

Historical aspect of the Kemerovo city flora studies

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Introduction

With the transition to the post-industrial era, the pace of human life has increased. The Human society transformed the natural environment according to its needs. Due to this, the speed of natural processes has increased rapidly, and the florogenesis ones are no exception. Thus, for alien species, a city – the human habitat, has become a migration corridor for the naturalization and expansion of its secondary area in the shortest possible time. When conducting floristic studies, the priority is to assess the rate of invasions, based on historical flora analysis.

The purpose of this study was to analyze the taxonomic structure of the flora of Kemerovo.

Materials and methods:

The Kemerovo City is located in Western Siberia (55°19'N, 86°4'E) on the territory of the Kuznetsk Basin, the area of the city is 294.8 km². The modern flora was studied by the method of model areas, 15 groups of habitats were noted for the city, 85 plots with an area of 6.25 hectares were laid. Flora historical data was obtained from the theses of K. S. Lazarev (1997), E. A. Fomina (2005) under the scientific supervision of G. I. Yakovleva and from the Kuzbass Botanical Garden (KUZ) herbarium materials.



Figure 1. Map-scheme of model areas of the flora of Kemerovo

Results:

Kemerovo flora had different levels of species richness at the stages of its study. The highest index of species diversity was recorded in 2005 (649), the lowest - in 1997 (480). The historical flora of Kemerovo is represented by 848 species from 398 genera and 99 families, modern flora - 541 species from 306 genera and 90 families.

Table 1. Characteristics of the taxonomic structure of the flora of Kemerovo

Year of flora study	1997	2005	2010	2021
Species	480	649	576	541
Genera	284	349	303	306
Families	71	89	91	90

Research in 2021 revealed 90 new and previously undetected species. For the historical flora, previous researchers did not note *Artctium lappa* L., *Rumex longifolius* DC., *Matricaria recutita* L., *Pastinaca sativa* L., *Medicago* × *varia* Martyn, *Cerasus vulgaris* Mill. 2 new alien species are noted for the region: *Trifolium pannonicum* Jacq. - on the ruderal meadows, *Chaenorhinum minus* (L.) Lange - along the railway [Fig. 2, 3].



Figure 2. *Trifolium pannonicum* Jacq. Figure 3. *Chaenorhinum minus* (L.) Lange

12 families of Kemerovo flora families were in top-10 in various combinations. The first 5 positions are traditionally occupied by Asteraceae, Poaceae, Rosaceae, Fabaceae and Brassicaceae. Lamiaceae, Caryophyllaceae, Apiaceae were changing their ranks from 6 to 9. Boraginaceae family was included into the list on the first stage of flora studies, while Cyperaceae is included on the second and third stages. For the modern flora, it is important to note the appearance of Polygonaceae with rank 9 among the leading families.[Tab. 2].

Table 2. The leading families of flora of Kemerovo

Family	Ranks of families / number of species			
	1997	2005	2010	2021
Asteraceae	1/59	1/82	1/76	1/75
Poaceae	2/49	2/65	*/5	2/45
Rosaceae	3/36	3–4/41	2/47	3/44
Fabaceae	4/31	5/35	4/34	4/29
Brassicaceae	5/29	3–4/41	3/37	6–7/22
Ranunculaceae	6/23	6/27	8/23	5/23
Lamiaceae	7/22	7/25	7/24	6–7/22
Caryophyllaceae	8/18	8/23	5–6/25	10/16
Apiaceae	9–10/15	9/22	5–6/25	8/19
Boraginaceae	9–10/15	*/16	*/14	*/9
Polygonaceae	*/14	*/18	10/17	9/17
Cyperaceae	*/10	10/21	9/19	*/8

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