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

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

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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,

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Fig. 2. 1-9 – *Ditrichopsis clausa* Broth. (from: China, Yunnan, *Handel-Mazzetti #1395*, H-Br); 10-16 – *D. gymnlostoma* 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 μm 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 – exothecial 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 μm for 5, 10-12, 14-22.
with thick inner and thin outer walls, wide and thin dorsal stereid band and ± 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, 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.

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

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 jula-
Ditrichopsis baikalensis, a new species from Asiatic Russia

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 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.

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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