

Quaternary Evolution of some coastal Lagoons of the Spanish Mediterranean Littoral (Valencia, Alicante and Mallorca)

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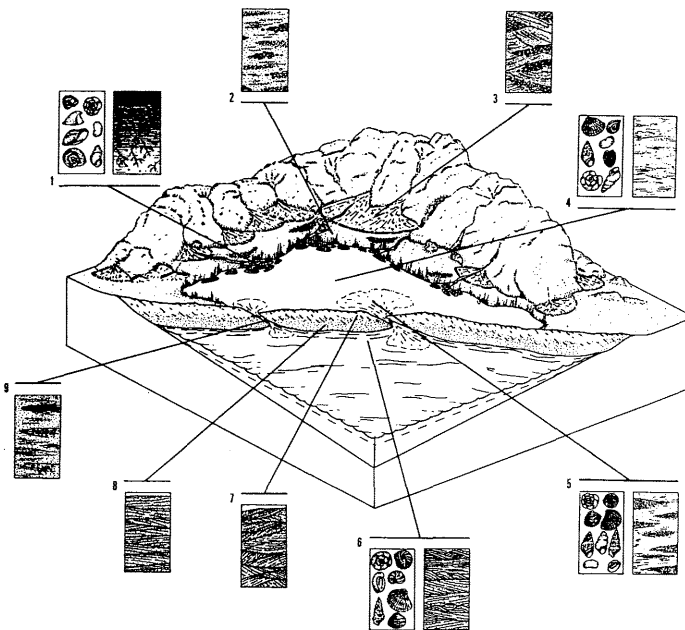
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This is a study of the quaternary evolution of four barrier-island systems in the Mediterranean coast. We have worked in four areas, three of them in the peninsular littoral: The Oliva-Pego marsh (Valencia), Xàbia and Moraira (Alicante). The fourth, S'Albufera de Alcúdia, is in the eastern coast of the island of Mallorca. These environments have very active sedimentary dynamics, dependant on the quaternary eustatic oscillations, finally responsible for the migration of the ancient coastlines.

The reconstruction of the successive depositional environments in these littoral zones is approached from the sedimentological and micropaleontological analysis and from absolute datings of the materials extracted from several cores.

The Oliva-Pego marsh is currently a barrier-island system placed in the southern part of the Valencia Gulf. DUPRE et al (1988) and VINALS et al (1989) have recognized several subenvironments from marginolittoral areas that allow us to place different positions of the coastline during Upper Quaternary.



Ideal reconstruction of the Oliva-Pego marsh in the Upper Pleistocene. Facies of the margino-littoral environment: (1) Biotope of the freshwater swamp; (2) facies of aluvial plain; (3) facies of aluvial fan; (4) Biotope of brackish lagoon; (5) Biotope of marine influenced brackish lagoon; (6) Biotope marine, infralittoral; (7) Dune facies; (8) Dry beach facies; (9) Inlet facies. Sedimentary structures are from REINECK and SINGH (1975).

The Xàbia and Moraira bays have a more structural morphology since they are inserted in the sea-cliffs of La Nao. Now they are relic systems (FUMANAL and VINALS, 1989 a; 1989 b), whose pleistocene barrier formations are recognizable in the present landscape (FUMANAL et al., 1990).

S'Albufera de Alcúdia is the biggest lagoon of the Balears. The cores taken inside this area have a depth of 350 m. From micropaleontological studies COLOM (1985) and MATEU (1982) have established different levels, the majority of them from the Tertiary age. The upper 62 m are due to quaternary sedimentation.

The sedimentological features of the records allow the reconstruction of the different sedimentary environments and the diverse positions of the coastline along the considered period.

The species found permit the paleoenvironmental reconstruction. The fact that many of the species are euryhalines, imply that the study must be based on the consideration of faunistic associations and the dynamics of populations.

References

- COLOM, G. (1985): estratigrafía y paleontología del Andalucense y del Plioceno de Mallorca (Balears). Bol. Soc. Hª Nat. Balears, 23. pp.25-33.
- DUPRE, M.; FUMANAL, M.P.; SANJAUME, E.; SANTISTEBAN, C.; USERA, J. y VINALS, M.J. (1988): Quaternary evolution of the Pego coastal lagoon (Southern Valencia, Spain). Palaeogeography, Palaeoclimatology, Palaeoecology, 68. pp.291-299.
- FUMANAL, M.P. y VINALS, M.J. (1989 a): La albufera residual de Moraira (Alicante): Evolución geomorfológica. Actas del XI Congreso Nac. de Geografía, Madrid, 25-30 septiembre. pp. 391-400.
- FUMANAL, M.P. y VINALS, M.J. (1989 b): El litoral de Xàbia: Contrastes morfológicos y genéticos. Xàbica, 5. pp.7-16.
- FUMANAL, M.P.; SANTISTEBAN, C. y VINALS, M.J. (1990): Implicaciones geomorfológicas de las formaciones de restinga en el sector Prebético externo (Alicante). Actas 18 Reunión Nac. Geomorfología. Teruel.
- MATEU, G. (1982 a): El Neógeno-Pleistoceno de Mallorca. Bol. Soc. Hª Nat. Balears, 26. pp.75-133.
- VINALS, M.J.; MATEU, G.; FUMANAL, M.P. y USERA, J. (1989): Aportación al conocimiento de las facies lagunares y litorales de la marjal de Oliva-Pego (Valencia). Cuaternario y Geomorfología, 3.

The Role of the Relative Sea Level Changes on the Quaternary Evolution of the "Mar Menor" (Murcia, Spain)

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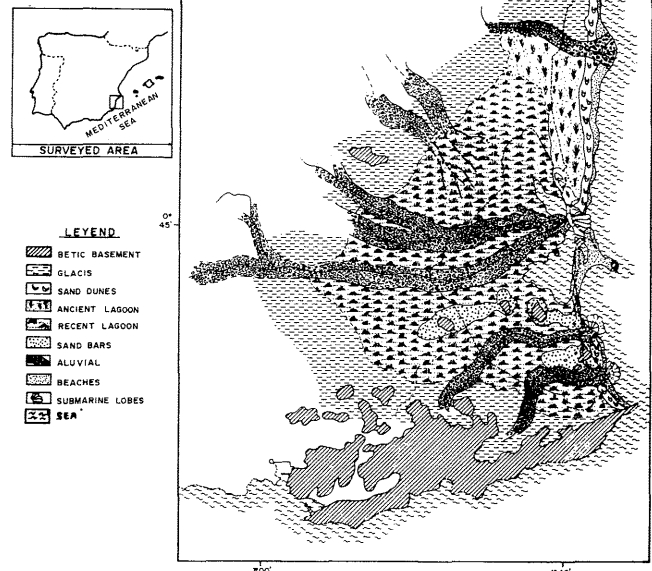
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Mar Menor is a simple coastal-lagoon in the southeastern end of the Iberian Peninsula (Western Mediterranean). Its origin is related to Flandrian transgression, and can be interpreted as a residual coastal-lagoon (DIAZ DEL RIO, 1989). It's underlain by Plio-Quaternary sedimentary sequences prograding seaward, developing the continental margin in the area. High-resolution seismic profiling, aerial reconnaissance studies, vibrocores and sediment samples have been used to interpret the Quaternary history and evolution of the system.

The sediments in the bottom are dominated by mud-size clastics and bioterritic materials, mainly from mining wastes. Only the borders are dominated by sandy sediments, forming the barrier and the land edge.



The thickness of the recent sedimentary units shows high variability, between 1 and 12 meters. The seismic reflectors are generally characterized by strong signals separated by an acoustic reflection (at the base of the series) having a large lateral extent, interpreted as a Tyrrhenian basal level.

Variations in sea level, in this case glacio-eustatic, display a high morphology variability on the coastal-lagoon, as well as in the barrier (SOMOZA, 1989; NICHOLS, 1989). The effect of relative sea level changes, as far as it relates to the construction of the youngest barrier, is the landward migration of the beach simultaneous to an expansionary lagoon.

Based on seismic-reflection data, and assuming a Tyrrhenian-III age (based on regional stratigraphic studies in the area) for the basal level, it is possible to estimate a sedimentation rate close to 1.2 mm/y - 2 mm/y, for the last 80.000 years.

As a result of a relative drop in sea level, 18.000 years B.P. (minimum regressive), a fluvial-torrential system was placed in the lagoon, developing a marsh system in the back-barrier. In the mouth of the channels fluvial sediments could be deposited constructing submarine lobes, composed by coarse sand and gravels. These sedimentary bodies, can be seismically recognised in the inner continental shelf.

REFERENCES.

- DIAZ-DEL-RIO, V., 1989. Morfología, formaciones superficiales y evolución reciente del margen continental en la región del Cabo de Palos (entre el Cabo Tiñoso y el Cabo Cervera), SE de la Península Ibérica. Tesis Doctoral. Universidad Complutense. 358 pp.
- NICHOLS, M.M., 1989. Sediment accumulation rates, and relative sea-level rise in lagoons. In: L.G. Ward and G. M. Ashley (Editors). Physical Processes and Sedimentology of Siliciclastic Dominated lagoonal Systems. Mar. Geol., Vol. 88: 201-219.
- SOMOZA, L., 1989. Estudio del Cuaternario litoral entre el Cabo de Palos y Guardamar del Segura (Murcia-Alicante): Las variaciones del nivel del mar en relación con el contexto geodinámico. Tesis Doctoral. Universidad Complutense.