

TWO NEW TAXA OF POTTIACEAE (BRYOPHYTA)  
FROM THE KURIL ISLANDS  
ДВА НОВЫХ ТАКСОНА ПОТТИАСЕАЕ (БРЮОФЫТА)  
С КУРИЛЬСКИХ ОСТРОВОВ

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Abstract

*Tortula edentula* sp. n. is described as a new for science from the Kuril Islands, the Russian Far East. Gametophytically it is similar to *T. aestiva* Hedw., but differs in peristome absence, dark colour of capsules and larger spores. A newly described variety, *Barbula indica* (Hook.) Spreng. ex Steud. var. *kurilensis* var. nov. differs from the type variety by more narrow lanceolate leaves, crisped when dry. Description, illustrations and comparison with close species are given.

Резюме

*Tortula edentula* sp. n. описана как новый для науки вид с Курильских островов (российский Дальний Восток). По признакам гаметофита она сходна с *T. aestiva* Hedw., однако отличается от нее отсутствием перистома, темной окраской коробочек и более крупными спорами. Описанная с о. Кунашир в качестве новой разновидности *Barbula indica* (Hook.) Spreng. ex Steud. var. *kurilensis* var. nov. отличается от типовой разновидности более узкими листьями с узкой верхушкой, в сухом состоянии курчавыми. Даны описание, иллюстрации и сравнение с близкими видами.

KEYWORDS: Bryophyta, *Tortula*, *Barbula*, taxonomy, new species, new variety, Kuril Islands.

In the course of the field work in Kuril Islands in 2007 V.A. Bakalin collected in Shikotan Island one peculiar specimen of *Tortula* which we failed to identify using available publications, so it is described here as a new species.

***Tortula edentula*** Ignatova & Ignatov sp. n. (Fig. 1).

*A species proximo Tortula aestiva peristomium nullo et spores majoribus, 15-20 µm vs. 8-12 µm differt.*

Type: Russia, Sakhalinskaya Province, Kuril Islands, Shikotan Island, northern slope of Ploskaya Mt., 43°48' 08.4"N, 146°38'45.8"E, 5 m alt.,

cliffs at sea coast, 28VIII.2007, Bakalin #K-49-2-07 (holotype MHA; isotypes MW, VLA).

Plants in dense compact tufts, yellowish-green in upper part, light brownish below. Stems 3-5 mm, with weak central strand, without hyalodermis, moderately branched, densely foliose, with sparse reddish tomentum below. Leaves incurved and appressed when dry, erect to erect-spreading when moist, 1.3-1.5×0.4-0.6 mm, lingulate, concave, rounded-obtuse or shortly apiculate at apex; costa percurrent or ending few cells below apex, slightly widened distally, moderately prominent abaxially, in transverse section with one row of

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guide cells, one row of large papillose cells on adaxial side, without adaxial pad of large inflated cells, with abaxial stereid band, abaxial epidermis not or weakly differentiated, surface cells on adaxial side of costa subquadrate and densely papillose in distal 1/2 of leaf, similar to laminal cells, surface cells on abaxial side of costa elongate rectangular, smooth; margins moderately recurved in distal 1/2-2/3 of leaf length except leaf apex, distal laminal cells subquadrate and short rectangular, 10-15×8-13µm, thin-walled, densely papillose, opaque, papillae large, multifid, c-shaped in front view; marginal cells with more strongly thickened walls, sparsely papillose, forming indistinctly delimited yellowish border at leaf apex at distal 1/3 of leaf, partially hidden in recurvation; median laminal cells 15-20×10-15µm, similar to upper laminal cells; basal laminal cells long rectangular, 50-75×14-20µm, smooth, thin-walled or with slightly thickened transverse walls, often with thickenings at cell angles, transition to papillose median cells gradual. Cladautoicous, but female and male plants also present. Perichaetial leaves similar to stem leaves, more strongly concave. Capsules exserted, stegocarpic. Setae 2.5-3.5 mm, dark purplish-brown, strongly twisted counterclockwise when dry. Urn oblong-ovate, 0.9-1.2×0.4-0.5 mm, dark brown or dark purplish-brown, glossy. Annulus of 2 rows of large inflated cells. Operculum 0.4-0.5 mm long, conic, with short to long oblique beak, rarely low conic and subobtuse, surface cells in straight rows. Peristome absent. Spores 15-20 µm, finely papillose. Calyptrae cucullate.

**Differentiation.** *Tortula edentula* resembles *T. aestiva* in gametophytic characters, including linguulate leaves with short apiculus, percurrent costa, moderately recurved leaf margins and especially yellowish border of more thick-walled and less papillose cells. However it is distinct from the latter species in several sporophytic characters: (1) peristome is totally absent, whereas *T. aestiva* always has it well-developed, to 300 µm long, with moderately high basal membrane and deeply cleft filamentose teeth twisted 1/2-2 turns; (2) setae and capsules are dark cherry-brown, while in *T. aestiva* they are lighter in colour, and rather warm brown; (3) urns are oblong-ovate, 0.9-1.2 mm long, while in *T. aestiva* urns are cylindrical and longer,

ca. 2 mm; (4) operculum is 0.4-0.5 mm high vs. 0.8-1.0 mm in *T. aestiva*; (5) surface cells of operculum are in straight rows vs. in spiral rows in *T. aestiva*; and (6) spores are larger, 15-20 µm vs. 8-12 µm in *T. aestiva*. Obviously many of these characters are correlated, exhibiting reduction in a way observed in e.g. a series '*Tortula-Desmatodon-Pottia-Phascum*'. Like in some other cases, the sporophyte reduction may appear along the quite stable gametophytic characters (cf. *Tortula mucronifolia* - *T. truncata* - *T. acaulon*). *Tortula edentula* is so similar to *T. aestiva*, that it would be extremely difficult to distinguish between them without sporophytes. Only a few quantitative differences may be noticed: (1) distal laminal cells in *T. edentula* are slightly larger, 10-15×8-13µm, vs. mostly 9-12 µm in *T. aestiva*; (2) the area of strongly papillose cells in *T. edentula* is relatively small and covers less than half-leaf, while in *T. aestiva* it occupies usually 1/2-2/3 of leaf. The presence of sporophytes in most collections of the these species provides no problem with their identification.

Tufts of *T. edentula* are more dense and compact than those of *T. aestiva*, resembling *T. obtusifolia* (Schwägr.) Math. However, the latter species has leaves with more strongly recurved or revolute margins, and leaves are slightly narrowing distally, oblong-ovate. Zander & Eckel (2007) mention that leaves of *T. obtusifolia* are "sometimes bordered distally with (2-)4 rows of thicker-walled cells, or occasionally border of rhomboidal, smooth cells commonly hidden in recurvature". We have never observed such border in specimens of *T. obtusifolia* from Russia, and Limpricht (1890) describes leaves of this species as unbordered.

**Ecology.** *Tortula edentula* was collected from cliff crevices at sea coast.

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In 2006 the second authors collected in Kunashir Island a specimen of *Barbula* with numerous axillary gemmae which was identified as *B. indica* (Hook.) Spreng. ex Steud. with some doubt because its leaf shape did not fit exactly the descriptions of this species. Careful comparison with specimens of *B. indica* from different regions in H, NYBG and MO made us sure that the speci-

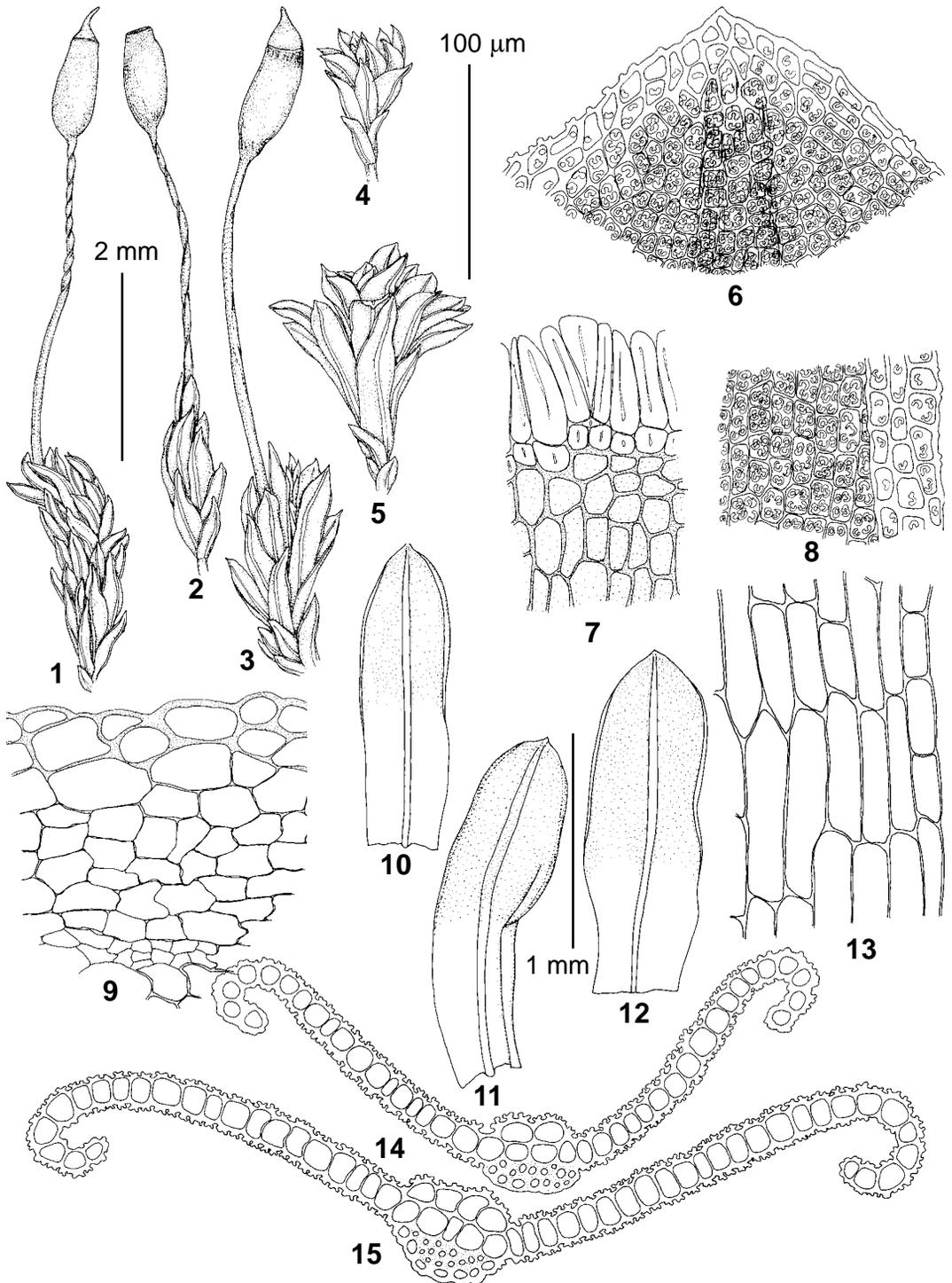


Fig. 1. *Tortula edentula* Ignatova & Ignatov (from Kuril Islands, *Bakalin* #K-49-2-07, MHA): 1-2 – habit, dry; 3-5 – habit, wet (3 – plant with sporophyte; 4 – male plant, 5 – young female plant); 6 – upper laminal cells; 7 – annulus & exothecium; 8 – median laminal cells; 9 – stem transverse section; 10-12 – leaves; 13 – basal laminal cells; 14-15 – leaf transverse section. Scale bars: 2 mm for 1-5; 1 mm for 10-12; 100  $\mu\text{m}$  for 6-9, 13-15.

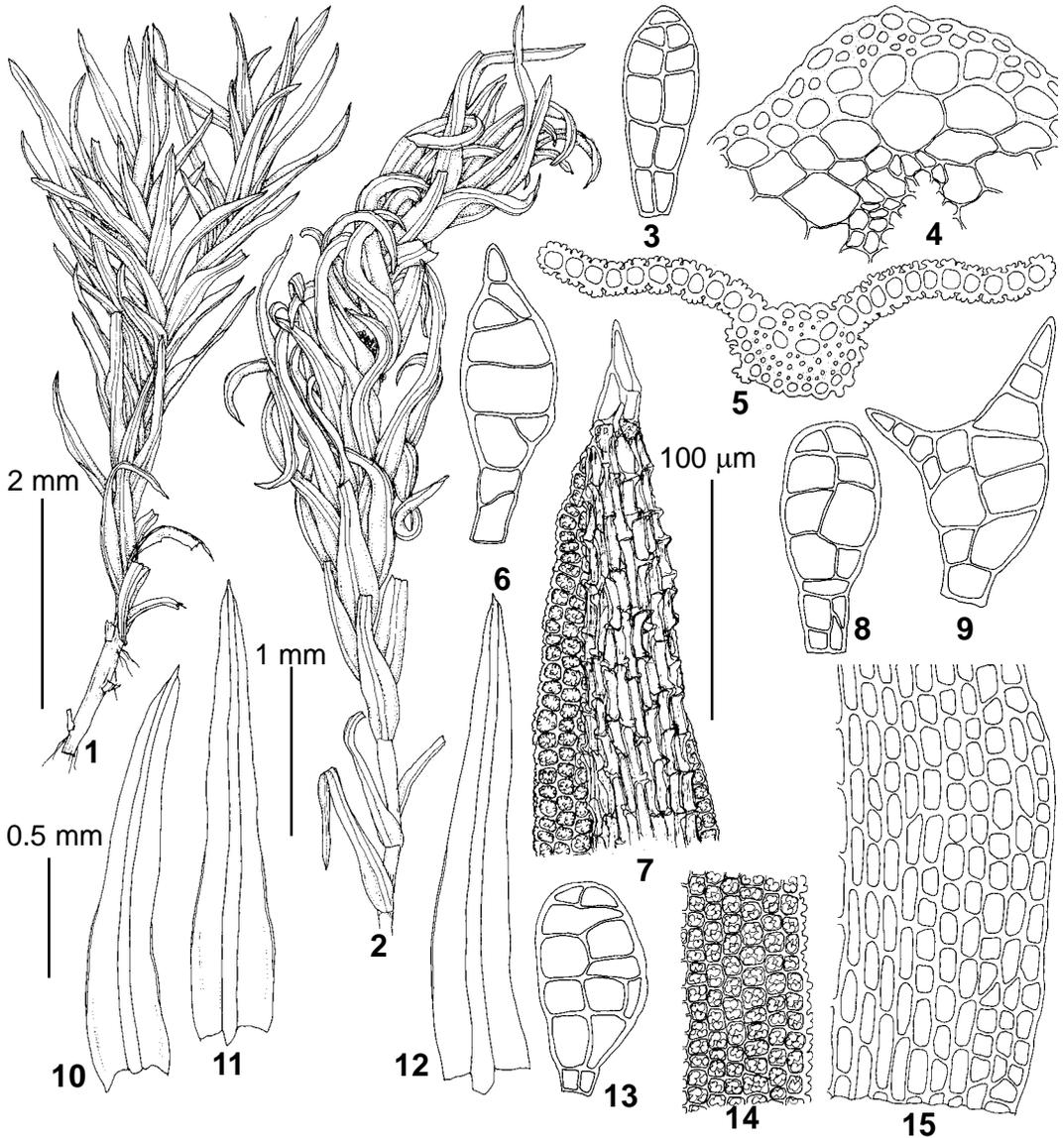


Fig. 2. *Barbula indica* (Hook.) Spreng. ex Steud. var. *kurilensis* Ignatova & Ignatov (from Kuril Islands, Ignatov #06-1884, MHA): 1 – habit, wet; 2 – habit, dry; 3, 6, 8-9, 13 – gemmae; 4 – stem transverse section; 5 – leaf transverse section; 7 – upper laminal cells & dorsal surface of costa; 10-12 – leaves; 14 – median laminal cells; 15 – basal laminal cells. Scale bars: 2 mm for 1; 1 mm for 2; 0.5 mm for 10-12; 100 µm for 3-9, 13-15.

men from Kuril Islands agrees with *B. indica* in main diagnostic characters, but the narrow lanceolate leaves of Kuril plants are out of variation of this species. At the moment we see no better solution than to describe them as a variety.

***Barbula indica* (Hook.) Spreng. ex Steud. var. *kurilensis* Ignatova & Ignatov, var. nov. (Fig. 2).**

*A var. indica folia angustioribus et apices non-obtusis differt.*

Type: Russia, Sakhalinskaya Province, Kuril Islands, Kunashir Island, Ruruj Mt., 44°29' N, 146°06' E, 20 m alt., on rocks in fir forest, 27.VIII. 2006, Ignatov #06-1884 (holotype MHA; isotype MW).

Plants in moderately dense tufts, yellowish-green in upper part, brownish below. Stems 5-7 mm, with central strand, without hyalodermis, rarely branched, densely foliose in upper

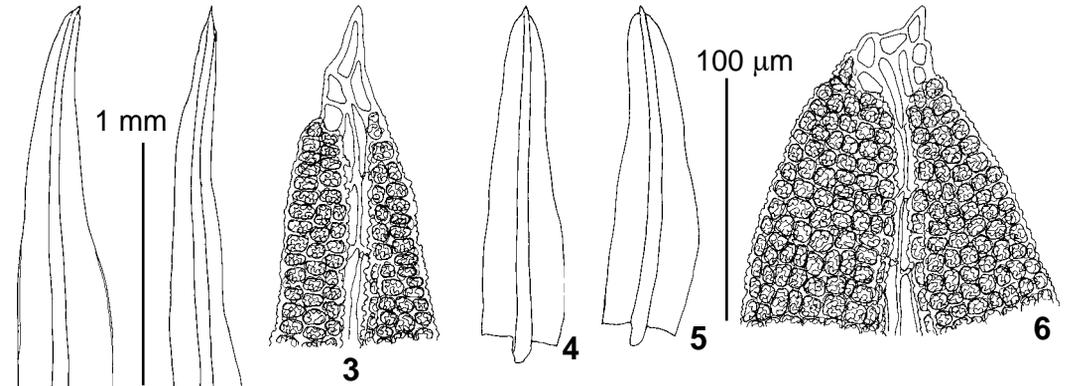


Fig. 3. 1-3: *Barbula indica* (Hook.) Spreng. ex Steud. var. *kurilensis* Ignatova & Ignatov (from Kuril Islands, Ignatov #06-1884, MHA), and 4-6: *B. indica* var. *indica* (from Thailand, Touw #9361, NYBG): 1-2, 4-5 – leaves; 3, 6 – leaf apices. Scale bars: 1 mm for 1-2, 4-5; 100 µm for 3, 6.

part, sparsely foliose below, not or weakly tomentose below. Leaves flexuose and crisped when dry, erecto-patent when moist, 1.7-2.0×0.3-0.4 mm, narrow lanceolate, concave, grooved along costa, gradually narrowing to the apex, narrowly rounded at apex and shortly apiculate; costa strong, 55-80 µm wide at base, gradually narrowing from base to apex, percurrent, strongly prominent abaxially, in transverse section with one row of guide cells, two stereid bands, adaxial and abaxial epidermises differentiated, surface cells on abaxial side of costa elongate rectangular, prorate at both ends, strongly scabrose distally, on adaxial side elongate rectangular, smooth or with slightly prorate cell ends; margins plane and slightly prorate distally, narrowly recurved below mid-leaf; apiculus of 2-5 smooth thick-walled elongate cells, distal and median laminal cells subquadrate, 8-10 µm wide, thin-walled, densely covered with large massive bifid papillae; basal laminal cells rectangular, 15-50×8-10 µm, smooth, thick-walled, not porose, transition to papillose median cells gradual. Dioicous. Perichaetial leaves with more wide and strongly concave base. Sporophytes unknown. Vegetative reproduction by numerous brown multicellular gemmae on stalks in leaf axils, ovate, clavate, and occasionally apiculate and corniculate, 50-120×30-40 µm.

**Differentiation.** *Barbula indica* differs from other species of the genus present in Russia in a

strong costa covered on both surfaces by elongate cells, scabrose on abaxial side due to protruding upper and lower cell angles, and by numerous gemmae in leaf axils. *Barbula amplexifolia*, another species with gemmae, has leaves ±oblong-ovate, rather shortly acute. Corniculate gemmae were never reported for *B. amplexifolia*. They are rather a characteristic of *Hydrogonium* (*Barbula* sect. *Hydrogonium*), but gemmiferous species of the latter differ from *B. indica* var. *kurilensis* in smooth or weakly papillose laminal cells.

**Ecology.** The type specimen was collected at foothills of Ruruj Volcano, close to the sea coast (less than 100 m apart), in *Abies sachalinensis* forest with admixture of *Acer* and *Kalopanax*, on rocks near stream.

*Barbula indica* is a widespread polymorphous species with pantropical and temperate distribution, with few records in more northern regions, i.e. in Alberta and North-West Territories of Canada, Alaska in U.S.A. and in Hungary in Europe. Its variability and morphological traits are discussed in details by Zander (1979). The variation includes mainly size, shape and number of gemmae and their position (in the axils of upper leaves or on rhizoids in a lower part of the stem, buried in the soil); leaf size and shape, recurvation of margins, papillosity of costa and lamina are also variable. However, leaves in apical part are always rather wide, rounded-obtuse or widely

acute. Specimen from Kunashir Island differs from other known specimens of the species in linear-lanceolate leaves with more narrow apex, 3-4 cells wide near apiculus vs. ovate to lingulate ones with lamina 4-9 cells wide near apiculus (cf. Fig. 3 and also: Li Xing-jiang et al.; Zander, 1979, Figs. 1-12; Zander, 1994, Fig. 215); long and narrow leaves become crisped when dry, whereas leaves of the type variety are usually incurved to catenulate and occasionally spirally twisted when dry.

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