Preliminary results of carbon degassing in the tectonically active areas of Balkan Peninsula

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The deeply derived CO_2 from tectonically active areas is contributing in a significant proportion, still un-quantified in detail, to CO_2 Earth degassing. Several studies highlighted how in these tectonically active areas most of the CO_2 is dissolved in the groundwaters circulating in the large regional aquifers hosted by the permeable formations of the active orogens. Quantifying the amount of deep CO_2 dissolved into groundwater can represent a powerful tool for regional investigations, because springs are representative of their catchment area that can extend from tens to hundreds of square kilometers.

In the framework of a Deep Carbon Observatory supported project, we investigated for the first time, the geogenic carbon emission from the Balkan Peninsula (southeastern Europe). This area is known for its high carbon Earth degassing (both CO_2 and CH_4), but lacks the necessary data for quantification and for determining the origin of carbon (especially for what regards the isotopic composition of dissolved carbon). We investigated thermal manifestations (thermal springs and drillings), CO_2 emission (including dry and wet moffetas), thermal wells containing CH_4 and karst springs from tectonically active areas.

During the field investigation, we visited Romania (Mangalia and Tyulenevo coastal area (Romania and Bulgaria), Apuseni Mountains, Ciuc Basin and Herculane Graben), Slovenia, Central Serbia, Macedonia and Croatia visiting and collecting more than 350 sites. Water samples were collected for water chemistry, water stable isotopes, carbon-13 from TDIC, dissolved H2S, dissolved gas composition, carbon-13 from CO_2 and CH_4 from dissolved gases, and for dissolved noble gases (He, Ne, Ar). For those sites were also free gas was present, the team collected free gas samples for compositional, isotopic and noble gas analyses.

The availability of this data is the first attempt in quantifying the carbon flux with real data from this tectonically active area.

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