

## SREDNA GORA MORPHOSTRUCTURAL AREA<sup>1</sup>

**Abstract:** The Sredna Gora Morphostructural Area is a Late Quaternary (Late Pleistocene- Holocene) first rare positive regional morphounit in the central parts of the Bulgarian Continental Microplate. It is disposed between the Sub Hemus Morphostructural Zone to the north, North Thracian Morphostructural Zone to the south and Vitosha Morphostructural Zone to the west. The investigated area is composed by Panagyurishte Morphostructural Region (with Eledzhik, Bratan and Hisarya Morphostructural Morphostructural Group) to the west and Stara Zagora Morphostructural Region (with Brezovo, Chirpan and Nova Zagora Hisarya Morphostructural Group) to the east. The mentioned area correspond with the east part of the Babutitsa-Sarnena Gora Morphostructural Zone.

The Sredna Gora Morphostructural Area was origin during the Late Pleistocene-Holocene time, after the full destruction of the respective part of the post Early Pleistocene Orthoplain. The new build positive morphostructures in the mentioned area belong to one older Late Pleistocene Generation and one younger Late Pleistocene-Holocene Generation. The first one is presented today through the more or less partial conserved traces of the eroded morphounits. The second generation morphostructures build the modern complete regional morphostructural plan of the area.

The morphotectonic position of the Sredna Gora Morphostructural Zone corresponds with the first rare large regional morphostructural threshold – the Srednogorie Threshold. It separates the Tsaribrod-Tvarditsa Complex `Morphostructural Passage (Sub Balkan Morphostructural Zone) from the Thracia Complex `Morphostructural Passage (Upper Thracian Morphostructural Zone) between Iskar and Tundzha River.

The geodynamic genesis of the Sredna Gora Morphostructural Zone is connected with the Early Paleogene saturation between the Moesian and Balkan Continental Microplate during the building of New Europe Continental massif.

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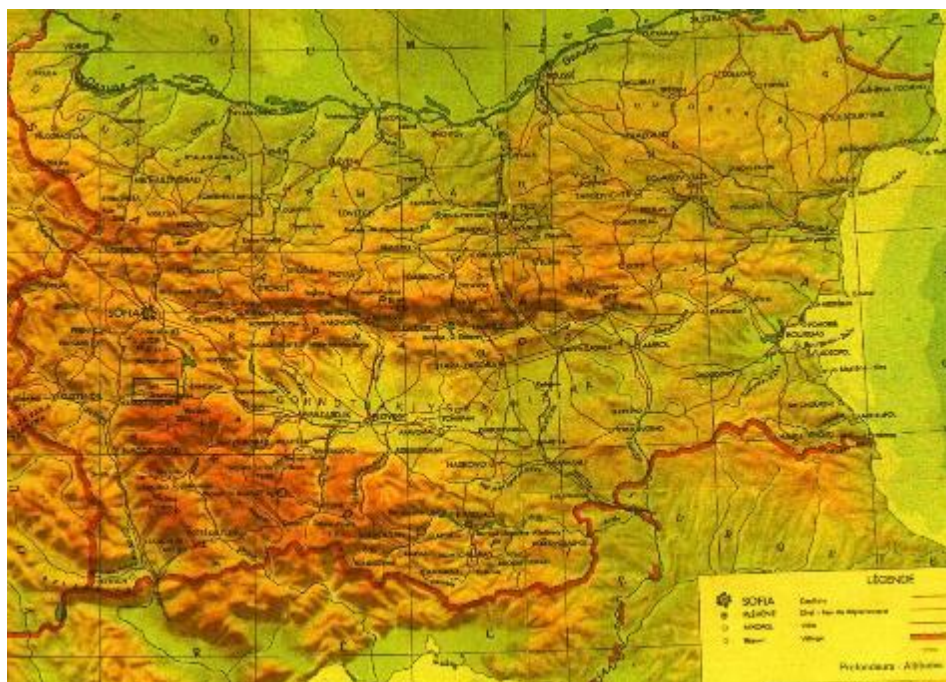
## Object and purpose of the investigation

The investigation object are the principal morphostructural, morphotectonic and morphogeodynamic characteristics of the Sredna Gora Morphostructural Area in concord with the modern plate tectonic concept.

### Terminological notices

The regional morphostructure of the Sredna Gora Morphostructural Area is given the possibility of morphostructural group separation. This not obligatory (optional) regional morphocategory presents a spatial detached group of monotype morphostructures with similar second rare morphocharacteristics within the frame work of certain morphostructural region.

### Orohydrographic overview



A



B

Fig. 1

Survey maps of the Sredna Gora Morphostructural Area

The Sredna Gora Morphostructural Area coincides spatial with the parts of Sashtiska Sredna Gora Mountain and Sarnena Gora Mountain from the Sredna Gora Mountain Range in Central Bulgaria (Fig. 1 A). It presents a west–east oriented 175 km, maximal 16 km wide, middle height (maximal altitude – 1604 m), easily convex curved to the south mountain range (Fig. 1 B). It is disposed between Topolnitsa River between the villages of Petrich and Muhovo) to the west, Tundzha river (to the south of town of Sliven) to the east, the Zlatitsa, Karlovo and Kazanlak field to the north and Plovdiv Low land, Chirpan Hills and Zagora Low land to the south (Fig. 1). The mentioned area is divided from the Strema River valley (between the Karlovo Field and Olovdiv Low land – fig. 1 A) to the Sashtinska Sredna Gora Mountain (heights picks – Bogdan – 1604 m, Bratan – 1572 m and Bratiya – 1519 – fig. 1 A) to the west and Sarnena Gora Mountain (height pick – Bratan – 1236 m).

The problem for the eventual morphostructural belonging of the Ihtimanska Sredna Gora (between Sofia Field and Topolnitsa River) and Eledzhik Mountain Massif (between Maritsa and Topolnitsa River) to be imminent solver.

### Building time

The Sredna Gora Morphostructural Area was origin during the Late Pleistocene-Holocene time, after the full destruction of the respective part of the post Early Pleistocene Orthoplain. The new build positive morphostructures in the mentioned area belong to one older Late Pleistocene Generation and one younger Late Pleistocene-Holocene Generation. The first one is presented today trough the more or less partial conserved traces of the eroded morphounits. The second generation morphostructures build the modern complete regional morphostructural plan of the area.

### Regional morphostructure

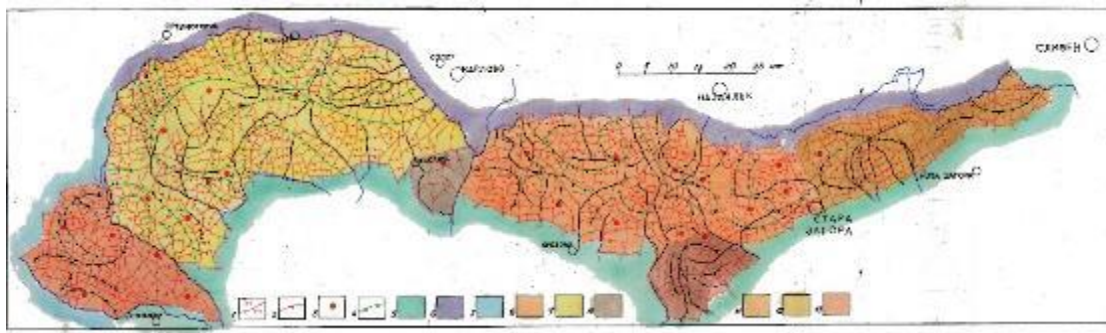


Fig. 2

#### Morphostructural map of the Sredna Gora Morphostructural Area

1- high angular (normal) fault, 2- low angular (listric) fault, 3- contemporary maximal elevation center, 4- traces of Late Pleistocene concentric morphostructure, 5- 7- neighbor regional morphounits: 5- Babuhnitsa-Vitosha Morphostructural Area (Srednogorie Morphostructural Zone), 6- Sub Hemus Morphostructural Zone, 7- Upper Thracian Morphostructural Zone; 8- Eledzhik Morphostructural Region (Babuhnitsa-Vitosha Morphostructural Area), 9-10 – Sashtinska Sredna Gora Morphostructural Area: 9- Panagyurishte Morphostructural Region, 10- Hisarya Morphostructural Region; 11-13 – Sarnena Gora Morphostructural Area: 11- Bresovo Morphostructural Region, Morphostructural Region, 12– Nova Zagora Morphostructural Region, 13- Chirpan Morphostructural Region.

### Morphotectonic overview

The morphotectonic position of the Sredna Gora Morphostructural Zone corresponds with the first rare large regional morphostructural threshold – the Srednogorie Threshold. It separates the Tsaribrod-Tvarditsa Complex `Morphostructural Passage (Sub Balkan Morphostructural Zone) from the Thracia Complex Morphostructural Passage (Upper Thracian Morphostructural Zone) between Iskar and Tundzha River (Fig.3).

The geodynamic genesis of the Sredna Gora Morphostructural Zone is connected with the Early Paleogene saturation between the Moesian and Balkan Continental Microplate during the building of New Europe Continental massif.



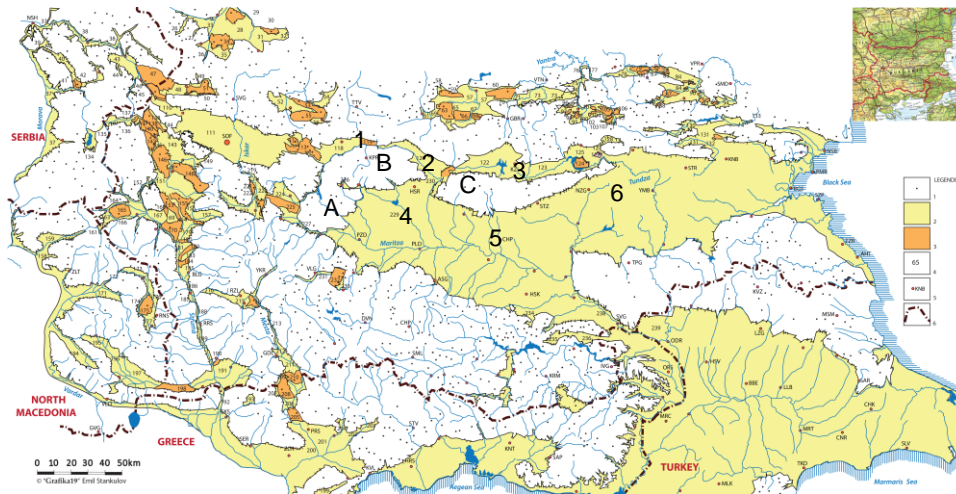


Fig. 3  
Morphotectonic position of the Sredna Gora Morphostructural Area  
in the east part of the Balkan Peninsula

1- 3- east part of the Tsaribrod-Tvarditsa Complex `Morphostructural Passage (Sub Balkan Morphostructural Zone): 1- Zlatitsa Kettle Morphostructure, 2- Karlovo Kettle Morphostructure, 3 – Kazanlak Kettle Morphostructure; 4 – 6 – west part of the Thracia Complex Morphostructural Passage (Upper Thracian Morphostructural Zone): 4- Plovdiv Lowland Morphostructure, 5- Spassovo Morphostructural Threshold, 6- Zagore Lowland Morphostructure; A- Eledzhik Morphostructural Region (Babushnitsa-Vitoshka Morphostructural Area), B-C - Sredna Gora Morphostructural Area: B- Panagyurishte and Hisarya Morphostructural Regions, C- Sarnena Gora Morphostructural Region.

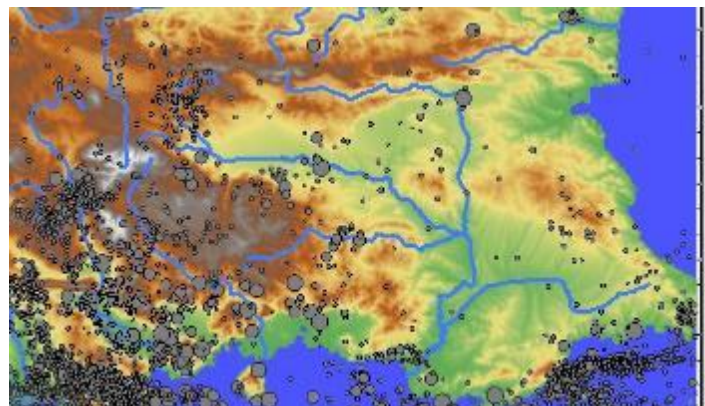
#### Seismic overview

The territory of the Sredna Gora Morphostructural Area is almost completely untouched from earthquakes (Fig. 4 A, B). The intensive seismic activity is established in the west boundary of the area – along the Topolnitsa River (Fig. 4 A, B) only. The south border of the Area is marked by a line of isolated earthquakes (Fig. 4 A, B) to.

The contemporary seismic passivity the Sredna Gora Morphostructural Area show for the relatively poorly modern influence of the endogen processes in the relief building.

#### Conclusion

The Sredna Gora Morphostructural Area is a Late Quaternary (Late Pleistocene- Holocene) first rare positive regional morphounit in the central parts of the Bulgarian Continental Microplate. It was origin on a place of the destroyed post Earli Pleistocene Orthoplain during the saturation end stadiums between the Moesian and Bulgarian Continental microplate in the east part of Balkan Peninsula. The observed area is the east part of the Babushnitsa – Vitoshka Morphostructural zone. The mentioned regional morphounit corresponds with the the Srednogorie Threshold between. the Tsaribrod- Tvarditsa Complex `Morphostructural Passage and the Thracia Complex Morphostructural Passage (Fig.3).



A



B

Fig. 4

Seismic survey maps of the Sredna Gora Morphostructural Area  
A- magnitude, B- earthquake focus deep

The morphostructural and seismic peculiarities of the Eledzhik Morphostructural Region show, that the last one belongs to the east end of the Babutitsa-Vitosha Morphostructural Area from the Srednogorie Morphostructural Zone.

#### References:

1. **Andreev A.** Geoprostranstveni danni ot preki geodezicheski izmervaniya na teritorii zaeti ot vodni techeniya. Sbornik nauchni trudove MATTEX , ShU "Ep. K. Preslavski" 2012.
2. **Andreev A., M. Markov** Geografski informatsionni s-mi, NVU - Shumen, 2009
3. **Tsankov, Ts. 2013.** *Morfostrukturen analiz.* Izdatelstvo „Grafika 19” Sofiya, ISBN 978-954-9764-34-5, 160.
4. **Tzankov, Tz., Sv. Stankova, R. Iliev, I. Mitkov. 2016.** *Methodological basement of the regional morphostructural analysis.* Proceedings of the Fifth International Scientific Conference „Geographical Sciences and Education”, November 4-5, 2016, Shumen, Bulgaria, 41-45.
5. **Tzankov, Tz., Sv. Stankova, R. Iliev, I. Mitkov. 2017.** *Modern methodological aspects of the regional morphostructural analysis.* SocioBrains, Issue 32, April 2017, 118-122.
6. **Stankova, S., Ts. Tsankov, B. Mavrudchiev. 2017.** *Obsta geologiya i geomorfologiya.* Izdatelstvo „Grafika 19” Sofiya, 144 p. ISBN 978-954-9764-38-3
7. **Tzankov, Tz., R. Iliev, Sv. Stankova, I. Mitkov. 2018.** *The Bulgarian continental microplate morphotectonic position in the eastern part of Balkan Peninsula.* SocioBrains, Issue 42, February 2018, 282-302; ISSN 2367-5721.
8. **Tzankov, Tz., Sv. Stankova, R. Iliev, I. Mitkov. 2018.** *Late Quaternary morphostructural generations in the eastern part of the Balkan Peninsula.* SocioBrains, Issue 41, 188-197.
9. **Tzankov, Tz., S. Stankova, R. Iliev, I. Mitkov. 2018** *Complex morphostructural passages in the eastern part of Balkan Peninsula.* International Scientific Conference “Smart Geograpy” – 100 Years Bulgarian Geographical Society, 2-4 November 2018, Sofia, Boou of abstracts, ISBN 978-954-07-4547-3, “ St. \ Kliment Ohridski” University Press, 47-53.