

MORPHOTECTONICS OF THE KRAISHTE MORPHOSTRUCTURAL ZONE AND THE NEIGHBOR AREAS (MIDDLE-WEST BULGARIAN CONTINENTAL MICROPLATE)¹

Abstract: The Kraishite Morphostructural Zone is a Late Quaternary (Late Pleistocene- Holocene) first rare positive regional morphounit in the south west part of the Bulgarian Continental Microplate. It is disposed between the South Morava Morphostructural Zone to the west, Bregalnitsa Morphostructural Zone to the southwest, Rila Morphostructural Zone to the south east, Sashtinska Sredna gora-Sarnena Gora Morphostructural Area (Sredna Gora Morphostructural Zone) to the east and Babushnitca-Vitosha Morphostructural Area (Sredna Gora Morphostructural Zone) to the north-east. The Kraishite Morphostructural Zone is distinguished from the enclosed first rare syncinematic morphounits by very intensive mosaic internal pattern and the relatively lest above sea-level of the regional relief.

Author information:

Tzanko Tzankov

Prof. DSc

South-West University „Neofit Rilski“ – Blagoevgrad

✉ tzankov1936@abv.bg

🌐 Bulgaria

Svetla Stankova

Prof., PhD

Konstantin Preslavski University of Shumen,

✉ s_stankova@abv.bg

🌐 Bulgaria

Tatyana Aleksieva

PhD

South-West University „Neofit Rilski“ – Blagoevgrad

✉ tan4eeto@abv.bg

🌐 Bulgaria

Keywords:

Late Quaternary positive and negative morphostructures, intensive mosaic internal pattern.

Introduction

The investigation treat the modern authors concept about the regional morphotectonic position and pattern of the Kraishite Morphostructural Zone and the neighbor morphostructural areas from the middle-west part of the Bulgarian Continental Microplate [1]. Those morphotectonic and morphostructural analysis as realized on a base of the mobility plate tectonic theory. The contemporary relief of the investigated territory was formed under the influence of the Late Pleistocene-Holocene listric tectonics as an effect of the geodynamic processes in the deep parts of the Earth Crust.

¹ Project № ПД-08-121/04.02.2019 „Resource potential as an opportunity for cross-border cooperation“, Konstantin Preslavsky University of Shumen

Regional morphostructural pattern

The Kraishte Morphostructural Zone is a Late Quaternary (Late Pleistocene- Holocene) first rare positive regional morphounit in the south west part of the Bulgarian Continental Microplate (Fig.1). It is disposed between the South Morava Morphostructural Zone to the west, Bregalnitsa Morphostructural Zone to the southwest, Rila Morphostructural Zone to the south east, Sashtinska Sredna gora-Sarnena Gora Morphostructural Area (Sredna Gora Morphostructural Zone) to the east and Babushnitca-Vitosha Morphostructural Area (Sredna Gora Morphostructural Zone) to the north-east (Fig.1). The investigated zone is composed from negative and positive morphostructures. The negative morphounits present relics from the destructed pre Late Pleistocene Orthoplain [2]. They form the Shoppe Complex Morphostructural Passage (Vlasina Kettle Morphostructure, Erma Morphostructural Gorge, Znepole Kettle Morphostructure, Strazha Morphostructural Threshold, Graovo Kettle Morphostructure, Golo bardo Morphostructural Threshold, Radomir Kettle Morphostructure, Bobov dol Morphostructural Passage, Dyakovo Morphostructural Threshold, Delyan Morphostructural Passage, Yahino Kettle Morphostructure, Verila Morphostructural Threshold, Palakariya Kettle Morphostructure, Shiroki dol Morphostructural Gorge, Iskar Kettle Morphostructure, Venkovetz Morphostructural Gorge, Ihtiman Kettle Morphostructure, Cherni rid Morphostructural Threshold, Kostenets Kettle Morphostructure and Momino Morphostructural Gorge) and Velbadzh Complex Morphostructural Passage (Gyushevo Morphostructural Gorge, Kamenitsa Kettle Morphostructure, Garlyano Morphostructural Passage, Kyustendil Kettle Morphostructure, Babino Morphostructural Threshold, Dolistovo Kettle Morphostructure and Razmetanitsa Morphostructural Threshold) . The Late Pleistocene – Holocene positive morphostructures are group in the Golo Bardo-Verila (with Strazhata, Cherna Gora, Golo Bardo, Veria and Lakatishka Rila Morphostructural Regions) and Rudina-Konyavska (with Sekirna, Rudina, Konyavska, Lisetc, Zemen and Rzmanitsa Morphostructural Regions) Morphostructural Lines (Fig.1).

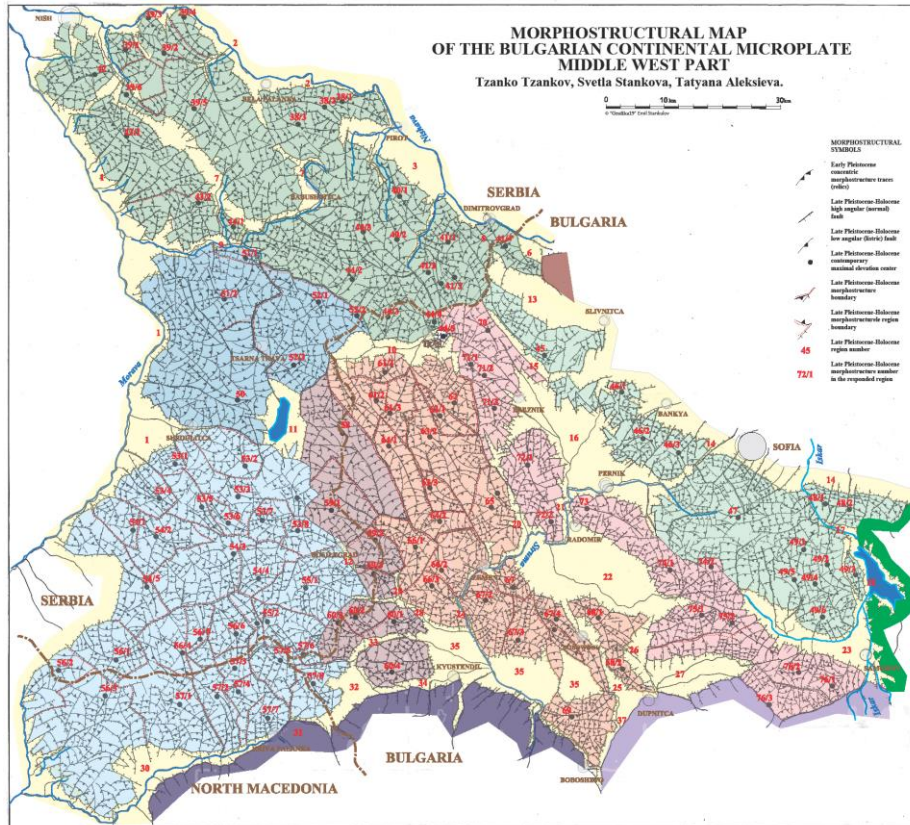


Fig.1

LEGEND – REGIONAL MORPHOUNITS

Abbreviations: CMSP– complex morphostructural passage, MSP– morphostructural passage, KMS– kettle morphostructure, MST– morphostructural threshold, MSG– morphostructural gorge, RVMS– river valley morphostructure, MSZ– morphostructural zone, MSA– morphostructural area, MSR– morphostructural region, MSL– morphostructural line, DLMS– dome-like morphostructure .

- 1-35- Pre Late Pleistocene Orthoplain Relics (negative morphostructures): 1 Morava CMSP, 2-6 – Nishava CMSP (2- Bela Palanka MSP, 3- Pirot KMS, 4- Erma RVMS, 5- Gaberska MST, 6- Godech KMS), 7- Babushnitca MSP, 8- Gomi Barbesh MSP, 9- Zlosina MSP, 10- Tran KMS, 11- Vlasina KMS, 12- Bosilegrad KMS, 13- Burela MSP, 14- Sofia KMS, 15- Krasava RVMS, 16- Graovo KMS, 17- Pasarel MSP, 18- Iskar KMS, 19- Okol MSP, 20- Svetiya MSP, 21- Vetrushka MSP, 22- Radomir KMS, 23- Palakariya KMS, 24- Blateshnitca MSP, 25- Bobov dol MSP, 26- Dyakovo MSP, 27- Yahimovo KMS, 28- Dragovishitca RVMS, 29- Gorno Uyno RVMS, 30- Kriva Palanka KMS, 31- Slavishite MST, 32- Kamenitca KMS, 33- Bistritca MSP, 34- Mirovo MSP, 35- Kyustendil KMS, 36- Boboshevo MSP, 37- Middle Struma CMSP).
- 38-77 - Late Pleistocene- Holocene positive morphostructures:
Hemus Morphostructural Zone
38-49- **Sredndgorie MSZ – west part**
38-44- Suva Planina-Greben Planina MSA: 38- Belava MSR (38/1- Gnilyn DLMS, 38/2- Karadashnitca DLMS, 38/3- Shlivovik DLMS), 39- Suva Planina MSR (39/1- Niska banya DLMS, 39/2- Suhevo DLMS, 39/3- Chelashnitca DLMS, 39/4- Ostrovitca DLMS, 39/5- Trem DLMS, 39/6- Gadzhin han DLMS), 40- Vlashka planina MSR (40/1- Petrovatc DLMS, 40/2- Gorni vrah DLMS, 40- Kusa vrana DLMS), 41- Greben MSR (41/1- Prangovo DLMS, 41/2- Dviglina livada DLMS, 41/3- Novo bardo DLMS), 42- Nish MSR, 43- Tsarkovnitca MSR (43/1- Lipovitca DLMS, 43/2- Krushovitca DLMS), 44- Ruy MSR (44/1- Veliki Bonintce DLMS, 44/2- Rakita DLMS, 44/3- Lomnitca DLMS, 44/4- Bankya DLMS, 44/5- Esemirtici).
- 45-49- Viskyar-Lozenska Planina MSA: 45- Viskyar MSR, 46- Lyulin MSR (46/1- Klisura DLMS, 46/2- Divotino DLMS, 46/3- Dupevitca DLMS), 47- Vitosha MSR, 48- Lozenska Planina MSR (48/1- Lalina mogila DLMS, 48/2- Polovrak DLMS), 49- Plana Planina MSR (49/1- Mamastirishite DLMS, 49/2- Dolni Pasarel DLMS, 49/3- Shtarkelovo gnyazdo DLMS, 49/4- Plana DLMS, 49/5- Popovyane DLMS, 49/6- Shiroki dol DLMS).

- Sredna Gora MSA (Sredndgorie MSZ – central part)**
50-57- South Morava MSZ:
50-52- Vartop MSA: 50- Chemernik MSR, 51- Ostrozub MSR(51/1- Yakovieva DLMS, 51/2- Ostrozubska chukka DLMS), 52- Gramada MSR (52/1- Krivi dol DLMS, 52/2- Tsarvena yabuka DLMS, 52/3- Vartop DLMS).
53-57- Besna Kobila MSA: 53- Varovnik MSR (53/1- Blashnitca DLMS, 53/2- Veliki Stresher DLMS, 53/3- Novo Selo DLMS, 53/4- Varbovo DLMS, 53/5- Kriva Feya, 53/6- Goma Lyubata DLMS), 54- Doganitca MSR (54/1- Vranska banya DLMS, 54/2- Dubrava DLMS , 54/3- Mala omitca DLMS, 54/4- Mali izvor DLMS, 54/5- Margentca DLMS), 55- Dukat MSR (55/1- Bresnitca DLMS, 55/2- Bela voda DLMS), 56- Kozyak MSR (56/1- Shaprantce DLMS, 56/2- Kozyak DLMS, 56/3- Bashovitce DLMS, 56/4- Targovishite DLMS, 56/5- Dyado DLMS, 56/6- Luke North DLMS), 57- Slavishite MSR (57/1- Dzherman DLMS, 57/2- Kozi dol DLMS, 57/3- Lesnitca DLMS, 57/4- Dyadostoyanovtci DLMS, 57/5- Like DLMS, 57/6- Strazha DLMS, 57/7- Srednya DLMS, 57/8- Chakmadzhyska mahala DLMS).
- 58-76- Kraishite MSZ:**
58-60 - Karvav kamak – Chudinska planina MSL: 58- Karvav kamak MSR, 59- Milevska planina MSR (59/1- Milavetc DLMS, 59/2- Koriten DLMS, 59/3- Gorno Uyno DLMS), 60- Chudintci MSR (60/1- Karshalevo DLMS, 60/2- Rezhitci DLMS, 60/3- Gurbanovtci DLMS, 60/4- Lisetc DLMS).
61-69 - Melna – Boboshevo MSL: 61- Melna MSR (61/1- Radovo DLMS, 61/2- Gorna Melna DLMS, 61/3- Gorochevtci DLMS), 62- Erul MSR, 63- Sekirna MSR (63/1- Golemi vrah DLMS, 63/2- Mureno DLMS, 63/3- Penkyovtci DLMS), 64- Kosovo MSR (64/1- Dalga luka DLMS, 64/2- Treklyano DLMS), 65- Rudina MSR, 66- Zemen MSR (66/1- Koriten DLMS, 66/2- Zlogosh DLMS, 66/3- Poletintci DLMS), 67- Konyavska planina MSR (67/1- Garbino DLMS, 67/2- Egalnitca DLMS, 67/3- Viden DLMS, 67/4- Fucha DLMS), 68- Delyan MSR (68/1- Kondofrey DLMS, 68/2- Piperovo DLMS), 69- Marvodol MSR.
- 70-76 - Zavalska planina – Lakatishka Rila MSL: 70- Zavalska planina MSR, 71- Strazha MSR (71/1- Filipovtci DLMS, 71/2- Lyubash DLMS, 71/3- Begunovtci DLMS), 72- Chema gora MSR (72/1- Tumba DLMS, 72/2- Radibosh DLMS), 73- Golo bardo MSR, 74- Yarlovo MSR (74/1- Bosnek DLMS, 74/2- Petrus DLMS), 75- Verila MSR (75/1- Dren DLMS, 75/2- Golyam Debeletc), 76- Lakatitca MSR (76/1- Klisura DLMS, 76/2- Dospay DLMS, 76/3- Zakiritca DLMS).
- Bregalnitca MSZ
Rila-Pirin MSL

Morphotectonic setting

The investigated territory is distinguished with very varied regional morphotectonic pattern (Fig. 1). The Kraishite Morphostructural Zone spread to a little irregular triangular segment from the middle-west part of the Bulgarian Continental Microplate. Its north-east boundary corresponds with the south margin of the west – north-west segment from the Upper Cretaceous-Lower Paleogene Suture Zone between the Bulgarian and Moesian Continental Microplate (Babushnitca-Vitosha Morphostructural Area - Fig. 1). The west boundary of the zone is marked from the responded part of the Bulgarian Continental Microplate West Margin (South Morava Morphostructural Zone – Fig. 1). The south boundary passes with the superficial effects of the transcontinental collision between the Gondwana and New Europe Continental massifs (Osogovska and Rila North Mountain Foothills – Fig. 1).

The Kraishite Morphostructural Zone Outskirts are marked by numerous negative morphostructures of the Shoppe Complex Morphostructural Passage (Vlasina Kettle Morphostructure, Erma Morphostructural Gorge, Znepole Kettle Morphostructure, Strazha Morphostructural Threshold, Graovo Kettle Morphostructure, Golo bardo Morphostructural Threshold, Radomir Kettle Morphostructure, Bobov dol Morphostructural Passage, Dyakovo Morphostructural Threshold, Delyan Morphostructural Passage, Yahino Kettle Morphostructure, Verila Morphostructural Threshold, Palakariya Kettle Morphostructure, Shiroki dol Morphostructural Gorge, Iskar Kettle Morphostructure, Venkovetz Morphostructural Gorge, Ihtiman Kettle Morphostructure, Cherni rid Morphostructural Threshold, Kostenets Kettle Morphostructure and Momino Morphostructural Gorge – Fig.1) and Velbadzh Complex Morphostructural Passage (Gyushevo Morphostructural Gorge, Kamenitsa Kettle Morphostructure, Garlyano Morphostructural Passage, Kyustendil Kettle Morphostructure, Babino Morphostructural Threshold, Dolistovo Kettle Morphostructure and Razmetanitsa Morphostructural Threshold – Fig. 1).

The central parts of the Kraishte Morphostructural Zone is occupied by The Late Pleistocene – Holocene positive morphostructures are group in the Golo Bardo-Verila (with Strazhata, Cherna Gora, Golo Bardo, Veria and Lakatishka Rila Morphostructural Regions) and Rudina-Konyavska (with Sekirna, Rudina, Konyavska, Lisetc, Zemen and Rzmetanitsa Morphostructural Regions) Morphostructural Lines (Fig.1).

The Kraishte Morphostructural Zone Average Relief Altitude is less in comparison with the same in the neighbor regional first rare morphounits. The tendency of the Relief uplifting in the mentioned territory is positive. It is controlled by the transcontinental collision between the Gondwana and New Europe Continental massifs

Seismic activity

The territory of the Kraishte Morphostructural Zone distinguish with very weak seismic activity in comparison with the neighbor regional morphounits (Fig.2).

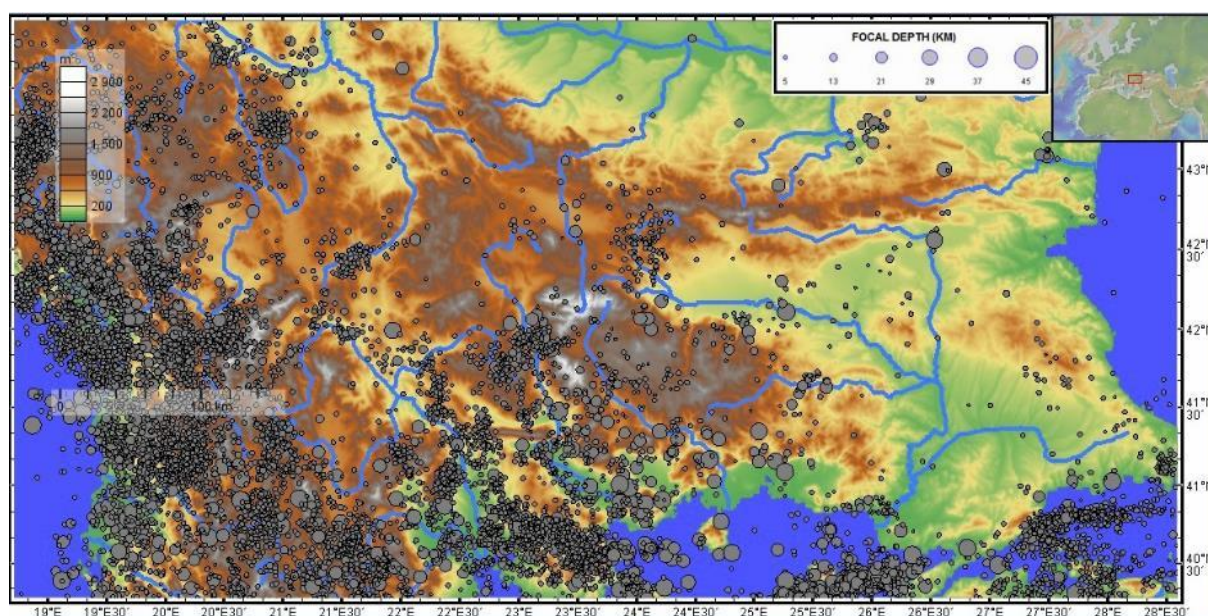


Fig. 2

Seismic activity within the Balkan Peninsula for the statistical of period 1965-2018 (Seismic data source: USGS Seismic Hazard Program- <https://earthquake.usgs.gov/earthquakes/search/>; Mapping tool: GeoMapApp-<http://www.geomapapp.org>)

Conclusion

The Kraishte Morphostructural Zone is a little clear limited fragment from the contemporary mosaic pattern of the Bulgarian Continental Microplate West Part. It distinguish from the neighbor regional morphounits trough the relative Late Pleistocene-Holocene morphotectonic passivity. This zonal peculiarity find expression in the relics of the still not completely destroyed post Early Pleistocene Orthoplain, slovlier uplifting of the positive morphostructures (in comparison wit the neighboring areas) and very weak seismic activity.

References:

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