УДК 582.34+ 581.52+581.92
ББК 28.592я 431
М341

Материалы VI Международного Симпозиума «Биология сфагновых мхов»
М341 (Санкт-Петербург; Ханты-Мансийск, 28 июля – 11 августа 2016 г.) / под ред. проф., д-ра биол. наук Е.Д. Лапшиной, канд. биол. наук О.В. Галаниной. – Томск : Издательский Дом Томского государственного университета, 2016. – 74 с.

ISBN 978-5-94621-552-7

Сборник содержит материалы VI Международного симпозиума «Биология сфагновых мхов». Авторы, специалисты по сфагновым мхам из разных стран мира, рассматривают отдельные виды мхов, экологические факторы, влияющие на их развитие, а также способы их практического применения. Материалы охватывают описания сфагновых мхов, распространенных как в разных регионах России, так и в европейских странах.

Для широкого круга специалистов, работающих в области ботаники, экологии и смежных дисциплин, а также студентов и преподавателей вузов.

УДК 582.34+ 581.52+581.92
ББК 28.592я 431

Организационная и финансовая поддержка:
1. Правительство Ханты-Мансийского автономного округа – Югры.
2. АО «НК «Конданефть».
3. Национальный исследовательский Томский государственный университет.
4. Югорский государственный университет.
5. Санкт-Петербургский государственный университет.
6. Русское ботаническое общество.

ISBN 978-5-94621-552-7

Сборник включен в систему РИНЦ (www.elibrary.ru)

СФАГНОВЫЕ МХИ РЕСПУБЛИКИ БАШКОРТОСТАН (ЮЖНЫЙ УРАЛ)

SPHAGNA IN THE REPUBLIC OF BASHKORTOSTAN (THE SOUTHERN URAL)

Э. З. Баишева

E. Z. Baisheva

Институт биологии Уфимского научного центра РАН

Ufa Instituite of Biology of RAS

The study of sphagna in the modern-day Bashkortostan started in the middle of the XIX century. Two species (*Sphagnum capillifolium* and *S. squarrosum*) have been reported by Yulian Shell' (Шелль, 1883) for the Iremel and Yamantau Mountains. Later, Czech botanist Josef Podpěra published information about six species (*Sphagnum squarrosum, S. teres, S. flexuosum, S. fallax, S. palustre* and *S.magellanicum*) for the territory of Ufa and interfluve area between the Kama and Belaya rivers (Podpěra, 1921). Some data were available in the publications devoted to geobotanical investigations (Герасимов, 1926, 1931; Тюлина, 1931; Крашенинников, Кучеровская-Рожанец, 1941, *etc.*). There are two preliminary lists that include Bashkortostan *Sphagnum* species. The first has been published by Dmitry Zerov – famous Ukranian botanist who worked in the Southern Ural with E. Bradis, A. Bachurina and other scientists from Institute of Botany of Ukrainian Academy of Sciences at the 1941-1943, during the Second World War. The list reported 27 species for the Bashkir Cis-Ural and the Southern Ural, including 25 species for Bashkortostan (Зеров, 1947). Forty six years later, E. Ignatova and M. Ignatov published the preliminary list of Bashkortostan mosses that includes 26 *Sphagnum* species (Игнатова, Игнатов, 1993). Since then, further information has been obtained on distribution and diversity *Sphagnum* species in the Bashkortostan.

The purpose of this paper is to present the checklist for *Sphagnum* species in Bashkortostan based on literature data, herbarium specimens collected by E. Baisheva, A. Muldashev, V. Martynenko, P. Shirokikh, A. Solomeshch, A. Khusainov and some other colleagues at 1993–2015. The author expresses the appreciation for all collectors.

The Republic of Bashkortostan is situated on the border of Europe and Asia between latitudes 51°34' – 56°31' N and 53°08' – 60°00' E and covers an area 143600 km². The temperate coniferous–broadleaf and hardwood forests, forest steppe and steppe zones replace each other along 500 km from the north to the south. In the mountains of the Southern Ural the vegetation cover is associated with vertical zoning and includes alpine belt with alpine tundra and bare rocks, subalpine belt with *Betula* shrublands, sparse pine-spruce forests and mesophytic tall-herb meadows, and forest belt with mountain taiga. The climate is continental. The mean annual precipitation is 350-800 mm. The mean temperature of January is –14.5°C - –17°C, the mean temperature of July is +16.5°C - +19.5°C. The frost-free period ranges from 55–120 days depending on the elevation above sea level (Атлас…, 2005).

The different parts of Bashkortostan are characterized by various degrees of bogginess: from 0.1 per cent in the steppe areas to 6–11 per cent in forest and mountain zones. The mires are most concentrated in the interfluve area between Kama and Belaya rivers and in the Southern Ural mountains. The minerotrophic (nutrient rich) fens predominate and represent more than 85 per cent of the total mires area in republic. The oligo- and mesotrophic raised and transitional bogs are rare and accounted only 5 per cent and 10 per cent of mires area, respectively.

According natural zoning of A. Muldashev (Реестр…, 2010) the territory of Bashkortostan is divided into fourteen districts: 1. Kamsko-Tanypskiy district of broad-leaved, mixed broad-leaved-coniferous, dark coniferous and pine forests; 2. Zabelskiy district of broad-leaved forests; 3. District of mixed broad-leaved-dark coniferous forests of Ufa Plateau; 4. North-Eastern district of forests and forest-steppe; 5. Predbel'skiy district of forest-steppe; 6. District of forests and forest-steppe of Belebey Upland; 7. Cis-Ural district of steppe; 8. Zil'merdakskiy district of broad-leaved-dark coniferous forests; 9. Yamantauskiy district of dark coniferous forests and high mountainous vegetation; 10. District of broad-leaved forests in the Southern Ural western slope; 11. District of light coniferous forests in the central part of the Southern Ural; 12. District of forest-steppe in the Southern Ural eastern slope; 13. District of forest and forest steppe of Zilair Plateau; 14. District of steppe of the Trans-Ural (fig.).

In the check-list of *Sphagnum* species of Bashkortostan below the nomenclature follows

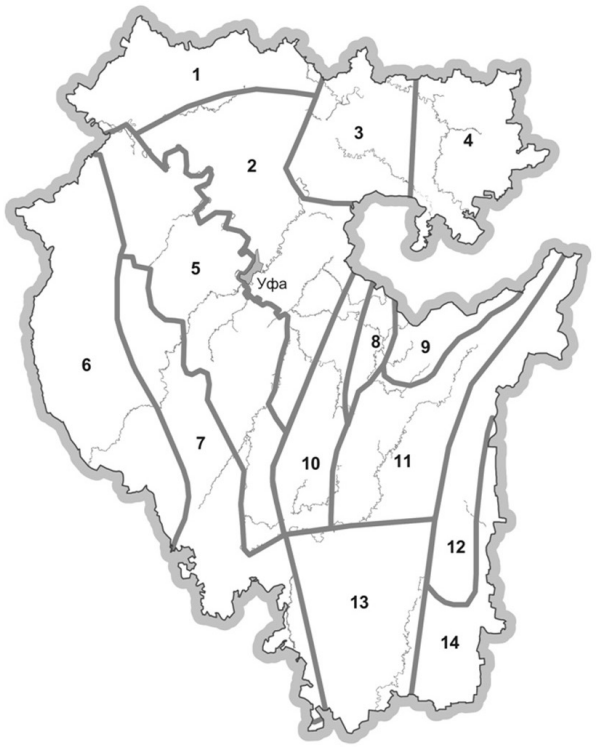

Fig. The scheme of natural zoning of Bashkortostan according A. Muldashev (Реестр…, 2010).

"Check-list of mosses of East Europe and North Asia (Ignatov, Afonina, Ignatova et al., 2006), Species are annotated with: citing the publication in which the species was mentioned for the first time for the modern-day Bashkortostan; frequency (Un – unique; Rar – rare; Sp – sporadically, Fr – frequent, Com – common); occurrence in 14 districts of zoning (cited above). Specimens are kept in UFA and partly in MHA.

1. *Sphagnum angustifolium* (C.E.O.Jensen ex Russow) C.E.O.Jensen – Gerasimov, 1926. Com. 1–3, 5, 9.

2. *Sphagnum balticum* (Russow) C.E.O.Jensen – Zerov, 1947. Rar. 1, 2, 5, 6, 9.

3. *Sphagnum capillifolium* (Ehrh.) Hedw. – Shell', 1883. Com. 1–4, 8–10.

4. *Sphagnum centrale* C.E.O. Jensen – Gerasimov, 1926. Sp. 1–3, 5, 9.

5. *Sphagnum compactum* DC in Lam. et DC – Un. 9. New record for the Bashkortostan.

6. *Sphagnum contortum* K.F. Schultz – Baisheva, Ignatova, 2013. Rar. 1, 3.

7. *Sphagnum cuspidatum* Ehrh. ex Hoffm. – Zerov, 1947. Rar. 1.

8. *Sphagnum fallax* (H. Klinggr.) H. Klinggr. – Podpera, 1921. Com. 1–3, 5, 8–10, 12.

9. *Sphagnum fimbriatum* Wilson – Ignatova, Ignatov, 1993. Rar. 1, 2, 9.

10. *Sphagnum flexuosum* Dozy & Molk. – Podpera, 1921. Fq. 1–3, 5, 9, 12.

11. *Sphagnum fuscum* (Schimp.) H. Klinggr. – Tyulina, 1931. Fq. 1, 2, 4, 9.

12. *Sphagnum girgensohnii* Russow – Tyulina, 1931. Com. 1, 3, 4, 9, 11.

13. *Sphagnum jensenii* H. Lindb. – Zerov, 1947. Rar. 1, 5, 9.

14. *Sphagnum lindbergii* Schimp. – Ignatova, Ignatov, 1993. Rar. 9. This species is included in Red Data Book of Bashkortostan (Красная книга…, 2011).

15. *Sphagnum magellanicum* Brid. – Podpera, 1921. Com. 1–5, 9, 11.

16. *Sphagnum majus* (Russow) C.E.O. Jensen. – Zerov, 1947. Sp. 1, 5, 9, 12.

17. *Sphagnum obtusum* Warnst. – Zerov, 1947. Sp. 1–3.

18. *Sphagnum palustre* L. – Podpera, 1921. Sp. 1–3, 9.

19. *Sphagnum papillosum* Lindb. – Zerov, 1947. Rar. 1, 9.

20. *Sphagnum platyphyllum* (Lindb. ex Braithw.) Warnst. – Baisheva, 2002. Sp. 1–3, 9, 12. This species is included in Red Data Book of Bashkortostan (Красная книга…, 2011).

21. *Sphagnum quinquefarium* (Lindb. ex Braithw.) Warnst. – Zerov, 1947. Rar. 3.

22. *Sphagnum riparium* Ångstr. – Gerasimov, 1926. Sp. 1–3, 5, 9.

23. *Sphagnum rubellum* Wilson – Zerov, 1947. Rar. 9.

24. *Sphagnum russowii* Warnst. – Tyulina, 1931. Fq. 1, 3, 4, 9.

25. *Sphagnum squarrosum* Crome – Shell', 1883. Com. 1–5, 9, 12.

26. *Sphagnum subnitens* Russow & Warnst. – Zerov, 1947. Rar. 9.

27. *Sphagnum subsecundum* Nees – Genkel', Ostasheva, 1933. Sp. 1–3, 9.

28. *Sphagnum teres* (Schimp.) Ångstr. – Podpera, 1921. Sp. 1–4, 9.

29. *Sphagnum warnstorfii* Russow – Tyulina, 1931. Fq. 2–4, 9, 12.

30. *Sphagnum wulfianum* Girg. – Tyulina, 1931. Sp. 1, 9.

In study area, the highest diversity of *Sphagnum* species have been revealed in the most elevated part of the Southern Ural (district 9 – 26 species), in the interfluve area between Kama and Belaya rivers (district 1 – 24 species) and in the Ufa Plateau (district 3 – 18 species). These areas are characterized by high degrees

of bogginess and diversity of wetland vegetation. Also, it should be noted, that mire vegetation of some others districts had not been sufficiently studied.

At present day the effectiveness of mire conservation is sufficient only in the district 9, where two protected areas have been organized – the Southern Ural Nature Reserve (2528 km²) and "Iremel" Nature Park (493 km²). In Bashkortostan, the most threatened mire types with respect to bryophytes are mesotrophic and eutrophic calcareous fens, oligotrophic raised bogs and karst mires. Most of them are small sized and play a vital role in the preservation of biodiversity in forest and forest-steppe zones, but theirs protection is not highly efficient. Natural areas preservation efforts should integrate information on mire vegetation and be increased.

Study was partly supported by UNDP/GEF №00072294 "Improving the coverage and management efficiency of protected areas in the steppe biome of Russia".

Атлас Республики Башкортостан. Уфа, 2005. 420 с. – [Atlas of the Republic of Bashkortostan. Ufa, 2005. 420 pp.]

Генкель А.А., Осташева Е.И. Висячие болота окрестностей горы Яман-Тау на Южном Урале // Известия Пермского биологического научно-исследовательского института. Т. VIII, вып. 6–8. 1933. С. 233–252. – [Genkel' A.A., Ostasheva E.I. Slope bogs in the vicinity of Yaman-Tau Mountain in the Southern Ural // Izvestiya Permskogo biologocheskogo nauchno-issledovatel'skogo instituta. T.VIII, vyp. 6–8. 1933. S.233-252].

Герасимов Д.А. К флоре сфагновых мхов Урала // Известия биологического научно–исследовательского института при Пермском государственном университете. 1926. Т. IV, вып. 9. С. 391–413. – [Gerasimov D.A. On Sphagna of Ural // Izvestiya biologocheskogo nauchno-issledovatel'skogo instituta pri Permskom gosudarstvennom universitete. 1926. T. IV, vyp. 9. S. 391–413].

Герасимов Д.А. Сфагновые мхи Урала и Западной Сибири // Изв. Пермского биологического научно–исследовательского института. 1931. Т. VII, вып. 10. С. 491–516. – [Gerasimov D.A. *Sphagnum* mosses of Ural and Western Siberia // Izvestiya Permskogo biologocheskogo nauchno-issledovatel'skogo instituta. 1931. T. VII, vyp. 10. C. 491–516].

Зеров Д.К. Сфагнові мохи Південного Уралу ї Башкирського Приуралля // Ботанический журнал АН УРСР. 1947. Т. 4. № 1–2. С. 95–106. – [Zerov D.K. Sphagna of the Southern Ural and Bashkir Cis-Ural // Botanicheskiy zhurnal AN URSR. 1947. T.4. № 1–2. S. 95–106].

Игнатова Е.А., Игнатов М.С. Мхи Башкирии: предварительный список видов и фитогеографические заметки // Бюлл. МОИП. Отд. биол. 1993. Т. 98. № 1. С. 103–111. – [Ignatova E.A., Ignatov M.S. Mosses of Bashkiria: preliminary check-list and phytogeographycal notes // Bull. MOIP. Otd. Biol. 1993. T. 98. № 1. S. 103–111].

Красная книга Республики Башкортостан. Т.1. Растения и грибы /под ред. Б.М. Миркина. Уфа: МедиаПринт, 2011. 384 с. – [Red Data Book of the Republic of Bashkortostan. V.1. Plants and mushrooms / B.M. Mirkin (ed.). Ufa: MediaPrint, 2011. 384 s].

Крашенинников И.М., Кучеровская-Рожанец С.Е. Природные ресурсы Башкирской АССР. Т. 1. Растительность Башкирской АССР. М. –Л.: Изд-во АН СССР, 1941. 156 с. – [Krasheninnikov I.M., Kucherovskaya-Rozhanets S.E. Natural resources of the Bashkir ASSR. T. 1. Vegetation of Bashkir ASSR. M.-L.: Izd-vo AN SSSR, 1941. 156 s.].

Реестр особо охраняемых природных территорий Республики Башкортостан. Изд. 2-е, перераб. Уфа: МедиаПринт, 2010. 414 с. – [Registry of nature protected areas of the Republic of Bashkortostan. 2nd ed. Ufa: MediaPrint, 2010. 414 s].

Тюлина Л. Материалы по высокогорной растительности Южного Урала // Известия государственного географического общества. 1931. Т. 63, вып. 5–6. С. 453–499. – [Tyulina L.N. Materials on high mountain vegetation of the Southern Ural // Izvestya gosudarstvennogo geograficheskogo obchestva SSSR. 1931. T. 63, vyp. 5–6. S. 455–499].

Шелль Ю.К. Материалы для ботанической географии Уфимской и Оренбургской губерний (Споровые растения) // Труды Общества естествоиспытателей при Императорском Казанском ун-те. Казань, 1883. Т. 12, вып. 1. С. 1–93. – [Shell' Yu.K. Materials for the botanical geography of Ufa and Orenburg provinces (Cryptogamic plants) // Trudy obshchestva estestvoispytateley pri Imperatorskom Kasanskom universitete. Kasan', 1883. T.12, vyp.1. S. 1–93].

Baisheva E.Z., Ignatova E.A. New moss records from Bashkortostan Republic. In: Sofronova E.V. (ed.) New bryophyte records. 2. Arctoa 2013. V. 22. P. 247.

Ignatov M.S., Afonina O.M., Ignatova E.A. et al. 2006. Check-list of mosses of East Europe and North Asia // Arctoa 15: 1–130.

Podpěra J. Ad bryophytorum cisuralensium cognitionem additamentum // Publicat. de la Fac. des Sciences de l'Univers. Masaryk. № 5. Brno: Tiskem polygrafie, 1921. 42 p.