

New Paleontological and Geochronological Data of Upper Cretaceous Volcanoedimentary Sequence from the Eastern Sakarya Zone, NE Turkey

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Based on the recent volcanostratigraphic studies, new paleontological data and U-Pb zircon ages, the Upper Cretaceous sequence of the Eastern Sakarya Zone (ESZ), NE Turkey, is divided into four different volcano-sedimentary formations. These are, from bottom to top, Çatak, Kızılkaya, Çağlayan and Tirebolu formations. This sequence of the ESZ is represented by voluminous volcanoclastic rocks alternating with six different levels of planktonic foraminifera-bearing red limestone interlayers (4 within the Kızılkaya, one within the Çağlayan and one within the Tirebolu formations). The presence of *Dicarinella asymetrica* in the lower stratigraphic levels suggests latest Coniacian-early Santonian, while presence of *Globotruncana esnehensis*, *Globotruncana linneiana* and *Gansserina gansseri* in the uppermost level suggests latest Campanian-Maastrichtian. First period of the late Cretaceous volcanism is generally represented by mafic-intermediate rock series (basaltic-andesitic lava flows, hyaloclastites and pyroclastic deposits). Although there is no geochronological data for the Çatak volcanics, a Turonian age was assigned based on its stratigraphic position and paleontological data. Second volcanic period is characterized by pyrite-bearing felsic volcanics (dacitic domes and lava flows, hyaloclastites and crystal-vitric tuffs) of the Kızılkaya Formation. U-Pb zircon dating from these felsic rocks yielded ages ranging from 88.5 ± 0.8 to 85.6 ± 0.5 Ma (i.e. Coniacian-early Santonian). Third volcanic activity related to Çağlayan Formation begins with the mafic-intermediate rock series (basaltic-andesitic lava flows, hyaloclastites and pyroclastic deposits), which is late Santonian-early Campanian in age, based on the planktonic foraminifera from the red pelagic limestones. The upper most volcanic period is composed of biotite-bearing felsic rock suites (rhyolitic domes and lava flows, and pyroclastic deposits). U-Pb zircon dating for this horizon yielded ages varying from 83.5 ± 0.8 to 80.9 ± 0.6 Ma (i.e. early Campanian). All these units are covered by Campanian-Paleocene calciturbidites, marl and lesser red limestones, which are often cut by mafic dykes and sills. U-Pb zircon dating for these small mafic intrusions yielded ages varying from 82.9 to 78.5 ± 1.1 Ma (i.e. early-middle Campanian), suggesting the latest magmatic activity in the final stage of subduction-related magmatism of the ESZ.

The detailed planktonic foraminifera analyses suggest that the red pelagic limestones of the Upper Cretaceous sequence from the ESZ should not be older than the latest Coniacian-Santonian and, in a regional-scale, should not be younger than the late Campanian-Maastrichtian. New U-Pb zircon ages support the paleontological records and indicate that the late Cretaceous subduction-related volcanism of the ESZ was active between the earliest late Turonian and middle Campanian.

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