

LOWER PLIOCENE OUTCROPPING ON THE EASTERN TYRRHENIAN CONTINENTAL SHELF: STRUCTURAL IMPLICATIONS

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RESUME - Le Pliocène inférieur a été carotté au large du Capo Circeo: on a pu ainsi tracer l'évolution de la plateforme continentale de ce secteur de la Mer Tyrrénienne.

A number of outcropping sedimentary sequences, topped by a marked erosional surface and covered by no more than 4 m. of sub-horizontal sediments were individuated on the continental shelf off Capo Circeo. Six gravity cores were taken in the area, two of which reached sediments of lower Pliocene age (Planctonic Foraminifera zone of Globorotalia bononiensis).

The seismic line TP6 shows a clearly defined and well stratified series of depositional units - A', A, B, C, D, E resting directly on the acoustic substratum. All, except A, exhibit a clearly progradational configuration related to the construction of the continental shelf. A clear unconformity can be recognized along the shelf up to unit B, causing the outcropping of the sedimentary units. The Ostracod Fauna in situ (Bosquetina dentata, Argilloecia acuminata, A. bulbifera, Callistocythere adriatica, Cytheropteron monoceros, Henryhowella sarsi, Pterigocythereis ceratoptera) of the sub-horizontal sediments covering the unconformity in the shelf area indicate depths of 80 to 150 m. (present average shelf depth is 120 m.) but the larger grain size and the greater number of displaced littoral Ostracods present in the lower parts of the cores indicate a slight depth increase from the bottom to the top. It is likely therefore that these sediments accumulated during the latter part of the Flandrian Transgression, the older Quaternary sediments probably being eroded during the same transgression. In the basin, on the other hand, unit A' can be taken to represent the complete interval of Flandrian age.

Unit A, lenticular in shape and with the poor resolution of its internal reflectors probably indicating proximal, coarse sedimentation, most likely deposited during the lowstand period of the Würm glaciation.

Unit E is defined as lower Pliocene in age due to the fact that both lower Pliocene core samples were collected within it, while the strong reflection of horizon e and its position immediately above lower Pliocene sediments suggest it being representative of the mid-Pliocene transgression. We have therefore unit E of lower Pliocene age, units B, C, D, ranging from upper Pleistocene to mid Pliocene, while units A and A' are of Würm glacial and Flandrian age respectively.

The faulting affecting the acoustic substratum, localized up against the structural high on which the volcanic Western Pontine Islands evolved, shows two intervals of enhanced movement. The units involved are B and E, to which have been attributed Pleistocene and lower Pliocene ages respectively on the basis of the coring results and seismic interpretation. In fact, these ages are in complete agreement with and supported by the K/Ar Radiometric data on the volcanic rocks of the islands which date two periods of activity: one, 5 to 4 my in age and the other, 1.7 to 1.1 my in age.

To conclude, the construction of the continental shelf in this area commenced during lower Pliocene; the first of the progradational units resting directly on an acoustic substratum of probable Mesozoic age since Liassic limestones outcrop on Mount Circeo. At about the same time volcanic activity began on the pre-existing structural high on which the present-day Western Pontine islands developed. The construction of the shelf continued until upper Pleistocene while Palmarola basin subsided mainly due to the two phases of movement affecting the units described above. With the deposition of unit A during the Würm glacial phase, the resumed outbuilding of the shelf from the Flandrian Transgression and the lack of tectonic activity affecting the units A' and A, the depression of Palmarola Basin is probably due to be completely filled.

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