РЕЗЮМЕТА НА НАУЧНИТЕ ПУБЛИКАЦИИ ВКЛЮЧЕНИ В СПРАВКАТА ЗА СЪОТВЕТСТВИЕ С МИНИМАЛНИТЕ, НАЦИОНАЛНИ И ИНСТИТУЦИОНАЛНИ ИЗИСКВАНИЯ

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за участие в конкурс за професор по Професионално направление 4.4. Науки за Земята, научна специалност „Методи и техника на геоложките изследвания (Триизмерно геоложко моделиране и ГИС)“, Минно-геоложки университет „Св. Иван Рилски“, София, обявен в ДВ, бр. 37 от 02.05.2025 г.

4.1 Dimitrov I., M. Panayotova **D. Sachkov**. 2009. Calcrete in Southeast Bulgaria - a study in progress – In: *SGEM 2009: 9th International Multidisciplinary Sci. Conf. Conference proceeding volume II*, 457-464. ISSN1314-2704

Abstract: A horizon of carbonate minerals underlies the organic soils of the Thracian plane. This horizon bas irregular thickness, density and mineral composition. In the world scientific literature, such horizons are usually described as pedogenic calcretes. The growth of the carbonate layer depends on many factors; among them are the global climate change, the acidity of the atmospheric precipitates and the agricultural practices. The carbonate layer is very significant to the biological productivity of the soil. It tends to grow in displacive or replacive manner, thus destroying the fertile organic layer. Soils developed on the top of a thick calcrete are usually deprived of nutrients. In the arable lands of the Thrace plane the calcrete is outcropping on many places, thus rendering the land unsuitable for intensive agriculture. In Bulgaria, the calcrete is not studied in the context of the world experience. In order to increase the awareness among the public, to improve scientific understanding of the problem and to evaluate the magnitude of calcretization, as well as to propose tools to confront this problem, a multidisciplinary project commenced at the University of Mining and Geology in Sofia.

4.2 Dimitrov I., B. Valchev, **D. Sachkov**, M. Panayotova, 2011. Sedimenthological response to postglaciation climate change in Southeast Bulgaria. – In: *International Multidisciplinary Sci. Conf. SGEM 2011.*Conference proceeding volume II, 259-264.

Abstract: The most recent glacial period span in the interval 110,000 to 10,000 years ago. Recent geomorphologic studies in the Eastern Thracian plane have shown significant change in the sedimentation rates since the Younger Driass (between 10,800 and 9500 BC), which may provide a new inside on the climatic evolution of the region. It was found that all local rivers are in an aggradation phase, depositing up to 3 m thick mudstone deposits on top of a colder climate's well-washed, coarse sandstones. The aggradation resulted in sediments covering or eroding some human settlements dated 1 500 - 1 200 BC, which originally were built above the flooded river terraces but now are found in the lowest flooded terrace.

4.3 Valchev, B., H. Dimitrov, **D. Sachkov**, S. Juranov. 2018. New data on the Dvoynitsa Formation distribution in the onshore part of the Dolna Kamchiya basin based on 3D lithological modeling. – *Compt. Rend. Acad. Bulg. Sci*., 71, 12, 1652–1656.

Abstract: Based on primary lithological data derived from 82 individual borehole sections and interpretation of 11 seismic profiles from the onshore part of the southern board of the Dolna Kamchiya basin, which is a part of the Southern platform zone of the Moesian platform, three formal units building up the Ypresian–middle Lutetian Dvoynitsa Formation are recognized – the ArmeraMember, the Gebesh Member, and the Goritsa Member. They have been initially described in the Eastern Balkanides and include entire spectrum of turbiditic deposits. For visualization of their spatial relationships and clarifying the internal structure of the Dvoynitsa Formation, a 3D lithological model is created. It demonstrates the highly variable time and spatial relationships between the three members and proves that they are of various stratigraphic position in the Dvoynitsa Formation volume.

4.4 Valchev, B., **D. Sachkov**, S. Juranov. 2019. Paleogene lithostratigraphy in the Varna Plateau (Northeastern Bulgaria): a new view based on 3D modeling. – *Rev. Bulg. Geol. Soc., 80*, 1, 41–53

Abstract. On the basis of primary lithological data derived from 35 boreholes' sections, from the northern, eastern, and southern part of the Varna Plateau, a 3D lithostratigraphic model of the Paleogene rocks was created in purpose to elucidate the spatial distribution and relationships of the Paleogene lithostratigraphic units. The Paleogene succession in the area of modelling includes six formal lithostratigraphical units, as follows: the Komarevo Fm. (Thanetian), the Beloslav Fm. (Ypresian), the Dikilitash Fm. (Ypresian), the Aladan Fm. (Ypresian), the Avren Fm. (uppermost Ypresian–lowermost Priabonian?), and the Ruslar Fm. (Oligocene). These units are easily recognizable as the lowermost four of them were visualized as separate bodies in the model. Due to their high lithological variety, both the Avren and the Ruslar Fms were subdivided into three individual packages: marly limestone, clayey, and marly; clayey-sandy, marly and sandy-clayey package, respectively. The model shows that the Dikilitash and the Aladan Fms, the marly package of the Avren Fm., as well as the sandy-clayey package of the Ruslar Fm. are distributed in the entire area of modelling, while the other bodies are present more restrictedly.

4.5 Sinyovski, D., **D. Sachkov**, I. Tsvetkova, N, Atanasova. 2020. Geomorphosite Characterization Method for the Purpose of an Aspiring Geopark Application Dossier on the Example of Maritsa Cirque Complex in Geopark Rila, Rila Mountain, SW Bulgaria. – *Geoheritage volume 12*, Article number: 26 (2020)

Abstract: Rila Mountain in Southwest Bulgaria is the highest mountain on the Balkan Peninsula. During the Pleistocene ice ages, large ice shields covered higher parts of the mountain forming cirques and through glacier valleys. Maritsa Cirque Complex is the through head of one of the most powerful glaciers, carved out in the mountain. Since it was nominated for a geosite of esthetic and scientific value within Geopark Rila, in order to improve, precise, and unify the method of

characterization and presentation of geomorphosites in alpine environment, it was chosen as an example description to serve as a model for characterization of the other geomorphosites in the geopark. Maritsa Cirque Complex is well outlined in its natural boundaries on an area of 5.29 km^2 including five composite cirques: Maritsa, Trionite, Preslap, Malak Bliznak, and Mancho. The cirque complex is incised in the Eocene granite of theMusala Body of the largest batholith on the Balkans – the Rila-West Rhodopes Batholith. The Maritsa Cirque is the deepest Rila's cirque with a diameter of 1500 m and displacement of 572 m between its bottom and the highest peak Musala (2925 m). In the middle of it, a younger cirque is incised with a diameter of 700 m, in which two tarns (Maritsa Lakes) are formed. The other cirques are smaller and higher, hanging over the main valley. The glacial and post-glacial deposits are represented by bottom moraines and supraglacial scree slopes, representing clusters of angular granite blocks and boulders on the slopes of the cirques and glacier valley. There are large scree cones at the base of the avalanche furrows on the cirques walls which are the product of frost weathering in the active periglacial alpine belt of Rila. The cirque complex is deeply incised into the Early Miocene Kapatnik denudation surface, the highest Rila's peneplain elevated at 2400 m above sea level, which shaped the rounded Rila's ridge before the Ice Ages. The present slope of this surface in Zavrachitsa area shows that the highest peak of Rila during the Pleistocene was just above theMaritsa Cirque and the surrounding peaks – Musala,Maritsa Chal,Mancho, and Twin Peaks – were situated on its slopes. The reconstruction of the Pleistocene paleorelief based on a simple GIS analysis of the modern relief shows that the height of the dome-shaped Rila's top peak Paleo Musala before the Pleistocene glaciations was more than 3000 m. Easily accessible and well-preserved glacial and post-glacial landscapes provide an excellent opportunity for demonstrating the geological processes and destructive glacial activity that shaped the highest mountain on the Balkans. The continental significance of this geomorphosite is complemented by the remarkable petrographic diversity of the granitoids of the Rila-West Rhodopes Batholith and metamorphic rocks contained therein, intersected by numerous pegmatite, aplite and quartz veins, vein-like granite

bodies, diorite, and granite porphyry veins, suitable for illustrating crystallization process, magmatic/metamorphic structures, and textures and demonstrating the principle of the crosscutting relationships in geology. Standard geosite's characterization in the form of scientific dossiers, including the most important information about the genesis and geoconservation features, will provide a reliable basis for estimation and comparison of their individual merits necessary for inclusion in the geosites inventory of Geopark Rila. It will contribute to the assessment and promotion of the geosites through development of itineraries inking geosites in alpine environment with appealing information panels containing well-interpreted scientific information directed to the general public.

4.6 Sachanski, V., B. Valchev, **D. Sachkov**, G. Angelov. 2023. Silurian graptolite sites in Bulgaria: Geological Settings and Geoconservation Value. *Geoheritage* 15, 117 (2023). https://doi.org/10.1007/s12371-023-00884-z

Abstract: Seven exceptional paleontological graptolite sites of Silurian age located in the Srednogorie Zone (the Svoge Unit and the Lyubash-Golo Bardo Unit) and the Moravo-Rhodope Zone (the Morava Unit) of the Alpine Orogenic Belt in Western Bulgaria are described. The graptolitic deposits include predominantly thin-bedded shales referred to 4 formal lithostratigraphic units in the Svoge Unit, and one informal lithostratigraphic unit in both the Lyubash-Golo Bardo and Morava units. This article provides a historical review of the foundation and description of the graptolite sites thus providing a better understanding of their historical value for stratigraphy and the geological evolution of this area during the Silurian. An analysis of their geotourism potential and geoconservation value, according to the new indicative criteria highlighting the specific characteristics of fossil sites, is also given.

4.7. Zareva E., V. Sachanski, L. Metodiev, B. Valchev, **D. Sachkov**, M. Slavchev, D. Yanev. 2024. Iskar Gorge and Ledenika cave – a brief overview. – *in: Geologica Balc*., 53, 3, 3-11 https://doi.org/10.52321/GeolBalc.53.3.3

Abstract. The Late Paleozoic and Mesozoic sequences in the Svoge, West Balkan and Fore-Balkan units (Western Bulgaria) are exposed in eight points. Most of the points are within the area of the Iskar Gorge. At point 1, SE of the village of Redina on the road to Svoge, the rocks of the Late Carboniferous Svoge Formation can be observed – terrigenous sediments of alluvial-limnic character with preserved megaflora. Triassic and Jurassic sequences are traced in the area of point 2 near the village of Zasele. Point 3 is in Triassic sediments and provides a view from the east of the Upper Carboniferous diorites of the Petrohan intrusion. Karst processes are developed in some sections of the Iskar Gorge and caves of different sizes can be seen. One of them is the Temnata Dupka Cave (point 4), which is formed in the Middle Triassic rocks of the Iskar Carbonate Group. In the area of the village of Cherepish (point 5), the lower part of the Lower Cretaceous Vratsa Urgonian Group (Cherepish Formation) is exposed. The upper level of the Vratsa Urgonian Group can be traced in the next point 6, where the geological phenomenon Ritlite (Lyutibrod Formation) is situated. In the area of the village of Chelopek (point 7), a continuous section between the Cretaceous and Paleogene is observed. Southwest of Vratsa, at point 8, the Ledenika Cave is revealed, located in the Upper Jurassic–Lower Cretaceous carbonate sediments of the Gintsi Formation.

7.1 Димитров, И., **Д. Съчков**, Б. Вълчев, К. Василева. 2010. Геохимични особености на калкретизираните площи от Тунджанското понижение, Югоизточна България. – В: *Сб. разширени резюмета „Геонауки 2010*", Бълг. геол. д-во, С., 29-30.

Резюме: В Източнотракийската низина, непосредствено под почвения слой и като вместени тела сред плиоценските (неогенски) седименти, се срещат масивни акумулации от карбонатни минерали. Най-голямо площно разпространение и вероятно най-голяма дебелина тези отложения имат в Тунджанското структурно понижение (Савов, 1983; Ангелова и др., 1991). В литостратиграфски аспект в българската геоложка литература тези карбонатни акумулации са описвани като Дугановски член на неогенската Елховска свита (Коюмджиева и др., 1984) и като Пръстнишка свита с

еоплейстоцен-плейстоценска възраст (Ангелова и др., 1991; Ангелова, 1992). Те носят всички характерни черти на континентални хемогенни седименти, известни в световната литература като калкрет или каличе.

С цел количествено геохимично характеризиране на карбонатизираните почви в осем представителни локалитета (полигони) бе проведено инструментално геохимично картиране с отчитане на киселинността на средата (pH), електропроводимостта и съдържанието на главните хранителни йони.

Между измерените почвени параметри се наблюдават следните корелационни връзки: електропроводимостта и почвената активност (съдържането на хранителни йони) имат близко пространствено разпределение, като високата проводимост съответства и на висока активност; в калкретизираните участъци стойностите на pH са значително по-високи от тези в участъците, където не се наблюдава карбонатна минерализация; като цяло, почти за всички полигони, изолиниите на проводимостта и киселинността се пресичат; наблюдава се припокриване на полетата за киселинност и проводимост в интервала, съответстващ на плодородни почви, тоест областите с pH между 6,5 и 7,3 и областите с активност между 0,2 и 0,5 приблизително съвпадат; в областите с максимално високи стойности на pH, обусловени от карбонатна минерализация, общото съдържание на хранителни вещества намалява, като проводимостта е или твърде малка, или твърде голяма.

7.2 Съчков, Д., Синьовски, Д. 2010. Каньонът на река Дряновска, Габровска област. – *Годишник на МГУ, Том 53, Св. I, Геология и геофизика*, 119-124

Резюме: Каньонът на река Дряновска се намира на 4 km западно от гр. Дряново, около Дряновския манастир. Реката пресича варовиковото плато “Стражата”, което попада в ядрото на голяма синклинална гънка, изградена от ургонски варовици. Каньонът е с дълбочина над 250 m, като долните по-полегати части на склоновете са сред скалите на Камчийската и Горнооряховсата свита, а горните 150 m представляват скален венец от

варовиците на Крушевската и Еменската свита. По билото на платото се разкриват теригенните скали на Българенската свита. Районът на река Дряновска притежава изключително красив и впечатляващ ландшафт. Във фокуса на тази невероятна природна красота стоят скалните венци, каньона на самата река и ждрелото на нейния ляв приток река Андъка, чиито води образуват каскада от водопади. Двете реки са изсекли три скални венци – "Стринава" от изток, "Поличките" от запад, и "Боруна" от юг. Благодарение на карстификацията в цялата площ се срещат разнообразни скални образувания, сред които над 35 пещери и повърхностни карстови полета. По-значими от тях са пещерата Бачо Киро – 3500 m и пещерата Андъка – 5000 m. Освен своята природна красота, те притежават висока научна стойност. В дебелите на места над 5 m културни пластове са открити повече от 6000 археологически находки. Пещерата Бачо Киро е една от първите в България, пригодени за туристически посещения, а пещерата Андъка е защитена заради популациите на редки и защитени видове прилепи и друга фауна.

7.3 Димитров, И., **Д. Съчков**, Б. Вълчев, К. Василева. 2010. Геохимични особености на калкретизираните площи от Тунджанското понижение, Югоизточна България. – *Сп. Бълг. геол. д-во, 71*, 1–3, 23–37.

Резюме: В Тунджанското понижение, което е част от Източнотракийската низина в Югоизточна България, се разкриват съвременни карбонатни почви, под които като вместени тела се срещат калкретни хоризонти. Понижението е запълнено от слабо литифицирани моласови отложения с неогенска и кватернерна възраст. Досега в България са направени малък брой изследвания за произхода и еволюцията на калкретните отложения, които са описвани като инфилтрационни варовици с различна стратиграфска позиция. Карбонатните почви се разкриват в земеделските площи, оказвайки значително влияние върху почвеното плодородие. Последните изследвания показват, че калкретът и по-слабо уплътнените карбонатни почви са с повишено съдържание на магнезий. Установени са два генетични типа калкрет – педогенен и калкрет, свързан с подземните води. Сезонните

изменения в продуктите на карбонатното равновесие в почвите и водите показват, че карбонатоотлагането не е непрекъснато във времето, а е повлияно от глобалните изменения в условията на средата в миналото и настоящето. При настоящото изследване е проведено дистанционно спектрално картиране на карбонатната минерализация, базирано на данните на сателитния инструмент ASTER за изследвания район. В подкрепа на дистанционните методи е извършено инструментално полево измерване на три геохимични параметъра – почвена киселинност, електропроводимост на почвата и съдържание на главните хранителни йони. Направен е опит за изготвянето на геохимични карти на избрани полигони с различна геоморфоложка позиция. Резултатите от полевите измервания показват, че високите стойности на pH са свързани с карбонатните почви. Електропроводимостта и pH стойностите на почвата не са пряко свързани, вероятно поради електросъпротивителните свойства на карбонатни минерали като калцита и доломита, въпреки че почви с повишено съдържание на неорганичен компонент биха демонстрирали повишена електропроводимост. Като цяло карбонатните почви са с понижено плодородие, поради по-ниското съдържание на хранителни елементи.

7.4 Стойков, Ст., **Д. Съчков**, Ив. Димитров. 2011. Пример на гънкова интерференция в Дизбаз-филитоидната формация от Софийска стара планина и нейното значение за практиката на геоложкото проучване. - *Годишник на МГУ, Том 54, Св. I, Геология и геофизика,* 67-72

Резюме: В тази работа се описва гънкова интерференция в находище на метабазалти, разположено в долината на р. Искър, северозападно от гара Бов. В находището се разграничават лежащи гънки със субхоризонтални осови повърхнини и изправени гънки с осови повърхнини с посоки СЗ-ЮИ и СИ-ЮЗ. Наслагването на последните две гънкови геометрии води до формиране на инферентационна картина от тип купол и басейн. Сложната гънкова интерференция затруднява търсенето и проучването и налага провеждането на детайлен структурен анализ с цел събиране на допълнителна информация

за тримерното разпределение на скалните тела. Наличието на сложна тримерна повърхност в горнището на полезното изкопаемо изисква прилагането на нови компютъризирани методи за изчисляване на запасите.

7.5 Dimitrov I., M. Panayotova, **D. Sachkov**. 2011. Geological conditions for prevention of nitrate pollution of potable waters in agricultural areas of Southeast Bulgaria. – *Geological Research Abstracts, vol.13*, European Geosciences Union General Assembly 2011, Vienna, 3-8 April.

Abstract: This work presents results of eighteen months monitoring study of the hydro-chemical parameters of ground waters from the Tundja basin in Southeast Bulgaria. During the study a variety of hydro-chemical parameters were measured and between them the amount of nitrates in potable water sources was recorded. It was found that the concentration of nitrates is elevated for the entire region and at some springs it is far above the acceptable values, posing significant health risk for the local population. The main source of nitrates appears to be the agricultural practice which is dependent upon fertilization. With far less significance but still noticeable is the pollution from cattle and pig farms, which although equipped with wastewater treatment facilities still release pollutants. Thirteen sample sites were studied, which are located in various geological and geomorphological environments. In these sites the measured nitrate amount varies according to the season but usually it is in the range 50 – 550 ppm. It was found that in some geological environments the pollution is less than in other. The main factors that affect the amount of nitrates in the water were found to be as follows: 1. The distance (separation) between the recharge zone where nitrates accumulate and the point of discharge; 2. The status of the recharge zone e.g. fertilized farmland, uncultivated grassland, forest, etc. 3. The elevation difference (the gradient) between the area of water pollution and the discharge point; 4. The type of aquifer, which collects and conducts the waters, e.g. porous aquifer, fracture aquifer, karst aquifer; 5. The geometry of the aquifer, e.g. factors that determine the internal path of waters like clay or caliche screens, etc. With about 540 mm rainwater per year, the region is relatively dry, so the selection of water sources is very limited.

Another factor that cannot be controlled is the type of aquifer. About 90% of the wells are located in the Quaternary river terraces and the rest are situated in karst aquifers in Triassic dolomitic marbles. Isolated springs are fed by fractures in Paleozoic granites. The only factor that appears in human control is the status of the land in the water accumulation zone. In this aspect significant conclusions were made during the study. In case of porous aquifer located in Quaternary or Pliocene sediments it appears, that distance of at least 300 m between the well and the fertilized land is obligatory in order to ensure natural purification and decrease of the nitrate content to the acceptable level of around 50 ppm. In case of karst aquifers, the clearance zone should be more that 500 m. At present requirements exist with respect to clearance zones around potable water wells in Bulgaria, but they are very modest regarding the proximity to the fertilized lands. Many wells are located at a distance varying between 50 and 150 m from intensely fertilized lands. At least from the point of view of nitrate pollution these clearance zones are insufficient.

7.6 Съчков Д., Кр. Кършева, Ив. Димитров, Н. Добрев. 2012. Оценка на блоковостта на кристалинни скали на примера на находище Гранитово, област Ямбол. – *Инженерна геология и хидрогеология*, Кн. 26, 45-57

Резюме: Находище Гранитово се намира в централната част на Гранитово-Черноземския плутон в Източен Сакар, Югоизточна България. Плутона е датиран в интервала 79-84 м.г. ± 4 м.г. В находището не се наблюдават аплитови и пегматитови жили. Локално се наблюдава слаба плоско-паралелна подредба на плочести минерали. Тъй като тези скали са внедрени след ранно-алпийските тектонски събития то те са съвсем слабо деформирани. Скалите от находището са гранодиорити от нормалната калциево алкална редица. Три систематични пукнатинни системи определят размера и формата на структурните блокове в находището. Две от пукнатинните системи имат морфология и кинематика на пукнатинни системи на срязване. Третата е с полегат наклон и е формирана от усилия на опън. Пукнатините от тази система са интерпретирани като плоскости на

ексфолиация, свързани с гравитационната декомпресия на масива по време на неговата ексхумация. Страната и наклонът на пукнатинните системи са както следва: 320°/86°, 64°/87° и 15°/12°. Отстоянията между пукнатините от дадена система са измерени по посока на пукнатина следа, видима в плоскостта на друга пукнатина. Измервани са от разстояние с помощта на високоточен геодезически уред. Те са обработени статистически чрез построяване на хистограми. Статистически установените най-вероятни отстояния между пукнатините определят формата и размерите на структурните блокове. Хистограмите указват за значителна вариация в отстоянията, която се изразява в наличието на блокове с различни размери, отделени от пукнатините. Установи се, че средният размер на структурния блок в находището е около 5,9 m^3, тогава когато в изчисленията са включени всики пукнатинни отстояния, включително и тези по малки от 1 m. Средният размер на блока, формиран от пукнатини с отстояния над 1 m, е 8,8 m3. Очаква се приблизително 77% от блоковете, добити в находището, да бъдат с обем над 1m^3.

7.7 Желев В., Б. Вълчев, Кр. Кършева, **Д. Съчков**. 2012. Геотопите „Устието на река Велека“ и „Силистар“ – един естествен геопарк по палеовулканология. - *Годишник на МГУ, Том 55, Св. I, Геология и геофизика*, 21-29

Резюме:. Българското черноморско крайбрежие на юг от Ахтопол предоставя отлични възможности за провеждане на теренни наблюдения върху къснокредните вулкански и вулканогенно-седиментни комплекси разкриващи се в стръмните крайбрежни откоси и включени в обхвата на два геотопа - "Устието на река Валека" и "Силистар". Първият геотоп включва част от крайбрежната ивица между Ахтопол и Синеморец, в която могат да се наблюдават разнофациалните продукти на Папийския и Ахтополския палеовулкан (лавови потоци от базалти, пилоу-лави от алкални трахити, хиалокластити, еруптивни брекчи, дайки и силове, туфи, туфити и пр.), разместени на места от разломи. В южния край на геотопа, при устието на р. Велека, се намира изключително красива пясъчна коса. Вторият геотоп

обхваща крайбрежната ивица на юг от Синеморец. Тук могат да се наблюдават непрекъснати разкрития от разреза на Горната Креда, включващ вулкански и вулкано-седиментни скали, процепени от Силистарския интрузив, нарушени от разломи и орудени на места с медна минерализация. Ландшафтът е изключително красив, с няколко малки залива с плажове, стръмни фиордообразни заливи и специфична преходно-средиземноморска растителност. Съгласно класификацията на геоложките феномени, двата геотопа попадат в групата на обектите с естетическа, научна, образователна и изследователска стойност, а според оригиналната българска методика за оценка на геоложки феномени те се отнасят към обектите с регионално и континентално значение. Настоящата статия има за цел да даде описания на два геоложки маршрута между Ахтопол и Силистар, да разшири обхвата на двата геотопа и да положи основите на превръщането на южното българско черноморско крайбрежие в един естествен геопарк по палеовулканология.

7.8 Вълчев, Б., И. Димитров, **Д. Съчков**, К. Кършева. 2012. Геоложкият феномен „Лековитите скали" при с. Скалица, Ямболска област – *Год. МГУ, 55, св. I – Геол. и геофиз*., 16-20

Резюме: Геоложкият феномен „Лечебните скали" се намира в южната част на с. Скалица, Ямболска област в най-високата част на местността „Баира", в близост до вододайната зона. Обектът включва най-северните разкрития на Манастирския плутон, изградени от габра и габродиорити. Феноменът представлява неголям естествен ансамбъл от безразборно разположени блокове с височина до 1,5m, които, според местните предания, при краткотраен досег влияят положително на здравния статус на хората. Според класификацията на геоложките феномени „Лековитите скали" попадат в групата на обектите с духовна и идентична стойност, а според оригиналната българска методика за оценяване на геоложките феномени те се отнасят към феномените с местно значение. Близостта до областния център гр. Ямбол, разположените на юг, в района на тополовград геоложки феномен „Черните камъни", тракийско светилище и антична крепост „Палеокастро", както и

селището от Микенския период край с. Драма, са отлични предпоставки за превръщането на района в туристически обект.

7.9 Б. Вълчев, **Д. Съчков**, К. Кършева. 2013. Геоложки феномени в Базовския дял на Врачанска планина. – *Год. МГУ, 56, св. I – Геол. и геофиз*., 119-127

Резюме Врачанска планина, заемаща преходно положение между Предбалкана и Главната Старопланинска верига, е известна с геоложките феномени „Ритлите“, „Вратцата” и „Лакатнишки скали”, които са включени в „Регистъра и кадастъра на геоложките феномени в България”, както и с описания по-късно геоложки феномен „Черепишки скали“. Базовският дял на планината, отделен от реките Лева (от северозапад) и Златица (от югозапад), предоставя отлични възможности за наблюдаването и изучаването на разнообразието от геоморфоложки обекти, изваяни в триаските, юрските и долнокредните карбонатни скали. Някои от тях са описани като природни забележителности или защитени местности в рамките на природен парж "Врачански Балкан" и резервата "Врачански карст”. Настоящата статия има за цел да популяризира някои от най-типичните геоложки феномени в Базовския дял на планината – скалните венци, оформени в скалите на Могилската (Оленек-Аниз) и Милановската свита (Ладин) в източния склон на Згориградската котловина, както и в скалите на Гложенската (Титон) и Черепишката свита (Титон-Барем) в североизточния склон на Врачанска планина, каменните гъби, изваяни в скалите на Бабинската свита (Аниз) източно от с. Згориград, малките земни пирамиди, образувани в пролвиалните отложения (Копоцен) в източните покрайнини на същото село, многообразието от скални пирамиди, скални колони и отвесни скални стени в Черепишката саита. Съгласно класификацията на геоложките феномени описаните геоморфоложки забележителности попадат в групата на обектите с естетическа стойност, а според оригиналната българска методика за оценка на геоложки феномени те се отнасят към обектите с локално и национално значение.

7.10 Dimitrov I., B. Valchev, **D. Sachkov**. 2013. Thickness of the Holocene aggradational package in the valleys of rivers Fakiiska and Yavuz Dere, SE Bulgaria, in the light of the hypothesis for abrupt change of the Black Sea level during the Holocene. - In: *Proceedings „Geoscience 2013*", BGD, 87-88.

Abstract: During geological and geomorphological mapping in SE Bulgaria it was found that a package of silty clays, 2, 5–3 m thick, has covered two eneolithic settlements. One, located in the valley of Tundzha river near the village of Konevets, and the other in the valley of Kalnitsa river near the village of Drama (Dimitrov et al., 2011). It was concluded that these settlements were situated several meters higher than the river's water level but later they were buried in sediments and at present are located in the flooded terrace. It happened, because of a general rise of the river's erosional bases, accompanied by deposition of an aggradational package (according to models of Walker, 1976; Miall, 1990). The observations of Dimitrov et al. (2011) were made for the Tundzha river system, which is connected to the Aegean basin. It is of scientific interest to compare the shift of the erosional bases of the rivers draining to the Aegean basin with those draining to the Black Sea basin.

South of the village of Drachevo and approximately 13 km from its estuary in the Mandra Lake, which is hydrologically connected to Black Sea, Fakiyska river passes through a deep valley. It was established that the silty clay package is consistent along the entire prospected length (about 1 km) and has an average thickness of 7 m. It is underlain by well washed sands and coarse conglomerates, presumably related to the more humid glacial environment prior to the Holocene.

South of the village of Goliam Manastir, 3.5-kilometer long section of the Yavuz Dere river channel (also Sinapovska river) similar to the channel of Fakiyska river, here the well-washed sands are located under a package of silty clays with an average thickness of about 5 meters. The studied section of the Yavuz Dere however is located about 150 km from the Evros Delta, which discharges the waters of the Tundzha system into the Aegean.

The difference between the two studied sections is that one is located far from the sea and at elevation of about 150 m above sea level, and the other one is close to

the sea and at elevation of about 45 m above sea level. These can explain the small difference in the thickness of the aggradational packages (2 m) but leave no room whatsoever for speculations regarding deeper erosional bases, connected with low sea level for the Black Sea. It appears that the water levels of the Black Sea and the Aegean were very similar during the deposition of the silty clay package, located on top of the well washed sands of the glacial time. Even though in Bulgaria real glacial conditions did not exist, prior to the Holocene dominated much more humid environment, which resulted in distinctive well washed and coarser grained sediments easily recognizable from the overlying silty clays. The relationships described here can be confirmed for all river channels of southeast Bulgaria. They will be published in detail in an extended publication.

7.11 Кършева, К., **Д. Съчков**, Г. Начев. 2013. ГИС анализ на потенциални наводнения в долината на р. Тунджа в района на гр. Елхово – В: *Сб. Разширени резюмета на БГД, 95*, Регионална геология и геофизика. 125-126

Резюме: Настоящото изследване е опит да се покажат в теоретичен и приложен аспект възможностите и резултатите от използването на ГИС анализа и дистанционните методи при изучаване на екологични катастрофи. То е посветено на моделиране на потенциални наводнения по поречието на р. Тунджа чрез софтуерния пакет ArcGIS. Основната задача е да се установят обхватът и интензитетът на тези бедствия в района на гр. Елхово, базирани на сведения за тежки наводнения в миналото, както и определянето на икономическите щети. Факторите, контролиращи речния отток, не са предмет на изследването. Проверен е следният сценарий – покачване на водното ниво от 1 до 6 m над средногодишното ниво на р. Тунджа, причинено от подприщване на моста на реката в югозападната част на гр. Елхово. Използвания от нас метод е базиран на софтуерния инструмент “Surface Difference”, и резултатите посочват, че наводненията не са животозастрашаващи поради сравнително бавното покачване на водите, главно в индустриалната зона, но неизбежно водят до значителни материални загуби.

7.12 Valchev, B., **D. Sachkov**, S. Juranov. 2017. Onshore-offshore lithostratigraphic correlation of the Paleogene in Northeastern Bulgaria based on 3D modeling. – In: *Proc. Vol. "Geosciences 2017*", Bulg. Geol. Soc., Sofia, 101-102. ISSN 1313-2377

Abstract: The Paleogene sedimentary rocks in the north-easternmost part of the territory of Bulgaria, comprising parts of the onshore and offshore sector of the Moesian platform, have been established only by means of boreholes. On the basis of the primary lithological data from the geological reports (kept in the National Geologic Fund, the Bulgarian Ministry of Energy) we recognized seven lithostratigraphic units - Komarevo Fm (Thanetian), glauconititic marker (early Early Eocene), Beloslav Fm (Early Eocene), Dikilitash Fm (Early Eocene), Aladan Fm (Early Eocene), Avren Fm (Early Eocene–Late Eocene), and Ruslar Fm (Oligocene). The purpose of our study is to conduct an onshore-offshore lithostratigraphic correlation based on 3D modeling by involving data from 338 onshore and 4 offshore boreholes. All the units demonstrate constant lithological characteristics throughout the area of their distribution, as the thickness of most of them shows a distinct trend passing from northwest to southeast.

7.13 Dimitrov, I., **D. Sachkov**. 2017. The structural geological approach in the evaluation of the geological losses in the deposits of carbonate rocks – limestones, dolomites and marbles. – *J. Min. Geol. Sci., 60, part I: Geol. and Geophysics*., 45-50. ISSN 2535- 1176

Abstract: The losses represent this part of the geological reserves, which cannot be extracted, or for one or another reason, cannot be sold for a profit. The amounts of the losses in all deposits are different, because of differences in the geological situation and in the technology of extraction and processing. The errors in the evaluation of the losses can result in shortening the life of the deposits. Via the concession contracts, the concessioners are obliged to make payments to the state, which they may not afford to do if the losses are too significant. This paper presents a short review on the problem with the evaluation of the losses in the carbonate

deposits. An evaluation approach is described, which is based on structural geological mapping of the karst-controlling fractures and faults. An example is shown of computer modeling of the karst in a real deposit.

7.14 Valchev, B., **D. Sachkov**, S. Juranov. 2018. 3D lithostratigraphic model of the Paleogene of the onshore part of the Moesian platform on the territory of Northeastern Bulgaria. – *Geologica Balcanica, 47*, 1, 23–36. ISSN 0324-0894

Abstract: The Paleogene sedimentary rocks in the north-easternmost part of the territory of Bulgaria have been penetrated by numerous boreholes. In terms of regional tectonic zonation, the study area is a part of the onshore sector of the Moesian Platform, which partly includes the South Dobrogea Unit and the easternmost part of the North Bulgarian Dome with its eastern slope. The lithostratigraphy of the Paleogene successions consists of six formal units (the Komarevo, Beloslav, Dikilitash, Aladan, Avren, and Ruslar formations) and one informal unit (glauconitic marker). For compiling an overall conception of the regional aspects (lithology, thickness, spatial distribution, and relationships) of the individual lithostratigraphic units and for illustration of their spatial distribution, a 3D lithostratigraphic model based on reinterpretation of individual borehole sections has been created. The model database was compiled by integration of the original lithological data from 338 borehole sections.

7.15 Valchev, B., **D. Sachkov**, S. Juranov. 2018. 3D lithostratigraphic model of the Paleogene in the Varna Plateau. – *Rev. Bulg. Geol. Soc.*, 79, 3, 107–108. ISSN 0007-3938

Abstract: On the basis of primary lithological data derived from 35 boreholes' sections, from the eastern part of the Varna Plateau, a 3D lithostratigraphic model of the Paleogene rocks was created in purpose to elucidate the spatial distribution and relationships of the Paleogene lithostratigraphic units. In terms of the regional tectonic zonation, the area of this study is a part of the onshore sector of the Moesian Platform.

7.16 Valchev, B., H. Dimitrov, **D. Sachkov**, S. Juranov. 2020. A new concept for the Paleogene lithostratigraphy in the onshore part of the Dolna Kamchiya Basin (eastern Bulgaria) on the basis of 3D modeling. – *Geologica Balc*., 49, 2, 59–73.

Abstract: This study is based on primary lithological data from 96 boreholes and lithostratigraphic interpretation of 17 seismic profiles from the onshore part of the Dolna Kamchiya Basin, which belongs to the onshore sector of the Moesian Platform and comprises the south-easternmost part of the Southern platform zone. Nine formal Paleogene lithostratigraphic units were recognized (the Byala, Komarevo, Dvoynitsa, Beloslav, Dikilitash, Aladan, Avren formations, the Dolni Chiflik Member of the Avren Formation, and the Ruslar Formation). For visualization of their spatial relationships and revealing the deep structure of the basin, a 3D lithological model was created. In addition, new data on the lithology, thicknesses and ages of the units were provided.

7.17 Valchev, B., **D. Sachkov**. 2020. Lithological variations of the Avren Formation in the Avren Step. – *Rev. Bulg. Geol. Soc., 81*, 3, 150–152.

Abstract: The Avren Formation was introduced as “Avren marls” (Gočev, 1933) and its rank of formation was determined by Dzuranov and Darakchieva (1986). The chronostratigraphical range of the unit has been determined based on planktonic foraminifera (Dzuranov, Darakchieva, 1986) and nannofossils (Muzilev in: Aladjova-Khrischeva et al., 1983) as uppermost part of the Ypresian–lowermost Priabonian.

The Avren Formation is widespread in Northeastern Bulgaria. It was established in numerous outcrops in the plateaus (Provadia, Varna, Avren) as well as in numerous boreholes in Dobrogea area and the Dolna Kamchiya Basin. Generally, it consists of pale-grey to grey-greenish thin-bedded, pure, sandy or limy marls interbedded in the lower levels with clayey limestones and usually, the unit is considered to be a considerably homogenous succession. The investigations, based on borehole data revealed that the formation demonstrates lithological varieties. In Dobrogea area and in the Varna Plateau it was subdivided into three packages –

marly limestone, clayey, and marly (Valchev et al., 2018, 2019). In the Dolna Kamchiya Basin another subunit, the Dolni Chiflik Member, was defined (see Juranov, 1993), and recently Valchev and Dimitrov (2020) noted that the unit comprises several lithological types.

The present study aims to investigate the spatial distribution and relationships of the lithotypes by creating a 3D lithological model and thus to clarify the internal structure of the Avren Formation in the Avren Plateau. The last is an onshore part of the Moesian Platform.

7.18 Valchev, B., H. Dimitrov, **D. Sachkov**. 2020. 3D lithostratigraphic model of the Paleogene in the Avren Step. – *Rev. Bulg. Geol. Soc., 81*, 3, 147–149.

Abstract: The Palaeogene is widespread in Northeastern Bulgaria, as it is almost entirely covered with Neogene and Quaternary sediments. Therefore, the 3D lithostratigraphic modeling, based on borehole lithological data and stratigraphic (litho- and chrono-) interpretation of seismic profiles, is the only way to reveal and visualize the deep geological structure. The 3D modeling was successfully applied to Dobrogea area, the Varna Plateau and the Dolna Kamchiya Basin, while the lithostratigraphic interpretation of seismic profiles was approbated in the onshore and offshore part of the Dolna Kamchiya Basin.

In terms of the regional tectonic zonation, the Avren Plateau includes the southern half of the Avren Step. The last is a part of the eastern slope of the North Bulgarian Dome, which is also known as Varna Monocline, belonging to the Moesian Platform. The studied area also comprises the southern part of the Varna Valley south of Varna and Beloslav Lakes.

On the basis of primary lithological data derived from 53 boreholes' sections and these after the lithostratigraphic interpretation of 5 seismic profiles, a 3D lithostratigraphic model of the Palaeogene rocks was created in purpose to elucidate the spatial distribution and relationships of the established lithostratigraphic units.

7.19 Сачански, В., **Д. Съчков**. 2021. Палеозойски траверс през Западния Балкан. – *Сп. Бълг. геол. д-во, 82*, 3, 124–125. ISSN 0007-3938

Резюме: Във връзка с организирането на XXII конгрес на КБГА през 2022 г. в България, разработен и предложен маршрут за една еднодневна екскурзия през пре-Вариските палеозойски скали в Западния Балкан. Машрута включва 11 точки, като се тръгва от с Врачеш, където се разкриват и най старите скали от маршрута - горен Арениг и се достига до с. Царичина, където да се види и флиша на Кътинската свита.

7.20 Rizova. R, **D. Sachkov**, G. Angelov. 2022. "Morphodynamics of slope processes in the Viskyar Mountain,SW Bulgaria".- *Сп. Бълг. геол. д-во*, 83, 3, 307-310 https://doi.org/10.52215/rev.bgs.2022.83.3.307. ISSN 0007-3938

Abstract: This article focuses on the dynamics of slope processes and the characteristics of their deposits in the Viskyar Mountain, SW Bulgaria. For the purpose of the study, 4 key sites with a different lithology, exposition, slope and altitude were observed. The results are gathered from 2-months period of monitoring.

7.21 Nikolova, V., **D. Sachkov**, R. Rizova. 2022. Morphometric indicators for erosion and debris flows propagation: a case study of the river Byuyukdere watershed, northwest of Kardzhali town (Bulgaria). - *Сп. Бълг. геол. д-во, 83,* 3, 303-306 https://doi.org/10.52215/rev.bgs.2022.83.3.303. ISSN 0007-3938

Abstract: Morphometric features of the topographic surface are one of the main prerequisites (conditioning factors) for the occurrence of erosion and debris flows. The following morphometric parameters of the river Byuyukdere watershed were calculated in the current study: basin area, basin relief, basin length, relief ratio, Melton's index, slope and stream power index. The analysis shows higher susceptibility to erosion and debris flows of the 1st and 2nd order basins (Strahler's method). The elevated values of the stream power index indicate an intensive

erosion in the lower part of the river Byuyukdere watershed, which is related to the volcanogenic-sedimentary rocks and the faulted nature of the river valley. The morphometric analysis was performed in ArcGIS Pro on the base of a 12.5 m resolution digital elevation model.

7.22 Valchev, B, H. Dimitrov, **D. Sachkov**. 2022. 3D chronostratigraphic model of the Paleogene in the onshore part of the Dolna Kamchia Basin (Eastern Bulgaria). - *Rev. Bulg. Geol. Soc., 83*, 2, 29-33 https://doi.org/10.52215/rev.bgs.2022.83.2.29. ISSN 0007-3938

Abstract: This study is based on biostratigraphic data from 53 boreholes and chronostratigraphic interpretation of 16 seismic profiles from the onshore part of the Dolna Kamchia Basin (DKB). Seven Paleogene chronostratigraphic units were recognized (the Danian, Thanetian, Ypresian, Lutetian, Bartonian, Priabonian stages, and the Oligocene Series). For visualization of their spatial distribution and relationships, a 3D chronostratigraphic model is created.

7.23 Ризова Р., **Д. Съчков**, В. Сачански. 2023. Съвременни морфодинамични процеси и наслаги в Западно Средногорие и Краище.- *Сп. Бълг. геол. д-во*, 84, 3, 345-348

Abstract: The present paper addresses investigation of modern morphodynamic processes, which lead to relief modelling on one hand and the formation of new landforms and deposits on the other. Erosional, denudational and gravitational landforms and deposits were observed in three key areas in the Zavalska mountain (Western Srednogorie), Strazha and Lyubash (Kraishte). The aim of this study is to trace the intensity of exogenous landforming processes, to characterize the deposits and elucidate the connection between the geological base, the topography and the local hydroclimatic conditions for their genesis and dynamics. To achieve this goal, field and laboratory methods were employed, as well as data from an automatic weather station in the territory of the Breznik municipality. Despite the

short observation period of three months, the data reveal significant dynamics, rendering the selected study areas interesting for future research.

7.24 Ivanov, I. D., **D. Sachkov**. 2023. A special case of mechanical instability in the northern slope of the Rila mountain in southeast Bulgaria. Description of the processes and social significance. *Annual of the University of mining and geology "St. Ivan Rilski"*, 66/2023, 144–149. https://doi.org/10.5281/zenodo.8334617

Abstract: The Bistritsa River in the Dupnitsa district, Southwest Bulgaria, supplies potable water for 20 settlements. The potable water is diverted from the river in a narrow gorge south of the village of Bistrica. The gorge is situated in fresh gneisses with significant strength and elasticity. Due to the elastic relaxation of the rock mass and tectonic stresses, joints of very unfavorable orientation for the overall stability of the slope have been developed. The general slope is around 35° but locally it is much steep*er* or vertical. On the other hand, the joint friction in the gneisses varies between 23° in wet conditions and around 29° in dry conditions, so this slope is naturally unstable. Toppling, wedge sliding, and sliding on a singular plane all act on this slope simultaneously. A geotechnical solution for the protection of the water catchment installation is urgently needed, yet it may be impossible to protect the facility permanently. Socially acceptable options for accident prevention or mitigation are discussed in short in this paper.

7.25 Sachkov, D., R. Rizova, **D. Strahilov** 2024. Remote sensing of slope processes in the southeastern part of the Viskyar Mountains – in: *Rev. Bulg. Geol. Soc., 85*, 3, 289-292 https://doi.org/10.52215/rev.bgs.2024.85.3.289

Abstract: This work presents the possibilities of joint use of UAV and GIS in the study of morphodynamical processes. A comparison of the results of direct field measurements with remote sensing using UAV is presented here. Point clouds and DTMs were studied to establish the degree of reliability of remote sensing when comparing periodically collected data and the terrain changes, they reflect. The goal is to prepare a working model that can be useful for scientific research and monitoring of infrastructure facilities.

7.26 Sachkov, D., B. Valchev. 2024. Web GIS systems for data collection and promotion of Bulgarian fossil deposits with high scientific and museum significance – in: *Rev. Bulg. Geol. Soc., 85*, 3, 329-332 https://doi.org/10.52215/rev.bgs.2024.85.3.329

Abstract: This work presents the potential of GIS technologies for collecting, processing, visualizing and promoting geospatial data on the example of the development of a Web-based system for public access to information on the geoconservation significance of Bulgarian fossil deposits of high scientific and museum value in order to raise public awareness of the role of Bulgarian geological heritage for sustainable regional development.

7.27 Valchev, B., H. Dimitrov, **D. Sachkov**. 2024. New data on the spatial distribution of the Paleogene lithostratigraphic units in the offshore part of the Moesian Platform southeast of the town of Varna – in: *Rev. Bulg. Geol. Soc., 85*, 3, 81-84 https://doi.org/10.52215/rev.bgs.2024.85.3.81

Abstract: The study is based on lithostratigraphic interpretation of three seismic profiles and reinterpretation of five borehole logs in the offshore part of the Moesian Platform southeast of the town of Varna. Three formal lithostratigraphic units were identified – Komarevo Formation (Thanetian), Avren Formation (uppermost Ypresian–upper Priabonian), and Ruslar Formation (Oligocene). New data on the lithology, stratigraphic and lateral relationships, as well as the thickness and internal structure of the units were obtained.

7.28 Valchev, B., **D. Sachkov**. 2024. The nummulitids' deposit at the Mizerlaka locality south of Obzor (Burgas District, Eastern Bulgaria) – a geosite of high scientific and educational value – in: *Rev. Bulg. Geol. Soc*., 85, 3, 337-340 https://doi.org/10.52215/rev.bgs.2024.85.3.337

Abstract: Rich and diverse assemblage of reworked nummulitids of latest Ypresian–earliest Lutetian age crops out at the Mizerlaka (Meshelika) locality on

the Black Sea coast 1.5 km south of the town of Obzor, Burgas District. It is hosted in a succession of conglomerates, olistolites of flysh sandstones, volcanic rocks, limestones, calcareous and detritic sandstones, shales, and marls with interbeds and lenses of coarse-grained sandstones and gravels. The fossil deposit is estimated as a geosite of national significance, with high scientific and educational value.

7.29 Dimitrov, I., **D. Sachkov**. 2024. Thickness of the aggradational marine sediments on the Bulgarian Black Sea coast, near Sunny Beach, deposited after the Younger Dryas, based on exploration drilling. – in: Annual of the University of mining and geology "St. Ivan Rilski", 67/2024, 154–159
https://doi.org/10.5281/zenodo.13762726

Abstract: It is believed that after the sharp decline and rise of the Black Sea level between 9000 to 7000 years ago (BP), corresponding to the effects of the Younger Dryas cooling phase, the Black Sea was connected with the level of the World Ocean and moved more or less in accordance with it. However, a New Chernomorian transgression is recorded on the Black Sea shores reaching 4-5 m above present sea level (p.s.l.) in the period 5600–4300 BP (Bronze age), followed by the Fanagorian regression, starting around 2500 BP, that is believed to have dropped to 3 m. below p.s.l. Both indicate significant sea level oscillations. If the archeological data are considered, it is evident that numerous Eneolithic (6800 – 5800 BP) and Early Bronze Age (5600 – 4400 BP) human settlements are now under 6-10 m of water; thus, confusion arises as to the accuracy and completeness of the data published on the sea level. Recent industrial sand exploration project in the Sunny Beach resort, in the Municipality of Necebar, has provided data about the thickness of the aggradation marine sand package deposited on top of a thick compacted clay strata, interpreted to represent the Younger Dryas dry land (approximately 7000 BP) that was subjected to transgressive sedimentation. This thickness of transgressive sediments is 12.5 m found in two boreholes and corresponds to the total Black Sea level rise as inferred by Genov (2016). The drilling has not provided reliable data on local transgression or regression events,

but rather is indicative of constant sea level rise, which more or less corroborates with the archaeological data.

7.30 Valchev, B, **D. Sachkov**. 2024. “3D chronostratigraphic model of the Paleogene in the easternmost part of the Moesian platform (Northeast Bulgaria)”. – in: Annual of the University of mining and geology "St. Ivan Rilski", 67/2024, 135–142. https://doi.org/10.5281/zenodo.13762693.

Abstract: This study is based on a chronostratigraphic interpretation of biostratigraphic data from 102 boreholes from the easternmost part of the Moesian Platform (Northeast Bulgaria) bordering the Black Sea Basin and including the southernmost part of the South Dobrogea Unit and the easternmost part of the North Bulgarian Dome with its eastern slope. Seven Paleogene chronostratigraphic units were recognised (the Thanetian, Ypresian, Lutetian, Bartonian, Priabonian, Rupelian, and Chattian stages). For the visualisation of their spatial distribution and relationships, a 3D chronostratigraphic model was created.

7.31 Valchev, B, **D. Sachkov**. 2024. “Interdisciplinary research for the creation of an interactive database and assessment of the geoconservation potential of fossil deposits of significant scientific and museum value from Bulgaria”. – in: Annual of the University of mining and geology "St. Ivan Rilski", 67/2024, 143-148. https://doi.org/10.5281/zenodo.13762705

Abstract: The project proposes an interdisciplinary approach, new for the Bulgarian scientific community, in the study of fossil deposits as part of the Bulgarian national geological heritage: integration of traditional geological methods (geological mapping, paleontological, stratigraphic, biochronological, geochronological, micropaleontological research) and modern geomorphological and geoinformation methods and techniques for the identification and imaging of fossil deposits of high scientific and museum value, processing, visualisation, and promotion of data. This article reviews the results obtained in the first phase (November 2021–May 2023). Criteria, indicators, and parameters for the

quantitative assessment of specific features of fossil geosites have been defined; an expert map has been compiled for the assessment of fossil geotopes for the purposes of geotourism; 23 sites of high scientific and museum value have been identified, and scientific dossiers have been compiled for 16 of them as a basis for the future register of fossil sites in Bulgaria. A preliminary version of an interactive portal has been prepared.

7.32 Ivanov, I., **D. Sachkov**, K. Ruskov, M. Panayotova. 2025. "Assessment of the potential of the southern part of the Zidarovo ore field in southeast Bulgaria for prospecting of critical and strategic raw materials". – In: E3S Web Conf. 623 02002 (2025), DOI: 10.1051/e3sconf/202562302002

Abstract: The work is dedicated to analyzing the relative abundance of chemical elements, defined as critical and strategic in recent EU documents, in an area with historical mining known as Zidarovo ore field, and located in Southeast Bulgaria. Fife samples of river sediments from the southern tributaries of the River Fakiiska were studied in order to assess the geochemical potential of the upper cretaceous rocks in the catchments. Critical metals and metalloids have been identified, which are found in the studied area in concentrations higher than the corresponding Clarke number. The correlations of these companion elements with the possible main carrier metals have been studied and the presumed base metals - carriers revealed. The findings can be used as an initial step in creation of a complex geomorphological-geological model of the area, based on GIS.

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