

A NEW SPECIES OF *TRITOMARIA* (LOPHOZIACEAE)
FROM THE KOREAN PENINSULA

НОВЫЙ ВИД *TRITOMARIA* (LOPHOZIACEAE)
С КОРЕЙСКОГО ПОЛУОСТРОВА

V. A. BAKALIN¹, S.-S. CHOI² & B.-Y. SUN²

В. А. БАКАЛИН¹, С.-С. ЧОЙ², Б.-Ю. САН²

Abstract

Tritomaria koreana Bakalin, S.-S. Choi & B.-Y. Sun is described as new to science from south of Korean Peninsula. The striking characteristics of the new species are green to whitish green 1-celled angular gemmae, 2-lobed leaves with unequal lobes, weakly papillose leaf cuticle – a combination not present in other members of the genus.

Резюме

Tritomaria koreana Bakalin, S.-S. Choi & B.-Y. Sun – новый вид описанный из южной части Корейского полуострова. Отличительными признаками нового таксона являются зеленые до беловато-зеленых угловатые выводковые почки, 2-лопастные листья с неравными по размеру лопастями и слабо папиллозная кутикула листа; такая комбинация признаков не встречается у других представителей рода.

KEYWORDS: *Tritomaria*, hepatics, taxonomy, new species, South Korea

In the course of field works in Jiri-san National Park in the southern part of Korean Peninsula, we collected a small jungermannioid hepatic which was recognized as *Lophozia* sp. in the field. Careful examination in laboratory showed that it belongs to *Tritomaria* rather than *Lophozia* and represents a new species described as below.

Tritomaria koreana Bakalin, S.-S. Choi & B.-Y. Sun. *sp. nov.*

Plantae dioicae, ascendentes, vivide virides. Caules in sectione transversali strato microcelluloso usque ad 1/2 portionem altitudinis caulis. Folia subtransverse inserta, lobis inaequalibus, cuticula debile striolato-verrucosa, trigonis concavis. Gemmae virides vel viride-albescens, unicellulares, in angulis valde protrudentes.

Holotypus: Korean Peninsula, Gyeongsangnam-do Province, Jiri-san National Park, area

near Jiri Mt. peak (35° 20' 24.1"N 127° 43' 53.8"E), 1820 m alt. Cliff crevice on steep slope in mountain coniferous forest with *Abies koreana* E.H. Wilson dominating, leg 15 July 2009 V.A. Bakalin and S.-S. Choi H3781 (JNU, isotypus in VLA).

Plants 4.8-10.1 x 1.1-1.4 mm, ascending, yellowish green. Stems to 175-200 µm in height and ca. 225-237.5 µm width, sparsely branching, cell walls thin along margin, ventral surface red-brown; rhizoids common, originating from dorsal side of stem at right angle. Leaves subtransversely inserted, spreading to erect-spreading, somewhat sulcate, distant, with apices deflected from the apex, ovate, 0.5-0.7 x 0.7-0.85 mm, divided by V(U)-shaped sinus descending to 1/3 of leaf length into 2(-3) unequal lobes with acute to elongate-acute apices, top of stem bearing cluster of gemmae; cells of midleaf nearly subquad-

¹ – Institute of Biology and Soil Science, 100 let Vladivostoku Street, 159, Vladivostok, 690022, Russia. E-mail: v_bak@list.ru

² – Faculty of Biological Sciences, Chonbuk National University, Jeonju, Jeonbuk Province, S. Korea. E-mails: hepaticae@chonbuk.ac.kr & sunby@chonbuk.ac.kr

Table 1. A comparison of *Tritomaria koreana* with related species (data on *T. camerunensis* are after Arnell, 1958)

Character	<i>Tritomaria koreana</i>	<i>T. mexicana</i>	<i>T. exsectiformis</i>	<i>T. camerunensis</i>	<i>Lophozia longidens</i>
Width of shoots, mm	1.1-1.4	1.6-2.0	1.6-2.0	ca. 0.8-1.2	1.1-2.0
Width of stem, μm	225-237.5	170-190	240-275	180-240	200-300
Size of leaves, mm	0.7-0.85 x 0.5-0.7	0.6-0.8 x 0.53-0.65	0.8-0.9 x 0.75-0.9	ca. 0.6 x 0.5	0.6-1.0 x 0.8-1.0
Number of lobes	2(-3)	2	(2-3)	2-3	2(-3)
Lobes	unequal	equal to subequal	unequally 3-lobed or more rarely strongly asymmetrically 2-lobed	unequal to strongly so	equal to subequal
Shape of sinus	U(V)-shaped	U-shaped	angular to U-shaped	gibbous	semilunate, U-shaped to angular and (rarely) gibbous
Midleaf cell length, μm	20-32.5	(12-)14-22(-25)	20-36(-40)	ca. 30	25-35
Midleaf cell width, μm	15-25	(12-)14-20(-25)	17-22	ca. 20	23-28(30)
Midleaf cell walls	thin	thin	thin	thick	thin
Trigones	small, concave	small, concave	bulging	distinct, convex	small, but bulging
Oil-bodies n per cells	5-11	4-8	(6-9)12-15	no data	4-10(15)
Oil-bodies shape	spherical to ellipsoidal	spherical to shortly ellipsoidal	spherical to ovoid	no data	spherical to irregularly ovoid
Oil-bodies texture	faintly papillose	faintly papillose	faintly papillose	no data	papillose
Oil-bodies size, μm	2.5-5 x 5-7	3-3.5 x 3.5-6	3.0-4.5 x 4.0-5.5	no data	4-6 in diameter to 4-9 x 4.5-10
Gemmae	1-celled, angular	1-celled, angular	2-celled, angular	1-celled rounded to 2-celled, angular	(1-2)-celled
Color of gemmae	green to greenish white	rusty-red to blackish purple	rusty-red	red brown	reddish yellow to reddish brown and purple
Gemmae, size, μm	10-12.5 x 12.5-15	18-23 x 20-26	13-20 x 16-26	14 x 14-22	14-24 x 20-30

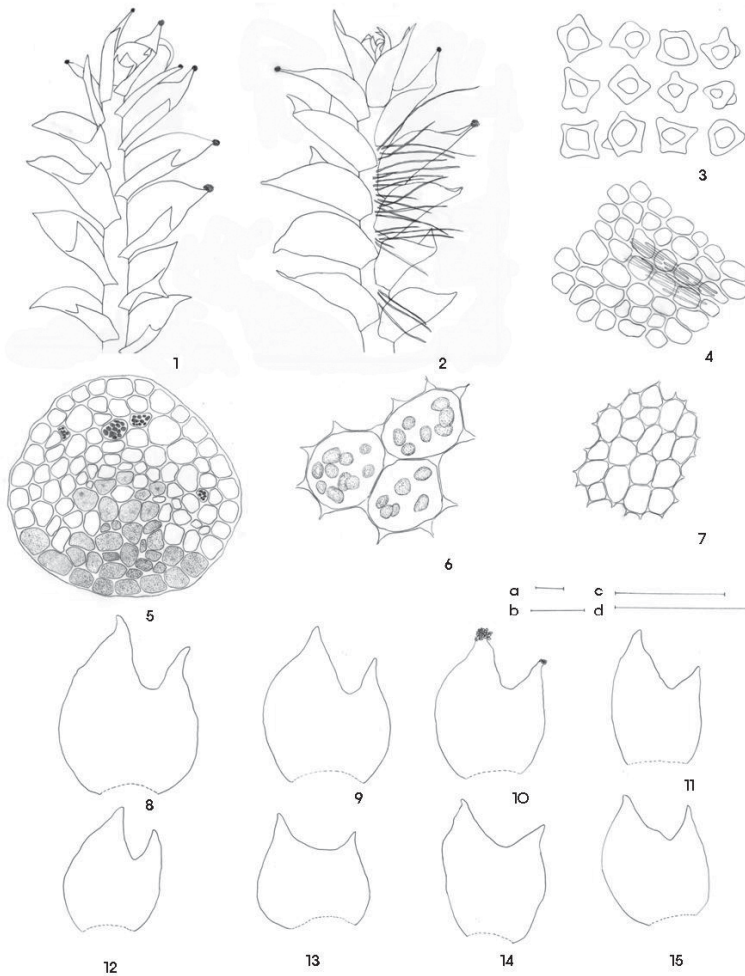


Fig. 1. *Tritomaria koreana* Bakalin, S. Choi et B.-Y. Sun. 1 – plants, dorsal view; 2 – plants, ventral view; 3 – gemmae; 4 – cells in the leaf base; 5 – stem cross section; 6 – oli-bodies in the midleaf; 7 – cells in the midleaf; 8–15 – leaves. Scales: a – 10 μm for 3, 6; b – 50 μm for 4, 7; c – 100 μm for 6; d – 1 mm for 8–15. All from holotype (JNU).

rate to rectangular, 15–25 \times 20–32.5 μm , in leaf base ca. 20–37.5 μm in length; cuticle smooth or sometimes striolately verrucose, wall thin, trigones concave; oil-bodies spherical to ellipsoidal 2.5–5 \times 5–7 μm , faintly papillose, 5–11 per cell; underleaves absent. Specialized asexual reproduction by gemmae at apex of shoots, greenish white, commonly 5–6 sided to polygonal in shape, 12.5–15 \times 10–12.5 μm , 1-celled, with strongly protruding angles. Sexual condition dioicous (only old androecious branch was seen).

The species described here has an intermediate position between two genera: *Lophozia* s. str. and *Tritomaria*. The species relates with *Lophozia* in having slightly or not elongated cells in the leaf base and weakly papillose leaf cuticle (in *Lophozia* exclusively smooth). At same time, the species has common characteristics with *Tritomaria*

in leaf (especially lobes) shape, general appearance, and (to some extent) gemmae morphology. In any way the generic position of new species will remain unclear until perianth will be found.

Within *Tritomaria*, the species seems to be most closely related to *T. exsecta*-group which includes four species: *Tritomaria exsecta* (Schmid. ex Schrad.) Loeske and *T. exsectiformis* (Breidl.) Schiffn. ex Loeske, widely distributed in Boreal and Temperate Holarctic regions, *T. camerunensis* S.W. Arnell, described from high elevation in equatorial Africa and *T. mexicana* Bakalin, recently described from subtropical Mexico (Bakalin, 2008). *Tritomaria koreana* differs from all above mentioned species in a) green to whitish green color of gemmae versus rusty-red to purplish and blackish gemmae, b) weakly (and only in leaf base) pap-

illose leaf cuticle versus distinctly and thoroughly papillose leaf cuticle, c) unicellular gemmae versus exclusively 2-celled (except *T. mexicana*, where gemmae color is red, rusty-red or blackish purple and leaf lobes nearly equal) gemmae.

Among *Lophozia* s. str., *T. koreana* seems to be most similar to *Lophozia longidens* (Lindb.) Macoun of sect. *Excisae* R.M. Schust. However, new species differs from the latter in a) green to whitish green color of gemmae versus reddish yellow to reddish brown and purple gemmae, b) strongly unequal lobes versus equal to subequal lobes, c) not deflexed leaf apices at shoot apex versus constantly and very characteristically deflexed leaf apices from shoot's top, and d) elongate and apiculate-acute leaf lobe apices versus mainly horn-like and obtuse leaf lobe apices.

The distinction between *T. koreana* and its closely related taxa are given in Table 1.

Currently the species is known only from the type locality and its ecological informations are incomplete. It was collected in deep, but not shaded crevice in vertical cliff - a habitat not common for related species. It was accompanied by *Tetralophozia filiformis* (Steph.) Urmi, *Marsupella pseudofunckii* S. Hatt. *Bazzania bidentula*

(Steph.) W. E. Nicholson, *Herbertus dicranus* (Taylor ex Gottsche et al.) Trevis., *Anastrophyllum assimile* (Mitt.) Steph., *Scapania ampliata* Steph., *Nipponolejeunea pilifera* (Steph.) S. Hatt., *Cheilolejeunea obtusifolia* (S. Hatt.) S. Hatt., etc. Almost all of them are characteristic species distributed at higher belts of high mountains in south of Korean Peninsula.

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