
33. LAPPULA Moench, Methodus 416. 1794.

鹤虱属  he shi shu

Echinospermum Sweet ex Lehmann.

Plants annual or biennial, rarely perennial, pilose, strigose, rarely sericeous throughout, hairs tuberclelike or discoid at base. Leaves alternate. Inflorescence a drepansion, elongated after anthesis, bracteate. Calyx 5-parted nearly to base; lobes frequently enlarged in fruit. Corolla light blue, rarely white, campanulate or low salverform; tube short; throat appendages 5, trapeziform; limb 5-parted. Stamens included. Ovary globose, 4-parted. Style not exserted; stigma capitate. Gynobase subulate veined, ca. as long as or surpassing nutlets, rarely shorter. Nutlets 4, adherent to gynobase by entire adaxial rib or only by rib base, erect, homomorphic or heteromorphic; margin of abaxial surface usually with 1(–3) rows of glochids; bases of glochids separated or contiguous or confluent into a wing, rarely reduced to tubereles.

About 61 species: temperate regions of Africa, Asia, Europe, and North America; 36 species in China.

1a. Gynophore free end (vertical part of gynobase) rising above nutlets as thick tetrahedral mucro with short style at apex.
   2a. Nutlets 3–5 mm, lustrous, stonelike, tuberculate, with thick walls and without ribs or disc or anchor-like tip on tuberules ................................................................. 1. L. spinocarpus
   2b. Nutlets 2–3 mm, finely tuberculate, with very short glochids on margin of inconspicuous disc, without glochids on margin of well-developed disc.
   3a. Calyx lobes exceeding fruit; pedicel always straight ............................................................................. 3. L. occultata
   3b. Calyx lobes short, appressed to base of much longer fruit; pedicel declining, sometimes recurved .......... 2. L. sinaica

1b. Gynophore entirely hidden between nutlets (gynophore should not be confused with the thin style sometimes elevated above nutlets as in L. brachycentra and L. microcarpa).
   4a. Developed nutlets 1, the other 3 aborting ......................................................................................... 31. L. monocarpa
   4b. Developed nutlets 4.
   5a. Disc of nutlets narrow and nearly closed, marginal parts of nutlets involute on disc.
       6a. Glochids on margin of disc ca. 0.5 mm ......................................................................................... 4. L. balchaschensis
       6b. Glochids on margin of disc ca. 1.5 mm ............................................................................................ 5. L. deserticola

5b. Disc of nutlets well developed, marginal parts of nutlets not involute on disc.
   7a. Disc margin of all or (1 or) 2 nutlets with well-developed mostly broad wing.
       8a. Perennial herbes.
           9a. Herbs forming small tufts of leaf rosettes, with several or sometimes many lateral ascending stems; nutlets 5–7 mm across ........................................................................... 33. L. transalaica
           9b. Cespitose herbs, with 1 or 2 straight stems; nutlets ca. 3 mm across ................................. 15. L. caespitosa
   8b. Biennial or annual herbs (when uncertain, stems straight, tall).
   10a. Nutlet with entire wing, pubescent or not.
        11a. Nutlets tuberculate, densely pubescent, without prickles .......................................... 32. L. lasiocarpa
        11b. Nutlets neither tuberculate nor pubescent, 2 nutlets with a single row of marginal glochids ............................................................... 30. L. alatavica
   10b. Nutlet with dentate wing, not pubescent.
   12a. Biennial or ?perennial herbs, with well-developed lateral rosette of leaves; stems (2 or) 3–5, few branched or not, straight ....................................................... 27. L. ferganensis
   12b. Annual herbs without rosette of leaves after anthesis; stems usually branched.
       13a. All nutlets homomorphic, with narrow wings to 1 mm, sometimes 1 nutlet wingless, disc of nutlets granulose ............................................................ 19. L. granulata
       13b. Nutlets heteromorphic, 2 with leathery wings and 2 with 2 rows of glochids on disc margin.
           14a. Corolla limb (5.5–)5.5–6 mm ................................................................................................. 34. L. lipskyi
           14b. Corolla limb 2.5–3.5(–4) mm.
               15a. Marginal glochids in 2 rows, uniform in length ................................................ 29. L. heteromorpha
               15b. Marginal glochids in 1 row, some short glochids forming a second row near base of nutlets .......................................................... 28. L. anocarpa
       7b. Disc margin of nutlets without well-developed wing, marginal prickles of disc sometimes widened and confluent into a very narrow winglike border.
   16a. Style projecting 1–1.5 mm above nutlets, filiform, persistent at fruiting.
       17a. Prickles along disc margin 0.5–0.9 mm, mostly developed in 1 row (sometimes a second row of prickles 0.1–0.2 mm, with very small tubereles and anchorlike tips) ........................................................................... 10. L. microcarpa
       17b. Prickles along disc margin 0.1–0.2 mm or absent and replaced by tuberules ........ 11. L. brachycentra
16b. Style hidden among apices of nutlets or projecting less than 0.5 mm above nutlet.

18a. Disc margin of nutlets with only 1 row of glochids (sometimes a medial row of glochids present).

19a. Perennial cespitose herbs, with several to many stems, branched only above

............................................................................................................................. 15. L. caespitosa

19b. Annual or rarely biennial herbs.

20a. Corolla sky blue, limb 5–8 mm ......................................................... 35. L. macrantha

20b. Corolla blue or white, limb to 3.5 mm.

21a. Corolla white; nutlets with marginal glochids to 0.5 mm, disc with 1 or 2 medial rows of glochids on tubercles ......................................................... 6. L. macra

21b. Corolla blue or white-blue; nutlets with longer marginal glochids or disc finely tuberculate.

22a. Heteromorphic nutlets present, 2 with short glochids, 2 with longer glochids; homomorphic nutlets sometimes also present.

23a. All nutlets heteromorphic, disc and adaxial surface smooth ......................................................... 16. L. karelinii

23b. Nutlets in lower part of inflorescences homomorphic, disc and adaxial surface tuberculate ........................................ 13. L. duplicicarpa

24b. All nutlets homomorphic.

24a. Marginal glochids slender, 0.5–0.9 mm .......................................... 9. L. tenuis

24b. Marginal glochids 1–2.5(–4.5) mm.

25a. Marginal glochids 1–2 mm; plants branched mainly on upper part of stems.

26a. Plants 25–40(–50) cm high; marginal spines 1–1.2 mm, disc not keeled ........................................ 8. L. intermedia

26b. Plants 15–20(–30) cm high; marginal spines ca. 1.5 mm, disc with protruding keel ..................... 7. L. stricta

25b. Marginal glochids 2–2.5(–4.5) mm; plants usually branched basally.

27a. Marginal glochids hollow, terete ...................... 36. L. physacantha

27b. Marginal glochids solid, or subglobose.

28a. Pedicel 1.5–4 mm, usually curved; nutlets 3.5–4 mm excluding prickles ..................... 12. L. semiglabra

28b. Pedicel to 1 mm, straight; nutlets ca. 3 mm excluding prickles ......................... 14. L. patula

18b. Disc margin of nutlets with 2 or 3 rows of glochids.

29a. Perennial herbs; stems several, 7–15 cm tall, ascending; basal leaves numerous, forming a rosette; glochids on disc 0.2–0.5 mm.

30a. Herbs silvery sericeous; basal leaves linear to filiform, to 4 cm × 1–2 mm; corolla ca. 5 mm; center line of disc of nutlet without glochids ...................... 20. L. sericata

30b. Herbs green-gray pilose; basal leaves spatulate, to 3 cm × 2–4 mm; corolla 2–2.5 mm; center line of disc of nutlet with glochids ......................... 21. L. himalayensis

29b. Biennial or annual herbs; stems few, usually 30–45 cm tall; basal leaves few, rarely forming a rosette; glochids on disc 1–3 mm, rarely smaller.

31a. Biennial herbs; corolla with spreading limb, 4–6–8 mm across.

32a. About 2/3 of adaxial angle of nutlets affixed to gynobase; gynobase longer than nutlets ................. 25. L. ramulosa

32b. Entire adaxial angle of nutlets affixed to gynobase; gynobase shorter than nutlets.

33a. Corolla sky blue, limb to 6–8 mm across, throat appendages blue or dark blue ................................................................. 22. L. tianschanica

33b. Corolla blue, limb to 4–5 mm across, throat appendages white, yellowish in herbarium specimens.

34a. Glochids on disc numerous but short, glochids of main row on margin of disc 1–1.5 mm; herbs to 30(–35) cm tall ................... 24. L. pratensis

34b. Glochids on disc usually 3 along center line, to 1 mm, glochids of main row on margin of disc 1.5–2.5 mm; herbs to 40–45 cm tall ........................................ 23. L. tadshikorum

31b. Annual herbs; corolla with campanulate limb, 2–3.5(–4) mm across.

35a. Calyx lobes stellate spreading in fruit, elongated to at least 7–8 mm;
leaves light green or green, with sparse spreading hairs on large
white tubercles; main marginal glochids with large anchorlike tip ........ 8. L. intermedia
35b. Calyx lobes spreading in fruit, not stellate, elongated to 4–5 mm;
leaves usually densely appressed pubescent, grayish green;
marginal glochids with small anchorlike tip.
36a. Upper part of nutlets separated by deep oval or elliptic pit;
style protruding above nutlets (excluding glochids) 0.5–1
mm ................................................................. 26. L. consanguinea
36b. Upper part of nutlets without pit; style protruding above
nutlets to 0.2–0.3 mm.
37a. Main marginal prickles widened basally, confluent near
base, 0.4–1.5(–2) mm ............................................... 18. L. shanksiensis
37b. Main marginal prickles all separated, 1.5–2 mm (or more) ................................................................. 17. L. myosotis

1. Lappula spinocarpos (Forsskål) Ascherson ex Kuntze,

2. Lappula sinaica (de Candolle) Ascherson & Schweinfurth,


4. Lappula balchaschensis Popov ex Pavlov,

leaves light green or green, with sparse spreading hairs on large
white tubercles; main marginal glochids with large anchorlike tip ........ 8. L. intermedia
35b. Calyx lobes spreading in fruit, not stellate, elongated to 4–5 mm;
leaves usually densely appressed pubescent, grayish green;
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1. Lappula spinocarpos (Forsskål) Ascherson ex Kuntze,

Anchusa spinocarpos Forsskål, Fl. Aegypt.-Arab. 41. 1775; Echinospermum spinocarpos (Forsskål) Boissier;
E. vahlianum Lehmann; Sclerocaryopsis spinocarpos (Forsskål-Brand.

Herbs annual. Stems erect, frequently branched from base or above middle, 3–12 cm tall, densely short appressed white pubescent; branches ascending. Basal leaves grayish green, spatulate-linear, to 3 cm × 4 mm, strigose, hairs discoid at base, base attenuate, apex obtuse; stem leaves smaller. Pedicel short, stout. Calyx lobes 3–4 mm, to 5–6 mm in fruit, minutely hispid. Corolla blue-purple, 3–4 mm; limb appended below throat. Gynobase subulate, surpassing nutlets by ca. 1.5 mm. Style short, exceeding gynobase. Nutlets gray-white, ovoid, 3.5–4 mm, pericarp firm, shiny; adaxially coherent to gynobase by entire rib, not easily separated; disc expanded at base, lower part with a few rudimentary glochids. Fl. May-Jun, fr. Jun-Jul.

Marshes, Anabasis and Nanoporty thickets, occasionally mountain terraces. Xinjiang (Zunheer Basin) [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW and W Asia, E Europe].

2. Lappula sinaica (de Candolle) Ascherson & Schweinfurth,

Echinopspermum sinaicum de Candolle in A. de Candolle,
Prod. 10: 141. 1846; E. divaricatum Bunge, E. kotschyi
Boissier.

Herbs annual. Stems erect or ascending, frequently branched from base, 15–40 cm tall, gray strigose or hispid, hairs white, tuberclelike at base. Basal leaves petiolate, oblong to oblong-lanceolate, 1.5–5 × 0.5–1.5 cm, sparsely short hispid; base attenuate, margin entire, apex obtuse; stem leaves sessile, shorter, narrower. Inflorescences elongated in fruit, usually 1- or 2-bracted. Fruiting pedicel erect, stout, 2–3 mm. Calyx lobes erect, oblong to linear, 1.5–2.5 mm, short hispid, hairs discoid at base, not enlarged in fruit, shorter than nutlets, subterminal base of fruit. Corolla light blue, campanulate, ca. 3 mm; limb 2.5–3 mm wide. Gynobase surpassing nutlets by ca. 1 mm. Nutlets 2.5–3.5 mm; disc narrowly oblong, densely granulose, margin prominent becoming a narrow rib, with a single sparse row of extremely short glochids or sometimes finely tuberculate; lateral surfaces tuberculate.

Fields, waste places. Xinjiang [Afghanistan, NW India, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; NE Africa, SW Asia].


Lappula sinaica (A. de Candolle) Ascherson & Schweinfurth var. occultata (Popov) Pavlov.

Herbs annual. Stems erect, frequently branched above, 30–40 cm tall, gray strigose. Basal leaves narrowly spatulate to oblong lanceolate, 3–7 cm × 3–5 mm, sparsely short gray strigose, base attenuate into a long petiole, apex obtuse; stem leaves sessile, linear-lanceolate to oblong, sometimes flexed along midvein. Inflorescences to 7–18 cm in fruit; bracts linear, shorter than nutlets. Fruiting pedicel erect, 2–5 mm. Calyx lobes erect, linear, 3–3.5 mm, to 4 mm in fruit, enclosing nutlets. Corolla light blue; tube slightly longer than calyx; throat appendages trapeziform, 0.6–0.8 mm; limb 5-parted; lobes spreading horizontally, 5–6 mm wide. Gynobase surpassing nutlets by ca. 0.5 mm. Fruit 2.5–3 mm, apex truncate; nutlets ovoid, shiny; disc oblong-ovate, densely rounded granulose, center line keeled, margin prominent and forming a narrow rib; lateral surfaces granular.

Exposed, rocky slopes; ca. 1400 m. Xinjiang (Yuli Xian) [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan].


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Lappula spinocarpos (Forsskål) Ascherson ex Kuntze,

Lappula spinocarpos (Forsskål) Ascherson ex Kuntze,
shorter, erect to somewhat ascending. Calyx 5-parted; lobes oblong-linear, ca. 2 mm, to 3.5 mm in fruit, subtending nutlets. Corolla light blue, campanulate, 2.5–3 mm; tube ca. as long as calyx; limb ca. 1 mm wide; lobes vertical, suborbicular. Gyrobasis ca. as long as nutlets. Fruit subglobose, 2.5–3 mm; nutlets narrowly ovoid; adaxially shiny, wrinkled; disc narrow, small, white granulose; margin thick, prominent, ca. 0.5 mm wide, usually revolute, with a single row of glochids 3 or 4 each side; basal pair of glochids ca. 1 mm, spreading outward, slightly widened at base.

Deserts, semideserts; ca. 1400 m. Xinjiang (Turpan Xian) [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan].


沙生鹤虱 sha sheng he shi

Herbs annual. Stems frequently branched from base, 15–30 cm tall, spreading or subpressed, white hispid; branches ascending; stem leaves oblong to linear, 1–3.5 cm × 2–5 mm, spreading hisrate, hairs discoid at base, usually flexed along midvein, rarely flat, apex obtuse. Inflorescences terminal, to 5–8 cm in fruit; bracts linear. Fruiting pedicel ca. 3.3 mm, erect. Calyx 5-parted; lobes spreading, linear, ca. 2.5 mm, 4–5 mm in fruit. Corolla blue-purple, campanulate, ca. 3 mm; tube ca. as long as calyx; limb spreading horizontally, 2.5–3 mm wide. Style ca. 0.5 mm, slightly surpassing nutlets. Nutlets oblong-ovoid, ca. 3 mm, adaxially wrinkled-tuberculate; disc narrowly lanceolate, center line keeled, with a single row of marginal glochids; glochids erect, rarely spreading horizontally, 1.2–2 mm, somewhat widened and contiguous toward nutlet base.

Roadsides, farms, hillside meadows, deserts, arid canyons. Gansu, Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, Uzbekistan].

7a. Lappula stricta var. stricta

劲直鹤虱 (原变种) jin zhi he shi (yuan bian zhong)

Echinospermum strictum (Ledebour) Popov in Komarov, Fl. URSS 19: 440. 1953.

Abaxial and adaxial surfaces of nutlets glabrous and shiny.

Roadsides, farms, hillside meadows, deserts, arid canyons. Gansu (Minqin Xian), Xinjiang (Qinghe Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

7b. Lappula stricta var. leiocarpa

Popov in Komarov, Fl. URSS 19: 440. 1953.

平滑果劲直鹤虱 ping hua guo jin zhi he shi

Abaxial and adaxial surfaces of nutlets glabrous and shiny.

Deserts, arid canyons. Gansu (Minqin Xian), Xinjiang (Qinghe Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].


蒙古鹤虱 meng gu he shi

Herbs annual. Taproots stout, conical, ca. 7 cm. Stems erect, usually single, much branched above middle, to 60 cm tall, gray hispid; branches ascending; stem leaves somewhat crowded, erect, linear to narrowly lanceolate, 2–5 cm × 2–4 mm, flat or flexed along midvein, hisrate, hairs discoid at base, axially sparser, apex obtuse. Inflorescences terminal on stem and branches, to 5–20 cm in fruit; bracts leaflike, slightly longer than fruit, apex gradually reduced. Pedicel erect, slightly elongated after anthesis, 2–3 mm. Calyx 5-parted; lobes spreading, linear, ca. 3 mm, to 5 mm in fruit. Corolla blue-purple or light blue, campanulate, ca. 2–3.5 mm, somewhat longer than calyx; tube ca. 1 mm; throat constricted, appendages attached at middle of corolla tube; limb ca. 3 mm wide; lobes oblong. Style ca. 0.5 mm, not surpassing nutlets. Fruit broadly ovoid to subglobose, ca. 3 mm; nutlets broadly ovoid, 2.5–3 mm, granulose, adaxially wrinkled; disc ovate with a single row of marginal glochids; glochids spreading horizontally, 1–1.5 mm, bases slightly wider and contiguous or free. Fl. and fr. May-Aug.

Waste places, fields, grasslands, sandy areas, arid slopes. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, NW Sichuan, Xinjiang, Xizang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan].


短刺鹤虱 xi ci he shi

Echinospermum tenuis Ledebour, Fl. Altaic. 1: 201. 1829.

Herbs annual. Stems slender, frequently branched above, 17–20 cm tall, spreading or oppressed green-hispid; branches ascending. Leaf blade linear to linear-lanceolate, 1.5–3 cm × 2–4 mm, flat and erect, obtuse to ± acute, abaxially densely strigose, adaxially green, sparsely strigose. Inflorescences 4–6 cm in fruit; bracts linear, slightly longer than fruit. Fruiting pedicel 1–1.5 mm. Calyx 5-parted; lobes spreading, linear, ca. 2.5 mm, to 4 mm in fruit. Corolla light blue, ca. 3 mm, campanulate; limb 2.5–3 mm wide; lobes oblong, ca. 1 mm. Gynobase somewhat surpassing nutlets. Fruit ca. 2.5 mm; nutlets broadly ovoid, ca. 2 mm, adaxially granulose or smooth, glabrous or sparsely tuberculate at base; disc ovate, without keel, smooth or granulose; marginal glochids in a single row, 4–7 on each side, 0.6–1 mm, fine, free at base.

Sunny slopes, desert communities of Haloxylon ammodendron and Anabasis aphylla; ca. 1500 m. Xinjiang (N Zhungeer Basin) [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan].


小果鹤虱 xiao guo he shi


Herbs annual or biennial, erect. Stems much branched above middle, 20–45 cm tall, white strigose. Basal leaves forming a rosette, withered in fruit; leaf blade oblong, 3–4 cm, base attenuate, apex obtuse; stem leaves linear, 2–3 cm × 2–4 mm, flexed along midvein, gray-white hispid, hairs discoid at base, margin spreading ciliate. Inflorescences terminal on branches, elongated in fruit; bracts linear. Fruiting pedicel erect, ca. 2 mm. Calyx 5-parted; lobes linear, ca. 3 mm, not enlarged in fruit. Corolla light blue, campanulate, ca. 5 mm; tube slightly longer than calyx; limb ca. 4.5 mm wide; lobes ovate- orbicular. Style surpassing nutlets 0.8–1.5 mm. Nutlets ovoid, 2.5–3 mm; adaxially granulose, sometimes with 2 rows of glochids below; disc narrowly ovate, granulose, center line keeled and with short glochids; marginal glochids in a single row, 0.8–1 mm. 2n = 22, 24.

Sunny slopes, low mountain canyons; 700–2500 m. N Xinjiang, S and SE Xizang [Afghanistan, N India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW and W Asia].


短刺鹤虱 duan ci he shi

Echinospermum brachycen trum Ledebour, Fl. Altaic. 1: 203. 1829.

Herbs biennial, gray oppressed pubescent. Taproots straight, dark brown. Stems much branched above middle, 20–35 cm tall. Basal leaves forming a rosette, mostly withered in fruit; leaf blade oblong to spatulate, 2–4 cm, abaxially densely gray oppressed sericeous, adaxially green and sparsely long oppressed pubescent, base attenuate into a short petiole, apex obtuse; stem leaves sessile, linear, 1–2.5 cm, margin spreading ciliate, apex obtuse. Inflorescences terminal on branches, elongated in fruit; bracts linear. Fruiting pedicel erect, 1–2 mm. Calyx 5-parted; lobes linear, ca. 2 mm, slightly enlarged in fruit. Corolla light blue; tube ca. 2 mm; limb ca. 4.5 mm wide; lobes ovate. Style surpassing nutlets, 1–1.5 mm. Fruit ovoid, ca. 2.5 mm; nutlets triangular-ovoid, adaxially granulose; abaxially granulose, sometimes obscurely keeled along center line; marginal glochids in 1 or 2 rows, protruding, ca. 0.5 mm.

Sunny slopes, arid terraces, semideserts, mountain meadows; 800–2800 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

Lappula ramulosa C. J. Wang & X. D. Wang may be a synonym of L. brachycen trum.


狭果鹤虱 xia guo he shi

Herbs annual. Stems much branched, 15–30 cm tall, white hispid. Basal leaves numerous, forming a rosette, sessile, spatulate to narrowly oblong or linear-lanceolate, 2–3 cm × 2–4 mm, abaxially densely spreading white hispid, hairs discoid at base, adaxially glabrous or sometimes sparsely hispid, base attenuate, margin entire, apex obtuse; stem leaves narrowly oblong to oblanceolate. Inflorescences short at anthesis, to 12 cm in fruit; bracts lanceolate to narrowly ovate. Fruiting pedicel usually curved, ca. 3 mm. Flowers short...
pedicellate. Calyx 5-parted; lobes oblong, 1–1.5 mm, to 3 × 0.5 mm in fruit, hispid. Corolla light blue, campanulate, ca. 3 mm; limb ca. 2 mm wide; lobes obtuse. Gynobase not surpassing nutlets. Nutlets homomorphic or heteromorphic, narrowly lanceolate, 3–4 mm, adaxially tuberculate or glabrous; disc with scattered tubercles, center line keel usually with short prickles or tubercles; marginal glochids in a single row, bases slightly wider and contiguous. Fl. and fr. Jun-Sep.

Alluvial fans, gravelly slopes, dunes, deserts. Gansu, Qinghai, Xinjiang [Afghanistan, NW India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

1a. Nutlets homomorphic .................... 12a. var. semiglabra
1b. Nutlets heteromorphic ............... 12b. var. heterocaryoides

12a. Lappula semiglabra var. semiglabra


异形狭果鹤虱 yi xing xiao guo he shi

Nutlets heteromorphic, 2 with marginal glochids 4–5 mm and 2 with marginal glochids 0.3–0.8 mm.

Alluvial fans, gravelly slopes, dunes, deserts. Gansu, Qinghai, Xinjiang [Afghanistan, NW India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].


两形果鹤虱 liang xing guo he shi

Herbs annual. Stems much branched above base, 15–30 cm tall, densely retrorse strigose or long hispid. Basal leaves sessile, linear-lanceolate, 0.8–2.5 cm × 2–6 mm; abaxially densely hispid, hairs discoid at base, adaxially glabrous or sparsely hispid; base attenuate, margin entire, apex obtuse. Inflorescences to 12 cm in fruit; bracts lanceolate to narrowly ovate. Fruiting pedicel ca. 3 mm, mostly curved. Calyx 5-parted, long retrorse strigose; lobes lanceolate, ca. 1.5 mm, to 2.5 mm in fruit. Corolla light blue, campanulate, 2–5 mm; limb 1.5–3.5 mm wide; lobes narrowly oblong to suborbicular, 0.5–2.5 mm. Style short, not surpassing nutlets. Nutlets homomorphic or both homomorphic and heteromorphic, oblong-ovoid, ca. 3 mm, adaxially tuberculate; disc tuberculate, narrowly ovate, center line with extremely short glochids; glochids 0.2–0.5 mm, bases complanate and contiguous.

Sunny slopes, rocky hills, sandy areas, deserts, desert marshes.

Gansu, Qinghai, Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].

1a. Plants ca. 7 cm, whole plant pubescent; nutlets homomorphic ..... 13c. brevispinula
1b. Plants 15–30 cm, mainly stems pubescent; nutlets dimorphic.

2a. Stems strigose; corolla 2–2.5 mm, limb 1.5–2 mm wide, lobes narrowly oblong, ca. 0.5 mm


密毛两形果鹤虱 mi mao liang xing guo he shi

Plants branched from base, stems densely long hispid. Corolla ca. 2.5 mm; limb 1.5–2 mm wide; lobes narrowly oblong, ca. 0.5 mm. Nutlets of lower part of inflorescences homomorphic; nutlets of upper part heteromorphic, (1 or) 2 (or 3) nutlets with glochids 0.2–0.5 mm, other nutlet(s) with glochids 2–4 mm. Fl. and fr. Jun-Aug.

Sunny slopes, rocky hills, desert communities of Haloxylon ammodendron and Anabasis salsa. Qinghai (Golmud Xian), N Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

Herbs annual. Stems branched above middle, 20–35 cm tall, with finely appressed white hairs. Basal leaves forming a rosette, sessile; leaf blade linear to spatulate, 2.5–3 cm × 2–4 mm, spreading white-hairy, hairs discoid at base, adaxially more sparsely hairy, margin entire, apex obtuse; stem leaves similar to basal leaves, narrow, mostly linear, smaller. Inflorescences numerous, frequently secund, to 20–23 cm in fruit; bracts leaflike, linear. Flowers sessile or short pedicellate. Calyx spreading hispid; lobes spreading, linear to narrowly oblong, 1–1.5 mm at anthesis, to 5 mm in fruit. Corolla light blue, campanulate, ca. 2.5 mm; limb 1.5–2 mm wide. Style ca. 0.5 mm, somewhat surpassing nutlets. Fruit orbicular-ovoid; nutlets homomorphic, ovoid, ca. 3 mm, base with 4 or 5 small prickles on each side; disc narrowly ovate to oblong-lanceolate, much shorter than nutlets. Corolla light blue, campanulate, 2.5–3 mm; limb 1.5–2 mm; throat appendages trapeziform; limb 3–4 mm wide; lobes obovate, ca. 0.5 mm. Style not surpassing nutlets; stigma capitate. Fruit light yellow, 2.5–3 mm. Nutlets heteromorphic, ovoid, glabrous, shiny; disc narrowly ovate, frequently dark greenish; marginal glochids in a single row, 2–2.5 mm on 2 nutlets and 0.3–0.5 mm, lanceolate on other nutlets. Fl. and fr. Jun-Aug.

Waste places, field margins, valley terraces. N Xinjiang [Afghanistan, NW India, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia].


密丛鹤虱 mi cong he shi

Herbs perennial. Taproots brown, straight, stout. Stems 4 to numerous, cespitose, branched above, 11–18 cm tall, brownish below, stiff, slightly spreading white-grey villous; branches ascending. Basal leaves numerous, forming a rosette, frequently persistent in withered state, sessile; leaf blade linear-spatulate to linear, 1–3 cm × 1.5–3 mm, flat or longitudinally flexed, densely white-grey villous, base attenuate, apex obtuse; stem leaves linear-spatulate to linear, 1–2 cm × 1.5–1.5 mm. Inflorescences 2–5 cm in fruit; bracts linear, 3–5 mm. Pedicel 1.5–2 mm. Calyx 5-parted; lobes erect, linear, ca. 2.5 mm in fruit, densely villous. Corolla light blue, campanulate, 3–3.5 mm; tube 1–1.5 mm; limb 2–2.5 mm wide; lobes obovate, ca. 3 mm. Style ca. 2 mm; bracts oblong, ca. 3 mm, somewhat shorter than fruit. Flowers crowded. Corolla 5-parted; lobes oblong, to 1.5 mm in fruit, much shorter than nutlets. Corolla campanulate, 1.5–2 mm; tube 1–1.5 mm; limb 1–1.5 mm wide; lobes obovate, ca. 0.5 mm. Style not surpassing nutlets; stigma capitate. Fruit light yellow, 2.5–3 mm. Nutlets heteromorphic, ovoid, glabrous, shiny; disc narrowly ovate, frequently dark greenish; marginal glochids in a single row, 2–2.5 mm on 2 nutlets and 0.3–0.5 mm, lanceolate on other nutlets. Fl. and fr. May-Aug.

• Sandy river banks; ca. 400 m. Xinjiang (Burqin Xian).


鹤虱 he shi


Herbs annual or biennial. Stems erect, much branched, 30–60 cm tall, densely short white hispid. Basal leaves oblong-spatulate, densely white hisrtle, hairs discoid at base, base attenuate to long petiole, to 7 cm × 3–9 mm (including petiole), margin entire, apex obtuse; stem leaves sessile, lanceolate to linear, shorter, narrower, flat or longitudinally flexed along midvein, base attenuate, apex acute. Inflorescences to 17 cm in fruit; bracts linear, slightly longer than fruit. Pedicel erect, ca. 3 mm in fruit, pubescent. Calyx lobes spreading or reflexed, linear, 2–3 mm at anthesis, to 5 mm in fruit, becoming lanceolate, pubescent, apex acute. Corolla light blue, funneliform to campanulate, ca. 4 mm; throat appendages trapeziform; limb 3–4 mm wide; lobes oblong-ovate. Style surpassing nutlets but not apical prickles. Nutlets ovoid, 3–4 mm, adaxially with spiny emergences or tuberculate; disc narrowly ovate to oblong-lanceolate, usually granulose, rarely smooth or keeled, with fine spiny emergences along center line; marginal glochids in 2 rows; inner glochids 1.5–2 mm, separated at base; outer row of glochids slightly shorter, usually erect. Fl. and fr. Jun-Sep. 2n = 48.

Hillside meadows. Gansu, Hebei, W Nei Mongolia, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang [NW Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; S Africa, SW Asia, C and E Europe, North America].

The fruit are used as an antiphlogistic and insecticide in Heilongjiang, Jilin, Liaoning, Ningxia, and Xinjiang.

China.

narrow wing; outer glochids 0.5–1 mm, usually only on lower yellow, 1.5–2 mm, bases exp anded and confluent in to a tuberculate; marginal glochids in 2 rows; inner glochids adaxially tuberculate; disc oblong-lanceolate, finely surpassing upper prickles of nutlets. Nutlets ovoid, 3–3.5 mm, yellow, appendages trapeziform; limb 2–4 mm wide. Style not light blue, campanulate, 3–3.5 mm; throat white or light spreading in fruit, linear, 2–3 mm, to 5 mm in fruit. Corolla thin at base; pubescent. Calyx lobes erect at anthesis, often spreading in fruit, linear, 2–3 mm, to 5 mm in fruit. Corolla light blue, campanulate, 3–3.5 mm; throat white or light yellow, appendages trapeziform; limb 2–4 mm wide. Style not surpassing upper prickles of nutlets. Nutlets ovoid, 3–3.5 mm, adaxially tuberculate; disc oblong-lanceolate, finely tuberculate; marginal glochids in 2 rows; inner glochids yellow, 1.5–2 mm, bases expanded and confluent into a narrow wing; outer glochids 0.5–1 mm, usually only on lower part. Fl. and fr. Jun-Sep.

• Hillside meadows, fields near villages. Gansu, Hebei, Nei Mongol, Shanxi, Xizang.


粒状鹤虱 li zhuang he shi


Herbs annual. Stems erect, branched above, 30–50 cm tall, spreading or subappressed grey pilose. Basal leaves forming a rosette; leaf blade oblong, 2–7 cm × 3–8 mm, spreading or slightly spreading grey hispid, hairs discoid at base, base attenuate, margin entire, pubescent; stem leaves sessile, shorter, narrower. Inflorescences widely spaced, strongly elongated in fruit; bracts linear, longer than fruit on lower part of inflorescences. Pedicel erect, elongated in fruit, 3–5 mm on lower part of inflorescence, stout above, thin at base; pubescent. Calyx lobes erect at anthesis, often spreading in fruit, linear, 2–3 mm, to 5 mm in fruit. Corolla light blue, campanulate, 3–3.5 mm; throat white or light yellow, appendages trapeziform; limb 2–4 mm wide. Style not surpassing upper prickles of nutlets. Nutlets ovoid, 3–3.5 mm, adaxially tuberculate; disc oblong-lanceolate, finely tuberculate; marginal glochids in 2 rows; inner glochids yellow, 1.5–2 mm, bases expanded and confluent into a narrow wing; outer glochids 0.5–1 mm, usually only on lower part. Fl. and fr. Jun-Sep.

Meadows, hilltops, fields on loess plateau, margins of cultivated land. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi [Kazakhstan, Mongolia].

The fruit are used as an antiphlogistic and insecticide in NE China.


绢毛鹤虱 juan mao he shi

Herbs perennial or biennial, densely cespitose. Stems usually 4–10, ascending or diffuse, branched above, 7–15 cm tall, densely gray-white sericose. Basal leaves numerous, forming a rosette, sessile; leaf blade linear to filiform, to 4 cm × 1–2 mm, pubescent; stem leaves similar to basal leaves, 0.5–1.5 mm. Inflorescences terminal on branches, 3–6 cm in fruit; bracts linear, usually ca. as long as fruiting pedicel. Fruiting pedicel erect, stout, 1.5–2 mm. Calyx 5-parted; lobes linear, densely sericeous, 2–2.5 mm in fruit, subtending fruit. Corolla blue; tube ca. 2 mm; throat appendages trapeziform, ca. 0.6 mm; limb ca. 5 mm wide; lobes oblong, 1.5–2 mm. Style surpassing nutlets by 0.3–0.5 mm. Fruit ovoid-globose, ca. 2.5 mm; nutlets ovoid, 2–2.5 mm, densely granulose with spines; disc ovate; marginal glochids in 2 rows, inner glochids 0.2–0.5 mm, base erect or curved, outer glochids ca. 0.2 mm.

Hillsides. Xinjiang (Yuli Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].


喜马拉雅鹤虱 xi ma la ya he shi

Herbs annual. Main roots black-brown, straight, terete. Stems 4–6, cespitose, ascending or erect, branched above, 7–15 cm tall, densely appressed pubescent; branches spreading. Basal leaves forming a rosette, sessile; leaf blade linear-spatulate to linear, 2–3 cm × 2–4 mm, longitudinally flexed along midvein, pubescent, adaxially with fewer hairs, base attenuate, pubescent; stem leaves similar to basal leaves, narrower, shorter. Inflorescences terminal on branches, 3–7 cm in fruit; lower bracts similar to stem leaves; upper bracts linear, slightly shorter than fruit. Fruiting pedicel erect, 1.5–2 mm. Calyx lobes linear, ca. 1.5 mm, pubescent outside, enlarged in fruit, usually shorter than nutlets. Corolla light blue, campanulate; tube ca. 1 mm; limb 2–2.5 mm wide; throat appendages trapeziform, ca. 0.5 mm; lobes oblong to ovate. Style surpassing nutlets by 0.5 mm. Nutlets ovoid, ca. 2.5 mm, densely granulose, disc with 3 or 4 short glochids along center line; marginal glochids in 2 rows; inner glochids 0.5–0.8 mm, often curved; outer glochids ca. 0.2 mm. Fl. and fr. Jun-Aug.

• Hillsides; 3700–4200 m. S Xizang.


天山鹤虱 tian shan he shi

Herbs biennial or perennial. Stems usually single, erect, much branched above, 40–60 cm tall, densely gray-white strigose. Basal leaves numerous, lanceolate to spatulate, 5–8 cm, withered in fruit; stem leaves lanceolate to linear-
lanceolate, 3–6 cm × 4–10 mm, flat, sparsely hirsute, hairs discoid at base, sometimes densely light gray pilose, apex ± acute. Inflorescences widely spaced, 10–15 cm, elongated and secund in fruit; bracts linear to linear-lanceolate, usually shorter than fruit. Fruiting pedicel 3–10 mm, erect or recurved. Calyx lobes spreading, linear, 2–3 mm, to 4 mm in fruit, apex acute. Corolla light blue, ca. 4 mm; tube ca. as long as calyx; throat appendages trapeziform, dark blue, ca. 0.8 mm; limb 5–6 mm wide; lobes divericate, obovate. Style surpassing nutlets by ca. 1 mm, not surpassing prickles. Fruit ovoid-globose, 3–4 mm; nutlets ovoid, adaxially finely tuberculate; disc narrowly ovate, tuberculare, center line with unequal glochids; marginal glochids in 2 rows; inner glochids 1.5–2.5 mm, bases slightly widened but free; outer glochids on lateral surface below, 0.4–0.6 mm. Fl. and fr. Jul-Aug.

Hillside meadows; 1800–2500 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].

1a. Herbs large, perennial; main root conical; stems many, unequal 22c. var. altaica
1b. Herbs small, biennial; main root not conical; stems single.

2a. Fruiting pedicel often recurved, 3–5 mm 22a. var. tianschanica
2b. Fruiting pedicel erect, 5–10 mm 22b. var. gracilis

22a. Lappula tianschanica var. tianschanica

天山鹤虱 (原变种) tian shan he shi (yu an bian zhong)

Herbs biennial, small. Main root not conical. Stems usually single, branched above middle; branches spreading. Basal leaves forming a rosette. Fruiting pedicel recurved, 3–5 mm.

Hillside meadows; ca. 1800 m. Xinjiang (Yuli Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].


细枝天山鹤虱 xi zhi tian shan he shi

Herbs biennial, small. Main root not conical. Stems usually solitary; branches slender, becoming reclinate, 10–15 cm. Basal leaves not forming a rosette. Fruiting pedicel erect, 5–10 mm.

• Hillside meadows; ca. 2500 m. N Xinjiang (Qinghe Xian).


阿尔泰鹤虱 a er tai he shi

Herbs perennial, large. Main root conical. Stems many, unequal in size; branches spreading. Basal leaves forming a rosette. Fruiting pedicel often recurved, 3–5 mm.

• Hillside meadows; ca. 2500 m. N Xinjiang (Qinghe Xian).


草地鹤虱 cao di he shi

Herbs biennial. Main root dark brown, straight, stout. Stems usually single, branched above, 10–35 cm tall, gray-white hispid, branches erect. Basal leaves numerous, forming a rosette, surrounded by persistent withered leaves; leaf blade spatulate to oblanceolate, 3–7 cm × 5–10 mm, gray-white hispid, abaxially with more numerous longer hairs, base attenuate, apex obtuse; midvein distinctly protruding; stem leaves widely spaced, linear. Inflorescences terminal on branches, elongated to 20 cm in fruit, with 1 or 2 leaflike bracts at base, other bracts small, slightly longer or shorter than pedicel. Pedicel 2–3 mm, or shorter above. Calyx lobes linear, ca. 1.5 mm, to 3 mm in fruit. Corolla light blue, ca. 4.5 mm; tube longer than calyx; throat appendages trapeziform, ca. 0.8 mm; limb 4–5 mm wide; lobes divericate, oblong, ca. 2.5 mm. Style slightly surpassing nutlets by ca. 1 mm. Fruit broadly ovoid, ca. 3 mm; nutlets ovoid to narrowly ovoid, 2.5–3 mm, adaxially with dense fine tubercles; disc triangular-ovate to narrowly ovate, sparsely granulose, center line keeled and with several short glochids; marginal glochids in 2 rows; inner glochids 1.5–2.5 mm, bases slightly widened but free; outer glochids ca. 0.5 mm. 2n = 22.

Mountainsides; ca. 1800 m. Xinjiang (Wuqia Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].


短梗鹤虱 duan geng he shi

Herbs biennial. Stems erect, much branched from base, ca. 45 cm tall, densely gray-white spreading or appressed hispid; branches slender, obliquely spreading. Basal leaves numerous, forming a rosette, sessile; leaf blade linear to lanceolate, 2–3 cm × ca. 5 mm, densely gray-white hirsute, apex obtuse. Inflorescences to 7–15 cm in fruit; bracts 1 or 2, leaflike, basal, other bracts extremely small. Pedicel erect, to 1–2(–3) mm in fruit, densely hispid. Calyx lobes spreading, linear, ca. 1 mm, to 2 mm in fruit. Corolla light blue, campanulate, ca. 2.5 mm; tube ca. as long as calyx; throat appendages light yellow, trapeziform, ca. 0.5 mm; limb (3–)4–5 mm wide; lobes suborbicular. Style slightly surpassing nutlets but not surpassing prickles. Fruit globose, 2.5–3 mm; nutlets ovoid, adaxially with dense fine tubercles; disc narrowly ovate, tuberculare, center line keeled and with 3 or 4 glo-echids; marginal glochids in 2 rows; inner glochids 1.5–2.5 mm, bases slightly widened but free; outer glochids ca. 0.5 mm. 2n = 22.

Mountainsides; ca. 1800 m. Xinjiang (Wuqia Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].


多枝鹤虱 duo zhi he shi

Plants annual or biennial, densely appressed strigose. Stems numerous, cespitose, branched at base, ca. 35 cm tall; branches ascending. Basal leaves withered at flowering season; stem leaves sessile, linear, 0.7–1.5 cm × 1–3 mm, ± appressed...
strigose, adaxially sparsely pubescent, apex obtuse. Inflorescences terminal on branches, densely branched; bracts narrowly ovate, lower bracts longer to slightly shorter than pedicel, upper bracts much shorter. Pedicel 4–7 mm, apressed strigose. Calyx ca. 2 mm at anthesis, to 3.5 mm in fruit; lobes erect or apressed to nutlets. Corolla funnelform, blue, ca. 4 mm; tube ca. 2 mm; throat appendages trapeziform; limb 4–5(–7) mm wide; lobes oblong. Gynobase 1.5–2 mm, longer than nutlets. Nutlets triangular-ovoid, tuberculate, inner angle united with gynobase for 2/3 length; disc center line keeled with a few glochids; marginal glochids in 2 rows; inner glochids 0.3–0.6 mm; outer glochids 0.1–0.2 mm. Fl. and fr. Aug. *Mountain meadows. Xinjiang.*


**蓝刺鹤虱**

Herbs annual or biennial, over 60 cm tall. Stems usually single, rarely 2- or 3-fascicled, branched above, strigose or spreading hirsute. Basal leaves oblong-lanceolate, to 5 cm, densely white hirsute, withered in fruit; stem leaves lanceolate to linear, 2–5 cm × 3–6 mm, flat or longitudinally folded along midvein, densely hirsute, hairs discoid at base, base attenuate, apex obtuse; midvein distinctly protruding. Inflorescences terminal on stems and branches, 7–25 cm in fruit; bracts linear. Fruiting pedicel erect, 1–3 mm, strigose. Calyx lobes spreading, linear, 2.5–3 mm, to 4–5 mm in fruit. Corolla light blue-purple, ca. 3.5–4 mm; tube slightly shorter than calyx; throat appendages cupuliform, ca. 0.5 mm; limb 2.5–3 mm wide; lobes oblong. Gynobase blue, ca. 4 mm; tube ca. 2 mm; throat appendages trapeliform, ca. 0.8 mm; limb 2.5–3 mm wide; lobes erect-spreading, oblong. Style included between nutlets. Fruit broadly ovoid, 2.5–3 × ca. 3 mm, above with spaces to broadly obovate. Styple surpassing nutlets by ca. 1 mm. Appendages ca. 0.5 mm; limb 2.5–3 mm wide; lobes oblong. Erect-spreading, oblong. Gynobase blue, ca. 4 mm; tube slightly shorter than calyx; throat appendages trapeziform, ca. 0.5 mm; limb 1.2–1.5 mm. Style included between nutlets. Fruit depressed globose, 4–4.5 × 6–7 mm; nutlets 3.5–4 × ca. 7 mm, wrinkled, granulose, disc ovate, marginal glochids in 2 rows; inner glochids unequal, 0.5–1.5 mm, confluent into a broad wing; wing slightly thickened. Calyx lobes linear-oblong, ca. 2 mm, to 3 mm in fruit, sericeous, apex obtuse. Corolla light blue, ca. 3 mm; tube ca. as long as calyx; throat appendages trapeziform, ca. 0.5 mm; limb ca. 3 mm wide; lobes oblong, 1.2–1.5 mm. Style included between nutlets. Fruit depressed globose, 4–4.5 × 6–7 mm; nutlets 3.5–4 × ca. 7 mm, wrinkled, granulose, disc ovate, marginal glochids in 2 rows; inner glochids unequal, 0.5–1.5 mm, confluent into a broad wing; wing subleathery, 1.5–2 mm wide, usually spreading horizontally; outer glochids 0.2–0.8 mm. Fl. and fr. Jun-Sep.

*Waste areas, rocky slopes, mountain terraces, roadsides; 600–2200 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Xinjiang [N India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; Europe].

#### 1a. Nutlets homomorphic throughout

**26a. var. consanguinea**

#### 1b. Nutlets heteromorphic in upper part of inflorescences

**26b. var. cupuliformis**


**畸形果蓝刺鹤虱**

Heteromorphic nutlets on upper part of inflorescences, 2 nutlets with inner marginal glochids of disc distinctly widened at base and confluent into a broad wing; wing usually erect, ± cupular. Fl. and fr. Jul-Sep.

- Dry mountain terraces, roadsides; ca. 600 m. Xinjiang.

**费尔干鹤虱**

Lepechiniella ferganensis Popov in Komarov, Fl. URSS 19: 713. 1953; Lappula platyptera C. J. Wang.

Herbs biennial; rhizomes ± horizontal, producing stems from nodes. Stems not branched or few branched, ca. 30 cm tall, sparsely gray fine pilose. Basal leaves fascicled, forming a rosette, sessile; leaf blade linear to linear-oblancoolate, 1.5–4.5 cm × 2–4 mm, abaxially densely sericeous, becoming silvery, adaxially gray-green, sparsely sericeous, base attenuate, apex obtuse; stem leaves sparse, sessile, linear to narrowly ovate, 0.5–2 cm × 1.5–2 mm, sparsely sericeous. Inflorescences terminal, few flowered, elongated in fruit; bracts narrowly ovate to linear, ca. as long as nutlets. Fruiting pedicel erect, 2–4 mm, slightly thickened. Calyx lobes linear-oblong, ca. 2 mm, to 3 mm in fruit, sericeous, apex obtuse. Corolla light blue, ca. 3 mm; tube ca. as long as calyx; throat appendages trapeziform, ca. 0.5 mm; limb ca. 3 mm wide; lobes oblong, 1.2–1.5 mm. Style included between nutlets. Fruit depressed globose, 4–4.5 × 6–7 mm; nutlets 3.5–4 × ca. 7 mm, wrinkled, granulose, disc ovate, marginal glochids in 2 rows; inner glochids unequal, 0.5–1.5 mm, confluent into a broad wing; wing subleathery, 1.5–2 mm wide, usually spreading horizontally; outer glochids 0.2–0.8 mm. Fl. and fr. Jun-Sep.

- *Mountainsides; ca. 3300 m SW Xinjiang (Wuqia Xian).*


**畸形果鹤虱**

Herbs annual. Roots single, conical, straight, stout. Stems much branched above, 35–48 cm tall, somewhat spreading or appressed hirsute; branches ascending. Basal leaves few, withered in fruit; leaf blade spatulate, to 7 cm × 5–7 mm, base attenuate, apex obtuse; stem leaves sessile, lanceolate, 3–5 cm × 4–6 mm, spreading or appressed hirsute, adaxially with fewer hairs, base attenuate, apex acute. Inflorescences terminal on branches, elongated to 20 cm in fruit; bracts linear-lanceolate, much longer than fruit. Flowers widely spaced. Pedicel 2.5–3.5 mm in fruit. Calyx lobes spreading, linear, 3–3.5 mm, to 5–6 mm in fruit, hirsute. Corolla light blue, ca. 4 mm; tube slightly shorter than calyx; throat appendages trapeziform, ca. 0.8 mm; limb 2.5–3 mm wide; lobes erect-spreading, oblong. Style surpassing nutlets by 0.5 mm, not surpassing prickles. Fruit broadly ovoid,
homomorphic along lower part of inflorescences; nutlets narrowly ovoid, densely tuberculate, disc with 2 rows of glochids along margin; inner glochids 1.5–2 mm, base somewhat widened but free; outer glochids ca. 0.5 mm, usually at base of vertical surface. Fruit of upper part of inflorescences heteromorphic, 2 nutlets with a broad wing; inner glochids of disc margin 1–2 mm, bases strongly widened and confluent into a wing 0.6–1 mm; outer glochids ca. 0.5 mm, on base of nutlets, other 2 nutlets wingless. Fl. and fr. Jul-Sep.

* Fields, waste areas, slopes on loess plateau. C and NE Gansu.  

**Herbs**.  

**Herbs annual. Stems much branched above, to 65 cm tall; branches ascending, spreading hispid. Lower stem leaves withered in fruit; leaf blade narrowly spatulate to linear-lanceolate, 4.6–6.5 cm × 3–5 mm, strigose, adaxially less so, base attenuate, apex obtuse; upper stem leaves narrower, shorter. Inflorescences terminal on branches, to 20 cm in fruit, becoming widely spaced; with leaflike bracts on lower part of inflorescences, longer than fruit; upper bracts linear, slightly longer than fruit. Calyx lobes spreading or revolute, linear, ca. 4 mm, to 6 mm in fruit, hispid, apex acute. Corolla blue-purple, ca. 4.5 mm; tube ca. 3 mm; throat appendages trapeziform, ca. 0.6 mm; limb ca. 4 mm wide; lobes spreading horizontally, oblong, 1–1.5 mm. Style slightly surpassing nutlets. Fruit broadly ovoid, 4.4–5 mm long, nutlets homomorphic along lower part of inflorescences, wingless, narrowly ovoid, 4.4–5 mm, densely granulose; disc with short glochids on keel along center line, with 2 rows of glochids along margin; inner glochids 1–2.5 mm, bases somewhat widened but free, outer glochids 1–1.2 mm. Nutlets heteromorphic in upper part of inflorescences, 2 with inner glochids on disc margin 1.5–2 mm, bases strongly widened and confluent into a divaricate wing; outer glochids 1–1.8 mm; 2 other nutlets with homomorphic prickles. Fl. and fr. Jul-Sep.

* Fields, waste places, near villages. Nei Mongol (Otog Qi Xian), Shanxi (Wutai Xian).  

**Herbs**.  

**Herbs annual. Stems stout, branched above, spreading and appressed hispid; stem leaves linear, 1.5–3.5 cm × 2–3 mm, flat or longitudinally flexed along midvein, spreading white hispid, hairs discoid at base. Inflorescences terminal on branches, elongated in fruit; bracts leaflike, much longer than fruit. Calyx lobes linear, 2–2.5 mm, slightly enlarged. Corolla light blue, ca. 3 mm; tube somewhat shorter than calyx; throat appendages ca. 0.5 mm; limb ca. 2 mm wide; lobes divaricate, suboblong. Ovary globose, 4-parted, with 1 mericarp developing into a nutlet. Gynobase ca. as long as nutlet, usually horizontal but somewhat raised at apex. Developed nutlet 1, acute ovoid, ca. 2 mm, usually horizontal, granulose, adaxial base coherent to gynobase, disc margin with a single row of glochids; glochids 0.5–1 mm. Fl. and fr. Jul-Aug.

* Sunny hillside meadows; ca. 1100 m. NW Xinjiang (Jeminay Xian).


**Herbs annual. Stems frequently branched from base, 6–20 cm tall, spreading hispid. Basal leaves few, usually withering early, narrowly obovate, 1–2 cm; stem leaves sessile or lower leaves attenuate at base to thin petiole, spatulate-linear, 0.8–2.5 cm, white hispid, apex acute or obtuse. Inflorescences to 8 cm; bracts linear to linear-lanceolate, 2–5 mm. Flowers short pedicellate, widely spaced. Calyx ca. 2.3 mm; lobes linear, densely minutely hispid. Corolla light blue, ca. 4 mm; tube somewhat shorter than calyx, ca. 1.2 mm; throat appendages trapeziform, ca. 0.7 mm, apex obtuse; limb 5-parted; lobes obovate, ca. 2 mm. Stamens inserted above middle of corolla tube; anthers oblong, ca. 0.5 mm. Style short terete, ca. 0.6 mm; stigma discoid. Nutlets brown, narrowly ovoid, ca. 3 mm, tuberculate; disc wing constricted upward, becoming yellowish, saccate, densely pubescent, margin entire. Fl. and fr. May-Jun.

隐柱鹤虱  yin zhu he shi


Herbs perennial; caudex few branched, forming small tufts of leaf rosettes. Stems several to many, laterally ascending, 10–25 cm tall. Basal leaves in rosettes, elongated or spatulate-linear, 4–6(–10) cm × 2–5 mm, gray sericeous; stem leaves linear, 1–3 cm × 1–3 mm, apex obtuse. Inflorescences leafless, loose, to 5–6 cm in fruit. Pedicel short, smaller, to 3–5 mm in fruit. Calyx ca. 2 mm. Corolla light blue or white; limb flat, 5–8 mm wide; lobes rounded-ovate; appendages trapeziform-ovate, ca. 1 mm. Nutlets with wings wider than long, rounded-ovoid, 5–7 mm wide; disc finely tuberculate, keeled, winged; wing yellowish, wide, leathery, undulate-parallel, generally flat, margin turning blue, with 3–5 glochids on each side, densely papillose-acute adaxially. Gynophore and very short style hidden. Fl. Jun-Jul, fr. Aug.

Stony places in mountains. W Xinjiang (Transalai Range west of Ulugbat and Pamir) [Kyrgyzstan, Tajikistan].


短柱鹤虱  duan zhu he shi

Herbs annual. Stems 20–35 cm, branched from base or above. Leaves oblong-spatulate, 1–3(–4) cm × 5–10 mm, abaxially somewhat grayish with large white tubercles and spreading pubescent or bristly, adaxially green and subglabrous. Inflorescences loose. Pedicel erect, 1–2 mm. Calyx ca. 2 mm; lobes oblong-linear, white tuberculate and strigose, apex obtuse. Corolla sky blue; limb flat, (5–)5.5–6 mm; lobes ovate-rounded. Nutlets with wings wider than long, rounded-ovoid, 3.5–4 mm, with or without a leathery dentate wing, with 5–7 upright triangular teeth on each side along wing margin or with short glochids along disc margin; disc with protruding keel. Style short, hidden. Fl. Jun-Jul, fr. Jul-Aug.

Slopes of hills, mainly acidic soils. NW Xinjiang (Altay Shan) [Kazakhstan, Mongolia].


大花鹤虱  da hua he shi


Herbs annual. Stems 20–40 cm, branched from base; branches ascending, sparsely spreading pubescent. Leaves light green, lanceolate-spatulate or oblong, wide and flat, 2–4 cm × 5–10 mm, abaxially densely spreading pubescent, apex obtuse. Infructescences branches 3–8 cm, not very loose; bracts small lanceolate. Pedicel 1–2 cm, pubescent. Calyx 1.5–2 mm, elongated in fruit; lobes lanceolate. Corolla sky blue; limb slightly funnelform, 5–8 mm wide; lobes ovate-rounded. Nutlets 4–5 mm; disc with keel of small anchorlike spines and tuberculate, margin with flat whitish yellow glochids 2–3 mm; glochids 4–6 on each side of disc. Style completely hidden. Fl. Apr-Jun, fr. May-Jul.

Sandy and acidic soils of mountain slopes. NW Xinjiang (Ertix He River, Altay Shan) [Kazakhstan, Mongolia].

It is doubtful that this species belongs in *Lappula*. The short style hidden by the nutlets and the comparatively short attachment scar of the nutlets are more characteristic of *Lepechiniella*.


囊刺鹤虱  nang ci he shi

Herbs annual. Stems (10–)20–40 cm, branched from base, pubescent, glaucous green. Basal leaves early deciduous; stem leaves oblong or lanceolate, 2–4 cm × 3–8 mm, reflexed, acute, with tubercle-based setae. Inflorescences leafy, to (5–)10–20(–30) cm. Corolla blue; limb to ca. 3.5 mm. Nutlets 4, homomorphic; gynophore hidden between nutlets; disc margin wingless, not involute; marginal glochids 2–2.5 mm, terete, hollow, in 1 row.

Sandy deserts. Xinjiang (Tien Shan) [Kyrgyzstan].