

COMPARATIVE ANALYSIS BETWEEN THE RHODOPE  
MOUNTAIN MASSIF AND RILA-PIRIN MOUNTAIN RANGE  
(SOUTH BULGARIA, NORT-EAST GREECE)

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The realized regional investigation show some important morphostructural differences between the Rhodopes and Rila-Pirin Mountains Range. The Rhodope Mountain represents a morphostructural zone with almost oval and gently WNW-ESE elongated form. Rila-Pirin Mountains Range is a NNW-ESE elongated morphostructural range. The both morphounits are distinguished through large (more than 700 m) maximal topography altitude differences. This and some others important differences between them in terms of relief be due to the deep Earth's crust Quaternary geodynamic processes in connection to intra continental collision between Gondwana and Neo Europe in the eastern part of the Balkan Peninsula.

**Keywords:** mountain range, morphostructural zone, morphounits, differences

СРАВНИТЕЛЕН АНАЛИЗ МЕЖДУ РОДОПСКИЯ ПЛАНИНСКИ  
МАСИВ И РИЛО-ПИРИНСКАТА ПЛАНИНСКА РЕДИЦА  
(ЮЖНА БЪЛГАРИЯ, СЕВЕРОИЗТОЧНА ГЪРЦИЯ)

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**Резюме.** Проведените регионални изследвания в мащаб 1:250 000 показват някои важни морфоструктурни различия между Родопския планински масив и Рило-Пиринската планинска редица в Южна България и Североизточна Гърция. Родопският планински масив представлява морфоструктурна зона с почти овална, слабо удължена в ЗСЗ-ИЮИ посока. Рило-Пиринската планинска редица се простира в посока ССЗ-ИЮИ и се състои от кулисообразно подредени морфоструктурни райони с различна форма и

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големина. Двете разглеждани морфоструктурни единици показват голяма разлика в абсолютната си височина (над 700 m). Рило-Пиринската планинска редица има компактен високо до среднопланински релеф. Разнообразният планински до хълмисто-планински релеф на Родопската морфоструктурна зона е изпъстрен с негативни морфоединици. Тези и някои други важни морфоструктурни различия между релефа на Родопския планински масив и Рило-Пиринската планинска редица се дължат на дълбоки земекорни кватернерни геодинамични процеси във връзка с междуконтиненталната колизия между съответните части на Гондвана и Неоевропа в източната част на Балканския полуостров.

**Ключови думи:** планинска редица, морфоструктурна зона, морфоединици

## INTRODUCTION

The Rhodope, Rila, Pirin and Slavyanka Mountains are treated and investigated in Bulgarian and foreign geologic and geographic scientific literature as a Rila-Rhodopean mountain massif (*Алексиев, 2002; Георгиев, 1991; Гълъбов и др., 1946, 1956, 1982; Иванов, 1959; Канев, 1977, 1983, 1989; Стоилов, 1995; Louis, 1930; etc.*). The realized during the last year regional morphostructural investigation in a scale 1: 250 000 has show some important morphostructural differences between the Rhodopean Mountain massif and Rila-Pirin Mountains Range (South Bulgaria and North-East Greece – Fig.1).

## RESULTS OF THE COMPARATIVE MORPHOSTRUCTURAL ANALYSIS

The regional morphostructural investigation in a scale 1: 250 000 have grounded the separation of the Rhodope morphostructural zone (*Tzankov, Iliev, 2015*) on the territory of Rhodopean Mountain massif and Rila-Pirin Morphostructural Range on the territory of Rila-Pirin Mountains Range (Fig. 2) in South Bulgaria and North-East Greece.

Traces of the mountain arched morphostructures (jagged black lines) and centers of maximal contemporary elevation (black points).

They have the following more important differences in its origin, pattern and evolution:

1) the morphostructural type of the mentioned morphounits is different (Table 1). The Rhodope Mountain massif represents a morphostructural zone with the almost oval gently WNW-ESE elongated form (*Tzankov, Iliev, 2015*). It is composed by six mosaic sutured morphostructural regions with an irregular-oval form. Rila-Pirin Mountains Range (Fig. 2) is a NNW-ESE elongated morphostructural range from link motion oriented morphostructural regions with different size and orientation.

2) both investigated units are separated by the Upper-Middle Mesta complex morphostructural passage. The last one is a fragment from the post middle Pleistocene initial orthoplain in the eastern part of the Balkan Peninsula (*Tzankov, Iliev, 2015*).

3) both mentioned regional morphounits are distinguished through the big (more than 700 m) maximal relief attitude differences.

4) Rila-Pirin Morphostructural Range distinguished by his compact high or middle high mountain relief (Fig. 1). The relief of the Rhodope morphostructural zone is varied from mountain till hills-mountain (*Tzankov, Iliev, 2015*).



Fig. 1 Survey map of the Rhodopean Mountain massif and Rila-Pirin Mountains Range. It has given a reason to separate in this area the Rila-Pirin Morphostructural range and the Rhodope morphostructural zone. The peculiarities of this principal regional morphounits and differences between them are the main object of the article

5) the seldom negative morphounits in Rila-Pirin Morphostructural Range are disposed on the borders between the morphostructural regions (Fig. 1 and 2). The quantitative more negative morphounits in the Rhodope morphostructural zone are disposed on different places (Tzankov, Iliev, 2015).

6) the area of the Rila-Pirin Morphostructural Range is characterized by relative numerous uniform widespread mountain arched morphostructures. The last one is relatively more seldom and irregular disposed in the area of the Rhodope morphostructural zone (Tzankov, Iliev, 2015).

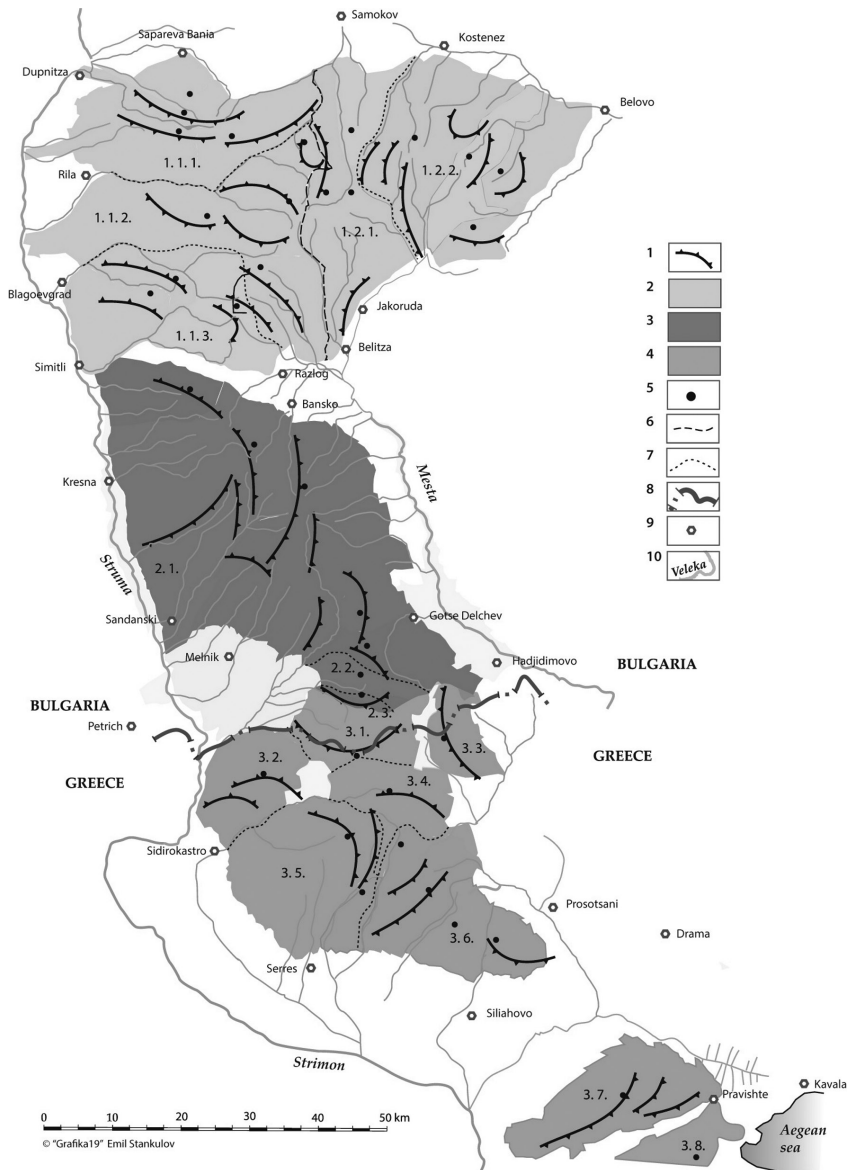


Fig. 2 Survey morphostructural map of Rila-Pirin Morphostructural Range: 1 - Rila morphostructural zone: 1.1 - West Rila Morphostructural area: 1.1.1 - Malyovitsa morphostructural region, 1.1.2 - Skakavets morphostructural region, 1.1.3 - Yakoruda morphostructural region; 1.2 - East Rila morphostructural area: 1.2.1 - Musala morphostructural region, 1.2.2 - Ibar morphostructural region; 2 - Pirin morphostructural zone: 2.1 - North Pirin morphostructural region, 2.2 - Central Pirin morphostructural region, 2.3 - South Pirin morphostructural region; 3 - Slavyanka (Orvilos) morphostructural zone: 3.1 - Ali Botush morphostructural region 3.2 - Angistro (Sengelitsa) morphostructural region, 3.3 - Stargach (Strangats) morphostructural region, 3.4 - Mavro vouno (Cherna gora) morphostructural region 3.5 - Vrontous (Sharaliya) morphostructural region, 3.6 - Menoikio (Zmiynitsa) morphostructural region, 3.7 - Pangeo (Kushnitsa) morphostructural region, 3.8 - Eleohorion (Lyuti rid) morphostructural region

Table 1

*Morphotectonic and morphostructural units*

<b>GLOBAL MORPHOTECTURES</b>		
<u>CONTINENT</u>		
Continental margin		
<i>Active</i>		<i>Passive</i>
	Continental shelf Continental slope	
<i>Accretion prism</i>		<i>Continental foot</i>
	Collision zone	
<i>Trans continental</i>	<i>Intra continental</i>	<i>Suture</i>
<u>OCEAN</u>		
	Oceanic bottom Oceanic ridge Oceanic trench Hot spot Island arc	
<i>Volcanic</i>		<i>Avolcanic</i>
	Subduction zone Spreading zone Obduction zone	
<i>REGIONAL MORPHOTECTURAS</i>		
	Macrotecture – Macroplate Tecture – Plate Microtecture – Microplate	
<i>Continental</i>		<i>Oceanic</i>
<i>REGIONAL MORPHOUNITS</i>		
<i>Obligatory</i>		<i>Optional</i>
Morphostructural zone		Morphostructural sequence
<i>Morphostructural area</i>		Morphostructural group
<i>Morphostructural region</i>		Morphostructural range
<i>Morphostructure</i>		
<i>Longitudinal</i>	<i>Link motion</i>	<i>Transverse</i>
<i>REGIONAL MORPHOSTRUCTURES</i>		
<u>INITIAL</u>		
Orthoplain		
<u>DERIVATIVE</u>		
<i>Negative</i>	<i>Faults</i>	<i>Positive</i>
Plain	High angular (normal)	Mountain arched
Lowland	Low angular listric	Concentric
Passage	Strike-slip	Dome-like
Complex passage	Over thrust	Comb-like
Kettle	Upper thrust	Anteclise
Threshold	Transform	Hemianteclise
Gorge	Fault bundle	Syneclise
	Fault zone	Hemisyneclise
	Listric prisms	
	Line (row)	

## CONCLUSION

Rila-Pirin Morphostructural Range and Rhodope morphostructural zone are different principal regional morphounits in the eastern part of the Balkan Peninsula. They have origin during the Quaternary destruction of post Middle Pleistocene orthoplain in connection to transcontinental collision between Gondwana and Neo Europe continental massifs. The last one deep Earth's crust process determines the different morphostructural type and peculiarities of the both morphounits.

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