IMPACT OF GEOGENIC CO\(_2\) ON DEEP MICROBIAL ECOSYSTEMS IN THE HARTOUŠOV MOFETTE SYSTEM IN NW BOHEMIA

K., Adler\(^1\), M., Alawi\(^1\), Q., Liu\(^1\), R., Bussert\(^2\), T., Vylita\(^3\), H.-M., Schulz\(^1\), H., Kämpf\(^4\), B., Plessen\(^1\), D., Wagner\(^1\), K., Mangelsdorf\(^1\)

\(^1\)GFZ German Research Centre for Geosciences – Helmholtz Centre Potsdam, Germany
\(^2\)TU Berlin – Technical University Berlin, Germany
\(^3\)AGUAS CF, Ltd., Geology and Balneotechnics, Czech Republic

A mofette is a natural cold either dry or wet gas vent releasing CO\(_2\)-rich gases into the atmosphere. The Hartoušov mofette system is located in the northern Cheb Basin (NW Bohemia, Eger Rift). The area is characterized by active seismicity in form of periodically occurring swarm earthquakes and lithospheric mantle derived gas emanations (> 99 % CO\(_2\)). The exhaling free gas phase of the Bublak mofette, the best investigated degassing site of the area, shows CO\(_2\) with a comparatively heavy \(\delta^{13}C\) signal (ca. -2 ‰) compared to atmospheric CO\(_2\) (ca. -8 ‰) (MANGELSDORF ET AL., 2008) and is characterized by a subcontinental mantle helium isotope signature of 5.9 Ra (BRÄUER ET AL., 2011). Magmatic fluids from lithospheric mantle, entering the whole crust, are the main reason for periodic/episodic earthquake swarm activity in this area (BRÄUER ET AL., 2003).

In early 2016 a borehole was drilled by GFZ in the framework of a DFG-ICDP project (Alawi, AL 1898/1). The area was characterized by active seismicity in form of periodically occurring swarm earthquakes and lithospheric mantle derived gas emanations (> 99 % CO\(_2\)). The exhaling free gas phase of the Bublak mofette, the best investigated degassing site of the area, shows CO\(_2\) with a comparatively heavy \(\delta^{13}C\) signal (ca. -2 ‰) compared to atmospheric CO\(_2\) (ca. -8 ‰) (MANGELSDORF ET AL., 2008) and is characterized by a subcontinental mantle helium isotope signature of 5.9 Ra (BRÄUER ET AL., 2011). Magmatic fluids from lithospheric mantle, entering the whole crust, are the main reason for periodic/episodic earthquake swarm activity in this area (BRÄUER ET AL., 2003).

In early 2016 a borehole was drilled by GFZ in the framework of a DFG-ICDP project (Alawi, AL 1898/1). The area was characterized by active seismicity in form of periodically occurring swarm earthquakes and lithospheric mantle derived gas emanations (> 99 % CO\(_2\)). The exhaling free gas phase of the Bublak mofette, the best investigated degassing site of the area, shows CO\(_2\) with a comparatively heavy \(\delta^{13}C\) signal (ca. -2 ‰) compared to atmospheric CO\(_2\) (ca. -8 ‰) (MANGELSDORF ET AL., 2008) and is characterized by a subcontinental mantle helium isotope signature of 5.9 Ra (BRÄUER ET AL., 2011). Magmatic fluids from lithospheric mantle, entering the whole crust, are the main reason for periodic/episodic earthquake swarm activity in this area (BRÄUER ET AL., 2003).

In early 2016 a borehole was drilled by GFZ in the framework of a DFG-ICDP project (Alawi, AL 1898/1). The area was characterized by active seismicity in form of periodically occurring swarm earthquakes and lithospheric mantle derived gas emanations (> 99 % CO\(_2\)). The exhaling free gas phase of the Bublak mofette, the best investigated degassing site of the area, shows CO\(_2\) with a comparatively heavy \(\delta^{13}C\) signal (ca. -2 ‰) compared to atmospheric CO\(_2\) (ca. -8 ‰) (MANGELSDORF ET AL., 2008) and is characterized by a subcontinental mantle helium isotope signature of 5.9 Ra (BRÄUER ET AL., 2011). Magmatic fluids from lithospheric mantle, entering the whole crust, are the main reason for periodic/episodic earthquake swarm activity in this area (BRÄUER ET AL., 2003).
**Figure 1** Initial visual lithological description for the depth interval 65 m - 95 m of the HAR1 borehole drilled into the Hartoušov mofette system.

**Acknowledgments**
We would like to thank the “Deutsche Forschungsgemeinschaft (DFG)” for funding this project (MA 2470/5-1 and AL 1898/1).

**References**
