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Petroleum Systems in the East-Mediterranean Basin Onshore and Offshore Israel

The East Mediterranean Basin (EMB) is an emerging exploration province. The recent significant biogenic gas discoveries offshore Israel (~3.5TCF) have drawn international attention to this area. The gas is accumulated in Pliocene deepwater turbidite sands, and it is considered an extension of the Nile delta biogenic province offshore Egypt.

Other thermogenic hydrocarbon systems (oil and gas) in the basin and on its margin are, however, under-explored. Geochemical fingerprints of the hydrocarbons encountered indicate at least four thermogenic systems: 1) Heletz system - reservoired in Lower Cretaceous siliciclastics and Jurassic carbonates on the basin margin. The source is the Middle Jurassic Barnea limestone; 2) Meged system - oil in Triassic carbonates tested east of the basin. The suggested source is unknown Silurian shale; 3) Yam system - non-commercial accumulations of condensates tested in Jurassic carbonates in offshore wells. The suggested source is unknown rocks deposited within Early Mesozoic grabens; 4) Mango system - sub-commercial oil quantities in Mango-1 well offshore Sinai. The suggested source is an unknown Lower Cretaceous rock.

A wide disagreement still exists among investigators as to the actual number of thermogenic systems and the general model of hydrocarbon generation and accumulation in them. The present study indicates that Heletz is the only 'known' system. Possible structural traps are deep-seated Early Mesozoic horsts and shallower, Syrian arc folds. Potential reservoirs are shallow-marine siliciclastic and carbonate beds found on the basin margin and deepwater turbidite strata found within the basin.