

## ABOUT THE ORIGIN AND MORPHOSTRUCTURE OF THE BLACK SEA BASIN

**Abstract:** The Black Sea Basin was a large Gulf in the north-eastern coast of the Phanerozoic Thetys Ocean. Its south-eastern margin was marked by the different in the time spatially disposed Anatolian (Little Asia) Peninsula. It was moved to the North-West under the pressure of the Arabian and Persian continental plates during the last 20 M. a. The frontal West-Northwestern part of the Anatolian Peninsula was arrived the Balkan Peninsula (in the area of Bosphorus) in the time of the completely closing of the Thetys Ocean in the Eastern Mediterranean and the beginning of the intercontinental collision between Gondwana and Europe. The little fragment from the oceanic crust in the area of the contemporary Black Sea Basin was remained as a Black Sea Oceanic microplate. It is distinguished from the enclosed continental microplates and epicontinental basins thru:

1. Deep, large, relatively flat sea bottom, formed in the rocks of the lower basalt layer from the Earth crust.
2. The sea shelf's and sea slopes of the Black Sea Basin represent typical passive continental margins of the enclosed continental microplates.
3. In the Black Sea Basin were established very typical only for the oceans natural events „Tsunami”.
4. The water of the Black Sea Basin includes the characteristically only for the ocean basins sulphuretted hydrogen layer.

**Keywords:** Black Sea Oceanic microplate, Thetys Ocean, intercontinental collision, Thetys closing.

---

### Author information:

#### Tzanko Tzankov

Prof. Dr. Sci, Bulgaria  
South-Western University “Neofit Rilski”  
Department of Geography, Ecology  
and Environment Protection  
✉ [tzankov1963@abv.bg](mailto:tzankov1963@abv.bg)  
🌐 Bulgaria

#### Svetla Stankova

Assoc. prof. PhD, Bulgaria  
Konstantin Preslavski – University of Shumen  
Department of Geography,  
Regional Development and Tourism  
✉ [s\\_stankova@abv.bg](mailto:s_stankova@abv.bg)  
🌐 Bulgaria

## Former concepts

The along the last sanctuary elapsed discussions about the origin and morphotectonic evolution of the region of the Black Sea Basin have formed the following hypothesis:

- 1/ the Black Sea Basin is result of continental rifting;
- 2/ the Black Sea Basin is effect of one uncompensated epicontinental depression;
- 3/ the Black Sea Basin represent a deep water uncompensated kettle.

Everyone former investigators holed up the attitude, that the Black Sea Basin is one epicontinental marine basin.

The stand-point about the Black Sea Basin continental rifting origin is groundless for lack of rifting morphostructures and rifting relief on the sea bottom. The basin concerned is not „epicontinental”, because its bottom is completely builder by the basalt (and not by granite) Lear of the Earth Crust. The Black Sea Basin isn't kettle bottom towards the marginal continental massifs. The „incompensated” character of the basin is one allegation.

### Main characteristics of the Black Sea Basin

The Black Sea Basin is distinguished from the enclosed continental microplates and epicontinental basins thru:

1. Deep, large, relatively flat sea bottom, formed in the rocks of the lower basalt layer from the Earth crust (Fig. 1).

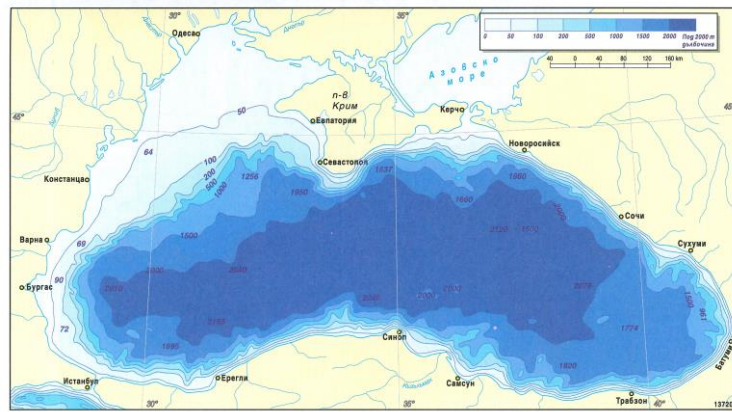


Fig. 1 General view of the Black Sea bottom

2. The sea shelf's and sea slopes of the Black Sea Basin represent typical passive continental margins of the enclosed continental microplates (Fig. 2 and Fig. 3).

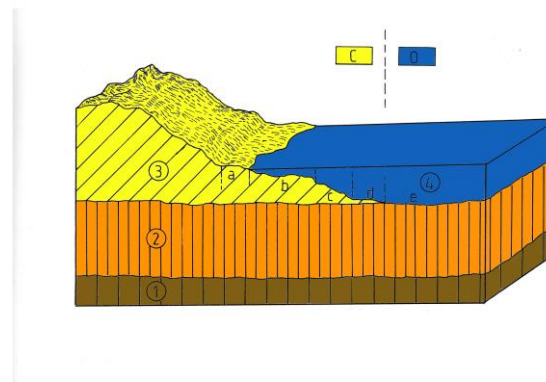


Fig. 2 Schematic block diagram of the western Black Sea Passive continental margin: 1- Upper Mantel; 2 and 3- Earth Crust: 2- „basalt” Layer, 3- „granite” and „sediment” Layer's: a- shelf, b- submarine shelf, c- continental slope, d- continental foot, e- oceanic bottom.

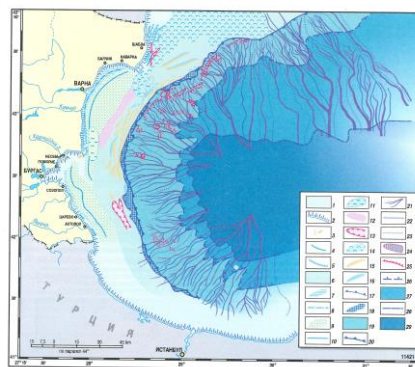


Fig. 3 Map of the western continental margin of the Black Sea [1]

3. In the Black Sea Basin were established very typical only for the oceans natural events „Tsunami”.

4. The water of the Black Sea Basin is included the characteristically only for the ocean basins suppurated hydrogen layer.

5. The Earth Crust on the Black Sea Basin bottom is relatively thin (Fig. 4 -20 – 30 km) in comparison with the Earth Crust of the marginal continental massifs (Fig. 4 - 30 -50 km).

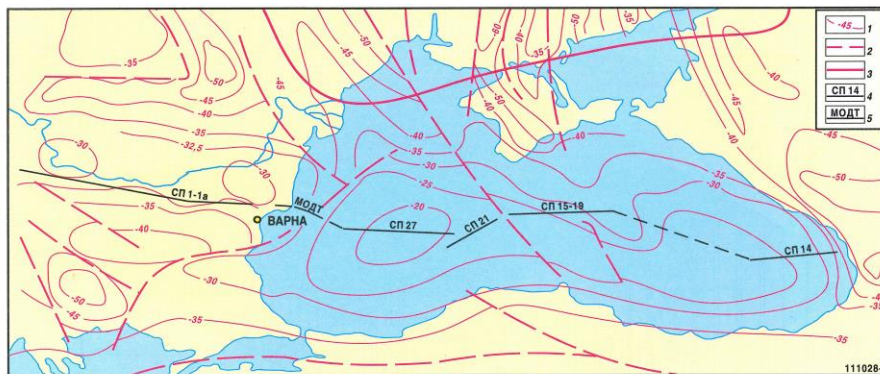


Fig. 4 „Moho” – structural sketch of the Black Sea Basin region [2]

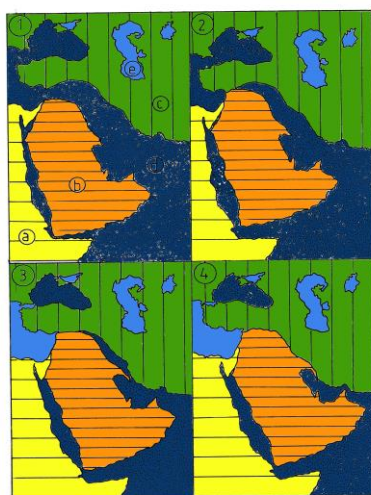


Fig. 5 Consecutive moments of the Tethys Ocean closing in the Eastern Mediterranean region (1- 4): a- Gondwana continental macroplate, b- Arabian continental plate, c- Euro-Asian continental macroplate, d- oceanic basins, d- epicontinental basins

The Black Sea Basin was a large Gulf in the north-eastern coast of the Phanerozoic Thetys Ocean (Fig. 5). Its south-eastern margin was marked by the different in the time spatial disposed Anatolian (Little Asia) Peninsula. It was moved to the North-West under the pressure of the Arabian and Persian continental plates during the last 20 M. a. The frontal West-Northwestern part of the Anatolian Peninsula was arrived the Balkan Peninsula (in the area of Bosphorus) in the time of the completely closing of the Thetys Ocean in the Eastern Mediterranean and the beginning of the intercontinental collision between Gondwana and Europe. The little fragment from the oceanic crust in the area of the contemporary Black Sea Basin was remained as a Black Sea Oceanic microplate.

#### Most important references:

1. **Krustev, T., S. Stankova.** Prirodna geografija na Bulgariya I Cherno more. ISBN 978-954-557-414-0, Universitetsko izdatelstvo „Episkop Konstantin Preslavski”, Shumen, **2008**, 240 p.
2. **Geografija na Bulgariya.** ISBN 954-464-123-8. Georafski institute na BAN, Izdatelstvo ForKom, Sofia, **2002**, 760 p.

3. Geologicheskaya evolyutsiya zapadnoy chasti Chernomorskoy kotlovine neogenchetvertichnoe vremya. Institut okeanologii Bolgarskoy Akademii nauk, Izdatelstvo BAN, Sofia, **1990**, 666 p.