Strike-slip tectonics in the Puglia Shelf between Gargano Promontory and Monopoli (Southern Adriatic Sea)

Mario TRAMONTANA

Institute of Geology, University of URBINO **(Italy)**

The Puglia shelf represents the prosecution of the foreland of the Apennine Chain (the Apulian Platform) which is affected by several normal-slip faults lowering it off shore (MOSTARDINI and MERLINI, 1986).

The faults characterizing the studied area constitute both mainly NW-SE trending systems, parallel to sub parallel to the coast, and rather straight-lined, roughly E-W trending ones. Some of the faults were activated as normal-slip faults since Jurassic (DE'DOMINICIS and MAZZOLDI, 1989) and caused a lateral differentiation of sedimentary environments. In correspondence with some of them, also during the Cretaceous, carbonate platform and basin facies were separated.

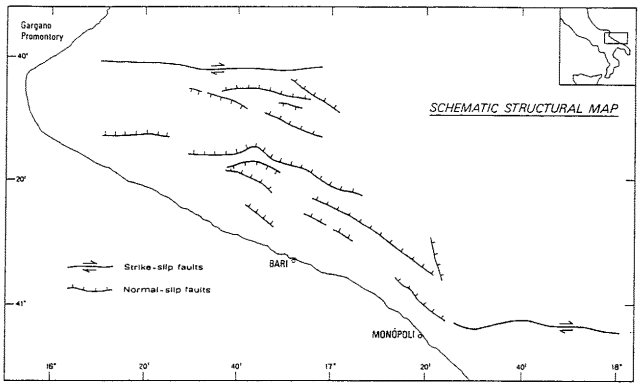
Flexotir and Air Gun seismic profiles interpretation allowed us to recognize an evolution in terms of strike-slip tectonics of the E-W trending systems located South of Gargano Promontory and East of Monopoli.

The South-Garganic system represents a right-hand shear zone whose main structural feature is the right-hand strike-slip fault pointed out by FINETTI (1982) (Gondola Line in DE'DOMINICIS and MAZZOLDI, 1989), which should extend as far as the mainland where it continues in the tectonic alignment S. Giovanni Rotondo-Monte S. Angelo. Cross sections of this structural element, which has been active at least till the base of the Plio-Quaternary sequence, show positive and negative flower structures (COLANTONI *et al.*, 1990).

The system East of Monopoli is located approximately in correspondence with the 41st parallel, and it is characterized by a set of high angle often anastomosing faults, bounding a series of basins and structural highs now buried by Plio-Quaternary deposits. The braided pattern of faults and especially the rhomb-shape of some basins allow us to relate such system to a right-hand shear zone. The presence of basins and structural highs results from divergence and convergence of the anastomosing right-hand strike-slip faults within the shear zone (CROWELL, 1974). The faults acted till Lower Pliocene; they do not seem to extend as far as the mainland but they end westwards in correspondence with normal-slip faults parallel to the coast.

The two systems represent deep regionally important features connected to the counterclockwise rotations of the Adriatic Plate or "African Promontory" already pointed out by FINETTI (1984), LOWRIE (1986), ANDERSON (1987).

The strike-slip tectonics took place during the Tertiary both reactivating the Jurassic normal-slip faults responsible of the first fragmentation of the Apulian Platform, and determining the formation of new strike-slip faults. Most of the parallel to the coast NW-SE trending normal-slip faults should be considered produced by the along-strike stepover on the right-slip zones or, in some cases, they may represent subsidiary structures across strike-slip faults with differing amounts of horizontal displacement.



REFERENCES

ANDERSON H., 1987. - Is the Adriatic an African promontory? *Geology*, 15 : 212-215.

COLANTONI P., TRAMONTANA M. and TEDESCHI R., 1990. - Contributo alla conoscenza dell'avampaese apulo : struttura del Golfo di Manfredonia (Adriatico meridionale). *Giorn. Geol.*, 52 (1/2) : 19-32.

CROWELL J .C., 1974. - Origin of Late Cenozoic basins in Southern California. In Tectonics and Sedimentation, W.R. DICKINSON ed., *Society of Economic Paleontologists and Mineralogists Special Publication* No. 22 : 190-204.

DE'DOMINICIS A. and MAZZOLDI G., 1989. - Interpretazione geologico-strutturale del margine orientale della piattaforma apula. *Mem. Soc. Geol. It.*, 38 : 163-176.

FINETTI I., 1982. - Structure stratigraphy and evolution of Central Mediterranean. *Boll. Geof. Teor. Appl.*, 24 (96) : 247-312.

FINETTI I., 1984. - Struttura ed evoluzione della Microplacca Adriatica. In Conferenza dei Rettori della Comunità di lavoro Alpe Adria, I problemi del Mare Adriatico. *Convegno Internazionale, Trieste* 1983 : 145-154.

LOWRIE W., 1986. - Paleomagnetism and the Adriatic promontory : a reappraisal. *Tectonics*, 5(5) : 797-807.

MOSTARDINI F. and MERLINI S., 1986. - Appennino centro-meridionale. Sezioni geologiche e proposta di modello strutturale. AGIP Mineraria. *73° Congresso Società Geologica Italiana, Roma.*

Late-Quaternary transgressive erosion and deposition in the Adriatic epicontinental Basin

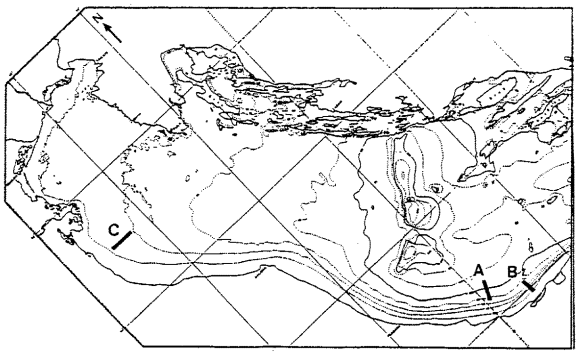
F. TRINCARDI, A. CORREGGIARI and M. ROVERI

Istituto per la Geologia Marina, CNR, BOLOGNA **(Italy)**

The study of modern continental margins provides several examples of transgressive erosion and deposition that originated during a short time span of increasing accommodation, and/or decreasing sediment supply, driven by the post-18-ky eustatic rise of sealevel. When detectable on seismic profiles the TST is defined as a succession of backstepping or retrogradational parasequences ; it rests on a transgressive surface marking the first major flood of the previous LST. The top of the TST is the surface of maximum flooding above which the parasequence stacking pattern is progradational. Low sediment supply and/or extensive erosional processes during relative sealevel rise can determine the lack of deposition or preservation of the TST. High-resolution reflection seismic profiles document the variability of thickness, internal organization and position in time of the transgressive systems tract that originated during the post-18-ky relative sea level rise within two distinct portions of the Adriatic epicontinental basin.

The Adriatic sea is an elongated and narrow (800 X 200 km) epicontinental basin consisting of a wide and gentle shelf to the north, the Mesoadriatic Depression, below a 140 m deep shelf-break, and a more complex ramp area to the south (Fig. 1). The shelf area located south of the Mesoadriatic Depression corresponds to the Apulian foreland ramp. During the late-Quaternary relative sealevel fall and lowstand a prograding wedge resulted from a process of "forced regression" and is capped by a transgressive erosional surface. A stack of onlapping (backstepping) marine wedges lying above the Transgressive surface is observed in areas where high sediment input counteracts the late stages of relative sealevel rise. In this case the Transgressive surface is markedly erosional with a plurimetric relief likely shaped by shoreface retreat as well as marine processes. No indication of paralic deposits is observed within the TST in this case ; as a consequence, the ravinement surface coincides with the transgressive surface (Fig. 2A). In areas of higher sediment supply, washover deposits can be preserved ; they downlap onto backbarrier deposits that show an aggradational backstepping configuration (Fig. 2B). Above the backbarrier transgressive deposits, a thin wedge or drape of shelf sediment can be detected; it belongs to the TST and is floored by the Ravinement surface and capped by the maximum flooding surface.

Fig. 1: Schematic bathymetric map of the Adriatic epicontinental basin.



The northern Adriatic area encompasses the Apennine foredeep and foreland basin filled by Plio-Quaternary progradational deposits with no evidence of aggradation . During the late-Quaternary lowstand this area underwent extensive subaerial erosion followed by the deposition of a lowstand wedge on the northern edge of the Mesoadriatic Depression. Seismic correlation proves that progradation from the north (fed by the Po river and tributaries) encompassed the early stages of relative sealevel rise (likely before R inflection point) while the southern area was experiencing erosional retreat and ensuing flooding of the shelf. Transgressive deposition in the Northern area is dominated by barrier island complexes and delta front bars (Fig. 2C). Tidal inlets and fluvial distributary channels appear as shallow (typically a few metres deep) erosional features that extend on short distances; they differ thus from the deeper and more continuous fluvial systems, entrenched during relative sealevel fall and lowstand, that are preserved in outer-shelf areas. Deposits appear sandier compared to the manne transgressive parasequences observed in the southern area. The Ravinement surface can be distinguished from the transgressive surface (TS) at the base of the TST, but is coincident with the maximum flooding surface (MF), because of the lack of detectable marine transgressive deposits, and, at places, with the sea floor, because of the lack of highstand deposition.

When imaged by means of high-resolution reflection seismic profiling, using broad-band sound sources, the stratigraphic record of the late-Quaternary transgressive deposits of the Adriatic epicontinental basin appears punctuated by several closely-spaced flooding surfaces that separate parasequences (i.e.: relatively conformable shoaling upward succession of genetically-related beds). Sediment supply, oceanographic setting and regional gradient control whether the facies that characterize the transgressive deposits are dominantly paralic. dominantly marine or both.

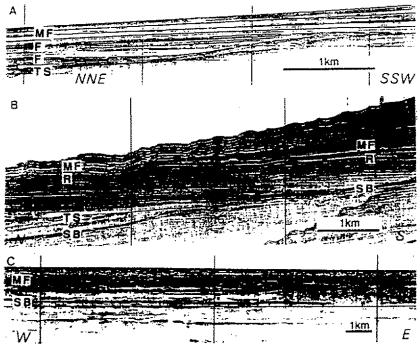


Fig. 2 : Examples of late-Quaternary transgressive deposits in the Adriatic epicontinental basin. A : Backstepping parasequences consisting of marine deposits bounded by flooding surfaces (F). Note coincidence of Transgressive surface and Ravinement surface (TS). MF is maximum flooding surface.
B : Land-ward dipping washover deposits downlapping onto backbarrier transgressive facies. Note the thin wedge of shelf transgressive deposit between the Ravinement surface (R) and the maximum flooding surface (MF). TS : transgressive surface; SB : sequence boundary. C: Transgressive parasequences underneath the HSST prodelta wedge; note the shallow distributary channels in delta-front deposits.