Neogene-Quaternary volcanic forms in the Carpathian-Pannonian Region: a review

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Neogene to Quaternary volcanic/magmatic activity in the Carpathian-Pannonian Region (CPR) occurred between 21 and 0.1 Ma with a distinct migration in time from west to east. It shows a diverse compositional variation in response to a complex interplay of subduction with roll-back, back-arc extension, collision, slab break-off, delamination, strike-slip tectonics and microplate rotations as well as in response to further evolution of magmas in crustal environment by processes of differentiation, crustal contamination, anatexis and magma mixing. Since most of primary volcanic forms have been affected by erosion, especially in areas of post-volcanic uplift, based on the level of erosion we distinguish: (1) areas eroded to the basement level, where paleovolcanic reconstruction is not possible; (2) deeply eroded volcanic forms with secondary morphology with possible paleovolcanic reconstruction; (3) eroded volcanic forms with remnants of original morphology preserved; (4) least eroded volcanic forms with original morphology quite well preserved. The large variety of volcanic forms present in the area can be grouped in: a) monogenetic volcanoes and b) polygenetic volcanoes and their subsurface/intrusive counterparts that belong to the major groups of various rock series found in the CPR: calc-alkaline magmatic rock-types (felsic, intermediate and mafic varieties) and alkalic types including K-alkalic, shoshonitic, ultrapotassic and Na-alkalic. The following volcanic/subvolcanic forms have been identified: (i) domes, dome/flow complexes, lava fields (in grabens), shield volcanoes, effusive cones, pyroclastic cones, various stratovolcanoes and calderas and associated intrusive bodies (necks, dykes, sills, laccoliths, stocks, plutons) for intermediate and basic calc-alkaline volcanism; (ii) domes, dome/flow complexes, calderas, ignimbrite/ash-flow fields with known or unknown eruption centers for felsic calc-alkaline volcanism and (iii) dome flows, shield volcanoes, maars, tuff-cones/tuff-rings, lava lakes, scoria-cones with or without related lava flow/field and their erosional or subsurface forms (necks/plugs, dykes, shallow intrusions, diatremes) for various types of K- and Na-alkalic and ultrapotassic magmatism. Finally, we provide a summary of the eruptive history and distribution of volcanic forms in the CPR using several subregion schemes (1 – Styermark + Burgenland + Balaton Highlands; 2 – Central Slovakia Volcanic Field + Börzsöny-Pilis-Visegrád + Cserhát + Mátra + Bük foreland + Southern Slovakia – Northern Hungary; 3 – Moravia + Pieniny; 4 – Tokaj-Zemplín + Slanské vrchy + Vihorlat-Gutin + Beregovo + Oas + Gutâi; 5 – Tibles-Rodna; 6 – Călimani + Gurghiu + Harghita + Persani; 7 – Apuseni) following our previous reviews.

Investigation of mass movement deposits within Lake Ohrid (FYR Macedonia/Albania) using high resolution acoustic methods

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Lake Ohrid (FYR Macedonia/Albania) is situated within a tectonically active region on the Balkan Peninsula, and is most likely one of the oldest lakes in Europe (2-5 Ma). Its

bathtub shaped basin is filled with over 700 m of partly undisturbed sediments. Lake Ohrid has been found as an important archive to study the sedimentary evolution of a graben system over several million years. Furthermore, with more than 210 endemic species, the lake is a unique aquatic ecosystem that is of worldwide importance. A drilling campaign within the SCOPSCO ICDP Project is scheduled for summer 2011. Here we present results from hydro-acoustic surveys carried out in between 2004 and 2008 by means of sediment echosounder and multichannel seismic data proofing that the lake experiences several mass wasting events mainly in the southern area. Transparent units can be found in cross sections up to a depth of 0.8 sec TWT. In combination with new acquired bathymetric data from 2009 covering almost the entire lake we are able to characterize the most recent events in terms of their morphological structure. The main focus is on two individual slide events: the Udenisht slide and the Struga Slide. The Udenisht slide complex covers an area of about 27 sqkm in the southwestern part of the lake. First age estimation of the Udenisht slide revealed that it is most likely younger than 1000 years suggesting that it had an environmental impact on the populated areas along the coastlines. Deposits of the Struga slide located in the northern part of the lake cover the northern shelf area of Lake Ohrid. A prominent head scarp within this area is observable in bathymetric data. Additionally, several slides are located close to normal faults. By tracing selected horizons across the entire lake, it was possible to obtain a relative stratigraphy showing that mass wasting events cluster at specific horizons, and hence had been occurred at the same time. Such sliding events occurring at the same time but at different locations in the lake most likely had a common trigger. We assume earthquakes as such a trigger mechanism. Subsequently, ages for older events can be used to reconstruct the earthquake activity in the area or in other words, slides can be used as proxy for paleo-seismicity.

Petroleum exploration in the Krasta-Cukali Basin: a review

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Based in a considerable number of geological fieldworks as well as a large number of geochemical analyses, geophysical interpretations, published papers and reports, combined with the enormous knowledge and experience in the surrounded area, concludes very importantly the prospective for hydrocarbons exploration in the so-called Krasta-Cukali basin.

In this publication a major effort has been done to better position the area under evaluation in a clear geological and tectonic concept, always with regard to oil and gas exploration. Another effort is done to better distinguish the lithotypes present and their stratigraphic and geochemical contribution closely related to petroleum potential.

The Krasta-Cukali as a tectonic zone within the Albanides it is identified as a basin during the Late Triassic and Early Jurassic (Lias) properly as an extension result of the tectonic regime. During the rifting this basin is breached into different paleogeographic horst-graben structures.

The interpretation of all the data available together the new seismic data acquired recently in the area, clearly demonstrate that Krasta-Cukali basin has all the necessary conditions for oil and gas accumulations likewise the nearby famous Ionian basin.