GENERAL FACTORS OF THE MESSINIAN EVAPORITIC SEDIMENTATION IN THE MEDITERRANEAN AND THE PROBLEM OF THE EROSIONAL SURFACES

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RESUME - Une étude détaillée des bassins évaporitiques messiniens actuellement émergés à la périphérie du domaine méditerranéen, apporte des données nouvelles pour la compréhension de la genèse des évaporites de cet âge et conduit à réexaminer l'interprétation de certaines phases d'érosion comme celle qui a affecté la région rhodano-languedocienne.

During several years, some presently emerged Messinian basins (Spain, Morocco, Algeria, Sicily, Ionian Islands, Creta, Cyprus) has been studied and compared with Mid Miocene evaporitic basin of the Gulf of Suez ; these studies provide new datas for the understanding of the "Messinian Salinity Crisis" (1) ; this so-called "Messinian Salinity Crisis" puts forward an unitarian concept at the origin of some oversimplifications. In fact, the Messinian event includes a score of evaporitic episodes and an interfering set of complex events: climatic, morphologic, tectonic, etc...

Amidst the main proposals drawn by our study, we insist on :

- the diversified paleogeography of the Messinian Mediterranean prefigures the present-day morphology with lesser maximum depths values (about 1000 meters in the western part) ; the present bathymetry is the result of near continuous tectonic differenciation. The important mio-pliocene paleogeographic reorganisation offers an instant picture of this differenciation because of particular hydrodynamic conditions of this period ;

- the mainly marine character of evaporites, both in western and eastern parts, but for a few distal endoreic depressions such as the Granada basin. This implies : 1) an almost continuous supply of oceanic waters with the condition of a slight depletion in them. The volume is no more sufficient for compensating evaporative losses ; nevertheless, temporary closures of the oceanic gap are probable ; 2) a persistency of subaqueous evaporitic deposition within residual hypersaline waters bodies to be contrary of a generalized desiccation ; 3) episodic -but minor- drawdowns of aquatic level during evaporitic phases.

- the progressivity of confinment with classical sequence : marine marls ; diatomites (type 1) related with marine active circulations (upwelling) and reefs build-up ; laminites and diatomites (type 2) related to increasing restriction ; stratification of water body ; progressive depths reduction (and definite coral disappearence before the first evaporitic episode) ; microbial occupation of the residual environments immediately before, after, and partially during evaporitic precipitation ;

(1) J.M. ROUCHY, La genèse des évaporites messiniennes de Méditerranée. Mém. Mus. Nat. Hist. Nat., C, Sci. de la Terre, L, 267 p.,18 pl. ph.

- the diachronism of the evaporitic conditions : the times gap increases from the edges to central parts of depressions that provide traps for thick accumulations of the more soluble salts ;

- the possible climatic control of the increased supply of fresh water and of terrigenous material in the highest portion of the upper evaporitic unit, ending into the diachronic terminal "lacmer" conditions ; the increase of humidity is interrupted by few arid periods near the end of Messinian. This fact involves evolution of the hydrological balance toward brackisch conditions (this is perhaps favoured by more severe restriction) ;

- the role of tectonic movements that implies : 1) creation and persistance of depressions trapping thick salt deposits (or in some instances reversed conditions where tectonics erase such depressions) ; 2) progressive reduction of the oceanic pass ending into hypersaline conditions (perhaps favoured by eustatic processes) ; 3) continuity of the morphological differenciation during plio-quaternary times up to present.

The episodic and limited fluctuations of the aquatic level involves a repeated emersions over marginal areas of various width and erosional reactivation. However, examples such as the paleo-Rhône valley indicate that the presently -observed incisions cannot be only related to a considerable water drop ; retreat of the sea from the considered area (Rhône valley and Languedoc) both on- and off-shore begins near the end of Mid-Miocene or early Tortonian. Therefore this retreat is independent from Messinian events ; probably the sea comes back in a diachronous manner during the full lower Pliocene. In this example as in others, we must consider not only the role of the Messinian base-level fluctuations but also the role of the tectonic.

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