Classification of meadow vegetation in the USSR*

Brief survey of history, current status and perspectives

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Abstract

The scientific classification of meadow vegetation (mesophilous grasslands) was already available in the 1930's due to A. P. Shennikov who suggested to apply new classification principles, on the basis of species dominance. This classification became subjected to criticism, as the criteria proposed did not correspond to the nature of the classification object and as meadow community dominants were instable. In 1971 the Soviet phytocenology was influenced by the ideas of the Braun-Blanquet classification, but before completely adopting it, the Soviet geobotanists employed the so-called dominant-determinant principles of classification, when differential species and dominants were simultaneously used for association determination. In the seventies phytocenoses on the floristic basis, were used though their syntaxonomic analysis was not performed. In 1981, the All-Union conference on vegetation classification was held in Ufa. This conference gave careful consideration to the problem of the floristic classification in the USSR, stated that impressive progress had been achieved in meadow classification on the floristic basis and recommended to use more strict principles for phytocenosis determination alongside with syntaxonomic analysis and subordination of the existing higher syntaxons of the Braun-Blanquet system. The perspectives for implementation of the Braun-Blanquet principles in the USSR are elucidated and a tentative question is raised on the necessity to develop some new classes in order to reflect the specific character of the meadows in the USSR.

Introduction

This paper aims at elucidating the current status of meadow classification in the USSR, providing a brief review of its history in retrospect and considering the general trend in the development of meadow vegetation classification. At the same time the history of meadow classification development in the USSR reflects the history of classification in general (Whittaker, 1962, 1973; Alexandrova, 1965; Trass, 1976).

In the history of meadow classification, we can distinguish at least four stages:

a) Stage of phytotopological classification – up to 1935, when A. P. Shennikov (1935) published his ‘Principles of meadow botanical classification’.

b) Stage of classification according to dominants (classification after A. P. Shennikov), which lasted from 1935 to 1971, the year, when the III-rd All-Union conference on vegetation classification took place in Leningrad.

c) Transitional ‘dominant–determinant’ stage of classification (1971–1981) when the ideas of the dominant classification were gradually replaced by the Braun-Blanquet approach, which was applied more resolutely and consistently each year. The end of this stage was marked by the VI-th All Union conference on vegetation science at Ufa (1981), when the isolated efforts of scientists were coordi-
nated in order to master the method of Braun-
Blanquet.

d) The stage of the consistent floristic classification which has only started, but is considered the main perspective for the development of meadow classification in the USSR.

'Phytotopologicai' stage of classification

This stage of classification was thoroughly covered by A. P. Shennikov in his textbook 'Grassland science' (1941). He particularly noted, that habitat conditions have been applied as classification criteria since the end of the last century (Margraph, 1982; Kolesov, 1899; Dmitriev, 1904; Williams, 1919; Sukachev, 1928; Tsinserling, 1932; Elenevsky, 1936; cit. from Shennikov 1941). A. P. Shennikov himself, at least in his first publications (e.g. 1919) also was an advocate of the phytotopological approach. He summarized all variation in the meadow communities in the floodplain of the Volga (in the area of Simbirsk, later on Ulianovsk) in nine cells of a two-dimensional system, the axes of which reflected a moisture gradient, and a gradient in the intensity of silt sedimentation.

Main advantages of the phytotopological classifications were their clarity and the limited number of differentiated types which were rather comprehensive and clearly distinguished as to their aetiology.

However, in different districts, ecologically similar sites were occupied by different species combinations and for this reason 'phytotopological' classifications were replaced by the so-called phytocenological ones, the main requirement of which was 'to classify vegetation according to the signs of the vegetation itself'. (Shennikov, 1935).

The stage of classification after dominants

A. P. Shennikov (1935, 1938, 1962) being one of the most authoritative phytocoenologists of the period 1930–1960, put forward some meadow classification principles, which for a long time remained a reliable basis for the systematization of information available on meadow communities.

Shennikov was the most outstanding spokesman of the trend in classification, which R. Whittaker (1962) defined as 'Northern'.

While analyzing the A. P. Shennikov classification against a methodological background and from a historical distance (Mirkin, 1981), we emphasized, that his classification was a consequence of a mechanistic shift of notions, originally meant for forest communities, to meadow types, where, however, the dominants were instable under the influence of weather conditions and seasonal development. Besides, these dominants were much more numerous than in the forest communities.

The system of Shennikov can be compared with syntaxonomic ranks as follows: an association was based on two, sometimes three, abundant species. A group of associations encompassed several associations, with one common dominant, while other dominants represented particular biological groups (for instance, tall grasses, short grasses, forbs, and legumes).

A formation represents an integration of communities with one common main dominant. Here one should bear in mind that the notion of 'formation' in Western European and Russian phytocenology is different: the scope of the Russian formation is considerably smaller than that of the European. The 'formation' in a European sense essentially corresponds to a 'vegetation type' in the classification of Soviet scientists.

'Group of formation' is an integration of formations, the dominants of which represent one life form (biological type), e.g. rhizome loose-bunch grasses, tussock or rootstock sedges etc.

'Class of formation' is an aggregation of formations with one life form and a similar ecology. This Shennikov unit reflected in a way the phytotopological sources of the Russian meadow classification, which means that the classes differed from scientist to scientist. Like classes in the Braun-Blanquet system, they were in reality deductive by their nature and characteristic for the site type.

Shennikov distinguished five classes of meadow formations, namely, true meadows, i.e. the most typical mesophilous communities, steppe meadows (transition to steppes), heath meadows (transition to heath), swamp meadows (transition to swamp vegetation), peat meadows (transition to mire). These units were distinctly reflected in the floristic composition of the communities, though, naturally, in the European part of the USSR, in Yakutia or in the Soviet Far East the diagnostic combinations of the species in the same formation classes varied and communities of each class of formations rep-