

TRANSVOLGA-TRANSURAL STEPPES OF THE MIDDLE SUBZONE OF THE STEPPE ZONE: FORMATION DIVERSITY AND REGIONAL FEATURES

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DOI: 10.31857/S0006813621120085

The contemporary vegetation cover of the middle subzone of the steppe zone to the east of the Volga River is represented mainly by formations of firm-bunch grasses, dwarf semishrubs, perennial forbs and annuals. *Stipeta lessingiana* predominate and are common in a variety of environmental conditions. *Festuca valesiaca* steppes are most often confined to saline soils and represent a halophytic variant of steppes. In the Transvolga region (Zavolzhye), petrophytic *Festuca valesiaca* steppes are rare, being found mainly in the Trans-Urals (Zauralye). In places, *Festuca valesiaca* steppes represent pasture or post-fire anthropogenic variants. Psammophyte and hemipsammophyte steppes do not occupy large areas in the region. They are represented by three formations, namely *Stipeta pennatae*, *Stipeta capillatae* and *Stipeta zaleskii*. *Poa bulbosa* steppes (pasture variants) are widespread. Dwarf semishrub communities play a significant role in the spatial structure of vegetation in the middle subzone of the Transvolga-Transural region. They are part of complexes on saline river plains and saline clay outcrops; they are a stage of *Stipa* steppes recovery on fallows, or the result of grazing near villages. *Artemisieta santonicae* and *Artemisieta lerchiana* predominate in the Transvolga region, *Artemisieta nitrosae* in the Transural region. *Artemisieta austriacae* are found throughout the subzone. Communities of *Tanacetum achilleifolium* are widespread. A regional feature of the vegetation cover of the Trans-Urals are communities of *Stipa zaleskii* (zonal type of the northern subzone). Petrophytic steppes are typical of the Trans-Urals. They are represented by peculiar complexes of communities on variegated saline clays formed by the species (*Anabasis salsa*, *Atriplex cana*, *Nanophyton erinaceum*, etc.) whose phytocenotic optimum is located much more south. These complexes also include communities of petrophytic wormwood *Artemisia lessingiana*, an endemic species to Western Kazakhstan and Mugodzhazh Mountains.

Keywords: steppe zone, middle subzone, edaphic variants, firm-bunch grasses, dwarf semishrubs

ACKNOWLEDGEMENTS

The work was carried out with financial support of the Russian Foundation for Basic Research (grant 18-05-00688), and within the research project of the Laboratory of General Geobotany of the Komarov Botanical Institute RAS “Vegetation of European Russia and Northern Asia: diversity, dynamics, principles of organization”, No. 121032500047-1.

REFERENCES

- Bulany Yu.I. 2011. Botanical-geographic division of the Saratov region. – Modern problems of science and education. Biological sciences. Online publication. 6. (In Russ.).
- Czerepanov S.K. 1995. Sosudistyye rasteniya Rossii i sprovedel'nykh gosudarstv [Plantae vasculares Rossicae et civitatum collimitanearum]. St. Petersburg. 992 p. (In Russ. and Latin.).
- Davidenko O.N., Nevsky S.A., 2018. Unikalnaya galofitnaya rastitelnost Saratovskoy oblasti I voprosi ee ochrany [The unique halophytic vegetation of the Saratov region and questions of its protection]. – Vestnik krasnoyarskogo gosudarstvennogo agrarnogo universiteta. 5: 314–318 (In Russ.).
- Filatova N.S. 1984. Polyni SSSR (*Artemisia* L., Asteraceae) iz podroda *Seriphidium* (Bess.) Peterm. [Wormwood of the USSR (*Artemisia* L., Asteraceae) from the subgenus *Seriphidium* (Bess.) Peterm.]. – Novosti Sist. Vish. Rast. 216: 155–185.
- Goryaev I.A. 2019. Halophytic wormwoods on the Caspian lowland (in Kalmykia). – Bot. Zhurn. 104 (1): 93–107 (In Russ.).
- Ivanov V.V. 1958. Stepi Zapadnogo Kazakhstana v svyazi s dinamikoq ikh pokrova [Steppes of Western Kazakhstan in connection with the dynamics of their cover]. Moscow, Le ningrad. 288 p. (In Russ.).
- Ilijina I.S., Skarlygina-Ufimtseva M.D. 1971. Tipchakovye stepi Or-Kumakskogo vodorazdela (ecologo-fitotsenoticheskiye I dinamicheskaya karakteristika) [Festuca steppes of the Or-Kumak watershed (ecological-phytocenotic and dynamic characteristics)]. – In: Teoreticheskiye voprosy biogeografii. Uchenye zapiski LGU. Leningrad. P. 102–144 (In Russ.).
- Ipatov V.S., Mirin D.M. 2008. Opisanie fitotsenozo. Metodicheskiye rekomendazii [Description of phytocenosis. Methodical recommendations]. St. Petersburg. 71 p. (In Russ.).
- Kalmykova O.G. 2012. O rastitelnom pokrove goszapovednika “Orenburgskii” [About the vegetation cover of the state reserve “Orenburg”]. – Izvestiya Samarskogo nauchnogo zentra RAN. 14. 1 (4): 1024–1026 (In Russ.).
- Kalmykova O.G. 2014. Rastitelnyy pokrov linii ucheta melkikh mlekopiyayushchikh na uchastke “Ashchisaiskaya step” goszapovednika “Orenburgskii” [Vegetation cover of small mammals accounting lines on the part

- “Aschisayskaya steppe” of the Orenburg State Nature Reserve]. — In: Orenburgskii zapovednik: znachenie dlya sohraneniya stepnich ecosystem Rossii i perspektivy razvitiya: trudi gos. Prirod. Zapoved. “Orenburgskii”. 1: 70–79 (In Russ.).
- Kalmykova O.G. 2014. Orenburg Nature Reserve: significance for the preservation of steppe ecosystems in Russia and prospects for development. — Proceedings of the Orenburg State Nature Reserve. Issue I.-Orenburg: IPK “Gazprompechat” LLC “Orenburggazpromservice”. P. 70–79 (In Russ.).
- Karta geobotanicheskogo raionirovaniya SSSR. 1947. [Map of geobotanical division]. — Geobotanicheskoe raionirovanie SSSR. Moscow, Leningrad. Prilozhenie. 1 list (In Russ.).
- Karta rastitelnosti Severnogo Kazakhstana. M 1 : 1500000. 1960. (Vegetation map of the Northern Kazakhstan). — In: Prirodnoe raionirovanie Severnogo Kazakhstana. Moscow. Prilozhenie. 1 list (In Russ.).
- Lavrenko E.M. 1947. Evraziatskaya stepnaya oblast [The Eurasian steppe region]. — In: Geobotanicheskoe raionirovanie SSSR. Moscow, Leningrad. P. 95–110 (In Russ.).
- Lavrenko E.M. 1956. Stepi i selskochozyaistvennyye zemli na meste stepei [Steppes and agricultural lands on the place of steppes]. — In: Rastitelnyy pokrov SSSR: Poyasnitelnyy tekst k Geobotanicheskoy karte SSSR. M. 1 : 4000000. Moscow, Leningrad. 2: 595–730 (In Russ.).
- Lavrenko E.M. 1970. Provintsialnoe razdelenie Prichernomorsko-Kazakhstanskoi podoblasti stepnoi oblasti Evrazii [Provincial division of the Black Sea-Kazakhstan subregion of the Eurasian steppe region of Eurasia]. — Bot. Zhurn. 55 (12): 609–625 (In Russ.).
- Lavrenko E.M. 1980. Stepi [Steppes]. — In: Rastitelnost Evropeiskoy chasti SSSR. Leningrad. P. 203–273 (In Russ.).
- Lavrenko E.M., Karamysheva Z.V., Nikulina R.I. 1991. Stepi Evrazii [Steppes of Eurasia]. Leningrad. 142 p. (In Russ.).
- Levina F.Ya. 1964. Rastitelnost polupustyni Severnogo Prikaspiya i ego kormovoe znachenie. [Vegetation of the semi-desert of the Northern Caspian Sea and its fodder value]. Moscow, Leningrad. 336 p. (In Russ.).
- Leonova T.G. 1994. Rod Polyn — *Artemisia* L. [Genus Wormwood — *Artemisia* L.]. — In: Flora Evropeiskoy chasti SSSR. St-Petersburg. 7: 150–174 (In Russ.).
- Makarov V.Z., Volkov Yu.V., Bulany Yu.I., Prokazov M.Yu., Mukalo A.S. 2009. Unikalnye stepnye prirodnye komplekсы dalnego Sratovskogo Zavolzhyia [Unique steppe natural complexes of the far Saratov Trans-Volga region]. — Izv. Saratov. un-ta. Seriya Nauki o zemle. Saratov. 9 (1): 28–32 (In Russ.).
- Malysheva G.S., Malakhovsky P.D. 2004. Diversity of the steppes of the Saratov Trans-Volga region and their current state. — Bot. Zhurn. 89 (6): 273–286 (In Russ.).
- Musaev I.F. 1969. Karty arealov edifikatornich rastenii Turana [Maps of the areas of edificatory plants of Turan]. — In: Karty arealov rastenii flory SSSR. Leningrad. 2: 120–167 (In Russ.).
- Pichugina N.V. 2010. Drevesno-kustarnikovaya rastitelnost kak element landshaftov polupustynnogo Saratovskogo Priuzeniya [Tree-shrub vegetation as an element of landscapes of the semi-desert Saratov Priuzeniya]. — Izv. Saratov. un-ta. Novaya seriya. Seriya Nauki o Zemle. Saratov. 10 (1): 21–26 (In Russ.).
- Polevaya geobotanica [Field geobotany] 1964. Moscow, Leningrad. Vol. III. 532 p. (In Russ.).
- Rodin L.E. 1933. Tipy stepei Nizhnego Zavolzhiya [Types of steppes of the Lower Volga region]. — Bot. Zhurn. 18 (4): 299–306 (In Russ.).
- Ryabinina Z.N. 2003. Rastitelnyy pokrov stepei Yuzhnogo Urala (Orenburgskaya oblast) [Steppe vegetation cover of the Southern Urals (Orenburg region)]. Orenburg. 224 p. (In Russ.).
- Safronova I.N. 2002. Fitoecologicheskoe kartografirovanie Severnogo Prikaspiya [Phytoecological mapping of the Northern Caspian region]. — In: Geobotanicheskoe kartografirovanie 2001–2002. St.Petersburg. P. 44–65 (In Russ.).
- Safronova I.N. 2010. On the subzonal structure of the vegetation cover of the steppe zone in the European part of Russia. — Bot. Zhurn. 95 (8): 1126–1133 (In Russ.).
- Tarasov A.O. 1968. Rastitelnost, zony, geobotanicheskie raiony [Vegetation, zones, geobotanical regions]. — In: Voprosy biogeografii Srednego i Nizhnego Povolzhia Saratov. P. 7–56 (In Russ.).
- Tarasov A.O. 1975. Geobotanicheskoe raionirovanie Yuzhnogo (Saratovskogo) Zavolzhiya [Geobotanical division of the Southern (Saratov) Zavolzhye]. — In: Voprosy botaniki Yugo-Vostoka. Saratov. 1: 40–46 (In Russ.).
- Tarasov A.O. 1976. Chernopolynniki yuzhnogo Zavolzhiya [*Artemisia pauciflora* communities of the southern Volga region]. — In: Voprosy botaniki Yugo-Vostoka. Saratov. 2: 100–107 (In Russ.).
- Tarasov A.O. 1977. Osnovnye geograficheskie zakonomernosti rastitelnogo pokrova Saratovskoi oblasti [The main geographical features of the vegetation cover of the Saratov region]. Saratov. 21 p. (In Russ.).
- Zony i tipy poiyasnosti rastitelnosti Rossii i sopredelnykh territoriy. 1999a. M. 1 : 8000000 [Zones and types of altitudinal zonality of Russia and adjacent territories]. Map of scale 1 : 8 000 000.]. 2 sheets. (In Russ.).
- Zony i tipy poiyasnosti rastitelnosti Rossii i sopredelnykh territoriy. 1999b. [Zones and types of altitudinal zonality of Russia and adjacent territories: Explanatory text and legend to the map. M. 1 : 8 000 000]. Moscow. 64 p. (In Russ.).