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ABSTRACTS AND FIELD TRIPS

Antropogeni vpliv v dveh zgodovinsko obiskanih jamah?

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Kraške jame so pomembne naravne vrednote in turistične destinacije. Na kapnikih ponekod opazimo temne prevleke. Vzroki so lahko različni: naravni in/ali antropogeni. Pogosto črne prevleke prerašča recentna svetla siga, kar kaže, da so črne prevleke nastale v preteklosti. Na primeru Predjame in Črne jame pri Kočevju smo izvor črnih prevlek skušali dokazati z različnimi analitskimi metodami: z optično mikroskopijo v polarizirani presevni svetlobi, z rentgensko difrakcijsko metodo ter z vrstičnim elektronskim mikroskopom z energijsko disperzijskim spektrometrom rentgenskih žarkov (SEM/EDS). Preiskovali smo polirane zbruske, neobdelane ter polirane koščke sige in netopni ostanek. Organsko snov iz črnih prevlek smo analizirali z Walkley-Blackovo metodo (mokri sežig) in žaroizgubo (LOI; suhi sežig).

Črne prevleke v Predjami najdemo za Vetrovno luknjo v Črni dvorani. Skozi Vetrovno luknjo pihajo močni zračni tokovi, kar zgodovinski viri omenjajo kot težavo pri obisku jame (Valvasor, 1689; Nagel, 1748; Schmidl, 1854). Preden so Vetrovno luknjo, ki je bila zasuta s podorom, leta 1912 razširili, so obiskovalci lahko prišli le do mesta, ki je neposredno pred njo. Najstarejši podpis pred Vetrovno luknjo je iz leta 1508. Do leta 1912 so obiskovalci skoraj 400 let uporabljali bakle.

SEM/EDS-analiza vzorcev črnih prevlek iz Predjame je potrdila prisotnost kalcita, glinenih mineralov, kremena, Fe-oksidov, težkih mineralov in povišano količino ogljika. Ugotovili smo, da so črne prevleke v Črni dvorani (Predjama) verjetno posledica gorenja. Močni zračni tokovi (maksimalna hitrost je 5,5 m/s, povprečna hitrost 2 m/s) so skozi Vetrovno luknjo predvsem v zimskem obdobju prenašali ostanke gorenja, pri čemer so se na kapnike in jamska tla v Črni dvorani usedali različni prašni delci. Z analizami smo potrdili, da so črne prevleke lahko posledica prisotne organske snovi.

Eden izmed dokazov o prisotnosti človeka v Črni jami pri Kočevju so ohranjena lesena korita. To bi lahko pomenilo, da je jama služila za oskrbo z vodo (verjetno za pastirstvo). V jami so najdeni tudi napisi na stenah (1895), na podlagi česar sklepajo, da je služila kot zavetišče in so v jami ali pred njo verjetno tudi kurili. V bližini se nahaja Koblarska jama, kjer so našli pomembno prazgodovinsko jamsko grobišče v Sloveniji, kar nakazuje, da je bil teren prazgodovinsko poseljen.

Analiza temnih prevlek je potrdila, da vzorec iz Črne jame pri Kočevju vsebuje organsko snov, vendar manj kot vzorec iz Črne dvorane v Predjami. SEM/EDS-analiza vzorcev iz Črne jame kaže na ostanke gorenja in na delce oglja.

Črne prevleke iz obeh jam so verjetno posledica obiskovanja jam, morda že od prazgodovine dalje. Obarvanost pa je lahko tudi posledica gozdnih požarov, oglarske dejavnosti v okolici, huminskih snovi iz tal, delovanja mikroorganizmov in/ali onesnaževanja zraka, ki ob določenih klimatskih pogojih lahko prodrejo daleč v notranjost jame.

Physical-mechanical and mineralogical-petrographical characteristics of the diabases at the locality "Udovo" (Vardar zone, Republic Macedonia)

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The diabases from the Udovo locality (Vardar area, Republic of Macedonia) have been analyzed in order to determine the possibility of their utilization as construction stone. The analyses and the laboratory tests have been performed on samples of diabases and quartz keratophyre. The samples were taken from the surface layers.

The results from their physical and mechanical analyses showed that these rocks meet the requirements for their utilization as construction stone suitable for all fractions of asphalt – concrete, concrete aggregate, material for compaction of roads, stone dust and other application in the civil engineering related to the traffic infrastructure. Additionally, the quality of the stone is higher in the deeper parts of the terrain, where the external influences have little effect.

Alluvial gold occurrences in Macedonia

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The paper refers to the secondary gold ore formations in Macedonia. Certain rules and criteria for the appraisal of the gold ore occurrences were established. Available data of long term investigation of this type of gold occurrences define existence of gold. Particular attention was paid to Konska Reka gold alluvial sediments, as to other ore occurrences appraised of particular importance. Nine ore occurrences of this type were analyzed and appraised.

Academician Vanda Kochansky-Devidé – Facing 100th birth anniversary

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Women in geology were present since the first geological explorations, but written documents on their contributions are extremely scarce. Their role within natural sciences rapidly increased during the 19th century, and was significant in the 20th century. In order to encourage women geoscientists, Association for Women Geoscientists was founded in 1977 in San Francisco.

At the territory of former Yugoslavia several extraordinary women dedicated their lives to geosciences. Among them was the first woman full-member of the Yugoslav Academy of Sciences and Arts, Vanda Kochansky-Devidé.

Professor Kochansky-Devidé was famous in all republics of former Yugoslavia, and she had particularly successful collaboration with Slovenia.

Modest, but highly educated, hard-working and excellent teacher, professor Kochansky was respected in wider community. One of Croatian magazines included her (2010) on the list of 20 women who most affected Croatian society.

Vanda Kochansky-Devidé was born on 10th April 1915 in Zagreb, from Slovenian mother and Croatian father, with Polish and Czech origin. She was educated in Zagreb and graduated Biological study group at the Faculty of Philosophy in Zagreb. After graduation she was employed at the Faculty Institute of Geology and Palaeontology. We remember her excellent lectures, when she managed to transfer her knowledge by high eloquence and exceptional drawing skills.

She was the first geologist to develop micropalaeontology in Croatia, and her main fields of interest were microfossils from different geologic periods and Neogene macrofossils.

She published more than hundred scientific papers, and even more professional and popular publications and reviews. Her textbooks in Palaeontology are still in use among students and senior geologists. She described numerous new taxa, and a variety of fossil taxa were named after her by national and international scientists.

She was the initiator and coauthor of the first geological bibliographic publications, chief editor of several scientific magazines, member of many professional associations, and was active in protection of geoheritage.

In the year 1973 professor Vanda Kochansky-Devidé became the first woman full-member of the Yugoslav Academy of Sciences and Arts. For her professional achievements she won several awards.

V. Kochansky had very good connections with geologists and palaeontologists all over the world. Her very close collaboration and friendship with Slovenian professor Anton Ramovš resulted with 30 scientific papers and congress abstracts dealing with geology and palaeontology of Slovenia, and several unpublished palaeontological studies prepared for the Slovenian Geological Survey.

Her contribution to Slovenian science, together with professor Ramovš, was prized by Sklad »Boris Kidrič« award (1966), and she became corresponding member of the Slovenian Academy of Sciences and Arts in 1975.

She was of fragile health since early childhood, but her sudden death caught us unprepared.

She died in Zagreb on 26th February 1990, and her colleagues and students expressed their last respects at the funeral and commemoration. Slovenian magazine Geology published memorial in her honor.

Palaeontological section of Croatian Geological Society, Croatian Academy of Sciences and Arts and Faculty of Science in Zagreb organize symposium dedicated to 100th birth anniversary and 25th death anniversary of academician Vanda Kochansky-Devidé, which will be held in Zagreb in April 2015. Symposium will be composed of lectures, exhibitions and excursions to Miocene outcrops in the vicinity of Zagreb, where V. Kochansky prepared her doctoral thesis. Our best contribution to her memory will be the continuity of scientific research based upon her foundations. Therefore it is our pleasure to invite palaeontologists from the entire region to attend the symposium and present their recent research in memory of this great woman.

Upper Permian (Lopingian) sponges of the Vojsko plateau (Slovenia)

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Sponge fauna has been studied from the carbonate succession of the Vojsko plateau (Slovenia) located in the north-western part of the External Dinarides. Sponge patch-reef crops out just below the Permian-Triassic boundary (PTB). Permian strata close to the PTB are intensively dolomitized. Neomorphic macrocrystalline dolomitic structure obscures its primary composition. Nevertheless, coarse-grained bioclastic detritus (algae, echinoderms, gastropods) can be recognized in dolomites. Locally, at the same locality, bioclastic, reef–like limestones were found. They are composed of poorly sorted fragments of sponges, echinoderms, algae, benthic foraminifers and gastropods.

During the whole Earth history reefs and reef-building biota were extremely sensitive to environmental conditions and were significantly restricted during the biotic crises. One of such stress events, End-Guadalupian crisis, strongly influenced the formation of biogene structures, and Uppermost Permian (Lopingian) reefs were restricted to a very few localities. They exhibit lower biodiversity than Middle Permian (Guadalupian) bioherms, and were previously described from South China and Greece.

Sponges from the studied uppermost Permian patch- reef, even fragile branching sphinctozoans, are preserved in situ, or slightly moved. Unfortunately, fine skeleton microstructure is not preserved, due to the recrystallization. All together twelve taxa of sponges were determined, belonging to classes Demospongea and Calcarea. Demospongea are more common and diverse than calcareous sponges, particularly large chambered forms (*Colospongia*, *Amblysiphonella*), which are visible on weathered surfaces at the outcrop. Some of sponge chambers exhibit differently preserved wall microstructure and geopetal infill, suggesting that they were only partly buried in the bottom sediment soon after death. Such texture pattern suggests slow deposition, rather than abrupt burial. Micropalaeontological research reveals other reef building sponge taxa within the patch reef, such as *Sollasia*, *Parauvanella*, *Hikorocodium* and *Heptatubispongia*. Calcareous sponge *Peronidella* is common in thin sections, while small benthic foraminifera occur in some parts of the reef. Sponge fauna shows similarities with Middle Permian assemblages from neighbouring countries (Italy, Croatia, Tunisia), Islamic Republic of Iran, Sultanate of Oman in Neotethyan realm, and Middle-Late Permian faunas from South China in the Palaeotethys. Heavily calcified demosponges (e.g. *Amblysiphonella, Colospongia, Parauvanella*) are known as PTB survivors, while, according to the state of knowledge, *Heptatubispongia* and *Hikorocodium* disappeared during the end-Permian biotic crisis. Cosmopolite calcareous sponge *Peronidella* was obviously extremely tolerant, and survived several biotic crises, with last occurrence in the Palaeogene period. The most recent evidence from the Lopingian sedimentary rocks of China shows that *Peronidella* was capable of producing biostromes in deeper shelf environment. Palaeontological and sedimentological characteristics of sponge patch-reef from Vojsko also suggest somewhat deeper depositional area. Such behaviour is probably linked with abrupt warming of sea-water and increased volcanic activity, which could also

contribute to the input of silica into the basin and enable the process of silicification. Palaeogeographic reconstruction of Permian oceans, land masses and palaeocurrents point to the possible migration routes along the shelves of Pangaea.

Geochemical properties of soil an attic dust around Bor open pit and Cu smelter

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The objective of this work was to investigating a distribution of chemical elements in attic dust and topsoil and to determine the differences between anthropogenic and geogenic concentrations. A particular type of household dust, attic dust, has been used in the present work. It represents the dust that accumulates on wooden carpentry of attics, the spaces in which the influence of inhabitants is minimized. Its chemistry, therefore, reflects the average historical levels of the atmospheric pollution. In previous geochemical studies, the properties of attic dust as a sampling medium for the territory of Slovenia were established.

Municipality Bor is located in southeast Serbia. Basic industries are cooper mining and metallurgy. The discovery of copper ore and its exploitation led to rapid development of Bor from a village to an industrial and urban centre of Serbia. In the year 1990 cooper production reached record levels, representing 1.5% of world production. In time, the constant increase of cooper mining and metallurgical activities in Bor left catastrophic consequences on the environment.

The whole study area is covered by 86 sampling sites. An old house with intact attic carpentry near to each sampling site has been selected. The attic dust samples were brushed from parts of wooden constructions that were not in immediate contact with roof tiles or floors. Soil was sampled from the surface to the depth of 5 cm close to the house in which attic dust was collected. Total contents of 20 elements were analyzed after four-acid digestion at the Institute of Chemistry, Faculty of Science, Skopje.

The major natural geochemical association consists of Al, Mg and Ni. High concentrations of these elements are characteristic for the areas of Andesite, Agglomerate, Brecia, Tuff, Tuffiite outcroping (2^{nd} volcanic phases) in the western part of investigated area. Their distribution results from natural processes, such as weathering of rocks (content of clay in soil), meteorological conditions and terrain morphology. For this group of elements it is characteristic the enrichment in the topsoil compared with attic dust unlike before mentioned geochemical associations. Geochemical association which was formed as a result of Cu production in attic dust and as a result from natural processes in topsoil includes Cr, Ni in Li. The area of heightened contents of Cr, Li and Ni in attic dust includes the areas around of copper smelter Bor. High concentrations of these elements in topsoil are characteristic for the north- eastern part of the investigated area and are related primarily to the Paleozoic rocks.

Geochemical anomaly resulting from the mining and copper production shows high contents of As, Cd, Cu, Pb and Zn. Contents of the elements of a chemical association change according to the type of sampling material and distance from the source of contamination. Contents in the soils and attic dust in areas that are situated in more than 10-25 km oscillate within the Slovenian average, while in the soils around copper smelter they exceed the Slovenian average for about 30 times. Anthropogenic source of the mentioned chemical elements is especially obvious in the case of attic dust. Contents of these chemical elements exceed the Slovenian average more than 130 of times. The form of a pollution halo depends strongly on morphology, height above sea level and local winds. The highest contents of the mentioned chemical elements were found in the soils and especially attic dust in the areas around Cu smelter Bor. The maximum contents of the strongest pollutants amount up to 0.10% As, 1.1 % Cu, 0.16% Pb, 0.34% Zn in topsoil and 0.39 % As, 11 % Cu, 0.54% Pb, 0.76% Zn in attic dust. Their high concentrations, especially of Cu, exceed the interventional (critical) levels area of about 180 km^2.

Fluviokarst forms: examples from the island Krk (Croatia)

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In this paper karst relief, with an emphasis on paleo and recent fluvial network will be analysed. The Island of Krk is one of two biggest Adriatic islands (405 km^2). It is located in the northeastern part of the Adriatic Sea channel area, between the Istrian peninsula and the Vinodol coast. This island consists mainly of carbonate rocks: Cretaceous limestones, dolomitic limestones and dolomitic breccias, Palaeogene limestones and carbonate breccias. Outcrops of siliciclastic rocks (marls and flysch) are restricted in relatively narrow and isolated zones. This island is part of the External Dinarides, and its major orographic axis and geological structures have a Dinaric strike (NW–SE to NNW–SSE). This dominant strike of tectonic structures has been disturbed by younger diagonal and transverse strike-slip faults during the Pliocene and Quaternary under the influence of re-oriented, a neotectonic regional stress orientated approximately N–S. Due to this, carbonate rock mass are partially extremely deformed and fissured. Present landscape of the Island of Krk is a consequence of simultaneous influence of tectonic movements, and climatic and sea-level changes during Pliocene and Pleistocene.

The Island of Krk is an example of a prevalently karst landscape, with very different karst forms. The relief of the island has been analyzed using topographic maps (scale 1 : 5000 and 1 : 25.000) together with aerial photographs (digital color orthorectified imagine scale 1 : 5000, dating in 2004) and by field work. Several distinct types of epikarst recently occur on this island, showing the degree of past tectonic activity and recent change of soil cover.

Three areas with significant differences in valley landscape were identified. Valleys of tectonic origin are primarily of 1^{st} order and developed on steep slopes, where gravitational processes prevail. They clearly show recent tectonic activity of the area. Old well branched paleofluvial network with complex drainage patterns (2^{nd} or 3^{rd} order) developed in recently tectonically inactive areas, some of them nowadays being located on high karst plateaus. These forms are now inactive in fluvial sense but are still subject to processes of karstification. They developed characteristic smooth relief with lack of accumulated fluvial and gravitational material. Some of them were strongly tectonically disturbed downstream forming composed type of valleys. These valleys have adapted to the drop of groundwater level by cutting canyons in their lower parts of the streams. Once active, these valleys fed coastal zones with gravel and pebbles, forming beaches. Finding of sandstone remnants in the upper parts of valleys proved that siliciclastic rocks covered much wider areas than it was thought, which may partly

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