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**Microfauna of the mid-Cretaceous turbiditic systems of the Black Sea (off Romania): occurrence interpretations, fluctuations related to sedimentary regime and correlations at an oil-field scale**

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Turbidite sediments are well-known in regions surrounding the western Black Sea, for example onshore Bulgaria (Srednogora region) and Turkey (Western Pontides). In the Romanian western Black Sea offshore, turbiditic sedimentation commenced at the beginning of the Aptian. During the Aptian-Cenomanian interval, turbidites accumulated as part of the Histria Trough tectono-structural unit. Three types of turbidite systems are recognized based on the sediment texture and type of feeder system. They correspond to the gravel-rich, sand-rich and mud/sand-rich turbidite systems distinguished by Reading and Richards in 1994.

The fossil assemblages show an admixture of four types. Planktonic foraminifera are mostly present as *in situ* constituents of the assemblages. Shallow-water benthic faunal constituents were delivered to the slope apron by short-duration transportation in turbidity currents. Deep-basin benthic fauna are most abundant in sediments that accumulated during peri-

ods of reduced terrigenous input, being present mainly in the dark marlstone interbeds at the top of gravel-rich turbiditic sequences. Reworked fossils from the adjacent continental areas are found mainly in the gravel-rich successions.

Two gravel-rich turbidite systems are recognized in the Lebada East oil-field and Portita discovery. Their age is Aptian-Albian and sediment thickness in the proximity of the footwall scarp is about 300 m. Organic material is mostly reworked from carbonate sediments of Late Jurassic age; such Jurassic carbonates are well-known in the North Dobrogea Fold Belt and Central Dobrogea sector of the Moesian platform. Most of the turbidite sequences contain sparse foraminiferal and ostracode assemblages. These foraminifera and ostracoda were transported downslope from the adjacent outer and distal shelves. The richest planktonic and deep-water benthic foraminiferal assemblages occur in the dark hemipelagites situated at the top of upward fining sequences. In these marlstone interbeds (whose thickness is no greater than a few centimetres), planktonics and deep-water benthics comprise up to 25% of the entire assemblage. Microfaunal abundance in the gravel-rich turbidite systems varies between 20 and 70 specimens/unit of sample (35 grams).

A sand-rich turbidite system of early Cenomanian age is widespread in the Histria Trough. Correlative outer-shelf siliciclastic sediments occur to the southwest in the 16 Iris and 18 Lotus boreholes. The extent of the turbidite system is strongly affected by the basin shape and dimensions. Basin scale is similar to basins of the California borderland. Microfaunal assemblages show lower abundance values when compared with those from the gravel-rich turbidites: 20-48 specimens/unit of sample. Up to 90% of the foraminiferal assemblage in the hemipelagic sediments consists of planktonic species. Deep-water *in situ* benthic foraminifera and ostracoda are scarce. This is regarded as an effect of sea-bottom instability due to sediment drifting from the north and southwest.

Middle-Upper Cenomanian turbidites are mud/sand-rich. A gradual increase in microfaunal abundance occurs throughout this interval (from 65-75 specimens/unit of sample at the base to 100-110 specimens/unit of sample at the top). Planktonic foraminifera dominate the microfossil assemblages, representing 75% of the total assemblage in the Upper Cenomanian. Reworked organic debris gradually decreases and eventually is absent in some samples. The microfauna present in these turbidite sediments show strong similarities with assemblages recorded in the coeval basinal sediments of the Tomis Formation. A hiatus spanning the latest Cenomanian to earliest Turonian is present in the Romanian western Black Sea offshore.

The fluctuations of the fossil assemblages have proved to be of paramount importance in developing correlations at the oil-field scale, particularly for poorly cored parts of the stratigraphic column.