Preliminary paleontological and mineralogical study of the diatomites from Patarlagele, Romania

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The diatomaceous earth from Patarlagele belongs to the Tarcau nape (External Flysch of Eastern Carpathians) and has a local thickness of 0.5 to 3 meters. They occur as layers and lenses, in alternance with menilites, quartzarenites, marls and clays. The diatomite levels are chalk-like, soft, friable, earthy, very fine-grained, and have a white – cream color. The micro-paleontological study shows that diatomaceous associations of Oligocene age are represented by centric species (more than 80%): *Actinocyclus*, *Coscinodiscus* and *Actinoptychus*. The diatom assemblages characterize a shallow marine basin environment, with littoral or freshwater contributions. The diatomaceous earth samples from Patarlagele were studied by X-ray fluorescence (XRF), wet-chemical analysis, scanning electron microscopy (SEM), FTIR and X-ray powder diffraction (XRD). The mineralogy of all but one sample is characterized by the major presence of amorphous silica (the broad hump registered between 15 and 20° 2 theta indicates the presence of opal-A). The associated mineral species are alpha quartz (up to 28 wt.%), opal-Ct (up to 21 wt%), clay minerals (up to 25 wt.%) and minor feldspar (up to 26 wt.%). Based on the characters and intensities of the bands centered around 3400 and 1630 cm^{-1} in the FTIR spectra, the amorphous silica from the diagenesis-affected diatom frustules was confirmed as (hydrated) opal-A. Most of the identified bands in the FTIR spectra are those of silica polymorphs, and particularly of alpha quartz and opal-A: the Si-O stretchings at ~ 1094 cm^{-1} and 790 cm^{-1} are common to all spectra. Another band, located at ~ 905 - 920 cm^{-1} is characteristic to clay minerals (Al-OH-Al bending).