

DITRICHOPSIS BAIKALENSIS (DITRICHACEAE, BRYOPHYTA),
A NEW SPECIES FROM ASIATIC RUSSIA

DITRICHOPSIS BAIKALENSIS (DITRICHACEAE, BRYOPHYTA) –
НОВЫЙ ВИД ИЗ АЗИАТСКОЙ РОССИИ

E.A. IGNATOVA¹ & O.M. AFONINA²

E.A. ИГНАТОВА¹, O.M. АФОНИНА²

Abstract

Ditrichopsis baikalensis is described as a species new to science from a single locality in southern Siberia (Buryatia). This is a third species of a small genus *Ditrichopsis*; *D. gymnostoma* Broth. is also represented only by a type collection in China, and *D. clausa* Broth. is known from a single locality in China and from India.

Резюме

Ditrichopsis baikalensis описан как новый для науки вид из южной Сибири (Бурятия). Это третий вид небольшого рода *Ditrichopsis*; *D. gymnostoma* Broth. также известен только по типовому образцу, а *D. clausa* Broth. был собран в одном местонахождении в Китае и в Индии.

KEYWORDS: Bryophyta, *Ditrichopsis*, new species, Siberia, Russia, taxonomy.

In the course of floristic investigation in southern Siberia, Buryatia a small peculiar plant with gymnostomous capsules was collected, which did not fit any genus from Siberian and Mongolian moss flora. After an expanded search we came to a conclusion that its closest affinity is the genus *Ditrichopsis* that includes two species described from Yunnan and Sichuan Provinces of China. Siberian plants resemble them in habit, leaf shape and costa structure; however, other characters do not fit any of two known species. Hereafter the new species is described.

Ditrichopsis baikalensis Ignatova & Afonina sp. nov. Fig. 1.

A Ditrichopsis clausa capsula stegocarpa, a D. gymnostoma pedicello curvato et theca angustiora, ab ambis plantae dimensionibus minorius, annulo praesentia et sporis minore differt.

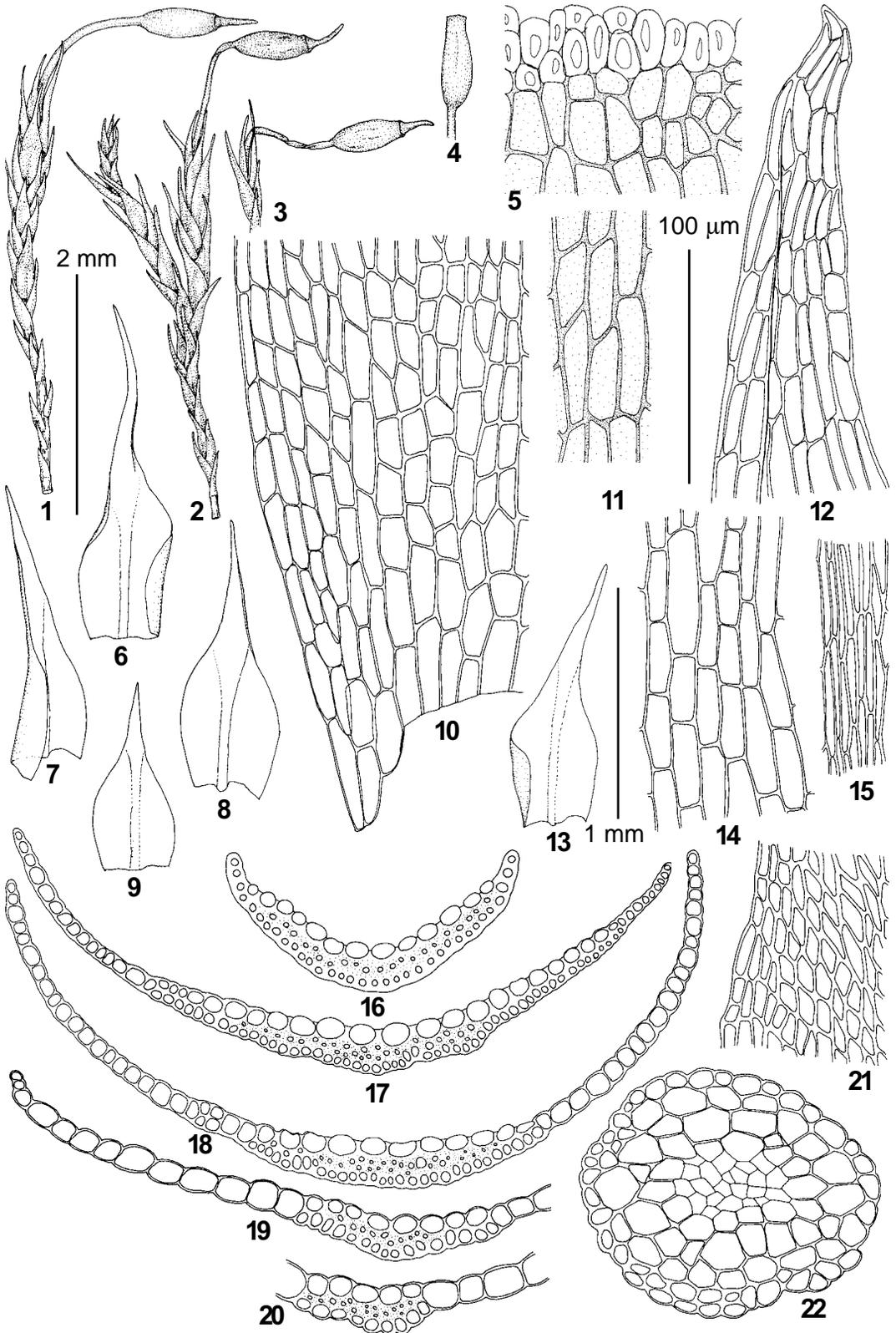
Type: Russia, southern Siberia, Transbaikalia, Republic of Buryatia, mountain at the left

bank of the Selenga River near Novoselenginsk, 51°94'N – 106°33' E, rock outcrops on hill slope, 3.VII.2007, Afonina #00507 (Holotype in LE; isotypes in MW, MHA).

Plants small, in moderately dense, easily separating tufts, green or yellowish-green in upper part, light brownish below, slightly glossy. Stems 3-5 mm, erect, simple or moderately branching, with well-developed central strand, cortical cells in 1-2 layers with moderately thickened walls. Leaves appressed at base, erect when wet and dry, 1.0-1.3×0.3-0.5 mm, from widely ovate base suddenly narrowed into narrow triangular acumen of the same length as base or slightly shorter, concave, with flat margins, entire or finely crenulate distally; costa not sharply delimited from lamina, narrow at base, gradually widening distally to the constriction of leaf from base to acumen, almost filling the acumen, with one row of guide cells exposed on adaxial surface of costa,

¹ – Moscow State University, Biological Faculty, Geobotany Dept., Moscow 119991 Russia – Россия 119991 Москва, Московский государственный университет, Биологический факультет, каф. геоботаники; arctoa@list.ru

² – V. L. Komarov Botanical Institute Rus. Acad. Sci., Prof. Popov Str., 2, St. Petersburg, 197376 Russia – Н-йцбз 197376 Санкт-Петербург, ул. Проф. Попова, 2, Ботанический институт им. В. Л. Комарова РАН; stereodon@yandex.ru



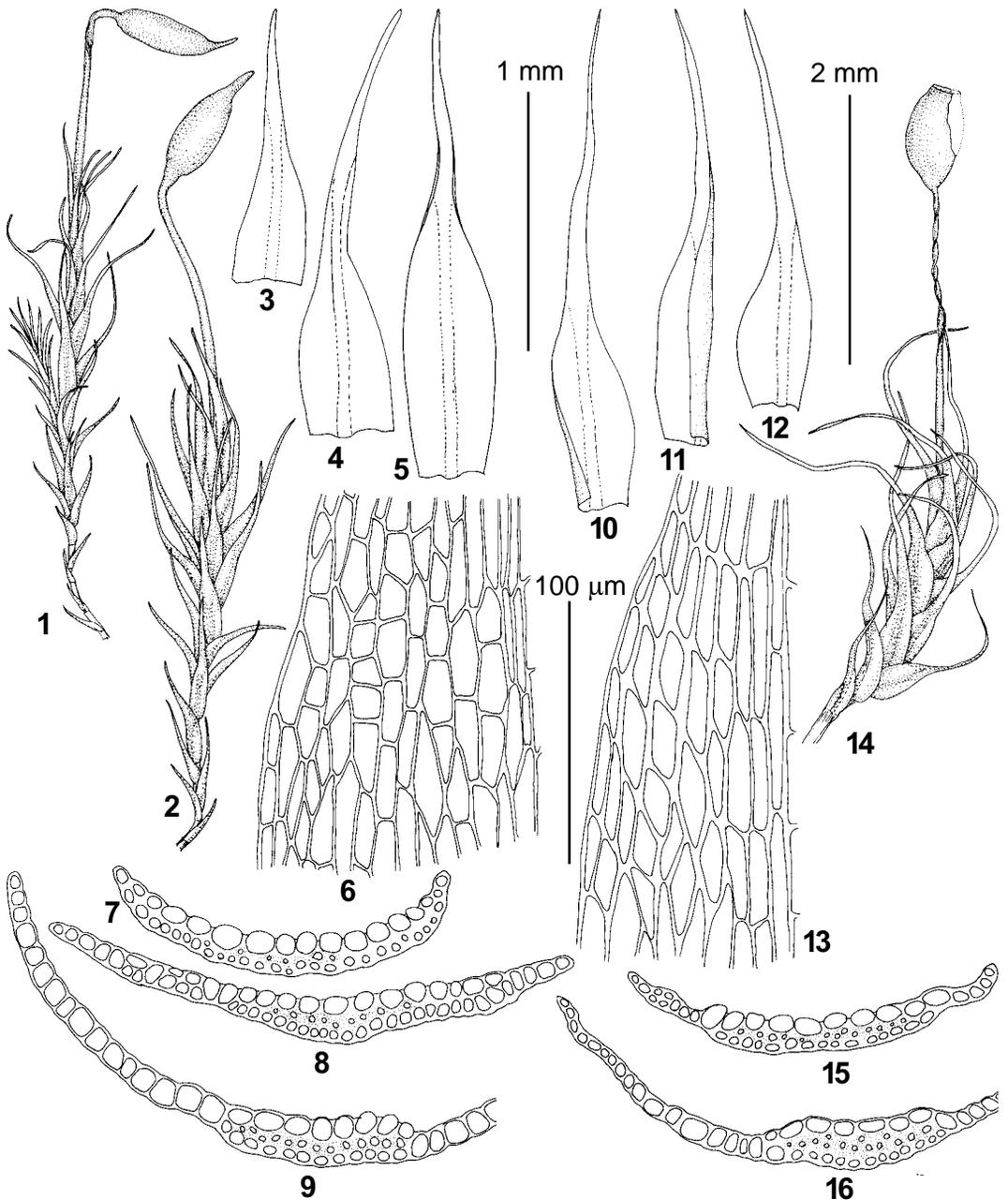


Fig. 2. 1-9 – *Ditrichopsis clausa* Broth. (from: China, Yunnan, Handel-Mazzetti #1395, H-Br); 10-16 – *D. gymnostoma* Broth. (from: China, Setschwan, Handel-Mazzetti #469, H-Br): 1, 14 – habit, dry; 2 – habit, wet; 3-5, 10-12 – leaves; 6, 13 – laminal cells at leaf shoulder; 7-9, 15-16 – leaf transverse sections. Scale bars: 2 mm for 1-2, 14; 1 mm for 3-5, 10-12; 100 μ m for 6-9, 13, 15-16.

To the left: Fig. 1. *Ditrichopsis baikalensis* Ignatova & Afonina (from Afonina #00507, LE): 1 – habit, wet; 2 – habit, dry; 3-4 – capsules; 5 – annulus; 6-9, 13 – leaves; 10 – basal laminal cells; 11 – exothelial cells; 12 – upper laminal cells; 14 – adaxial surface cells of costa; 15 – abaxial surface cells of costa; 16-20 – leaf transverse sections; 21 – laminal cells at leaf shoulder; 22 – stem transverse section. Scale bars: 2 mm for 1-4; 1 mm for 6-9, 13; 100 μ m for 5, 10-12, 14-22.

Table 1. Comparison of three species of *Ditrichopsis*

	<i>D. baikalensis</i>	<i>D. gymnostoma</i>	<i>D. clausa</i>
Leaves when dry	erect and appressed	flexuose	erect or flexuose
Leaf length	1.0-1.3 mm	1.5-2.0 mm	1.5-3.5 mm
Leaf width	0.3-0.5 mm	0.25-0.4 mm	0.25-0.4 mm
Seta	to 1.5 mm, cygneous	to 3 mm, straight	2-5 mm, curved
Capsule shape	ovate-cylindrical	ovate	ovate-cylindrical
Capsule	stegocarpous	stegocarpous	cleistocarpous
Annulus	present	absent	absent
Spores	15-18 μ m	ca. 25 μ m	ca. 25 μ m

with thick inner and thin outer walls, wide and thin dorsal stereid band and \pm differentiated dorsal epidermis, adaxial surface cells of costa rectangular, wide, abaxial surface cells linear, narrow; lamina unistratose or with few bistratose strips near costa, very narrow at base of acumen, 1-2 cells wide, upper laminal cells rectangular; cells at leaf shoulders rhomboidal, 12-20 \times 8-10 μ m, thin-walled, basal lamina cells rectangular, 20-30 \times 10-15 μ m, with thin, non-porose walls, basal marginal cells not differentiated. Dioicous. Perichaetial leaves similar to stem leaves, ca. 1-4 mm long, with longer acumen. Seta light brownish, to 1.5 mm, cygneous. Capsule stegocarpous, annulus of 2-3 rows of vesiculose cells; urn light brown, ovate-cylindrical to cylindrical, 0.7-0.8 \times 0.25-0.3 mm, narrowed to the mouth when open, smooth or weakly furrowed when dry; exothecial cells rectangular, thin-walled. Peristome absent. Operculum conic, with long and narrow, straight or oblique beak ca. 0.25 mm long. Spores 15-18 μ m, finely papillose. Calyptra cucullate.

Differentiation. All three species of *Ditrichopsis* are similar in leaf shape, cell areolation and especially in costa structure (Figs. 1-2). However, plants of *D. baikalensis* are smaller, leaves are shorter, both in basal part and acumen, but the leaf base is comparatively wide. It shares with *D. clausa* a curved, cygneous seta; however, the latter species has cleistocarpous capsules and larger spores. *Ditrichopsis gymnostoma* which has stegocarpous capsules is a considerably larger plant, with long leaf acumina, flexuose when dry, lamina cells are larger, setae are straight, urns are wider, ovate, and spores are larger. The comparison of some characters of the three species is given in Table 1.

Costa structure of *Ditrichopsis* has never been described in details earlier, neither in the original description (Brotherus, 1924, 1929), nor in further treatments (Tong & He, 1999). Our study reveals that the costa cross section in *Ditrichopsis* is very similar to that of the genus *Astomiopsis* Müll. Hal. (Snider, 1987). The latter genus includes 6 species, three of them are distributed in mountains of South America, one on Juan Fernandez Islands, one in high mountains of Mexico, and one, *A. julacea* (Besch.) K.L. Yip & Snider, in Asia, in China and Japan (Snider, 1987, 1994; Yip & Snider, 1998).

The costa in both *Ditrichopsis* and *Astomiopsis* has an exposed layer of guide cells with thin outer walls and thick inner walls, central stereid band and differentiated dorsal epidermis (cf. Figs. 1-2 and also illustrations in Snider, 1987). However, in *Astomiopsis* the costa is mostly narrow throughout, usually not considerably widened or flattened, except for perichaetial leaves of *A. julacea*. Additional similarities between these genera include small plant size and gymnostomous capsules (one species of *Ditrichopsis* is cleistocarpous), while further differences between *Astomiopsis* and *Ditrichopsis* are: (1) leaves obtuse at apex or very shortly acuminate versus moderately to long acuminate from a broadened to sheathing base; (2) seta short versus elongate; (3) operculum conic, obtuse versus longly rostrate.

Astomiopsis julacea is the most similar to *Ditrichopsis* superficially and has distribution that is quite overlapping with *Ditrichopsis*: in addition to a single locality in Tokyo area in Japan it occurs in Yunnan and Sichuan Provinces of China.

Their similarities are especially sound in plants without capsules, as in *Astomiopsis julacea*.

cea the upper leaves have broad costa filling subulate acumen. At the same time in the latter species (1) the lower stem leaves are short and obtuse, very different from acuminate leaves in *Ditrichopsis*; (2) shoulder cells are linear, vermicular and thick-walled versus rhombic. When plants have sporophytes, *Astomiopsis julacea* is immediately different by emergent capsule that is situated at the level of perichaetial leaf tips.

Ecology. *Ditrichopsis baikalensis* was collected in a rather dry habitat, on soil among rocks on slope with nipheline-sienite outcrops, at 647 m a.s.l. Both collections of the genus from China were made at high altitude, 3550 and 4000 m a.s.l., on calcareous substrates.

Distribution. *Ditrichopsis* is one of East Asiatic endemic genera discussed by Wu (1992). He placed it into Sino-Himalayan type of distribution, with the main distribution area on slopes of the Himalayas and in southwest China. The new record of the genus in Siberia widens its area considerably to the north.

There are two other oligotypic genera that have very similar distribution in Himalayas, Yunnan, Sichuan and South Siberia: *Orthodontopsis* (Ignatov et al, 2006) and *Struckia* (Ignatov et al, 2007). Interestingly, they are also quite rare plants, at least in South Siberia. In addition, the genus *Actinothuidium* likely represents the somewhat similar range, being however more widely distributed in southern China (cf. Ignatov et al., 1999), and having differentiation between northern and southern populations which was evaluated at the level of subspecies (Ignatov et al., l.c.).

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