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The West Black Sea passive continental margin in the east part of Balkan Peninsula

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Abstract*: The Black Sea Neozoic passive continental margin marks the natural „bridge" between the Moesian and Bulgarian continental microplates and the Black Sea oceanic microplatte. It was coming in to being after the saturation between the terrains which are composed the Neo Europe south east part during the Early Paleogene. The subaerial part of the margin includes the most east parts of the South Moesian, Hemus, and Upper Thracian and Sakar-Strandzha morphostructural zones. The subaquatic part of the margin is composed by the consequently orderly step lower to the Black Sea bottom: high shelf zone, lover shelf zone, continental slope and continental foot. The Black Sea Neozoic passive continental margin is characterized by low seismic activity. It is concentrated in some fault zones.*

Keywords*: passive continental margin, morphostructure, morphotectonic evolution, seismic activity*

Introduction

The Balkan Peninsula is bordered on the east with Black Sea basin. The last one is a relict from the north east marginal parts of the phanerozoic Tethis Ocean. The article considers the contemporary concept of the authors about the pattern of the West Black Sea passive continental margin [1], [2].

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The subaeral part of the West Black Sea passive continental margin includes different wide band from the terrestrial areas of the South Moesian, Hemus, and Upper Thracian and Sacar-Strandzha morphostructural zones (Fig. 1). The subaqual part of the margin is composed by the high and low shelf steep, the continental slope and the continental foot (Fig. 1). The west border of the subaeral part of the margin, between Danube and Kamchiya rivers (Fig. 1) is marked by Venelin-Prut fault zone on the meridian of the Suha Reka River (Fig. 1) [3]. The border south prolongation is following the fault predestinated Luda Kamchiya, Mochuritsa and Tundzha river valleys (Fig. 1) to the parallel of the town of Edirne (Odrin – Fig. 1). The south east border of the subaeral margin coincides with the south west boundary of the Sakar-Strandzha morphostructural zone between the town of Edirne and Black Sea coast (Fig. 1).

The subaeral part of the West Black Sea passive continental margin include the North Dobrudzha and South Dobrudzha (Dobrich) block, the Frangen Hemisineclize and the Momino Anteclize of the South Moesian Morphostructural zone, the Primorska Morphostructural area of the Hemus Morphostructural zone, the Burgas Low land morphostructure of the North Thracian morphostructural zone and the Strandzha Morphostructural area of te Sacr-Strandzha Morphostructural zone (Fig. 1).

The subaqual part of the West Black Sea passive continental margin is composed by consecutively orderly from west to the east, tertase-like to the Black Sea bottom: high and low shelf steep, continental sloupe and continental foot (Fig. 1).

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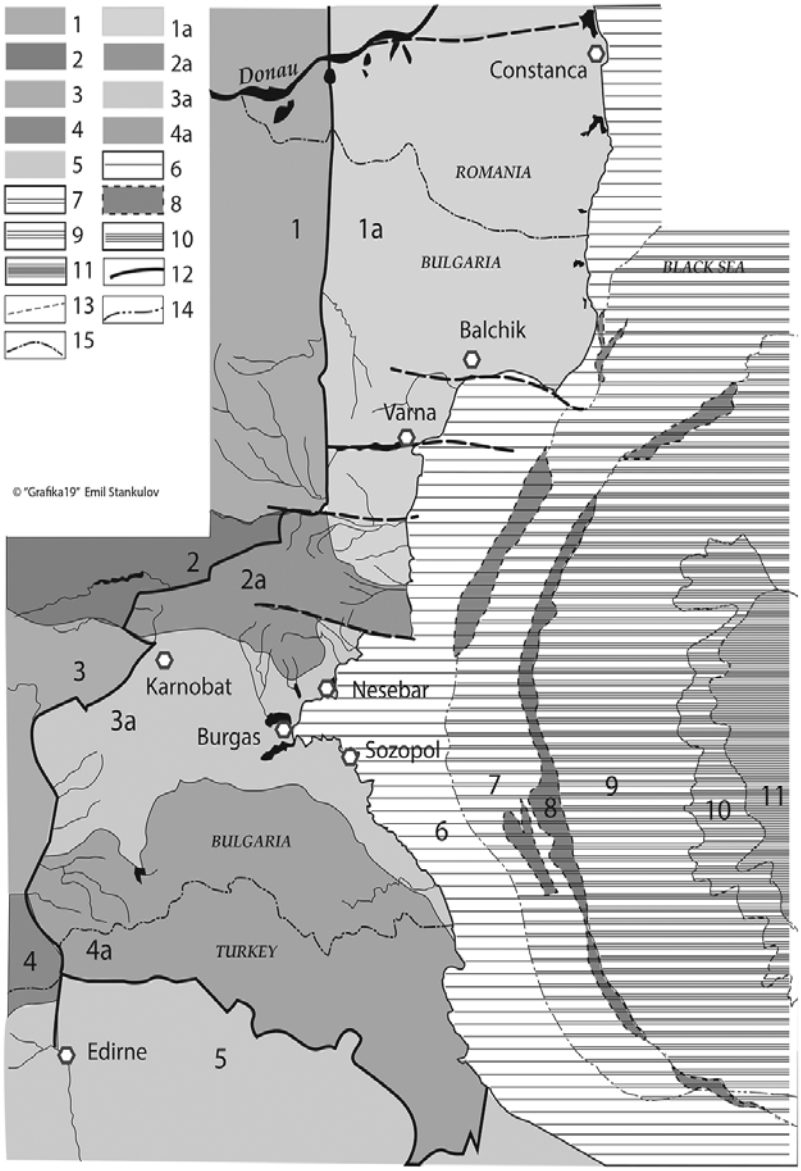

Fig. 1 Survey morphostructural sketch of the West Black Sea Passive Continental margin

1-5 – subaeral margin area: 1-1a – South Moesian morphostructural zone: 1- continental part, 1a- margin part: 2-2a -Hemus morphostructural zone: 1- continental part, 1a- margin part: 3–3a - Upper Thracian morphostructural zone: 3- continental part, 3a- margin part: 4 – 4a - Sakar-Strandzha morphostructural zone: 4- continental part, 4a- margin part: 5- Lower Thracian morphostructural zone; 6-11 – subaqual margin area: 6-8 – continental shelf: 6- high step, 7- down step, 8- fault zone; 9- continental slope, 10- continental foot, 11- Black Sea bottom; 12 – west border of the West Black Sea Passive Continental margin, 13- some important faults, 14- border between the morphostructural zones, 15 – boundary between Turkey and Bulgaria.

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The meridian oriented West Black Sea passive continental margin finishes in the south direction to the north of the Istanbul City. The mentioned morphounit is following to the north till the parallel of the towns of Mangalia and Constance in Rumania (Fig. 1).

Results and Discussion.

The investigated morphotectonic contact between the Moesian and Bulgarian Continental microplates to the west and the Black Sea Oceanic microplate to the east is coming in to being in the Early Paleocene time as a relic from the Thetys passive continental margin in the area of the contemporary Black Sea [1], [2]. The realized investigations show the following most important conclusions:

1/ the West Black Sea passive continental margin has a very clear west fault border. It was cam in to being during the Paleocene time, immediate after the suturing between the different continental fragments (terrains) in this part of Neo Europe;

2/ the morphounits in the subaeral part of the margin lover everywhere to the east. This is an important difference with the morphostructural pattern of the most west part from the Moesian and Bulgarian continental microplates;

3/ East part of the Stara Planina mountain range loses its unity and „disfingers" it crest in the area of the West Black Sea passive continental margin [4].

4/ the firth and lack abundance (more than 20 firths and lacks on the Bulgarian Black Sea Coast [5] show the morphotectonic „calm" and passive character of the West Black Sea continental margin (Fig. 2);

5/ the firsts of the Primorska and Sakar-Strandzha morphostructural zones are formed in the mountain relief of the coast. This events is not observed in the other parts of the Black Sea coast [6], [7], [8], [9] et all.

6/ the seismic activity in the area of the West Black Sea passive continental margin is sharply reduced in comparation with the most west part from the Moesian and Bulgarian continental microplates (Fig. 3). The not numerous earthquake centrums are group together the some Quaternary active faults or fault zones;

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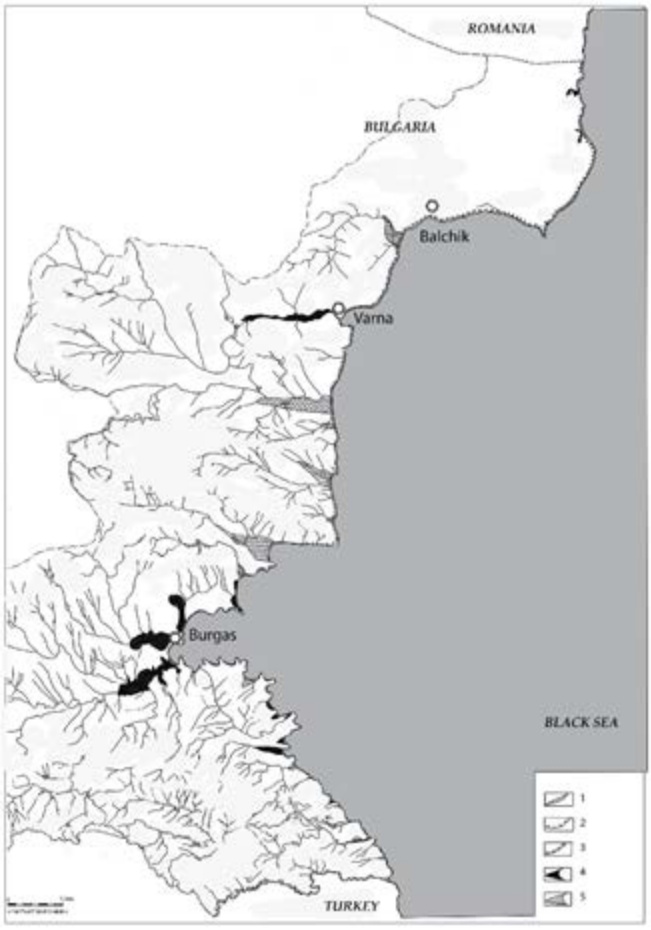

Fig. 2 Survey sketch map of the firths and lacks along the Bulgarian Black Sea Coast (after [5])

1- lack, 2- firth

7/ the separate morphotectonic parts of the West Black Sea passive continental margin have the some mosaic block pattern of the respective morphostructural unit.

8/ the West Black Sea passive continental margin show spatial satisfactory dimensional character along the whole it length. It origin, orographic and morphotectonic characteristic is essentially differ from the north and south Black Sea coasts.

Conclusion

The West Black Sea passive continental margin is the unig conserved segment from the border between Neo Europe and Paleo Tethis Ocean in the east part of the Mediterranean zone. The first one represent the natural east prolongation of the orographic, morphotectonic and morphostructural units of the Moesian and Bulgarian continental microplates. The mentioned margin is characterised by lower seismic activity and relative morphotectonic „calm".

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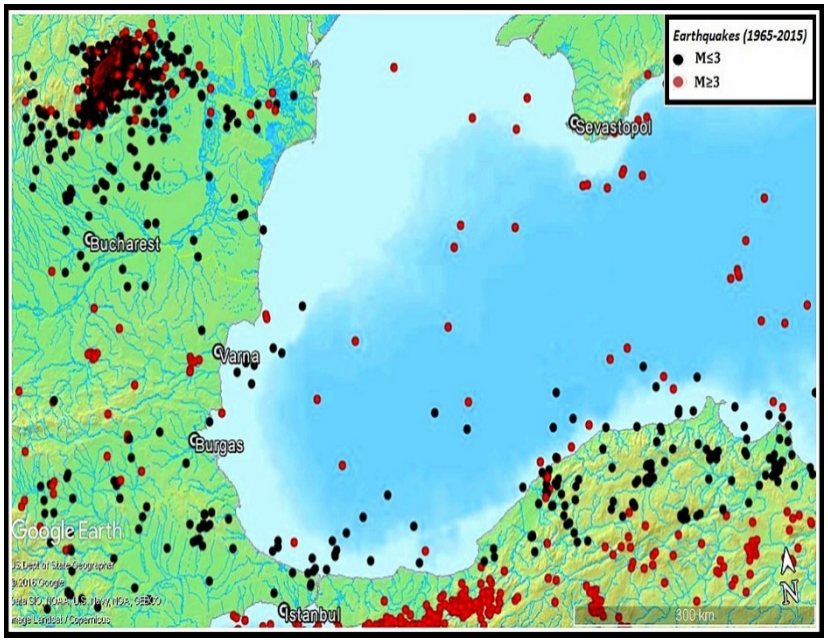

Fig. 3 Comparative map of the seismic activity between the area of the West Black Sea passive continental margin and the neighbor areas during the period of fifty years (1965 – 2016).

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