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Sedimentological properties of the Western Pontides Middle Eocene evaporites (Kaynaşlı-Bakacak, West of Bolu, Turkey)

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Kaynaşlı-Bakacak Paleogene basin developed on the Abant Complex (Bolu Massive), and the sedimentary unit commence with Early Eocene aged Fındıcak Formation. It is composed of mainly pre-evaporate platform type carbonate sedimentary systems and characterized by pelagic fossil bearing micritic mudstones, and miliolids, pelecypods, nummulitic, alveolinds (Alveolina cusbitata Drobne, Nummulites cantabricus Schaub, Nummulites lucasanus (Defrance), Asterigerina cf. cayrazensis Sirel&Deveciler) and pellet bearing grainstone-packstone. The carbonate sedimentation was terminated by mainly evaporite deposition with carbonates (Apalar Formation; Middle - Late Middle Eocene). The overlying evaporite unit comprises different kinds of petrographic and textural types. It is composed of banded-nodular, partially preserved primary anhydrite facies, and show lateral and vertical secondary gypsum facies transition. Secondary gypsum mostly consists of white alabastrin texture and moderately less macro-porfiroblastic texture, and also nodular, chiken-wire, nodular-banded, laminal, brecciated and pseudomorphic lithofacies. Pseudomorphic facies have generally ghost of the primary selenitic crystals and brecciated grains. In addition, secondary gypsum facies are accompanied by satin-spar and fibrous gypsum. The evaporite succession contains limestone interlayers with planktic and benthic fossils and towards the upper part, the evaporite is relatively decreased and replaced with carbonate and clayey carbonate layers which consist of lignite fragment bearing clayey limestone, ostrea shell within the gypsum cement. These limestones are rich in pelagic bivalves filaments, gastropoda (some vermetide gastropod) and green algae. The top unit, last depositional package of the Kaynaşlı–Bakacak basin is composed of vitric and crystalline tuffs, called Melendere Formation (Middle Eocene).
Marine evaporites in the Central Anatolia belt was precipitated as last depositional unit through the Late Middle Eocene time (e.g., Çankırı, Tuzgölü, Ulukışla Basins). Evaporites studied here, which accumulated in the Pontides belt, show similar trend those of Central Anatolian evaporite bearing basins. They took place during Middle Eocene (Late Lutetian) regression after the precipitation of the platform type carbonates. Western Pontides evaporites (Kaynaşlı-Bakacık area) shows partly restricted inner basin character divided into shallow lagoon and sabkha environment. These environment changing was probably controlled by MECO (Middle Eocene Climatic Optimum) paleoclimatic phenomena. MECO phenomena was resulted in starting with the deposition of the platform carbonates, and it is terminated by evaporate precipitation in the deeper (20-40 m) and shallow basins (0-1 m). The evaporite environment turned into normal marine condition from time to time and precipitated neritic and pelagic carbonates, and also brackish environments with coal fragments bearing clayey carbonates and fossiliferous carbonates with vermetide-type gastropods were developed within the evaporite succession.

KEY WORD: Middle Eocene Evaporite, Lagoon-Sabhka, Apalar Formation, Kaynaşlı-Bolu

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