Arctoa (1998) **7**: *207-210*

DIDYMODON HEDYSARIFORMIS, A NEW SPECIES OF POTTIACEAE (MUSCI) FROM SOUTH SIBERIA (TUVA REPUBLIC, RUSSIA)

DIDYMODON HEDYSARIFORMIS (POTTIACEAE, MUSCI), НОВЫЙ ВИД ИЗ ЮЖНОЙ СИБИРИ (РЕСПУБЛИКА ТУВА, РОССИЯ)

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Abstract

A new propaguloid species of Pottiaceae (Musci) *Didymodon hedysariformis* is described from the Tuva region (South Siberia Mountains, Russia). Among the propaguloid species of Pottiaceae it differs in its gradually narrowing leaves with rounded or blunt tips; apex variably and repeatedly deeply notched and windingly-fractured, including lamina as well costa, not swollen or terete, when matured deciduous as propagulum.

Резюме

Из Тувы описан новый вид семейства Pottiaceae (Musci), *Didymodon hedysariformis*. Он имеет ломкие верхушки листьев, но отличается от прочих видов более постепенно суженными листьями, на верхушке закругленными или тупыми. Верхняя часть листа извилистая, с многочисленными перетяжками. Сегменты, на которые распадается верхушка, включают как жилку, так и 2-6 рядов однослойной пластинки листа.

In 1995, I collected mosses from the Todginskaya Valley of the South Siberia Mountains (Tuva Republic, Russia). In this collection was an unknown moss with a propaguloid leaf apex. R. Zander and B. Murray, who have studied the matter, confirmed my suggestion that this is an undescribed taxon of *Didymodon*.

In 1996, the moss was recollected in the Todginskaya Valley from the known site, and additional localities were found too. Initial collections were made in the low stream of the Toora-Khem River (ca. 850 m, 52°27'N, 96°04'E) where it grew on weathering basalt stones. Later it was found on basalt stones in the vicinity of Toora-Khem Village at the mouth of the Toora-Khem River (52°28'N, 96°03'E) and on weathering sandstone rocks on the high bank of the Biy-Khem River at the mouth of Arbyk Creek (52°27'N, 96°03'E).

In 1997, I have looked for the same substrates: basalt stones and sandstone rocks in the valleys of springs and rivers in the territory of the State Reserve "Azas" in the Todginskaya Valley. And one more locality was found: on weathering sandstone rocks in the lower part the Azas River (ca. 950 m, 52°25'N, 96°42'E).

This species occurs abundantly in wet and shaded rocks along springs and rivers near to water-level and abundantly covers rocks. Probably it will be found in future in many other localities in the system of the valleys of South Siberia adjoining Mongolia because this territory is floristically nearly unknown.

Didymodon hedysariformis T. Otn., sp. nov. (Figs. 1-36)

Plantae caespitosae vel separatae, caespitis rigidiusculi, pulvinati, densi vel laxi. Caulis ramificans, superne viridis, inferne rubro-fuscus. Folia juvenila lanceolata, versus apicem sensim angustata, margine inferne planata, superne sinuata, flexuoso-infracta, non dentata, apice rotundata vel obtusata. Folia matura apice truncata; apex deciduus. Costa percurrens, apicem folii attingens. Cellulae laminorum levae, non mamillosae vel papillosae. Dioicus. Archegonii suprema. Folia perichaetialia lanceolata, abrupte angustata.

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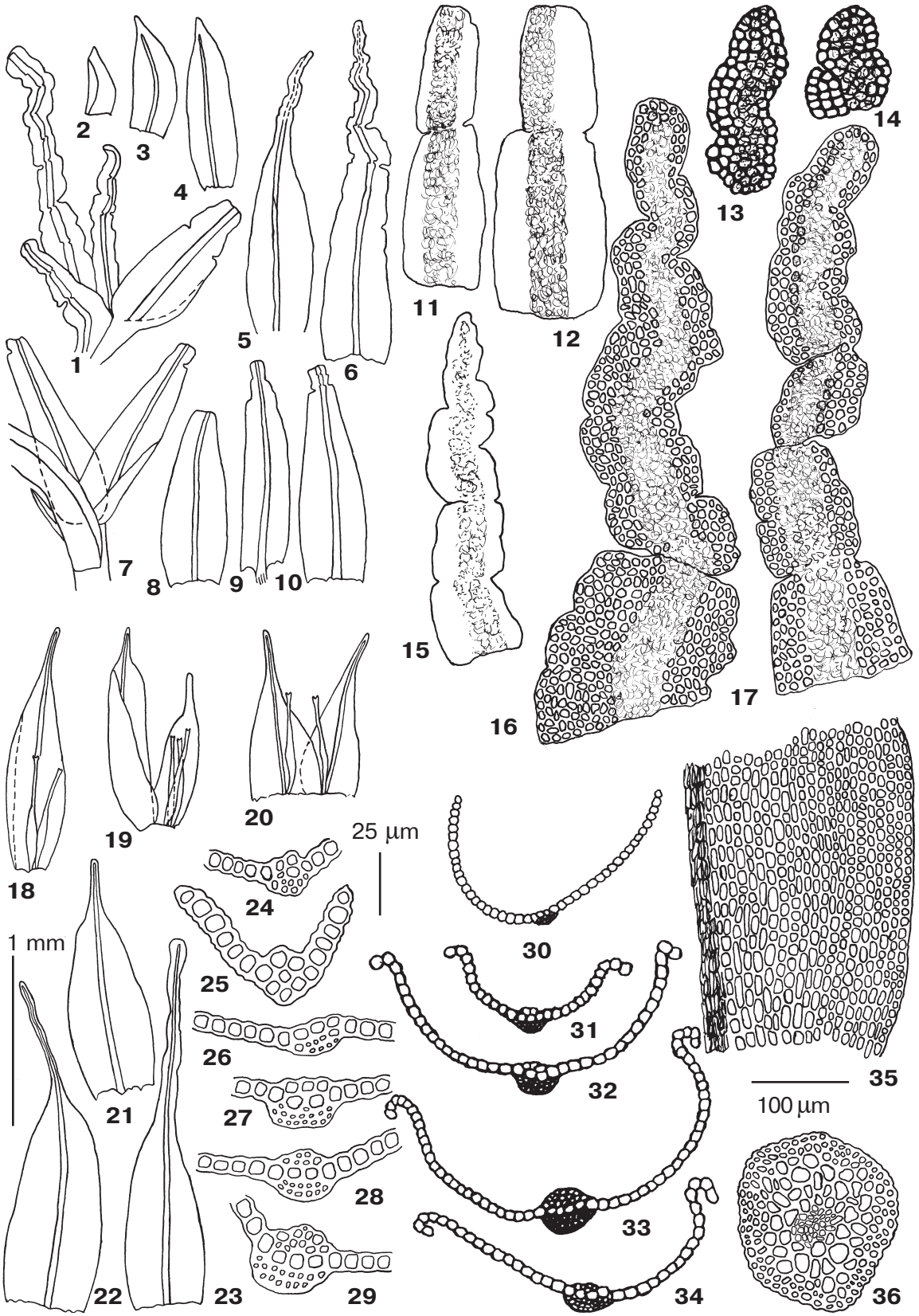
Species affinis *Didymodon sinuosus* cui folia sinuoso-crenata, margine dentata, apice acutata indicantur.

HOLOTYPUS: Russia, Tuva Respublica, Todginskaja Vallis, Toora-Khem flumen, in molibis erraticis basalticis ad ripam fluminis. 13.VII. 1996. T.N. Otnjukova (KRF, isotypi BUF, ALA, MHA).

Plants forming lax or tight turfs, cushions, or occasionally scattered in turfs of other mosses; green above, red-brown to brown below. Stems (0.3)0.8-1.2(2.0) cm long, sparingly or densely branched in the upper part, yellow-brown to red-brown; tranverse section rounded-pentagonal (with 3-6 rounded angles), 150-250 μm diam; hyalodermis absent or slightly developed; sclerodermis with 2-3(4) rows, inner cells in 3(4) rows; central strand present and distinct, 6-8(10) cells across. Rhizoids present, more abundent below, scarce or absent above, red-brown, 15-25 μm wide, smooth, walls 3-4 μm thick, with a few narrow, 7-10 μm wide, tan-brown branches. Juvenile leaves present, to 0.4 mm long, acute, entire. Mature leaves loosely erect, curved when dry, spreading when wet; lanceolate, 0.35-0.55 mm width, truncate, 0.7-1.3 mm long excluding the tip to 2.0 mm long, concave base short-sheathing to long-ovate; margins recurved at midleaf, near the truncation variably notched and partially fractured or entire. Apex gradually narrowly acute with rounded or blunt tip, irregularly and repeatedly notched and its lamina as well as costa consequently windingly-fractured; deciduous and absent in mature leaves. Costa distinct, red-brown, straight or slightly curved, filling 1/7-1/10 of the leaf base, gradually narrowing towards the apex, usually distinct in propaguliferous apex, sometimes becoming indistinct in unistratose propagula, ending in the apex or several cells below; smooth. Proximal costal cells (13)18-31(40) μm long, (4)5-7(9) μm wide, in 4-5 rows; median costal cells near truncation even, rounded-quadrate in shape, (5)6-8(10) μm (a little smaller than adjoining laminal cells) in 2-3(4) rows; in cross section costa round and biconvex with two stereid bands; dorsal stereid band strong, cells (4) 6-8 in 2-3 rows, epidermis little or not differentiated; ventral stereid band usually apparent, cells 2-4(5) in 2(3) rows or absent; epidermis usually somewhat differentiated; guide cells (1)2-4(5) in 1(2) rows. Proximal laminal cells centrally (16)22-28(53) μm long, (4)8-11(20) μm wide, marginal cells (5)10-13(18) μm long, (6)8-12(15) μm wide. Median laminal cells (near to truncation) even or uneven in shape, subquadrate, short-rectangular and rectangular, (4)8-10(13) μm long, (5)6-8(13) μm wide. Mature (brown) leaves in cross section variable in shape and size, unistratose, usually epapillose, very rarely mammillose; young leaves (green) in cross section very often with several low papillae. Laminal cells of propaguliferous apex distinct in 2-6 rows, rounded-quadrate, 8-10 μm diam, evenly thin-walled. Asexual reproduction by the deciduous apices as propagula. Deciduous apices variable in shape and size, 0.3-0.7 mm long, repeatedly fractured at uneven notches including unistratose lamina and multistratose costa. Dioicous. Sporopytes are unknown, perichaetia present, terminal; perichaetial leaves oblong-lanceolate to long-oval, sheathing, lamina abruptly constricted above into a narrow, cilindrical, weakly notched and blunt apex; inner leaves to 1.5 mm long with apex 1/3 of the leaf length; external leaves to 2.5 mm long with apex equal the lamina length, broadened at the tip; costa weak and narrow filling 1/20 of the leaf base, ending in apex or several cells below.

HOLOTYPE: RUSSIA. South Siberia Mts. Tuva Republic, Todginskaya valley, 52°27'N – 96°04'E, T. Otnyukova. Holotype: South Siberia Mts., Todginskaya Valley, Biy-Khem (Big Yenisey) River basin, its right bank, Toora-Khem River, on weathered basalt stones, 13 Jul. 1996 T. Otnyukova s.n. (KRF; isotypes, MHA, BUF, ALA). Paratypes: South Siberia Mts., Todginskaya Valley, Biy-Khem River basin, its right bank, Toora-Khem River, on weathered basalt stones, 25 Jul. 1995 T. Otnyukova s.n. (KRF); Biy-Khem River basin,

Figs.1-36. *Didymodon hedysariformis* T. Otn. sp. nov. (from the holotype, *Otnyukova 567*): 1 – stem tip with windingly-notched young leaves and mature truncate leaf; 2-4 – juvenille small leaves from lower part of stem; 5-6 – windingly-notched leaves; 7 – mature truncate leaves in the middle part of stem; 8-10 – mature truncate leaves; 11-12 – fragile middle parts of leaves; 13-15 – fragile tips of leaves; 16-17 – fragile upper parts of leaves; 18-20 – inner perichaetial leaves; 21-23 – outer perichaetial leaves; 24-29 & 31-34 – cross sections of stem leaves (25 – on upper part); 30 – cross section of perichaetial leaf; 35 – cells of leaf base; 36 – stem cross section. Scale bars: 1 mm – for 1-10, 18-23; 100 μm – for 11-17, 30-36; 25 μm – for 24-29.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its left bank, Arbyk Creek mouth, on weathered sandstone rocks, 26 Jul. 1996, T. Otnyukova s.n. (KRF, MHA, BUF, ALA); Biy-Khem River basin, its right bank, Toora-Khem Village vicinity, on weathered basalt stones, 27 Jul. 1996, T. Otnyukova s.n. (KRF); Azas (Todga) Lake basin, Azas River, its lower part, on weathered sandstone rocks, 27 Aug. 1997, T. Otnyukova s.n. (KRF, MHA).

The specific epithet referes to general impression of propaguliferous apex which is similar of the fruit-pod of leguminous plants of the *Hedysarum* genus of Fabaceae.

Didymodon hedysariformis is similar to *D. sinuosus* (Mitt.) Delogn. in having notched and fragile leaf apices bearing lamina with costa, and lacking a fleshy multistratose disseminule. However, the notches of *D. sinuosus* are shallow, do not reach the costa, and propagula are usually marginally and apically dentate while the notches of *D. hedysariformis* are very deep, reach the costa and penetrate it, and propagula are marginally and apically smooth. *Didymodon sinuosus* sometimes possesses notched and fragile apices that when fallen leave a wide and broken line of truncation whereas juvenile leaves of *D. hedysariformis* always possess windingly-fractured leaf apicies, and mature leaves have a rather narrow and rounded line of truncation.

Didymodon hedysariformis also resembles *D. johansenii* (Williams) Crum and *D. anserinocapitatus* (X.-j. Li) Zand., in having propaguloid leaf apices. However both these species are characterized as always having long, deciduous apices, bearing only costa, and abruptly differentiated from the rest of the leaf as swollen, thickened, and fleshy disseminules. *Didymodon johansenii* differs as well as in its costa narrow and rather weak in the low halfpart of leaf, gradually broadening in the upper part of leaf, excurrent, and forming a cylindrical propagulum which is sometimes constricted medially once or twice. The costa of *D. anserinocapitatus* is rather strong and thick in the middle of leaf, gradually narrowing toward the apex, and when running up the apex abruptly broadens into a lanceolate propagulum.

Didymodon hedysariformis is also similar to the recently described from China *D. goachenii* B. C. Tan & Y. Jia (Tan & Yu, 1997) in having notched and fragile leaf apicies bearing lamina with costa. *D. hedysariformis* differs from it in broad, windingly-fractured leaf apex having unistratose lamina with 2-6 rows of cells, whereas *D. gaochenii* has very narrow unistratose lamina of only 1 row of cells, fractured into square or rectangular units.

ACKNOWLEDGEMENTS

I am grateful to Dr. Nina N. Molokova, the assistant director of the State Reserve "Azas", for arranging the field trip to the Tuva region in 1995-1997. Dr. Olga M. Afonina and Dr. Irina V. Czernyadjeva kindly provided the LE moss collections and literature on Pottiaceae for study. Dr. R. Zander kindly commented on the specimen. I thank Dr. W. Reese for sending me some material on Pottiaceae and Dr. V. Bolyukh for sending a *Didymodon sinuosus* sample from Ukraina. I am very grateful to Dr. Barbara Murray for reading the manuscript for English correction.

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