

Small karstic Dobra River (Croatia) suggested as natural laboratory for impactite research

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An unexpected anomaly of magnetic susceptibility (MS) was observed in stream sediments of the upper course of the karstic Dobra River (Croatia). Preliminary results pointed to a possible impactite, formed by a shock event caused by a meteorite impact or by volcanic processes [1]. In addition to geophysical experiments, petrological and geochemical studies are reported [2, 3]. The multidisciplinary work for identification and confirmation of impact structure is still in progress.

Results will be presented and the difficulties due to weathering and transport processes will be discussed and compared with recent literature [4, 5]. In reported results numerous evidences exist, which are in support of impact origin, such as vesicular glass with quench texture, ballen textures in the lechatelierite, presence of Troilite, etc.

We suggest that the Dobra River from its source to the abyss in Ogulin (Upper Dobra) is a possible natural laboratory for studying processes of mixing between impactite material and fluvial sediments within a small area, including spherules exposed to water and in the overbank sediments. Especially the introduction of isotope studies in this research and enlargement of multinational team of experts are suggested.

Literature:

[1] Frančišković-Bilinski, S., Bilinski, H., Scholger, R., Tomašić, N., Maldini, K. (2014): Magnetic spherules in sediments of the sinking karstic Dobra River (Croatia). *Journal of soils and sediments* 14(3), 600-614.

[2] Frančišković-Bilinski, S., Sikder, A.M., Bilinski, H., Castano, C.E., Garman, G.C. (2015): Traces of meteorite impact in the sediments of karstic Dobra River (Croatia). 15th International multidisciplinary scientific geoconference SGEM 2015 Conference proceedings, Vol. 1, 507-514.

[3] Sikder, A.M., Frančišković-Bilinski, S., Bilinski, H., Castano, C.E., Clifford, D.M., Turner, J.B., Garman, G.C. (2015): Petrographic analysis of the magnetic spherules from the sediments of karstic Dobra River, Croatia. 2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015), Paper No. 169-2.

[4] French, B.M., Koeberl, C. (2010): The convincing identification of terrestrial meteorite impact structures: What works, what doesn't, and why. *Earth-Science Reviews* 98, 123–170.

[5] Koeberl, C., Claeys, Ph., Hecht, L., McDonald, I. (2012): Geochemistry of Impactites. *Elements* 8, 37–42.