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THE GENUS AONGSTROEMIA (DICRANACEAE, BRYOPHYTA) IN RUSSIA

РОД AONGSTROEMIA (DICRANACEAE, BRYOPHYTA) В РОССИИ

TATYANA P. DRUGOVA[1]

ТАТЬЯНА П. ДРУГОВА[1]

Abstract

Three species of *Aongstroemia* are known in Russia: *A. longipes* (Sommerf.) Bruch et al., *A. julacea* (Hook.) Mitt. and *A. orientalis* Mitt. Key for identification, species descriptions and illustrations are given.

Резюме

Род *Aongstroemia* представлен в России тремя видами: *A. longipes* (Sommerf.) Bruch et al., *A. julacea* (Hook.) Mitt. и *A. orientalis* Mitt. Приводится ключ для определения видов, описания и иллюстрации.

KEYWORDS: *Aongstroemia,* Dicranaceae, mosses, phytogeography, Russia, taxonomy.

INTRODUCTION

Recent investigation of anthropogenic habitats in Murmansk Province has revealed many localities of *Aongstroemia longipes*. The genus is represented in Russia by three species. Herbarium collections of the genus from MHA, LE, and KPABG have been revised. We provide a description and illustrations for these species.

Aongsroemia Bruch, Schimp. & Gümbel, Bryol. Eur. 1: 171. 1846.

Type species: *A. longipes* (Sommerf.) Bruch, Schimp. & Gümbel (= *Weissia longipes* Sommerf.)

Plants small, in loose or dense tufts, or growing by separate shoots, pale-green, golden-green or yellowish brown. Stems 1-2 cm, erect, simple or slightly branched. Leaves imbricate, symmetric or asymmetric, ovate, ovate-lanceolate or shortly linguate, obtuse, broadly acute or acuminate, concave, cochleariform; margin entire, undulate, serrate or serrulate; lamina unistratose; costa strong, smooth, ending below apex; median laminal cells narrow hexagonal to rhomboidal, thick-walled, at margins narrower and thin-walled; basal cells rounded-quadrate, irregularly narrow rectangular or short rectangular. Dioicous. Seta 1-1.5 cm, straight, red. Capsule erect, symmetric, ovate, red-brown. Peristome teeth divided in distal half or undivided, vertically striolate to almost smooth proximally, papillose to smooth distally. In Russia sporophytes are known only for one species.

KEY FOR IDENTIFICATION OF *AONGSTROEMIA* SPECIES IN RUSSIA

1. Lower leaves ovate-lanceolate, obtuse to shortly acuminate; upper leaves from broad sheathing base abruptly narrowed to acuminate or subulate acumen; leaf margins smooth, in upper part slightly undulate; gemmae absent; occasionally with sporophytes ..... *A. longipes*
— All leaves ovate to shortly lingulate, obtuse and rounded in apex or broadly acute; leaf margins serrate or serrulate distally; gemmae present; sporophytes unknown in Russia .. 2
2. Leaves cochleariform, shortly linguate, ovate or shortly ovate, symmetric, obtuse or rounded at apex; margins serrate in upper half of leaf or occasionally almost throughout .... *A. julacea*
— Leaves ovate to shortly linguate, broadly acute, asymmetric, slightly bent to one side at the tips; margins serrulate in upper half of leaf ..... *A. orientalis*

[1] – Polar-Alpine Botanical Garden-Institute of Kola Sci. Center of RAS, Kirovsk-6, Murmansk Province 184256 Russia – Россия 184256 Мурманская область, г. Кировск, Полярно-альпийский ботанический сад-институт Кольского НЦ РАН ; e-mail: darktanya@mail.ru

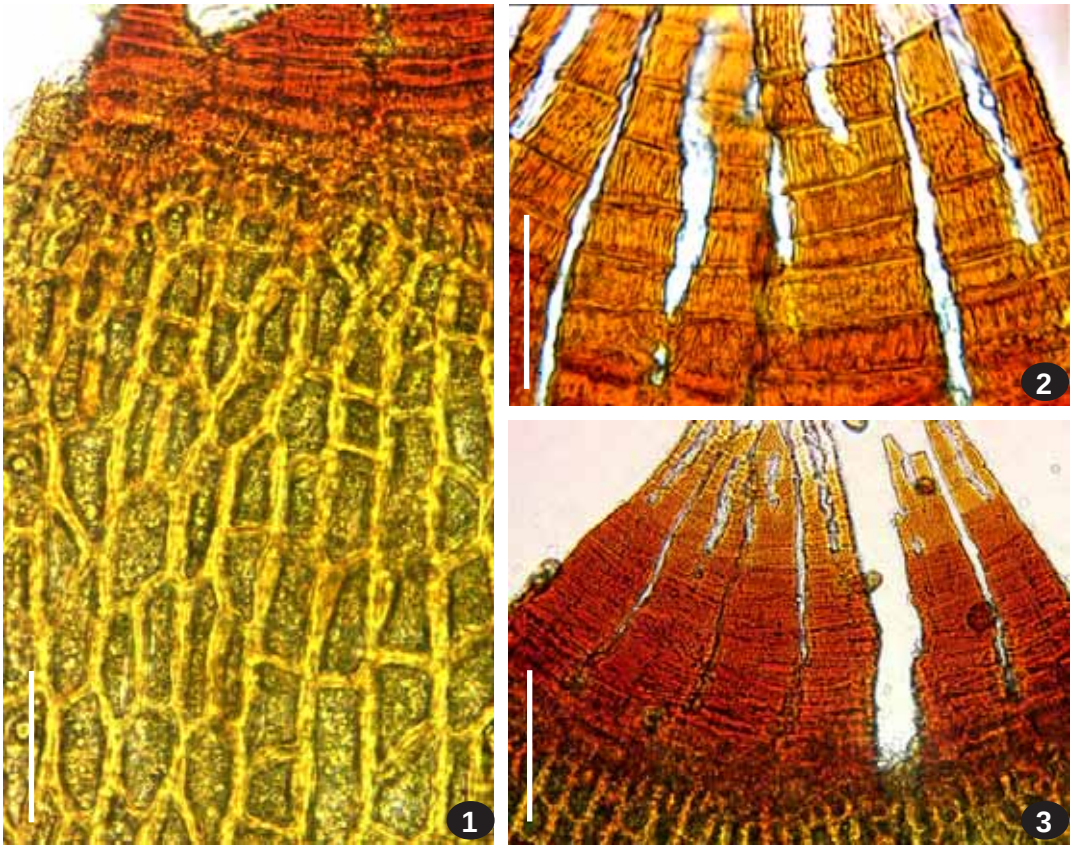

Fig. 1. *Aongstroemia longipes* (from *Drugova # 19198*, KPABG): 1 – exothecium; 2-3 – peristome. Scale bars: 50 μm for 1, 3; 20 μm for 2.

Aongstroemia longipes (Sommerf.) Bruch, Schimp. & Gümbel, Bryol. Eur. 1: 173. 1846. — *Weissia longipes* Sommerf., Flora Lapponica Suppl.: 52, 1, fasc. 1-10.1826. Figs.1-2.

Plants small, in loose pale-green tufts or colonies. Sterile and young plants filiform. Stems up to 1 cm, erect, stiff, julaceous, simple or with one subterminal shoot. Leaves imbricate, 0.5-0.8(-1.0)×0.3-0.4(-0.5) mm, ovate-lanceolate, concave, obtuse or shortly acuminate; margin smooth proximally, more or less undulate distally; costa strong, smooth, ending below apex, 50-55 μm wide at the base; upper laminal cells narrow hexagonal to rhomboidal, 12-22(-27)×6-7(-9) μm; median laminal cells irregularly rectangular to narrow rhomboidal, 18-30(-40)×6-8 (-10) μm; basal laminal cells irregularly narrow rectangular, basal marginal cells narrower and with thinner walls, forming indistinct border. Dioicous. Perigonial leaves to 1.3 mm long, incurved, long acuminate. Perichaetial leaves to 1.5 mm long, concave in lower part, from broad sheathing base abruptly narrowed into acuminate or subulate acumen. Seta red, 10-15 mm. Capsule 0.5-1 mm, exserted, erect, ovate, red-brown, stomata absent. Peristome teeth orange-red to yellow distally, perforate or divided at distal half, vertically striolate almost throughout and distally also papillose. Calyptra cucullate, with tip slightly bent to one side. Spores 14-20 μm, olive-green, smooth. Capsules mature in late summer.

Ecology. The species grows in various tundra habitats, dwarf-shrub-mossy tundra, in depressions, on sand terraces, exposed places in willow-beds, floodplain pebbles, seashore meadows, river and stream banks, creek sediments under limestone outcrops, nival herbaceous willow shrubs, disturbed habitats, ground roads, roadsides, waste grounds, moist and exposed

sandy or silty soil (Afonina, 2004; Afonina et al, 2007; Bachurina, 1939; Czernyadjeva, 2001, 2005; Czernyadjeva & Ignatova, 2008; Fedosov & Ignatova, 2005; Ignatov & Ignatova, 2003; Konstantinova et al, 1993; Kurbatova, 2002; Red data…, 2003). In Kola Peninsula all localities of *A. longipes* are in the Khibiny Mts. and its vicinities. In the Khibiny Mts., it grows in floodplains on exposed soil near ground roads; in lowland areas it grows in disturbed habitats of the cities: waste grounds, industrial areas, roadsides, banks of rivers and lakes.

Distribution. *Aongstroemia longipes* occurs sporadically in the Holarctic: Europe (from Spitsbergen and Iceland to Italy and Bulgaria), Russia, Greenland and North America (Alberta, Alaska, Yukon) (Eckel, 2007; Hallingbäck, 2006; Ignatov & Ignatova, 2003; Ignatov et al., 2006; Savicz-Lyubitskaya & Smirnova, 1970, Smith, 1978). In Russia it occurs in the Kola Peninsula, Leningrad Province, Yamal Peninsula, Nenets, Taimyr and Evenki Autonomous areas, Chukotka and Kamchatka (Afonina, 2004; Afonina et al, 2007; Bachurina, 1939; Czernyadjeva, 2001, 2005; Czernyadjeva & Ignatova, 2008; Fedosov & Ignatova, 2005; Ignatov & Ignatova, 2003; Konstantinova et al, 1993; Kurbatova, 2002).

Specimens examined: EUROPEAN RUSSIA: **Murmansk Province**: Khibiny Mts., bank of Ajkuajvenchyok River, 17.IX.1989, *Afonina # 9383* (KPABG); Khibiny Mts., Lovchorr Mt., 17.IX.1989, *Konstantinova # 93824* (KPABG); vicinity of abandoned lime factory, 28.VIII.2000, *Belkina #* 9385 (KPABG); Monchegorsk, VIII.2009, *Drugova # 19198, # 19272, #19278, # 19198* (KPABG)*;* same place, IX.2007, *Drugova # 17892* (KPABG); **Leningrad Province**: Gatchina District, Pudost' Station, abandoned quarries, 13.VI.1971, *V'yunova # 24* (LE); same place, 22.VI.1972, *V'yunova #* 394 (LE); ASIATIC RUSSIA: **Yamal-Nenetz Autonomous District**: lower Erkutayaha River, Tabortato Lake, 21.VII.1994, *Czernyadjeva s.n.* (LE); **Chukotka**: Anadyr River basin, upper course of Tanyurer River, Golubaya River, 14.VII.1981, *Afonina s.n.* (LE); lower course of Utaveem River, 5.VIII.1991, *Afonina s.n.* (LE); lower course of Chegitun River, 9.VIII.1991, *Afonina s.n.* (LE); Vrangel Island, upper course of Neizvestnaya River, 14.VIII. 1987, *Sekretaryova s.n.* (LE); **Kamchatskaya Province**, Klyuchevskie Volcanoes, middle course of Hapica River, 3.IX.2003, *Czernyadjeva # 125* (LE).

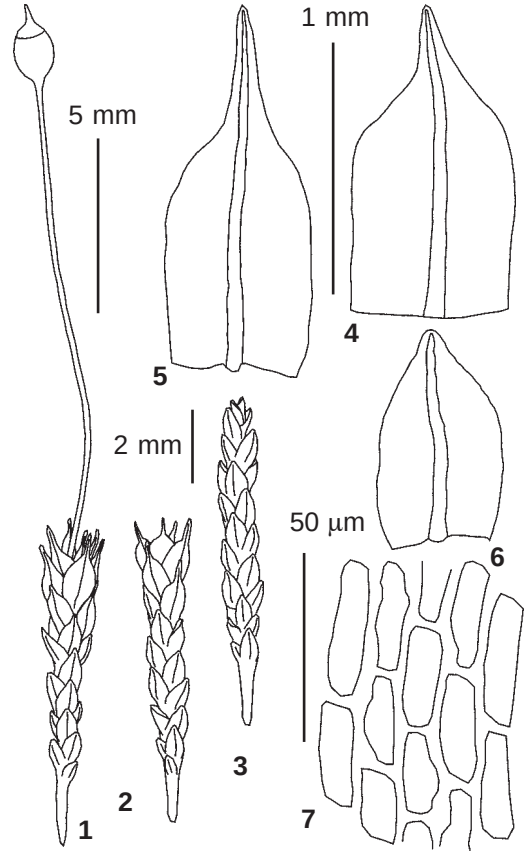

Fig. 2. *Aongstroemia longipes* (from *Drugova # 19198*, KPABG): 1-3 – habit, wet; 4 – perigonial leaf; 5 – perichaetial leaf; 6 – leaf from sterile plant; 7 – median laminal cells. Scale bars: 5 mm for 1; 2 mm for 2-3; 1 mm for 4-6; 50 μm for 7.

Aongstroemia julacea (Hook.) Mitt., J. Linn. Soc., Bot. 12:27. 1869. — *Gymnostomum julaceum* Hook., Musci Exot. 1:42. 1818. Fig.3.

Plants small, in dense golden-green tufts. Stems up to 2 cm, erect, furcate or simple, densely and evenly foliate, lower part of stems with rhizoids. Leaves imbricate, 0.4-0.5(-0.7)×0.3-0.4 (-0.5) mm, ovate or shortly ovate to shortly linguate, obtuse to rounded, cochleariform; margins serrate in upper half or occasionally almost throughout, teeth double, formed by protruding upper and lower angles of marginal cells; costa strong, smooth, ending below apex, 40-55 μm wide at the base; distal laminal cells 13-30 (-40) ×8-12(-16) μm, cells thick-walled, rhomboida1, marginal cells with thinner walls, 11-22(-25)×6-9(-12) μm; basal cells short rectangular. Apical

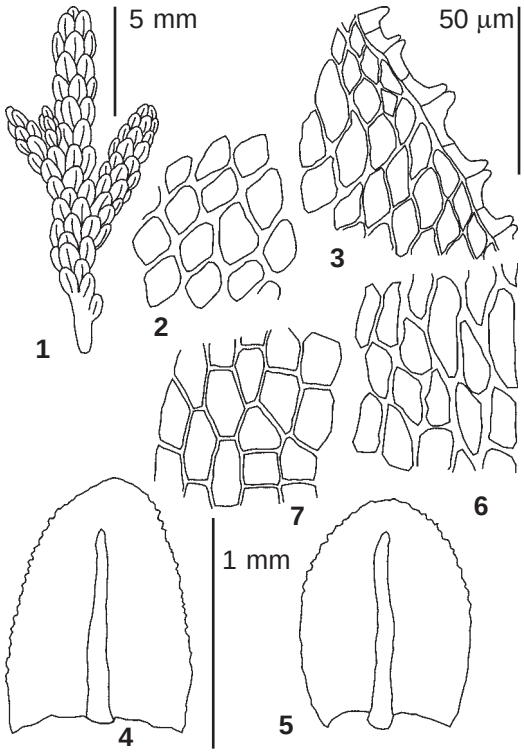

Fig. 3. *Aongstroemia julacea* (from 2.VIII.1960 *Bardunov s.n.*, MHA): 1 – habit, wet; 2 – upper laminal cells; 3 – upper marginal cells; 4-5 – leaves; 6 – median laminal cells; 7 – basal laminal cells. Scale bars: 5 mm for 1; 1 mm for 4-5; 50 μm for 2-3, 6-7.

and marginal cells of old leaves are partly destroyed. Gametangia and sporophytes unknown in Russia. Gemmae in leaf axils, oblong, 5-9-cellular, brownish, not inflated at the ends.

Ecology. The species grows in mountain tundra, in cracks of rocks and lava, at river banks (Bardunov, 1969; Savicz-Lyubitskaya & Smirnova, 1970).

Distribution. *Aongstroemia julacea* is known from East, South-East and Central Asia, Central America, Africa (Allen, 1994; Bardunov, 1969; Delgadillo, 1971; Savicz-Lyubitskaya & Smirnova, 1970). In Russia it occurs in Eastern Siberia:Western Sayan Mts., Buryatia, Tunkinsky Range, vicinity of Mondy Village and upper course of Hubuty Stream (Bardunov, 1969; Savicz-Lyubitskaya & Smirnova, 1970).

Specimens examined: ASIATIC RUSSIA: Krasnoyarsk Territory, East Sayan Mts., Tunkinsky Range, Hubuta River, 2.VIII.1960 *Bardunov s.n.* (MHA).

Aongstroemia orientalis Mitt., Trans. J. Linn. Soc., Bot. 3:154. 1891. — *Aongstroemia uncinifolia* (Broth.) Broth., Nat. Pflanzenfam. ed. 2, 10:179. 1924. — *Anomobryum uncinifolium* Broth., Philippine J. Sci. 5:146. 1909). Fig.4.

Plants small, in loose yellowish-brown tufts. Stems up to 1 cm, erect, simple or slightly branched. Leaves imbricate, asymmetric, slightly bent to one side at the tips, 0.4-0.5(-0.6)×0.3-0.35(-0.4) mm, ovate to shortly lingulate, broadly acute, concave; margin entire proximally, serrulate above middle at shoulders, weakly serrulate to entire near apex; costa strong, smooth, ending below apex, 50-53 μm wide at the base; upper and median laminal cells 15-30(-33)×6-8(-9) μm, oval or rhomboidal, thick-walled, marginal cells narrower, with thinner walls, 9-14(-16)×4-5(-7) μm; basal laminal cells rounded-quadrate, short rectangular, 11-17(-20)×10-14(-17) μm. Gametangia and sporophytes unknown in Russia. Gemmae in leaf axils, brownish, oblong, 7-9-cellular, with inflated apical cell.

Ecology. The species grows in mountain areas on dry slopes, on coastal rocky outcrops, in cracks of rocks, on sandy substrates and on soil (Bardunov, 1969; Gao et al., 1999; Savicz-Lyubitskaya & Smirnova, 1970).

Distribution. Russia, China, Himalayas, India, Myanmar, Indonesia, Philippines, Japan, Mexico, Central and South America (Allen, 1994; Bardunov, 1969; Delgadillo, 1971; Gao et al., 1999; Savicz-Lyubitskaya & Smirnova, 1970). In Russia it occurs in Southern Siberia (Transbaikalia) (Bardunov, 1969; Savicz-Lyubitskaya & Smirnova, 1970).

Specimens examined: ASIATIC RUSSIA: Zabaikalsky Territory, Kyra District, vicinity of Bukukun Settlement, 30.VII.1964 *Bardunov s.n.* (MHA); Sokhodinski Biosphere Reserve, upper Bukukun River, 17.VII.2008 Afonina # *04208* (LE); Bukukun River south of the Sokhodinski Biosphere Reserve, 30.VIII. 1964 *Bardunov s.n.* (MHA**).**

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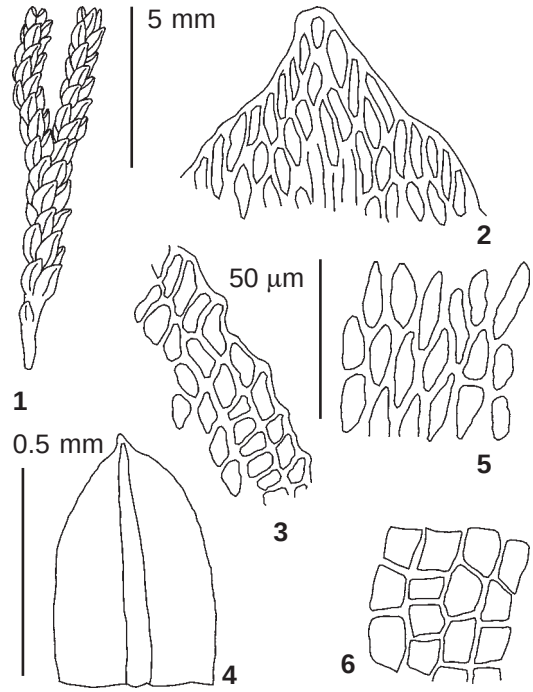

Fig. 4. *Aongstroemia orientalis* (from 30.VII.1964 *Bardunov s.n.*, MHA): 1 – habit, wet; 2 – cells of leaf apex; 3 – upper marginal cells; 4 – leaf; 5 – median laminal cells; 6 – basal laminal cells. Scale bars: 5 mm for 1; 0.5 mm for 4; 50 μm for 2-3, 5-6.

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