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Notes on *Lophozia* IV. Some new taxa of *Lophozia sensu stricto*

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The paper describes the following species of *Lophozia* (Dum.) Dum. *s. stricto*: *L. lantratoviae* Bakalin *sp. nova*, *L. austro-sibirica* Bakalin *sp. nova*, and *L. nepalensis* Bakalin *sp. nova*. *Lophozia lantratoviae* is characterised by brown gemmae and biconcentric oil-bodies, *L. austro-sibirica* by paroecious inflorescences and greenish to colourless gemmae, and *L. nepalensis* by slender, attenuate shoot tips with reduced leaves. *Lophozia handelii* Herzog is synonymised with *L. ventricosa* (Dicks.) Dum. var. *guttulata* (Lindb. & H.W. Arnell) Bakalin.

Key words: Hepaticae, *Lophozia*, Lophoziaceae, taxonomy

Lophozia lantratoviae Bakalin, *sp. nova* (Fig. 1)

Planta sordide ad intense viridis vel viridi-luteola. Ramulus 2–10 mm longa et 1–2 mm lata. Caulis 0.5–0.7 mm lata, dense foliosus. Segmentum caulis ventrale fuscescens vel fusco-luteolus. Folia bilobata. Cellulae foliorum triangulariter incrassatae, in parte media (18)20–27(30) µm latae et (25)27–40(45) µm longae. Corpuscula oleosa in cellula 5–10, granulata cum sphaerulis centralibus. Gemmae ad norma tri- vel quadriangularis raro quinquangularis, fuscum vel fuscescens. Dioecius.

TYPE: Russia. Yakutia, Olekminsky district, Tokko River, 2.VIII.2000 *V.A. Bakalin* (holotype and isotype KPABG).

Plants sordid- to bright-green or green-yellowish in caespitose mats with admixture of other hepatics or mosses. Shoots 2–10 mm long, 1.0–2.0 mm wide. Stem 0.5–0.75 mm wide; ventral side of stem brownish to brown-yellowish or similar as dorsal side. Ventral segment to 2(3) cells wide. Medulla with distinct dorsiventral differentiation, ventral 1/3 or less of smaller cells. Rhizoids colourless or brownish at base. Leaves mostly rather dense, usually subtransverse to slightly obliquely inserted, clinging to stem, slightly funnel shaped, loosely folded to almost explanate with incurved lobes, more or less symmetrical or with larger ventral lobe, ovate to ovate-rectangular or trapezoidal; sinus descending to 1/3–1/6 leaf length, deeply lunate to widely obtuse-angular; lobes obtuse to triangular, with ends usually brownish. Cells slightly collenchymatous, colourless, with triangular to concave thickenings, median (18)20–27(30) × (25)27–40(45) μm; oil-bodies 5–10 per cell, granulate, biconcentric, spherical and 5–7 μm in

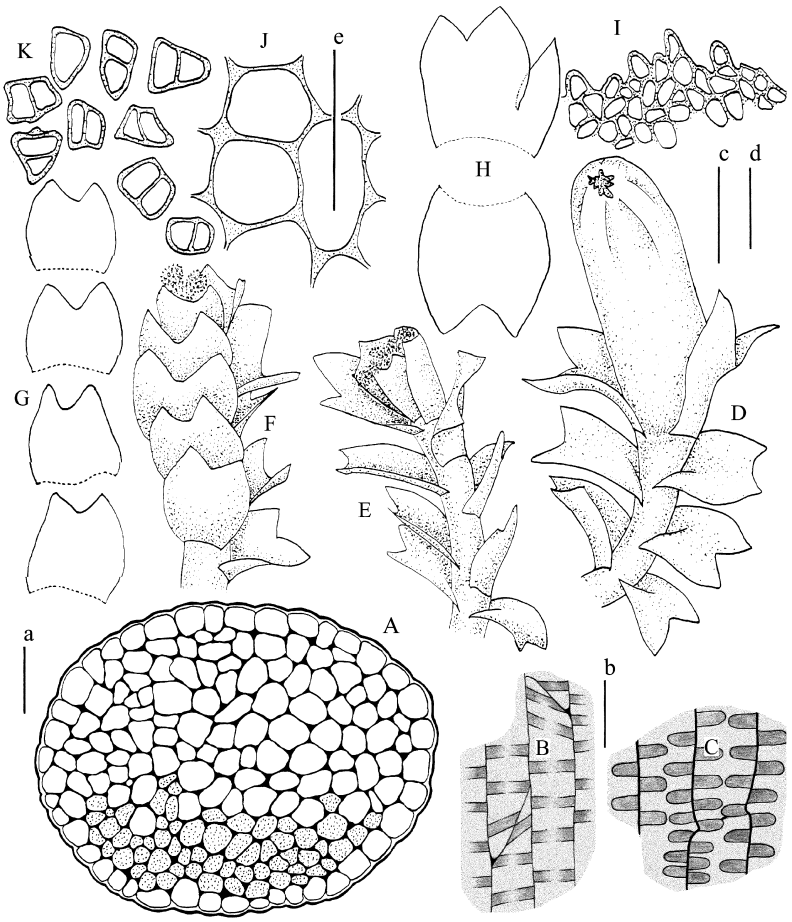

Fig. 1. *Lophozia lantratoviae* Bakalin (from holotype). — **A**: Stem cross section. — **B**: Cells of inner layer of capsule. — **C**: Cells of outer layer of capsule. — **D**: Perianthous shoot. — **E**, **F**: Gemmiparous shoots. — **G**: Sterile leaves. — **H**: Bracts and bracteole. — **I**: Perianth mouth. — **J**: Leaf cells. — **K**: Gemmae. Scale bars: use a = 70 μm for **A**; b = 10 μm for **B** and **C**; c = 1000 μm for **D**–**H**; d = 100 μm for **I**; and e = 50 μm for **J** and **K**.

diameter or short-ellipsoidal and 5–6 × 5–8 μm; cuticle smooth. Underleaves lacking. Gemmae abundant on tips of apical leaves, (1)2-celled, brownish to brown or colourless when immature, angulate with protruding angles, 3–4-, more rarely 5-angled, 10–16 × 13–18 μm; oil-bodies in gemmae 5–8 per cell, sphaerical, 2.5–4 μm in diameter, biconcentric.

Dioicous. Female bracts almost explanate with more or less incurved lobes, 2–3-lobed. Bracteole lanceolate. Perianth wide-cylindrical or obovate, mouth pluriplicate, with 1(2)-celled teeth. Capsule 3(4)-stratose. Cells of outer layer 13–16 μm thick, in inner layers 8–10 μm thick. Spores 10–12 μm in diameter, slightly papillose.

This species grows on sandy soil along streams. It may be associated with *Tritomaria exsectiformis*, *Dicranella* spp. and some pioneer mosses and hepatics.

The combination of biconcentric oil-bodies and brown gemmae is the main diagnostic feature of the species. The habit, dentation of perianth mouth and structure of oil-bodies resemble *Lophozia silvicola*, but *L. lantratoviae* differs from it in the pigmentation of gemmae (brown vs. green to colourless) and (to some degree) in leaf shape, since the leaves are wider below median part. *Lophozia lantratoviae* may also be mistaken for *L. longidens*, but the biconcentric oil-bodies, dentate perianth mouth, and obliquely inserted, more or less wide leaves are diagnostic. *Lophozia longidens* has granulate and non-biconcentric oil-bodies, a ciliate perianth mouth, and transversely inserted, narrower leaves.

The coloration of gemmae resembles *Lophozia sudetica*, but *L. lantratoviae* differs from *L. sudetica* in a number of features: biconcentric vs. non-biconcentric oil-bodies, sharply dentate vs. crenu-

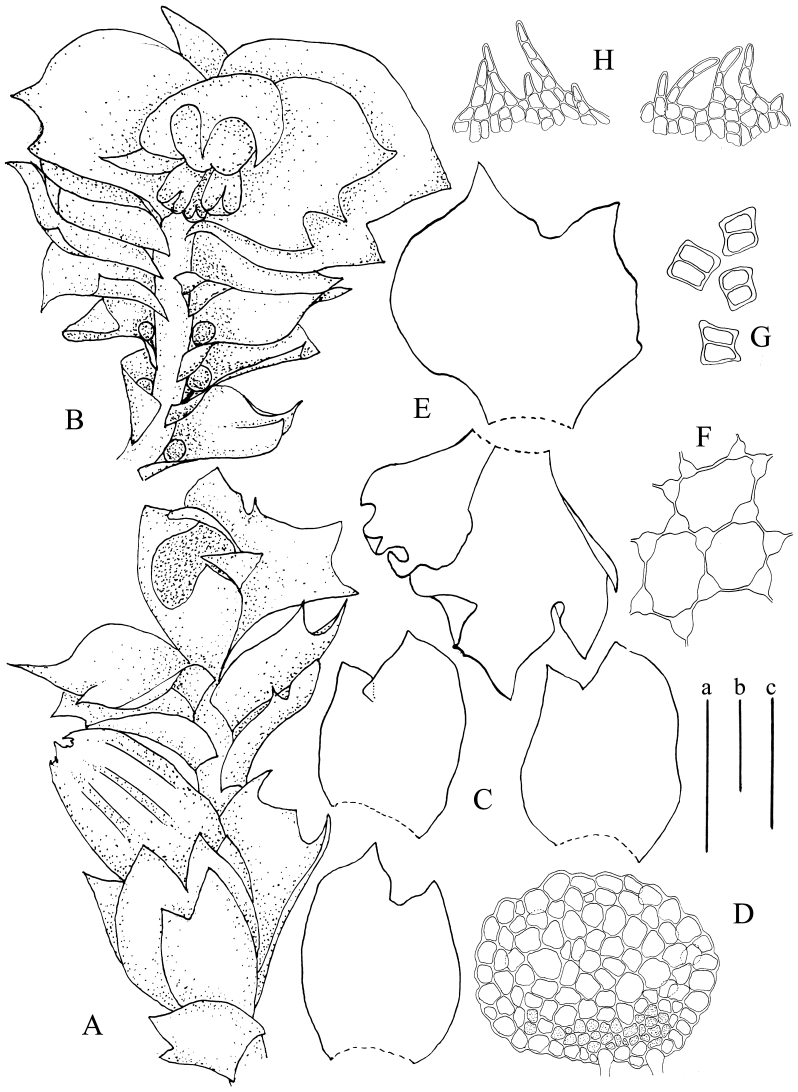

Fig. 2. *Lophozia austro-sibirica* Bakalin (**B**, **C**, **E–G** from holotype; **A**, **D**, **H** from paratype, KPABG). — **A**: Perianthous shoot. — **B**: Fertile shoot. — **C**: Sterile leaves. — **D**: Stem cross section. — **E**: Bracts and bracteole. — **F**: Leaf cells. — **G**: Gemmae. — **H**: Perianth mouth. Scale bars: use a = 1000 *µ*m for **A–C**; b = 100 *µ*m for **D** and **H**; and c = 50 *µ*m for **F** and **G**.

late-denticulate perianth mouth, constant absence of rusty-brown pigmentation of shoots that is very characteristic for *L. sudetica*.

Lophozia lantratoviae seems to belong in sect. *Lophozia* due to the relatively obliquely inserted leaves with rather broad, often obtuse or rectangular lobes, decumbent growth, strong dorsiventral differentiation of the stem medulla, and shortly dentate perianth-mouth. In this section only *L. lantratoviae* has coloured gemmae.

ETYMOLOGY: The species is named in honour of Dr. A. S. Lantratova, a Karelian dendrologist and my first scientific supervisor.

ADDITIONAL SPECIMENS EXAMINED (paratypes): **Russia**. Area of Baikal Lake, Snezhnaya River, 6.VIII.1999 *V.A. Bakalin* (KPABG); Vydrinaya River, 7.VIII.1999 *V.A. Bakalin* (KPABG).

Lophozia austro-sibirica Bakalin, *sp. nova* (Fig. 2)

Planta intense viridis. Ramulus 5–10 mm longa et 1.5–2.5 mm lata. Caulis 0.2–0.5 mm lata, dense foliosus. Segmentum caulis ventrali fusco-rubrum vel purpurescens. Folia ad normam bilobata, raro trilobata, caulem amplectens

infundibularis, valde asymmetrica. Paroecius. Folia perichaetialia 3–4(5)-lobata. Perianthium ore ciliato vel lobulato cum uniserialis cilia 3–5-cellularis. Gemmae hyaline vell pallide virides.

HOLOTYPE: Russia. Parabaikalia, Baikalsk, *Abietum graminosa-hylocomiosum,* 4.VIII.1999 *V.A. Bakalin* (KPABG).

Plants bright green in pure mats or mixed with *Sanionia uncinata* and various hepatics. Shoots 5–10 mm long and 1.5–2.5 mm wide. Stems 0.2–0.5 mm wide, ventral side brown-red with purple tinge, medulla with small cells in 3–5 layers. Leaves bi- to trilobed, almost transversely inserted, with slightly decurved ventral part of insertion, dense, with often obscurely incurved lobes; somewhat loosely and obscurely conduplicate-canaliculate; base funnel shaped, clinging to stem; dorsally strongly secund with a convex ventral margin and an almost straight antical margin; slantwise broadly ovate to quadrate-ovate; 0.5–0.6 mm long and 0.3–0.5 mm wide; sinus gibbous or obtuse-angular, descending to 1/5–1/3 leaf length; lobes triangular to broadly triangular, acute, unequal. Cells thin-walled with convex to strongly bulging trigones, 21–40 × 22–30 μm, cuticle smooth. Gemmae pale-green to hyaline, (3)4(5)-angled with obscurely protruding angles, 15–20 × 13–17 μm.

Paroicous. Androecia below gynoecia, usually of 3–4 pairs of bracts, those usually 3-lobed, 1–2-androus. Male bracts entire-lobed. Female bracts variable, larger then leaves, 3–4(5)-lobed. Bracteole 1–2-lobed, lanceolate. Perianth rather cylindrical, pluriplicate, mouth lobulate with 3–5-celled unistratose cilia.

This species is restricted to *Abies*-dominated and swampy *Picea* forests of South Siberia, where it grows on damp, shaded decaying wood with various other Lophoziaceae (*Anastrophyllum michauxii*, *Lophozia ascendens*, etc.), *Blepharostoma trichophyllum*, *Bazzania bidentula*, *Lepidozia reptans*, *Geocalyx graveolens*, *Mylia taylori*, *Cephalozia* spp., etc. Of mosses, only *Sanionia uncinata* was seen mixed with *Lophozia austro-sibirica*.

Lophozia austro-sibirica differs from most congeners in the paroicous inflorescences and greenish gemmae. Also *L. excisa* has paroicous inflorescences, but it differs from the new species in pigmented gemmae, softer texture, more delicate and leptodermous cells, as well as more or less dentate bracts. The dorsally strongly secund leaves and lobulate perianth mouth of *L. austro-sibirica* resemble *L. lacerata*, which, however, is dioicous and has a not bracteoled perianth. In appearance, some shoots of *L. austro-sibirica* resemble *L. silvicoloides*, but the differences include the non-biconcentric oil-bodies and dorsally secund leaves. As *L. lantratoviae*, also *L. austro-sibirica* appears to be a member of sect. *Lophozia*.

ADDITIONAL SPECIMEN EXAMINED (paratype): **Russia**. Tomsk Prov., Zyryansk districtus, Tuendaj, *Piceetum hylocomiosum*, 20.VII.1998 *E.D. Lapshina* (KPABG, TK).

Lophozia nepalensis Bakalin, *sp. nova* (Fig. 3)

Planta flavescofuscus, ad apex purpurescens. Ramulus 5–10 mm longa et 0.8–1.5 mm lata, ascendens. Apice caulium attenuescentis. Folia bilobata, caulem amplectens subinfundibularis. Gemmae purpureus vel porphyreus.

HOLOTYPE: East Nepal. Vorhimalaja, *Abies-Rhododendron* forest, on decaying wood, 1962 *Poelt H214* (JE).

Plants yellowish-brown, with purplish apex. Shoots 5–10 mm length and 0.8–1.5 mm wide, ascending. Shoot tips with reduced leaves commonly observed. Stem 0.2–0.5 mm wide, brownish-red to purple-black; medulla with a small-celled ventral layer to 1/3–1/2 thick (sometimes absent in apex and in attenuate shoot apices). Leaves bilobed, more or less dense, clinging to stem fairly funnel shaped, rather subtransversely oriented, somewhat concave or loosely conduplicate-canaliculate, antically oriented, unsymmetrical, with a convex ventral margin, 0.7–1.0 mm long and 0.7–0.9 mm wide, sinus obtuse to U-shaped; lobes triangular, obtuse. Cells thin, with triangular thickenings, lumen subrounded, 20–26 × 22–28 μm. Gemmae purple to wine-red 4–5(6)-angled, 10–15 × 13–18 μm with obscurely protruding angles, 1–2-celled.

Dioicous. Androecia becoming intercalary; bracts saccate or gibbous basally, usually in 3–4(5) pairs. Gynoecia unknown.

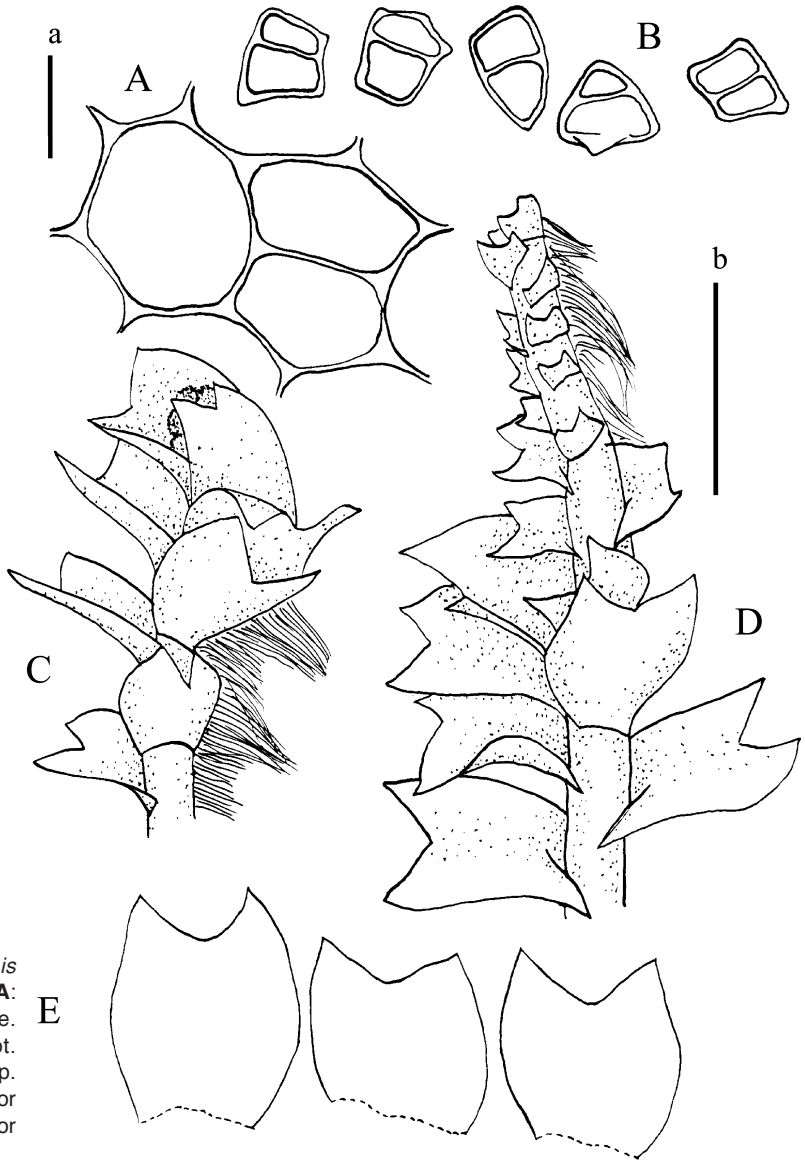

Fig. 3. *Lophozia nepalensis* Bakalin (from holotype). — **A**: Leaf cells. — **B**: Gemmae. — **C**: Gemmiparous shoot. — **D**: Shoot with a slender tip. Scale bars: use a = 15 *μ*m for **A** and **B**; and b = 1000 *μ*m for **C** and **D**.

The appearance, stem morphology, pigmentation of shoots, and insertion of leaves in *Lophozia nepalensis* resemble *L. ventricosa* var. *guttulata*. However, the former differs in purple gemmae and attenuate shoot apices. Differences between *L. nepalensis* and *L. longidens* are: (1) acute-lobed leaves with angulate sinus vs. more or less hornlike lobes and U-shaped sinus, (2) concentration of gemmae (purple, not red-brown) in apical leaves, not on lobe tips, (3) funnel-like base of the leaves, which are loosely canaliculate-conduplicate vs. almost transversely inserted and decurved *L. longidens*, and (4) presence of attenuate shoot apices.

Type specimen was identified as *Lophozia handelii*, but *L. nepalensis* differs from that taxon in purple vs. colourless gemmae and absence of flagellae.

Lophozia handelii is a taxon that, although known for 70 years, has been poorly understood. I studied specimens so named in JE and they represent different taxa (including even *Scapa-*

nia apiculata). The type specimen of *L. handelii* represents a fairly typical *L. ventricosa* var. *guttulata*.

Lophozia ventricosa (Dicks.) Dum. var. ***guttulata*** (Lindb. & H.W. Arnell) Bakalin

Arctoa 10: 208. 2001. — *Jungermannia guttulata* Lindb. & H.W. Arnell, Musci As.-Bor.: 51. 1889.

Lophozia handelii Herzog *in* Handell-Mazzetti, Symb. Sin. 5: 14. 1930, *syn. nov.* Type: China. Yunnan, 21.VII.1915 *Handel-Mazzetti 1285* (JE!).

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