

Structure of Forest-steppe Vegetation of Small Khamar-Daban Foothills (Western Transbaikalia)

S. A. Kholboeva, B. B. Namzalov and M. G. Tsyrenova

Buryat State University, Smolina str. 24, Ulan-Ude, Russia

Abstract

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Correspondence:

tsyrenova2000@mail.ru

The characteristic aspects of the structure of vegetation of the forest-steppe of Khamar-Daban are studied. The authors made the detailed large-scale geobotanical map of vegetation (1:25000, 1:100000) on the basis of satellite imagery of different scales. The structure of forest-steppe differs in complexity in conditions of hilly and ridges eminences of a strip of the foothills, up to 1200 m high. These are mainly combinations of larch forest (*Larix sibirica*) shrub-grass with bunchgrass petrophyte communities and meadow steppe grass with part shrub communities. The combinations of ridges eminences are completely composed of mezocombinations in the form of combinations, but in concrete combinations micricombinations (complexes) different in their structure may join along with coenosis – tsenomer.

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Introduction

The aim of the present research was to identify patterns of spatial structure of vegetation of forest-steppe of array in mid-mountain Barun Burin-Khan of Khamar-Daban, in the areas Inzagatuy, in valley of the river Djida. The following tasks were set to achieve the objective: the description of vegetation of model key site with environmental characteristic, mapping for identifying heterogenic and homogenic elements, preparation of large-scale geobotanical map with the detailed legend.

Material and Methods

The descriptions of vegetation were made in summer in 2009 (more 80). For investigation of the spatial structure of vegetation, we used the combination of geobotanical descriptions and remote sensing data. We used Landsat TM data and multispectral high resolution images Terra

ASTER, working on decoding Satellite image of the given territory by classical approach. As a result detailed cartographical model of vegetation of the key site (1:25000, 1:100000) was made. The area of the key site is 3.25 km², height amplitude is 900-1200 m. above sea level.

The spatial heterogeneity of vegetation was clearly recognized by the contour work on decoding Satellite image. The numbers of geobotanical descriptions were put on Space image. As a result large-scale map of vegetation was made and its legend was created. We recognized both homogeneous and heterogeneous elements during the process of mapping. The last ones are regarded as territorial units or combination of vegetation (Sochava, 1979).

From apportionment homogeneous elements, the authors used dominant-determinant classification of vegetation (Vasilevich, 1984). Also during the analysis the ecological statuses

from humidity of combination and community calculated in IBIS program were taken into account (Korolyuk, 2007; Zverev, 2007).

Results

On the key site, the forest, steppe and meadow communities are present, and the insignificant space was occupied by agrocoenosis and fallow land. The steppes are located on the southern and southwest slopes, develop associations of meadow and mountain option of real steppe. Shadow exposition and tops of slopes are covered with larch forest (*Larix sibirica*) shrub-grass and seldom with birch communities of different structure (*Betula platyphyla*), with aspen (*Populus tremula*), inducing different stages of post fire series. The meadow communities are formed in bottom-land of the stream.

The structure of forest-steppe differs in complexity in conditions of hilly and ridges eminences of a strip of the foothills, up to 1200 m high. These are mainly combinations of larch forest (*Larix sibirica*) shrub-grass with bunchgrass petrophyte communities and meadow steppe grass with part shrub communities. The combinations of ridges eminences are completely composed of mezocombinations in the form of combinations, but in concrete combinations micricombinations (complexes) different in their structure may join along with coenosis – tsenomer. These phyto-combinations significantly complicate mountain forest-steppe structure.

The example of mezocombinations on southern macroslope of the foothills is the combination of forest narrow gully and steppe hill. In the narrow gully, there is larch forest with herbs (*Larix sibirica*, *Cotoneaster melanocarpus*), with meadow steppe sinuses of herb (*Stipa krylovii*, *Artemisia latifolia*, *Hemerocalis minor*, *Anemone sylvestris*), with high density coverage of vegetation up to 40 cm high.

Fragmentary shrub groups with plenty of *Rosa acicularis*, *Cotoneaster melanocarpus* are identified in the communities. On the slopes the dry steppes dominated by xerophytic sod cereals (*Stipa baikalensis*, *Agropyron cristatum*)

are formed, on fine earth fraction and on rocky gravelly tops grass-sedge-fescue steppes (*Festuca lenensis*, *Carex pediformis*, *Potentilla tanacetifolia*, *Artemisia commutata*) are formed, whereas on the top small gravel with *Filifolium sibirica* is identified.

The forest-steppe microcombinations of complex type are presented on the southern macroslope of spur of the sub-width orientation: communities *Festuca lenensis*-*Hamaerhodos altaica*-*Androsace incana* the gravelly-grass soil on slightly convex the slopes, communities *Stipa krylovii* - *Potentilla tanacetifolia*, in poorly expressed hollows of a drain of depth 10-15 cm.

As a whole, the specific character of forest-steppe zone of foothills of Khamar-Daban (Southwest Zabaikalie) is the strict dependence of steppe and forest phytocoenosis from a slope exposition, where ecotone is not shown (Namzalov *et al.*, 2012). The forests are presented by homogeneous elements mainly. It is organized in successional post fire series.

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