

MORPHOCLIMATIC FACTOR OF DIFFERENTIATION OF THE ECOLOGICAL - GEOMORPHOLOGICAL SYSTEMS OF PLATFORM PLAINS (FOR EXAMPLE OF THE TERRITORY OF CENTRAL KAZAKHSTAN)

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Main part

In this paper is considered morphoclimatic factor (the spatial orientation of the major forms of relief, their morphology, exposure of slopes, as well as the related distinction meteorological indicators) as one of the main exodynamical factors of formation and differentiation of the ecological and geomorphological systems of the territory of Central Kazakhstan /2/.

The territory of Central Kazakhstan as a whole is a peneplain provenance guide epipaleozoic platform with differentiation on accumulative basins, denudation upland and lowland-island uplift. Bounded on three sides by morphologically pronounced deflections (in the north - the West Siberian basin and the valley of the Irtysh river, in the west - Turgay basin, and south - piedmont basins) Central Kazakhstan stretches from west to east over 1200m, and from north to south - to 600-700m. Total crest elevation, layering, the prevalence in the relief altitudes over 500m and sopochny dismemberment are a characteristic feature morphography of Kazakh shield. In the Central Kazakhstan hypsometric plan is clearly divided into two parts - the western and eastern, towering in the background of relatively flat surfaces, complicated by individual basins. The western part - the roots of the Caledonian structures, elongated in the meridional direction as far as 980km - is characterized by greater uniformity of the relief with average altitudes of 300 to 600m /3,4,5/. Against the backdrop of upland denudation plains stand mountain-sopochny rock massifs (with altitudes over 1000m - meridian-oriented Ulytau - Arganatinsky on the west and sublatitudinally Kokshetau to the north). Between these uplifts is plain Teniz depression, which has the form of horseshoe, elongated in the latitudinal direction and open lines of prevailing (western and north-west) airflows. This situation to some extent determines the physical properties of air and a relatively smaller gradients and temporal variability of the individual meteorological indicators (temperature, pressure, humidity), than the more protected from the influence of the main transport of air masses of the eastern slopes Ulytau Arganatinsky uplift and plain Zhezkazgan-Sarysu depression.

To the east of Ulytau-Arganatinsky mountain - sopochny uplift extends sublatitudinally oriented Sarisu-Teniz watershed, expressed elevated sopochny - ridge plain with altitudes of 600-800m, turning into a vast Central Kazakhstan is low-mountain zone. The core of the zone forms a system of low mountains on a raised basement denudation plains and melkosopochnic. The system of low mountains - Kyzyltau, Niaz, Karkaraly, Kent, Muzhyk, Kyzylray, Abraly and others - with an absolute altitude within 1000-1560m differ in morphology and the northern, north-west (according to the strike of the main plicative and disjunctive structures from the basement) orientation sopochny and ridges and disposed of their valleys. Low-mountain zone sublatitudinal along with Sarisu-Teniz uplift represents the main watershed between the Arctic Ocean basin and the Aral - Balkhash inland undrained basin. To the north and south of the low-mountain zone tiered observed decrease in altitude from 1000m to 340m in the south (denudational-coastal plains to the north from the Balkhash lake) and up to 250m in the north (denudation plains about valley's watershed of the Irtysh river), while the northern slopes low mountains steeper than the southern lowlands richer, springs and vegetation. Ulytau mountain-sopochny uplift and the Central low -mountain belt play a barrier role in the way of prevailing air currents - the north-western, western, south-western and north-east, - differing heat and moisture content. Air masses north and west rhumbs, especially near-surface layers, passing through this barrier, is transformed (become drier), amplified their barogradyent. The latter is particularly evident in the relative concentration of the summer oroizobar along the southern slopes of the Central low-mountain, and eastern and southeastern slopes Ulytau uplifts, due to increasing air-in-mass processes and the establishment of a local anticyclonic mode. In the winter time over the territory is installed unstable regime of high atmospheric pressure, interrupted by frequent breakthroughs с north and north-

east of submeridianally oriented intermontane depressions - river valleys, cold air more powerful Asian anticyclone. According to regional reports Zhezkazgan and Karaganda hydrometeorological service (1996-2001.) average summer temperature in northern Karaganda region ranged between $+19,9^{\circ}$ $+21,4^{\circ}$ C., while in the south (values of the MS Kairakty and Balkhash) and in the eastern part of the Zhezkazgan region (values of the MS Zhezkazgan and Terekty) - within the limits $+25,8^{\circ}$ $+26,7^{\circ}$ C, average winter temperatures in the north have changed in the range $-16,8^{\circ}$ $-18,2^{\circ}$ C, in the south and east within $-12,3^{\circ}$ $-13,1^{\circ}$ C. In the same ways also changes the annual quantity of precipitation - from 250-300mm in the north and west to the 120-150mm in the south. The thin snow cover is blown off by strong winter winds in depressions. Morphoclimatic barrier, defining the provincial differences in climate the area in question, quite clearly fixed the northern boundary of semi-desert zone (according to the physical-geographical zoning of Kazakhstan held Veselova L.K. and Geldyeva G.V.), internal differences in the same morfoography the area in question - the differentiation zone (dry steppes and semideserts) types of landscapes /5/.

The intensity and morphological fragmentation of demonstration exodinamical processes in subarid and arid climate of Central Kazakhstan is largely degree is conditioned by the orientation of the slopes (from macro – to mikroslopes) with respect to sunlight. The slopes of northern exposure, unlike the south, are more zadernovanny and softer shape. Exposure of slopes determines the time of complete melting of snow. Snow "cakes" on the shaded northern slopes are observed in some places before the end of May, while on the southern slopes, they completely disappear in late March - early April. Relatively rapid melting of snow in the form of a continuous stream or small jets of weak turf surface of the elevated slopes of southern exposure (within 10-20 days) leads to the formation of small stretcher bond network (the depth of shallow furrows and drain trays varies from several cm to a few tens of cm) and formation at the foot of the slopes deluvial plumes capacity 1-1,5 m. The deepening of the shallow drainage network (furrows, gullies, ruts, trays) amplified by intense torrential rainfall. On the southern slopes and the steep inland (35° and more) slopes, protected from moisture bearing air masses, are actived processes of physical weathering and, consequently, collapse-talus processes. At the foot of the slopes accumulated detrital talus (scree-cones, scree-loops) with a jumble of large blocks of capacity of 1-5m and more. Gradients of the surface varies from 15° до 30° . However, it should be noted, that the avalanche-talus slopes are often associated with areas of regenerating and new faults and fracture systems that control the erosion network lowmountain – sopochny arrays of Central Kazakhstan.

The increase in aridity of the climate and moisture deficits, respectively, within about an alignment of internal parts of the territory due to Ulytau and Central - Kazakh lowmountain – sopochny elevations (these raise and determine the position within the present territory of the "axis of continentality" of Kazakhstan, dedicated Vilesov E.N., Uvarov V.N., etc.) contribute to the development of wind processes, the formation of suffusion, sor- deflationary and takyr depressions, the development of aeolian formations (within the lower reaches of the Sarisu river).

Morphoclimatic factor is determined and the density of drainage area. It decreases in general from north to south and varies greatly depending on the hypsometric level territory. Favourable conditions for the formation of relatively dense hydrographic network are created on the slopes of the Central Kazakhstan lowmountain zone and Ulytau uplift. Lowmountain – sopochny relief and unloading of fractured groundwater at the foot of these arrays facilitate the emergence of small river streams and lakes in the depressions in the earth's surface.

Conclusions

Thus, morphoclimatic factor, controlling the natural - climatic conditions of the territory of Central Kazakhstan, causes complex exodinamical processes - temperature and salt weathering, sheet, deflation, erosion, sorformation, karst, etc. - the nature and intensity of their manifestation. The growing influence of morphoclimatic factor, especially in the inner parts of the territory, promotes also technogenic factor. Natural zadernovannost or cover (availability soil - floral cover) surface limits deflation, however, increasing industrial load per unit area leads to a dramatic increase in water and

wind erosion and increase land, affected by plane washout, takyr- and sorformation, deflation, and other processes.

References:

1. Timofeev D.A., Trofimov A. M. About the nature and location systems approach in geomorphology /Geomorphology. 1982, № 1. -P.: 37-40.
2. Bekseitova R. T., Aliaskarov G.S. Morfoorografical factor of ekomorfolitogenesis territory of Central Kazakhstan. // Herald Kazakh National University, ser. geographical. - 2005, № 1. -P.: 13-17
3. Boskresensky S.S. Geomorphology of the USSR. -M.: MGU, 1972. -147p.
4. Gerasimov I.P. Plains and mountains of Central Asia and Kazakhstan. – M.: Nauka, 1975. -262p.
5. Svarichevskaya Z.A. Geomorphology of Kazakhstan and Central Asia. -Leningrad: LGU, 1965. - 295p.
6. Geldyeva G.V. Physical map -P.:78-79. Map of physiographic regionalization –P.: 80-81. //Atlas of the Kazakh SSR. V.1. Natural conditions and resources. -M.: GUGK, 1982.