# *Frullania ignatovii* (Porellales, Marchantiophyta), a new species from Siberia

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**Abstract.** A new species *Frullania ignatovii* Sofronova, Mamontov et Potemkin is described and illustrated from the tundra belt of highlands of Yakutia (Republic of Sakha) and Baikal Siberia (Republic of Buryatia and Trans-Baikal Territory), Russia. It was collected on rocks together with calciphilous bryophytes. It resembles *F. amplicrania* Steph. known from Japan but differs from it in leaf lobules inflated throughout (vs. occasionally explanate) with vertex parallel to the stem and the shoot plane vs. oriented obliquely away from the stem and strongly turned up from the shoot plane; oil-bodies more numerous 4–10 vs. 2–4 per cell, nearly homogenous vs. of few globules.

**Keywords:** liverworts, *Frullania*, *Porellales*, *Marchantiophyta*, Russia, Baikal Siberia, Buryatia, Trans-Baikal Territory, Yakutia.

# *Frullania ignatovii* (Porellales, Marchantiophyta) — новый вид из Сибири

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**Резюме.** Новый для науки вид *Frullania ignatovii* Sofronova, Mamontov et Potemkin описан и проиллюстрирован по материалам из тундрового пояса высокогорий Республики Саха (Якутия) и Байкальской Сибири (Республика Бурятия и Забайкальский край). *F. ignatovii* обнаружена на скалах, где произрастает вместе с кальцефильными видами мохообразных. Этот вид сходен с известным из Японии видом *F. amplicrania* Steph., от которого отличается повсюду, кроме гинецеев, вздутыми вентральными лопастями с верхушкой, ориентированной параллельно стеблю и плоскости побега, а не обращенной к субстрату и от стебля, и более многочисленными масляными телами с почти гомогенной структурой.

**Ключевые слова:** печеночники, *Frullania*, *Porellales*, *Marchantiophyta*, Россия, Бурятия, Байкальская Сибирь, Забайкальский край, Якутия.

The genus *Frullania* Raddi is largest and most taxonomically complicated genus of the order Porellales. About 300–375 species of *Frullania* are known at present (Schuster, 1992; Frey *et al.*, 2009; Hentschel *et al.*, 2009). .....
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**Frullania ignatovii** Sofronova, Mamontov et Potemkin, sp. nov. (Fig. 1, 2; Plate I). Plants in thin dense mats, blackish brown, somewhat glossy, loosely or rather strongly adhering to substrate, freely but irregularly branched; shoots to 2 cm long and 0.6–0.7 mm wide, stems 70–100 µm wide. Leaves imbricate to remote; antical lobes entire, slightly convex, ± reniform to broadly or oblique ovate or cordate, (445)530–640 µm long, (340)380–450 µm wide, usually (1.0)1.1–1.35(1.5) × as long as wide (0.9–1 × as long as wide in lobes subtended the vegetative branches), antically extending ca. stem-width beyond the farther edge of stem, antical base auriculate, apex of lobes decurved, broadly rounded. Lobules inflated throughout, obovoid and skull-shaped, 0.16–0.25 of the size of the lobes, (162)175–195 µm wide and (180)210–230 µm long, 1.1–1.26 × as long as wide, oriented parallel to the stem and the shoot plane, vertex saccate and ± narrowed downward into bilabiate mouth with antical part longer than postical. Stylus distinct or indistinct, filiform, 1–3 cells wide at base and (2)3–12 cells long, sometimes ending by slime papilla. Cells in the middle of lobes rounded hexagonal, with distinct acute to slightly bulging and sinuous trigones, with intermediate thickenings, ca. 12–17(24) × (15)19–24 µm, smaller and nearly quadrate near margins, 9–14 × 13–18 µm, elongated to the base, 16–18 × 17–30 µm. Oil-bodies 4–10 per cell, look homogeneous because of extremely finely granulate structure, largely spherical and 5–8 µm in diameter, more rare elliptical, up to 10 µm long. Ocelli lacking. Cell surface smooth. Underleaves 200–300 µm long, 150–310 µm wide, 1–2(3) times as wide as stem; line of insertion straight, remote, obtrapezoid, obovate or nearly cuneate with slightly elongated base, often with small auricles on each side, at base patent, bent towards the stem distally or nearly plane, undecurrent, bilobed (0.1)0.2–0.35 of the length, sinus U-shaped, often with incurved lobes, margins plane, entire or with obtuse tooth at each side; lobes acute or oblique truncate, straight or somewhat connivent and then crossing each other, or uncinately decurved. Asexual reproduction unknown. Dioicous. Unfertilized gynoecia on abbreviated lateral branches or terminal on main shoots and leafy axis. Female bracts with entire margins, divided 0.35–0.5 of the length; lobes slightly concave, elongate-ovate, 650–700 µm long, 400–420 µm wide, apex rounded; lobules similar to lobes in shape and size, 550–560 µm long, 290–300 µm wide, apex rounded; stylus at base of lobules, small, filiform, 1–3 cells at base and up to 10 cells long, often vestigial. Female bracteoles with entire margins, long lingulate, 480–510 µm long, 120–160 µm wide, bilobed 0.2 of the length, lobes triangular entire, at apex rounded or truncate, uncinately incurved towards the stem. Male plants unknown.

Type: **RUSSIA**, **Republic of Buryatia**, Kurumkanskiy District, Dzherginskiy State Reserve, Yuzhno-Mujsky Range, Upper Barguzin River (55°07' N, 111°53' E), 1618 m alt., on

rocks over the stream, 01.08.2013 Yu. S. Mamontov No. YuSM-384-8 (holotype LE, isotypes KPABG, SASY, MHA, JE, TNS, HSNU).

Differentiation: *F. ignatovii* have the following significant distinction – the leaf lobules obovoid and skull-shaped, slightly longer than wide and ± narrowed downward from saccate vertex into bilabiate mouth. The similar lobules are in Japanese *F. amplicrania* Steph., western North American *F. hattoriana* J. D. Gogfrey et G. Godfrey (Godfrey, Godfrey, 1980) and European *F. fragilifolia* (Taylor) Gottsche, Lindenb. et Nees.

*F. ignatovii* is most close to *F. amplicrania*. It differs from the latter in leaf lobules constricted at base into a bilabiate (vs. obliquely truncate) mouth; vertex of lobules parallel to the stem and the shoot plane vs. oriented obliquely away from the stem and strongly turned up from the shoot plane; oil-bodies more numerous 4–10 vs. 2–4 per cell, nearly homogenous vs. of few segments. .....

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## References


Frey W., Stech M., Fisher M. 2009. *Syllabus of plant families: Adolf Engler's Syllabus der Pflanzenfamilien. Pt 3. Bryophytes and seedless vascular plants.* Stuttgart: 419 p.

Godfrey J. D., Godfrey G. A. 1980. Frullania hattoriana, a new hepatic from British Columbia, Canada. *J. Hattori Bot. Lab.* 48: 321–327.

Hentschel J., Konrat M. J. von, Pócs T., Schäfer-Verwimp A., Shaw A. J., Schneider H., Heinrichs J. 2009. Molecular insights into the phylogeny and subgeneric classification of Frullania (Frullaniaceae, Porellales). *Molec. Phylogen. Evol.* 52: 142–156.

Ignatova E. A., Ivanova E. I., Ivanov O. V., Ignatov M. S. 2011. Mosses of the Mus-Khaya Mountain (Yakutia, Asiatic Russia). *Arctoa*. 20: 211–226.

Potemkin A. D., Sofronova E. V. 2009. *Pechenochniki i antocerotovye Rossii, T. 1* [Liverworts and hornworts of Russia, Vol. 1]. St. Petersburg; Yakutsk: 368 p. (In Russ. and Engl.).

Potemkin A. D., Doroshina G. Ya., Urbanavichus G. P. 2010. On the liverwort flora of Dagestan. *Bot. Zhurn.* 95(11): 1625–1638 (In Russ. with Engl. summary).

Schuster R.M. 1992. *The Hepaticae and Anthocerotae of North America east of the hundredth meridian, Vol. 5*. Chicago: xvii + 854 p.


## Литература


Frey W., Stech M., Fisher M. 2009. *Syllabus of plant families: Adolf Engler's Syllabus der Pflanzenfamilien. Pt. 3. Bryophytes and seedless vascular plants.* Stuttgart: 419 p.

Godfrey J. D., Godfrey G. A. 1980. Frullania hattoriana, a new hepatic from British Columbia, Canada. *J. Hattori Bot. Lab.* 48: 321–327.

Hentschel J., Konrat M. J. von, Pócs T., Schäfer-Verwimp A., Shaw A. J., Schneider H., Heinrichs J. 2009. Molecular insights into the phylogeny and subgeneric classification of Frullania (Frullaniaceae, Porellales). *Molec. Phylogen. Evol.* 52: 142–156.

Ignatova E. A., Ivanova E. I., Ivanov O. V., Ignatov M. S. 2011. Mosses of the Mus-Khaya Mountain (Yakutia, Asiatic Russia). *Arctoa*. 20: 211–226.

[Potemkin, Sofronova] Потёмкин А. Д., Софронова Е. В. 2009. *Печеночники и антроцеротовые России, Т. 1.* СПб.; Якутск: 368 с.

[Potemkin *et al.*] Потёмкин А. Д., Дорошина Г. Я., Урбанавичюс Г. П. 2010. К флоре печеночников Дагестана. *Ботан. журн.* 95(11): 1625–1638.

Schuster R. M. 1992. The Hepaticae and Anthocerotae of North America east of the hundredth meridian, Vol. 5. Chicago: xvii + 854 p.