

- 11.II.1942, *Huuskonen* (H); Ontojarvi, 14.V.1942, *Huuskonen* (H); Tolvuya, 16.VII.1969, #079, *Volkova* (LE); White Sea, Sidorov Island, 13.VIII.1998, *Maksimov* (PTZ); Paanajarvi, 19.IV.1990 & 25.VI.2003, *Maksimov* (PTZ); Lendery, 10.VIII.2003, #L-03/52-48a, *Maksimov* & *Maksimova* (PTZ); Elmozero, 11.VIII.2000, #6-72, *Maksimov* & *Maksimova* (PTZ); Kindasovo, 24.V.1995, #207, *Maksimov* & *Maksimova* (PTZ); **Leningrad Province**, St. Andrae [=Kamennogorsk], 6.VI.1888, *Linden* (H); [Vyborg], in saxo horti Monrepos, 6.VIII.1851, *Nylander* (H); St.Iohannes [=Sovetskij], 11.IX.1895, *H.Lindberg* (H); Raisala [=Melnikovo], 20.VI.1888, *Linden* (H); **CAUCASUS: Kabardino-Balkaria**, Agashtan, Dorbunla-aly, 23.VII.1925, *E. & N.Bush* (LE, MW); Balkarskij Cherek gorge, 19.VII.1925, *E. & N.Bush* (LE); Bezengi Gorge, Mizhgiri glacier, 23.VII.1987, #1988A, *N. & E.Portenier*, 27.IX.1986 (MHA); **North Ossetia**, North Ossetian Reserve, 19.VII.1976, 21.07.1976, 31.VII.1976, 9.VII.1977, 24.VII.1977, 25.VII.1979, *L.I.Abramova* (MW); ad glacier Zei, #1897, *Tkheschelaschwili* (H-Br); fl.Ardon, 1881, *V.F.Brotherus* (H-Br); ad mare glaciale Zei, VIII.1881, *V.F.Brotherus* (H-Br); **Karachaev-Cherkessia**, Urup River basin, Chapal 2nd Range, 11.VIII.1945, *Shiffers* (LE); Ullukama Gorge (Kuban upper course), 8.VIII.1979, #3/5, *Gogina* (MHA); Uzunkol, 5.IX.1988, *Bochkin* (MHA); Teberda Reserve, Ullu-Murudzu, 7-9.VIII.1986, *Ignatova* (MHA); Goral-y-Kol, 13.VIII.1986, *Ignatova* (MHA); Teberda River, 1.VIII.1986, *Ignatova* (MHA); M.Khati para Gorge, #10/94, 174/96, *Onipchenko* (MW); M.Khati para Gorge, 2-3.VIII.1986, *Ignatova* (MHA); Kyshkadzher Gorge, 10.VII.1994, 38/94, *Onipchenko* (MW); Azgek River, 17.VIII.1955, *A.L.Abramova* & *I.I.Abramov* (LE, MW); Mukhu Gorge, 17-18.VIII.1955, *A.L.Abramova* (LE, MW); Shubaidai-Chat Gorge, 31.VII.1994, #139/94, *Onipchenko* (MW); 22.VII.195, *E.Z.Baisheva* (LE); Ishimbaj Distr., Uryuk River, 19.VI.2001, #13-192, *V.I.Zolotov* (MHA); **Krasnodar Territory**, Malaya Laba River basin, Armovka Mt., 21.VII.1997, *Akatova* (CSR); Tryu-Yatyr-gvarta Mts., 16.VII.1997, *Akatova* (CSR, MHA); **Adygeya**, Belaya River basin, Abago Mt., 15.VII.1986, 10-12.VII.1988, 15.VII.1986, *Akatova* (CSR, MHA); **URALS: Komi Republic**, Kozhviniskij Distr., Nyadokota River, 21.IV.1956, *Kil'dyshevskij* (LE); ad mont. Jegenni Pai., 2.VIII.1905, *Pohle* (LE); **Perm Province**, Basegi Reserve, Yuzhnyj Baseg, First, 9.VI.1994, #788, *Ignatov* & *Bezgodov* (MW), 22.VI.1993, #255, *Bezgodov* (MW); Vishera Reserve, Kuryksar Range, 24.VI.1995, #338, *Bezgodov* & *Selivanov* (MW); Kuroksarskij Kamen, *P.Krylov* (LE); Vishera Reserve, Olkhovka Creek, 26.VI.1994, #131, 144, 120, 121, *Bezgodov* (MW); Vishera Reserve, Moiva River, 5.VII.1994, #378, 373, *Bezgodov* (MW); **Sverdlovsk Province**, Iset River, Beklemishevo, Revun rapids, 1.VII.1999, *Goldberg* (SVER); Sysert river, 6-10.VII.1997, 19.VIII.1998, *Goldberg* (SVER); Cherdantzevo Village, 27.VI.1997, *Goldberg* (LE); Dvurechensk, 18.VII.1995, *Goldberg* (SVER); Ekaterinburg, pr. riv. Kamenka, #14, *Navashin* (LE); prope Ekaterinburg, 23.VIII.1887, *Navashin* (LE); Ekaterinburg Sity, Shartashskie kamennye palatki, 13.VI.1953, #33, *Gorchakovskij* (LE, MW), 3.X.1996, *Goldberg* (SVER, MW); Severka Rv. Station, 12.V.1953, #50, 65, *Gorchakovskij* (LE, MW); Chusovaya River, Sobachyi Rebra, 2.VII.1998, *Goldberg* (SVER); Pershino, 23.VII.1996, *Goldberg* (SVER); Rezh River, Samotsvety, 31.VII.1981, *Chernogorodova* & *Dyachenko* (SVER); Koptelovo Rv. Station, 24.VII.1982, *Dyachenko* (SVER); Denezhkin Kamen Mt., 26.VII.1996, *Dyachenko* (SVER); **Bashkortostan**, Uryuk River, 19.VI.2001, #13-222, *Zolotov* (MHA); Bashkirskij Reserve, Ural-tau, 19.IX.1946, 1.IX.1946, 23.VI.1948, #2896, #2055/c, 4690, 4694, *Selivanova-Gorodkova* (LE); South Kraka, 9-10.VII.1946, #110, #6210, *Selivanova-Gorodkova* (LE); Bretyak, 12.IX.1990, #13/110, 13/37, 13/6, *Ignatova* (MHA); Tlyashevo, 21-22.VI.1997, #47, 217, *Solomeshch* (MW), 22.VI.1997, #44/67, 37, *Muldashev* (MW); Kara-Tash Mt., 8.VI.1990, #13, *Muldashev* & *Galeeva* (MHA); Bash-tau, Bolshoj Shatak Mt., 11.VIII.1946, 19.VII.1948, #1540/c, 5416, *Selivanova-Gorodkova* (LE); Murakaev, 18.VI.1997, #18, *Muldashev* (MW); Bulanusher Mt., 19.VI.1997, #26, *Solomeshch* (MW); Mashak Range, 11.VII.1997, #13, *Solomeshch* (MW); Kobeya Mt., 7.VII.1998, #27, #55, *Muldashev* (MW); Malyj Iremel Peak, 30.VIII.1990, #3/15, #3/14, *Ignatova* (MHA); Zuyakovo, 22.VII.1995, *Baisheva* (LE); **Chelyabinsk Province**, Satka Distr., B.Nurgush Mt., 16-20.VIII.1997, #73, #74, #40, *Kulikov* & *Balandin* (MW); Myass, Ilmenskij Reserve, 4.IX.1990, #4/2, #4/7, *Ignatova* (MHA); Miass surr., Chashkovskij Range, 29.VIII.1927, *Tyulina* (LE); Miass, Ilmen Mt., *Tyulina* (LE); **SIBERIA: Tyumen Province**, Berezovo Distr., Polja River, 30.VIII.1950, #81/16, *I.D.Kil'dyshevskij* (LE); Berezov Distr., Lyapin River basin, Sarakappyer Mt., 13.VIII.1950, #54/7, *Kildyshevskij* (LE); Sob River, #53, *Czernyadjeva* (LE); Berezov Distr., Khadyta-Shchuchya watershed, 23.VI.1909, #147, *Sukachev* (LE); Junto Lake, #8, *Czernyadjeva* (LE); **Altai Republic**, jug. Narymj, pr. p. Altajskaya, 22.VI.1899, *Ladygin* (H-Br); Bortyltag & Kair Rivers watershed, 25.VII.1903, *P.Krylov* (H-Br, LE); watershed of Soyen-Chadyr & Ak-Kem, 25.VII.1903, *P.Krylov* (H-Br, LE); between Shebalino & Topuchaya, Kumalyr River, 22.VI.1903, *P.Krylov* (H-Br, LE); Chibilik River, 24.VI.1903, *P.Krylov* (LE); fl. Aigulak, 3.VII.1903, *P.Krylov* (H-Br); Ak-Kem, 26.VII.1903, *P.Krylov* (H-Br); fl.Argut, 23.VII.1903, *P.Krylov* (H-Br); Ak-Turu River, 12.VII.1908, *Vereshchagin* (LE); 14.VI.1907, *Vereshchagin* (LE); Yustyd, 2.VII.1907, #632, *Vereshchagin* (LE); Tyekta, 1.VII.1908, #876, *Vereshchagin* (LE); Manzhherok, 22-25.VII.1908, *Tyumentzeva* (LE); Katon Karagai, Narymskij Range, 2-22.VII.1919, *Vereshchagin* (LE); Shebalino, 6.VII.1909, *P.Kurskij* (H-Br); Inya Glaciers, 16.VII.1913, #2357, *Kusnezov* (LE); Anujskij trakt, Svetlaya River, 22.VI.1911, *Nekrasova* (LE); Tschuja Alpen, 20.VIII.1915, *J.Grano* (H-Br); Sajlyugem Range, Sartemot River valley, 10.VIII.1926, #18, *Baranov* (H-Br, LE, MW); Sajlyugem Range, Boguty Lake, 30.VII.1926, #182, *Baranov* (LE); Kostakhta River, 4.VII.1931, *B.Schischkin* & *al.* (LE); Kurkure River, 23.VII.1931, *B.Schischkin* & *al.* (LE); Chulyshman, 4.IX.1931, *B.Schischkin* (LE, MHA); Teletzkoe Lake, Kyrasai Creek, 7.IX.1931, *B.Schischkin* (LE); Shebalino surroundings, 15.V.1947, *Palamarchuk* (LE, MW); Ak-Turu, 18-19.VII.1966, *L.V.Bardunov* (IRK); Chuya River, 16.VII.1966, *L.V.Bardunov* (IRK); Chiket-Aman pass, 27.VII.1966, *L.V.Bardunov* (IRK); Kyga Creek, 20.IX.1977, *Barashkova* & *al.* (MHA); Kosh-Agach, Tabozhok Creek, 29.VII-7.VIII.1992, #30/8, 30/9, 30/43, *Ignatov* (MHA); Kokorya Creek, 2.VIII.1992, #32/5, *Ignatov* (MHA); Kosh-Agach, Tabozhok Peak, 30.VII-1.VIII.1992, #31/6, 31/7, 31/9, 31/11, 31/79, *Ignatov* (MHA); Tokpak Creek, 23.VII.1993, #36/275, *Ignatov* (MHA); Uzuntutygem Creek, 24.VII.1993, #36/350, *Ignatov* (MHA); Karakem River, 18.VI.1989, #0/477, *Ignatov* (MHA); Bogoyash

- Creek, 27.VII.1993, #36/330, *Ignatov* (MHA); 18.VI.1986, 17.VI.1989, *Zolotukhin* (MHA); Tura Creek, 2.VIII.1991, #28/1, *Ignatov & Ignatova* (MHA); Malyj Yaloman, 30-31.VII.1991, #21/8, 23/130, 25/8, 25/59, 25/71, 25/86, 25/129, *Ignatov & Ignatova* (MHA); Karakem Creek, 18-25.VI.1989, #0/732, #0/472, 0/931, 0/921, 0/922, 0/923, 0/928, *Ignatov* (MHA); Kobiguayuk - Ayulyuyuzuk watershed, 15.VI.1989, #0/924, *Ignatov* (MHA); Kobiguayuk Creek, 14-18.VI.1989, #0/728, 0/730, 0/463, *Ignatov* (MHA); Chulyshman River, Berekhtuyaryk, 26.VI.1989, #0/731, 0/473, 0/920, *Ignatov* (MHA); Chulyshman River, Chodro, 14.VI.1989, #0/935, *Ignatov* (MHA); Chulyshman River near Yazula, 25.VI.1989, 0/916, 0/925, *Ignatov* (MHA); Ulagan, 5.VIII.1993, #36/103, *Ignatov* (MHA); Shapshal Range, Tashkalykaya Mt., 14, 19.VII.1990, *N.Zolotukhin* (MHA); Yakhansoru Lake, 26.VI.1990, *N.Zolotukhin* (MHA); Shavla Creek, Oimok, 8.IX.1987, *N.Zolotukhin* (MHA); Uzunoyuk Creek, 9.VII.1990, *N.Zolotukhin* (MHA); Seminskij pass, 15.VI.1966, *L.V.Bardunov* (IRK); Kurkure Range, Kayakkatiyarykskij Creek, 28.VI-8.VII.1991, #3/14, 3/39, 3/67, 3/100, 3/102, 3/103, 3/111, 3/132, 3/141, 3/183, 3/247, 3/273, 3/275, 3/290, 4/27, 6/36, 7/32, 7/82, 7/128, 7/136, 8/18, 8/96, 8/147, 8/149, 8/153, 8/154, 8/178, 8/275, 8/284, 8/301, 8/307, 8/328, *Ignatov* (MHA); Buguzun Creek, 19.VIII.1993, *V.N.Pavlov* (MHA); Artyshtu Creek, 20.IX.1989, *N.Zolotukhin* (MHA); Aedigan, 7.VII.1993, #34/126, 34/168, *Ignatov & Ignatova* (MHA); Chulcha River, 11.VII.1991, #9/11, 9/30, 9/37, 9/48, 9/166, *Ignatov* (MHA); Katun River near Bjika creek mouth, 10.VII.1993, #34/219, *Ignatov & Ignatova* (MHA); Aedigan Creek, 8.VII.1993, #34/218, *Ignatov & Ignatova* (MHA); Tamaral Peak, 8.VII.1993, #34/190, *Ignatov & Ignatova* (MHA); Bardaky Lake, 14.VII.1991, #11/8, *Ignatov* (MHA); Syrjyaz, Arsoek Creek, 16.VIII.1986, *E.Koroleva* (MHA); Kayra-bazhi Peak, 14.VII.1991, #13/32, 13/61, 13/79, *Ignatov* (MHA); between Kayra-bazhi Peak & Bardaky Lake, 14.VII.1991, #13/96, 13/122, *Ignatov* (MHA); Kayra River, 17.VIII.1991, #15/36, *Ignatov* (MHA); Kuyakhtonary, Sykhoy Log, VIII.1973, *I.A.Palamarchuk* (MHA); Kolyushta Mt., 27.VII.1982, *Zolotukhin & Kosheleva* (MHA); Chemal, 5.VIII.1991, 7.VII.1993, #29/41, 34/12, *Ignatov & Ignatova* (MHA); Teletzkoe Lake, Chiri, 13.VI.1989, 19.VII.1991, #0/950, 17/43, 17/48, 17/54, 17/80, *Ignatov* (MHA); Chemal, 12.VI.1909, *V.I.Vereshchagin* (LE); Elekmonar Creek, 2.VIII.1991, #28/12, *Ignatov & Ignatova* (MHA); Tura Creek, 2.VIII.1991, #28/52, *Ignatov & Ignatova* (MHA); Izhon, 10.IX.1931, *B.Schischkin* (LE); Ust-Sema, #B-65190, *T.S.Elias & al.* (NY); Barangol, 14.VII.1966, *L.V.Bardunov* (IRK); Ust'-Sema, 28-29.VII.1991, #24/51, 24/61, 24/74, *Ignatov & Ignatova* (MHA); Teletzkoe Lake, Bele, 3.VII.1989, #0/926, *Ignatov* (MHA); Teletzkoe Lake, Kumzir, 24.VII.1991, #20/11, *Ignatov* (MHA); Teletzkoe Lake, Yailyu, 1.VI.1989, #0/918, 0/919, 0/929, 0/932, 22.VI.1991, 1/43, *Ignatov* (MHA); Teletzkoe lake, Yurga, 24.VII.1991, #1/13, *N.Zolotukhin* (MHA); Teletzkoe Lake, Kamga Creek, 5.VI.1989, #6/933, *Ignatov* (MHA); Kayra Creek, 11.IX.1987, *N.Zolotukhin* (MHA); **Kemerovo Province**, Novokuznetsk Distr., Lower Ters' River, Zayach'ya Mt., 29.VII.1971, *A.Vasiljev* (IRK); Tisulskij Distr., Kiya River, Makaraskij settlement, 5.IX.1971, *A.Vasiljev* (IRK); Tisul Distr., Apataga Mt., 9.IX.1971, *A.Vasiljev* (MHA); Tashtagol Distr., Pustag Mt., 20.IX.1970, *A.Vasiljev* (IRK); **Krasnoyarsk Territory**, Jenisei, Antziferova, 27.VI.1876, #236B, *H.W.Arnell* (H-SOL); Jenisei, Antziferova, *H.W.Arnell*, #273A (H-SOL); Jenisei, Dudinka, *H.W.Arnell*, #237B (H-SOL); Krasnojarsk, 11.VI.1876, *H.Arnell* (H-SOL, lectotype of *G.cavifolia*; H-Br, isotype of *G.cavifolia*); Minussinsk, V.1888, *N.Martianoff* (sub. *G.cavifolia*) (H-Br); Enissejsk Distr., Karabuly River, 3.IX.1908, #899, *J.V.Kuznezov* (H-Br, LE); Dudinka River, 20.VII.1914, #1150, *N.Kusnezov & W.Reverdatto* (LE); Turukhansk Distr., Bakhta River, Keteollo Lake, 11.VIII.1992, #85, *S.Shcherbina* (MW); Podkamennaya Tunguska, Shumikha Creek, 10.VII.1994, #291, *S.Shcherbina* (MW); Taimyr, Taimyr Lake, Ledianaya Bay, 6-28.VII.2004, #G1, G8, G10, G16, G21, *V.Fedosov* (MW); Putorana Plateau, Bucharama Mt., 19.VII.1978, *R.Vilde* (LE); Putorana Plateau, Nyakshin Lake, 21.VII.1969, #47, *V.Kuvae* (MW); Putorana Plateau, Beldunchana Lake, 26.VII.1971, 2.VIII.1971, 4.VIII.1971, *L.V.Bardunov* (IRK); Western Sayan Mts., Malyi On Creek upper course, 4.VII.1968, *L.V.Bardunov* (IRK); Western Sayan Mts., Borus Range, Berezovaya River, 28.VII.1968, *S.Gudoshnikov* (IRK); Western Sayan Mts., Ury River, 30.VII.1968, *L.V.Bardunov* (IRK); Western Sayan Mts., Karasu [Karasug] Rive, 6.VII.1968, *L.V.Bardunov* (IRK); Western Sayan Mts., Olenjya Rechka, 19.VI.1968, *Bardunov & Stezko* (IRK); Western Sayan Mts., Alash River, 3.VII.1968, *L.Bardunov & A.Vasiljev* (IRK); Krasnoyarsk City, Stolby, 26.V.1996, 31.VII.1997, 10.V.2001, 26.V.2001, Akademgorodok, 21.V.1995, *T.N.Otnyukova* (KRF, MW); **Khakassia**, Askizskij Distr., Malyj Zub Mt., Amzas River left tributary, 21.VIII.1970, *A.Vasiljev* (IRK); **Tyva Republic**, Todginskaya Valley, Azas River, 27.VIII.1997, *T.N.Otnyukova* (KRF, MW); Azas Lake basin, Ilgi-Chul Hut, 31.IX.1995, *T.N.Otnyukova* (KRF, MW); Toora-Khem, 17.VII.1995, *T.N.Otnyukova* (KRF, MW); Kadysh Lake, 30.VIII.1999, *T.N.Otnyukova* (KRF, MW); **Irkutsk Province**, [Zhigalovsk Distr.] ad.fl.Tytyra, 20.VI.1910, *N.Kusnezov* (H-Br); Kupa River, 2.VIII.1994, *S.Shcherbina* (MW); Chunkskij Distr, Dagdyzherma River, Imen Creek, 17.VII.1957, *E.M.Zlobina* (IRK); Kazachinskoe, 25.VI.1976, *L.V.Bardunov & al.* (LE); Vitimskij Reserve, Oron Lake, Kulturnaya River, 31.VII.1984, *L.V.Bardunov* (IRK); Vitimskij Reserve, Amalyk River, 29.VI.1984, *L.V.Bardunov* (IRK); NE Baikal, Bolshaya Rechka, 3.VII.1956, 11.IX.1956, *L.V.Bardunov* (IRK); **Buryatia**, Sayan, Khara-Daban, 12.VI.1902, #1829, *A.A.Elenkin* (H-Br, LE); Eastern Sayan Mts., Kitoj River, 11-13.VIII.1960, *L.V.Bardunov* (IRK); Eastern Sayan Mts., Belskij Range, Urik River, Alarskij Creek, 28.VII.1959, *L.V.Bardunov* (IRK); Tunka, prope pag. Arshan, 26.VI.1926, #33, *V.Smirnov* (H-Br, IRK); Eastern Sayan, Tunkinskaya Depression, Arshan, 18.VII.1926, *V.Smirnov* (MHA); Baikal, Bolshaya Cheremshanaya Creek, 25.VII.1956, *L.V.Bardunov* (IRK); Tunkinskij Distr., Sayan Mts., Oka River, 7.VIII.1902, #1797, *A.A.Elenkin* (LE); Baikal, Svyatoj Nos peninsula, 27.VI.1956, *L.V.Bardunov* (IRK); Baikal, Solontzovaya Creek, 12.VII.1956, *L.V.Bardunov* (IRK); Baikal, Bolshoj Cheremshanyj cape, 24.VIII.1955, *L.Malyshev* (IRK); Baikal, Turali cape, 26.VIII.1956, *L.V.Bardunov* (IRK); Baikal, Tompuda Creek, 17.VIII.1956, *L.V.Bardunov* (IRK); Baikal, Aya bay, 29.VIII.1956, *L.V.Bardunov* (IRK); Bajkal, Bolshie Koty, *J.Vana* (NICH); Khamar-Daban Ridge, Baikalskij Reserve, Osinovskij Goletz Mt., 18.VIII.2001, *N.A.Konstantinova* (MW); Khamar-Daban Ridge, Baikalskij Reserve, Nemskij Klyuch Creek, 9.VIII.2001, *N.A.Konstantinova* (MW); Baikal Lake, Snezhnaya River, 20.VIII.1912, *V.Smirnov* (H-Br, IRK); Eravinskije Lakes, 24.VII.1912, *M.Korotkij & al.* (LE); Dzherginskij Reserve, 14.VII.2002,

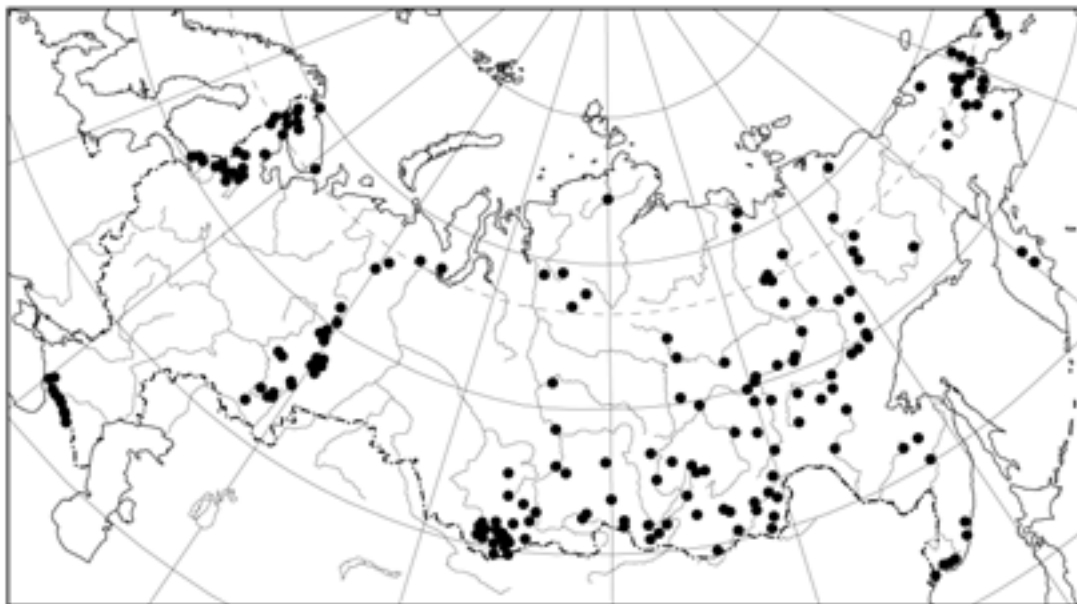


Fig. 29. Distribution of *Grimmia longirostris* Hook. in Russia

#13, *D.Tubanov* (UUH); **Chita Province**, Onon River basin, Adun-Chelon Mts., 27.VII.1911, *V.Smirnov* (MHA); Upper Shakhtama, 20-22.VIII.1963, *L.V.Bardunov* (IRK); Kyra Distr., VII.1965, *P.Shvedchikov* (LE, MW); Chita, 10.VI.1903, *Stukov* (LE); Nerchinsk Distr., Shaverna River, 19.VII.1909, #1193, *N.I.Kuznetsov* (LE); Shilka River, Boty Creek, 29-30.VIII.1963, *L.V.Bardunov* (IRK); Verkhneudinskij Distr., Yamarovskie springs, 16.VII.1903, *Stukov* (H-Br, LE); Verkhneudinskij Distr., Yamarovka, 23.VI.1919, #1609, *A.Zolotukhina* (H-Br, LE); Akshinskij Distr., Tsagan-Oluj, 12.X.1909, *G.Mikhno* (LE, MW); Yamarovka, 2.VII.1904, *G.Mikhno* (H-Br); Balej, 5.VIII.1963, *L.V.Bardunov* (IRK); Selenga Distr., 1900, *M.P.Mollesni* (LE, MW); Gazimur River, Batakan, 28.VIII.1963, *L.V.Bardunov* (IRK); between Shilka & Chernyj Uryum, 10.VII.1909, *N.Blagoveshzhenskij* & *G.Poplavskaya* (H-Br); **Yakutia**, Ytyh-Chaj ad fl. Lena, 5.VII.1901, *A.K.Kajander* (sub. *G.cavifolia*) (H-Br); Kii psaraj, 6.IX.1901, *A.K.Kajander* (H-Br); Kumachsur, 4.IX.1901, *A.K.Kajander* (H-Br); Ytyh-Chaj ad fl. Lena, *A.K.Kajander* (H-Br); Nikolsk, 3.VII.1910, *V.Sukachev* & *G.Poplavskaya* (H-Br); Bulun Distr., Chobogan River, 12.VII.1956, *I.Kil'dyshevskij* (LE); Aldan River, 1911, #1199, *F.V.Sokolov* (LE); Kalarskij Distr., Khodar Mt., 31.VIII.1932, *N.Savicz* (MHA); Khodar Mt. slope to Chara River, 31.VIII.1932, #557, *N.Savicz* (LE); Vilyui River, 12.VIII.1958, #101/8, *I.Kildyshevskij* (LE); Indigirka River, 28.VI-1.VII.1976, *O.M.Afonina* (LE, MW); Indigirka River, Ust-Nera, 13.VI.1976, *O.M.Afonina* (LE, MW); middle course of Indigirka River, In'yali Creek, 16-17.VI.1976, *O.M.Afonina* (LE); upper course of Indigirka River, Bolshaya Ercha River, 3-7.VIII.1974, *O.M.Afonina* (LE); middle course of Lena River, Nemkon, 5.VII.1999, *O.N.Khazieva* & al. (MHA); Zhiganskij Distr., Undyulyung River, Byrandja Creek, 12.VII.1990, *E.V.Ivanova* (SASY); Kobyajskij Distr., Undyulyung River upper course, 3-16.VI.1990, *E.V.Akimova* (SASY); Kobyajskij Distr., Bytantaj River upper course, 12.VI.1990, *E.G.Nikolin*

(SASY); Sobolokh-Mayan – Bytantaj watershed, 5-9.VIII.1991, *Baryshev E.V.* (SASY); Kobyajskij Distr., Kele River, Ugun Imta, 28.VI.1987, *E.G.Nikolin* (SASY); Verkhoyansk Range, Taudandya River, 23.VIII.1956, #145/27, *V.I.Ivanova* (LE); Aldan Distr., Chagda, Chyulbyu, 28.VII.1991, *E.Ivanova* (IRK); Aldanskij Distr., Ket-Kap Range, Right Berdyakit River, 20.VII.1989, *K.Volotovskij* (IRK); Aldanskij Distr., Gynym River, 24-26.VII.1991, *E.I.Ivanova* (SASY); Aldanskij Distr., Ili River, 8-10.VII.1991, *E.I.Ivanova* (LE); Khangalassky Distr., Lenskie Stolby, 17.VIII.2000, #00-117, *Ignatov* (MHA), 25.VIII.1999, *K.Krivoshapkin* (LE) & 15.VII.1999, *E.I.Ivanova* (SASY); Lenskij Distr., Nam, 22.IX.1953, #174/4, *V.B.Kuvaev* (SASY); Neryungri Distr., Chul'man, 5.VII.1993, *E.I.Ivanova* (LE); Neryungri Distr., B.Toko, Ivak Creek, 30.VII.1987, *K.Volotovskij* (LE); M.Toko Lake, 26.VII.1990, *K.Volotovskij* (LE); Olyekminsk Distr., Dzyagdachi River, 3.VII.1910, #141, 181, 188, *V.Sukachev* & *G.Poplavskaya* (LE); Olyekminskij Reserve, 6.IX.1996, *K.Krivoshapkin* (MW); Olekminsk Distr., Tokko River, 4.VII.1994, *E.I.Ivanova* (SASY); Biryk River, #060107, 060108, *K.Krivoshapkin* (LE, IBA); Olekminsk, #010602, 010404, *K.Krivoshapkin* (LE, IBA); Suntar-Khayata Range, 18.VI.1999, *E.Ivanova* & *K.Krivoshapkin* (MHA); Tompo Distr., 150 km of Khandyga-Oimyakon Hw, Siaegaeliaekh, 21.VI.1999, *E.I.Ivanova* (SASY); Tompo Distr., Khandyga-Oimyakon Hw, 17-18.VI.1999, *E.I.Ivanova* (SASY); Tompo Distr., Suntar-Khayata Range, Kyubyume Creek, 16.VI.1999, *E.I.Ivanova* & *K.K.Krivoshapkin* (SASY, MW); Verkhoyansk Range, Menkyule River, 28.V.1956, #152/60, *V.Ivanova* (LE); Verkhoyansk Range, Tompo River, 13.VII.1956, #66/12, *V.I.Ivanova* (LE); Tomponskij Distr., Tukulun River, Temirdekh Creek, 4-8.IX.1990, *E.V.Akimova* (SASY); Tuora-Tukulan Creek, 3.IX.1990, *E.Baryshev* (SASY); Suntar Distr., Vilyuj River 217 km downstr. Ulakhan-Vava mouth, 12.VIII.1958, #101/8, *I.Kildyshevskij* (SASY); Suntar Distr., Vilyui River 50 downstr. Ulkhan-Vava 25.VII.1958, #53/2, *I.Kildyshevskij* (LE);

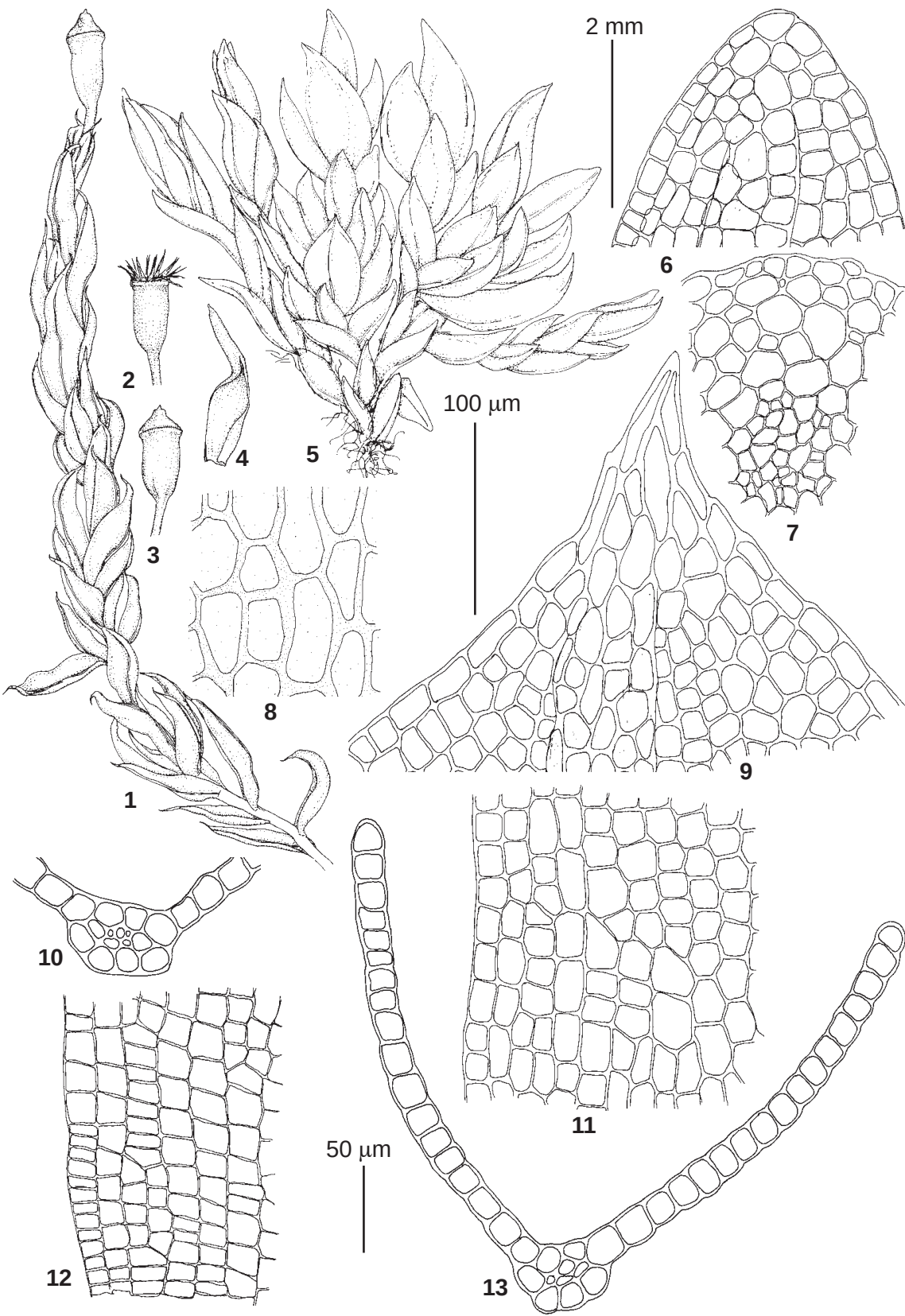
Ust-Maya Distr., Solnechnyj, Tom Creek, 2-3.IX.2000, #00-129, 00-135, 00-136, *Ignatov* (MHA); Ust-Maya Distr., Allakh-Yun, Selyakh Creek, 30.VIII.2000, #00-120, *Ignatov* (MHA); Ust-Maya Distr., Allakh-Yun, Tarbagannakh, 25.VIII.2000, #00-123, 00-945, *Ignatov* (MHA); Ust-Maya Distr., Yugorenok Creek, 6.IX.2000, 00-12, *Ignatov* (MHA); Ust-Maya Distr., Chabda Reserve, 5.IX.2001, *E.V.Sofronova* (SASY, MW); Aldan Distr., Uchur River, 1.VII.1991, *E.Ivanova* (LE, IRK); 25.VII.1989, *K.Volotovskij* (MHA, SASY); Kobya'skij Distr., Kitchan Settlement, 3.VII.2002, *E.I.Ivanova* (SASY, MW); Neryungri Distr., Udokan Range, 10.VIII.2001, *L.V.Kuznetsova* (SASY, MW); **FAREAST: Amurskaya Province**, Zeya Reserve, Teplyi Klyuch, 20.IX.1979, #254, *D.Petelin* (MHA), 8-11.VIII.1980, #19, 13, 19, 96, 109, 110, 111, 112, *L.I.Abramova* (MW), 12-13.VIII.1980, *N.Stezura* (IRK); Smirnovskij Klyuch, 9.VIII.1980, #39, *L.I.Abramova* (MW); Kamraj Creek, 5.IX.1979, *D.Petelin* (MW); B.Erakingra River, 23.IX.1979, #302, *D.Petelin* (MW); Beloborodovskij Klyuch, 12.VIII.1977, #1, *I.A.Gubanov* (MW); Zeya Reserve, Peak 1442 m, 22.VIII.1980, #213, 270, *L.I.Abramova* (MW); Upper Zeya plane, Zhurban settlement, 30.VI.1974, *S.K.Gambaryan* (IRK); Gilyuj River, 11.IX.1979, #140, *D.Petelin* (MW); Motovaya Creek, VIII.1979, #24, *D.Petelin* (MW); Zeya River basin, 2.VII.1908, *N.Prokhorov* & *O.Kuzeneva* (LE); Gilyuj River, 18.VII.1915, *N.Prokhorov* & *O.Kuzeneva* (LE); Bakharevaya & Starkovka, 11.VI.1910, *M.Korotkij* (H-Br, LE); **Khabarovsk Territory**, Komsomol'skij Reserve, VI.1985, *V.Ya.Cherdantseva* (VLA); Bureinskij Reserve, Bureya River, Umalta-Makit Creek, 28.VIII.1997, #97-110, *Ignatov* (MHA); Chapkhoz, 16.VIII.1989, #89-M-207, *O.Grigorjeva* (MHA); Pravaya Bureya River lower course, 27.VIII.1997, #97-1101, *Ignatov* (MHA); Kuraigagna Creek, 15.VIII.1997, #97-1106, *Ignatov* (MHA); Medvezhje Lake, 10.VIII.1997, #97-1102 & 12.VIII.1997, #97-1095, *Ignatov* (MHA); **Chukotka**, Anadyr River basin, Iljmynyjeem Creek, 27-28.VII.1978, 3.VIII.1978, 11.VIII.1982, *O.M.Afonina* (LE); Tamvatvaam Creek, 22.VIII.1983, *O.M.Afonina* (LE); Shakhterskij settlement, 27.VIII.1977, *O.M.Afonina* (LE); Achchen Lake, 7.VII.1970, 30.VII.1970, *O.M.Afonina* (LE); Yablon River upper course, 7-11.VIII.1982, *O.M.Afonina* (LE); Tanyurer River upper course, 5-9.VII.1979, *O.M.Afonina* (LE); Golubaya Creek, 14-16.VII.1981, *O.M.Afonina* (LE); Baranje Lake, 25.VII.1980, 31.VII.1980, 4.VIII.1980, *O.M.Afonina* (LE); Tanyurer River, Kujviveemkaj, 10.VIII.1981, *O.M.Afonina* (LE); Bering Strait, C.Wright, #77 (FH); Getlyan River, *O.M.Afonina* (LE); Malaya Vesnovannaya Creek, *O.M.Afonina* (LE); Ushkanji Gory, 11-14.VIII.1978, *O.M.Afonina* (LE); Lorino, 14.VIII.1962, *Gavrilyuk* (LE); Lavrentiya bay near Krauze cape, 18.VII.1973, *T.Belova* (LE), 29.VII.1975, 2.IX.1975, *O.M.Afonina* (LE); Pekulnej Mt. Range, South Pekulnejveem, 31.VII.1979, *O.M.Afonina* (LE); Televeem-First Creek, 18.VII.1979, 22.VII.1979, *O.M.Afonina* (LE); Karvalyanskaya Creek, Berezovye Mts., 19-27.VII.1982, *O.M.Afonina* (LE); Amguema River middle course, Aevgekinot-Iultin road, 20-25.VI.1969, *O.M.Afonina* (LE); Aevgekynot settlement surroundings, 20.VI.1969,

20.VI.1970, 19.VIII.1977, *O.M.Afonina* (LE); Kalenmyvaam River, 20.VII.1973, *A.Sytin* (LE); Iul'tin, 20.VII.1971, *Maksimova* (LE); Enmyvaam Creek, 30.VI.1980, 1.VII.1980, 9.VII.1980, *O.M.Afonina* (LE); Palyavaam River lower course, 12.VII.1979, 26.VII.1989, *O.M.Afonina* (LE); **Magadan Province**, Ten'kinskij Distr., Sibit-Tyeliakh Settlement, 23.VII.1976, *L.S.Blagodatskikh* (LE); **Kamchatka**, Verkhnekireunskie Springs, 27.VIII.2001, *O.Czernyagina* (LE); Ushkovskij volcano slope, 21.VII.2003, *I.Czernyadjeva* (LE); **Primorskij Territory**, Alekseevskij Range, Ol'khovaya Mt., 31.VII.1980, 21.IX.1993, 22.IX.1998, *V.Ya.Cherdantseva* (VLA); Sovetskij Distr., Murtto surroundings, *B.Kolesnikov* (LE); Kedrovaya Pad' Reserve, 14.VIII.1977, *V.Ya.Cherdantseva* (VLA); Sujoruna River, Kondratenkova village, VIII.1913, #90, *V.L.Komarov* (LE); Chuguevka Distr., Oblachnaya Mt., 31.VII.1980, 2.VIII.1980, *V.Ya.Cherdantseva* (VLA); Chuguevka Distr., Snezhnaya Mt., 31.VIII.1977, *L.V.Bardunov* & *V.Ya.Cherdantseva* (VLA); Dal'negorsk Distr., Rudnaya Pristan', 7.IX.1977, *L.V.Bardunov* & *V.Ya.Cherdantseva* (VLA); Sikhote-Alin'skij Reserve, Yasnaya River, 20.VI.1979, *V.Ya.Cherdantseva* (VLA); Sovetskij Distr., Tutto River, 6.VIII.1945, *B.Kolesnikov* (LE); Chernigovskij Distr., above Lunza settlement, 30.IX.1984, *A.Lazarenko* (LE); Partizansk Distr., Koj settlement surroundings, Mana Creek, 8.III.1971, *N.Komarov* (IRK).

Distribution. *Grimmia longirostris* is one of the most widespread species of the genus in Northern Hemisphere, growing also in Andes in South America, high mountains of New Guinea, Hymalaya, mountains of eastern Africa, Australia, and New Zealand. It is also the most widespread *Grimmia* species in Russia, common in all montane areas, from Chukotka, Taimyr, and Kola Peninsula to southern Far East, southern Siberia, and Caucasus, not rare in Urals, and absent in lowland European Russia and Western Siberia. Equally frequent in forest and alpine belts. Grows on acidic and neutral rocks, on sunny and shaded places.

Differentiation. Plants with sporophytes are readily recognized by numerous cylindric exserted capsules, with smooth, stramineous urns, orange opercula contrasting in color with the urns, and short to long, but usually $\pm$ obtuse beak. The species is very polymorphous, and its different forms were often confused, as seen from studied herbaria, with other species, mostly with *G. ovalis*, *G. montana*, and *G. reflexidens*. The differentiation from *G. ovalis* is discussed under the latter species. All records of *G. montana*

Fig.30. *Grimmia mollis* B. S. G. (1-4, 7-8 – from Yakutia, M.Ignatov, #00-152; 5-6, 9-13 – from Perm Province, A.Bezgodov, #321): 1, 5 – habit; 2-3–capsules; 4 – calyptra; 6, 9 – upper leaf cells; 7 – stem transverse section; 8 – exothecium; 10, 13 – leaf transverse sections; 11 – median leaf cells; 12 – basal leaf cells. Scale bars: 2 mm for 1-5; 50 μ m for 10, 13; 100 μ m for 6-9, 11-12.



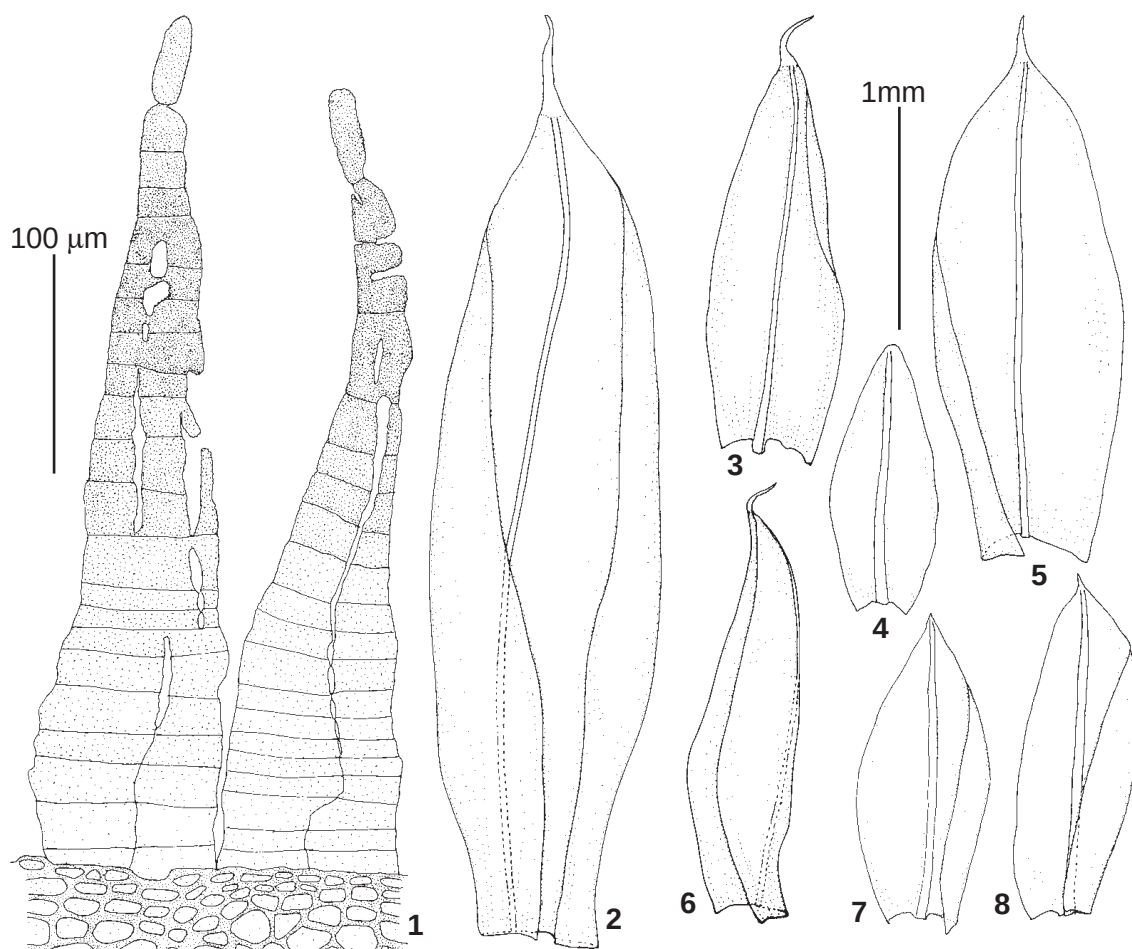


Fig. 31. *Grimmia mollis* B. S. G. (1-3, 5-6 – from Yakutia, M. Ignatov, #00-152; 4, 7-8 – from Perm Province, A. Bezgodov, #321): 1 – part of peristome; 2 – perichaetial leaf; 3-8 – stem leaves. Scale bars: 1 mm for 2-8; 100 µm for 1.

from Urals (and also from other regions of the country, except Caucasus and Karelia) were found to be small phenotypes of *G. longirostris* with quadrate basal marginal (and sometimes also juxtacostal) cells. However *G. longirostris* can be easily differentiated from *G. montana*, *G. reflexidens* and other species with keeled leaves by the shape of costa in transverse section: it is reniform, with 3-8 ventral epidermal cells in *G. longirostris* vs. semi-circular, with 2 ventral epidermal cells in *G. montana*, *G. reflexidens*, *G. pilifera*. Similar reniform costa is known in *Grimmia jacutica*, *G. hartmanii*, and *G. ramondii*; their differences from *G. longirostris* are discussed under these species.

16. *Grimmia mollis* B. S. G., Bryol. Europ. (fasc. 42) 3: 133. 1849. – *Hydrogrimmia mollis* (B. S. G.) Loeske, Stud. Morph. Syst. Laubm.: 108. 1910. Figs. 30-32.

Plants in soft, loose, easily separating tufts, bright to dark green or bluish green, not hoary. Stems erect, 1-3 cm long, with central strand. Leaves erect or loosely appressed when dry, erect-spreading when moist, ovate to broadly ovate, acute to obtuse, 1.4-2.5×0.5-0.9 mm, widely keeled to concave distally; margins plane throughout; costa differentiated, thin, slightly prominent dorsally, semi-circular in cross section, with 2 ventral epidermal cells; hyaline hair-points absent or short, ca. 0.1-0.3 mm long; lamina unistratose, rarely bistratose in 1-2 cell rows at margins in distal 2/3 of leaf; upper and median laminal cells subquadrate, 12-20 µm, with thin and not sinuose walls, basal juxtacostal cells short rectangular, 14-40×13-25 µm, with thin, not porose walls, basal marginal cells quadrate to oblate for several rows, with thin longitudinal and thick transverse walls. Dioicous, sporophytes rare. Setae straight, 2-3 mm. Capsules emergent to shortly exserted, ovate-cylindric, 1.5 mm long. Operculum conic, mamillate or with short beak. Annulus of Schistidium-type. Peristome teeth red,

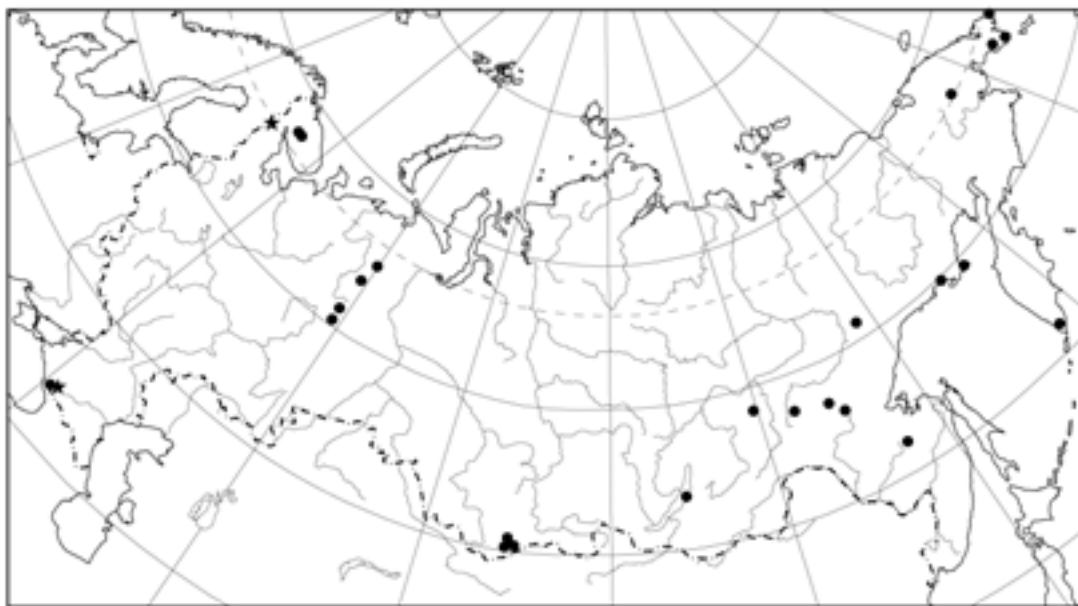


Fig. 32. Distribution of *Grimmia mollis* B. S. G. (circles) and *G. montana* B. S. G. (stars) in Russia.

perforated and cleft in distal part. Spores 10-13 μm . Calyptrae cucullate.

SPECIMENS EXAMINED: EUROPEAN RUSSIA: **Murmansk Province**, Khibiny Mts., 23.VII.1892, *Kihlman* (H); Lapponia Imandrae, [E of Lovozero], 2 & 29.VII.1892, *Kihlman* (H); Khibiny Mts., Yuksporlak pass, 8.VIII.1948, *R.N.Shlyakov* (KPABG), 3.VIII.1995, #8-95, *O.A.Belkina* (KPABG); Podjemnaya River, 19.VIII.1948, *Shlyakov* (LE); Lovozerskie Mts., Karnasurt, #101-14-82, *O.Belkina* & *A.Likhacjev* (KPABG); Lovozerskie Mts., Parganyun, #20-12-84, *O.Belkina* & *A.Likhacjev* (KPABG); **CAUCASUS: Karachaevo-Cherkessia**, Teberda Reserve, Nazlykol Gorge, 10.VIII.1986, *Ignatova* (MHA); Nazlykol Gorge, 29.VIII.1995, #128/95, *Onipchenko* (MW); Ullu-Murudzhu Gorge, 10.VIII.1986, *Ignatova* (MHA); **URALS: Komi Republic**: Narodnaya Mt., 8.VII.1955, *Gorchakovskij* (LE); Telpos Range, 13.VIII.1907, *R.Pohle* (LE); **Perm Province**, Vishera Reserve, Tulym Range, 1.VII.1994, #321, 335, *Bezgodov* (MW); Vogulskij Kamen Mt., 23.VII.1958, *K.Igoshina* (LE); **SIBERIA: Altai Republic**, Shapshal Range, Uzunoyuk River, 9.VII.1990, *Zolotukhin* (MHA); Karakem River basin, Ayulyuyzyuk Creek, 16.VI.1989, #0/466, *Ignatov* (MHA); between Bashkaus & Pravyy Bogoyash Rivers, 26.VI.1983, #36/79, *Ignatov* (MHA); **Buryatia**, Baikal Lake, Svyatoj Nos Cape, 24-26.VII.1961, *V.Siplivinskij* & *L.Lagutskaya* (LE); **Yakutia**, Nerungri Distr., Toko, 23.VII.1987, *K.Volotyovskij* (SASY, LE); Pravaya Ungra River sources, 21.VIII.1989, *K.Volotovskij* (SASY, MHA, LE); Algama River, Karaelag Creek, 31.VII.2000, *E.Sofronova* (SASY); Olekminskij Distr., Torgo, 14.VII.1994, *E.I.Ivanova* (SASY); Ust-Maya Distr., Semench-Yuryakh Creek, 26.VIII.2000, #00-961, *Ignatov* (MHA); Tarbagannakh Creek, 25.VIII.2000, #00-150, 00-152, 00-155 *Ignatov* (MHA); **FAR EAST: Khabarovsk Territory**, Bureinskij Reserve, Medvezhje Lake, 11.VIII.1997, #97-1089, 97-1090, *Ignatov* (MHA); **Chukotka**, Bering Strait, #73, *C.Wright* (FH); Chaplinsk hot springs, 12.VII.1969, *O.Afonina* (LE); Pepenveem River, 5.VIII.1970, *A.Galanin* (LE); Enmynvaam River, 9.VII.1980,

O.Afonina (LE); **Magadan Province**, pr. Magadan, Marchekanskaya Sopka, 19.IX.1977, *O.M.Afonina* (LE), 19.VII.1978, *L.Blagodatskikh* (LE); Tenkinskij Distr., Gusakova pass, 19.VII.1972, *L.Blagodatskikh* (LE); Sibit-Tyellakh, 13.VII.1977, *V.Zvezdenko* (LE); Ol'skij Distr., P'yagin Peninsula, 11.VIII.1978, *L.Blagodatskikh* (LE); Luzhina Bay, 7.IX.1977, *L.Blagodatskikh* (LE); **Kamchatka**, South Kamchatian Protected Area, 24.VII.1990, *I.Czerenyadjeva* (LE).

Distribution. *Grimmia mollis* is distributed sporadically in mountain areas of the Holarctic. In Russia, it is known from Kola Peninsula, Polar and Northern Urals, Caucasus, mountains of Siberia and Far East. It grows at wide elevation range, in forest and alpine belts, usually on moist rocks along streams and rivers.

Differentiation. *Grimmia mollis* differs from any other species of *Grimmia* by its soft, ovate-lanceolate to broadly ovate leaves, usually mucicous, only upper leaves with short hyaline hair-points, plane margins, and large (12-25 μm vs. 6-12(-14) μm in other *Grimmia* species), thin-walled and esinuose subquadrate upper leaf cells.

17. *Grimmia montana* B. S. G., Bryol. Europ. (fasc. 25-28) 3: 128, tab. 250. 1845. Figs. 32, 33.

Plants in small cushions, dark green to blackish, not very hoary. Stems ascending or erect, fasciculate branching, 0.5-1.0 cm long, with central strand. Leaves loosely appressed and slightly flexuose when dry, erect-spreading when moist, 1.5-2.1x0.5-0.6 mm, from ovate base gradually tapering into lanceolate acumen, acuminate, keeled in distal

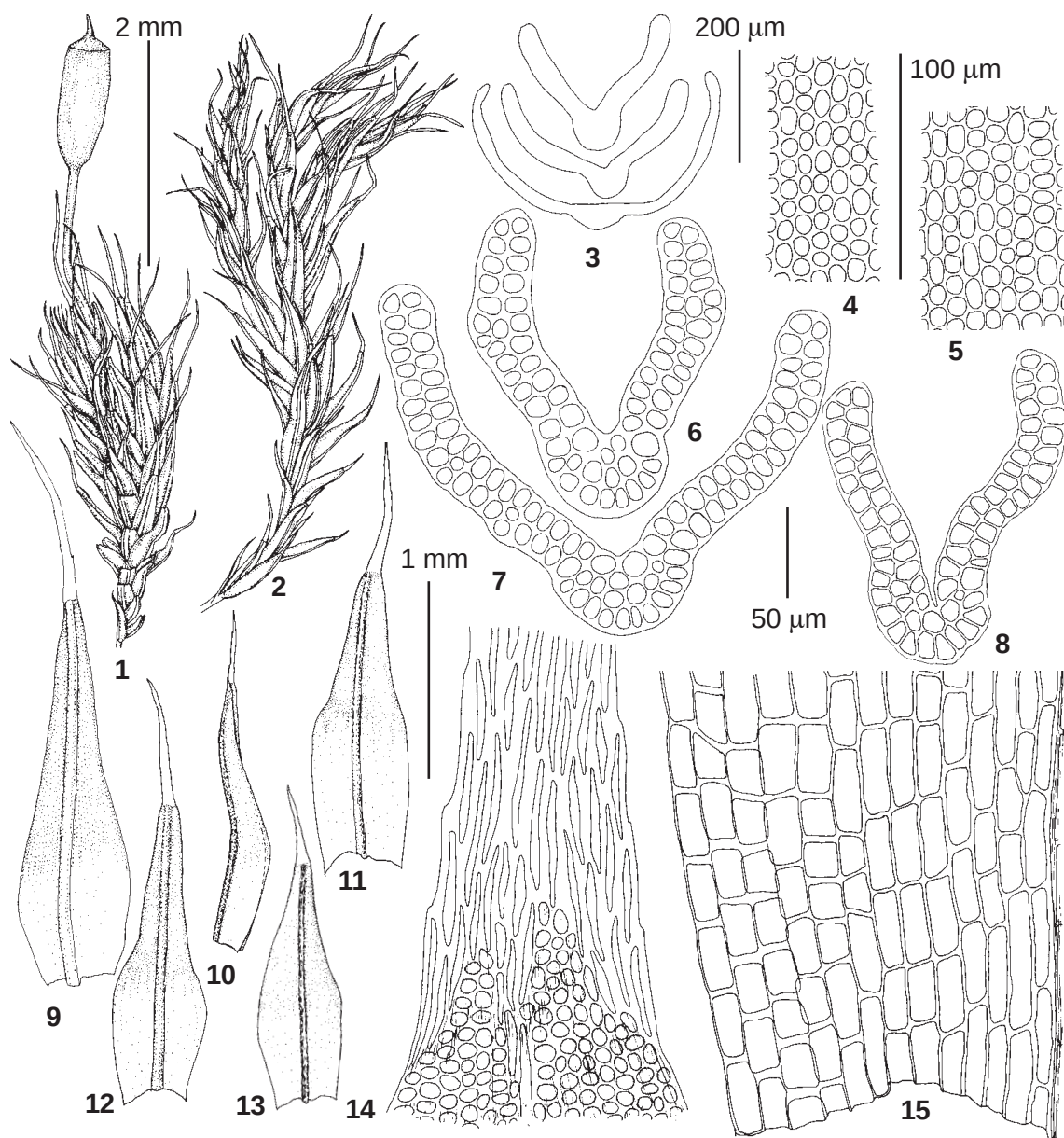


Fig.33. *Grimmia montana* B. S. G. (1, 8-9 – from Karelia, 27.VII.1937, A. V. Auer & al.; 2-7, 10-15 – from Karachaevo-Cherkessia, 16.V.2001, V. Onipchenko): 1, 2 – habit; 3, 6-8 – leaf transverse sections; 4 – upper leaf cells; 5 – median leaf cells; 9-13 – leaves; 14 – base of hair-point and upper leaf cells; 15 – basal leaf cells. Scale bars: 2 mm for 1, 2; 1 mm for 9-13; 200 µm for 3; 100 µm for 4-5, 14-15; 50 µm for 6-8; 1.

part; margins plane to incurved; costa differentiated, prominent dorsally, semi-circular in cross section, with 2 ventral epidermal cells; hyaline hair-points 0.3-0.7[-1.5] mm long, terete, denticulate; lamina completely bistratose in distal 2/3, unistratose at base, not plicate, upper and median laminal cells isodiametric, 9-12 µm, rounded-quadrate to short rectangular, with moderately thickened, not sinuose walls, basal juxtacostal cells elongate rectangular, 20-50×10-14 µm, with thin, not porose walls, basal

marginal cells shorter, pellucid, with thin longitudinal and thick transverse walls. Dioicous, sporophytes not rare. Androecia terminal. Perichaetial leaves similar to vegetative leaves. Setae 2-4 mm, straight. Capsules exserted, 1-1.5 mm long, ovoid-cylindric, smooth, chestnut. Exothecial cells thin-walled, stomata lacking. Operculum low conic, with oblique beak. Annulus of Schistidium-type. Peristome teeth concolorous with the urn, perforate and cleft distally. Spores 10-14 µm. Calyptrae cucullate.

SPECIMENS EXAMINED: **EUROPEAN RUSSIA:** **Karelia**, Kuusamo, 27.VII.1937, A.V.Auer & al. (H), 28.VII.1937, O.V.Lumiala (H), 28.VII.1937, M.J.Kotilainen (H); **CAUCASUS:** **Karachaevo-Cherkessia**, Teberda Reserve, Malaya Khatipara Gorge, 16.V.2001, V.Onipchenko (MW).

Distribution. *Grimmia montana* is known in Europe from Iceland, Great Britain, and Scandinavia to Spain and Portugal, eastward to Turkey, and also in Greenland, Canada, USA, and Mexico. Up to date it is found in Russia only from two localities. The collections of *G. montana* from Karelia are fertile. It was also collected recently in Teberda Nature Reserve, Karachaevo-Cherkessia (specimens lacking sporophytes, plants with archegonia). It grows on rock outcrops in forest belt in Karelia and on granite boulders among alpine lichen heath in alpine belt, 2800 m alt., in Caucasus. One more Caucasus locality of *G. montana* is known from Georgia, Kvarelskij District (coll. A.L. Abramova & I.I. Abramov, 25.VI.1964, LE).

Differentiation. *Grimmia montana* was often reported from the different regions of Russia, from Arctic to Caucasus and from Kola Peninsula to Far East, and was considered as rather common species (Bardunov, 1969; Melnichuk, 1970; Savicz-Lyubitzkaya, Smirnova, 1970; Ignatov & Afonina, 1992; Afonina & Chernyadjeva, 1995; Krivoshapkin & al., 2001). But as it can be seen from the herbarium material all these records represent other species, mostly *G. longirostris*, more rarely *G. teretineris* or *G. reflexidens*. Most commonly the forms of *G. longirostris* with subquadrate basal marginal (and sometimes also juxtacostal) cells were confused with *G. montana*; such forms are not rare in dry areas of Siberia (Yakutia, Tyva, etc.) and Urals (this character was used in keys of Russian handbooks as diagnostic character of *G. montana*). The shape of costa in cross section was usually ignored, which caused numerous misidentifications.

Grimmia montana is clearly differentiated from *G. longirostris* by costa semi-circular in cross section, with 2 ventral epidermal cells (vs. reniform in cross section, with 3-8 ventral epidermal cells in *G. longirostris*), margins always plane to incurved (vs. recurved at least at one side in middle part of leaf in *G. longirostris*). Also plants of *G. longirostris* are usually larger, yellowish-green, capsules with

stramineous urns contrasting in color with the orange opercula, whereas plants of *G. montana* are smaller, always dark green, and the opercula are of the same color as the urns, chestnut. *Grimmia montana* differs from *G. reflexidens* by leaves more widely keeled (vs. sharply and narrowly keeled with almost parallel blades near the costa in *G. reflexidens*), lamina completely bistratose distally (vs. only partly bistratose distally), leaf margins plane (vs. occasionally recurved, at least at one side), beaks long and oblique (vs. mamillate), urns and opercula of the same color (vs. orange opercula contrasting in color with stramineous urns in *G. reflexidens*); a good differentiating character is the absence of stomata at urn base in *G. montana* and their presence in *G. reflexidens*. *Grimmia teretineris*, another species sometimes confused with *G. montana* in Russian herbaria, was only recently reported for the first time for the territory of the country (Muñoz & Pando, 2000; Goldberg, 2002). The plants of this species are about the same size as those of *G. montana*, and are similar also in lamina being completely bistratose distally and margins plane throughout. However, *G. teretineris* can be easily separated of *G. montana* by the costa round in cross section and prominent both dorsally and ventrally (unique character in the genus), whereas in *G. montana* the costa is prominent only dorsally, and narrowly channeled ventrally.

18. *Grimmia muehlenbeckii* Schimp., Syn. Musc. Eur. 212. 1860. — *Grimmia trichophylla* var. *tenuis* (Wahlenb.) Wijk et Marg., Taxon 8: 106. 1959. — *Campylopus pulvinatus* var. *tenuis* Wahlenb., Fl. Suec. (ed. 2) 2: 748. 1826. Figs. 34, 35.

Plants in dense or loose tufts, dark green or blackish green. Stems ascending, 1-2 cm long. Leaves flexuose, loosely appressed when dry, patent to spreading when moist, lanceolate, acuminate, 1.5-2.5×0.4-0.6 mm, sharply keeled distally; margins plane in distal part of leaf, recurved on one or both sides below; costa differentiated, strongly prominent dorsally, winged, in cross section irregularly angled or trapezoid, with 2 ventral epidermal cells; hyaline hair-points short or rather long, sharply denticulate; lamina mostly unistratose, 2(-3-4)-stratose at margins in 1-6 cell rows and sometimes with bistratose strips in distal 1/2 of leaf; upper laminal cells isodiametric, 7-9 µm, rounded-quadrate, with moderately thickened, not or slightly sinuose walls, median laminal cells

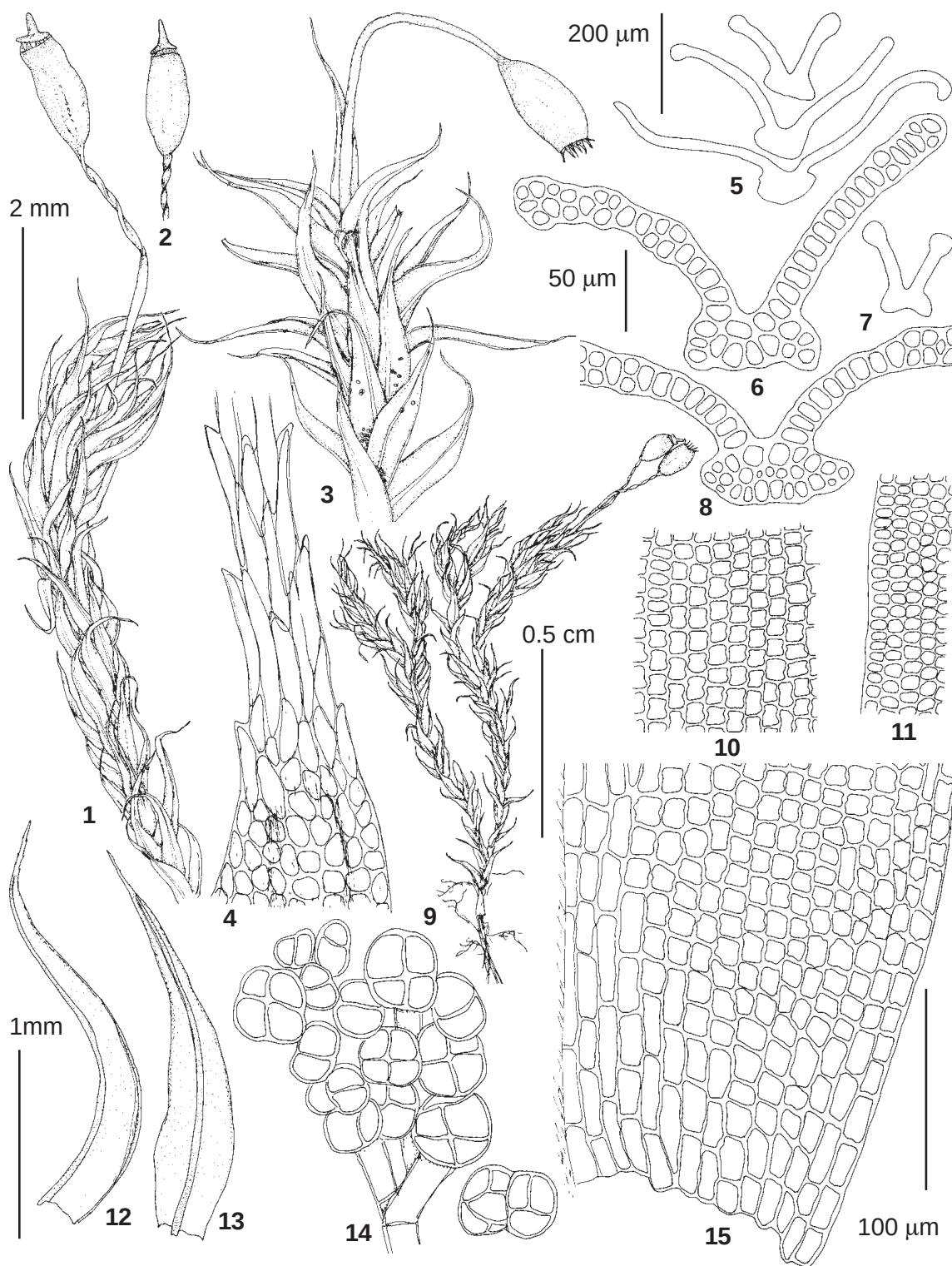


Fig. 34. *Grimmia muehlenbeckii* Schimp. (from Perm Province, M. Ignatov & A. Bezgodov, #244): 1, 3, 9 – habit; 2 – capsule; 4 – base of hair-point and upper leaf cells; 5-8 – leaf transverse sections; 10 – median leaf cells; 11 – upper leaf cells; 12-13 – leaves; 14 – gemmae; 15 – basal leaf cells. Scale bars: 0.5 cm for 9; 2 mm for 1-3; 1 mm for 12-13; 50 µm for 6, 8; 100 µm for 4, 10-11, 14-15; 200 µm for 5, 7.

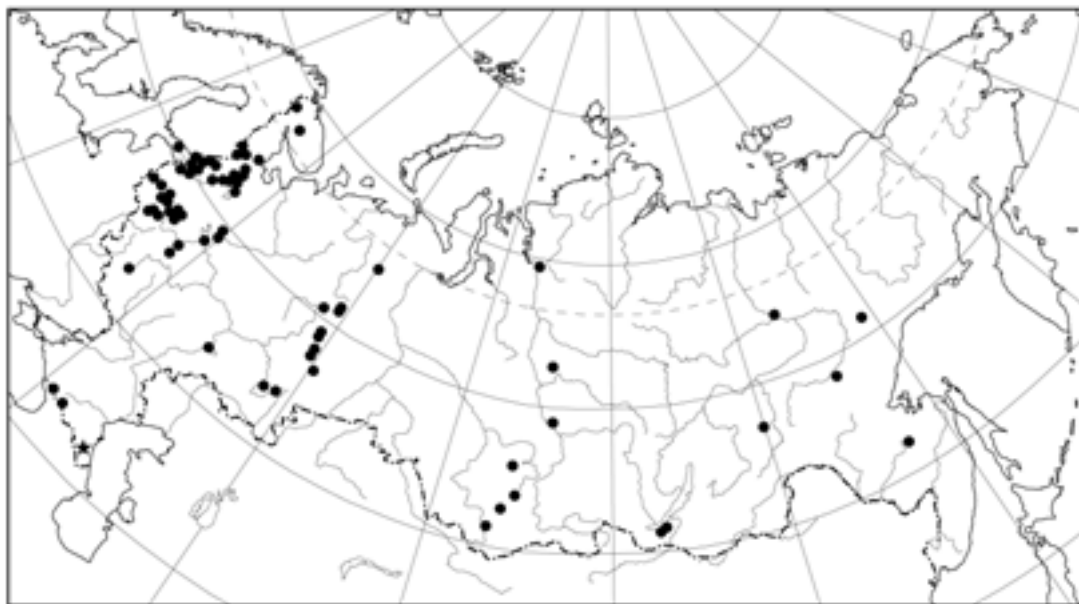


Fig. 35. Distribution of *Grimmia muehlenbeckii* Schimp. (circles) and *G. orbicularis* Bruch ex Wils. (star) in Russia.

thin-walled, moderately sinuose, basal juxtacostal cells rectangular, with moderately thickened, weakly porose walls, basal marginal cells short rectangular, pellucid, with thin longitudinal and thick transverse walls. Gemmae often present, developing on short branched stalks on ventral side of leaf base, rounded-ovoid, red-brown, 3-8-celled, often clustered, to 60 μm in diameter. Dioicous, androecia terminal, sporophytes not rare. Setae to 3 mm, arcuate when moist. Capsules exserted, ca. 1 mm long, ovoid, slightly furrowed when dry. Operculum low conic, with moderately long erect beak. Annulus of affinis-type. Peristome teeth red-brown, densely papillose, entire or weakly perforated. Spores 12-18 μm . Calyptrae mitrate.

SPECIMENS EXAMINED: **EUROPEAN RUSSIA:**

Murmansk Province, Khibiny Mts., Pirrotinovoe Gorge, 9.VIII.1948, #2070, 2073, *R.N.Shlyakov* (KPABG); Khibiny Mts., Yukspor, 30.VII.1948, #1947, Khibiny Mts., *R.N.Shlyakov* (KPABG); Vudjavrchorr Mt., 16.VIII.1948, #2136, *R.N.Shlyakov* (KPABG); 6.VIII.2004, *I.V.Blinova* (KPABG); Lavnatundra Mt., 25.VII.1977, #97/63, *O.Belkina* (KPABG); **Karelia**, Sandal Lake surroundings, 7-21.VI.1920, #116, 126, 207, 1299, *L.I.Savicz* (LE); Bygozero, 12.VII.1921, #002470, *A.I.Belyaeva* (LE); Segozero, 9-19.VI.1921, #3200, 3225, 3226, 3241, 3246, 3506, *L.I.Savicz* (LE); Hiisjarvi, Pallinvaara, IX.1934, *R.Tuomikoski* (H); Ruskeala, 21.VII.1935, *A.J.Huuskonen* (H); Suistamo, 3.XI.1935, *A.J.Huuskonen* (H); Suojarvi, 16.VIII.1939, *R.Tuomikoski* (H); Vieljarvi [Vedlozero], 30.VIII.1942, 7-12.IX.1942, 29.X.1942, 14.VII.1943, 3.IX.1943, 18.III.1944, *A.Railonsala* (H); Nestejarvi, 8.VII.1942, *A.J.Huuskonen* (H); Uksjarvi, «Peninsula digitiformis», 29.VI.1942, *M.J.Kotilainen* (LE); Zaonezhskij Distr., Tolvuya, 16.VII.1969, #080, *L.A.Volkova* (LE); Muezerskij Distr., Reboly, 14.VIII.1970, *L.Volkova*

(LE); Shuyskaya Chupa, 23.VII.1973, *L.Volkova* (LE); Kondopoga Distr., Sampo Mt., 23.VII.1973, *L.Volkova* (LE); Pudozhskij Distr., Vodla Settl., 30.VIII.1976, *L.Volkova* (LE); Onega Lake, Peschanoe Settl., 9.IX.1976, *L.Volkova* (LE); Vodlozero, 9-10.VII.1977, *L.Volkova* (LE); Belomorskij Distr., Shuezero Lake, Lekhta Settl., 30.VII.1977, *L.Volkova* (LE); Pudozhskij Distr., Onega Lake, Shal'skij Settl., 5.IX.1978, *L.Volkova* (LE); Olonetskij Distr., Obzhinskij lighthouse, 8.VIII.1984, *L.Volkova* (KPABG); Elmozero, 13.VIII.2001, #26-91, *Maksimov & Maksimova* (PTZ); Lendery, 8.VIII.2003, #L-03/40-59a, *Maksimov & Maksimova* (PTZ); **Leningrad Province**, Viborg [=Vyborg], VIII.1851, *W.Nylander* (H); Hogland, 18 & 20.VI.1867, *S.O.Lindberg*, 18.VI.1867, *M.Brenner* (H); St. Andrea [=Kamenogorsk], 6.VI.1888, *J.Linden* (H); Muola [=Pravdino], 22.X.1893, *H.Lindberg* (H); St. Iohannes [=Sovetskij], 3.V.1895, *B.Poppus* (H); Valkjarvi [Michurinskaya], 17.VI.1895, *H.Lindberg* (H); Raisala [Melnikovo], 19.VIII.1926, 4 & 6.VII.1928, *I.Hiitonon* (H); Luga Distr., Osmino, 1972, *G.Vjyunova* (KPABG); Priozersk Distr., Otradnoe, 2.VIII.1966, *I.I.Abramov* (LE); Volosovskij Distr., Shugovitsy, 14.V.1985, *Ignatov* (MHA); **Pskov Province**, Dno surr., Polonka River, Beloshka village, 23-28.V.1940, *I.I.Abramov* (LE, MW); **Novgorod Province**, Staraya Russa Distr., 10.VIII.1908, *P.Kurskij* (LE); Leokhnovo village, 19.IX.1905, *P.Kurskij* (LE); **Wologda Province**, Wologda surr., Domanovo, VII.1906, *A.A.Snietkow* (LE); Kubinskoe Lake, 4.IX.1891, *E.Zickendrath* (MW, LE); **Yaroslavl Province**, Rybinsk U., Koprinskaya Volost, 1924, *D.Meshczeryakov* (LE); **Tver Province**, Finyevo, 20.07.1999, *A.A.Notov* (MW); Nelidovo Distr., Fedorovskoe, 3.VIII.1994, *Ignatov* (MW); Toropetskij Distr., Khvorost'evo, 18.07.1999, *A.A.Notov* (MW); Andreapol'Distr., between Khotilitzy & Spiridovo, 6.08.1998, *A.A.Notov* (MW); **Moscow Province**, Lyubertzij Distr., Lytkarino, 4.VII.1988, *Ignatov* (MHA); Moscow City, territory of University Botanical Garden,

22.IV.1988, *Ignatov* (MHA); Mytishzhi Distr., Stepan'kovo, 18.VI.1987, *Ignatov* (MHA); Dmitrov Distr., near Turist Station, 26.VI.1987, *Ignatov* (MHA); Taldom Distr., Mel'dino, 3.VII.1986, 6.VI.1988, 18.VII.1996, *Ignatov* (MHA); **Orel Province**, Vysokoe, Kamennyj les, 21.IV.1990, *N.N.Popova* (MHA); **Samara Province**, Syzran Distr., Rachejskoe forestry, 18.VIII.1989, *A.Mordvinov* (IRK); **CAUCASUS: Karachaevo-Cherkessia**, Teberda Reserve, Ullu-Murudzhu Gorge, 8.VIII.1986, *Ignatova* (MHA); Baduk Lakes, 26.VII.1955, *V.V.Makarov* (MHA); **URALS: Sverdlovsk Province**, Sukhogorskij Kamen Mt. top, 15.VII.1959, *M.Storozheva* (LE); Sysert River, 10.VII.1995, *I.Goldberg* (SVER); Chusovaya river, 30.IV.1981, Soroka, *Dyachenko* (SVER); **Perm Province**, Basegi Reserve, Vilva River, 23.VI.1993, #279, *A.Bezgodov* (MW), 8.VI.1994, #162, 172, 181, 217, 244, *Ignatov & Bezgodov* (MW); Basegi Reserve, Southern Basegi, 9.VI.1994, #84, 791, *Ignatov & Bezgodov* (MW); 20.VI.1992, #388, *A.Bezgodov* (MW); Basegi Reserve, Northern Basegi, 17-19.VI.1993, #204, 228, 7.VII.1993, #428, 6.VI.1992, *A.Bezgodov* (MW), 5.VI.1994, #399, 455, *Ignatov & Bezgodov* (MW); Vishera Reserve, Bolshoj Kolchim River, Churochnaya Creek, 12.VIII.1995, #714, 722, *A.Bezgodov* (MW); Vishera Reserve, Shchugor River, 4.VIII.1995, *A.Bezgodov* (MW); Kuryksar Range (23.VI.1995), #321, 355, *A.Bezgodov & A.Selivanov* (MW); Tulym Range, 1.VII.1994, #333, *A.Bezgodov* (MW); Olkhovka River lower course, 26.VI.1994, #117, *A.Bezgodov* (MW); **Bashkortostan**, Beloretzk Distr., Zuyakovo, 22.VII.195, *E.Z.Baisheva* (LE); Ishimbaj Distr., Uryuk River, 19.VI.2001, #13-192, *V.I.Zolotov* (MHA); **SIBERIA: Tyumen Province**, Berezovo Distr., Polja River, 30.VIII.1950, #81/16, *I.D.Kil'dyushevskij* (LE); **Altai Republic**, Tura Kreek, 2.VIII.1991, #28/1, *Ignatov & Ignatova* (MHA); **Kemerovo Province**, Tisul Distr., Apataga Mt., 9.IX.1971, *A.Vasiljev* (MHA); Tashtagol Distr., Pustag Mt., 20.IX.1970, *A.Vasiljev* (IRK); **Krasnoyarsk Territory**, Jenisei, Antziferova, *H.W.Arnell*, #273A (H-SOL); Jenisei, Dudinka, *H.W.Arnell*, #237B (H-SOL); Turukhansk Distr., Bakhta River, Keteollo Lake, 11.VIII.1992, #85, *S.Shcherbina* (MW); **Khakassia**, Askizskij Distr., Malyj Zub Mt., Amzas River left tributary, 21.VIII.1970, *A.Vasiljev* (IRK); **Irkutsk Province**, NE Baikal, Bolshaya Rechka, 3.VII.1956, 11.IX.1956, *L.V.Bardunov* (IRK); **Buryatia**, Khamar-Daban Ridge, Baikalskij Reserve, Osinovskij Goletz Mt., 18.VIII.2001, *N.A.Konstantinova* (MW); **Yakutia**, Aldan Distr., Uchur River, 1.VII.1991, *E.Ivanova* (LE, IRK); 25.VII.1989, *K.Volotovskij* (MHA, SASY); Kobyajskij Distr., Kitchan Settlement, 3.VII.2002, *E.I.Ivanova* (SASY, MW); Neryungri Distr., Udokan Range, 10.VIII.2001, *L.V.Kuznetzova* (SASY, MW); **FAREAST: Khabarovsk Territory**, Bureinskij Reserve, Medvezh'e Lake, 10.VIII.1997, #97-1102, *Ignatov* (MHA).

Distribution. *Grimmi. muehlenbeckii* is known from most European countries, in Transcaucasia and Turkey, North America. In Russia it is very common in Karelia and not rare in the Kola Peninsula and the Urals. It is almost the only *Grimmia* species in lowland European Russia, especially in its northern part. It is sporadic in Caucasus and east of the Urals (mountain

chains of southern Siberia, Yakutia, and one collection from Khabarovsk Territory). *Grimmia muehlenbeckii* grows on granitic boulders, more rarely on sandstones and granitic walls of channels and rivers; in the mountains it usually occurs in forest belt.

Differentiation. *Grimmia muehlenbeckii* can be recognized by its medium-sized plants and trapezoid costa in cross section. Besides, it often has multicellular gemmae on branched stalks on ventral side of leaf base. Gemmae of similar shape and size are usually present in *G. torquata*, but they develop in the latter species on dorsal side of costa near leaf base, on shorter stalks (looking as sessile). *Grimmia torquata* further differs in having strongly crisped dry leaves (resembling *Tortella* in habit). Another two species producing gemmae are *G. anomala* and *G. hartmanii*, but their gemmae develop on leaf apices at distal part of shoots, and they are much larger plants. When gemmae are lacking, *G. muehlenbeckii* can be separated by its winged costa, irregularly angled and usually trapezoid in cross section. It is similar to the costa structure of *G. elatior*, but plants of the latter species are more robust, 2-7 cm long (vs. small plants, to 2 mm long), leaves usually >2.5 mm long (vs. 1.5-2.5 mm long), costa (2-)3-5-stratose (vs. 2(-3)-stratose), upper laminal cells usually papillose and often bulging (vs. never papillose or bulging in *G. muehlenbeckii*).

19. *Grimmia orbicularis* Bruch ex Wils., Engl. Bot. Suppl. 4: 2888. 1844. Figs. 35, 36.

Plants in dense cushions, yellowish green to dark green, very hoary. Stems erect, 1-4 cm long. Leaves gradually larger to the distal part of shoot, 1.3-2.0x0.6-0.8 mm, oblong-ovate, acute to obtuse, keeled; margins recurved on both sides at middle part of leaf; costa differentiated, prominent dorsally, semi-circular in cross section, with 2 ventral epidermal cells; hyaline hair-points in upper and perichaetial leaves as long as lamina or longer, 1-2(-2.5) mm, weakly denticulate or almost smooth, in lower leaves short or absent; lamina unistratose throughout; upper laminal cells isodiametric, 10-12 µm, rounded-quadrate, thick-walled, not sinuose, median laminal cells short rectangular, with moderately thickened, strongly sinuose walls, basal juxtacostal cells elongate rectangular, slightly porose, basal marginal cells short rectangular, with thin longitudinal and thick transverse walls. Autoicous, androecia terminal, sporophytes usually present. Setae 2-3 mm, arcuate when moist. Capsules exserted, horizontal or pendent,

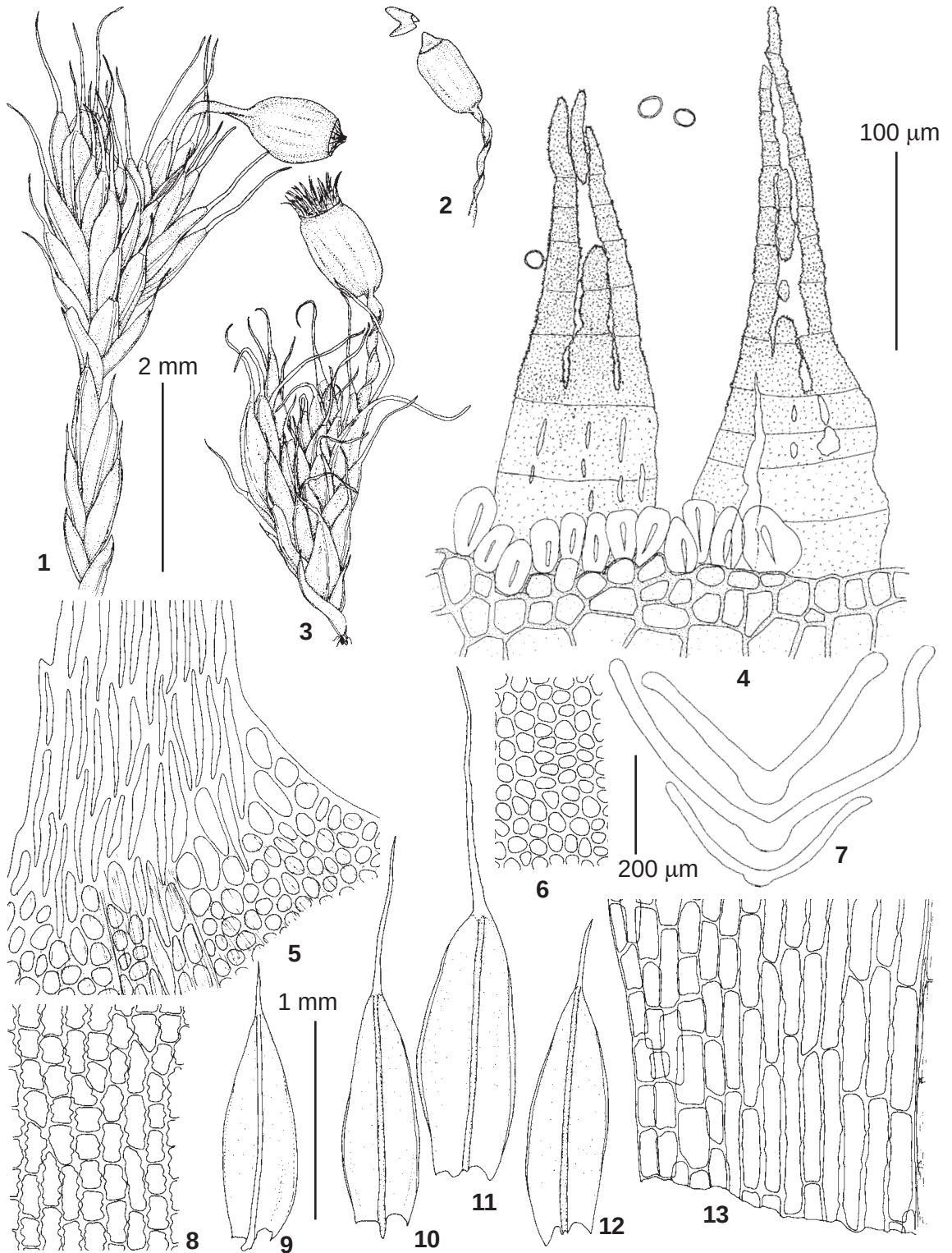


Fig. 36. *Grimmia orbicularis* Bruch ex Wils. (from Dagestan, 19.V.1988, V.Bochkin): 1, 3 – habit; 2 – capsule & calyptra; 4 – part of peristome; 5 – base of hair-point and upper leaf cells; 6 – upper leaf cells; 7 – leaf transverse sections; 8 – median leaf cells; 9-12 – leaves; 13 – basal leaf cells. Scale bars: 2 mm for 1-3; 1 mm for 9-12; 100 µm for 4-6, 8, 13; 200 µm for 7.

1-1.5 mm long, ovoid, ribbed. Operculum conic, with short beak. Annulus of affinis-type. Peristome teeth cribose, irregularly cleft distally. Spores 10-14 µm. Calyptrae cucullate.

SPECIMENS EXAMINED: **CAUCASUS: Dagestan**, 10 km SE of Derbent, between Maraga & Rukel' villages, 19.V.1988, V.D.Bochkin (MHA); Derbent, 17.III.1902, #14211, Th.Alexeenko (LE).

Distribution. *Grimmia orbicularis* is widespread in xeric areas of central and southern Europe, northern Africa, Middle East, Transcaucasia, Turkey, Middle Asia and Pakistan. It is very rare in Russia, known only of 2 specimens from Dagestan. Savicz-Lyubitzkaya & Smirnova (1970) thought that *G. orbicularis* is a synonym of *G. pulvinata* var. *africana* (Hedw.) Wils., and they reported it under the latter name from the southern part of European Russia and Caucasus. According to Muñoz & Pando (2000), however, *G. pulvinata* var. *africana* is a synonym of *G. pulvinata*, not *G. orbicularis*.

Differentiation. In gametophyte characters *G. orbicularis* is very similar to *G. pulvinata*, differing in completely unistratose lamina (vs. bistratose at margins in *G. pulvinata*) and longer basal juxtacostal cells. But these species can be easily separated by androecia position (terminal in *G. orbicularis* vs. lateral, hidden just below perichaetia in *G. pulvinata*), peristome teeth perforation (cribose and cleft in *G. orbicularis* vs. entire or slightly perforated in *G. pulvinata*), and calyptrae shape (cucullate in *G. orbicularis* vs. mitrate, rarely subcucullate in *G. pulvinata*). Usually it is enough to check androecia position for their differentiation: presence of bud-like perigonium just below perichaetium readily excludes *G. orbicularis*.

20. ***Grimmia ovalis*** (Hedw.) Lindb., Acta Soc. Sci. Fenn. 10: 75. 1871. — *Dicranum ovale* Hedw., Sp. Musc. Frond. 140. 1801. — *Grimmia commutata* Hueb., Muscol. Germ. 185. 1833. Figs. 37, 38.

Plants in loose tufts or patches, dark green or blackish-green, brownish in lower part, not very hoary. Stems erect or ascending, 1-4 cm long. Leaves erect to flexuose, loosely imbricate when dry, sigmoid in lateral view when wet, not considerably enlarged to the distal part of shoot, 2-3x0.5-0.7 mm, from ovate base gradually tapering into long lanceolate acumen, acuminate, concave, not plicate; margins plane; costa weakly differentiated in distal 2/3 of leaf, flattened, semi-elliptic in cross section, 4-6 cells wide ventrally; hyaline hair-points 0.5-1.5 mm long,

terete, slightly denticulate, not decurrent; lamina bistratose in distal 2/3, not translucent; upper cells isodiametric, 6-8 µm, rounded-quadrate, with evenly thickened to slightly sinuose walls, median cells quadrate and short rectangular, moderately sinuose, basal juxtacostal cells long rectangular, with moderately thickened, slightly porose walls, basal marginal cells short rectangular or sometimes quadrate, hyaline, with thin longitudinal and thick transverse walls. Dioicous, sporophytes rare (known from Russia only in two collections from Caucasus). Perichaetial leaves not differentiated. Setae straight, 3-4 mm. Capsules exserted, ovoid, 1-1.5 mm long, smooth, narrowed to the mouth. Operculum conic, with long oblique beaks. Annulus of affinis-type. Peristome teeth cleft distally, red-brown, papillose. Spores 8-10 µm. Calyptrae cucullate.

SPECIMENS EXAMINED: **EUROPEAN RUSSIA: Karelia:** Sortavala, 28.VII.1935 & 18.VI.1939, A.Pankakoski (H); **Leningrad Province**, Luzhskij Distr., Kopezerje, 13.VIII.1971, #166, G.Vjunova (LE); Luzhskij Distr., Golubkovo, 10.VIII.1971, #140b, G.Vjunova (LE); **Pskov Province**, Staryj Izborsk, 19.X.1996, Ignatov & Zolotov (MHA, MW); **Moscow Province**, Lyubertzjy Distr., Dzerzhinskij, 6.VII.1988, Ignatov (MHA); **Udmurtiya**, Izhevsk City, 27.VII.2000, A.Sedych (SVER); **Lipetz Province**, Svishnya Creek, 20.VIII.1994, N.N.Popova (MHA); **Rostov Province**, Krasnosulinskij Distr., Kundryuchjya River, 5.V.1993, #768, L.Babenko (MHA); **Volgograd Province**, Kletskij Distr., Kremenskaya, 7.VIII.1999, Ignatov (MHA); **CAUCASUS: Dagestan**, Levashi Distr., Udokkarskie gates, 11.VII.1961, A.E.Bobrov (LE, MW); **North Ossetia**, upper course of Tsej Riv., 25.VII.1979, L.I.Abramova (MW); North Ossetian Reserve, 31.VII.1976, 27.VII.1980, L.I.Abramova (MW); **Karachaevo-Cherkessia**, Teberda Reserve, Semen-Bash Mt., 6.VII.1976, Onipchenko (MHA); Teberda River valley, 1.VIII.1986, Ignatova (MHA); Malaya Khatipara Gorge, 10.VIII.1955, A.L.Abramova & I.I.Abramov (LE, MW); Mukhu Gorge, 17.VIII.1955, A.L.Abramova & I.I.Abramov (LE, MW); Bolshaya Laba River basin, Zaksen Mt., 22.VI.2003, T.Akatova (CSR, MHA); **Krasnodar Territory**, Mzymta River basin, Kogot Mt., 4.VIII.2000, T.Akatova (CSR, MHA); **Adygeya**, Belaya River basin, Tybga Mt., 6.VIII.1987, T.Akatova (CSR, MHA); **URALS: Sverdlovsk Province**, Alapaevsk Distr., Reps River, 23.VI.2000, I.Goldberg (SVER, MW); **Bashkortostan**, Burzyan Distr., Bainazarovo, 9.IX.1990, #10/9, Ignatova (MHA); Bashkirskij Reserve, Ural-tau, Gyr-tash, 24.VI.1948, #4688, E.Selivanova-Gorodkova (LE); Abzelilovskij Distr., Bulanusher Mt., 19.VI.1997, #38, A.Solomeshch (MW); **SIBERIA: Altai Republic**, Teletzkoe ozero, VII.1913, J.Grano (H-Br); Kosh-Agach, Tabozhok Peak, 30.VII-1.VIII.1992, #31/80, 31/77, 31/78, Ignatov (MHA); Chulyshman River, Yazula, 26.VI.1989, #0/951, 0/917, Ignatov (MHA); Kayakkatuyarykskij Creek, 6.VII.1991, #8/279 Ignatov (MHA); left branch of Kaira Creek near Kaira-bazhi Peak, 14.VII.1991, #13/170, Ignatov (MHA); Chermal, 5.VIII.1991, #19/68, Ignatov & Ignatova (MHA); Teletzkoe Lake, Kishte waterfall, 9.VIII.1953, Mel'nichuk (MHA); Teletzkoe Lake, 30.III.1988, I.Zolotukhina (MHA); Yailyu, 24.VI.1993, #0/915, 149, Ignatov (MHA); **Krasnoyarsk Territory**, Malyi On Creek upper course, 4.VII.1968,

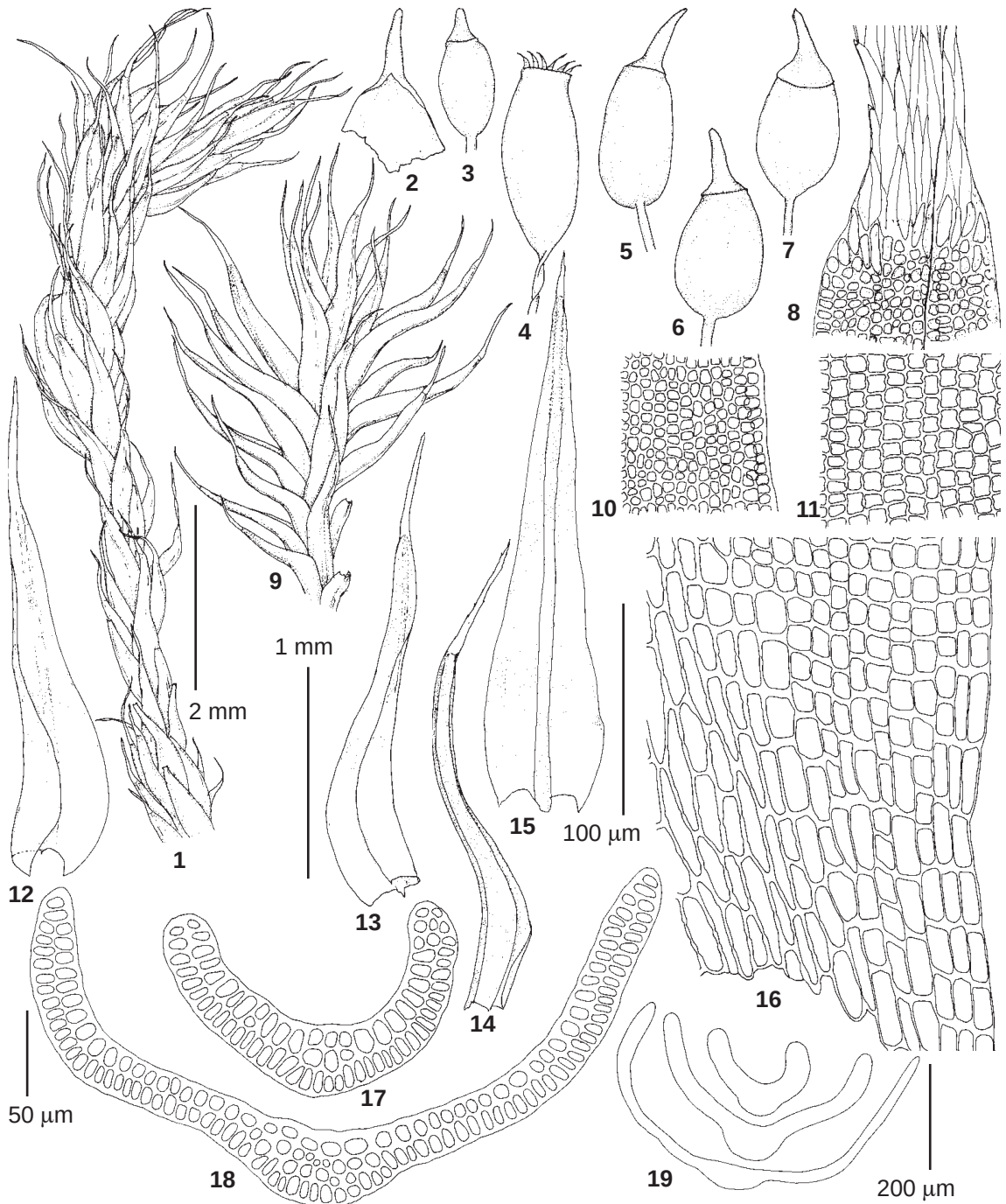


Fig. 37. *Grimmia ovalis* (Hedw.) Lindb. (1, 8-19 – from Bashkortostan, A.Solomeshch, #38; 2-7 – from Karachaevo-Cherkessia, 17.VIII.1955, A.L.Abramova & I.I.Abramov): 1, 9 – habit (dry & wet, respectively); 2 – calyptra; 3-7 – capsules; 8 – base of hair-point and upper leaf cells; 10 – upper leaf cells; 11 – median leaf cells; 12-15 – leaves; 16 – basal leaf cells; 17-18, 19 – leaf transverse sections. Scale bars: 2 mm for 1-7, 9; 1 mm for 12-15; 50 µm for 17-18; 100 µm for 8, 10-11, 16; 200 µm for 19.

L.V.Bardunov (IRK); Minussinsk, VIII.1880, *Martianoff* (H-Br); **Irkutsk Province**, 20.VI.1910, *N.I.Kuznetsov* (LE); Tutura River, 20.VI.1910, #553, *N.I.Kuznezov* (LE); **Chita Province**, Upper Shakhtama, 22.VIII.1963, *L.V.Bardunov*

(IRK); **FAR EAST: Amurskaya Province**, Zeya Reserve, Teplyj Creek, 10.VIII.1980, #56, *L.I.Abramova* (MW); **Primorskij Territory**, Khanka Lake, Orlovka village, 27.VI.1913, #17, *V.L.Komarov* (LE).

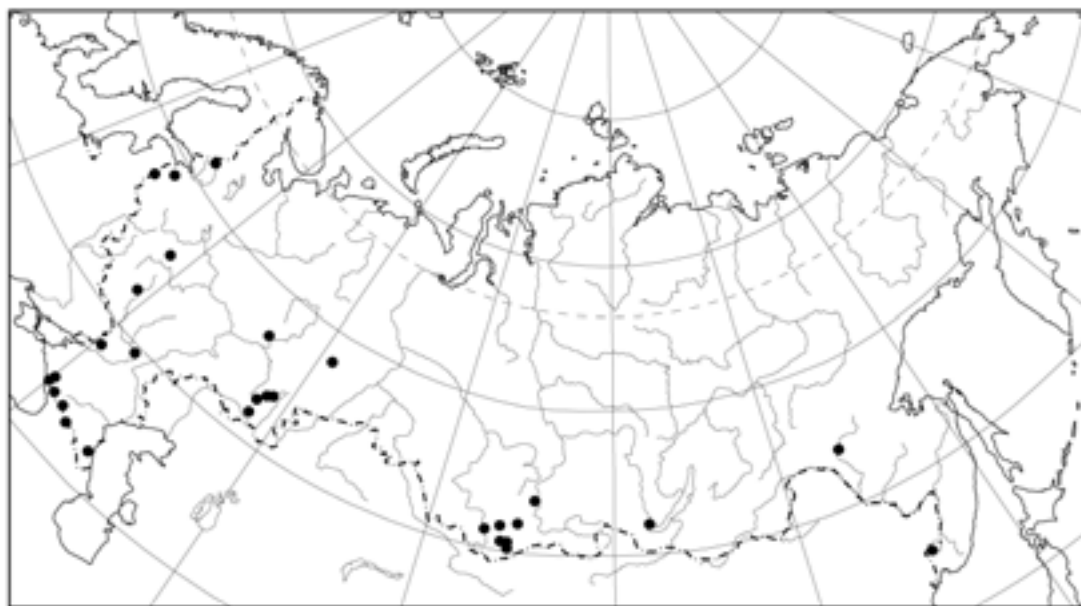


Fig. 38. Distribution of *Grimmia ovalis* (Hedw.) Lindb. in Russia

Distribution. *Grimmia ovalis* is rather widespread in Europe and xeric regions of Asia, known from North Africa, North and Central America. It was considered to be the most widespread species of the genus in Russia, but considerable number of specimens in herbaria labeled as *G. ovalis* represent *G. longirostris*, mostly because of long existing nomenclature confusion (see Sayre, 1951). *Grimmia ovalis* is distributed sporadically in Caucasus and southern Siberia (becoming more frequent in Middle Asia and Ukraine); several collections are known from Urals and central European Russia, mostly in forest-steppe and steppe zones, and also few records are from Leningrad, Pskov, and Moscow Provinces; very rare in Far East. It grows on dry, shaded or exposed substrates, on siliceous or, rarely, basic rocks (mostly on sandstones).

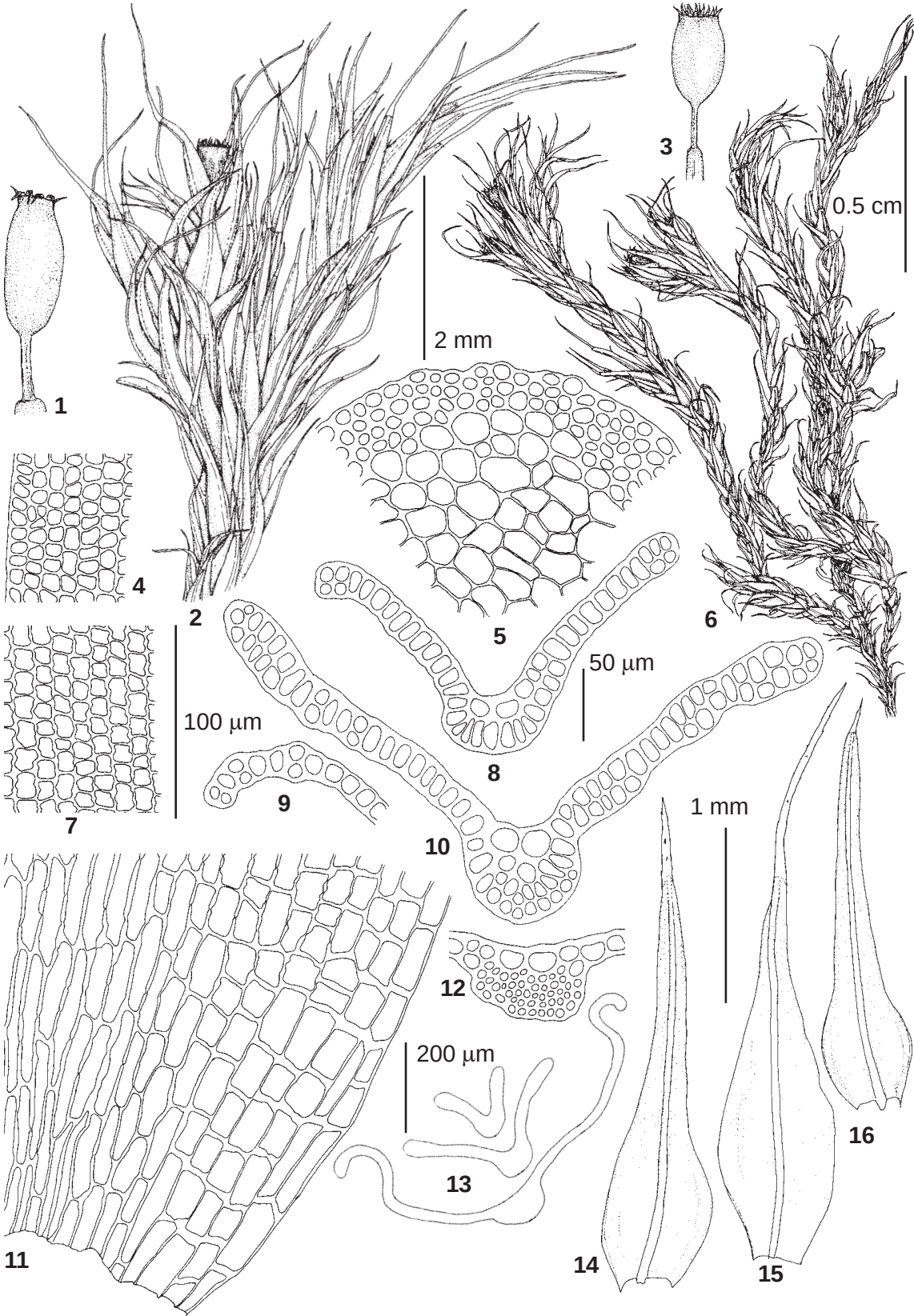
Differentiation. *Grimmia ovalis* differs from *G. longirostris* by concave, channeled, not keeled leaves with plane margins, flattened, weakly differentiated costa, slightly or not prominent dorsally (vs. keeled leaves with recurved on one side margins and costa prominent dorsally, reniform in cross section in *G. longirostris*). Sporophytes are very rare in Russian collections of *G. ovalis* whereas they

are often present in *G. longirostris* specimens; the shape and color of urns and opercula are also different in these species (capsules ovoid, opercula long-rostrate, concolorous with the urns in *G. ovalis* vs. capsules cylindric, opercula usually with obtuse beaks, orange, contrasting in color with the urns in *G. longirostris*). Small plants of *G. ovalis* can be confused with *G. laevigata* or *G. tergestina* (see comments under these species).

21. *Grimmia pilifera* P. Beauv., Prodr. Aethelogam.: 58. 1805. Figs. 39, 40.

Plants medium-sized to robust, rigid, in loose, easily separating tufts, dark green to black green. Stems erect to ascending, (1-)2-3 cm long, without central strand. Leaves erect or slightly flexuose, loosely appressed when dry, with appressed base and spreading acumen when wet, becoming larger to the distal part of shoot, 2.0-3.0×0.6-0.8 mm, from ovate sheathing base quickly narrowed into long lanceolate acumen, keeled above, not plicate; margins plane in distal part of leaf, recurved on one or both sides at leaf base; costa differentiated from the lamina, strongly prominent distally, semi-circular in cross section, with 2(-3) ventral epidermal cells, 2-5(-6)-stratose; hyaline hair-points short in lower leaves, rather long in upper and perichaetial leaves, to 1.5 mm long, moderately denticulate; lamina unistratose with bistratose strips

Fig. 39. *Grimmia pilifera* P. Beauv. (from Primorskij Territory, 20.IX.1988, V.Ya.Cherdantseva): 1, 3 – capsules; 2, 6 – habit; 4 – upper leaf cells; 5 – stem transverse section; 7 – median leaf cells; 8-10, 12-13 – leaf transverse sections; 11 – basal leaf cells; 14-16 – leaves. Scale bars: 0.5 cm for 6; 2 mm for 1-3; 1 mm for 14-16; 50 µm for 8-10, 13; 100 µm for 4-5, 7, 11; 200 µm for 13.



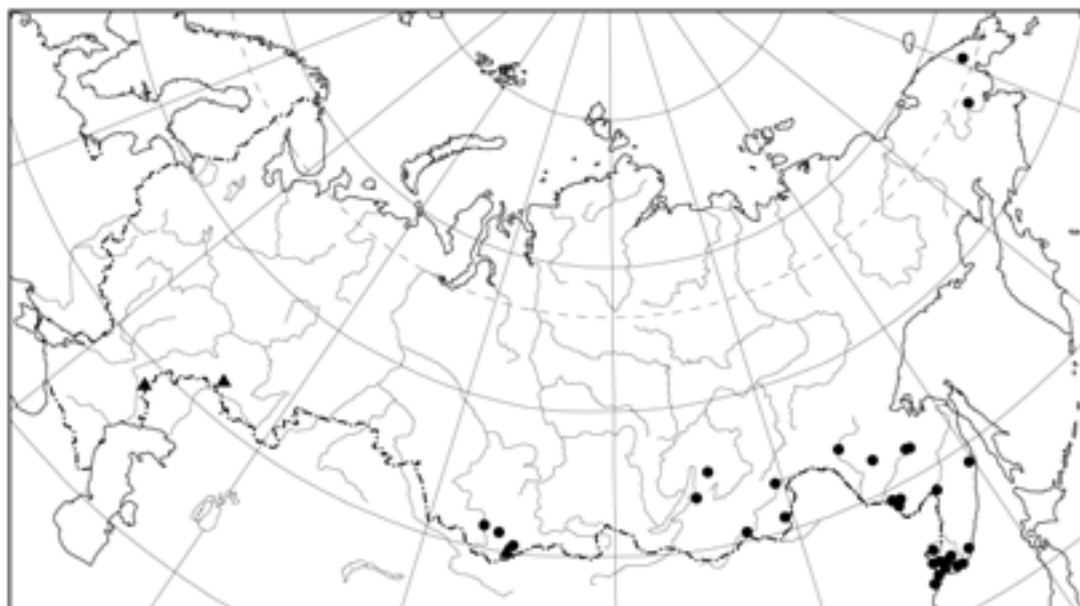


Fig. 40. Distribution of *Grimmia pilifera* P. Beauv. (circles) and *G. plagiopodia* Hedw. (triangles) in Russia

or mostly bistratose in distal 2/3 of leaf, to 3-4-stratose at margins, unistratose at base; upper leaf cells oblate to subquadrate and short rectangular, 6-8 μm wide, with moderately thickened and slightly sinuose walls, median laminal cells short rectangular, with moderately sinuose walls, basal juxtacostal cells linear, thick-walled, porose, basal marginal cells shorter, rectangular, pellucid, with thin longitudinal and thick transverse walls. Dioicous, androecia terminal, sporophytes not rare. Perichaetial leaves considerably longer than vegetative leaves, 3-4 $\times$ 0.9-1.2 μm , with longer hyaline hair-points. Setae 0.3-0.4 mm, erect, straight. Capsules immersed, oblong-ovoid, 1.0-1.5 mm long, smooth. Operculum conic, with long straight beak. Annulus of affinis-type. Peristome teeth orange-brownish, entire or slightly cleft distally, densely papillose distally. Spores 12-15 μm . Calyptrae mitrate.

SPECIMENS EXAMINED: **SIBERIA: Altai Republic**, Chulyshman River, Dzholukul' Lake, 1.VIII.1988, *N. Zolotukhin* (MHA); Katun River 2 km upstream Bijka Creek mouth, 10.VII.1993, #34/52, *Ignatov & Ignatova* (MHA); Chemal, 7.VII.1993, #34/215, 34/97, 34/217, *Ignatov & Ignatova* (MHA); Kuba River, 3.VI.1972, *V. Makarov* (MHA); **Buryatia**, Dzherginskij Reserve, 18.VII.2002, #27a, *D. Tubanova* (UUh); Barguzinskij Distr., Ina, 8.VII.1997, #524, *L. V. Krivobokov* (UUh); **Chita Province**, Onon River basin, Adun-Chelon Mts., 19 & 27.VII.1911, #9161, *V. Smirnov* (H-Br, LE); Nerch-Zavodskij Uezd, Kalginskaya Station, 18.VIII.1902, *Stukov* (IRK); distr. Nerchinsk, VIII.1902, *Stukov* (H-Br); inter fl. Shilka et Chernyj Uryum, 15.VI.1905, *N. Blagoveshzhenskij & G. Poplavskaya* (H-Br); **FAR EAST: Amurskaya Province**, Khinganskij Reserve, 16.IV.1992, *V. Ya. Cherdantseva* (VLA); Selezmdzhinskij Distr., 25 km from Fevral'sk, Medvezhje, 28.VII.1976, *Zinovjev & Sleptzov* (VLA); Zeya Reserve, VIII.1980, *N. Stezura* (IRK); Upper Zeya plane, Zhurban, 30.VI.1974, *S. K. Gambaryan* (IRK); **Khabarovsk**

Territory, Bolshekhkhzhirskij Reserve, Khkhzhir Mt., 9-14.VIII.1981, *V. Ya. Cherdantseva* (VLA); Bureinskij Reserve, Lan & Balaganakh watershed, 22.VIII.1989, #89-M-269, *O. V. Grigorjeva* (MHA); Pravaya Bureya River right bank, 27.VIII.1997, #97-1109, *Ignatov* (MHA); **Chukotka**, Anadyr Distr., Pekulnej Mts., Televeem River, *O. M. Afonina* (LE); 115 km of Egvekinot-Iultin road, *O. M. Afonina* (LE); **Primorsky Territory**, Nikolsk-Ussurijskij surr., Sujfun River, Krasnoyarskaya Mt., 26.VI.1927, *V. Transhel* (LE); Nikolsk, III.1905, *P. V. Siuzew* (H-Br, LE); Nikolsk-Ussurijskij, 22.III.1905, *P. V. Siuzew* (LE); Sovetskij Distr., Tutto, Aleshkin Klyuch, 10.VIII.1945, #68, *Kolesnikov* (LE); Vityaz' Bay, 13.X.1978, *L. V. Bardunov* (VLA); Suchan River basin, #77, *V. L. Komarov* (LE); Vladivostok Distr., Muravjev Amurskij peninsula, *V. Transhel* (LE); Rejneke Island, 28.VIII.1977, *S. Gambaryan* (VLA); Rejneke island, 20.IX.1997, *K. V. Gorobetz* (VLA); Nikolsk-Ussurijskij surr., Sujfun River, Krasnoyarskaya Mt., 26.VI.1927, *V. Transhel* (LE); Nikolsk, III.1905, *P. V. Siuzew* (H-Br, LE); Nikolsk-Ussurijskij, 22.III.1905, *P. V. Siuzew* (LE); Sovetskij Distr., Tutto, Aleshkin Klyuch, 10.VIII.1945, #68, *Kolesnikov* (LE); Vityaz' Bay, 13.X.1978, *L. V. Bardunov* (VLA); Suchan River basin, #77, *V. L. Komarov* (LE); Vladivostok Distr., Muravjev Amurskij peninsula, *V. Transhel* (LE); Rejneke Island, 28.VIII.1977, *S. Gambaryan* (VLA); Rejneke island, 20.IX.1997, *K. V. Gorobetz* (LE); Sudzuchinskij Reserve, Tumannaya Mt., 19.VII.1944, *Zhudova & Pokrovskaya* (LE); Lazovskij Reserve, Sokolovka, 21.IX.1988, *V. Ya. Cherdantseva* (VLA); Sudzuchinskij Reserve, Southern Sikhote-Alin Mts., 2.X.1946, #218, *P. Zhudova* (LE); Popov Island, 16.IX.1930, *A. S. Lazarenko* (LE); Lazovskij Reserve, Egerevka, 20.IX.1988, *V. Ya. Cherdantseva* (VLA); Lazo Distr., Chistovodnoe, 13.IX.1977, *L. V. Bardunov & V. Ya. Cherdantseva* (KPABG); Kedrovaya Pad' Reserve, 19.VIII.1977, *V. Ya. Cherdantseva* (VLA); Vladivostok, 28.III.1905, *P. V. Siuzew* (H-Br, LE); Shkotovo cape, 23.VIII.1930, *A. Lazarenko* (LE); Shkotovo Distr., Peishula village, 16.X.1950, #5675, *V. Voroshilov* (MHA); Vladivostok Distr., Okeanskaya village, 28.VII.1952, #6601,

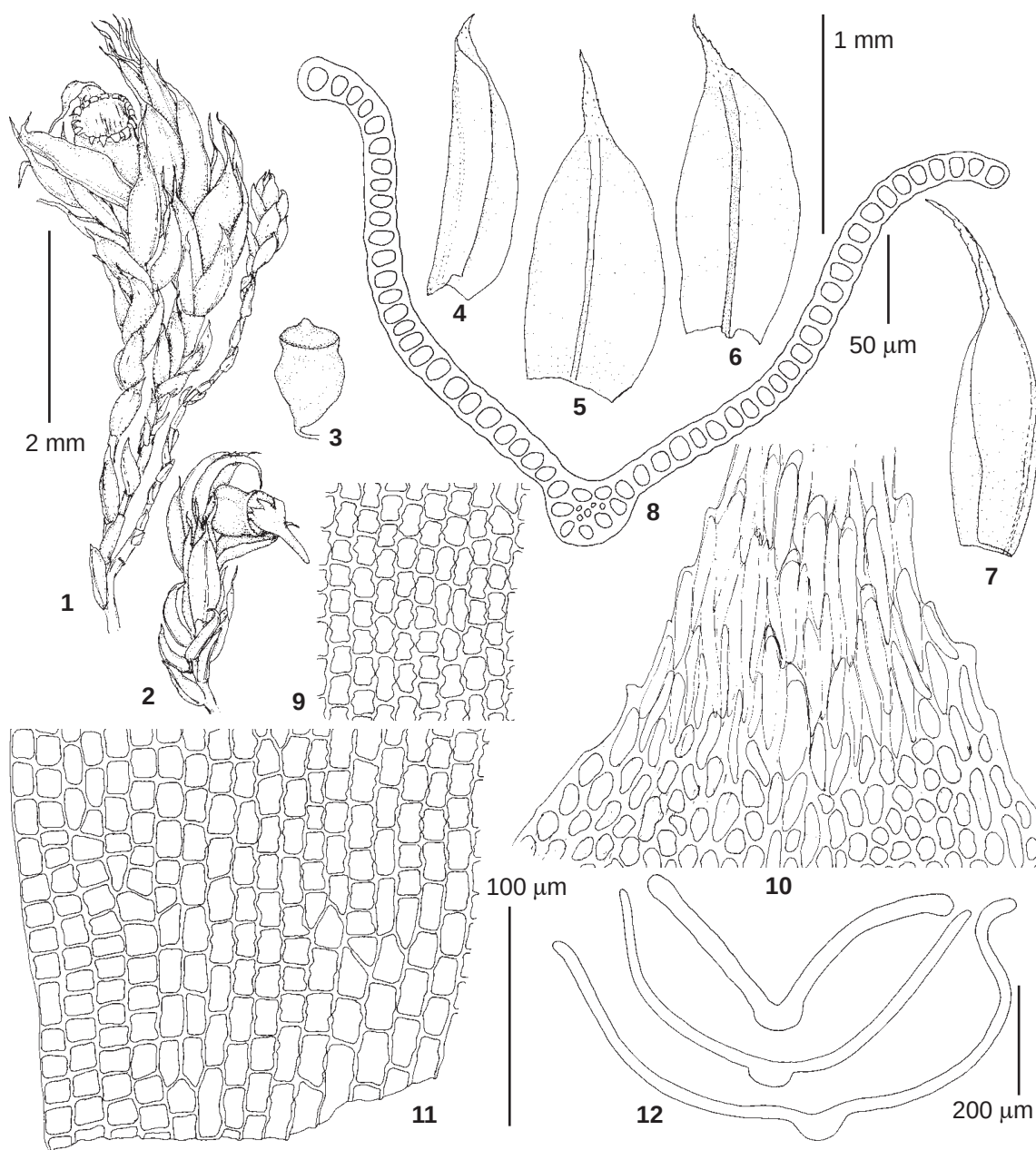


Fig. 41. *Grimmia plagiopodia* Hedw. (from Astrakhan Province, 9.V.1997, I.Zemlyanskaya): 1-2 – habit; 3 – capsule; 4-7 – leaves; 8, 12 – leaf transverse sections; 9 – median leaf cells; 10 – base of hair-point and upper leaf cells; 11 – basal leaf cells. Scale bars: 2 mm for 1-3; 1 mm for 4-7; 50 µm for 8; 100 µm for 9-11; 200 µm for 12.

V. Voroshilov (MHA); Lazovskij Reserve, Kamenka, 24.IX.1974, L. V. Bardunov & V. Ya. Cherdantseva (VLA); Sudzhukhinskij Reserve, Zhudova & Pokrovskaya (LE); Ol'ga Distr., Shcherbakovka, 3.IX.1977, L. Bardunov & V. Cherdantseva (VLA); Ussurijskij Reserve, Peishula River, 2.VII.1974, V. Ya. Cherdantseva (VLA); Ussurijskij Reserve, Zmeinaya Mt., 16-20.VII.1974, S. Nesterova (VLA); Khasan Distr., Gakkelevskij Mt. Range, 1959, V. Ya. Ardeeva (LE); Oktyabr'skij Distr., Chernyatino, Razdol'naya Creek, V.1989, V. Ya. Cherdantseva (VLA); Faddeevka village, 3.X.1950,

#5495, V. Voroshilov (MHA); Anuchino Distr., Tikhorechnoe, 30.VI.1988, V. Ya. Cherdantseva (VLA); Khanka Distr., Kamen-Rybolov settl., 28.VI.1928, #343, D. P. Vorobjev (LE).

Distribution. *Grimmia pilifera* is distributed in North America from Canada to Mexico, and in temperate Asia (Japan, Korea, Mongolia). In Russia it is known only east of the Urals, mostly in the southern Far East (the most common

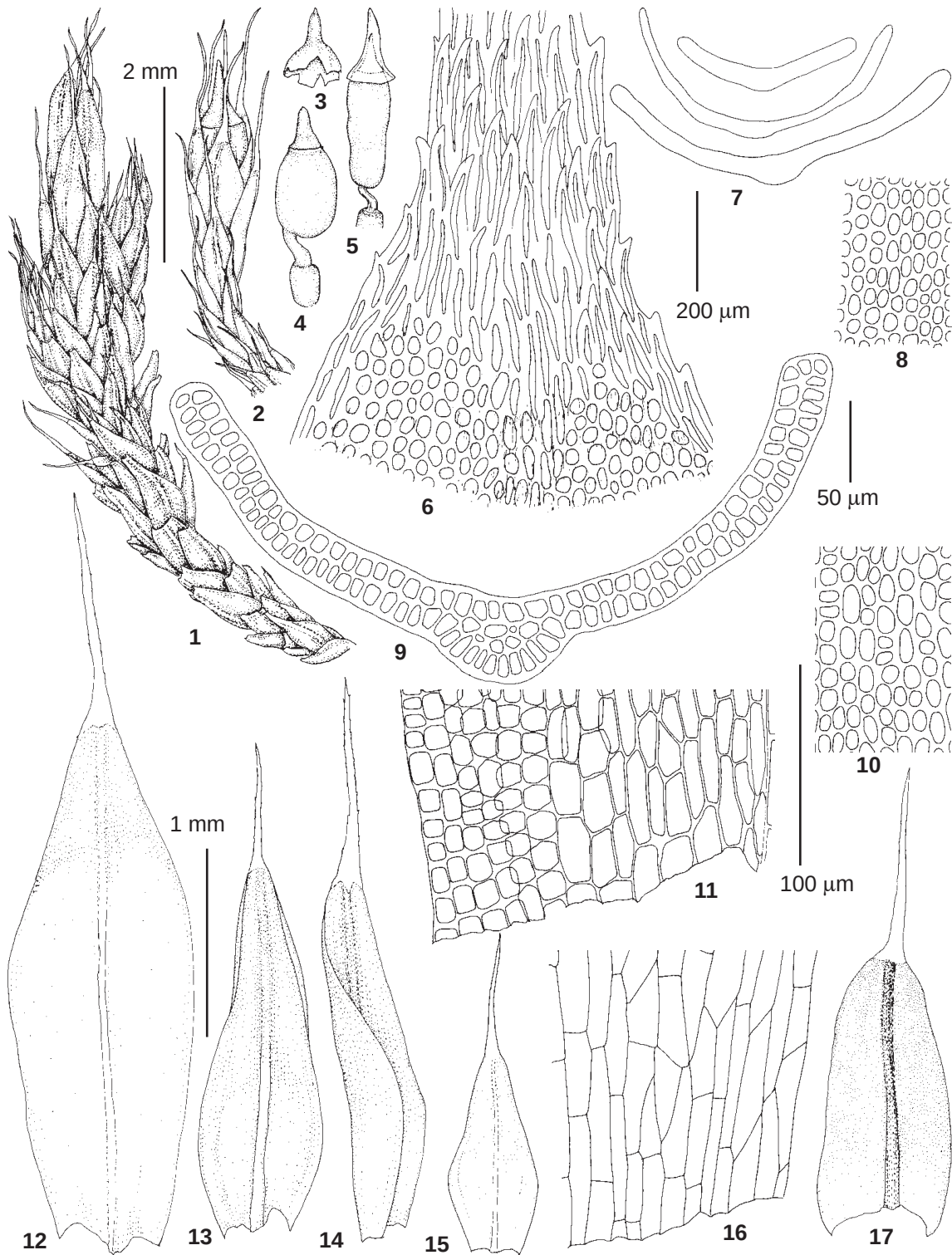


Fig. 42. *Grimmia poecilostoma* Card. et Seb. (1, 9, 12-14 – from Altai Republic, Ignatov, #33/1; 2-8, 10-11, 15-16 – from Yakutia, Ignatov, #00-128; 17 – from Kabardino-Balkaria, 30.VII.2004, Ignatov & al.): 1, 2 – habit; 3 – calyptra; 4-5 – capsules; 6 – base of hair-point and upper leaf cells; 7, 9 – leaf transverse sections; 8 – upper leaf cells; 10 – median leaf cells; 11 – basal cells of vegetative leaf; 12 – perichaetial leaf; 13-15, 17 – leaves; 16 – basal cells of perichaetial leaf. Scale bars: 2 mm for 1-5; 1 mm for 12-15, 17; 50 µm for 9; 100 µm for 6, 8, 10-11, 16; 200 µm for 7.

species of the genus in that area), extending northward to Chukotka and westward to Altai Mts. It was erroneously reported for European Russia (Muñoz & Pando, 2000). *Grimmia pilifera* grows usually in the forest belt at low altitudes (up to 1900 m alt. in Altai Mts.), on shaded rock outcrops or boulders, mostly acidic or neutral.

Differentiation. Plants with sporophytes can be easily recognized by comparatively large rigid plants, long perichaetial leaves with long hyaline hair-points, and immersed capsules on short erect setae. Sterile plants can be confused with *G. elatior* or with *G. longirostris*. *Grimmia elatior* is similar in leaf length, longer than 2.5 mm, and in the costa strongly prominent dorsally, but differs in distal laminal cells distinctly papillose and often also bulging (vs. smooth, not bulging cells in *G. pilifera*), costa furrowed dorsally and irregularly angular in cross section (vs. smooth dorsally, semi-circular in cross section in *G. pilifera*). Some phenotypes of *G. longirostris* from dry habitats have rigid plants with long hair-points and are very similar to sterile plants of *G. pilifera*, but can be easily differentiated by costa reniform in cross section with 4-6 ventral epidermal cells (vs. semi-circular in cross section with 2 ventral epidermal cells in *G. pilifera*) and central strand present (vs. absent in *G. pilifera*). Moreover, the leaves of *G. longirostris* are shorter, 1.3-2.0(-2.5) mm long (vs. 2.0-3.0 mm in *G. pilifera*), more gradually tapering into acumen (vs. abruptly tapered from the sheathing base in *G. pilifera*).

22. *Grimmia plagiopodia* Hedw., Sp. Musc. Frond. 78. 1801. Figs. 40, 41.

Plants in dense low tufts, dark green or brownish, slightly hoary. Stems erect, to 0.5 cm long. Leaves appressed when dry, erect-spreading when moist, upper and perichaetial leaves enlarged, 1.0-2.0×0.7-1 mm, widely ovate to oblong, concave, keeled in upper part, not plicate; margins plane in distal 1/3, recurved below at both sides; costa clearly differentiated from the laminal cells, thin, slightly widened in upper part, prominent dorsally, semi-circular in cross section, 2 cells wide ventrally; hyaline hair-points short to long in upper leaves, denticulate, broadened and flattened at base, in lower leaves absent; lamina unistratose throughout; cells in distal part of lamina rounded-quadrate, 8-12 µm, thin-walled, slightly sinuose, basal juxtacostal cells elongate, basal marginal cells shorter, rectangular, with thin longitudinal and thick transverse walls.

Autoicous, sporophytes usually present. Setae ca. 0.3 mm, curved, attached excentrically to the capsules. Capsules 1-1.5 mm long, immersed, asymmetric, ventricose, rounded, smooth, with wide mouth when open. Operculum plane to low convex, mamillate. Annulus of Schistidium-type. Peristome present, strongly cleft and perforate. Spores 11-13 µm. Calyptrae mitrate.

SPECIMENS EXAMINED: EUROPEAN RUSSIA:

Astrakhan Province, riparian lac. Baskunczak prope montem Bogdo, 8.V.1926, #16, V.P. Savicz (LE, MHA); Bogdo-Baskunchak Reserve, 9.V.1997, I. Zemlyanskaya (MHA), 14.VII.2002, S. Suragina (MHA); **Orenburg Province**, Sorochinskij Distr., Golubovka, VII.1993, G.D. Musikhin (LE); **SIBERIA: Altai Republic**, Yustyd, 3.VII.1907, V.I. Vereshchagin (H-Br, LE).

Distribution. *Grimmia plagiopodia* is known from scattered localities in Europe, North Africa, Turkey, Caucasus, Middle Asia, North America. Only few collections from Russia are known: from Astrakhan and Orenburg Provinces, and also one old collection from Altai Mts. (one more specimen from this area reported by Bardunov (1974) as *Schistidium plagiopodium* (Hedw.) Loeske represents another species, *Grimmia capillata*). It grows mostly on sandstones, often with *G. anodon*.

Differentiation. Differences from most close species, *G. anodon* and *G. capillata*, are discussed under these species.

23. *Grimmia poecilostoma* Cardot et Sebillé, Rev. Bryol. 28: 118, tab. 5. 1901. — *Grimmia tergestina* var. *poecilostoma* (Cardot et Sebillé) Loeske, Laubm. Eur. Part I: 84. 1913. Figs. 42, 43.

Plants in dense or loose, easily separating tufts, dark-green, olive-green to blackish when wet, black above and brownish below when dry, hoary. Stems erect, 0.7-1.0 cm long. Leaves erect to appressed when dry, erect-spreading when moist, gradually enlarged to the distal part of fertile shoot, 1.5-1.8(-2.0)×0.5-0.7 mm, ovate to ovate-lanceolate, concave, not plicate; margins plane; costa weakly differentiated in distal part, semi-elliptical in cross section, 3-7 cells wide ventrally; hyaline hair-points of vegetative leaves 0.5-0.8 mm long, terete distally, flattened proximally, sometimes shortly decurrent, almost smooth to slightly denticulate; lamina bistratose in distal 2/3, unistratose basally, upper laminal cells isodiametric, 6-9 µm, thick-walled, median laminal cells short rectangular, 15-25×10-12 µm, thick-walled, not sinuose, basal juxtacostal cells long rectangular, to 70×12 µm, moderately thick-walled and slightly porose, basal marginal cells shorter, 20-40×12 µm, with thin longitudinal and

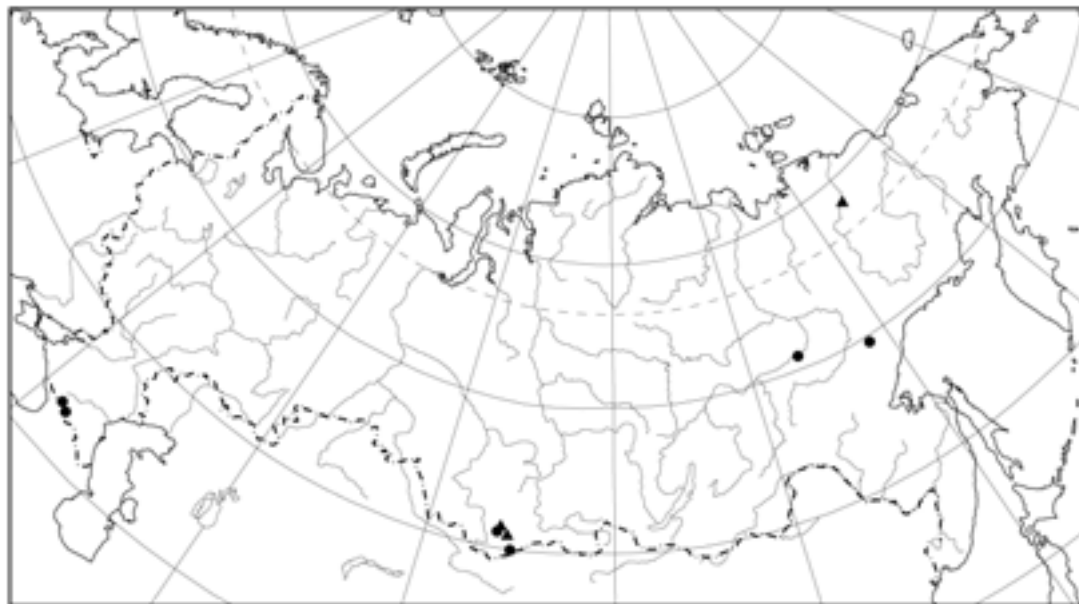


Fig. 43. Distribution of *Grimmia poecilostoma* Card. et Seb. in Russia: with (circles) and without (triangles) capsules.

thick transverse walls. Dioicous, sporophytes not rare. Androecia terminal. Perichaetial leaves 2.5-3.0×0.6–1.1 mm, hyaline hair-points 1.3-1.5 mm long, widened and flattened basally, decurrent; basal cells of outer perichaetial leaves very thin-walled, hyaline, inner perichaetial leaves mostly hyaline and filmy, except uppermost cells, convolute. Setae very short, sigmoid, excentrically attached. Capsules immersed, ovate, 0.7-1.0 mm long, ventricose. Operculum conic, rostrate. Annulus of affinis-type. Peristome teeth cribrate and cleft. Spores 9-12 µm. Calyptrae mitrate.

SPECIMENS EXAMINED: Specimens with sporophytes: **CAUCASUS:** Kabardino-Balkaria, Baksan River near Adyl-Su Creek mouth, 30.VII.2004, *M. Ignatov & al.* (MHA); Cherek-Bezengiyskiy River at Dumala Creek mouth, 30.VII.2004, *Ignatov & al.* (MHA); **SIBERIA:** Altai Republic, Kosh-Agach, Tabozhok Peak, 2-8.VIII.1992, #32/7, 33/1, *Ignatov* (MHA); Malyj Yaloman, 4.VIII.2000, *Ignatova* (one of four specimens with immature asymmetric capsules) (MW); **Yakutia**, Ust-Maya Distr., Yugorenok, Shchel Creek, 8.IX.2000, #00-121, 00-127, 00-128, *Ignatov* (MHA); Khangalassky Distr., Lenskie Stolby, Labydjya River, 17.VIII.2000, *Ignatov* (MHA).

Specimens lacking sporophytes, referred tentatively to *G. poecilostoma* (basing on distributional pattern or growing on acidic and neutral substrates): **SIBERIA:** Altai Republic, Kosh-Agach, Tabozhok Peak, 4.VIII.1992, #33/2, *Ignatov* (MHA); Malyj Yaloman, 30-31.VII.1991, #25/26, 25/128, 25/160, *Ignatov & Ignatova* (MHA); Karakem River, 23.VI.1989, #0/952, *Ignatov* (MHA); Chermal, 7.VII.1993, #34/212, 34/213, *Ignatov & Ignatova* (MHA); Teletzkoe Lake, Derbogach, 4.VI.1989, #0/897, *Ignatov* (MHA); **Yakutia**, Ust-Maya Distr., Yugorenok, Shchel Creek, 8.IX.2000, #00-124, *Ignatov* (MHA); Indigirka River, 17.VI.1976, *O.M. Afonina* (LE).

Distribution. *Grimmia poecilostoma* is known from Central and Southern Europe, Mongolia, Middle Asia, Turkey, North America (to Mexico). In Russia it was collected in Caucasus, Altai, and Yakutia. Sporadically found with sporophytes (more frequently than *G. tergestina*); some collections were referred to this species tentatively.

Differentiation. The differences of *G. poecilostoma* from *G. tergestina*, *G. laevigata*, and *G. ovalis* are discussed under *G. tergestina*.

24. *Grimmia pulvinata* (Hedw.) Sm., Engl. Bot. 24: 1728. 1807. — *Fissidens pulvinatus* Hedw., Sp. Musc. Frond. 158. 1801. — *Grimmia pulvinata* var. *africana* (Hedw.) Wils., Bot. Antarct. Voy., Fl. Nov.-Zel. 2: 75. 1854. Figs. 44, 45.

Plants in dense small cushions, light green or dark green to black, very hoary. Stems erect, 1-4 cm long. Leaves 1.3-1.8×0.6-0.8 mm, ovate to oblong-ovate, acute to obtuse, widely keeled; margins recurved on both sides at middle part of leaf; costa differentiated, prominent dorsally, semi-circular in cross section, with 2 ventral epidermal cells; hyaline hair-points in upper and perichaetial leaves as long as lamina or longer, to 2 mm, almost smooth or denticulate, lower leaves muticous; lamina unistratose, bistratose at margins in 1-2 cell rows at distal 2/3 of leaf; upper laminal and median cells isodiametric, 8-10 µm, subquadrate to short rectangular, moderately thick-walled, not or slightly sinuose, translucent, basal juxtaposed cells subquadrate to short rectangular,

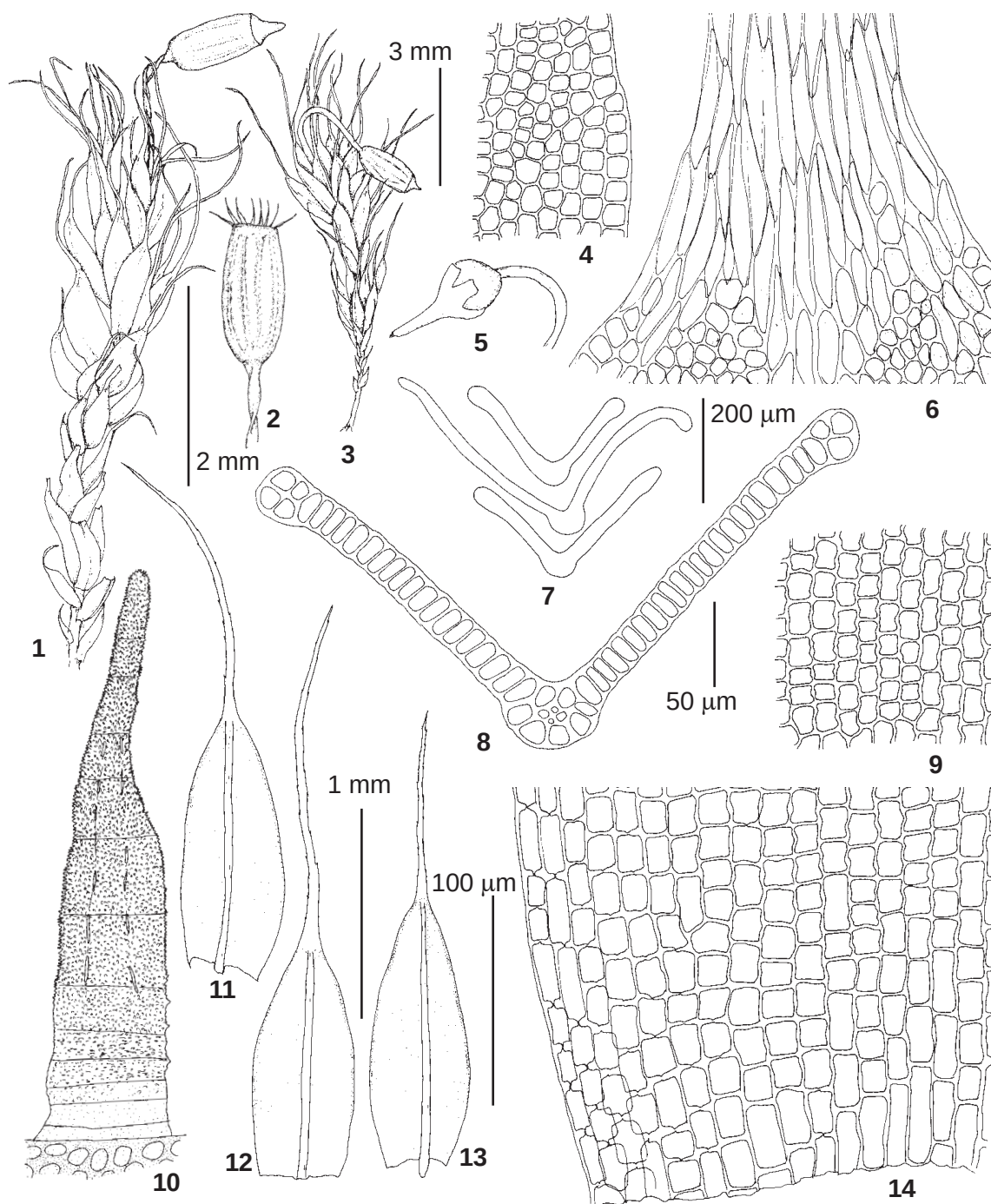


Fig. 44. *Grimmia pulvinata* (Hedw.) Sm. (from Voronezh Province, N.N. Popova, #4382): 1, 3 – habit; 2 – capsule; 4 – upper leaf cells; 5 – calyptra; 6 – base of hair-point and upper leaf cells; 7-8 – leaf transverse sections; 9 – median leaf cells; 10 – part of peristome; 11-13 – leaves; 14 – basal leaf cells. Scale bars: 3 mm for 3; 2 mm for 1-2; 1 mm for 11-13; 50 µm for 8, 10; 100 µm for 4, 6, 9, 14; 200 µm for 7.

basal marginal cells short rectangular, pellucid, with thin longitudinal and thick transverse walls. Autoicous, androecia lateral, just below perichaetia, sporophytes usually present. Setae 2-4 mm, arcuate when moist. Capsules exserted, horizontal or pendent,

1-1.5 mm long, ovoid, ribbed. Operculum conic, with short to long erect beak. Annulus of affinis-type. Peristome teeth entire or slightly perforated, densely papillose. Spores 8-13 µm. Calyptrae mitrate, sometimes almost cucullate.

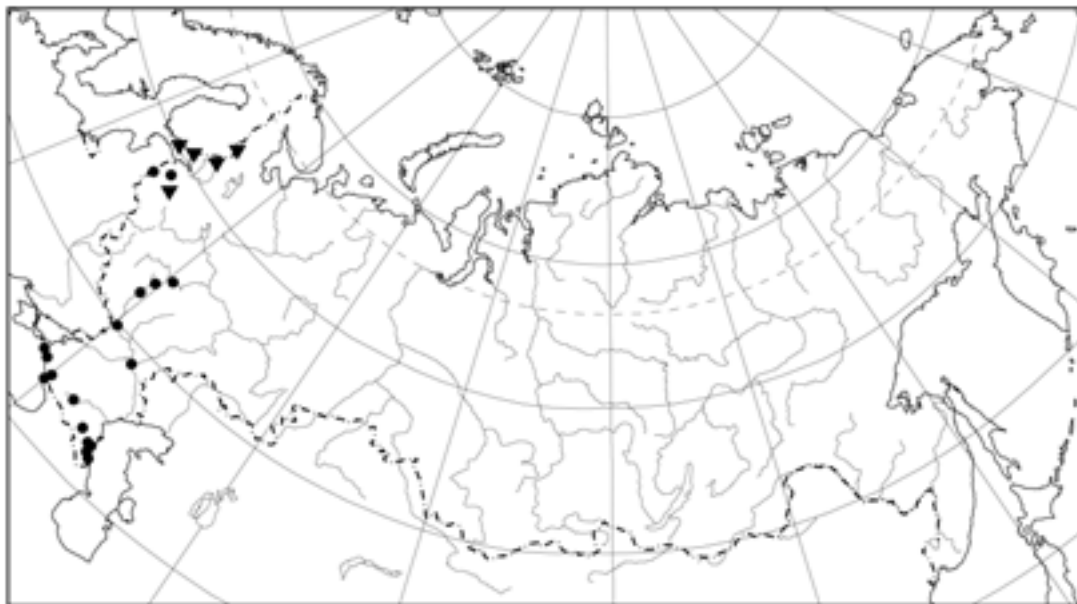


Fig. 45. Distribution of *Grimmia pulvinata* (Hedw.) Sm. (circles) and *G. ramondii* (Lam. et DC.) Margad. (triangles) in Russia.

SPECIMENS EXAMINED: **EUROPEAN RUSSIA:**
Leningrad Province, Luzhskij Distr., Ruchji, 18.VIII.1971, #185, *G. Vjunova* (LE); **Pskov Province**, Staryj Izborsk, 19.X.1996, *Ignatov & Zolotov* (MHA, MW); **Ryazan Province**, Miloslavskij District, Voeikovo, 21.VI.2001, *L. Volosnova* (MW); Spasskij Distr., Okskij Reserve, 19.VII.2000, *L. Volosnova* (MW); **Voronezh Province**, Boguchary Distr., Leskovka, *N.N. Popova* (MHA); Verkhnemamonskij Distr., Derezhovka, 16.VII.1983, #4382, *N.N. Popova* (LE); **Lipetsk Province**, Apukhtino Distr., *N.N. Popova* (MHA); **Volgograd Province**, Volgograd City, 3.IV.1996, *Yu. Matveeva* (MHA); **CAUCASUS:**
Dagestan, Petrovsk, 26.V.1890, *W. Lipsky* (LE); SW of Petrovsk, Kakhulaj Spring, 12.VI.1925, #153, *A.K. Prokofieva* (LE); Temir-khan-Schura, 7.V.1891 *Th. Alexeenko* (LE); supra Derbent, ad p. Dshalgan, #117-65, *Th. Alexeenko* (LE); Derbent Distr., prope st. Rubas, 11.VIII.1892, *Th. Alexeenko* (LE); prope Derbent, 23.VIII.1899, #3807, *Th. Alexeenko* (LE); Derbent, V.1901, *Th. Alexeenko* (H-Br); Kaitag-Talassaron pr. Kajakont, 17.VII.1900, *Th. Alexeenko* (H-Br); Makhachkala Distr., Tarki-tau Mt. near Tarki village, 22.III.1953, 9.VIII.1953, #1, 1250, *Ya.I. Prokhanov* (LE, MW); Bujnasksk Distr., Kapchugaj Station, 3.VIII.1955, #471, *Ya.I. Prokhanov* (LE, MW); **Chechenia**, Groznyj, 5.V.1890, #273, *W. Lipsky* (LE); **Stavropol Territory**, Pyatigorsk, Mashuk Mt., 29.IX.1928, *E. Schteinberg* (LE, MW); **Krasnodar Territory**, Armavir Distr., Ergolyk, 4.VII.1926, #35/2331, *E. Schiffers* (LE, MW); Gelendzhik Distr., Arkhipo-Osipovka, 6-9.VIII.1958, 1.X.1959, *A.L. Abramova & I.I. Abramov* (LE), 2.IX.1937, *A.S. Lazarenko* (LE); Novorossiisk Distr., 22.IV.1889, 10.IV.1891, *Anonymo* (LE); Anapa Distr., Malyj Utrish, VII.1996, *A. Tishkova* (MW), 21.VI.2000, *E. Kirichok* (MW); Malyj Utrish, 24-25.VIII.2004, *T. Akatova* (CSR, MHA); Bolshoj Utrish, 22.VIII.2004, *T. Akatova* (CSR, MHA); Khosta, 11.VIII.2000, *Ignatov & Ignatova* (MW); Aibga Mt.,

30.VI.1951, *V. Alper* (CSR, MHA); Kavkazskij Reserve, Mzymta River, 30.V.1951, *N.P. Ariskina* (LE); **Adygeya**, Belaya River basin, Zhelobnaya Creek, Inzhenernyj Ridge, 5.VIII.1997, *T. Akatova* (CSR, MHA).

Distribution. One of the most widespread species throughout the world, common in most european countries, Macaronesia, northern, eastern and southern Africa, North and South America, Australia and New Zealand. In Asia it is very common in its western areas, eastward to Middle Asia and Afganistan, but from Mongolia is known only from few localities, and unknown from China (all former reports of this taxon from China are in fact other species, mainly *G. longirostris*). In Russia, *G. pulvinata* is frequent in Caucasus, and grows there only at low altitudes, usually in coastal areas of Black and Caspian Seas. In Middle European Russia it is not rare in steppe zone and sporadic in forest zone (known from few localities in Leningrad, Pskov, and Ryazan Provinces). Grows on calcareous, more rarely acidic rocks, sometimes on concrete or other man-made substrates.

Differentiation. *Grimmia pulvinata* can be recognized by elliptic, keeled leaves, and unistratose translucent lamina. This species is a considerably larger than *G. anodon*, and both species usually bear sporophytes, which precludes confusion. The differences from its closest species, *G. orbicularis*, are discussed under that species.

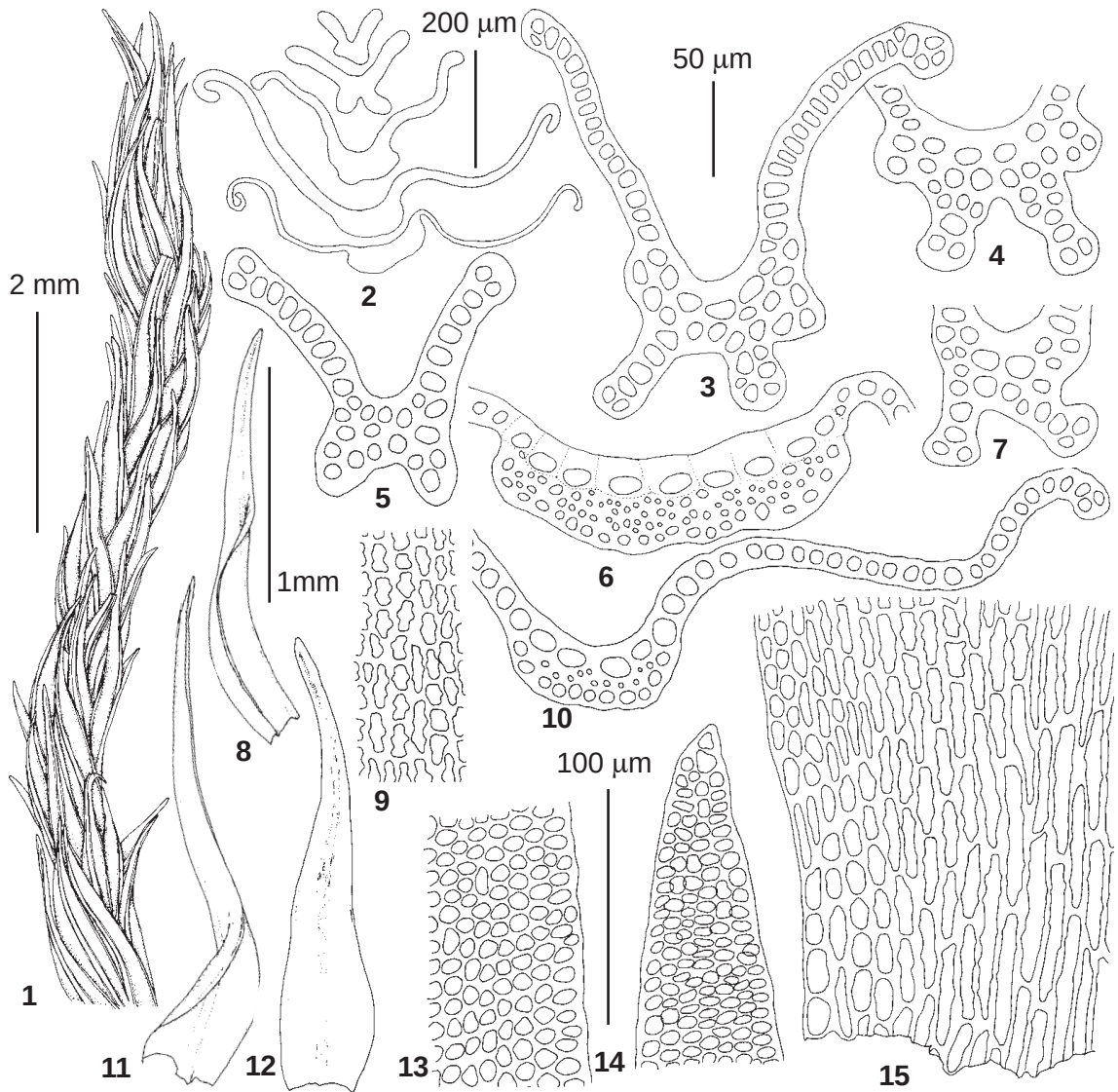


Fig. 46. *Grimmia ramondii* (Lam. et DC.) Margad. (1-2, 5, 8-15 – from Novgorod Province, V.1908, P.Kurskij; 3-4, 6-7 – from Leningrad Province, Hogland, 18.VI.1867, S.O.Lindberg): 1 – habit; 2-7, 10 – leaf transverse sections; 8, 11-12 – leaves; 9 – median leaf cells; 13-14 – upper leaf cells; 15 – basal leaf cells. Scale bars: 2 mm for 1; 1 mm for 8, 11-12; 50 μ m for 3-7, 10; 100 μ m for 9, 13-15; 200 μ m for 2.

25. ***Grimmia ramondii*** (Lam. et DC.) Margad., *Lindbergia* 1: 128. 1972. – *Pterigynandrum ramondii* Lam. et DC., *Fl. Franc.*, ed. 3, 2: 462. 1805 [*ramondi*]. – *Bryum patens* Hedw., *Sp. Musc. Frond.*: 86. 1801. – *Dryptodon patens* (Hedw.) Brid., *Bryol. Univ.* 1(1): 192. 1826. – *Grimmia patens* (Hedw.) B. S. G., *Bryol. Europ.* 3: 120. 1845, nom. illeg. – *Racomitrium patens* (Hedw.) Hüb., *Muscol. Herm.*: 198. 1833. Figs. 45, 46.

Plants in large, loose, easily separating patches, dark green, brownish green to black. Stems ascending, without central strand, 2-6[-10] cm long, evenly foliated. Leaves erect to slightly curved, appressed

when dry, erect-spreading when moist, 2.0-2.6 $\times$ 0.4-0.6 mm, from ovate base gradually tapering into narrow lanceolate acumen, mucous and obtuse at apex, keeled distally, widely channeled proximally; margins plane to weakly recurved in distal 1/3 of leaf, more strongly recurved to revolute on both or, more rarely, on one side below; costa differentiated, prominent dorsally, winged in distal 2/3 of leaf, reniform and irregularly angled on dorsal side, with (2-)3-8 ventral epidermal cells; lamina unistratose, bistratose for one cell row at margins; upper laminal cells isodiametric, 7-9 μ m, rounded or irregular in shape, oblate at leaf apex, thick-walled, median laminal cells rectangular, incrassate, moderately

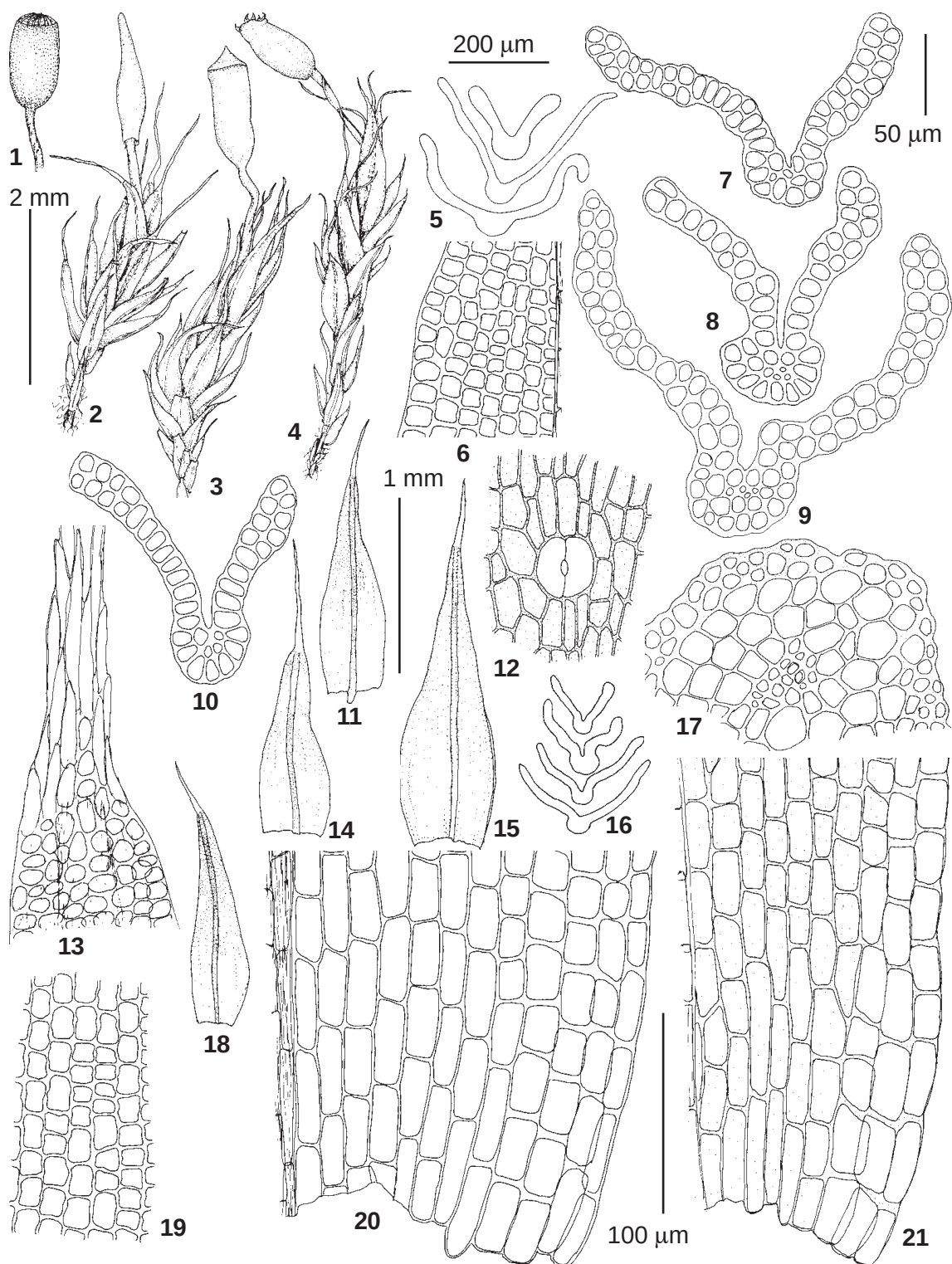


Fig. 47. *Grimmia reflexidens* Müll. Hal. (2-11, 13-14, 18-20 – from Perm Province, A. Bezgodov, #335; 1, 12, 15-17, 21 – from Altai, 23.VI.1966, L. Bardunov & L. Novak): 1 – capsule; 2-4 – habit; 5, 7-10, 16 – leaf transverse sections; 6 – upper leaf cells; 11, 14-15, 18 – leaves; 12 – cells of exothecium and stomatum; 13 – base of hair-point and upper leaf cells; 17 – stem transverse section; 19 – median leaf cells; 20-21 – basal leaf cells. Scale bars: 2 mm for 1-4; 1 mm for 11, 14-15, 18; 50 µm for 7-10; 100 µm for 6, 12-13, 17, 19-21; 200 µm for 5, 16.

sinuose, basal juxtacostal cells linear, thick-walled, slightly sinuose and porose, basal marginal cells short rectangular, pellucid, with thick longitudinal and transverse walls. Dioicous, sporophytes rare, not known from Russia. [Setae to 3-5 mm, arcuate when moist. Capsules exserted, pendent, ovoid, ribbed. Operculum conic, with long erect beak. Annulus of affinis-type. Peristome teeth red, strongly cleft. Spores 12-16 µm. Calyptrae mitrate].

SPECIMENS EXAMINED: **EUROPEAN RUSSIA:**

Karelia Ladogensis, Impilahti, Pullinvuori, 23.VII.1935, *A.J.Huuskonen* (KPABG, ex H); Muezerskij Distr., Lendery, 8.VIII.2003, #L-02/40-1, *Maksimov & Maksimova* (PTZ); **Leningrad Province**, Hogland, 18.VI.1867, *S.O.Lindberg*, 18.VI.1867, *M.Brenner* (H); Vyborg, 18.VI.1908, *H.Buch* (H); **Novgorod Province**, Staraya Russa Distr., Vilenka village, V.1908, *P.Kurskij* (LE).

Distribution. Widespread in Europe, known also from Japan and western North America. Rare in Russia, where it has been found in few localities of Karelia, Novgorod and Leningrad Province.

Differentiation. *Grimmia ramondii* can be recognized by narrow lanceolate muticous leaves and costa winged dorsally in the distal part of the leaf. Leaves of *Grimmia unicolor* are also muticous, but plants of this species are smaller, leaf lamina is completely bistratose, and the costa is poorly differentiated, flattened and without wings. Another species resembling *G. ramondii* in plant size, foliation pattern, and costa structure is *G. hartmanii* (sometimes also having weakly winged costa), but it differs by dark red multicellular gemmae usually present on the tips of upper leaves, and the short hyaline hair-points present on non-gemmiferous leaves. Large plants, winged costa and muticous leaves differentiate *G. ramondii* from *G. longirostris* with poorly developed hair-points.

26. *Grimmia reflexidens* Müll. Hal., Syn. Musc. Frond. 1: 795. 1849. — *Grimmia sessitata* De Not., Atti Reale Univ. Genova 1: 704. 1869. Figs. 47, 48.

Plants in dense tufts or cushions, yellowish-, brownish- or blackish-green, rarely glaucous, moderately hoary. Stems erect, 0.5-2 cm long, with central strand. Leaves erect, appressed when dry, patent to spreading when moist, 1.0-1.8×0.3-0.5 mm, from oblong base gradually tapering into lanceolate acumen, sharply and narrowly keeled in distal part, blades forming <45° angle to almost parallel near the costa; margins plane to slightly recurved in distal part of leaf, usually narrowly recurved on one or rarely on both sides in middle and lower part of

leaf, sometimes plane throughout; costa differentiated, prominent dorsally, semi-circular in cross-section, with 2 ventral epidermal cells; hyaline hair-points short to long, to 1.5 mm, slightly denticulate; distal part of lamina unistratose near the costa, bistratose in 2-6-cell rows at margins and with bistratose strips; upper laminal cells isodiametric, 8-12 µm, rounded-quadrate, with moderately thickened and slightly sinuose walls, not bulging or slightly bulging, median laminal cells short rectangular, with moderately sinuose walls, basal juxtacostal cells elongate rectangular, 20-55×8-10 µm, with moderately thickened, not or slightly porose walls, basal marginal cells in 3-5 cell rows shorter, pellucid, with thin longitudinal and thick transverse walls. Autoicous, androecia axillary or terminal, sporophytes usually present. Setae 1.5-3 mm, pale yellowish, straight. Capsules exserted, ovoid-cylindric, rounded at base, stramineous, 0.8-1.2 mm long, exothecial cells thin-walled, stomata at urn base present. Operculum low conic, mamillate. Annulus of Schistidium-type. Peristome teeth orange, contrasting in color with the urn. Spores 10-14 µm. Calyptrae cucullate.

SPECIMENS EXAMINED: **EUROPEAN RUSSIA:**

Murmansk Province, Khibiny Mts., Ajkuaivenchjok Creek, 30.VIII.2001, *Ignatova* (MW), 17.IX.1989, #25, *N.Konstantinova* (KPABG); Takhtarvumchorr Mt., Molibdenovyj Cirque, 8.VIII.1994, #NK-3-95, *N.Konstantinova* (KPABG); Vudjavrchorr, 16.VIII.1948, #2135, *R.N.Shlyakov* (LE); Vudjavrchorr Mt., Botanicheskij Cirque, 31.VIII.2001, *Ignatova* (MW); Lovozerskie Mts., Chivruaj Gorge, 14.VII.1983, #12/2, *O.Belkina* (KPABG); Il'majok Gorge, 23.VIII.1982, #79/11, *O.Belkina* (KPABG); Rajyavr Lake, 27.VIII.1983, #87/1, *O.Belkina* & *A.Likhachev* (KPABG); **Karelia:** Kuusamo, Ruskeakallio, 5.VIII.1883, *V.F.Brotherus* (H); Paanajarvi, Krasnaya Skala, 19.VI.1990, *A.Maksimov* (PTZ); **CAUCASUS:** **Dagestan**, Kasi Kumukh, 10.VIII.1898, *Th.Alexeenko* (LE); ad Djulti Tschai, conf. Samuri, 21.VII.1860, *Ruprecht* (LE); **Kabardino-Balkaria**, Karasu, 30.VII.1927, *E. & N.Bush* (LE, MW); 26.VII.1980; Elbrus Mt., 1959, *Vladimirova* (LE, MW); Adyl-Su Gorge, X.1994, #11, *I.Pospelov* (MW); Elbrus Mt., 14.VI.1892, *Anonymous* (LE); **North Ossetia**, North Ossetian Reserve, 20-24.VII.1977, 26.VII.1980, *L.I.Abramova* (MW), 28.VII.1982, *A.Amirkhanov* (MW), 28.VIII.1988, *V.Bochkin* (MHA); ad mare glaciale Zei ad fontes fl. Ardon, *V.F.Brotherus* (H-BR); **Karachaevo-Cherkessia**, Teberda Reserve, Alibek Gorge, 3.X.1989, *Onipchenko* (MHA); Semen-Bashi Mt., 6.VII.1976, *Onipchenko* (MHA); Mussa-Achitara Mt., 6.VIII.1986, *Ignatova* (MHA); Klukhor pass, 11.VII.1982, *E.Vaulina* (MHA); Northern Klukhor, 12.IX.1994, #208/94, *Onipchenko* (MW); Amanauz River, 23.VIII.1955, *A.L.Abramova* & *I.I.Abramov* (LE, MW); Chuchkhur River, 15.VIII.1954, *I.Patrobolova* (LE, MW); Ullu-Murudzu Gorge, 8-10.VIII.1986, *Ignatova* (MHA); Ullu-Murudzu-Nazlykol pass, 10.VIII.1986, *Ignatova* (MHA); Malaya Khatipara Gorge, 14.VIII.1955, *A.L.Abramova* & *I.I.Abramov* (LE, MW), 31.VIII.1983, #35-83, *Onipchenko* (MHA), 3-4.VIII.1986, *Ignatova* (MHA); Kyshkadzher Mt.,

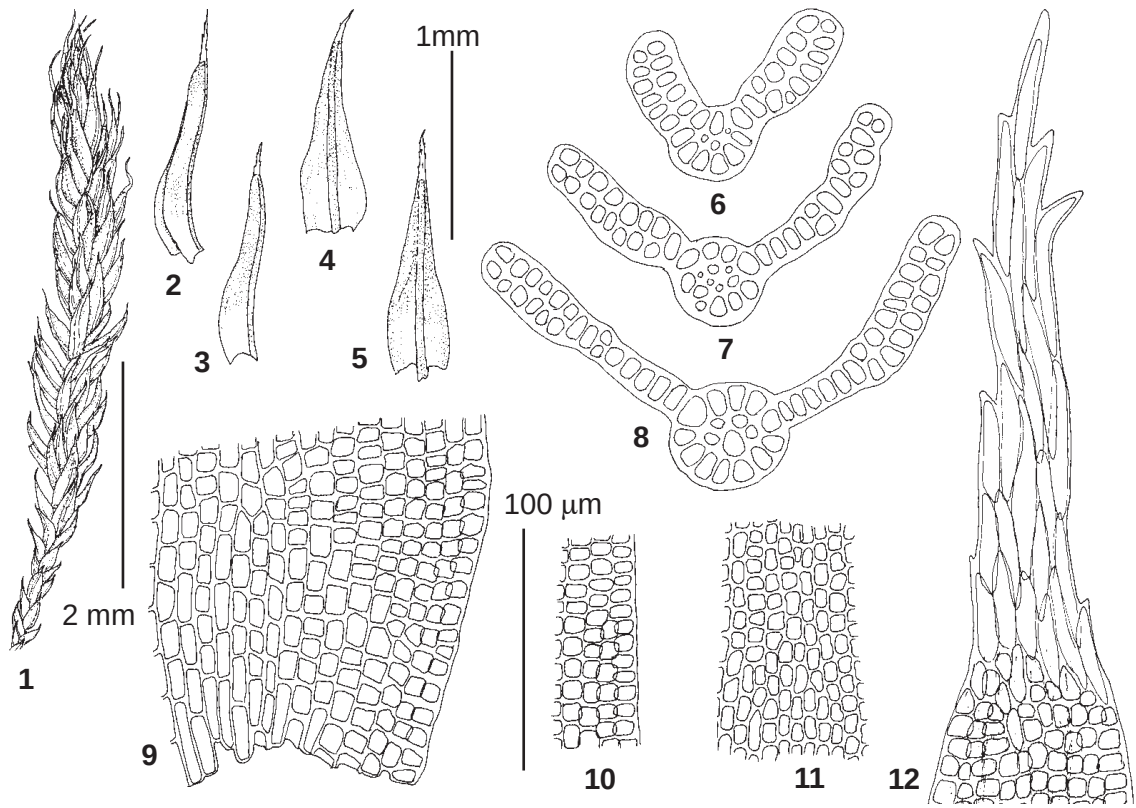


Fig. 49. *Grimmia teretineris* Limpr. (from Perm Province, A.Bezgodov, #624): 1 – habit; 2-5 – leaves; 6-8 – leaf transverse sections; 9 – basal leaf cells; 10 – median leaf cells; 11 – upper leaf cells; 12 – base of hair-point and upper leaf cells. Scale bars: 2 mm for 1; 1 mm for 1-5; 100 µm for 6-12.

calyptra, is lacking on all the isotypes of *G. reflexidens* (BM, JE, NY, PC). Drawings by Maier, of outstanding quality, also show (Maier, 2002: fig. 23, illustrations numbers 20f, 24, or 27) that the plications in the type of *G. reflexidens* (fig. 23 #24) are simply an exaggerated expression of what otherwise is common in specimens identified by her as *G. sessitana* (fig 23 #20f, 27), but that cannot be used to include this taxon into *Coscinodon*. Sporophytes in Pöppig s.n. (Pöppig s.n., BM), are also typical for *Grimmia*, with narrow teeth that, at least for the small part remaining, are not cribose, as usually seen in *Coscinodon*. Muñoz failed in annotating correctly the lectotype specimen deposited in BM. As Maier (2002) pointed out, there is one specimen annotated as «isotype» (identified in the database that Muñoz keeps of Grimmiaceae names as BM 2811M7, which corresponds to the BM loan number, 2811M, plus an internal unique identifier for this loan, 7 in this case) and other as «isolectotype» («BM 2811M36» coded as in the previous case). The

specimen that Muñoz intended to designate as lectotype is obviously «BM 2811M7», labelled «Herb. Hampe 1881. *Grimmia reflexidens* inter *Dryptodon consobrinus* Kze. Chile leg. Pöppig».

Distribution. *Grimmia reflexidens* is widely distributed throughout the world, common in mountain areas of Europe and Asia, North and South America, known from Africa, Australia, New Zealand and Antarctic. In Russia, *G. reflexidens* is not rare in the mountains of Siberia, common in Caucasus, scattered in Kola Peninsula, Polar and North Urals, and the Far East. It grows on exposed siliceous rocks in alpine belt.

Differentiation. *Grimmia reflexidens* can be confused with *G. alpestris* (see comments to the latter species), and also with *G. donniana* and *G. montana*. It differs from *G. donniana* in narrowly keeled leaves, with blades forming mostly 20-35° angle, as seen in leaf cross section (vs. more widely keeled leaves in *G. donniana*, with blades forming 35-100° angle in distal part of leaf), basal marginal cells with transverse

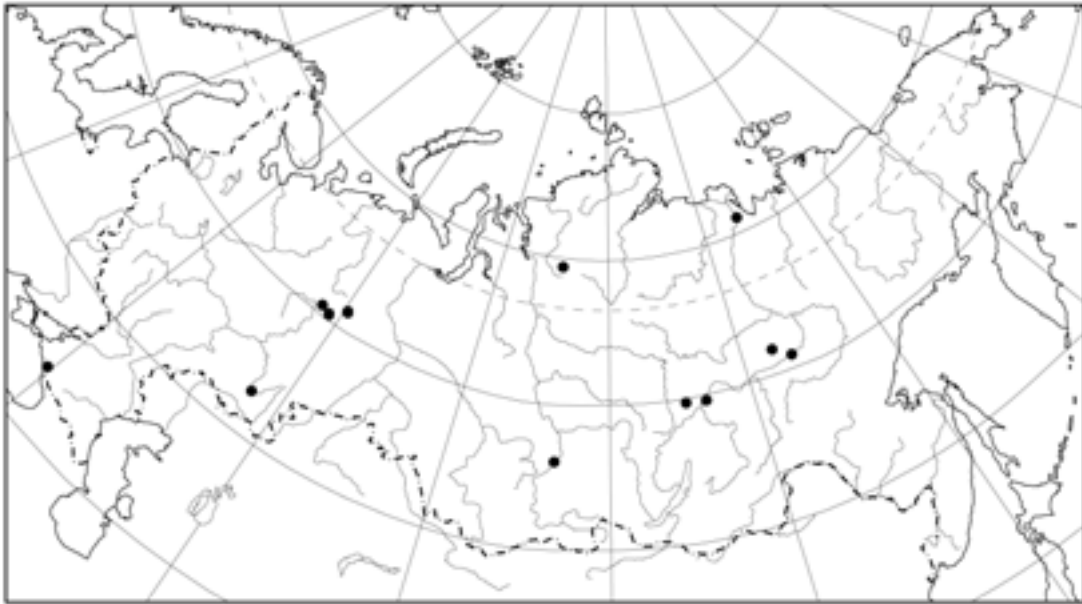


Fig. 50. Distribution of *Grimmia teretinervis* Limpr. in Russia.

walls more thick than longitudinal walls (vs. uniformly thin walls of basal marginal cells in *G. donniana*), and leaf margins mostly recurved on one or both sides in middle part of leaf (vs. margins plane throughout in *G. donniana*). The hyaline hair-points of *G. donniana* are usually long in the upper and perichaetial leaves, and cushions are usually very hoary, whereas in *G. reflexidens* the hyaline hair-points are short to moderately long, and the tufts are not very hoary. *Grimmia montana* differs from *G. reflexidens* in more widely keeled leaves, always plane margins and completely bistratose lamina in distal 1/2 of leaf.

27. *Grimmia teretinervis* Limpr., Jahresber. Schles. Ges. Vaterl. Cultur 61: 216. 1884. — *Schistidium teretinerve* Limpr., Jahresber. Schles. Ges. Vaterl. Cultur 61: 216. 1884, nom alt. Figs. 49, 50.

Plants small, in dense, easily separating tufts, dark green or brownish green, weakly hoary. Stems erect, 0.5-1 cm long, shoots thin. Leaves imbricate when dry, from ovate base gradually tapering into short narrowly acute acumen, 0.8-1.3×0.3-0.4 mm, sharply to widely keeled distally; margins plane throughout; costa differentiated, prominent both dorsally and ventrally, rounded in cross section, with (2)3-5 ventral epidermal cells; hyaline hair-points rather short, ca. 3 mm long, sharply denticulate; lamina bistratose or unistratose near costa and bistratose in 4-8 cell rows at margins in distal 2/3 of leaf; upper and

median laminal cells subquadrate to short rectangular, 6-8(-9) μ m, with slightly thickened and not or weakly sinuose walls, basal juxtacostal cells short rectangular, with moderately thick, not porose walls, basal marginal cells quadrate for several rows, with thin longitudinal and thick transverse walls. Dioicous, sporophytes unknown.

SPECIMENS EXAMINED: CAUCASUS: *Adygeya*, Caucasian Reserve, Kamennoe More Ridge, 26.VI.1992, *T.Akatova* (CSR, MHA); **URALS:** *Perm Province*, Krasnovishersk Distr., B. Shchugor River, 4.VIII.1995, #24, *A.Bezgodov* (MW); Krasnovishersk Distr., Vyels surroundings, 17.VI.1995, #169, 170, *A.Bezgodov* (MW); **Sverdlovsk Province**, Ivdal Distr., Lozva River, 5.VIII.2000, *I.Goldberg* (SVER, MW); **Bashkortostan**, Shulgan-Tash Reserve, 2001, #02-25, 02-49, *V.Zolotov* (MHA); **SIBERIA:** *Krasnoyarsk Territory*, Putorana Plateau, Lama Lake, 16.VII.1984, #28, *I.Czernyadjeva* (LE, MW); Krasnoyarsk City, left bank of Yenisey River, 10.V.2001, *T.N.Otnyukova* (KRF, MW); prope Krasnojarsk, 1912, #1734, *Zhuravlev* (H, LE); **Yakutia**, Lenskij Distr., Peleduj River, 23.VIII.1953, #136/2, *V.Kuvaev* (SASY); Lenskij Distr., Peleduj River upper course, 1.IX.1953, #151/16, *M.Sukhikh & V.Kuvaev* (SASY); Lenskij Distr., Pilka River, 25.VII.1999, *E.I.Ivanova* (SASY, MW); Khangalassky Distr., Lenskie Stolby, 17.VIII.2000, #00-130, *Ignatov* (MHA); Khangalassky Distr., Sinyaya River, 7.VI.2000, *E.I.Ivanova* (SASY, MW); Lena River lower course, Chekurovka, 26.VII.1988, *V.R.Filin* (MW).

Distribution. *Grimmia teretinervis* is sporadically distributed in Northern and Central Europe, and North America. Only recently it was reported from the territory of Russia (Muñoz & Pando, 2000), and it is not

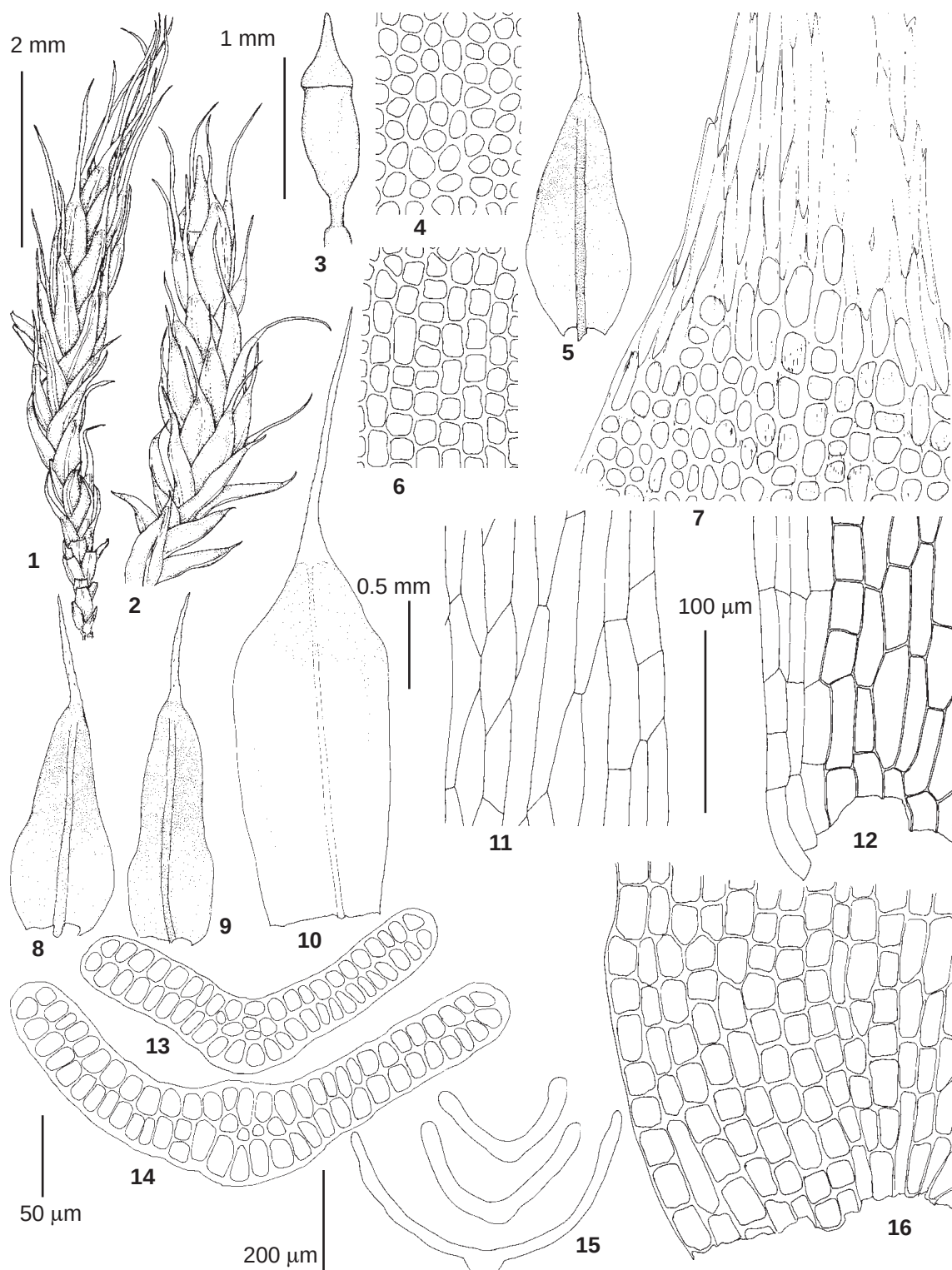


Fig. 51. *Grimmia tergestina* Tomm. ex B.S.G. (1, 4-16 – from Perm Province, A. Bezgodov, #624; 2-3 – from North Ossetia, 11.VIII.1979, Amirkhanov): 1, 2 – habit; 3 – capsule; 4 – upper leaf cells; 5, 8-9 – leaves; 6 – median leaf cells; 7 – base of hair-point and upper leaf cells; 10 – perichaetial leaf; 11 – median cells of perichaetial leaf; 12 – basal cells of perichaetial leaf; 13-15 – leaf transverse sections; 16 – basal cells of vegetative leaf. Scale bars: 2 mm for 1; 1 mm for 2-3; 0.5 mm for 5, 8-10; 50 µm for 13-14; 100 µm for 4, 6-7, 11-12, 16; 200 µm for 15.

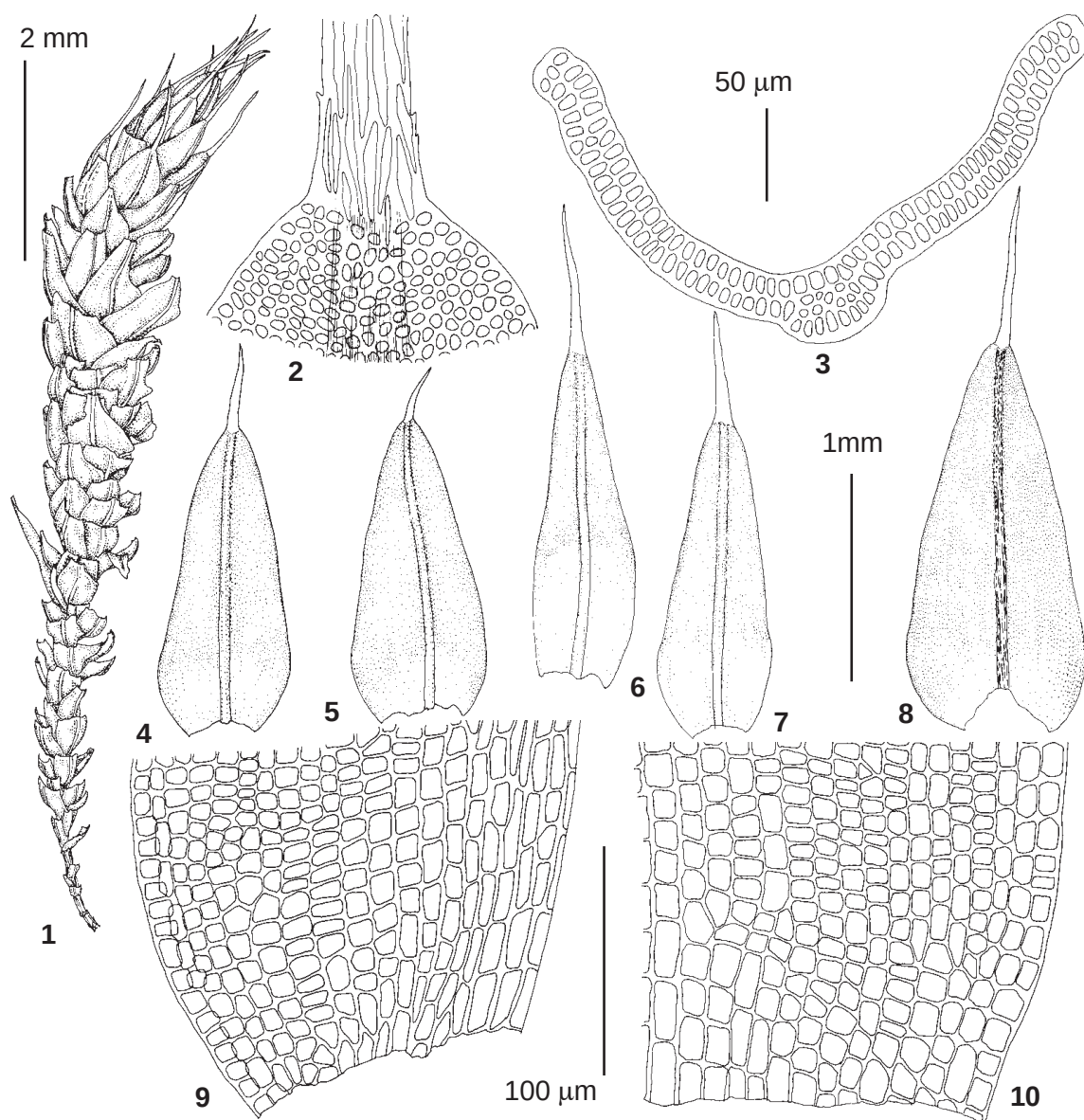


Fig. 52. *Grimmia tergestina* Tomm. ex B.S.G. (1-5, 9 – from lectotype of *G. crassifolia* Lindb. ex Broth., Ossetia, VII.1877, V.F.Brotherus; 6 – from Bashkortostan, V.Zolotov, #02-28; 7 – from Altai Republic, M.Ignatov, #30/15; 8 – from Kabardino-Balkaria, 30.VII.2004, Ignatov & al.; 10 – from North Ossetia, 11.VIII.1979, Amir Khanov): 1 – habit; 2 – base of hair-point and upper leaf cells; 3 – leaf transverse section; 4-8 – leaves; 9-10 – basal cells of vegetative leaves. Scale bars: 2 mm for 1; 1 mm for 4-8; 50 µm for 2-3; 100 µm for 9-10.

mentioned in any handbooks of mosses of USSR or Russia. The revision of herbarium material revealed its sporadic distribution in Siberia (several records from Putorana Plateau, Yakutia, and Krasnoyarsk surroundings), in Caucasus and Urals. It grows at low elevations, mostly on calcareous rocks.

Differentiation. *Grimmia teretinnervis* differs from any other species of *Grimmia* by its costa round in cross section, convex both dorsally

and ventrally. The species can be also recognized by imbricate leaves and very thin shoots. Limpricht (1884) described this species also under the alternative name *Schistidium teretinnervis*, and he later used this latter placement to treat the taxon. Plants with anteridia and archegonia are known, but sporophytes have never been found, and consequently, the precise generic placement of this species needs further studies.

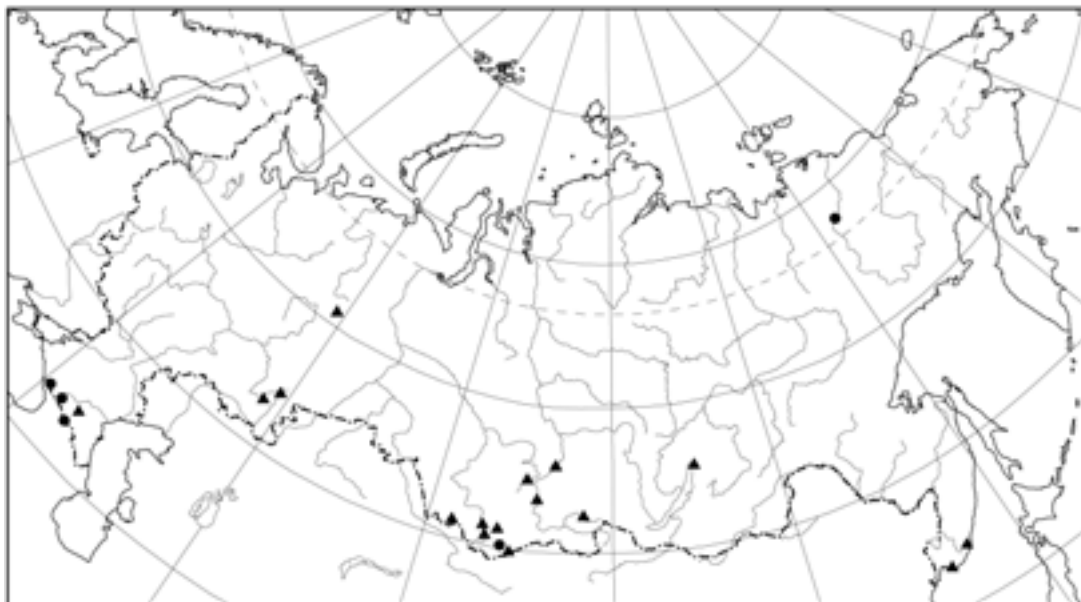


Fig. 53. Distribution of *Grimmia tergestina* Tomm. ex B. S. G. in Russia: with (circles) and without (triangles) capsules.

Plants in dense tufts, dark green to bluish when wet, black above and brownish in lower part when dry, usually rather hoary. Stems erect, 0.5-2 cm long. Leaves erect to appressed when dry, erect to patent when moist, gradually enlarged to the distal part of fertile shoot, 1.4-2.0×0.5-0.7 mm, ovate to ovate-lanceolate, obtuse to shortly acuminate, concave, not plicate; margins plane; costa weakly differentiated in distal part of leaf, flattened, semi-elliptical in cross section, 4-6 cells wide ventrally; hyaline hair-points of vegetative leaves to 0.5-0.7 mm long, terete, weakly denticulate to almost smooth, not decurrent; lamina bistratose in distal 2/3 of leaf, unistratose in basal part, upper laminal cells rounded-quadrate, 9-12 µm, thick-walled, slightly sinuose, basal juxtacostal cells rectangular, basal marginal cells short rectangular, with thin longitudinal and thick transverse walls. Perichaetial leaves larger, 2.0-2.5×0.7-1.0 mm, with longer hyaline hair-points, to 1.5 mm, widened and flattened at base; basal marginal cells long rectangular, with very thin walls, forming filmy margin, in innermost perichaetial leaves widened and extending to proximal 2/3 of leaf. Dioicous, male and female plants in separate tufts, not mixed, often in different populations. Sporophytes rare (but archegonia usually present). Setae straight, centrally attached, to 0.3 mm. Capsules immersed, 0.5-0.8 mm long, ovate, symmetric. Operculum conic, rostrate. Annulus of affinis-type. Peristome present [capsules immature or very old in Russian material]. Spores 8-10 µm. Calyptrae mitrate.

SPECIMENS EXAMINED: Specimens with sporophytes: **CAUCASUS: Kabardino-Balkaria**, Baksan River near Bylym, 30.VII.2004, *Ignatov & al.* (MHA);

Karachaevo-Cherkessia, Verkhnyaya Teberda, 8.VII.1995, #46/95, *Onipchenko* (MW); **North Ossetia**, Unali village, 11.VIII.1979, *A.Amirkhanov* (MW); **SIBERIA: Altai Republic**, Chagan-Uzun, 23.VII.1966, *L.V.Bardunov* (IRK, MW); Yakutia, Indigirka River basin, Injali River, 16-20.VI.1976, *O.M.Afonina* (LE).

Specimens lacking sporophytes, tentatively referred to *G. tergestina* (according to the occurrence of fertile collections in the area or growing on calcareous substrate): **CAUCASUS: North Ossetia**, North-Ossetian Reserve, 25.VII.1977, *L.I.Abramova* (MW); Verkhniy Tsej, 31.VII.1980, *L.I.Abramova* (MW); Balta, 20.V.1881, *A.H. & V.F.Brotherus* (LE); in valle fl. Ardon, inter Alagir et Mizurtzy, 7.1877, *V.F.Brotherus* (H-Br #1829002, lectotype of *G. crassifolia*); pr. fl. Ardon, VII.1877, *A.H. & V.F.Brotherus* (H #3066219, 3066220); **Stavropol Territory**, Kislovodsk, Sinie Gory, 1915, *V.P. & L.I.Savicz* (LE); Kislovodsk, Krasnye kamni, 1915, *V.P.Savicz* (LE); **URAL: Perm Province**, Krasnovishersk Distr., Bolshoj Shchugor River, 4.VIII.1995, #624, *A.Bezgodov* (MW); **Bashkortostan**, Abzelilovo Distr., Tlyashevo, 22.VI.1997, #11, *A.Solomeshch* (MW); Burzyan Distr., Shulgan-Tash Reserve, 5.VI.2001, #02-50, *V.Zolotov* (MHA); **SIBERIA: Altai Republic**, Kosh-Agach, Tabozhok Creek, 29.VII.1992, #30/15, 30/16, 7.VIII.1992, 30/18, *Ignatov* (MHA); Malyj Yaloman Creek, 30-31.VII.1991, #25/42, 25/89, *Ignatov & Ignatova* (MHA); Malyj Yaloman, 4.VIII.2000, *Ignatova* (MW); Shebalino Distr., Katun River 2 km upstr. Bjika Creek, 10.VII.1993, #34/120, *Ignatov & Ignatova* (MHA); Chermal, 8.VII.1948, #7/3, *T.F.Voszhenakova* (LE, MW); **Tyva**, Todginskaya Valley, Azas Lake basin, Ilgi-Chul Hut, 1.VIII.1995, *T.N.Otnyukova* (KRF, MW); Todzhinskaya Valley, Kadysh Lake, 30.VIII.1999, *T.N.Otnyukova* (KRF, MW); **Krasnoyarsk Territory**, Minussinsk Distr., opp. Krasnoyarsk, 12.VIII.1912, #1593, *Z.Glagoleva* (LE); Krasnoyarsk City, 4.V.2001, *T.N.Otnyukova* (KRF, MW); Minussinsk, V.1888, *N.Martianoff* (H-Br); **Khakassia**, Ordzhonikidze Distr., Kopjevo railway station, 30.VI.1970,

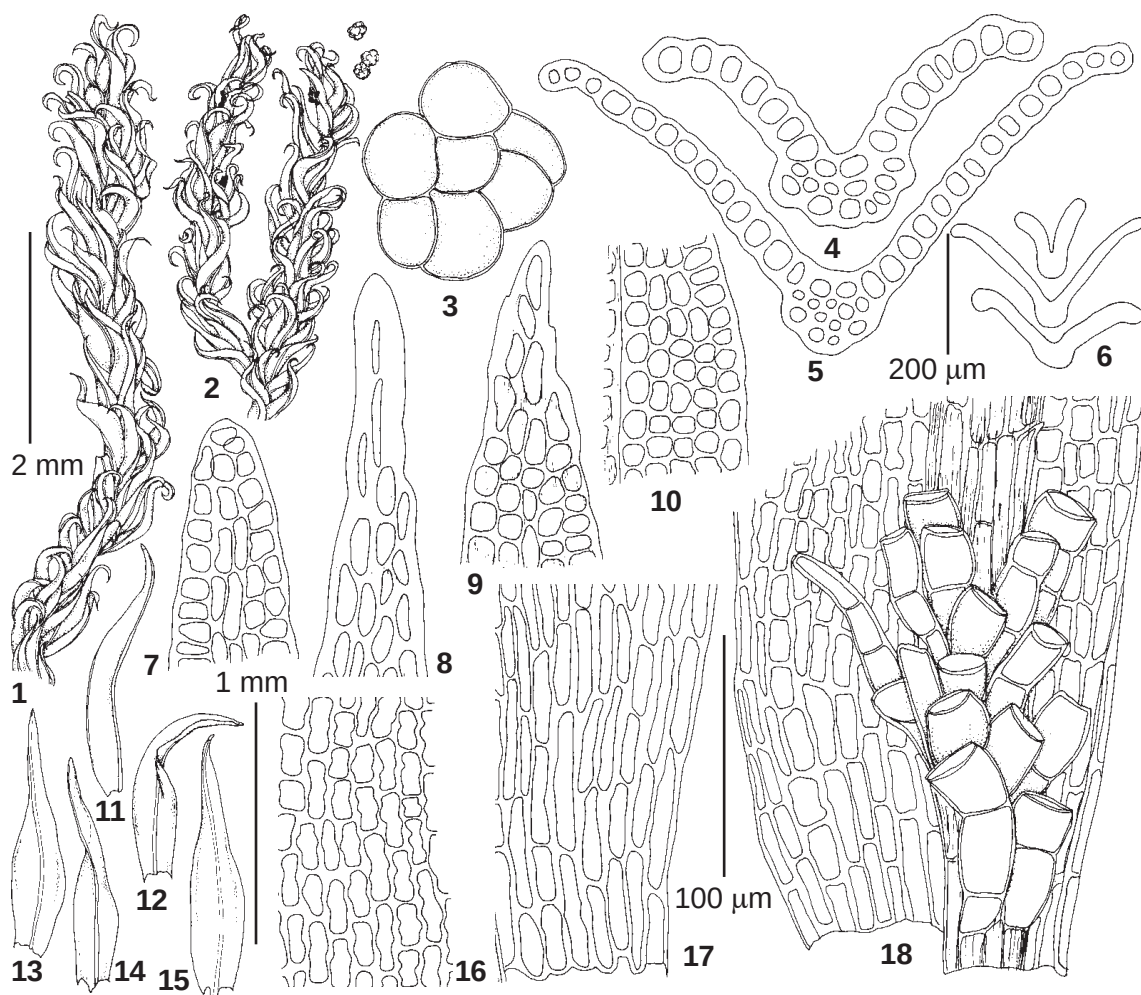


Fig. 54. *Grimmia torquata* Drumm. (1 – from Vrangal Island, O.M.Afonina, #35; 2-18 – from Yakutia, M.Ignatov, #00-11): 1-2 – habit; 3 – gemma; 4-6 – leaf transverse sections; 7-10 – upper leaf cells; 11-15 – leaves; 16 – median leaf cells; 17 – basal leaf cells; 18 – leaf base with gemmae stalks. Scale bars: 2 mm for 1-2; 1 mm for 11-15; 100 µm for 4-5, 7-10, 16-18; 200 µm for 6.

A. Vasiljev (IRK, MW); **Irkutsk Province**, Baikal Lake, Aya bay, 24.VI.1987, L.V.Bardunov (IRK, MW); **FAREAST: Primorskij Territory**, Ol'ga Distr., Mokrushikha, 5.IX.1977, A.Minakov (VLA); Suchan River basin, Ekaterinovka, Zolotaya Gora, 4.IX.1913, #73, V.L.Komarov (LE).

Distribution. *Grimmia tergestina* is known in Europe, from southern Scandinavia to Spain, Central Asia, North and South America. Widespread in xeric areas (Altai, Tyva, Mongolia, Middle Asia), scattered in other places. In Russia collections with sporophytes are known only from Caucasus, Altai and Yakutia; we refer tentatively to this species some specimens without sporophytes from Urals, southern Siberia, and southern Far East.

Differentiation. Fertile plants of *Grimmia tergestina* are easily recognized by immersed

peristomate capsules on straight setae (concave leaves with plane margins, distally bistratose lamina, and semi-elliptical in cross section costa differentiate *G. tergestina* from *G. capillata*, another species with immersed capsules on straight setae). However sterile material of *G. tergestina* cannot be surely differentiated from *G. poecilostoma*, species identical in gametophyte characters. The latter species is sporadically found in Siberia and Caucasus, with many collections having sporophytes. Greven (1995) considers that *G. poecilostoma* grows exclusively on acidic or neutral substrates and always is found with sporophytes whereas *G. tergestina* is found only on calcareous rocks and rarely form capsules. The distributional

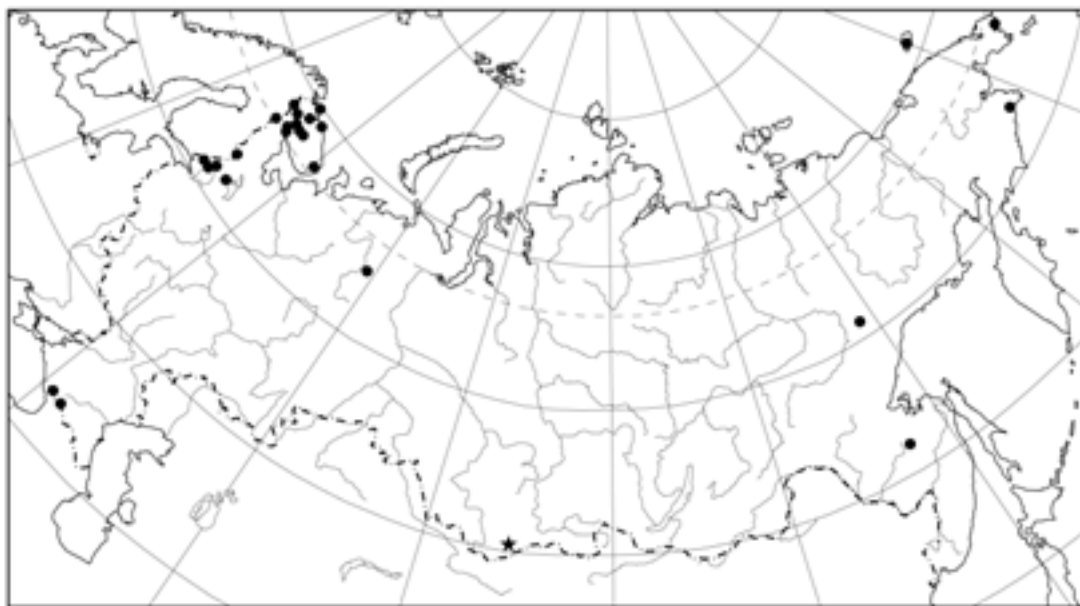


Fig. 55. Distribution of *Grimmia torquata* Drumm. (circles) and *G. triformis* Carestia et De Not. (star) in Russia.

pattern of both species generally agree with these statements, but we have seen some exclusions (see also Muñoz, 1999). We tentatively refer some sterile collections to either of the two species based on the occurrence in the area of other populations with sporophytes or the calcareous or siliceous nature of the substrate.

We also tentatively refer to *G. tergestina* the isoelectotype of *G. crassifolia* (H-Br #1829002) and other specimens in H (#30663219, 3066220) identified as *G. crassifolia*. The latter species was synonymized by Muñoz (1999) with *G. poecilostoma*, and it is recognized by Greven (1995, 2003) as a separate species (he also mentions that this species has its main distribution in the steppes of Asiatic Russia). Greven (l.c.) points out the following characters differentiating *G. crassifolia* from *G. tergestina*: 1) leaves with incurved margins and concave leaf apices, loosely appressed when dry; 2) hyaline hair-points weak, not decurrent; 3) basal marginal cells subquadrate, lamina bistratose almost to the leaf base; 4) perichaetial leaves hardly differentiated. The straight setae, according to Greven (l.c.) separates *G. crassifolia* from *G. poecilostoma*. However, all specimens collected by Brotherus in Ossetia are sterile, which preclude their sure identification (fertile specimens of *G. tergestina* were collected later in close area of North Ossetia). We failed to separate in the

material in Russian herbaria the collections with the character combination suggested by Greven. All these characters (leaf shape and concavity, hyaline hair-point length and decurrency, cell areolation of basal lamina of vegetative leaves) are very variable in *G. tergestina*. Furthermore, all fertile specimens of *G. tergestina* from the territory of Russia have perichaetial leaves with filmy margins typical for this species.

Both *G. poecilostoma* and *G. tergestina* differ from *G. laevigata* by filmy margins of perichaetial leaves (and almost completely filmy innermost ones), and very slightly denticulate to almost smooth hyaline hair-points; the leaves of *G. laevigata* are usually triangular, whereas leaves of *G. tergestina* and *G. poecilostoma* are ovate-lanceolate, though this character is rather variable. In some cases it is difficult to differentiate sterile specimens of *G. tergestina* or *G. poecilostoma* from small plants of *G. ovalis*. But the latter species differs in longer leaves (2–3 mm, vs. 1.4–2.0(–2.5) mm in *G. tergestina* and *G. poecilostoma*) with long, gradually tapering acumen, not rounded at apex, and perichaetial leaves similar to vegetative ones, without filmy margin formed by thin-walled cells.

29. ***Grimmia torquata*** Drumm., Musci Scotici, Vol. 2, n° 28. 1825. Figs. 54, 55.

Plants in soft, dense tufts or cushions, yellowish green or olive green above, brownish or blackish

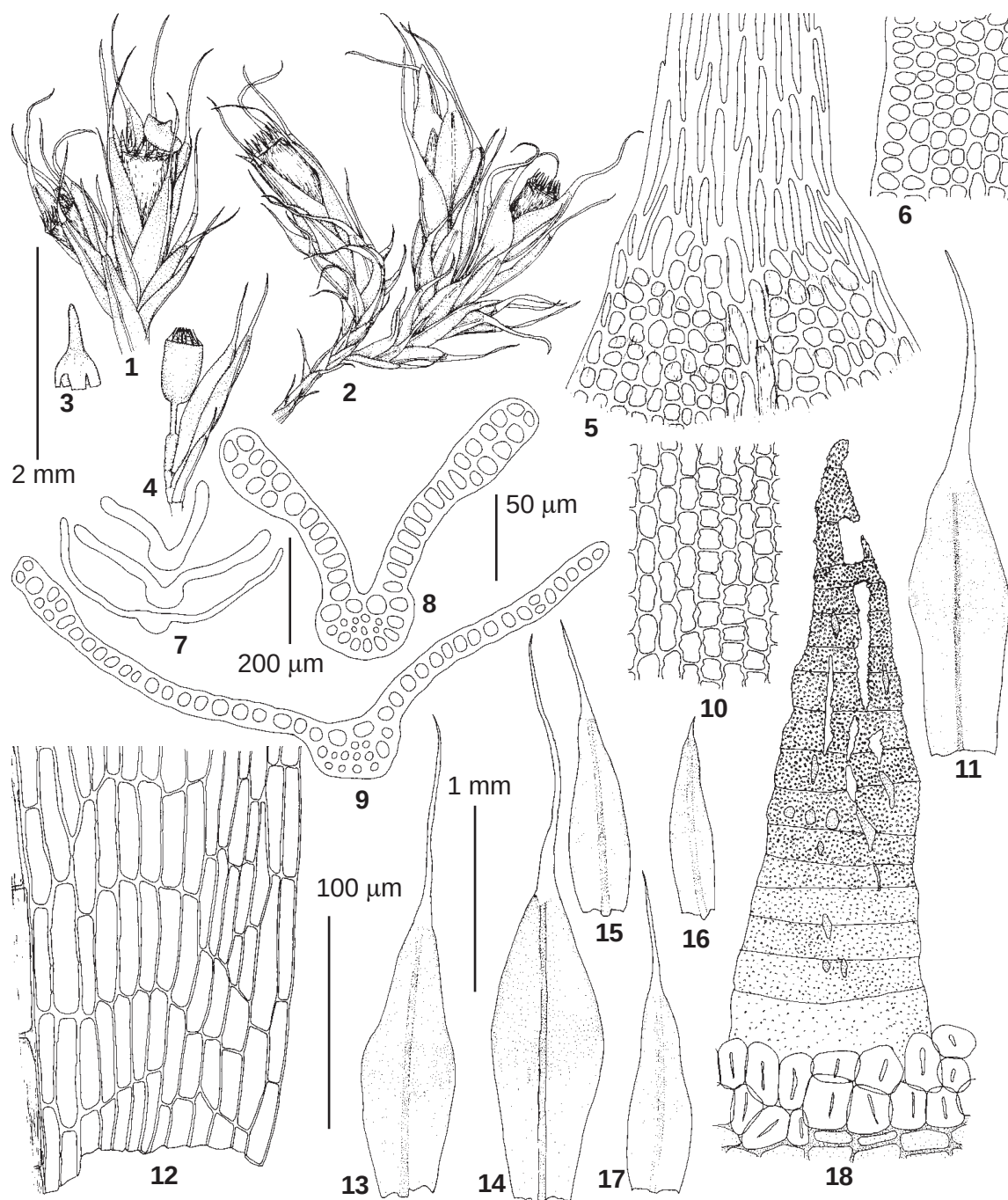


Fig. 56. *Grimmia triformis* Carestia et De Not. (from Altai Republic, M. Ignatov, #0/474): 1-2 – habit; 3 – calyptra; 4 – capsule; 5 – base of hair-point and upper leaf cells; 6 – upper leaf cells; 7-9 – leaf transverse sections; 10 – median leaf cells; 11, 13-17 – leaves; 12 – basal leaf cells; 18 – part of peristome. Scale bars: 2 mm for 1-4; 1 mm for 11, 13-17; 50 µm for 8-9; 100 µm for 5-6, 10, 12, 18; 200 µm for 7.

brown below. Stems erect, 2-5 cm long, fasciculately branching. Leaves strongly crisped and contorted when dry, slightly curved and loosely appressed when moist, occasionally 3-ranked, 0.9-1.6×0.2-0.4 mm, lanceolate, acuminate, keeled distally; margins

plane in distal part of leaf, slightly recurved below; costa differentiated, strongly prominent dorsally, semi-circular in cross section, with 2 ventral epidermal cells; hyaline hair-points very short, ca. 0.1-0.2 mm long, seldom longer, in lower leaves absent;

lamina unistratose throughout, often yellowish-colored; upper laminal cells isodiametric, 9-11 μm , thick-walled, subquadrate to short rectangular or oblate at margins, slightly sinuose, median laminal cells short rectangular, 15-25 $\times$ 10-12 μm , gradually elongating to the leaf base, with thick, strongly sinuose walls, basal juxtacostal cells thick-walled, porose, basal marginal cells more pellucid, with thick longitudinal and transverse walls. Gemmae common, aggregated on dorsal leaf base, forming on short stalks at dorsal surface of costa, dark-red, multicellular, with protuberant cells, 40-60 μm in diameter. Dioicous, androecia terminal, sporophytes very rare, not known from the territory of Russia. [Setae arcuate when moist. Capsules exserted, small, ovoid, slightly furrowed. Operculum conic, with long erect beak. Annulus of elongata-type. Peristome teeth orange, short, cleft. Spores 9 μm . Calyptrae mitrate].

SPECIMENS EXAMINED: EUROPEAN RUSSIA:
Murmansk Province, Teriberka, VII.1872, *V.F. Brotherus* (H); Petsamo [Rybachij Peninsula], 7.VII.1932, *A.V. Auer* (H); Pyukhyakuru Gorge, 1-2.VII.1972, #58, 107, *R.N. Shlyakov* (KPABG); 4-8.VIII.1986, #26/14, 26/15, 26/19-2, 27/14, 27-15-86, 0/20, *O. Belkina & A. Likhachev* (KPABG); Kandalaksha Bay of White Sea, Ryazhkov Island, 4-5.VIII.1988, #391-58-88, 32, 405/2, 405/3, 405/3a, *O. Belkina & A. Likhachev* (KPABG); Kandalaksha Bay of White Sea, Olenij Island, 30.VII.1988, #323/50, *O. Belkina & A. Likhachev* (KPABG); Ponoj River, 29-30.VII.1972, #330, 354, *R.N. Shlyakov* (KPABG); Kandalakshskie Mts., Middle Luven'gskoe Lake, 8.VIII.1985, #88/5, *A. Likhachev* (KPABG); Kandalakshskie Mts., Okatjeva Mt. northern slope, 18.VIII.1985, #208/4, *A. Likhachev* (KPABG); 5-7 km E of Kandalaksha, White Sea Shore, 4.VIII.1998, *Ignatov* (MHA); Khibiny Mts., Jukspor Creek Gorge, 23.VIII.1948, #2191a, *R.N. Shlyakov* (KPABG); Khibiny Mts., Southern Canyon, 5.VIII.1998, *Ignatov* (MHA); Khibiny Mts., Yuzhnoe Gorge, 5.VIII.1998, #8-13-98, 10-2-98, *O. Belkina* (KPABG); Khibiny Mts., Kukisvumchorr Mt., 4.IX.2001, *Ignatova* (MW); Lovozerskie Mts., Kujvchorr Mt., 29.VIII.1982, #117/1, *O. Belkina & A. Likhachev* (KPABG); Lovozerskie Mts., Ninchurt Mt., 14.VII.1983, #13/14, 13/9, 21.VIII.1983, 48/3, 48/13, *O. Belkina & A. Likhachev* (KPABG); Chiltald Mts., Chil' Creek, 9.VII.1988, #171-27-88, *O. Belkina* (KPABG); Ionnnjugoajv Mts., Ionnlakk Mt., 23.VII.1989, #24/3, 24/1, *A. Likhachev* (KPABG); Chiltald Mts., Malaya Konja Mt., 11.VII.1988, #207-4-88, *O. Belkina* (KPABG); Lavna-tundra Mts., Lavnatundra Mt., 7.VIII.1987, #293-6-87, 295-9-87, 297-7-87, 297-9-87, 297-10-87, *O. Belkina* (KPABG); Tuloma & Kola Rivers lower course, 2.VIII.1952, *R.N. Shlyakov* (KPABG); Salla, Kutsa, 24.VII.1934, *R. Tuomikoski* (H); **Karelia**, Valaam, 30.VI.1914, *V. Pesola* (H); Koikari, 20.VI.1870, *J.P. Norrlin* (H); Muezerskij Distr., Lendery, 5.VIII.2003, #L-03/21-52a & 8.VIII.2003, #L-03/39-37a, *Maksimov & Maksimova* (PTZ); **Leningrad Province**, Leningrad Distr., Kurkijoki, 1874, *E. Juslin* (KPABG); **CAUCASUS: Kabardino-Balkaria**, Elbrus Mt. area, Adyl-Su River upper course, X.1994, #31, *I. Pospelov* (MW); **Karachaevo-Cherkessia**, Teberda Reserve, Oriuchat Gorge, 4.IX.1994, #151/94, *Onipchenko* (MW); Khadzhibei Gorge,

25.VII.1995, #94/95, *Onipchenko* (MW); Bolshaya Khati para Gorge, 16.VII.1994, #78/94, *Onipchenko* (MW); **URALS: Komi Republic**, Sablya Mt., 19.VIII.1983, *A.P. Dyachenko* (SVER); **SIBERIA: Yakutia**, Ust-Maya Distr., Allakh-Uyn, Semench-Yuryakh Creek, 26.VIII.2000, #00-11, *Ignatov* (MHA); Ust-Maya Distr., Allakh-Uyn, Semench-Yuryakh Creek, 26.VIII.2000, #00-115, *Ignatov* (MHA); Ust-Maya Distr., Allakh-Uyn, Tarbagannakh Creek, 25.VIII.2000, #00-119, 00-507, 00-508, *Ignatov* (MHA); **FAR EAST: Chukotka**, Lavrentiya Bay, *O.M. Afonina* (NY); Vrangl Island, Rodgers Bay, Nasha River, 27.VIII.1987, #35, *O.M. Afonina* (LE, MW, MHA, KPABG); **Magadan Province**, Koryakia, Pekulnejskoe Lake, *O.M. Afonina* (LE); **Khabarovsk Territory**, Verkhnebureinskij Distr., Bureinskij Reserve, Kerbi-Kuraigagna watershed, 15.VIII.1992, *B. Borisov* (MW).

Distribution. *Grimmia torquata* is spread throughout Europe, in the mountains or at sea level in northernmost countries, in Greenland, in the north or in mountains of North America. In Russia it is rather common in Kola Peninsula and Karelia, scattered in Chukotka, and recently found in south-eastern Yakutia and Khabarovsk Territory. In 1990 it was collected several times in Caucasus, Karachaevo-Cherkessia and Kabardino-Balkaria, an area from where it had not been reported before. In northern localities grows at low altitudes, on acidic cliffs or rock outcrops, often on vertical surfaces, sometimes dominating on soil in tundra communities (Vrangl Island). In more southern areas, like south-eastern Yakutia and Caucasus, it grows in the mountains above tree-line, in the alpine and subnival belts, on moist cliffs (the Yakutian collection is from cliffs near a waterfall).

Differentiation. The species can be easily recognized by comparatively short, strongly contorted and crisped leaves with very short hyaline hair-points, thick-walled and sinuose median laminal cells, and also because it has numerous dark red gemmae on dorsal surface of costa at leaf base in all collections. Another species with strongly crisped leaves is *Grimmia incurva*, but it differs in considerably longer, linear leaves, usually 2.5-3.0 mm long, always without gemmae. Spirally twisted leaves and similar thick-walled laminal cells are characteristic of *G. funalis*, but leaves of this species are not crisped, hyaline hair-points are usually long, and it lacks gemmae.

30. *Grimmia triformis* Carestia et De Not., Comment. Soc. Crittog. Ital. 2: 102.1866. — *Grimmia donniana* var. *triformis* (Carestia et De Not.) Loeske, Laubm. Eur. Part 1: 96. 1913. Figs. 55, 56.

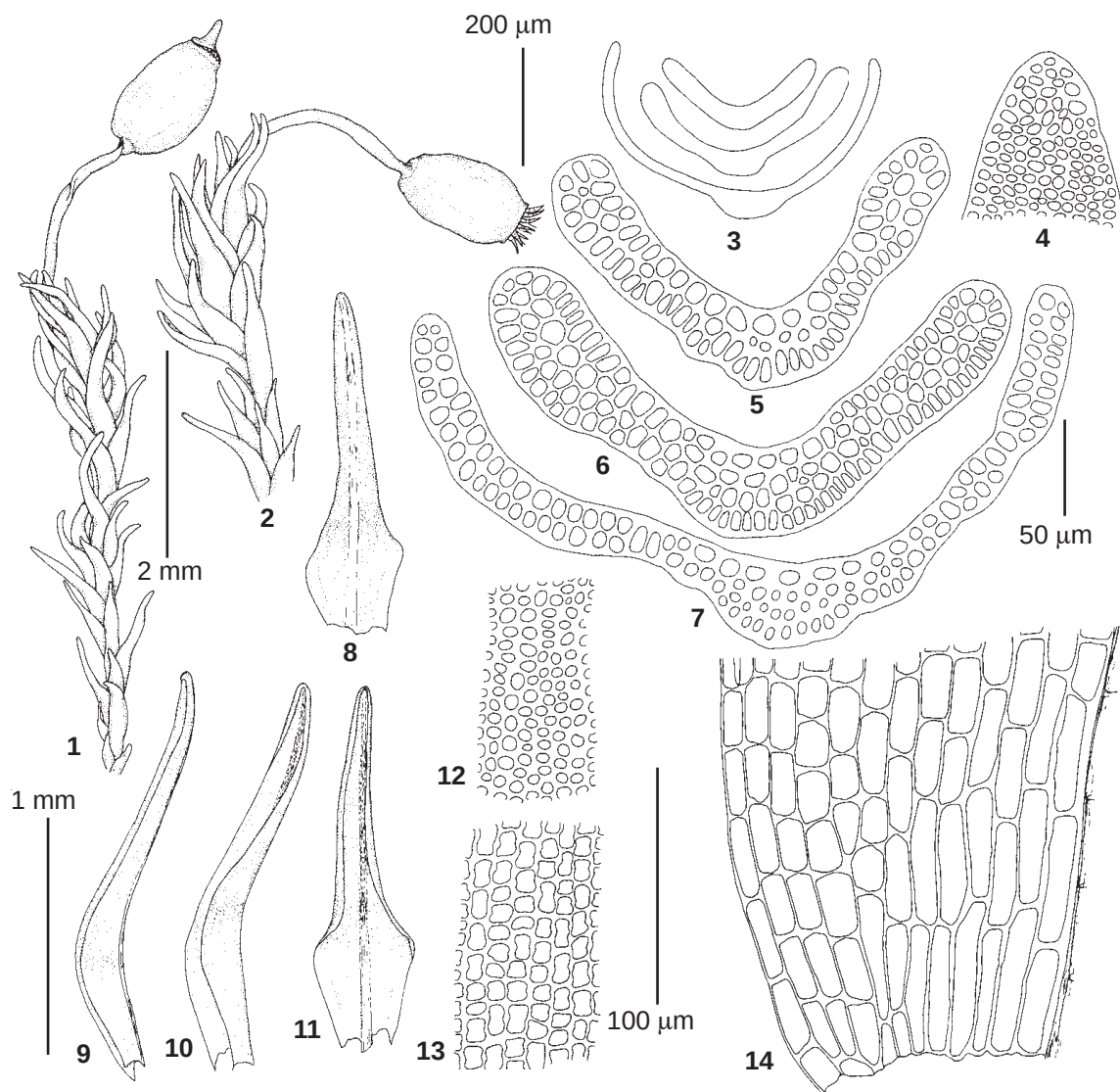


Fig. 57. *Grimmia unicolor* Hook. (from Altai Republic, M. Ignatov, #3/147): 1, 2 – habit; 3, 5–7 – leaf transverse sections; 4 – leaf tip; 8–11 – leaves; 12 – upper leaf cells; 13 – median leaf cells; 14 – basal leaf cells. Scale bars: 2 mm for 1–2; 1 mm for 8–11; 50 µm for 5–7; 100 µm for 4, 12–14; 200 µm for 3.

Plants in dense tufts, dark green, hoary. Stems erect, 0.5[–2] cm long, with weak central strand. Leaves flexuose, loosely appressed when dry, erect-spreading when moist, 1.0–1.6×0.3–0.5 mm, from oblong base gradually tapered into lanceolate acumens, widely keeled in distal part, not plicate; margins plane; costa differentiated, strongly prominent dorsally, semi-circular in cross section, with 2 ventral epidermal cells; hyaline hair-points 0.3–0.5(–1.3) mm long, denticulate, terete distally, flattened basally, flexuose; lamina unistratose near the costa, bistratose at margins and in strips in distal 2/3 of leaf, upper and median laminal cells not bulging, 11–14×10–11 µm, rounded-quadrate to short rectangular, with not or slightly sinuose walls, median laminal cells gradually

elongating to the leaf base, 12–20×10–12 µm, with moderately sinuose walls, basal juxtacostal cells elongate rectangular, 30–50×10–12 µm, with slightly thickened, not or very slightly porose walls, basal marginal cells uniformly thin-walled, to 70×10 µm. Autoicous, androecia terminal, sporophytes always present. Perichaetial leaves considerably larger than vegetative leaves, 1.7–2.0[3.1]×0.6–0.7[0.8] mm, with longer hyaline hair-points, 1.2–1.7[2.0] mm long, widened and flattened at base. Setae ca. 0.5[–1.0] mm, erect, straight. Capsules immersed, smooth, ovoid-cylindric, 0.8–1.0 mm long, smooth, stramineous, exothelial cells thick-walled, stomata at urn base present. Operculum low conic, mamillate. Annulus of elongata-type. Peristome teeth orange, contrasting

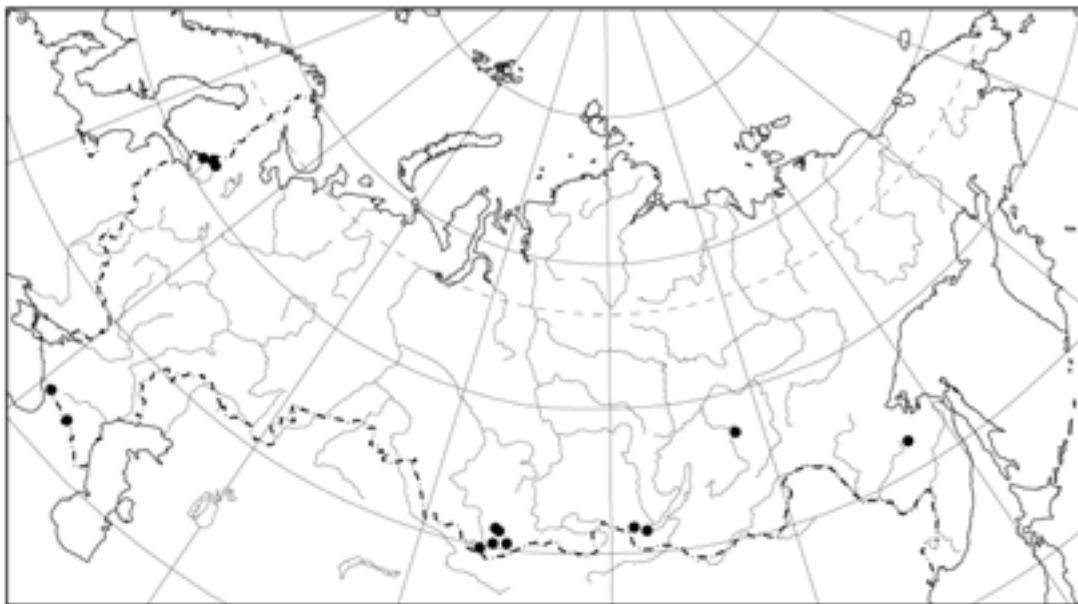


Fig. 58. Distribution of *Grimmia unicolor* Hook. in Russia.

in color with the urn, cribose throughout and irregularly cleft distally, densely papillose. Spores [8]9-11 μ m. Calyptrae mitrate.

SPECIMENS EXAMINED: **SIBERIA: Altai Republic**, Karakem River between Ayulyuyuzuk & Kobiguayuk Creeks, 20.VI.1989, #0/474, M.Ignatov (MHA).

Distribution. *Grimmia triformis* is a very rare species known from few localities in mountains of Central Europe. In Russia it is represented by single collection from Altai Mts., very far from its main area in Europe. It grows at 2050 m alt., at tree-line of *Pinus sibirica* forest, on siliceous rocks.

Differentiation. *Grimmia triformis* is very close to *G. donniana* and differs only in sporophytic characters (capsules are usually present in both species). In *G. triformis*, setae are very short, ca. 0.5 mm long and capsules are immersed (vs. setae 1.5-2.5 mm long and capsules exserted in *G. donniana*), and peristome teeth are wider, 70-100 μ m at base, cribose in *G. triformis* (vs. peristome teeth 50-70 μ m wide at base, almost entire in *G. donniana*). Altaian specimen of *G. triformis* was reported by Ignatov & Cao (1995) as *Coscinodon cribrus*, another species with immersed capsules and strongly cribose peristome teeth. However, *Coscinodon cribrus* is easily separated from *Grimmia triformis* by deeply plicate leaves (vs. not plicate in *G.*

triformis) and plicate, campanulate calyptrae, covering the capsules almost to the base (vs. small, mitrate, smooth calyptrae in *Grimmia triformis*).

31. ***Grimmia unicolor*** Hook. in Grev., Scott. Crypt. Fl. 3: 123. 1825. Figs. 57, 58.

Plants in loose or rather dense rigid patches, dark green or bluish-green. Stems erect or ascending, 1-3 cm long, fasciculately branched. Leaves appressed when dry, sigmoid in lateral view when wet, gradually enlarged to the distal part of shoot, 1.5-2.8×0.6-0.7 mm, from short ovate base quickly narrowed into long lanceolate obtuse acumen, concave, cucullate at apex, not plicate; margins plane to incurved in proximal part of leaf; hyaline hair-points absent; costa weakly differentiated in distal 2/3, flattened or slightly prominent dorsally, semi-elliptical in cross section; lamina 2-3-stratose in distal 2/3, opaque, to 4-stratose at margins, upper laminal cells isodiametric, 6-7 μ m, rounded, thick-walled, median laminal cells ca. 9 μ m wide, quadrate to short rectangular, with moderately thickened sinuose walls, basal juxtacostal cells elongate rectangular, to 50×10-12 μ m, with not porose or sinuose walls, basal marginal cells pellucid, short rectangular, to 35×10-12 μ m, with thin longitudinal and thick transverse walls. Perichaetial leaves 2.5-3.0×0.7-0.9 mm, with wider and longer basal part, formed by more thin-walled pellucid cells. Dioicous, sporadically with sporophytes. Setae 3-4 mm, straight when wet, often variously curved when dry. Capsules exserted, ovoid, strongly narrowed to the

mouth, 1-1.5 mm long, smooth. Operculum conic, long-rostrate. Annulus of affinis-type. Peristome teeth red-brown, finely papillose, entire or perforated distally. Spores 10-12 µm. Calyptrae mitrate, lobed at base.

SPECIMENS EXAMINED: **EUROPEAN RUSSIA:** **Karelia**, Ladoga, Puutsalo, 30.VI.1874, S.O.Lindberg (H); Sortavala, 14.VI.1934, M.J.Kotilainen (H); Impilachti, VII.1876, V.F.Brotherus & H. Hjelt (H), 20.VII.1914, V.Pesola (H), 15.VI.1916, M.J.Kotilainen (H), 12.VII.1926, E.Kanervo (H); Kronoborg [Kurkijoki], 1874, E.Julin (H); **CAUCASUS: North Ossetia**, North Ossetian Reserve, 25.VII.1977, L.I.Abramova (MW); ad mare glaciale Zei ad fl. Ardon, A.H. & V.F. Brotherus (H-SOL, H-Br); **Karachaevo-Cherkessia**, Teberda Reserve, Baduk Gorge, 17.VIII.1993, #1/93, Onipchenko (MW); Ullu-Murudgu Gorge, 8.VIII.1986, Ignatova (MW); Bolshaya Khatipara-Khadzhej pass, 17.VII.1994, #80/94, Onipchenko (MW); Goral-Kol Gorge, 21.VII.1994, #104/94, 111/94, Onipchenko (MW); Azgek Gorge, 30.VII.1993, #32/93, Onipchenko (MW); **SIBERIA: Altai Republic**, Verkhne-mul'tinskoe Lake, 5.VII.2000, O.Pisarenko (MW); Ak-Turu, 18.VII.1966, L.V.Bardunov (IRK, MW); between Kolbakaya & Saluru Creeks, 31.VII.1993, #36/347, Ignatov (MHA); Kobiguayuk Creek, 14.VI.1989, #0/464, Ignatov (MHA); Kayak Lake, 30.VI.1991, #7/11, Ignatov (MHA); Kayakkatuyarykskij Creek, 3-6.VII.1991, #111/94, 3/268, 27.VI.1991, 3/12, 3/32, 3/61, 3/84, 8/158, 8/163, Ignatov (MHA); left branch of Kaira Creek at Kaira-bazhi Peak, 14-17.VII.1991, #13/21, 13/41, 13/49, 13/162, Ignatov (MHA); Teletzkoe Lake, Chulyshman mouth, 5.VII.1966, L.V.Bardunov (IRK, MW); **Irkutsk Province**, Baikal Lake, Longatui River, 30.VIII.1921, #91, V.Smirnov (H-Br, MHA, IRK, MW); Murino, 30.VIII.1921 (H-Br); Vitimskij Reserve, Amalyk River, 9.VIII.1984, L.V.Bardunov (IRK, MW); **Buryatia**, Tunkinskij Range, 1934, #44, V. Smirnov (LE); **FAR EAST: Khabarovsk Territory**, Bureinskij Reserve, Medvezh'e Lake, 10.VIII.1997, #97-1096, Ignatov (MHA).

Distribution. *Grimmia unicolor* is sporadically distributed in Europe, from Scandinavia and Great Britain to Spain, known in Asia from India, China, Mongolia, Middle Asia, in Africa from Ethiopia, and from North America. In Russia it is known of old collections from Karelia, sporadically found in Caucasus, rather common in Altai Mts., extending eastward to Irkutsk Province and Khabarovsk Territory. *Grimmia unicolor* grows on siliceous rocks in the mountains, usually above tree-line, at 1700-3000 m alt., but in Baikal area it was collected in forest belt, on cliffs at lake shore and river banks.

Differentiation. *Grimmia unicolor* can be easily recognized by concave, channeled leaves with plane to incurved margins, obtuse, cucullate apex without hair-point, weakly differentiated flattened costa, and lamina often 3- to 4-stratose at margins.

TAXA EXCLUDED FROM BRYOFLORA OF RUSSIA

Grimmia trichophylla Grev. Species most close to *G. muehlenbeckii*, differs from the latter in larger plant size, longer hyaline hair-points and gemmae subsessile, formed on short stalks on both sides of the lamina. *Grimmia trichophylla* was reported by Savicz-Ljubitskaya & Smirnova (1970) for European Russia, Polar Urals, Caucasus, and Eastern Siberia, and by Ignatov & Afonina (1992) also for Beringian Arctic. All specimens of this species in herbaria were erroneously identified (they belong mostly to *G. longirostris*, *G. reflexidens* or *G. muehlenbeckii*). *Grimmia trichophylla* is widespread in North and South America, known from Australia and New Zealand, Africa, Middle East and Turkey, common in Europe (but not found in Finland). Its occurrence in Russia is unlikely.

Grimmia decipiens (Schultz) Lindb. This species occurs in Europe and northern Africa, and known also from Turkey and Armenia. It is characterized by robust plants with ribbed capsules on arcuate setae, resembling habitally *G. trichophylla* and *G. elatior* (but can be readily separated from both these species in costa reniform in cross section, with 3-8 ventral epidermal cells). Savicz-Ljubitskaya & Smirnova (1970) reported this species for European Russia, Ignatov & Afonina (1992) – for North-West European Russia and Caucasus, Abramov & Volkova (1998) – for Priladozhskij District of Karelia. All these records were based on erroneously identified specimens. However, the species can be found in Caucasus.

SYNONYMS

Dryptodon patens (Hedw.) Brid. – *Grimmia ramondii*

Grimmia affinis Hoppe et Hornsch. – *G. longirostris*

Grimmia apiculata Hornsch. – *G. fuscolutea*

Grimmia brachydictyon (Card.) Deguchi – *G. hartmanii*

Grimmia calvescens Kindb. – *G. funalis*

Grimmia campestris Burchell ex Hook. – *G. laevigata*

Grimmia cavifolia Lindb. et Arnell – *G. longirostris*

Grimmia commutata Hueb. – *G. ovalis*

Grimmia crassifolia Lindb. ex Broth. – *G. tergestina*

Grimmia donniana var. *triformis* (Carestia et De Not.) Loeske – *G. triformis*

- Grimmia funalis* var. *calvescens* (Kindb.) H.Möller
– *G. funalis*
Grimmia hartmanii var. *anomala* (Hampe ex Schimp.) Mönk. – *G. anomala*
Grimmia leucophaea Grev. – *G. laevigata*
Grimmia mesopotamica Schiffn. – *G. capillata*
Grimmia ovata auct. non Web. et Mohr. – *G. longirostris*
Grimmia patens (Hedw.) B. S. G. – *G. ramondii*
Grimmia pulvinata var. *africana* (Hedw.) Wils. – *G. pulvinata*
Grimmia sessitana De Not. – *G. reflexidens*
Grimmia tergestina var. *poecilostoma* (Cardot et Sebillé) Loeske – *G. poecilostoma*
Grimmia trichophylla var. *tenuis* (Wahlenb.) Wijk et Marg. – *G. muehlenbeckii*
Hydrogrimmia mollis (Bruch et Schimp.) Loeske
– *Grimmia mollis*
Racomitrium patens (Hedw.) Hueb. – *Grimmia ramondii*

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