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TWO NEW TAXA OF *SOLENOSTOMA* (SOLENOSTOMATACEAE, HEPATICAE) FROM CHINA

ДВА НОВЫХ ТАКСОНА *SOLENOSTOMA* (SOLENOSTOMATACEAE, HEPATICAE) ИЗ КИТАЯ

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Abstract

The paper describes two new taxa of *Solenostoma* from China, basing on study of Chinese collections in PE and IFP. *Solenostoma purpuratum* (Mitt.) Steph. var. *koponenii* Bakalin et Li Wei *var. nov*. is different from var. *purpuratum* in smaller size of plants, smaller and transversely elliptic leaves. The next taxon, *Solenostoma sichuanica* Bakalin et Li Wei *sp. nov*., belongs to *S. pyriflorum-sphaerocarpum* complex and is characterized by gentle texture, pale yellow-brownish pigmentation (without admixture of red or purple pigmentation), instability of rhizoid orientation, loosely 3-plicate perianth in its upper part and commonly obscurely beaked mouth.

Резюме

В статье описываются два новых таксона *Solenostoma* из Китая на основании изучения крупнейших китайских коллекций из PE и IFP. *Solenostoma purpuratum* (Mitt.) Steph. var. *koponenii* Bakalin et Li Wei var. nov. отличается от var. *purpuratum* мелкими размерами растений, мелкими и поперечно эллиптическими листьями. *Solenostoma sichuanica* Bakalin et Li Wei *sp. nov*., принадлежит к комплексу *S. pyriflorum-sphaerocarpum* и характеризуется нежной текстурой растений, бледной желтовато-буроватой окраской (без примеси красной или пурпурной пигментации), нестабильным положением ризоидов, неявно 3-складчатым периантием в верхней части с обычно неясно клювовидным устьем.

KEYWORDS: *Solenostoma*, taxonomy, liverworts, Himalaya, Sichuan.

Solenostoma is the genus with the worldwide taxonomic diversity center in the Himalaya and has a quite limited number of entities in other parts of the world. The state of knowledge on species composition in many regions outside of Europe, Boreal Asia and America is far from perfect. According to our estimates, a number of recognized species in East Asia (in the broad sense of this term) is likely to increase by 20-30% in the course of future studies (cf. Bakalin, 2013). Currently, while working in the largest Chinese herbaria of PE and IFP, the senior author has revealed some taxa new for science, two of them are described below.

Solenostoma purpuratum (Mitt.) Steph. var. **koponenii** Bakalin et Li Wei **var. nov.**

Plants erect to ascending in loose patches, brownish to yellowish brownish, 375-1100 μm wide and 5-7 mm long. Stem 125-225 μm in diameter, brown, not branched with the exceptions of lateral or dorsal subfloral innovations (1-3 per perianth). Rhizoids sparse to numerous, commonly forming distinct fascicle decurrent down the stem, grayish. Leaves distant to rarely contiguous, subtransversely inserted, dorsally decurrent for ca. 1/2 of stem width, ventrally decurrent for 1/3 of stem width, slightly convex, mostly transversely elliptic, 475-625×725-1025 μm. Midleaf cells subisodiametric to shortly oblong, walls brownish to colorless, thin, 17.5-30.0×17.5-25.0 μm, trigones moderate to small, concave to triangle; cells along margin 10-18 μm, thin-walled with thick to thin-walled and commonly discolored external wall, trigones moderate, concave to convex; cuticle smooth to slightly papillose near leaf base. Dioicous? (Androecia not seen) Perianth shortly fusiform to obpyriform, 3-plicate, gradually narrowed to not beaked mouth, composed by subisodiametric cells, 2(-3)-stratose in lower half.

Holotypus: China, Sichuan Province, Maerkang County, North of Qiang-Lai Range, 3000 m alt., on soil, leg. T. Koponen (field number 47490) 23 Sept. 1991, PE (PE-1735267).

The new variety is characterized by combination of fasciculate rhizoids decurrent down the stem, absence of red or purple pigmentation, more or less ventricose leaves

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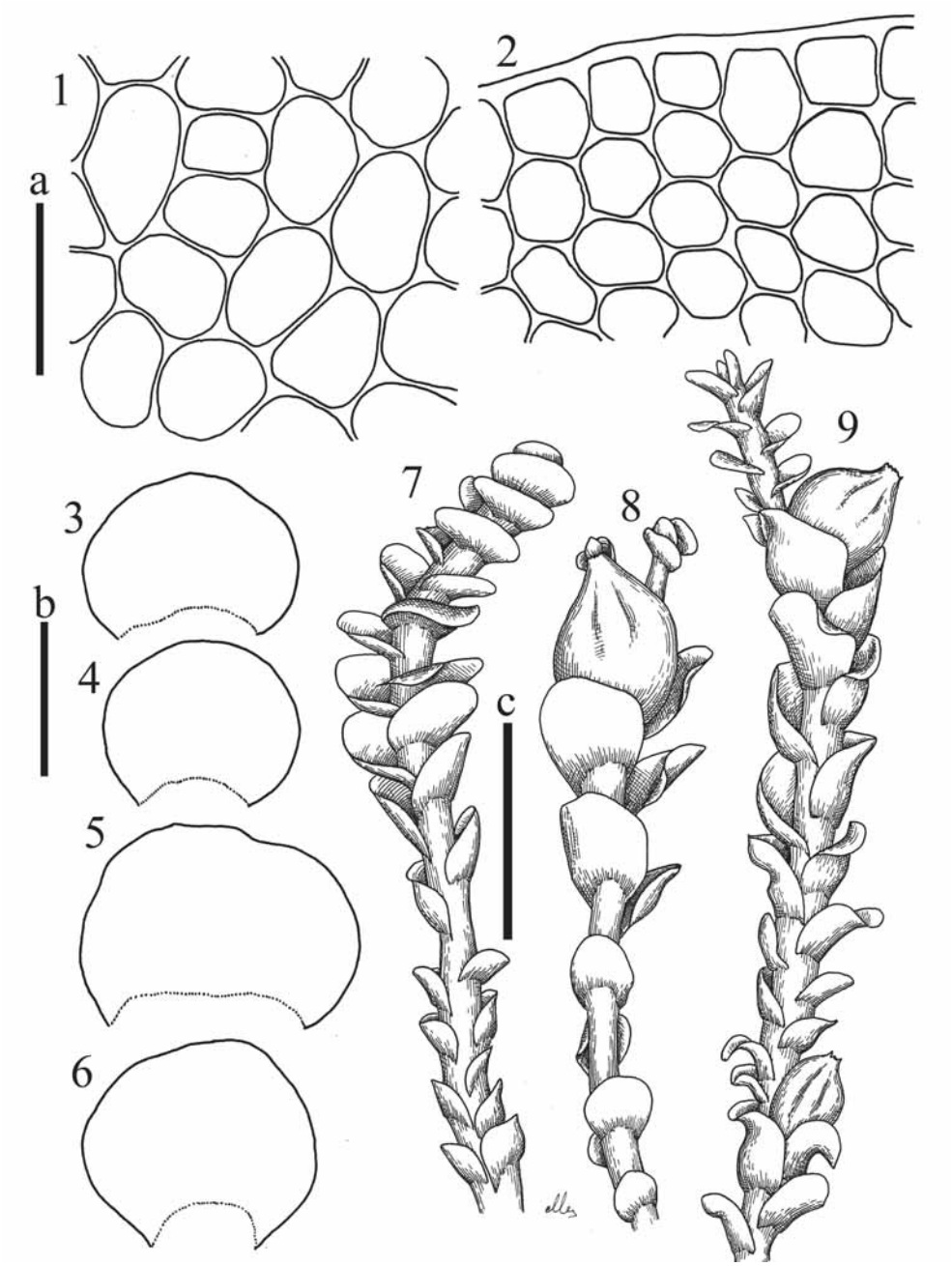

Fig. 1. *Solenostoma purpuratum* (Mitt.) Steph. var. *koponenii* Bakalin et Li Wei. 1 – midleaf cells; 2 – cells along leaf margin; 3-6 – leaves; 7 – sterile plant; 8, 9 – perianthous plant. Scales: a – 30 μm, for 1, 2; b – 500 μm, for 3-6; c – 1 mm, for 7-9. All from holotype (PE-1735267).

(although they are free of antheridia) which are erect to obliquely spreading (not appressed to the stem) and erect growth form. We were able to find only one closely related taxon *Solenostoma purpuratum* (Mitt.) Steph., which is sparsely distributed in the Himalaya. The latter is characterized by aforementioned features and, despite its name, also by absence of purple pigmentation. Its first more or less detailed description and illustrations were published by T. Amakawa (1967) basing on study of type collection (NY). We re-studied the lectotype (NY-00967458) and agreed with the species concept of the taxon in Amakawa (l.c.). The relationships of two varieties remain unclear. Var. *koponenii* differs from var. *purpuratum* in smaller size of plants (1.320-1.760 mm wide in var. *purpuratum* type versus 0.375-1.1 mm in var. *koponenii*), smaller but relatively wider leaves (880-924×836-1210 μm versus 475-625×725-1025 μm), which are cordate (Amakawa, 1967) to obliquely triangular in var. *purpuratum* versus transversely elliptic in var. *koponenii*. We suggest that future researches will probably show that this taxon merits species rank, but now this decision seems to be premature due to imperfect data.

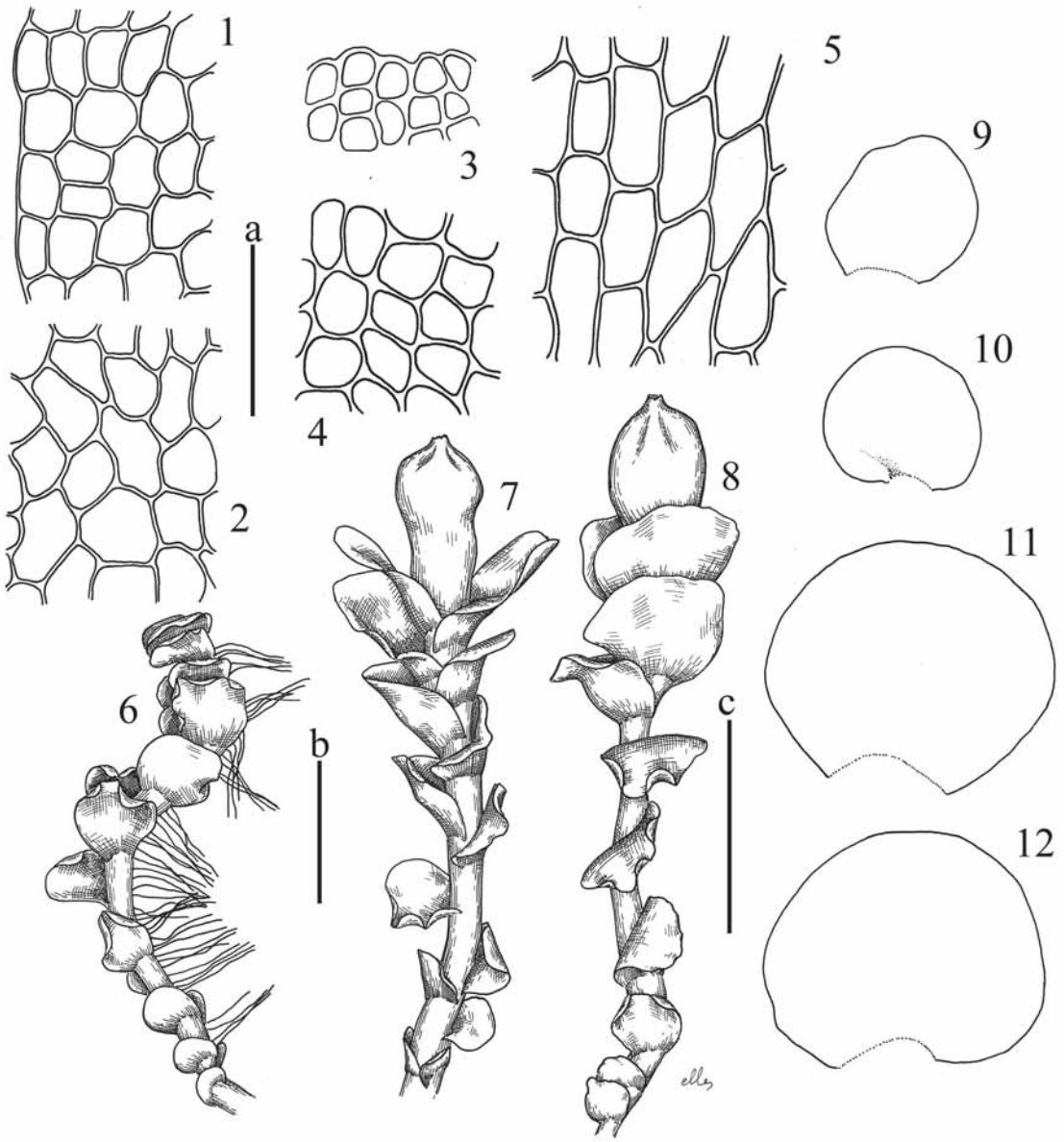

Fig. 2. *Solenostoma sichuanica* Bakalin et Li Wei. 1 – cells along leaf margin; 2 – midleaf cells; 3 – perianth mouth; 4 – cells in perianth middle; 5 – cells near perianth base; 6 – sterile plant, 7, 8 – perianthous plants, 9-12 – leaves. Scales: a – 100 мм, for 1-5; b – 500 мм, for 6-8; c – 500 мм, for 9-12. All from holotype (IFP-24600).

Solenostoma sichuanica Bakalin et Li Wei **sp. nov.**

Plants pallid, pellucid, ascending to rarely erect in dense patches, pale yellowish, rarely gray-brown colored near apex, 500-850 μm wide (slightly wider near perianth), 3-7 mm long, soft, lax. Stem 125-175 μm in diameter, not branched, with rare exception of ventral subfloral innovations (1-2), yellowish in color. Rhizoids numerous, erect to slightly obliquely spreading, separated or united into unclear fascicles, rarely forming more or less distinct fascicle decurrent down along the stem, originated from ventral side of stem. Leaves subtransversely inserted, barely to shortly (up to 1/4 of stem width) decurrent, distant to contiguous, commonly undulate at margin, loosely concave to concave-canaliculate, (200)400-675×(300)425-875(900) μm. Midleaf cells oblong, 30.0-50.0×12.5-30.0 μm, thin-walled, with small, concave trigones, cuticle smooth; cells along margin 17.5-35.0 μm, thin-walled, with thin external wall, trigones small to moderate in size, concave, cuticle smooth. Dioicous? (Androecia not seen, but archegonia unfertilized, even in some descendant generations). Perianth clavate, loosely 3-plicate in upper 1/3, gradually narrowed to obscurely or more or less distinctly beaked mouth; composed in the most part by subquadrate to subisodiametric cells, 22.5-30.0×22.5-25.0 μm, thin-walled, with moderate in size, triangle to slightly convex trigones; mouth crenulate, composed by subquadrate to slightly elongate cells; to the perianth base cells become elongated, 42.5-62.5×17.5-23.0 μm, thin-walled, with small, concave to slightly convex trigones; bistratose in lower 1/3-1/2 of

Table 1. The differentiation features of *Solenostoma sichuanica* Bakalin et Li Wei and closely related species.

Feature	*S. pyriflorum* Steph.	*S. sphaerocarpum* (Hook.) Steph.	*S. confertissimum* (Nees) Schljakov	*S. sichuanica* Bakalin et Li Wei
Rhizoids forming distinct fascicle decurrent down the stem	–/+	–	+/–	–/+
Inflorescence	Dioicous	Paroicous	Paroicous	Dioicous
Rhizogenous cells in leaf lamina	–	–	+	–
Red or purplish pigmentation of plants	+	–	+	–
Distinct beak in perianth mouth	+	+	+/–	–/(+)
Soft textured plants	–	–	+/–	+/–
Perianth upper part plication	Distinctly 4-5-plicate	Distinctly 4-5-plicate	Distinctly to loosely 3-5-plicate	Loosely 3-plicate
Bistratose lower third of perianth	+	–	–	+

its length; perigynium virtually absent; female bracts similar to leaves, concave, loosely undulate, rarely slightly crispate at margin.

Holotypus. China, Sichuan, Muli County, leg. Gao C., date unknown, field no. 21125 IFP (IFP24600)

Other specimens examined (Paratypes) China, Sichuan, Muli County, leg. Gao C., date unknown, field no. 20423 IFP (IFP24601); leg. Gao C., date unknown, field no. 21134 IFP (IFP24603)

Ecology of the species is poorly known. According to labels, this species grows on rocks or on soil in subalpine forest belt to alpine heathlands, in altitudinal diapason 3100-4000 m alt.

The plants of the new species are pallid, soft, lax and mostly pellucid that inclined to treat them as a depauperate phase of something from the *S. pyriflorum*-*sphaerocarpum* complex. Nonetheless, since plants were found in different specimens from different locals, we suggest this is a rather common appearance of the species, but not the result of depauperation. Aside of gentle texture, the new species is characterized by combination of pale yellow brownish pigmentation (no red or purple pigmentation was observed, although some plants from sunlight places acquire gray-brown pigmentation, but never reddish), instability of rhizoids orientation (decurrent down the stem and forming fascicle or erect spreading and separated), loosely 3-plicate perianth in its upper part and commonly obscurely beaked mouth. The differences from the most closely related species are put into table 1. All of the studied specimens are from Sichuan (and from the same local flora) that suggests this species may be treated as local endemic, but due to poor data on *Solenostoma* spp. distribution in China this conclusion may be premature.

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LITERATURE CITED

AMAKAWA, T. 1967. New or little known Asiatic species of the family Jungermanniaceae. III. – *J. Hattori Bot. Lab*. **30**: *181-198*.

BAKALIN, V.A. 2013. New taxa of Solenostoma and Plectocolea and other taxonomical novelties based on study of collections in the New York Botanical Garden. – *Polish Bot. J.* **58**(1): *127-142*.