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Preliminary study of Late Middle Devonian Bentonites in Western Black Sea (Zonguldak-Bartin) Region, NW Turkey: a possible link with climate change

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In addition to climatic biological changes, extensive volcanic activity associated with the closure of the Rheic Ocean took place during Late Devonian. The products of explosive eruptions in the form of volcanic ash, after long distance transportation, were settled down and the diagenetic processes converted the ashes into pottasium rich claystones called as K-bentonites or metabontonites. They are originally silisic volcanic ashes which are altered to claystones rich in smectite.

In the western Black Sea region, near Bartin and Zonguldak cities, yellowish brown and gray-green colored claystones having maximum thicknesses of 50-60 cm are exposed along with thick sequences of limestones-dolomitic limestones (Middle Devonian to Early Carboniferous in age, The Yılanlı formation). These carbonates were deposited on a shallow marine carbonate platform. Microfacies analysis of limestones indicate the cyclic nature of alternation charophyta and ostracoda rich wackestones, pellodial intraclastic packstones/wackestones and breccia along the section. Claystones are alternating with these microfacies without transition or gradual passage. Cyclic alternation of very shallow marine facies are interrupted by volcanic occurences. Our preliminary investigations indicate that these claystone horizons are K-bentonites of volcanic origin (TÜRKMENOGLU 2001, TÜRKMENOGLU *et al*. 2009). Thus, they indicate successive Devonian explosive volcanic eruptions, with yet unknown source and distances.

In this research, two sections across bentonite-bearing successions in the Yılanlı Formation were measured and sampled both for clay mineralogical and paleontological purposes. The preliminary XRD data indicate that these K-bentonites are mainly consisting of illite, trace amounts of kaolinite, some quartz, feldspar, biotite, zircon, pyrite, calcite and gypsum. Chemical analyses demonstrate the volcanic origin of these K-bentonites. The foraminiferal content of the studied sections assign the Late Middle Devonian age (TÜRKMENOGLU *et al*. 2009). Results of this investigation have implications on tephra diagenesis and event-stratigraphic applications of the Bartin K-bentonites.

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