

CLX OROBANCHACEAE

3. *Boschniakia* C. A. Meyer¹

Stems stout, simple. Flowers in dense, spike-like racemes; bracteoles absent. Calyx short, cupuliform, obscurely 3- to 5-lobed. Corolla 2-lipped; upper lip much longer than the lower. Stamens exserted. Placentae 2, deeply lobed.

1. *B. rossica* (Cham. & Schlecht.) B. Fedtsch. in B. Fedtsch. & Flerow, *Fl. Evr. Ross.* 896 (1910). Glabrous, except for minutely ciliate bracts, calyx and corolla. Stems 15–40 cm, red or brown, usually in groups of 2–8. Leaves 5–10 mm, ovate to deltate. Raceme 15–20 cm, dense, narrow. Bracts c. 8 mm, ovate; pedicels very short in flower, elongating in fruit. Calyx 3–4 mm. Corolla 10–12 mm, red or brownish; tube subglobose; lower lip equally 3-lobed; upper lip subentire. Stamens inserted 2–3 mm above base of corolla-tube. Capsule 6–7 mm. *On species of Alnus. N. Ural (Ilyč basin). Rs (N). (N. Asia and coasts of Bering Sea.)*

4. *Phelypaea* L.¹

Stems slender, simple. Leaves few, amplexicaul. Flowers solitary (very rarely 2), terminal; bracteoles absent. Calyx tubular, 5-lobed, more or less 2-lipped. Corolla more or less

2-lipped, with 5 large, patent lobes. Stamens included. Placentae 4, deeply lobed.

Literature: O. Stapf, *Kew Bull.* 1915: 285–295 (1915).

Corolla-lobes obovate-orbicular, not overlapping; anthers glabrous
Corolla-lobes orbicular, overlapping; anthers hairy

1. *coccinea*
2. *boissieri*

1. *P. coccinea* Poiret in Lam., *Encycl. Méth. Bot.* 5: 268 (1804) (incl. *P. helenae* Popl.). Stem 30–40 cm, reddish or orange, glandular-puberulent, at least above. Leaves c. 2 cm, ovate-oblong, obtuse, confined to lower half of stem. Calyx 15–30 mm, puberulent; lobes 5, longer than the tube. Corolla c. 30 × 40 mm, yellow outside, bright red or orange-yellow inside; lobes obovate-orbicular, not overlapping. Filaments and anthers glabrous. Stigma large, reniform. Capsule c. 15 mm, ovoid. *On Psophellus spp. Krym. Rs (K). (Caucasus.)*

2. *P. boissieri* (Reuter) Stapf, *Kew Bull.* 1915: 291 (1915). Like 1 but stem shorter and stouter; corolla always red inside, with overlapping, orbicular lobes; anthers hairy. *On various species of Centaurea. S. Jugoslavia (C. Makedonija, around Gradsko). Ju. (S. & E. Anatolia.)*

CLXI. LENTIBULARIACEAE²

Small, carnivorous perennial herbs. Leaves alternate or in a basal rosette. Flowers solitary or in a short raceme. Corolla 2-lipped, spurred. Stamens 2, epipetalous. Ovary superior, 1-locular; placenta free-central. Fruit a capsule; seeds numerous.

Leaves entire, in a basal rosette
Leaves divided into filiform lobes, alternate

1. *Pinguicula*
2. *Utricularia*

1. *Pinguicula* L.³

Leaves in a basal rosette, entire, soft and fleshy, clothed with viscid glands above; margin usually more or less involute. Flowers solitary, on naked pedicels. Calyx persistent, 2-lipped; upper lip 3(–)-, lower 2-lobed. Corolla 2-lipped, spurred, open at throat, with a hairy and often spotted palate; upper lip 2-, lower 3-lobed. Capsule opening by 2 valves. Seeds numerous, very small.

In the descriptions the terms *spring* and *summer leaves* indicate that the rosettes of some species undergo a regular change of form during their development; this is often not evident in dried specimens. The measurements of the corolla and leaf include the spur and the petiole respectively.

Literature: S. J. Casper, *Feddes Repert.* 66: 1–148 (1962); *Biblioth. Bot. (Stuttgart)* 127/128: 1–209 (1966). A. Ernst, *Bot. Jahrb.* 80: 145–194 (1961). J. Schindler, *Österr. Bot. Zeitschr.* 57: 409–421, 458–469 (1907); 58: 13–18, 61–69 (1908).

- 1 Corolla white, with one or more yellow spots on the palate; roots stout
1 Corolla violet, lilac, blue or pinkish; roots slender
2 Lobes of the lower lip of the corolla emarginate; plant overwintering as a rosette

3. *alpina*

¹ By E. M. Rix and D. A. Webb.

² Edit. T. G. Tutin.

³ By S. J. Casper.

- 3 Corolla 7–11 mm; tube cylindrical; spur 2–4 mm
3 Corolla 16–32 mm; tube infundibuliform; spur 6–13 mm
2 Lobes of the lower lip of the corolla entire; plant overwintering as a bud
4 Pedicels with glandular hairs, the stalks at least 10 times as long as the gland; leaves elliptical to suborbicular, strongly involute; corolla 6–11 mm
4 Pedicels glandular, the stalk not more than twice as long as the gland; leaves not or only slightly involute; corolla at least 12 mm
5 Corolla 25–40 mm; spur 9–24 mm, more than half as long as the rest of the corolla
6 Leaves oblong to obovate-oblong, horizontal; lobes of the lower lip of the corolla about as wide as long
6 Leaves elliptic-ovate to ligulate or linear-lanceolate, sub-erect; lobes of lower lip of corolla much longer than wide
7 Spring leaves sessile, elliptic-ovate; summer leaves 100–260 mm, ligulate, acute; lobes of upper lip of calyx ovate-oblong to ovate-suborbicular
7 Leaves 60–175 mm, the lowest elliptical, the others lanceolate, obtuse; lobes of upper lip of calyx elliptic-ligulate to linear
5 Corolla 12–30 mm; spur 4–10 mm, usually less than half as long as the rest of the corolla
8 Leaves not much longer than wide
9 Lobes of upper lip of calyx about as long as wide
9 Lobes of upper lip of calyx much longer than wide
8 Leaves distinctly longer than wide
10 Lobes of lower lip of corolla oblong, divergent, not overlapping or touching
10 Lobes of lower lip of corolla suborbicular, overlapping or touching
11 Lobes of upper lip of calyx about as long as wide
11 Lobes of upper lip of calyx distinctly longer than wide

1. *lusitanica*

2. *hirtiflora*

4. *villosa*

11. *grandiflora*

9. *vallisneriifolia*

10. *longifolia*

7. *balkanica*

8. *nevadensis*

12. *vulgaris*

7. *balkanica*

1 *Pinguicula*

- 12 Lower lip of calyx divided nearly to base; lobes divergent **6. leptoceras**
 12 Lower lip of calyx divided halfway to base; lobes not divergent **5. corsica**

1. P. lusitanica L., *Sp. Pl.* 17 (1753). Overwintering as a rosette. Leaves 5–12, 10–24(–29) × 3–8 mm, oblong-ovate, greyish; margin strongly involute. Pedicels 1–8, 60–150 (–250) mm, glandular-pubescent, very slender. Corolla 7–9(–11) mm. Calyx-lobes ovate. Corolla-lips subequal, pinkish to pale lilac, yellow at the throat; lobes suborbicular, emarginate. Tube cylindrical; palate entire. Spur 2–4 mm, subcylindrical, deflexed. Capsule subglobose. $2n=12$. *Bogs and wet heaths. W. Europe, eastwards to 5° E. in S. France.* Br Ga Hb Hs Lu.

2. P. hirtiflora Ten., *Fl. Nap.* 1, *Prodr.*: 6 (1811) (incl. *P. louisii* Markgraf). Overwintering as a rosette. Leaves 6–9, 20–60(–80) × 10–25(–35) mm, elliptic-oblong to ovate-oblong, truncate or emarginate at apex; margin scarcely involute. Pedicels 1–3, 50–110(–140) mm, slender. Corolla 16–25(–32) mm. Upper lip of the calyx with spatulate lobes, those of the lower lip obovate, very short. Corolla-lips unequal, pink to pale blue, yellow at the throat; lobes of upper lip obovate, weakly emarginate; those of lower lip cuneate, emarginate. Tube infundibuliform; palate divided. Spur 6–10(–13) mm, subulate, straight or somewhat curved. Capsule subglobose. $2n=16$. *Wet rocks in the mountains. S. & W. parts of Balkan peninsula; C. & S. Italy.* Al Gr It Ju.

3. P. alpina L., *Sp. Pl.* 17 (1753). Overwintering as a bud. Roots long and relatively thick, brownish. Leaves 5–8, (15–)25–45(–60) × 8–14 mm, elliptic-oblong to lanceolate-oblong, pale yellowish-green; margin involute. Pedicels 1–8, 50–110 (–130) mm, sparsely glandular. Corolla 10–16(–21) mm. Upper lip of the calyx with triangular lobes; lower lip lobed for $\frac{1}{2}$ its length, the lobes obovate. Corolla-lips unequal, white with one or more yellow spots on the palate. Tube short, thick. Spur 2–3(–5) mm, curved, yellowish. Capsule ovoid-oblong. $2n=32$. *Bogs and wet places. Arctic and subarctic Europe; mountains of Fennoscandia; islands of Baltic sea; mountains and uplands of C. Europe; Pyrenees.* Au †Br Cz Fe Ga Ge He Hs Hu It Ju No Po Rm Rs (N, B, ?C, W) Su.

4. P. villosa L., *Sp. Pl.* 17 (1753). Overwintering as a bud. Leaves 1–5, 8–10(–13) × 4–6(–7) mm, elliptical to suborbicular; margins strongly involute, often touching each other. Pedicels usually solitary, 30–60(–95) mm, glandular-hairy with the stalk at least 10 times as long as the gland. Corolla 6–9(–11) mm. Calyx-lobes lanceolate, purple. Corolla-lips unequal, pale violet, with yellow stripes in the throat; lobes broadly cuneate. Spur 2–3(–5) mm, straight, cylindric-conical. Capsule obovoid, much longer than the persistent calyx. $2n=16$. *Sphagnum-bogs. Fennoscandia, southwards to 61° N. in Sweden; N.W. Russia.* Fe No Rs (N) Su.

5. P. corsica Bernard & Gren. in Gren. & Godron, *Fl. Fr.* 2: 443 (1853). Overwintering as a bud. Leaves 5–9, 25–35(–40) × 9–16 mm, ovate to obovate-oblong, petiolate. Pedicels 40–90(–150) mm, glandular. Corolla 16–25(–30) mm. Upper lip of the calyx with narrowly oblong-lanceolate lobes; lower lip lobed for at least $\frac{1}{2}$ its length; lobes not divergent. Corolla-lips unequal, pale blue to pink; lobes obovate, rounded, overlapping. Tube infundibuliform, about as long as upper lip of the corolla. Spur 4–6(–9) mm, straight, cylindric-subulate. Capsule subglobose. $2n=16$. *Wet places in the mountains.* ● *Corse.* Co.

6. P. leptoceras Reichenb., *Pl. Crit.* 1: 69 (1823). Overwintering as a bud. Leaves 5–8, 25–40(–65) × 10–16(–22) mm, oblong to ovate-oblong; margin scarcely involute. Pedicels 1–6, 40–100(–130) mm, glandular. Corolla 16–25(–30) mm. Upper lip of the calyx with 3(–7) triangular-acuminate to oblong-obtuse lobes, the middle lobe often much larger than the lateral and irregularly dentate or truncate; lower lip divided nearly to the base, the lobes lanceolate and usually divergent. Corolla-lips unequal, blue; lobes of the upper lip obovate-obtuse, those of the lower lip broadly obovate to suborbicular, overlapping, white-spotted at the base. Tube infundibuliform, somewhat wider than long. Spur 4–6(–9) mm, straight, cylindrical. Capsule ovoid. $2n=32$. *Wet places in the mountains.* ● *Alps, Alpe Apuani, N. Appennini.* Au Ga He It.

7. P. balcanica Casper, *Feddes Repert.* 66: 105 (1962) (*P. leptoceras* sensu Hayek, non Reichenb.). Overwintering as a bud. Spring leaves 20–30 × 15–20 mm, broadly ovate; summer leaves 20–50 × 10–20 mm, elliptic-oblong. Pedicels 1–5, 40–80 (–100) mm, glandular. Corolla 14–19(–23) mm. Calyx-lobes broadly ovate, about as long as wide, rarely longer than wide; lower lip divided for up to $\frac{1}{2}$ its length; lobes not divergent. Corolla-lips unequal, blue-lilac, the lobes of the upper lip broadly ligulate, those of the lower lip obovate-oblong, contiguous or overlapping, the middle lobe often larger, white-spotted at its base. Spur 3–5(–7) mm, straight, cylindrical. Capsule ovoid. $2n=32$. *Wet places in the mountains.* ● *Balkan peninsula.* Al Bu Gr Ju.

8. P. nevadensis (Lindb.) Casper, *op. cit.* 112 (1962). Overwintering as a bud. Leaves 5–8, 15–20 × 6–12 mm, little longer than wide. Pedicels 1–3, 40–55(–90) mm, glandular. Corolla 12–16 mm. Calyx-lobes linear, obtuse; lower lip divided for up to $\frac{1}{2}$ its length; lobes usually not divergent. Corolla-lips lilac with white lobes; those of the upper lip ovate, obtuse, those of the lower lip obovate-oblong, overlapping, the two lips subequal. Tube infundibuliform, about as long as the lips. Spur 3–4 (–5) mm, straight. *Bogs and wet places in the mountains.* ● *S. Spain (Sierra Nevada, Sierra de Alfacer).* Hs.

9. P. vallisneriifolia Webb, *Otia Hisp.* ed. 2, 48 (1853). Overwintering as a bud. Spring leaves 30–40(–55) × 15–20 (–25) mm, sessile, elliptic-ovate, the margin not involute; summer leaves 100–200(–260) × 8–20(–30) mm, suberect, ligulate, undulate, acute, petiolate. Pedicels 1–8, 100–150(–175) mm, glandular. Corolla 25–35(–40) mm. Calyx-lobes ovate-oblong to obovate; lower lip divided for up to $\frac{1}{2}$ its length. Corolla-lips unequal, violet, white-spotted at the throat; lobes obovate, overlapping. Tube c. 5 mm, broadly infundibuliform. Spur 10–14(–20) mm, cylindric-subulate, straight or curved. $2n=32$. *Shady, wet rocks.* ● *Mountains of S.E. & E.C. Spain.* Hs.

10. P. longifolia Ramond ex DC. in Lam. & DC., *Fl. Fr.* ed. 3, 3: 728 (1805). Overwintering as a bud. Leaves 5–11, 60–130(–175) × 10–20(–25) mm, the lowest elliptical, the others linear-lanceolate, suberect, slightly undulate, obtuse, petiolate. Pedicels 1–5, 70–130(–150) mm, glandular. Corolla 22–40 (–46) mm. Calyx-lobes conspicuous, elliptic-ligulate to linear, obtuse, the lower divided for up to $\frac{1}{2}$ its length or sometimes nearly to the base. Corolla-lips unequal, lilac to pale blue; lobes of the upper lip ovate, obtuse, those of the lower lip obovate-cuneate, much longer than wide, overlapping, white-spotted at the base. Tube short, broadly infundibuliform. Spur 10–16(–24) mm, cylindric-subulate, straight or curved. Capsule ovoid-subglobose. *Wet rocks.* ● *Mountains of S. Europe, from S.C. France to the Pyrenees and C. Appennini.* Ga Hs It.

CLXI LENTIBULARIACEAE

- 1 Lobes of upper lip of calyx linear, sometimes more than 3
(c) subsp. *reichenbachiana*
1 Lobes of upper lip of calyx wider, never more than 3
2 Corolla 30–46 mm (a) subsp. *longifolia*
2 Corolla 22–35 mm (b) subsp. *caussensis*

(a) Subsp. *longifolia*: Lobes of the upper lip of the calyx elliptic-ligulate; lower lip divided for up to $\frac{1}{2}$ its length. Corolla 30–46 mm. *C. Pyrenees*.

(b) Subsp. *caussensis* Casper, *Feddes Repert.* 66: 70 (1962): Lobes of the upper lip of the calyx ovate-lanceolate to linear, obtuse. Corolla 22–35 mm. *Mountains of S.C. France*.

(c) Subsp. *reichenbachiana* (Schindler) Casper, *op. cit.* 71 (1962): Lobes of the upper lip of the calyx linear, acute or obtuse, often irregular, sometimes more than 3; lower lip divided nearly to the base. $2n=32$. *Mountains of C. & N.W. Italy, just extending to S.E. France*.

11. *P. grandiflora* Lam., *Encycl. Méth. Bot.* 3: 22 (1789). Overwintering as a bud. Leaves 5–8, 30–45(–65) mm, oblong to obovate-oblong. Pedicels 1–5, 60–150(–230) mm, glandular. Corolla 25–35(–40) mm. Lower lip of calyx divided for up to $\frac{1}{2}$ its length; lobes obovate. Corolla-lips unequal, violet to pinkish or pale lilac, white at the throat; lobes of the upper lip suborbicular or obovate, those of the lower lip suborbicular, about as long as wide, somewhat undulate, overlapping. Spur 10–12(–14) mm, straight, sometimes slightly bifid. Capsule subglobose. $2n=32$. *Bogs and wet rocks. S.W. Ireland; mountains of S.W. Europe, from the Cordillera Cantábrica to the Swiss Jura. Ga Hb He Hs [Br]*.

(a) Subsp. *grandiflora*: Upper lip of calyx divided nearly to the base; lobes ligulate. Corolla violet to pinkish; spur rather stout. *Throughout the range of the species*.

(b) Subsp. *rosea* (Mutel) Casper, *Feddes Repert.* 66: 85 (1962): Like (a) but smaller in all its parts; lobes of the upper lip of the calyx short, elliptical, about as long as wide; corolla pinkish to pale lilac; spur subulate. *S.E. France (Savoie)*.

12. *P. vulgaris* L., *Sp. Pl.* 17 (1753) (incl. *P. norica* G. Beck). Overwintering as a bud. Leaves 5–11, 20–45(–90) × 14–20 (–26) mm, oblong to obovate-oblong; margin somewhat involute. Pedicels 1–6, 75–180(–270) mm, glandular. Corolla 15–22 (–30) mm. Calyx-lobes triangular to ovate or oblong, acuminate or obtuse, broadly based, the lower lip divided for up to $\frac{1}{2}$ its length. Corolla-lips unequal, violet, usually white at the throat; lobes of the upper lip oblong, those of the lower lip oblong, much longer than wide, divergent, not overlapping. Spur 3–6(–10) mm, cylindric-subulate, straight. Capsule ovoid. $2n=64$. *Bogs, wet heaths and wet rocks. N., W. & C. Europe, extending eastwards to W. Ukraine. Au Be Br Cz Da Fa Fe Ga Ge Hb He Ho Hs Hu Is It Ju Lu No Po Rm Rs (N, B, C, W) Su*.

Hybridization between 11 and 12 almost certainly occurs and a hybrid between 12 and 3 has been reported.

2. *Utricularia* L.¹

Annual or perennial rootless herbs with horizontal stems and erect racemose inflorescences; terrestrial in damp places, with usually inconspicuous simple leaves, or aquatic with numerous conspicuous leaves which are divided into linear to filiform segments; leaves bearing small bladders which trap minute organisms. Calyx 2-lipped, divided almost to the base, usually

accrescent; corolla 2-lipped, yellow; lower lip more or less spurred, with a gibbous palate; upper lip usually smaller. Capsule usually globose, circumscissile, indehiscent or dehiscing by pores or slits. Seeds usually many.

The genus is predominantly tropical and most of the species native in Europe (3–6) are atypical in the development of winter buds (turions). The vegetative parts are usually very variable and the identification of non-flowering material is often impossible; many of the published records are, therefore, open to doubt.

- 1 Terrestrial; lower lip of corolla 3-lobed; bracts peltate; leaves entire **1. subulata**
- 1 ± Aquatic; lower lip of corolla entire; bracts not peltate; leaves divided into linear to capillary segments
- 2 Seeds with an irregular wing; upper lip of corolla 3–4 mm wide **2. gibba**
- 2 Seeds not winged; upper lip of corolla at least 6 mm wide
- 3 Spur saccate or broadly conical, obtuse, not longer than wide; leaf-segments without bristles **3. minor**
- 3 Spur with at least the apical part narrowly cylindrical or subulate, usually ± acute, longer than wide; leaf-segments with bristles
- 4 Stems dimorphic, with either green ± palmately divided leaves without bladders or much reduced colourless leaves with bladders **4. intermedia**
- 4 Stems all with green, ± palmately divided leaves with bladders
- 5 Lower lip of corolla with deflexed margin; pedicels 2–3 times as long as bract; glands inside the apex of the spur on abaxial surface only **5. vulgaris**
- 5 Lower lip of corolla ± flat, with undulate margin; pedicels 3–5 times as long as bract; glands inside the apex of the spur on both adaxial and abaxial surfaces **6. australis**

1. *U. subulata* L., *Sp. Pl.* 18 (1753). Terrestrial; stems capillary, subterranean; leaves 10–20 × 0.5 mm, often decayed at anthesis; bladders 0.2–0.5 mm. Inflorescence 3–20 cm; flowers 2–8; scape capillary; bracts c. 1 mm, peltate; pedicels 3–7 mm. Corolla 8–9 mm; upper lip 4 mm, broadly ovate; lower lip longer, with prominent 2-gibbous palate and 3-lobed limb, about as long as the subulate spur. Capsule globose; seeds ovoid, striate, unwinged. *Damp sand. Portugal (Beira Litoral), perhaps native. *Lu. (North and South America, tropical Africa and Asia.)*

2. *U. gibba* L., *Sp. Pl.* 18 (1753). Aquatic or subaquatic; stems radiating from the base of the scape; leaves unequally forked from the base, the segments capillary and again 1–3 times forked; bladders 1–1.5 mm. Inflorescence 2–8 cm; flowers 1–3(–4); scape filiform; bracts 1 mm, scarcely auriculate; pedicels 2–10 mm, erect in fruit. Corolla 5–7 mm; upper lip 3–4 mm wide, broadly ovate, obtuse, obscurely 3-crenate; lower lip with prominent 2-gibbous palate, entire, about as long as the narrowly conical spur. Capsule globose; seeds winged. *Shallow water or liquid mud. W. Portugal, S.W. Spain. Hs Lu. (Africa, S. Asia, Australia.)*

The above description refers to subsp. *exoleta* (R. Br.) P. Taylor, *Mitt. Bot. Staatssamm. (München)* 4: 101 (1961) (*U. exoleta* R. Br.). Subsp. *gibba*, from America and tropical Africa, has been recorded from Hungary as a casual (as *U. biflora* Lam.).

3. *U. minor* L., *Sp. Pl.* 18 (1753). Aquatic, more or less anchored to substratum; stems up to 25 cm, slender, more or less dimorphic; bearing either green, orbicular, more or less palmately lobed leaves 3–10 mm long, with glabrous, entire,

¹ By P. Taylor.