

Horizons with the Late Permian vertebrate coprolites from the Vyazniki and Gorokhovets, Vyatkian Gorizont, Russian Platform – preliminary report

Krzysztof Owocki¹, Grzegorz Niedźwiedzki¹⁺², Andrey G. Sennikov³, Valeriy K. Golubev³, Katarzyna Janiszewska¹, Kornel Biernacki⁴ & Tomasz Sulej¹

- 1) Institute of Paleobiology, Polish Academy of Sciences, Warsaw
- 2) Department of Biology, University of Warsaw
- 3) Institute of Paleontology, Russian Academy of Sciences, Moscow
- 4) Department of Geology, University of Warsaw

Numerous and well preserved coprolites of vertebrates (probably all reptiles in origin) have been found in the Vyazniki and Gorokhovets localities of European Russia. Three identified coprolite-bearing horizons are in the Upper Permian (Changhsingian) deposits of the upper part of Vyatkian Gorizont (uppermost Tatarian). Nearly 100 coprolites were collected and are referred to the three distinct ichnomorphotypes. The coprolites were gathered from a brown-greenish mudstone with coprolite 'breccia-like' layer and also from intra-sandstone conglomerates that were deposited in a floodplain environment probably during a sheet-flood event. The coprolites were produced by small and medium-sized carnivorous vertebrates and contain fish (scales) and small tetrapod remains. In one, large-sized coprolite a small fragment of amphibian bone was also found. It is suggested that was possibly produce by large therapsid or by early archosauromorph predator. SEM images (both in scattered and backscattered electrons) show that coprolite matrix has its bulk mass made of abundant spheres and thin walled vesicles with diameters 0.5-4 μm . Electron Micro Probe analyses of polished thin sections of coprolites show that the matrix is composed of microcrystalline carbonate-fluoride-bearing calcium phosphate with small amounts of calcium replaced in the crystal lattice by Na, Sr. The optical microscopy and EMP investigations show that iron and manganium oxides are responsible for elevated iron (0,52-7,26 wt% Fe) and manganium (up to 1319 ppm) concentrations in the bulk mass of coprolite. Other metals (e.g.V, Ni) can be associated with oxides forming spheroids with diameters 3-10 μm . This is first detailed description of vertebrate coprolites from the Vyatkian Gorizont of Russia.