LITHO-FACIES FEATURES OF THE UPPER TRIASSIC-JUNCTION ZONE OF THE CASPIAN BASIN, NORTH USTYURT AND BOZASHI

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Abstract - Basing on the study of lithologic and tectonic features of the structure of the south-eastern side of the Pre-Caspian basin and the surrounding areas are invited tectonic-sedimentary model of the study region, accurate staging in which development allows to prove prospects of oil-and-gas content of upper Permian-Triasic.

Keywords - Caspian Basin, Tengiz, geodynamic, clay-carbonate deposits, paleogeography

1. Introduction

By the end of the Paleozoic East European and Kazakhstan, lithospheric plates soldered together and formed a new Eurasian lithospheric plate. Formed because of orogenic areas served as the source for the demolition of the bend and sag sections of the East European plate in the Late Permian and Early Triassic.

Beginning of the Late Permian is a time of intense stretching. North Ustyurtsky sag basin filled with sediments of the Upper Permian - Triassic crumbling mountain structures of the Urals. On the South Emba most elevated part in the roof were denuded.

Since the beginning of this period is associated with the formation of salt domes and the largest subsidence study area. Upper Permian - Triassic deposits account for 2/3 of the post-salt complex. Precipitation is mainly formed in the continental conditions; there were only occasionally marine environment of sedimentation [1].

The areas served by the demolition of the east Urals and Western Primugodzhare, south- east - South Emba uplift in the south- west - the shaft Karpinski.

The processes of stretching at the beginning of the Late Permian and Bozashi also affected. During this period, lay the South Bozashi graben on Karajanbas Tokubay - fault, which for the Late Permian and Triassic filled by huge power (up to 5 - 6km) clastic sediments. Probably associated areas are also subject to subsidence, as evidenced by the accumulation of thick strata of the Upper Permian - Triassic deposits Bozashi picked up. Clastic material from the demolition of the Ural Mountains, the South Emba Upland and local provenance in North Karazhanbas uplift.

In the North Ustyurt Upper Permian, sediments stand out in Shomyshti suite, which is characterized by increased density of the rocks and the presence of fragments of volcanic rocks of andesite and basalt series, quartzite, silica and clay- siliceous rocks. Lower Triassic sediments are also characterized by the presence of volcanic material, probably showed the influence of volcanic activity in the South Bozashi deflection and Mangishlak [2].

In the Pre-Caspian basin of the Upper - Lower Triassic red-colored sand and clay deposits are characterized by a continental genesis with periodic ingress shallow sea (the accumulation of gray-colored fine-grained sandstones). In the south- east of the Caspian Sea in the period sources demolition served as a towering mountain ranges and ridges of the Urals Mugodzhar , South Emba uplift . This is confirmed by an increase in sand content of these deposits in the eastern and south- eastern direction.

2. Research

The formation of red-colored continental clastic sediments of the Upper Permian formations and the Lower Triassic of the study region was held in hot and dry (arid) climate change (Figure 1).

After a short break in sedimentation and tectonic activity in the revitalization of the ocean began Mezotetis accumulation of marine, coastal and marine and continental sediments Olenekian stage of the Lower Triassic.

In shallow periodically, drained conditions accumulated clastic sediments with rare interbedded carbonate and picked up on Bozashi North Ustiurt. It is dominated by dark brown, dark gray, sometimes tinged with purple mudstone (bozashi suite) with rare siltstone and fine-grained sandstones. The rocks are the remains of ostracods, fish scales, harofity. From west to east toward the North Ustyurt and south -east of the Caspian Sea turns into a shallow low-lying coastal plain, temporarily flooded by the sea. In the North Ustyurt coastal plain wedge comes within Samskogo deflection and capture the south- western part of Mynsualmass stage. Have accumulated and red- gray-colored clay with rare interbedded siltstones, sandstones and limestones. In the north side of the Caspian Sea, it captures the seaside part of the south -east of the Caspian Basin (Tengiz, Prorva).

From west to east coastal plain gives way to a low-lying plain with accumulative typical continental alluvial- lacustrine depositional environments (Ayyrshagyl , Shagirli) .

In most of the studied sections of the Middle Oleneksky deposits and deposits are similar in species composition and the terms of their education,

so we combined them into a single stage of geological development (Figure 2).

In the Middle Triassic sea gradually recedes and sedimentation takes place in a predominantly shallow marine basin, which increased its size to the east.

Deposits of the Middle Bozashi picked up on the Pre-Jurassic were destroyed by erosion and preserved in the most loaded areas (areas Torlun West, North Bozashi, Kalamkas). In the south- east of the Caspian these deposits are absent in the Maritime region and the south- eastern edge of the South Emba uplift, which in the Late Permian - Triassic time was a source of demolition.

Deposits of the Middle as Oleneksky mainly represented variegated thickness interbedded with volcanic and carbonate rocks. The upper part of the Middle Triassic (area Kalamkas) appear gray-colored carbonate- clay deposits, the accumulation of which was held in a very shallow marine basin drained periodically.

There has been an increase in sand content of rocks from west to east. For example, in the Caspian basin in the coastal area there was an accumulation of coarse-grained sands, and in the open part of the basin, along the sandy material deposited silt and clay sediments (V.V.Lipatova, 1982).

For a typical Middle Triassic volcanic activity related to the Triassic magmatism in the South Mangishlak that enriched sediments of pyroclastic material.

General analysis palynoflora (ferns, conifers) indicates its formation in hot and dry (arid) climate with intermittent wetting (the presence of gray-colored layers with ferns and cycadophytes).

At the end of the Middle era marks the beginning humidization climate. Along with oxidizing conditions existed at Bozashi picked up in the seaside area of south- east Caspian basin.

Thus, the territory Bozashi uplift, North Ustyurt and south- eastern side of the Caspian Sea in the early period of the Middle - belonged to a single sedimentary basin, where the accumulation of predominantly clastic rocks speckled in coastal marine and lagoon- continental conditions [2].

After a short break, and weak tectonic movements, have led to a slight angular unconformity and erosion, sedimentation in the Late Triassic began setting the extensive low-lying coastal plain, which at times in the west ingressirovalo sea, and the accumulative alluvial plains of the lake [3].

During this period, the territory of Bozashi uplift as a result of the intensive raising of the area turned into a washout of accumulated precipitation. Upper Triassic sediments are preserved only in the most loaded zones (South Bozashi deflection). They are composed mainly of gray-colored clastic rocks: mudstone, siltstone, sandstone, enriched with finely divided carbonaceous material and a thin organic plant detritus are marked seams of fine-grained limestone, indicating a short-term ingress of sea basin.

In the North Ustyurt Upper Triassic has a wider areal extent and is provided for differences clastic rocks interbedded with tuffaceous having rhythmic structure. Species coalified saturated vegetable organic and do not contain faunal remains. The accumulation of these rocks came in river valleys and lake basins through rewashing and re-deposition of older triassic species of local provenance. The increase in the number of dimensions and debris observed closer to the South Emba uplift (Figure 3).

The area south-east of the Caspian Basin and the North Ustyurt region was moderate subsidence. Formation of Upper Triassic sedimentary rocks took place in the coastal plain. The main sources were the demolition of the Ural- MUGOJAR mountain ridge and Karpinski.

In general, the Upper Triassic sediments are characterized by the high content of organic matter, the predominance of the ferrous iron oxide, which is typical for reducing or geochemical environment of sedimentation. Palynological analysis of the data shows that the flora of the Late Triassic, with a predominance of hydrophilic forms of ferns evolved in hot and humid (humid) climate. This is also evidenced by the abundance of organic matter, the gray color of rocks, low degree of polymictic.

At the turn of the Late Triassic - Early Jurassic environment stretching to contraction caused by the collision of the Iranian plate with the Eurasian continent and the closure of the ocean Mezotetis [3]. This has led to intense folding Permian and Triassic sediments on Bozashi, a partial inversion of the South Bozashi graben. In the North Ustyurt it contributed to the widespread development of structures associated with the compressive strain (Zhayylgan, Aschitaypak, etc.). Anticlines are asymmetrical shape and broken in crestal part of a series of oblique thrusting, flatten with depth. It should be noted that folds basically cover the entire section of the Permo- Triassic until its erosion surface, indicating that the Late Triassic - Early Jurassic age thrust faults oriented in a northerly direction towards the Caspian basin. This confirms the fact that the main compression occurred from south to north.

Comparative analysis of the Upper Permian and Triassic deposits of the south -east of the Caspian Basin, North Ustyurt and Bozashi shows that they have much in common and come in a single sedimentary basin, the formation of precipitation that occurred in the same climatic zone.

3. Conclusions

Thus, from the foregoing that in the geological history of the junction zone of the Caspian Sea, the North Ustyurt Bozashi are the following features:

1. The development of the study area was influenced by Ural paleoocean , ocean Paleotethys , divergence , convergence and collision of different geoblocks in the east and south of the Caspian basin, thrusting of tectonic plates on the edge of the East European platform , which were formed by the action of certain types of Paleozoic and Upper Permian - Triassic formations.

2. By the end of the Paleozoic East European and Kazakhstan lithospheric plates were welded together and formed a new Eurasian lithospheric plate. Demolition of clastic material, mainly from the Ural Mountains, the South Emba uplift and Karpinsky Ridge.
3. The intense compression from the south to the Late Triassic - Early Jurassic time exposed active - wrinkling of the Upper Triassic complex Bozashi and North Ustiurt.

Thus, the junction zone southeast of the Caspian Basin, North Ustyurt and Bozashi lift has a very complex history of geological development. The formation of the modern structural plan study area was influenced by the convergence , collision and the collision of the East European and Kazakhstan lithospheric plates , closing the Ural paleo -ocean Paleotethys , which were formed by the action of palaeorift South Emba - in the Devonian and Bozashi - in the Carboniferous , and the compressive strain in the Pre-Jurassic time .

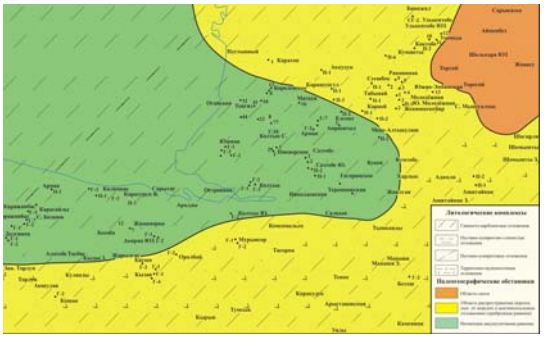

Fig. 1. Lithological - paleogeographic maps of Late Permian - Early Triassic (Indies century) time (270-245 Mln.a) scale 1:500000
Amounted to S.G. Nursultanova based on IGN, VNIGRI

lithological complexes
1 - Clay- carbonate deposits
2 - Sand and silt- clay deposits
3 - Sand and silt deposits
4 - terrigenous -volcanic deposits
PALEOGEOGRAPHY
5 - provenance
6 - The scope of the transition from marine to continental sediments (coastal Plain.)
7 - The lowland accumulative plain

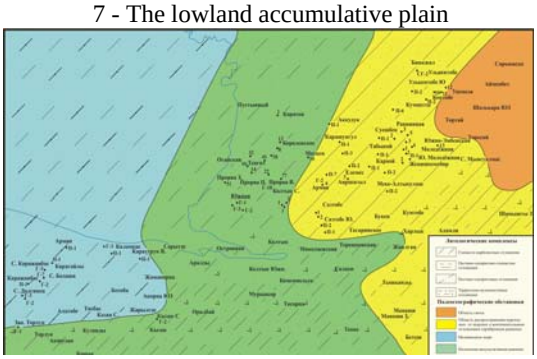

Fig. 2. Lithological - paleogeographic maps of early Triassic (Oleneksky century) of the Middle of time (245-230 Mln a) scale 1:500000
Amounted to S.G. Nursultanova based on IGN, VNIGRI

lithological complexes
1 - clastic- clay- carbonate sediments
2 - Sand and silt- clay deposits
3 - Sand and silt deposits
4 - terrigenous -volcanic deposits
PALEOGEOGRAPHY
5 - provenance
6 - The scope of the transition from marine to continental sediments (coastal Plain.)
7 - Shallow Sea
8 - The lowland accumulative plain

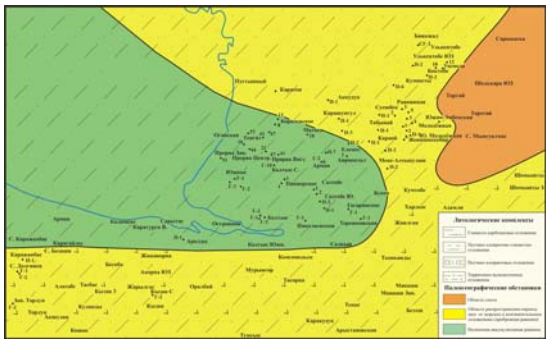

Fig. 3. Lithological -paleogeographic maps of Late Triassic time (230-203 Mln.a) scale 1:500000
Amounted to S.G. Nursultanova based on IGN and VNIGRI

lithological complexes
1 - Clay-carbonate deposits
2 - Sand and silt-clay deposits
3 - Sand and silt deposits
4 - terrigenous-volcanic deposits
PALEOGEOGRAPHY
5 - provenance
6 - The scope of the transition from marine to continental sediments (coastal Plain.)
7 - The lowland accumulative plain

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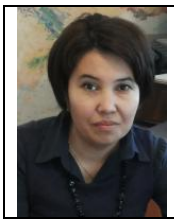

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