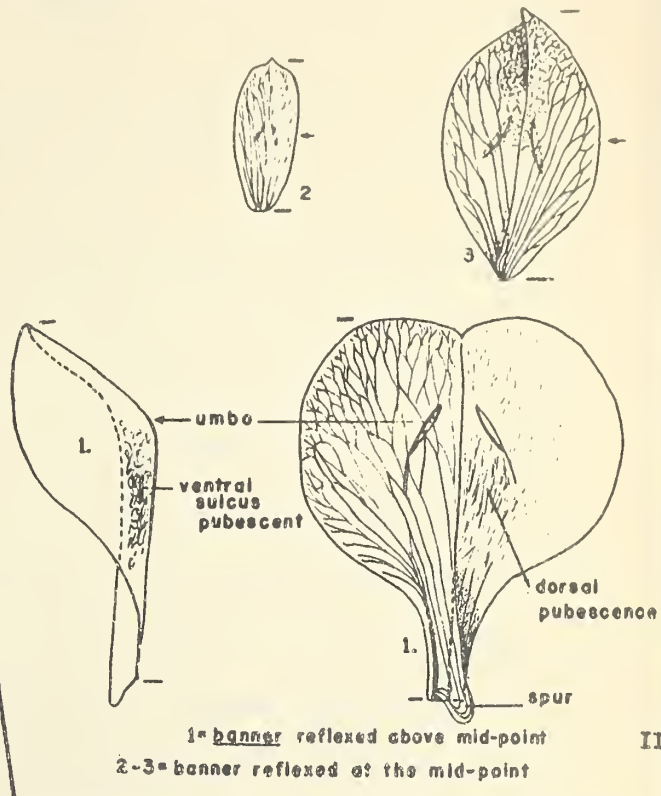
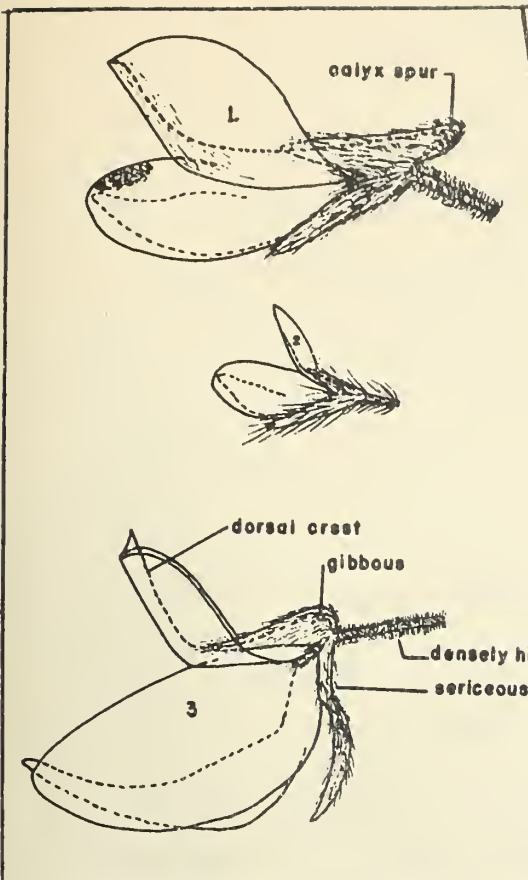
Drawn to scale

- I. Lateral views of the entire flower.
- II. Types of banners, the upper two being glabrous.
- III. Variation in the keel.
- IV. Wing, indicating the various areas in which pubescence may be present. In other taxa one or more of these areas may be glabrous.
- V. Calyces cut at the sinus of left side and flattened, to show variation in shape, degree of fusion, types and location of pubescence.

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Taxa used for illustration.

1. L. arbustus ssp. calcaratus, 2. L. bicolor ssp. tridentatus,
3. L. albicaulis, 4. L. arbustus ssp. arbustus var. arbustus,
5. L. nanus ssp. menkeræ.





LEGUMINOSAE OF NEVADA  
PART II - LUPINUS

By David B. Dunn<sup>1</sup>

Contribution Toward a Flora of Nevada, No. 39

LUPINUS L., Sp. Pl. 721. 1753.

Annual or perennial herbs, one shrub in Nevada; stems solitary or in dense clumps from a woody caudex, of ten branching above; glabrate or with various types of pubescence<sup>2</sup>; stipules usually subulate, foliaceous in one species, connate at the base or for as much as three-fourths of the length; leaves either basal or cauline, alternate, palmately compound, with 5-15 leaflets; leaflets linear to oblanceolate or obovate; flowers perfect, pedicellate, in terminal, sessile or pedunculate racemes (axillary in one species); calyx two-lipped, three sepals fused into an often nearly entire lower lip, the upper lip formed by two more or less connate sepals; corolla usually pale blue and white to deep blue or purple or lavender with a white to yellow spot on the banner, all yellow, white or pink flowers are not uncommon; wing petals fused at the tip; keel petals fused above and below for the outer half and often ciliate; stamens 10, monadelphous, 5 with large

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1. The work on this paper was done while a visiting botanist at the Rancho Santa Ana Botanic Garden and as a visiting lecturer at the University of Minnesota. Type material of all but a few of the epithets was studied.

2. The terminology regarding pubescence follows Lawrence, Taxonomy of Vascular Plants, p. 746.

anthers alternating with 5 small anthers; legume violently dehiscent, 2 to several seeded. (Latin, a wolf, since the plants often grow in poor soil and were thought to rob the soil. Type species, L. albus L.)

There are 49 taxa treated as specific here but several are doubtfully specific. The amount of introgression between the perennial taxa appears to be of such a magnitude that wherever two come together, some gene exchange may be expected. In the absence of adequate data, from breeding experiments, it was considered desirable to avoid nomenclatural changes, except where necessary.

#### KEY TO SPECIES

1. Plants annual.
2. Flowers solitary, axillary, equalling the foliage, which forms a dense tuft, like a pincushion, commonly less than 2.5 cm. tall and 5 cm. diam. . . . . 1. L. UNCIALIS
2. Flowers in terminal racemes; the plants usually much larger, and not a compact tuft, 2.5 cm. tall.
3. Flowers in distinct verticils, at least below; the leaves pubescent above.
4. Keel ciliate near the acumen.
  5. Banner reflexed above the midpoint; angle of the keel less than 90°; ovules generally 5-7. . 12. L. VALLICOLA
  5. Banner reflexed at the midpoint; angle of the keel over 100°; ovules commonly 9-11. .13. L. NANUS ssp. MENKERAE
4. Keel glabrous.



6. Racemes lax; flowers bright blue; center of the banner yellow, turning purple in age; ovules 4 or more.

14. L. PACHYLOBUS

6. Racemes compact; flowers white with a tinge of blue; the entire banner yellowish, turning bluish in age; ovules 2. . . . . 8. L. MALACOPHYLLUS

3. Flowers non-verticillate; a few species with the leaves pubescent above, the rest glabrous above.

7. Keel ciliate near the claws, sometimes only above or below, and sometimes minutely so (or in L. arizonicus rarely nearly glabrous); ovules 4 or more.

8. Leaflets broadly oblanceolate, glabrous above, with only a few scattered hairs below; flowers 8-10 mm. long, lavender-magenta, sometimes drying blue.

10. L. ARIZONICUS

8. Leaflets narrowly linear-oblanceolate, glabrous above or with some hairs above and below; flowers 10-13 mm. long, bright blue. . . . . 11. L. SPARSIFLORUS

7. Keel glabrous.

9. Ovules 4-6 (sometimes 2-3, if so, the cotyledons petioled).

10. Leaflets pubescent above; plants usually densely villous, including the pods; cotyledons petioled.

9. L. CONCINNUS

10. Leaflets glabrous above; plants nearly glabrous, including the sides of the pods; cotyledons sessile.

## 4. L. ODORATUS

9. Ovules 2, rarely 3; cotyledons sessile; the upper surface of the leaflets glabrous, (some hairs near the margins in L. shockleyi and L. kingii).

11. Flowers borne in pedunculate, headlike racemes.

12. Plants essentially acaulescent, the stems, at most, only 1-2 cm. long; the upper lip of the calyx 2 mm. long or less, the lobes obsolete.

## 2. L. BREVICAULIS

12. Plants caulescent, 1-2 dm. tall, with distinct stems even when young; upper lip of the calyx 3-6 mm. long, with distinct lobes. . . . . 7. L. KINGII

11. Flowers borne in elongate racemes, 3 cm. long or more.

13. Peduncles obsolete, rarely as much as 1 cm. long; inflorescence shorter than the leaves; plants coarsely hairy throughout except the upper surface of the leaflets. 6a. L. PUSILLUS ssp. INTERMONTANUS

13. Peduncles evident; inflorescence exceeding the foliage, sometimes just barely.

14. Stems without spreading hairs, densely covered with a feltlike canescence about 1 mm. long;

pods 7 mm. wide. . . . . 5. L. SHOCKLEYI

14. Stems with numerous spreading hairs 1.5-2 mm. long; pods 5-6 mm. wide.

15. Peduncles 1-3 cm. long, erect; racemes lax; mature pods 6 mm. wide, abundantly pubescent.

6. *L. PUSILLUS* ssp. *RUBENS*

15. Peduncles 3-6 cm. long, decumbent or erect;  
racemes dense; mature pods 5 mm. wide, sparsely  
pubescent on the sides. .3. *L. FLAVOCULATUS*

## 1. Plants perennial.

16. Plants shrubby, with woody stems at least 15 cm. long, often  
5-15 dm. tall. . . . . 23. *L. EXCUBITUS*

16. Plants herbaceous, dying back annually, nearly to the ground.

17. Leaflets glabrous above (the marginal hairs sometimes folding inward on drying).

18. Largest leaflets 10 mm. wide or more; banner glabrous; the flowers 12 mm. long or more, reflexed at the midpoint. (Leaflets sometimes less than 10 mm. wide and the flowers 10 mm. long in *L. wyethii* but the banner glabrous.)

19. Keel naked, (sometimes minute papillae visible under a microscope, on the upper edge near the claws).

20. Leaflets 9-17, 6.5-15 cm. long; bracts lanceolate, scarcely exceeding the flowers; racemes dense and long; keel naked. . . . . 15. *L. POLYPHYLLUS*

20. Leaflets 5-10, 5-9 cm. long; bracts linear-subulate, commonly much exceeding the flowers; racemes lax or dense; keel minutely papillate above the claws, when viewed under a microscope. . . . . 16. *L. SUPERBUS*

19. Keel ciliate.

21. Keel ciliate toward the base, near the claws.

## 17. L. LATIFOLIUS

21. Keel ciliate above, near the acumen.

22. Leaflets oblanceolate-obovate, the tips rounded or obtuse; the upper lip of the calyx incised 2 mm. or more. . . . . 18. L. AMMOPHILUS

22. Leaflets elliptic-oblanceolate, the tips acute-apiculate, the midvein hirsute beneath; the upper lip of the calyx only slightly notched.

## 19. L. WYETHII var. PRUNOPHILUS

18. Largest leaflets less than 10 mm. wide, except sometimes in L. parviflorus and L. arbustus ssp. pseudoparviflorus and then the banner reflexed well above the midpoint.

23. Flowers 6-7.5 mm. long. . . . . 28. L. PARVIFLORUS

23. Flowers 8-12 mm. long.

24. Banner and keel glabrous or sometimes a few scattered cilia on each; stems simple, in clumps, the upper 1-2 nodes may later produce secondary racemes; leaflets oblanceolate to narrowly oblanceolate.

25. Banner orbicular; leaflets 3-6 cm. long, 6-10 mm. wide; racemes generally 10-15 cm. long; calyx gibbous to spurred at the base.

## 35d. L. ARBUSTUS ssp. PSEUDOPARVIFLORUS

25. Banner obovate; leaflets 2.2-3.5 cm. long, 4-7 mm. wide; racemes generally less than 10 cm. long; calyx gibbous at the base, rarely with a spur to

0.4 mm. long. . . . . 29. L. RUBRICAULIS

24. Banner pubescent on the back, sometimes sparsely;  
keel ciliate along the upper edge near the acumen;  
branches numerous; lower leaves fallen by anthesis;  
leaflets linear-elliptic to linear-oblongate.

26. Wings 4.5-6 mm. wide; flowers 10-12 mm. long, orb-  
icular in outline as viewed laterally.

30. L. ARGENTEUS ARGENTEUS

26. Wings 4.5mm. wide or less; flowers 8-10 mm. long;  
narrow as viewed laterally; upper lip of the calyx  
gibbous at the base to protruding slightly back-

ward. . . . . 30a. L. ARGENTEUS var. TENELLUS

17. Leaflets pubescent above, sometimes sparsely.

27. Banner pubescent on the back, sometimes only beneath the  
upper lip of the calyx or in the grooves of the folded  
portion.

28. Calyx not spurred, the upper lip sometimes gibbous at  
the base but not extending backward into a spur.

29. Plants matted with prostrate woody stems; the foliage  
5-8 cm. tall. . . . 41b. L. BREWERI var. GRANDIFLORUS

29. Plant with erect stems from a woody caudex; the fol-  
iage 12 cm. tall or more.

30. Banner reflexed at or below the midpoint.

31. Stems with spreading hairs; calyx not gibbous at  
the base (Mts. of NE. Nev.)

38a. L. SERICEUS var. EGGLESTONIANUS

31. Stems with appressed hairs.
32. Calyx gibbous at the base (Endemic in the Mt. Rose region) . . . . . 37. L. MONTIGENUS
32. Calyx not gibbous at the base. (Ore. and Wash. into NE. Nev.) . . . . . 38. L. SERICEUS
30. Banner reflexed well above the midpoint, the apex relatively close to the tip of the wings.
33. Stems with spreading hairs; flowers 8-11 mm. long.
34. Pubescence of the leaves and stems densely velutinous to woolly; hairs spreading, 2-4 mm. long, masking the stem (N. Great Basin to Wash.).
39. L. LEUCOPHYLLUS
34. Pubescence of the leaves sericeous to densely sericeous; hairs spreading, 1-2 mm. long, not hiding the stem (S. Great Basin). 33. L. PALMERI
33. Stems with appressed hairs (except sometimes in L. leucophyllus var. tenuispicus which has flowers less than 8 mm. long).
35. Flowers less than 8 mm. long.
36. Plants velutinous-canescens, 3-6 dm. tall; foliage 2-4 dm. tall; banner sericeous on the back.
- 39a. L. LEUCOPHYLLUS var. TENUISPICUS
36. Plants sericeous, 2 dm. tall; foliage 12-15 cm. high; banner sparsely pubescent to glabrate. . . . . 32. L. EVERMANNII
35. Flowers over 8 mm. long.

37. Upper surface of the leaflets densely sericeous. . . . . 34. L. HOLOSERICIUS

37. Upper surface of the leaflets sparsely strigose to sparsely puberulent, often appearing glabrous to the unaided eye.

38. Flowers narrow, viewed laterally, wings 4.5 mm. wide or less; calyx distinctly gibbous or short-spurred at the base; flowers 8-10 mm. long.

30a. L. ARGENTEUS var. TENELLUS

38. Flowers nearly orbicular; wings 4.5 mm. wide or more; calyx not or slightly gibbous at the base; flowers 10-12 mm. long.

31. L. ALPESTRIS

28. Calyx distinctly spurred in the mature flowers, the spur extending backward 0.4-2.5 mm. or more.

39. Lips of the calyx 5 mm. long or less; flowers 8-12 mm. long; spur of the calyx 0.4-1 mm. long; leaflets sparsely strigose to glabrate, appearing bright green; wings pubescent laterally near the tip.

40. Wings 3-3.5 mm. wide; flowers 8-10 mm. long.

35c. L. ARBUSTUS ssp. SILVICOLA

40. Wings 4-5 mm. wide; flowers 10-12 mm. long.

35b. L. ARBUSTUS var. MONTANUS

39. Lips of the calyx 6 mm. long or more; flowers 10-15 mm. long; the upper lip of the calyx commonly with

a spur, 1-3 mm. long; leaflets densely silvery sericeous.

41. Wings pubescent near the tip, laterally; flowers white, sometimes bluish.

35a. L. ARBUSTUS ssp. CALCARATUS

41. Wings ciliate above and, or below the claws and, or laterally near the base, or sometimes glabrous; keel often with lateral villi ahead of the claws.

42. Banner reflexed well above the midpoint; flowers 8-12 mm. long. . . . . 36. L. CAUDATUS

42. Banner reflexed at the midpoint; flowers 12-13 mm. long. . . . . 37. L. MONTIGENUS

27. Banner glabrous; the calyx not spurred, although the base of the upper lip is gibbous in a few species.

43. Plants with cauline leaves, the basal leaves generally fallen by anthesis; the foliage over 18 cm. high.

44. Banner reflexed above the midpoint; the keel ciliate above, near the acumen.

45. Flowers 6 mm. long or less (Endemic to the Sierra Nevada Mts.). . . . . 27. L. MEIONANTHUS

45. Flowers 8 mm. long or more (the banner with some hairs on the back, near or under the upper lip of the calyx, but commonly overlooked).

31. L. ALPESTRIS

44. Banner reflexed at the midpoint; keel glabrous, or rarely with a few scattered cilia.



46. Stipules foliaceous; leaflets flat, broadly oblanceolate, obtuse at the tip; stems and petioles retroversely pubescent. . . . . 24. L. FULCRATUS

46. Stipules subulate; leaflets conduplicate, linear-oblanceolate to oblanceolate, acute or obtuse at the tip; stems minutely appressed pubescent.

25. L. ANDERSONI

43. Plants with leaves primarily in dense basal clusters; the foliage generally 18 cm. or less high.

47. Leafy portion of plant over 10 cm. high.

48. Banner nearly orbicular; leaflets 8-12.

49. Banner reflexed above the midpoint.

26. L. NEVADENSIS

49. Banner reflexed at the midpoint.

50. Leaflets sparsely strigose to glabrate above, the mid-vein hirsute beneath.

19. L. WYETHII var. PRUNOPHILUS

50. Leaflets evenly sericeous, strigose-pilose, or densely woolly canescent on both sides.

51. Leaflets densely woolly-canescant with a feltlike pubescence; flowers 13-18 mm. long, verticillate. . . . . 22. L. GRAYI

51. Leaflets evenly strigose-pilose to sericeous; flowers 10-14 mm. long, verticillate or non-verticillate.

52. Leaflets 4-4.5 cm. long; pedicels 8-10 mm.

- long; bracts caducous or tardily deciduous  
 (Known only from the type collection,  
 Esmeralda Co. Nev.). . 21. L. HOLMGRENANUS
52. Leaflets 1.4-2.5 cm. long; pedicels 4-7  
 mm. long; bracts persistent (Modoc Co.,  
 Calif. northward). . . . . 20. L. SAXOSUS
48. Banner oblong-ovoid; leaflets 5-8.
53. Flowers 7-10 mm. long.
54. Peduncles not exceeding the foliage; the pubescence with numerous, coarse, spreading, scaberulous hairs; the upper surface of the leaflets with less hairs and greener (Oregon and Wash., southeastward to Colorado).
44. L. ARIDUS
54. Peduncles extending well above the foliage; pubescence evenly sericeous to velutinous (Sierra Nevada Mts., northward to Washington).
45. L. SELLULUS
53. Flowers 11-13 mm. long.
55. Racemes densely verticillate; peduncles exceeding the foliage; 3-5 leaves on the flower stalk; upper lip of the calyx notched 1.5 mm. or less; wings 4.5-5.5 mm. wide; verticils commonly 6-8-flowered (Sierra Nevada Mts., southward). . . . . 46. L. CONFERTUS
55. Racemes lax or dense; peduncles arising near

the base of the plant and may or may not exceed the foliage; upper lip of the calyx incised 2.5-4 mm.; wings 3-4.5 mm. wide; subverticils with 4-5, rarely 6 flowers (SE. Oregon to Arizona). . . . . 47. L. VOLUTANS

47. Leafy portion of plant 10 cm. or less high; plants densely caespitose or matted.

56. Racemes equal to or shorter than the leaves; the plants often appearing acaulescent; stems only 1-3 cm. long, sometimes longer in L. cusickii.

57. Largest leaflets 10-14 mm. long, densely canescent; petioles 3-4 cm. long. . . 42. L. CUSICKII

57. Largest leaflets 17-25 mm. long; pilose hairy; petioles 5-10 cm. long. . . . 43. L. CAESPITOSUS

56. Some or all of the racemes extending above the foliage.

58. Peduncles not rising above the foliage; racemes 5-13 cm. long, three-fourths below the foliage; petioles 6-10 cm. long; longer hairs somewhat scaberulous (E. Oregon and Wash. to Utah).

59. Upper lip of the calyx notched 1-2 mm.; flowers 9-11 mm. long, blue, the central whitish spot extending nearly to the tip of the banner.

44. L. ARIDUS

59. Upper lip of the calyx incised 3-4 mm.; flowers 12-13 mm. long, dark blue-purple, the white

spot of the banner central and at the base.

47. L. VOLUTANS

58. Peduncles as long as, or longer than, the foliage (Sierra Nevada Mts. and vicinity, N. and S., except L. lyallii ssp. subpandens).

60. Banner obovate to rounded or orbicular; keel glabrous or a few scattered cilia above.

61. Banner obovate to spatulate, 6-8 mm. long; leaflets 10-15 mm. long, 3-4.5 mm. wide; densely matted (Sierra Nevada Mts.).

41. L. BREWERI

61. Banner obovate-orbicular, 9-11 mm. long; leaflets 13-17 mm. long, 4.5-9 mm. wide; cespitose (Mono Crater region).

40. L. DURANII

60. Banner elliptic-oblong, slightly wider above; keel ciliate above, near the acumen; plants suberect, decumbent or prostrate.

62. Plants appressed pubescent to pilose, the hairs not or slightly scaberulous.

63. Pubescence appressed, silky sericeous, the few longer hairs (1 mm. long) also appressed; racemes 1-2 cm. long, occasionally 3-4 cm. long. .48. L. LYALLII LYALLII

63. Pubescence appressed, with numerous, longer, spreading hairs, 1.5-3 mm. long; ra-

cemes 2-6 cm. long. . . . .49. L. LOBBII

62. Plants densely covered with coarse, subap-  
pressed or ascending hairs that are scaberu-  
lous, ringed or barbellate, clinging like  
those of *Mentzelia*.

48b. L. LYALLII ssp. SUBPANDENS

ANNUALS, Nos. 1-14

1. LUPINUS UNICIALIS S. Wats., Bot. King Rep. 54, pl. 7, f. 5-10.  
1871.

Plants a compact, dense tuft of leaves surpassing the flowers and pods, the entire plant only 2.5 cm. tall and 2.5-5 cm. diam.; petioles 8-10 mm. long; leaflets 4-5, 4-5 mm. long, glabrous above, pubescent beneath; flowers axillary, solitary or occasionally 2, 6 mm. long; peduncles 2-6 mm. long; upper lip of calyx 1/2 as long as the lower; pods 2-seeded, 6-7 mm. long, sparsely pubescent.

One collection was from Pinyon-Juniper knolls. It could easily be overlooked as a pebble. It is not an anomaly. Thus far known only from Nevada. Nevada material seen from Elko; Ft. McDermitt Indian Res., Humboldt; Lander; Nye; and Truckee Hills, Washoe Cos. It should be found in adjacent Oregon, Idaho, Utah and California.

2. LUPINUS BREVICAULIS S. Wats., Bot. King Rep. 53, pl. 7, f. 1-4.  
1871.

L. scaposus Rydb., Bull. Torr. Club. 34: 45. 1907.

L. dispersus Heller, Muhl. 5: 141. 1909.

Stems obsolete to 1 or 2 cm. long in fruit; petioles often decumbent, 2-4 cm. long, 6 cm. or more in some forms; leaflets 5-8, glabrous above, sparsely pilose below as well as on petioles; peduncles often decumbent, sometimes exceeding the leaves; flowers 6-7 mm. long, in compact, headlike racemes; banner narrow oblong-elliptic; upper lip of the calyx nearly obsolete; pods 4.5-5 mm.

wide (wider in a southern form); seeds 2-3.

Sandy plains of the Great Basin from Oregon to Colorado, Arizona and New Mexico. Nevada material seen from Churchill, Esmeralda, Eureka, Humboldt, Mineral, Nye, Ormsby, and Washoe Cos. It probably occurs throughout the State.

3. LUPINUS FLAVOCULATUS Heller, Muhl. 5: 149. 1909.

L. rubens var. flavoculatus (Heller) C.P.Sm., Bull. Torr. Club 46: 404. 1919.

L. odoratus var. flavoculatus (Heller) Jepson, Fl. Calif. 2: 282. 1936.

Stems as obsolete as those of L. brevicaulis, pilose hairs the same; leaflets 7-10, broadly oblanceolate to obovate, glabrous above; petioles and peduncles decumbent; racemes usually 4-10 cm. long, dense; flowers 7-10 mm. long, the smaller may be hybrids with the above species; banner broadly obovate; upper lip of the calyx well developed; pods and seed number as above.

Sandy or gravelly desert flats to Pinyon-Juniper association. SW. Nevada and adjacent California. Nevada material seen from Clark, Esmeralda, Lincoln, Nye and Washoe Cos.

4. LUPINUS ODORATUS Heller, Muhl. 2: 71. 1905.

Acaulescent with long-petioled, basal leaves, the petioles 8-12 cm. long; glabrous at maturity except for the bracts, stipules and the upper edge of the pod; leaflets 7-9, obovate; peduncle 7-12 cm. long, some decumbent or ascending; raceme 6-12 cm.

long; flowers scattered, 10-11 mm. long, deep blue, calyx glabrous; banner orbicular, the sides flaring out; wings inflated; pods 7-8 mm. wide; ovules 4-6, some abortive.

Sandy desert slopes. Primarily the Mohave Desert and adjacent Arizona. Nevada material seen from Washoe Co., 2 records. It should occur in the south.

4a. var. PILOSELLUS C. P. Sm., Bull. Torr. Bot. Club 46: 402. 1919.

Stems pilose; ovules 2-3. It probably occurs in Clark and Nye Cos. It is doubtfully distinct from L. flavoculatus, but appears to be larger flowered and may represent some introgression between the two taxa.

5. LUPINUS SHOCKLEYI S. Wats., Proc. Am. Acad. 22: 470. 1887.

Stems short, distinct, the first internode of the basal branches 2-4 cm. long (as in L. rubens), rarely nearly acaulescent; petioles 7-9 cm. long; plant covered with dense, short, spreading canescence, about 1 mm. long; long hairs essentially absent; leaflets 8-9, narrowly obovate, glabrous above or pubescent near the margins; peduncles 3-7 cm. long; racemes 3-5 cm. long, with numerous flowers 5-6 mm. long; banner commonly not reflexed, blue; pods large for this group, 8-10 mm. wide, very sparsely pubescent, except on the upper vein (related to L. odoratus in this), ovules 2-3, rugose, pale.

Sandy or gravelly soil of the desert. W. Nevada and adjacent California, one collection from NW. Arizona. Nevada material seen



from Esmeralda and Mineral Cos.

6. LUPINUS PUSILLUS ssp. RUBENS (Rydb.) Dunn, Leaflets W. Bot.

7: 255. 1955.

L. rubens Rydb., Bull. Torr. Club 34: 45. 1907.

L. odoratus var. rubens (Rydb.) Jepson, Fl. Calif. 2: 282.  
1936.

Plants with definite short stems, with decumbent basal branches from the lower leaf axils; the first internode of the basal branches commonly 3-4 cm. long; lower petioles 5-6 cm. long, hirsute; leaflets 6-7, glabrous above, oblanceolate; peduncle about 2 cm. long, hirsute; racemes lax, 8-10 cm. long, the upper half above the foliage; calyx lips pubescent, the tube and pedicel glabrous; flowers 8-10 mm. long; pods hirsute; seeds 2-3.

Sandy, gravelly soil with Larrea and blackbrush. S. Great Basin, Utah, Arizona to California. Nevada material seen only from Clark Co.

6a. LUPINUS PUSILLUS Pursh ssp. INTERMONTANUS (Heller) Dunn, Leaflets W. Bot. 7:255. 1955.

L. intermontanus Heller, Muhl. 8: 87. 1912.

L. pusillus var. intermontanus (Heller) C. P. Sm., Bull. Torr. Bot. Club 46: 408, f. 52. 1919.

Plants 1-1.5 dm. tall, with short branching leafy stems, hirsute throughout, except for the glabrous upper leaf surface; stems may be glutinous, herbarium specimens coated with fine sand; leaf-

lets 5-6, oblanceolate-oblong; petioles 4-5 cm. long, the foliage surpassing the racemes; peduncles obsolete; racemes 2-5 cm. long, dense; flowers 6-7 mm. long; the base of the calyx partly glabrous; pods usually two-seeded, partially constricted between the seeds.

Sandy-gravelly soil or in sand dunes of the Great Basin, from Washington to Arizona and Colorado. Nevada material seen from Churchill, Esmeralda, Humbolt, Lyon, Ormsby and Washoe Cos.

7. LUPINUS KINGII S. Wats., Proc. Am. Acad. 8: 534. 1873.

L. sileri S. Wats., Proc. Am. Acad. 10: 345. 1875.

L. capitatus Greene, Pittonia 1: 171. 1888.

Plants 5-20 cm. tall, the terminal bud producing a raceme early, the subsequent branching abundant; abundant hirsute, spreading hairs, 2 mm. long; petioles 2-2.5 cm. long; leaflets 5-7, oblanceolate, acute or obtuse, glabrous above or occasional hairs near the margins; peduncles 1-7 cm. long, sometimes on the same plant, when reduced resembles L. pusillus ssp. intermontanus; racemes capitate, generally equal to or surpassing the foliage; flowers 7-9 mm. long, blue; the upper lip of the calyx nearly as long as the lower, both nearly as long as the petals; pods 5 mm. wide; ovules generally 2.

Open flats in the Pinyon or Pine belts. Widely distributed from Utah to Arizona, New Mexico and Colorado. Only one specimen seen from Nevada at Deer Lodge, Lincoln Co.

8. LUPINUS MALACOPHYLLUS Greene, Pittonia 1: 215. 1888.

Plants erect, 10-15 cm. tall, commonly with several basal branches flowering as the central raceme is in fruit and commonly equalling the central raceme, hirsute throughout; petioles 2-4 cm. long; leaflets 5-7, oblanceolate, distinctly pubescent above; peduncles 5 cm. long; racemes compact, 4-8 cm. long, 3-9 verticils, distinct, at least below; flowers 11-14 mm. long, white to yellowish with a pale bluish tint; the banner yellow, tinted in age; upper lip of calyx slightly gibbous at the base; pods 6 mm. wide, slightly constricted between the seeds; ovules generally 2.

Dry sandy soils. Centered in Washoe Co., Nevada, near Reno. Probably occurring in adjacent California.

9. LUPINUS CONCINNUS var. ORCUTTII (S. Wats.) C. P. Sm., Bull. Torr. Club. 48: 225. 1921.

L. orcutti S. Wats., Proc. Am. Acad. 20: 359. 1885.

L. micensis Jones, Proc. Cal. Acad. II, 5: 630. 1895.

Stems branched below, sometimes profusely, 5-20 cm. tall, densely pubescent with spreading hairs, 1-1.5 mm. long; petioles 2-4 cm. long; leaflets 5-8, obovate-oblanceolate, pubescent on both sides; peduncles about 1 cm. long; raceme 2-4 cm. long; flowers scattered, 6-7 mm. long, blue-purple; pods 5 mm. wide; seeds 3-4, rarely 2 by abortion.

Gravelly soils, 3000-6000 ft. ele., New Mexico to Nevada. The species is known in Nevada only from Clark and Nye Cos.

9a. LUPINUS CONCINNUS var. DESERTORUM (Heller) C. P. Sm., Bull. Torr. Club. 48: 230, f. 73. 1921.

Petals white or yellowish and 6-9, oblong-ob lanceolate leaflets. This variety may well occur in S. Nevada.

10. LUPINUS ARIZONICUS (S. Wats.) S. Wats., Proc. Am. Acad. 12: 250. 1876.

L. concinnus var. arizonicus S. Wats., Proc. Am. Acad. 8: 537. 1873.

L. sparsiflorus var. arizonicus (S. Wats.) C. P. Sm., Bull. Torr. Club 47: 495. 1920.

L. sparsiflorus var. setosissimus C. P. Sm., l. c.: 496.

L. sparsiflorus var. barbatulus Thornber ex C.P.Sm., l.c.: 497.

Stems erect, commonly branching above, sometimes from the lower nodes as well, 15 cm. to 1 m. tall, fistulose when large, sparsely pilose to glabrate; petioles 2-4 cm. long, occasionally 7 cm. long; leaflets 7-9, glabrous above, sparsely pubescent beneath, broadly oblanceolate to obovate; peduncles 2-5 cm. long; racemes of scattered flowers, 5-25 cm. long; flowers 8-10 mm. long, magenta when fresh; banner broadly obovate; the keel often ciliate only below the claws, occasionally glabrous; pods 4 mm. wide; seeds 4-6.

Sandy washes and sites of runoff at lower elevation in the California and Arizona deserts. Material seen from Clark Co., Nevada, 500-600 ft. ele. This species has been intersterile with L. sparsiflorus in a series of trials.

11. LUPINUS SPARSIFLORUS Benth., Pl. Hartw. 303. 1848.

L. subhirsutus Davidson, Proc. S. Calif. Acad. Sci. 18: 80.  
1919.

Plants 1.5-4.0 dm. tall, commonly with basal branches, later some branching above, sparsely pilose with few to numerous, spreading hairs; petioles 4-8 cm. long; leaflets 5-9, linear-oblongate to narrowly elliptical, glabrate above or sparsely pilose; peduncles 2-4 cm. long; racemes 6-20 cm. long; flowers 10-12 mm. long, generally deep blue, scattered; banner suborbicular; keel generally ciliate above and below near the claws; calyx sometimes slightly gibbous at the base; pods 5 mm. wide, with coarse, appressed hairs; seeds 4-6.

Open, sandy, gravelly soil, usually growing at higher elevations than the last, but mixed populations are not uncommon. Widely distributed in Arizona, California, and Mexico. Nevada material seen only from Clark Co.

12. LUPINUS VALLICOLA Heller, Muhl. 4: 40. 1908.

L. persistens Heller, Muhl. 2: 62. 1905. (non Rose).

L. nanus var. vallicola (Heller) C. P. Smith, Bull. Torr. Club 50: 168. 1923.

L. blaisdellii Eastw., Leaflets W. Bot. 3: 18. 1941.

Plants erect, 2-5.5 dm. tall, with basal branching; leaflets 6-7, the largest 1.4-3.7 cm. long, linear-oblong to linear-oblongate, both surfaces appressed pubescent; petioles 3-8 cm. long; peduncles 4-10 cm. long; racemes 3.5-16 cm. long, 3-11 verticils,

usually well separated; flowers 6.7-10 mm. long, banner squar-orbicular, wider than long; emarginate at the apex, reflexed above the middle; keel ciliate above on the distal half, hooked back, the angle 65°-95°; pods 4.0-5.2 mm. wide, seeds 5-9.

Open meadows on slopes in the Sierra Nevada and Bay region in California. Collected at the southern end of Lake Tahoe and one specimen from Douglas Co. in Nevada.

13. *LUPINUS NANUS* ssp. *MENKERAE* (C. P. Sm.) Dunn, *El Aliso* 3: 162. 1955.

*L. nanus* var. *menkeræ* C. P. Sm., *Bull. Torr. Club.* 50: 167. 1923.

An erect annual 9-40 cm. tall, the longer branches basal, appressed pubescent with hispid spreading hairs; petioles 3.5-7.5 cm. long; leaflets 6-8, the largest 1-4 cm. long; linear-oblongate, pubescent on both surfaces; peduncles 3-11 cm. long; racemes 4-12 cm. long, 2-8 distinct verticils; pedicels 3.5-7 mm. long, banner rotund, emarginate, 9-15 mm. long, reflexed at the middle; keel ciliate near acumen, the angle about 100°; pods 3.6-4.6 mm. wide; seeds 5-13, generally 10 or 11, about 2 mm. diam.

Restricted to the southern end of the San Joaquin Valley, California. Now reported as common on the one specimen seen from Elko Co., Nevada. Apparently introduced via livestock transport.

14. *LUPINUS PACHYLOBUS* Greene, *Pittonia* 1: 65. 1887.

*L. micranthus* var. *pachylobus* (Greene) Jeps., *Fl. West.*

Mid. Calif., Ed. 1: 318. 1901.

Plants erect, 10-25 cm. tall; petioles 4-8 cm. long; leaflets 5-8, 1.5-3 cm. long, linear-oblong to oblanceolate, both surfaces pubescent; peduncles 3-12 cm. long; racemes few-flowered, 1-3.5 cm. long, subverticils 1-3; pedicels 1.5-2.5 mm. long; banner orbicular, reflexed slightly above the middle; keel glabrous, the angle 90°-105°; pods 7.2-9.2 mm. wide; seeds 3-5.

Found in open areas. Not yet found in Nevada but collected just inside California, in Mono Co., near Sweetwater.

PERENNIALS, Nos. 15-50

15. LUPINUS POLYPHYLLUS Lindl., Bot. Reg. 13, t. 1096. 1827.

L. polyphyllus ssp. polyphyllus var. polyphyllus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 180. 1955.

Stems erect, 1-1.7 m. tall or more, fistulose, sparsely pilose; petioles up to 30 cm. long; leaflets 9-17, glabrous above, sparsely puberulent below, 6-15 cm. long, oblanceolate; racemes 30-60 cm. long, densely verticillate, or a confluent spiral; pedicels 6-8 mm. long; calyx lips entire; corolla blue-purple; banner apiculate; keel falcate, glabrous.

Wet places from Yellow Pine forests to Aspen, from British Columbia to California, and into the Rocky Mountains. Nevada material, on the small side, seen from Water Canyon Springs, White Pine Co.

16. LUPINUS SUPERBUS Heller, Muhl. 2: 209. 1906.

L. elongatus Greene ex Heller, Muhl. 6: 17. 1910.

L. procerus Greene ex Heller, l. c.: 19.

L. apodotropis Heller, Muhl. 7: 14, f. 5. 1911.

L. polyphyllus ssp. polyphyllus var. polyphyllus (sensu Phillips) (pro parte). Wash. State Coll. Res. Studies 23: 180. 1955.

Stems 1-1.7 m. tall, clustered, generally fistulose, glabrate to minutely appressed pubescent; lower petioles 10-20 cm. long; leaflets 5-11, oblanceolate, apiculate, largest leaflets 5-8 cm. long; peduncles 5-14 cm. long; racemes 15-25 cm. long, lower verticils 2-3 cm. distant in fruit; bracts caducous; pedicels 4-5 mm. long; flowers 11-14 mm. long; upper lip of calyx fused nearly to the tip, 5-8 mm. long, lower entire, 6-10 mm. long; banner glabrous, reflexed at the midpoint; keel minutely papillate on the upper margin near the claws, appearing glabrous; pods densely velutinous.

Widespread from British Columbia to California, east to Wyoming. Nevada material seen from Douglas, Ormsby and Washoe Cos.

17. LUPINUS IATIFOLIUS var. COLUMBIANUS (Heller) C. P. Sm., Bull. Torr. Bot. Club 51: 307. 1924.

L. confusus Heller, Muhl. 8: 63. 1912. (non Rose).

L. columbianus Heller, Muhl. 8: 84. 1912.

L. rivularis (pro parte) as in Jep., Fl. Calif. 2: 259. 1936. (non Dougl.).

L. perennis ssp. latifolius (Agardh.) Phillips (pro parte)



Wash. State Coll. Res. Studies 23: 176. 1955.

Stems 1-2 m. tall, generally fistulose; petioles of the upper leaves 6-8 cm. long, (the lower not seen); leaflets 7-9, oblanceolate, glabrous above, sparsely pubescent below; peduncles of the primary racemes 10-15 cm. long, numerous secondary racemes, lower verticils 1.5-3.0 cm. apart; flowers 12-14 mm. long, pale blue-lavender to creamy-white, drying brown; pods densely villous, 8 mm. wide, 4-8 seeded.

Nevada material seen from Douglas, Ormsby and Washoe Cos., from wet sites, 5000-9000 ft. ele. June-August.

17a. LUPINUS LATIFOLIUS var. VIRIDIFOLIUS (Heller) C. P. Sm.,  
Contr. Dudley Herb. 1: 50. 1927.

L. viridifolius Heller, Muhl. 2: 64. 1905.

L. rivularis var. viridifolius (Heller) Jep., Fl. Calif.  
2: 260. 1936.

L. perennis ssp. latifolius (Agardh.) Phillips (pro parte).  
Wash. State Coll. Res. Studies 23: 176. 1955.

This taxon has flowers 8-9 mm. long and was described from Siskiyou Co., California. It may occur in Nevada.

18. LUPINUS AMMOPHILUS Greene, Pittonia 4: 136. 1901.

Stems 20-25 cm. tall, solitary or occasionally 2; leaves mostly basal, petioles of the basal leaves 8-14 cm. long, spreading pubescent to hirsute, as the stems; leaflets 6-9 glabrous above, sparsely appressed hairs below, oblanceolate to obovate, the tip

round or obtuse, the largest 12-20 mm. wide, 4-6 cm. long; peduncles about 6 cm. long; raceme somewhat lax, the flowers scattered, 12-13 mm. long; the upper lip of the calyx incised into two lobes, the cut 1.5-4 mm. deep; banner obovate-orbicular; keel sparsely ciliate near the acumen; pods 10 mm. wide.

Described from Colorado. The only location known from Nevada is on the slope of the Junipers, NE. of Vya, Washoe Co., (P. Train 2937). The Nevada material is slightly less hairy than that of Colorado but otherwise appears the same.

19. LUPINUS WYETHI var. PRUNOPHILUS (Jones) C. P. Sm., St. John, Fl. SE. Wash. and Adj. Idaho 229. 1937.

L. prunophilus Jones, Contrib. West. Bot. 14: 7. 1910.

L. arcticus var. prunophilus C. P. Sm., Sm. Sp. Lup. 235. 1940.

L. polyphyllus ssp. polyphyllus var. prunophilus (Jones) Phillips, Wash. State Coll. Res. Studies 23: 180. 1955.

Stems several, ascending, slender or somewhat fistulose, 3-7 dm. tall, sparsely spreading-villous, few-leaved; leaves mostly basal, their petioles 12-25 cm. long; leaflets 8-12, glabrous or above, rarely sparsely strigose, sparsely pilose below, hirsute on the midvein, elliptic-oblongate, acute, apiculate-tipped, rarely obtuse, the largest 4-8 cm. long, rarely less than 10 mm. wide; peduncles 6-8 cm. long; racemes dense; flowers scattered or subverticillate; bracts sub-persistent; pedicels 4-8 mm. long; calyx lips subequal, the lower slightly longer, 5-7 mm. long, tridentate,

two-lobed with a notch 1 mm. deep, or less; banner 10-14 mm. long, glabrous, orbicular; keel sparsely ciliate near the acumen; pods 4-6 seeded, 7-11 mm. wide.

Common on grassy slopes, British Columbia to Oregon, east to Montana, the southern limits in Nevada and Utah. Nevada material seen from Elko and White Pine Cos. The Nevada and Utah specimens have the smallest plants and flowers.

20. *LUPINUS SAXOSUS* Howell, *Erythea* 1: 110. 1893.

Plants 10-30 cm. tall, with soft-pubescent and spreading hairs; leaflets 8-12, 14-25 mm. long, oblanceolate, densely sericeous below, sparsely strigose above; petioles of the basal leaves up to 14 cm. long; peduncles 3-7 cm. long; racemes 3-8 cm. long, subverticillate; pedicels 4-7 mm. long, slender; bracts persistent; flowers 12-14 mm. long; banner orbicular, glabrous; keel sparsely ciliate near the acumen.

Found from Modoc County, California, northward to E. Washington, on gravelly flats or plains, 3000-5000 ft. ele. Probably occurring in N. Washoe Co., Nevada.

21. *LUPINUS HOLMGRENANUS* C. P. Sm., *Smith Sp. Lup.* 637. 1948.

Plants 4.5 dm. tall, evenly, thinly sericeous throughout; stems clumped, from a woody caudex; 3-4 of the cauline leaves with dwarf branches in the axils; petioles 8-10 cm. long; leaflets 6-8, elliptic-oblanceolate, 4-4.5 cm. long, 6-10 mm. wide, acute; peduncles 8 cm. long; bracts lanceolate, caducous or tardily decidu-

ous; pedicels 8-10 mm. long; banner glabrous, orbicular, keel vil-  
lous-ciliate toward the acumen; verticils 15-18 mm. apart.

Known only from Esmeralda Co., Nevada, from Lida Pass, be-  
tween Magruder Mt. and Palmetto Mt., 6800 ft. ele.

22. LUPINUS GRAYI S. Wats., Proc. Amer. Acad. 11: 126. 1876.

Foliage 10-18 cm. tall, stems decumbent, densely woolly-canes-  
cent throughout; leaves mostly basal, the petioles 6-12 cm. long;  
leaflets 8-10, oblanceolate, obtuse, mucronate, canescent on both  
sides; peduncles 6-10 cm. long; racemes 6-16 cm. long, verticils  
1.5-2.5 cm. apart at anthesis; bracts caducous; pedicels 3-4 mm.  
long; flowers 13-18 mm. long; banner glabrous, orbicular, reflexed  
near the middle; keel ciliate near the acumen; ovules 4-6.

Lower parts of the Sierra Nevada Mts., primarily in Califor-  
nia but also in the Lake Tahoe region. It grows on dry slopes  
among pines, 1500-7000 ft. ele.

23. LUPINUS EXCUBITUS Jones, Contr. West. Bot. 8: 26. 1898.

Shrubby, 0.5-1.5 m. tall; the overwintering foliage densely  
silvery, satiny-canescent to woolly, the spring growth finely ap-  
pressed silky-canescent; winter petioles 3-3.5 cm. long, spring pet-  
ioles 4-6.5 cm. long; peduncles 6-8 cm. long; racemes 5-6 dm. long,  
or more, verticils 3-3.5 cm. apart; bracts caducous; pedicils 5-6  
mm. long; banner glabrous; keel minutely ciliate along the acumen.

No collections seen from Nevada but undoubtedly occurring in  
Nevada adjacent to Mono Co., California, in desert washes.

24. LUPINUS FULCRATUS Greene, Pittonia 3: 159. 1897.

L. fraxinetorum Greene, Leaflets Bot. Obs. & Crit. 2: 236.  
1911.

Plants 3-4 dm. tall; branching somewhat above, hispidulose with spreading or retrorse hairs; petioles 4-4.5 cm. long; stipules foliaceous, 10-15 mm. long and 3.5 mm. wide; leaflets 6-9, oblanceolate, flat, obtuse or rounded at the tip, appressed-canescenscent on both sides; peduncles 2-3 cm. long; racemes 5-6 cm. long; flowers subverticillate, 8-10 mm. long; banner glabrous, oblong-obovate, mucronate; keel glabrous; bracteoles of the calyx setaceous, 2 mm. long. (The flowers are up to 12 mm. long and the racemes up to 17 cm. long in a Sierra Nevada form called L. fraxinetorum).

Occurs in the S. Sierra Nevada Mts., and the Mts. of S. Nevada. Nevada material seen from Esmeralda and Nye Cos.

25. LUPINUS ANDERSONI S. Wats., Bot. of King Rep. 5: 55. 1871.

L. apertus Heller, Muhl. 8: 103. 1912.

L. andersoni var. apertus (Heller) C. P. Sm. in Jepson, Man. Fl. Pl. Calif. 528. 1925.

Plants 5-8 dm. tall, stems few but branching freely above, minutely appressed-pubescent throughout; leafy above at flowering time; petioles 2-4 cm. long; stipules minute, caducous; leaflets 7-10, linear-elliptic to linear-oblanceolate, conduplicate; peduncles 2-7 cm. long; racemes 5-17 cm. long; flowers 10-13 mm. long, scattered or verticillate; banner glabrous, ovate to orbicular,

mucronate at the tips; keel glabrous, sometimes a few cilia above ; bracteoles of the calyx minute, 0.1-0.2 mm. long.

Sand Bernardino Mts., California to S. Oregon. Nevada material seen only from Washoe Co., 5700-6700 ft. ele.

26. LUPINUS NEVADENSIS Heller, Muhl. 6: 107, f. 17. 1910.

Foliage 12-25 cm. tall, the leaves primarily basal from a woody caudex; petioles of basal leaves 8-16 cm. long; short appressed-pubescent with spreading, villous hairs 2-2.5 mm. long, throughout; leaflets 8-10, linear-elliptic to oblanceolate, villous on both sides; peduncles 3-7 cm. long; racemes dense, 7-15 cm. long, subverticillate; bracts persistent or tardily deciduous; pedicels 4-6 mm. long; upper lip of calyx incised 2-4 mm.; bracteoles 1-3 mm. long, attached at the base of the calyx tube; banner glabrous, reflexed above the middle; the angle of the keel 90° or less; keel short ciliate near the middle above; ovules 6.

In Lincoln, Lyon, Storey and Washoe Cos., Nevada, and probably adjacent California, 4400-6300 ft. ele., along Pinyon-Juniper woods and probably in sagebrush.

27. LUPINUS MEIONANTHUS Gray, Proc. Amer. Acad. 6: 522. 1865.

Plants 2.5-5 dm. tall, with numerous simple stems from a woody caudex; lower leaves fallen by flowering time; silvery-silky sericeous throughout; petioles 2.5-3 cm. long; leaflets 6-8, linear-oblanceolate, conduplicate; peduncles 1-2 cm. long; racemes 3-9 cm. long, densely verticillate, the verticils 5-6 mm. apart;

flowers 5.5-6 mm. long; banner glabrous, orbicular, reflexed well above the midpoint, near the tip; keel ciliate above, near the acumen.

Occurs in the Sierra Nevada Mts. and Mt. Rose. Nevada material seen from Douglas and Washoe Cos., 7300-9700 ft. ele.

28. LUPINUS PARVIFLORUS Nutt., Hook. & Arn., Bot. Beechy Voy. 336. 1840.

L. allimicranthus C. P. Sm., Sm. Sp. Lup. 319. 1942.

L. argenteus ssp. parviflorus (Nutt.) Phillips (pro parte) Wash. State Coll. Res. Studies 23: 190. 1955.

Plants 3-4.5 dm. tall, branching above, one to several stems from a woody caudex; the lower leaves fallen by anthesis; petioles 2-4 cm. long; leaflets 7-8, 3-5 cm. long, 5-16 mm. wide, glabrous above, minutely puberulent below, broadly oblanceolate to obovate, the tip rounded or mucronulate; peduncles 1-4 cm. long; racemes 3.5-9 cm. long, densely verticillate, these 7-10 mm. apart; pedicels 1-2 mm. long; flowers 6-7.5 mm. long; banner sparsely pubescent on back in the bud, sometimes glabrate in anthesis, reflexed above the midpoint, 7 mm. wide, 6 mm. long; keel ciliate near the acumen; pods 3-4 seeded, 6-6.5 mm. wide.

Generally in damp woods with aspen but sometimes in drier sites, 5600-8000 ft. ele. Nevada material seen from Elko, Lander and Nye Cos. It appears to introgress with L. argenteus var. tenellus.

29. LUPINUS RUBRICAULIS Greene, Fl. Baker, 3: 35. 1901.

L. caudatus var. rubricaulis (Greene) C. P. Sm., Contrib. Dudley Herb. 1: 29. 1927.

L. argenteus ssp. argenteus (sensu Phillips) (pro parte) Wash. State Coll. Res. Studies 23: 188. 1955.

Erect, often purplish stems, 3.5-6 dm. tall, simple and clumped, the upper nodes sometimes producing secondary racemes; basal leaves present or absent at anthesis; minutely puberulent throughout, except the glabrous upper leaf surface; petioles 4-8 cm. long; leaflets 7-9, generally 2.5-3.5 cm. long, occasionally 5.5 cm. long, 4-7 mm. wide, occasionally 9 mm. wide; peduncles 2.5-5 cm. long; racemes 6-10 cm. long, rarely 15 cm. long, densely verticillate; pedicels 2-4 mm. long; bracts caducous, 3-5 mm. long; calyx gibbous at the base, the upper lip nearly entire, the notch 0.2-0.3 mm. deep; flowers 8-10 mm. long, typically glabrous but not uncommonly a few scattered hairs on the back of the banner and the upper margin of the keel.

Doubtfully distinct; the typical material occurs in Utah, Colorado and extends into New Mexico but is rare in Nevada. Its affinity is with L. argenteus. Hybrid material appears to be more common in Nevada. Nevada material seen from Elko, Esmeralda, Nye and White Pine Cos., 6500-9500 ft. ele.

30. LUPINUS ARGENTEUS (ARGENTEUS) Pursh, Fl. Sept. 468. 1814.

L. decumbens Torr., Ann. Lyc., N. Y., 2: 191. 1828.

L. laxiflorus B foliosus Nutt. ex T. & G., Fl. N. Am. 1:



377. 1840.

(L. foliosus Nutt., mss. ibid. pub. in syn.)

L. argenteus var. decumbens (Gray) S. Wats., Proc. Am. Acad.  
8: 532. 1873.

L. foliosus Nutt. ex Rydb., Fl. Rocky Mts. and Adj. Plains  
463. 1917. (non Hook.).

L. garrettianus C. P. Sm., Sm. Sp. Lup. 672. 1949.

L. argenteus ssp. argenteus (sensu Phillips) (pro parte),  
Wash. State Coll. Res. Studies 23: 188. 1955.

Plants 4-7 dm. tall, with a cluster of branched stems, puberulent to appressed-strigose throughout, except the glabrous upper leaf surface, leafy above, the basal leaves fallen by anthesis; petioles 2-4 cm. long; leaflets 7-9, linear-elliptic, 2.5-3 or 4 cm. long, 2-4 or 5 mm. wide, with obtuse or acute tips; peduncles 2-4 cm. long; racemes 5-12 or rarely 25 cm. long, subverticils 10-12 mm. apart; bracts 2-3 mm. long, persistent or caducous; pedicels 2-4 mm. long; flowers 10-12 mm. long, orbicular viewed laterally; banner orbicular, pubescent on the back beneath or near the lip of the calyx, reflexed above the midpoint; keel ciliate along the upper edge near the acumen.

From the NE. corner of California to Montana and then southward in the Rocky Mts. Nevada material seen from Humboldt, Nye and Washoe Cos., 5400-8400 ft. ele., in Artemisia to timbered creek bottoms.

30a. LUPINUS ARGENTEUS var. TENELLUS (Dougl. ex G. Don) Dunn, Leaflets W. Bot. 7: 254. 1955.

L. laxiflorus Dougl. ex Lindl., Bot. Reg. 14, t. 1140. 1828.

L. tenellus Dougl. ex G. Don, Hist. Dichl. Pl. 2: 367. 1832.

L. tenellus Dougl. ex Agardh, Syn. Gen. Lup 27. 1835.

L. stenophyllus Nutt. ex Rydb., Flora Rocky Mts. & Adj. Plains 461. 1917.

L. laxiflorus var. tenellus Dougl. ex T. & G., Flora N. Am. 1: 377. 1840.

L. lanatocarinatus C. P. Sm., Sm. Sp. Lup. 317. 1942.

L. fremontensis C. P. Sm., l. c. 320. 1942.

L. cariciformes C. P. Sm., l. c. 73. 1946.

L. hullianus C. P. Sm., l. c. 573. 1946.

L. montis-cookii C. P. Sm., l. c. 726. 1952.

L. argenteus var. stenophyllus (Nutt. ex Rydb.) Davis, Flora Idaho, Wm. C. Brown Co., Dubuque, Iowa 439. 1952.

L. argenteus ssp. argenteus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 188. 1955.

Plants similar to L. argenteus argenteus, differing in pubescence sericeous to strigose; petioles of the lower leaves, which are often present, up to 8 cm. long; leaflets 2-4.5 cm. long, 3-6 mm. wide, elliptic to linear-oblongate, glabrous or sparsely strigose above; flowers 8-10 mm. long; calyx gibbous at the base or distended backward slightly; wings narrow, 4 mm. wide or less, giving the flower a slender appearance laterally. It appears to introgress with L. parviflorus, L. rubricaulis and L. alpestris.

The var. stenophyllus may eventually prove to be distinct but the type was not available to determine such.

Widespread in the Great Basin region from E. Oregon to W. Colorado and New Mexico. Nevada material seen from brushy areas in Elko, Eureka, Lander, Lincoln, Nye, Washoe and White Pine Cos., 5000-8400 ft. ele.

31. LUPINUS ALPESTRIS A. Nels., Bull. Torr. Bot. Club 26: 127. 1899.

L. adscendens Rydb., Bull. Torr. Bot. Club 30: 256. 1903.

L. laxus Rydb., l. c.: 258. 1903.

L. pulcherrimus Rydb., l. c.

L. macounii Rydb., l. c. 34: 42. 1907.

\* L. argenteus var. submanens C. P. Sm., Sm. Sp. Lup. 133. 1940.

L. argenteus var. aristovatus C. P. Sm., l. c. 134.

L. argenteus var. prati-harti C. P. Sm., l. c.

L. argenteus var. krauchianus C. P. Sm., l. c. 135.

L. argenteus var. wallianus C. P. Sm., l. c.

L. alpestris var. argentatus (Rydb.) C. P. Sm., l. c. 136.

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\* The Smith epithets for 1940 were made from plants from different habitats in the vicinity of Flagstaff, Arizona and some show introgression with L. palmeri; those named in 1944 by Smith are all from the Charleston Mts., Nev. and again there has been some introgression from other taxa.

- L. clokeyanus C. P. Sm., l. c. 391. 1944.
- L. flavo-pinuum C. P. Sm., l. c. 392.
- L. junipericola C. P. Sm., l. c.
- L. alexanderae C. P. Sm., l. c. 393.
- L. sicco-silvae C. P. Sm., l. c. 394.
- L. calcicola C. P. Sm., l. c. 394.
- L. clarkensis C. P. Sm., l. c. 395.
- L. patulipes C. P. Sm., l. c.
- L. trainianus C. P. Sm., l. c. 396.
- L. abiesicola C. P. Sm., l. c.
- L. annieae C. P. Sm., l. c. 397.
- L. populorum C. P. Sm., l. c.
- L. acclivatatis C. P. Sm., l. c. 398.
- L. charlestonensis C. P. Sm., l. c.
- L. lariversianus C. P. Sm., l. c. 399.
- L. argenteus var. macounii (Rydb.) R. J. Davis, Madrono  
11: 144. 1951.
- L. argenteus ssp. argenteus (sensu Phillips) (pro parte),  
Wash. State Coll. Res. Studies 23: 188. 1955.

Plants 2.5-4.5 dm. tall, stems several from a woody caudex; basal leaves often fallen by anthesis; petioles 4-7 cm. long; leaflets 7-9, oblanceolate-elliptic, 3-6 cm. long, 4-11 mm. wide, finely puberulent on both sides, often appearing glabrous to the unaided eye; peduncles 3-4 cm. long; racemes 8-12 cm. long or longer; pedicels 2.5-4 mm. long; flowers 9-12 mm. long, scattered or subverticillate; upper lip of the calyx often somewhat gibbous at the

base; banner reflexed above the midpoint, glabrate or sparsely pubescent near the calyx lip; keel sparsely short-ciliate near the acumen. A doubtful species, intergrading with L. argenteus var. tenellus but with flower size and shape of L. argenteus argenteus.

Throughout the SE. part of the Great Basin in the mountains from Inyo Co., California to Arizona, Colorado and north to Wyoming and Montana. Nevada material seen from Clark, Elko, Mineral, Nye and White Pine Cos.

32. LUPINUS EVERMANNII Rydb., Bull. Torr. Bot. Club 30: 255. 1903.

L. minearanus C. P. Sm., Sm. Sp. Lup. 565. 1946.

L. amniculi-vulpum C. P. Sm., l. c. 740. 1952.

L. argenteus ssp. argenteus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 188. 1955.

Densely caespitose or clumped from a woody caudex; foliage about 12 cm. tall; plants 15-20 cm. tall; stems very slender, only 1-1.5 mm. diam. in dried material, very finely silky-sericeous throughout; petioles 2-4 cm. long; leaflets 6-8, linear-elliptic, 15-18 mm. long, 2-3 mm. wide, evenly pubescent on both surfaces; peduncles 2-2.5 cm. long; bracts caducous; pedicels 2-3 mm. long; flowers 7 mm. long; verticils 5-7 mm. apart; banner reflexed above the midpoint, glabrate on the back; keel ciliate above near the acumen. Related to the L. argenteus complex.

Apparently a rare species in southern Idaho and adjacent Wyoming but it may occur in the NE. corner of Nevada.

33. LUPINUS PALMERI S. Wats., Proc. Am. Acad. Arts & Sci. 8: 530. 1873.

Plants 3-6 dm. tall, several simple stems with dwarf, axillary branches, the upper flowering later; stems hispidulose with retrorsely spreading hairs, 1-2 mm. long; petioles 4-10 cm. long; leaflets 6-9, elliptic-oblongate, acute to obtuse, the larger 2.5-4.8 cm. long and 6-9 mm. wide, densely sericeous on both sides; peduncles 4-7 cm. long, somewhat lax, subverticillate; bracts caducous; pedicels 2-7 mm. long; flowers 8-10 mm. long; the banner suborbicular, a few dorsal cilia in the groove and under the upper calyx lip, reflexed above the midpoint; keel ciliate above near the acumen.

Mountains of the southern Great Basin from Westgard Pass to Arizona and the mountains of W. New Mexico. Nevada material seen from the Grapevine Mts. and the Sheep Mts., Clark Co. The taxon appears to hybridize with L. alpestris and its close allies. Several names have been applied to plants appearing to belong to a hybrid complex but their evaluation will require extensive field study. They are: L. candidissimus Eastw., L. portae-westgardiae C. P. Sm. and L. keckianus C. P. Sm.

34. LUPINUS HOLOSERICEUS Nutt. ex T. & Gr., Fl. N. Amer. 1: 380. 1840.

L. lupinus Rydb., Bull. Torr. Bot. Club 40: 44. 1913.

L. utahensis Moldenke, Torreya 34: 9. 1934.

L. lacum-trinitatum C. P. Sm., Sm. Sp. Lup. 576. 1946.

Plants 3-7 dm. tall, with a clump of simple stems from a woody caudex, with dwarf, axillary branches, densely sericeous to silky-canescens throughout; basal leaves present or absent at anthesis, their petioles 4-8 cm. long; leaflets 5-9, linear-elliptic, often conduplicate or arcuate, 2-4 cm. long, 4.5-7 mm. wide; peduncles 2.5-5 cm. long; racemes 9-20 cm. long, verticils 10-14 mm. apart; bracts subulate, tardily deciduous; pedicels 2-3 mm. long; flowers 8-10 mm. long; calyx gibbous at the base of the upper lip; banner reflexed above the midpoint, sericeous in the center of the back; keel ciliate above near the acumen. A connecting link between the L. argenteus complex and the L. caudatus complex.

Mountains of the Great Basin from Washington southward to Utah and Nevada. Nevada material seen from Elko, Eureka, Lander, Lincoln, Lyon, Nye, Washoe and White Pine Cos., 5000-9000 ft. ele., on open or timbered slopes.

35a. LUPINUS ARBUSTUS ssp. CALCARATUS (Kell.) Dunn, Leaflets W. Bot. 7: 255. 1955.

L. calcaratus Kell., Proc. Calif. Acad. 2: 195, f. 60. 1862.

L. variegatus Heller, Muhl. 8: 89. 1912.

L. multinctus A. Nels., Bot. Gaz. 53: 221. 1912.

L. laxiflorus var. calcaratus (Kell.) C. P. Sm., Bull. Torr. Bot. Club 51: 304. 1924.

L. laxiflorus var. villosulous C. P. Sm., Amer. Journ. Bot. 13: 530. 1926.

- L. noldecae Eastw., Leaflets W. Bot. 4: 149. 1945.
- L. geraniophilus C. P. Sm., Sm. Sp. Lup. 727. 1952.
- L. varneranus C. P. Sm., l. c. 730. (a hybrid).
- L. multitinctus var. grandjeani C. P. Sm., l. c. 735.
- L. graciliflorus C. P. Sm., l. c. 739.
- L. laxiflorus var. laxiflorus (sensu Phillips) (pro parte),  
Wash. State Coll. Res. Studies 23: 197. 1955.

Plants 4-6 dm. tall, with or without basal leaves at flowering time, finely sericeous on the stems; leaflets of the larger leaves 9-13, commonly conduplicate, arcuate, narrowly oblanceolate, mucronate, 3-5 cm. long, 6-10 mm. wide, subappressed, sericeous-villous on both sides; basal petioles 6-15 cm. long; peduncles 2-5 cm. long; racemes 4-25 cm. long, commonly dense; flowers 10-14 mm. long (not measuring the spur), generally yellowish-white but may be bluish or blue; calyx lips 6-7 mm. long, nearly equal, the upper with a spur 1.5-2.5 mm. long; banner pubescent on the back or in the grooves of the back and also ventrally within the fold, rarely glabrous on the back; wings pubescent laterally near the upper edge near the tip; keel ciliate along the entire upper margin; ovules 5-6.

Along E. side of the Sierra Nevada Mts., north-eastward to Wyoming. Nevada material seen from Douglas, Elko, Eureka, Humboldt, Ormsby and Washoe Cos., in sandy soils, with sagebrush or pine forests, 5000-8000 ft. ele.



35b. LUPINUS ARBUSTUS Dougl. in Lindl. ssp. ARBUSTUS var. MONTANUS (Howell) Dunn, Leaflets W. Bot. 7: 254. 1955.

L. laxiflorus var. montanus T. Howell, Erythea 3: 33. 1895.

L. laxiflorus var. cognatus C. P. Sm., Jeps. Man. Fl. Pl. Calif. 527. 1925.

L. proteanus Eastw., Leaflets W. Bot. 4: 190. 1945.

L. perconfertus C. P. Sm., Sm. Sp. Lup. 738. 1952.

L. laxiflorus var. laxiflorus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 197. 1955.

Basal leaves present at flowering time; lower petioles 10-12 cm. long; the leaflets commonly green and sparsely pubescent above, evenly pubescent in the southern material; racemes generally lax; flowers 10-12 mm. long, deep blue; banner sparsely pubescent on both sides; wings pubescent as above, 4-5 mm. wide.

Ill-defined, but reported from the San Gabriel Mts. of S. California to central Idaho. Possibly the parent stock from which the better defined taxa were derived. Nevada material seen only from Washoe Co.

35c. LUPINUS ARBUSTUS ssp. SILVICOLA (Heller) Dunn, Leaflets. W. Bot. 7: 255. 1955.

L. laxiflorus var. silvicola (Heller) C. P. Sm., Jepson, Man. Fl. Pl. Calif. 527. 1925.

L. silvicola Heller, Muhl. 6: 81, f. 12. 1910.

L. elegantulus Eastw., Leaflets W. Bot. 3: 20. 1940.

L. laxiflorus var. laxiflorus (sensu Phillips) (pro parte),

Wash. State Coll. Res. Studies 23: 197. 1955.

Basal leaves generally present and smaller than the cauline leaves; lower petioles 6-10 cm. long; leaflets bright green but sparsely sericeous on both sides; racemes generally lax; flowers 8-10 mm. long, deep blue; banner pubescent on both sides; wings only 3-3.5 mm. wide, pubescence as above.

Sierra Nevada Mts., northward to Washington.

35d. LUPINUS ARBUSTUS ssp. PSEUDOPARVIFLORUS (Rydb.) Dunn, Leaflets W. Bot. 7: 255. 1955.

L. pseudoparviflorus Rydb., Mem. N. Y. Bot. Gard. 1: 232. 1900.

L. laxispicatus Rydb., Bull. Torr. Bot. Club 34: 42. 1907.

L. laxiflorus var. durabilis C. P. Sm., Am. Jour. Bot. 13: 529. 1926.

L. laxiflorus var. pseudoparviflorus (Rydb.) C. P. Sm. & St. John in St. John, Fl. SE. Wash. & Adj. Idaho 227. 1937.

L. laxispicatus var. whithamii C. P. Sm., l. c.

L. laxiflorus var. elmerianus C. P. Sm., Sm. Sp. Lup. 106. 1939.

L. mucronulatus var. umatillensis C. P. Sm., l. c. 108. 1939.

L. fieldianus C. P. Sm., l. c. 567. 1946.

L. lacus-payettii C. P. Sm., l. c. 574. 1946.

Basal leaves present at flowering time, with petioles 8-12 cm. long; the upper surface of the leaflets generally glabrous but

grading into var. cognatus, then glabrate above; flowers 8-12 mm. long; banner sparsely pubescent on both sides, occasionally entirely bare; wings generally pubescent laterally as above, occasionally with only a few obscure cilia; calyx spur 0.5-1 mm. long. (The type specimen has glabrous wings).

N. Idaho and Montana southward into the Rocky Mts. of Colorado. Nevada material seen only from Elko Co.

36. LUPINUS CAUDATUS (CAUDATUS) Kell., Proc. Calif. Acad. 2: 197, f. 61. 1862.

L. meionanthus var. heteranthus S. Wats., Bot. King Rep. 56. 1871.

L. holosericeus var. utahensis S. Wats., Proc. Am. Acad. Arts & Sci. 8: 533. 1873.

L. argentinus Rydb., Bull. Torr. Bot. Club 30: 257. 1903.

L. rosei Eastw., Leaflets W. Bot. 2: 22. 1941.

L. stinchfieldiae C. P. Sm., Sm. Sp. Lup. 509. 1945.

L. montis-liberatis C. P. Sm., l. c. 571. 1946.

L. gayophytophilus C. P. Sm., l. c. 734. 1952.

Plant 3-6 dm. tall, the stems in clumps, erect or decumbent; the basal leaves present or absent at flowering time; petioles of the basal leaves 6-10 cm. long, of the cauline 2-5 cm. long; leaflets 7-8, 2-4 cm. long, linear-oblongate, acute, mucronate, evenly densely sericeous on both surfaces; peduncles 2-5 cm. long; racemes 4-10 cm. long, verticils usually only 10-12 mm. apart; bracts caducous; pedicels 2-4 mm. long; flowers 8-12 mm. long;

calyx with a spur 0.4-1 mm. long above, the upper lip 5.5-9 mm. long, the lower 6-11 mm. long; banner pubescent on the back and in the ventral groove, reflexed well above the midpoint; wings with lateral villi near the claws and cilia above and below the claws on the margins or glabrous in one or more of the locations mentioned; keel ciliate above near the acumen and also often pubescent laterally from near the claws forward near the bottom margin.

With sagebrush or pines in the mountainous areas from California northward to Oregon and Idaho and southeastward to Arizona and New Mexico. Material was seen from throughout the State of Nevada except Clark, Eureka and White Pine Cos. As treated here the species is polymorphic but the forms do not appear to have any geographic correlation.

37. *LUPINUS MONTIGENUS* Heller, Muhl. 6: 109, f. 16. 1910.

Plants 2.5-4 dm. tall, sericeous throughout, long-petioled, basal leaves usually present, but some plants have short-petioled lower leaves; petioles 4-13 cm. long; leaflets 8-10, elliptic-oblongate, 2.5-4.5 cm. long, 4-6 mm. wide, acute, often conduplicate; peduncles 3-5 cm. long; racemes 5-10 cm. long; flowers 12-13 mm. long; calyx slightly gibbous to spurred at the base; banner pubescent on the back, reflexed at the midpoint, sub-orbicular to obovate, 12 mm. long; wings glabrous or some lateral villi near the claws; keel densely lanate-ciliate above along the acumen, also with lateral villi near the claws.

Typical material seen only from Washoe Co., Nevada, where it appears to be an endemic, in the vicinity of Mt. Rose, at 10,000 ft. ele. or more. It would appear to interbreed with L. caudatus.

38. LUPINUS SERICEUS (SERICEUS) Pursh, Fl. Am. Sept. 2: 468. 1814.

L. leucopsis Agardh, Syn. Gen. Lup. 29. 1835.

L. flexuosus Lindl. ex Agardh, Syn. Gen. Lup. 34. 1835.

L. subulatus Rydb., Bull. Torr. Bot. Club 34: 43. 1907.

L. sericeus var. flexuosus (Lindl. ex Agardh) C. P. Sm., Bull. Torr. Bot. Club 5: 307. 1924.

L. flasocomatus C. P. Sm., Sm. Sp. Lup. 736. 1952.

L. herman-workii C. P. Sm., l. c. 741.

L. sericeus ssp. sericeus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 167. 1955.

Plants 3-6 dm. tall, branching at some of the upper nodes, sericeous throughout, usually densely; basal leaves often present at anthesis, with numerous cauline leaves, petioles 3.5-6 cm. long, 5-5.5 mm. wide; peduncles 3-5.5 cm. long; pedicels 5-6 mm. long; racemes lax, 10-20 cm. long; flowers 10-13 mm. long; calyx densely canescent; banner silky-pubescent over the entire central area of the back, obovate, reflexed at the midpoint; keel ciliate along the upper edge toward the acumen.

From E. Oregon and Washington southeastward in the Rocky Mts. Nevada material seen from Elko and Nye Cos., 7600-10,500 ft. ele.

38a. LUPINUS SERICEUS var. EGGLESTONIANUS C. P. Sm., Sm. Sp. Lup.  
104. 1939.

L. barbiger S. Wats., Proc. Am. Acad. Arts & Sci. 8: 528.  
1873.

L. ramosus E. Nels., Bot. Gaz. 30: 120. 1900.

L. buckinghami C. P. Sm., Sm. Sp. Lup. 741. 1952.

L. huilcoflorus C. P. Sm., l. c. 744.

L. spiraeaphilus C. P. Sm., l. c. 746.

L. sericeus ssp. sericeus (sensu Phillips) (pro parte),  
Wash. State Coll. Res. Studies 23: 167. 1955.

Plants differing in that the basal leaves have petioles 9-11 cm. long; stems densely hispid, often becoming ferruginous on drying; largest leaflets sericeous on both sides, 6-12 mm. wide.

Probably represents introgression with L. leucophyllus. In E. Oregon and Idaho to Utah. Nevada material seen from Elko Co. L. barbiger S. Wats. may prove to be a taxon worthy of recognition when more material is available.

39. LUPINUS LEUCOPHYLLUS Dougl. ex Lindl., Bot. Reg. 13: t. 1124.  
1827.

L. plumosus Dougl. ex Lindl., Bot. Reg. 13: t. 1217. 1829.

L. cyaneus Rydb., Bull. Torr. Bot. Club. 28: 35. 1901.

L. macrostachys Rydb., l. c. 34: 44. 1907.

L. enodatus C. P. Smith, Sm. Sp. Lup. 689. 1951.

L. forslingi C. P. Sm., Sm. Sp. Lup. 743. 1952.

Plants 5-9 dm. tall, densely woolly and with additional spread-

ing or retrorse hairs on the stems; lower petioles 8-12 cm. long; leaflets 7-10, 4-7 cm. long, 9-13 mm. wide, woolly on both sides, elliptic-oblongate; peduncles 3-5 cm. long; racemes 10-40 cm. long, densely verticillate; bracts caducous; pedicels 1.5-3 mm. long; flowers 10-12 mm. long; banner densely pubescent on the back, reflexed above the midpoint; keel ciliate along the entire upper margin; ovules 4-6. The first two synonyms listed above are variants of inadequately known distribution and nature.

From Washington to Wyoming and Utah. Nevada material seen from Elko and Nye Cos. but was of a hybrid nature with longer pedicels and lax racemes.

39a. *LUPINUS LEUCOPHYLLUS* var. *TENUISPICUS* (A. Nels.) C. P. Sm., Bull. Torr. Bot. Club. 51: 306. 1924.

*L. erectus* Henders., Bull. Torr. Bot. Club 27: 343. 1900.

*L. tenuispicus* A. Nels., Bot. Gaz. 54: 410. 1912.

*L. leucophyllus* (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 170. 1955.

Plants 3-4.5 dm. tall; pubescence sub-appressed-canescient to woolly, with or without spreading hairs; leaflets 3-5 cm. long, 5-10 mm. wide, elliptic-oblongate; peduncles 3-7 cm. long; racemes 8-12 cm. long, densely verticillate; pedicels 1-2 mm. long; flowers 6.5-8 mm. long; ovules 3-4; pods 5.5 mm. wide. It appears to intergrade with the species.

From Idaho to Wyoming and Utah and probably occurs in the NE. corner of Nevada.

40. LUPINUS DURANII Eastw., Leaflets W. Bot. 2: 251. 1940.

Plants dwarfed, caespitose, with short, decumbent, perennial branches without internodes, the old, woolly petioles and stipules persisting for several years; foliage 5-10 cm. tall; petioles 3.5-5 cm. long; leaflets 5-6, obovate, cuneate at the base, the tip rounded, mucronulate, 10-17 mm. long, 4.5-9 mm. wide, woolly on both sides; peduncles 4-5 cm. long, rising above the foliage; racemes 3-6 cm. long, densely verticillate; bracts caducous; pedicels 3-4 mm. long; flowers 8-11 mm. long; banner suborbicular to obovate, glabrous, or a few hairs apically or laterally in the bud but glabrous in age, 9.5-10 mm. long, 7-9 mm. wide; keel ciliate above near the acumen; ovules 4-5; seeds white; pods 6-7 mm. wide.

Apparently endemic to the volcanic sands of the Mono Crater region of California, 6500-8500 ft. ele. Probably also occurring in the adjacent area in Nevada.

41. LUPINUS BREWERI Gray, Proc. Amer. Acad. Arts & Sci. 7: 334. 1867.

Forming dense mats from prostrate, branching, woody stems, leaves and flowering stems erect; petioles 1.5-2.5 cm. long; leaflets 6-9, oblanceolate-cuneate, densely appressed, silvery-pubescent on both sides; peduncles 1.5-2 cm. long; raceme 1-2.5 cm. long, dense, 2-4 verticillate, internodes about 7 mm. long in fruit; bracts caducous; pedicels 1-2 mm. long; lips of the calyx nearly equal, 5-6 mm. long, the upper incised for 3-3.5 mm; banner obovate to round, with a claw, 2.5 mm. long, reflexed above the



middle, glabrous or some dorsal pubescence in the southern Sierra Nevada; the angle of the keel about  $90^{\circ}$  at anthesis, glabrous or a few hairs above, near the acumen; seeds 3-4.

Occurs in the Sierra Nevada Mts., N. to Oregon. Nevada material seen from Douglas and Washoe Cos., 4500-8500 ft. ele.

41a. *LUPINUS BREWERI* var. *BYROIDES* C. P. Sm., Jepson, Man. Fl. Pl. Calif. 526. 1925.

Petioles 1 cm. long, leaflets 5 mm. long, and flowers 4-6 mm. long.

In high mountains, 8000-12,000 ft. ele.

41b. *LUPINUS BREWERI* var. *GRANDIFLORUS* C. P. Sm., Jepson, Man. Fl. Pl. Calif. 526. 1925.

Vegetatively similar to the species, but slightly larger; racemes longer; flowers 9-11 mm. long, banner obovate-spatulate, reflexed near the midpoint, 8-10 mm. long; pubescent over the central area of the back; keel densely ciliate above near the acumen.

From the Mono Crater region and southern Sierra Nevada Mts., southward to the San Bernardino Mts. Probably in Nevada adjacent to the Mono Crater region. 7000-9500 ft. ele.

42. *LUPINUS CUSICKII* S. Wats., Proc. Am. Acad. Arts & Sci. 22: 469. 1887.

L. aridus var. cusickii (S. Wats.) C. P. Sm., Bull. Torr.

Bot. Club 51: 303. 1924.

L. longivallis C. P. Sm., Sm. Sp. Lup. 561. 1946.

L. lepidus ssp. cusickii (S. Wats.) Detl., Am. Mid. Nat.

45: 493. 1951.

L. lepidus ssp. lepidus (sensu Phillips) (pro parte),

Wash. State Coll. Res. Studies 23: 184. 1955.

Plants 6-8 cm. tall, densely caespitose, densely hoary-canescenscent throughout, turning rusty in dried material; longer hairs scaberulous, ringed; petioles 3-4 cm. long; leaflets 5-7, obovate-oblongate, mucronate; peduncles 1-2 cm. long; racemes 1-1.5 cm. long, 1-3 verticils; bracts persistent, 4-6 mm. long; pedicels 2-4 mm. long; banner oblong-obovate, slightly or not reflexed; keel ciliate above, near the acumen; ovules 3-4.

On hillsides from Oregon to Montana, and southeastward to Utah. Nevada material seen from near Ely, White Pine Co.

43. LUPINUS CAESPITOSUS Nutt. ex Torr. & Gray, Fl. N. Amer. 1: 379. 1840.

L. aridus var. utahensis S. Wats., Proc. Am. Acad. 8: 534. 1873.

L. watsonii Heller, Muhl. 1: 114, No. 6. 1905.

L. markleanus C. P. Sm., Sm. Sp. Lup. 559. 1946.

L. sinus-meyersi C. P. Sm., l. c. 562.

L. lepidus ssp. caespitosus (Nutt. ex Torr. & Gray) Detl., Am. Mid. Nat. 45: 494. 1951.

Plants 10-12 cm. tall; stems 2-3 cm. long or less, appears

acaulescent; petioles commonly 5-10 cm. long; pilose throughout, the hairs 2-2.5 mm. long, scaberulous, ringed; leaflets 5-7, 15-22 mm. long, oblanceolate, mucronate on both sides; peduncles 1-2 cm. long; racemes 2-3.5 cm. long, dense, verticillate; bracts subulate, 7-8 mm. long, persistent; pedicels 3-4 mm. long; banner oblong, rounded or emarginate at the tip, not reflexed or only slightly; keel ciliate on upper margin; seeds 3-4.

Gravelly valleys in the Yellow Pine and Aspen belts. Oregon to Montana and Colorado. Nevada material seen from Gold Creek, Humboldt Reserve, Elko Co. One specimen seen from the White Mts., California.

44. LUPINUS ARIDUS Dougl. in Lindl., Bot. Reg. t. 1242. 1829.

L. psoraleoides Pollard, Proc. Biol. Soc. Wash. 13: 129. 1900.

L. lepidus var. aridus (Dougl.) Jep., Jepson Fl. Calif. 2: 268. 1936.

L. amnicoli-cervi C. P. Sm., Sm. Sp. Lup. 561. 1946.

L. lepidus ssp. aridus (Dougl.) Detl., Am. Mid. Nat. 45: 491. 1951.

L. lepidus ssp. lepidus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 184. 1955.

Plants 10-18 cm. tall, usually densely caespitose, densely villous throughout, (more sparsely so on surface of leaflets), the hairs scaberulous, ringed; longer petioles 8-10 cm. long; leaflets 6-8, 20-25 mm. long, obovate-oblanceolate, yellowish-

green cast; peduncles 2-8 cm. long, not extending above the foliage; racemes 5-8 cm. long, densely scattered or subverticillate, the verticils 4 mm. apart; bracts persistent subulate; pedicels 1 mm. long at flowering, 2 mm. long in fruit; upper lip of calyx 4-6 mm. long, notched at the tip for 1-2 mm.; flowers 9-11 mm. long; banner 7-9 mm. long, oblong-obovate, the central whitish-yellow spot extending from the base to or nearly to the tip; keel ciliate above near acumen. In the more moist locations in Oregon and Washington the specimens are larger in all measurements except those of the flowers.

E. Washington and Oregon to NE. Nevada, Utah, and introgresses with L. caespitosus in Colorado. Nevada specimens were collected by M. E. Jones at Eureka Springs which may have been in White Pine Co., Nevada, or in Utah. Elevation 6000 ft. (L. psoraleoides appears to be a product of introgression or an intermediate step to L. caespitosus).

45. LUPINUS SELLULUS Kell., Proc. Calif. Acad. 5: 36. 1873.

L. chionophilus Greene ex Baker, West. Am. Pl. (1): 18.

1902. Nomen nudum.

L. aridus var. torreyi (Gray in Wats.) C. P. Sm., Bull.

Torr. Bot. Club 51: 303. 1924.

L. lepidus var. torreyi (Gray in Wats.) Jepson, Fl. Calif.

2: 268. 1936.

L. lepidus ssp. confertus (Kell.) Detl. (pro parte), Am.

Mid. Nat. 45: 496. 1951.

L. lepidus ssp. lepidus (sensu Phillips) (pro parte),

Wash. State Coll. Res. Studies 23: 184. 1955.

Foliage 7-15 cm. tall; sericeous throughout, sometimes with subappressed hairs up to 2 mm. long; the longest petioles basal, 5-10 cm. long; leaflets 6-7, 17-22 mm. long, elliptic-oblongate, generally nearly equally pubescent on both sides; peduncles extending above the foliage, 4-8 cm. long; racemes 3-10 cm. long, densely verticillate, the verticils only 5-6 mm. apart; bracts persistent; pedicels 1-1.5 mm. long; flowers 7-9 mm. long; the banner oblong, truncate, 4-5 mm. wide; keel ciliate above near the acumen; ovules 2-6.

Washington southward into the Sierra Nevada Mts. Nevada material seen from Douglas, Ormsby and Washoe Cos. at 6000-8500 ft. ele.

45a. LUPINUS SELLULUS var. ARTULUS (Jeps.) Eastw., Leaflets W. Bot. 4: 284. 1946.

L. lepidus var. artulus Jeps., Fl. Calif. 2: 268. 1936.

Foliage to 12 cm. tall; peduncles 8-12 cm. long; immature racemes 3-11 cm. long, dense; flowers 6-7 mm. long; the keel lanate-ciliate near the acumen.

Sierra Nevada Mts. in Plumas Co., California and in Douglas, Ormsby and Washoe Cos. in Nevada.

46. LUPINUS CONFERTUS Kell., Proc. Calif. Acad. 2: 192, f. 59. 1863.

L. torreyi Gray in Wats., Bot. King Rpt. 58. 1871.

L. lepidus var. confertus (Kell.) C. P. Sm., Bull. Torr. Bot. Club 51: 304. 1924.

L. lepidus var. ramosus Jeps., Fl. Calif. 2: 268. 1936.

L. confertus var. ramosus (Jeps.) Eastw., Leaflets W. Bot. 4: 282. 1946.

L. lepidus ssp. confertus (Kell.) Detl. (pro parte), Amer. Mid. Nat. 45: 496. 1951.

L. lepidus ssp. lepidus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 184. 1955.

Foliage 10-28 cm. tall; densely sericeous throughout, with numerous subappressed hairs up to 2.5 mm. long; lower petioles 4-12 cm. long; cauline leaves 3-5; leaflets 6-7, narrowly oblanceolate, occasionally broadly oblanceolate, silky on both sides; peduncles 2-12 cm. long, extending above the foliage; racemes 6-23 cm. long, dense, verticils 1 cm. apart; bracts persistent; pedicels 1-1.5 mm. long; flowers 11-13 mm. long; banner 7 mm. wide, oblong-oval, truncate; keel densely villous near the acumen; ovules generally 4.

Sierra Nevada Mts., S. <sup>to</sup> Bear Valley, California. Nevada material seen from Douglas, Ormsby and Washoe Cos. at 4000-9000 ft. ele.

47. LUPINUS VOLUTANS Greene, Muhl. 8: 118. 1912.

L. lepidus ssp. lepidus (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 184. 1955.

Densely caespitose, the leafy portion 7-30 cm. tall (generally

15-20 cm.), densely villous-hairy throughout, the longer hairs often flattened and scaberulous near the tip, twisted in dry material; leaves mostly basal; the longer petioles 6-12 cm. long; the lower stipules adnate for 2 cm., free for only the top 2 mm.; leaflets 6-7, obovate-oblong, generally densely villous on both sides, with a grayish cast; peduncles 2-5 cm. long; racemes 10-15 cm. long or more, dense at first, the verticils up to 12 mm. apart later; bracts persistent, lanceolate; pedicels 2-2.5 mm. long; the upper lip of the calyx 6 mm. long, incised 3-4 mm; flowers 12-13 mm. long; the banner oblong-obovate, 10-11 mm. long, a white spot at the fold, the top portion blue-purple; keel ciliate near the acumen; ovules 4.

SE. Oregon to NW. Arizona. Nevada material seen from Nye and White Pine Cos., at 7000 ft. ele.

48. LUPINUS LYALLII Gray (ssp. LYALLII var. LYALLII), Proc. Amer. Acad. Art & Sci. 7: 334. 1868.

L. alpinus Heller, Muhl. 6: 22. 1910.

L. lepidus ssp. lyallii (Gray) Detl. (pro parte), Am. Mid. Nat. 45: 490. 1951.

Foliage 5-7 cm. tall, from a crown or short-branched root-stalk; both petioles and peduncles sprawling-decumbent; finely sericeous throughout; longer hairs absent or appressed and only/1<sup>about</sup> mm. long; mature petioles 3-6 cm. long; leaflets 5-7, elliptic-oblong, the largest 10-15 mm. long; peduncles 4-10 cm. long, much exceeding the foliage; racemes dense, 1-2 cm. long, rarely

3-4 cm. long; bracts persistent; pedicels 1-1.5 mm. long; banner 8 mm. long, oblong-elliptical; keel glabrate to ciliate above near the acumen; pods 1-3 seeded.

High montane in the Sierra Nevada Mts., N. into Washington, 7500-10,000 ft. ele. Nevada material seen only from Washoe Co.

48a. LUPINUS LYALLII var. DANAUS (Gray) Wats., Proc. Amer. Acad. 8: 534. 1873.

L. danaus Gray, Proc. Amer. Acad. Arts & Sci. 7: 335. 1868.

L. lepidus ssp. lyallii (sensu Phillips) (pro parte), Wash. State Coll. Res. Studies 23: 186. 1955.

Racemes reduced to about 1 cm.; petioles 1.8-3.8 cm. long; leaflets 6-9 mm. long.

Very high montane near 12,000 ft. ele. or above.

48b. LUPINUS LYALLII ssp. SUBPANDENS C. P. Sm. ex Dunn, El Aliso 3: 171. 1955.

Densely caespitose, from a woody caudex; foliage 3-6 cm. tall; densely subappressed, coarse hairy throughout, the hairs scaberulous, ringed or barbed; petioles 1-3.5 cm. long, occasionally 6.5 cm. long; leaflets 5-6, 10-13 mm. long, elliptic, the hairs of the upper surface are less scaberulous; peduncles ascending, 3-7 cm. long, exceeding the foliage by 2 cm. or more; racemes 1-6 cm. long, densely verticillate; bracts persistent; pedicels 1 mm. long; upper lip of the calyx 4-4.7 mm. long, incised 2-2.5 mm., lower lip 5 mm. long, entire; banner narrowly oblong, yellow with a tinge of



blue; keel lanate-ciliate above near the deep purple acumen, ovules 3.

Found in Elko Co., Nevada and adjacent Idaho, in flatlands of Artemisia, 5500-6500 ft. ele.

49. LUPINUS LOBBII Gray ex Greene, Fl. Franciscana 43. 1891.

(L. lobbii Gray ex Wats., published in syn.)

L. aridus var. lobbii Gray ex Wats., Proc. Amer. Acad. 8: 533. 1873.

L. pinetorum Heller, Muhl. 6: 25. pl. 1. 1910. (non Jones).

L. washoensis Heller, l. c.: 72. 1910.

L. aridus var. washoensis C. P. Sm., Bull. Torr. Bot. Club 51: 303. 1924.

L. lyallii var. villosus Jepson, Fl. Calif. 2: 267. 1936.

L. lyallii var. lobbii (Gray ex Wats.) C. P. Sm. in Jepson, Man. Fl. Pl. Calif. 522. 1925.

L. lepidus ssp. lyallii (Gray) Detl. (pro parte), Am. Mid. Nat. 45: 490. 1951.

About 15 cm. tall or less; the leafy portion 5-10 cm. tall; pilose throughout with hairs 1.5-3 mm. long, spreading or ascending; lower petioles 4-6 cm. long, decumbent or erect; leaflets 5-6, 10-20 mm. long, oblanceolate-obovate, pilose on both sides; peduncles erect or decumbent, 3-9 cm. long, exceeding the leaves; racemes 2-6 cm. long, dense; bracts tardily deciduous; pedicels 1.5-3 mm. long, verticils 7 mm. apart at maturity; banner 7-8 mm. long, oblong-elliptic; keel densely lanate-ciliate near the acu-

men; ovules 3-4. A more densely hirsute form has been segregated as var. villosus by authors.

E. slopes of the Sierra Nevada Mts. in montane meadows from 5000-7000 ft. Nevada material seen only from Washoe Co.

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