the major tectonic and geological units (NW-SE). This already gives evidence that the basin is formed due to a younger deformation stage. In addition, the area meets all criteria of an active, seismogenic landscape with linear step-like fault scarps on land and within the lake. In general, the faults and fault scarps are getting younger towards the basin centre, as depicted on seismic and hydroacoustic profiles. Post-glacial (or Late Pleistocene) bedrock fault scarps along the steep flanks of Mokra and Galicica Mountain chains are long-lived reflections of repeated surface faulting in tectonically active regions, where erosion cannot outpace the fault slip. Others like wind gaps, wineglass-shaped valleys and triangular facets, are accompanying morphological features of a tectonically active area. Additionally, mass movement bodies within the lake and also onshore (rockfalls, landslides, sub-aquatic slides, homogenites, turbidites) are likely to have been seismically triggered. Multichannel-seismic studies reveal evidence for wedge-like growth strata incorporating mass movement bodies, rather pointing to sudden earthquake-triggered events than to fault creep. Earthquakes larger than magnitude M 6.0 at Lake Ohrid may also be accompanied by secondary effects like liquefaction, seeps, dewatering structures, rock falls and landslides and others. These morphotectonic observations correspond to focal mechanisms of earthquakes in the greater Lake Ohrid area. An integrated multidisciplinary approach was chosen to investigate the neotectonic history of the basin, using tectonic morphology and a variety of geophysical and remote sensing methods.

Tectonic evolution of the Lake Ohrid and Prespa Basins (FYROM/Albania)

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The region of the Lake Ohrid and Prespa Basins is located at the Greek/ FYROM (Former Yugoslav Republic of Macedonia)/Albanian border. The neotectonic and landscape evolution of the southern Albanian fold-and-thrust belt and the Albanian-FYROM extensional back-arc area (basin and range type) are directly linked to subduction and subduction roll-back within the Hellenic trench system. The initiation of the Ohrid Basin is estimated between 2 and 8 million years. The deformation can be divided in three major deformation phases (1) NW-SE shortening from Late Cretaceous to Miocene with compression, thrusting and uplift; (2) uplift and diminishing compression during Messinian - Pliocene; (3) vertical uplift and (N)E-(S)W extension from Pliocene to recent associated with (half-) graben formation. This latter phase of an orogenic collapse is related with a seismogenic landscape with linear step-like fault scarps on land and offshore, wineglass shaped valleys and triangular facets. The geomorphology also points to rotated and tilted blocks. Seismic and hydroacoustic data of Lake Ohrid show that the faults and fault scarps, in general, are getting progressively younger towards the basin centre. A tectonic multi-proxy approach (palaeostress analysis, remote sensing) has been made to reveal the stress history of the region. Furthermore, apatite fission-track (A-FT) analysis and t-T-paths modelling was performed to constrain the thermal history, and the exhumation rates.

For fission-track analysis apatites were separated from a suite of granitoid rocks from basement units and from flysch- and molasse-type deposits of Paleogene to Neogene age. Apatites show a range of the apparent ages from 56.5±3.1 to 10.5±0.9 Ma. The spatial distribution of ages suggests different blocks with a variable exhumation and rock uplift history. Fission-track ages from molasse and flysch sediments of the basin fillings show distinctly younger ages. Generally, the Prespa Basin reveals A-FT-ages around 10 Ma close to normal faults, whereas modelling results of the Ohrid Basin suggest a rapid uplift initiated around 1.4 Ma associated with uplift rates (? rock uplift rates or surface uplift rates?) on the order of 1 mm/a. As a conclusion we observe a westward migration of the extensional basin formation, i.e. the initiation of the Prespa Basin occurred well before the formation of the Ohrid Basin.

The stable isotopic composition of cryptocrystalline magnesite occurrences in Turkey and Austria and implications for their origin

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Cryptocrystalline magnesite occurs predominantly in ultramafitic rocks of ophiolite sequences and associated sediments. Two types are recognized, the Kraubath type (KT), which occurs – tectonically controlled – in ultramafic rocks as veins, networks and zebra ore, and the Bela Stena type (BST), which occurs as nodules and layers in sediments.

The two types not only differ by the nature of their host rock but also by their C and O isotopic composition. The KT has lower C isotope values (-18 to -6‰ VPDB) than the BST (-1 to +4‰ VPDB). $\delta^{18}O$ values of both types overlap, whereby the KT shows a tendency to lower values (+22 to +29‰ VSMOW) than the BST (+26 to +36‰ VSMOW).

This study is based on extensive fieldwork and a total of 320 samples from Austria (Kraubath) and Turkey (western and eastern Anatolia).

Kraubath (Austria) contains the lowest C isotope values (-22.5 to -11.3‰ VPDB). Turkish KT magnesite contains higher C isotope values (-12.7 to -3.1‰ VPDB). Turkish BST magnesite contains mainly positive C isotope values (+1.5 to +6.9‰ VPDB) with the exceptions of Dutluca and Bahtyiar (Eskişehir/Western Anatolia)

In the operated magnesite deposit of Dutluca (Eskişehir/Turkey) KT magnesite and zebra ore (-10.6 to -7.8‰ VPDB) are covered by sediments with BST magnesite, which occurs as nodules and layers (-6.5 to -5.8‰ VPDB).

The deposit of Bathyiar (Eskişehir/Turkey) shows a transition from network to iron-rich zebra ore and BST. The network shows normal isotope values, but the $\delta^{18}O$ values of the zebra ore are extraordinary high (+29 to +35‰ VSMOW).

The $\delta^{18}O$ values of KT magnesite suggest general formation temperatures between ca. 60 and 70°C. Exceptions are the deposits of Tavşanlı/Turkey, which formed at temperatures of ca. 80°C. Zebra ore of Bathyiar (Eskişehir/Turkey) formed at temperatures below ca. 30°C.

The range of the $\delta^{13}C$ values (-22.5 to +6.1‰ VPDB) suggests that CO_2 was derived from several sources (biogenic – atmospheric, decarboxylated, mantle-derived or magmatogene) and was transported by meteoric waters. Supergene water with dissolved HCO_3^- invaded the serpentinite and leached Mg^{2+}. The release of Mg^{2+} and OH^- into the solution raised the pH. Extension of strike-slip system provided pathways for migration and the formation of hydrothermal convection cells. At shallow levels the drops in pCO_2 due to outgassing caused supersaturation and formation of magnesite.

The Tokaj Mts. obsidian – its use in praehistory and present application

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Homogeneous acid volcanic glass of low water content has been an object of human attention since the prehistory. There exist archaeological evidences dealing with the use of obsidian from the Tokaj Mts. (eastern Slovak Republic and the north-eastern part of Hungary, as well) Late Tertiary volcanic province in the Late Palaeolithic. There at present exist