A 90 m long borehole, drilled at the Viareggio coast (Versilia, northern Tuscany), was studied in order to reconstruct the sea levels changes linked to Late Quaternary glacial-interglacial intervals, paying attention to the last deglaciation. The study area is the type locality of the Versilian Stage, instituted by Blanc (1942). He found, near the Massacciuccoli Lake, a continuous succession of the last 15 kyr, characterised by sediments ranging from coastal marine to transitional environment. This geographic setting offers the ideal record to reconstruct a paleobathymetric curve, because proxies from transitional environments give more precise evaluation of sea level, with respect to marine and continental ones (Lambeck, personal communication). After Federici (1993), the Versilian stage represents the transgressive phase that started from the last glacial low-stand and reached its maximum at the begin of the Atlantic chronozone. The new data carried by Antonioli et al. (1999) suggest, on the contrary, that the sandy deposits characterising the base of the last transgressive cycle date 10.4 kyr BP. Consequently, the Versilian stage would coincide with the Holocene.

The preliminary results of the micropaleontological study are based mainly on benthic foraminifers that offer, in suitable environments, the possibility to carry out the statistical analysis. Moreover, the study on ostracods and the most significant mollusc fauna gives more information for the paleoenvironmental reconstruction. At this moment, five radiocarbon dates (AMS) carried out on shell or coral fragments are available.

The Hierarchical Cluster Analysis (Q-mode) was carried out on the benthic foraminiferal assemblages in order to single out distinct groups of samples corresponding to different paleoenvironments. Moreover, the two first components of the PCA may be interpreted as the main ecological parameters, possibly organic matter content and salinity, conditioning the assemblage composition. On this basis, four environmental settings are singled out: lagoon with near normal marine salinity and relatively oligotrophic conditions (Ammonia parkinsoniana, Aubignyna perlucida and miliolids); brackish relatively oligotrophic lagoon (Ammonia parkinsoniana and A. tepida) evolving into shallow-marine with fresh water influence environment (Ammonia parkinsoniana, A.
tepida and miliolids); brackish and relatively eutrophic lagoon (*Haynesina depressula* and *Aubignyna perlucida*); offshore marine environment (infralittoral/upper circalittoral zone) (*Ammonia* spp. and miliolids/*Rectuvigerina phlegeri* and miliolids). Their succession singles out three sedimentary episodes, corresponding to the eustatic changes due to the Late Quaternary climatic oscillations. The oldest one, at the core bottom, lead to the establishment of the lagoon with near normal marine salinity that indicates a good connection with the open sea. The successive one determined a single brackish water lagoon event. These episodes are older than 49100 yr BP and could be hypothetically related to warm oscillations of MIS 5 or MIS 3. During the subsequent phase, that begins before 49100 yr BP and finishes before 36400 yr BP, the environmental setting evolves from brackish relatively oligotrophic lagoon to shallow-marine with fresh water influence environment. It could be attributed to a warm climatic episode related to MIS 3. During the third sedimentary phase the eutrophic brackish lagoon recognised at the base evolves into marine offshore environment up to the transition infralittoral/upper circalittoral zone; successively, a regressive trend leads back to shallow marine and then to backshore environment that is dated 7351 yr BP. This last cycle may be considered corresponding to the Versilian transgression.

Our next purpose is to date the bottom of the Versilian sediments in order to give a further contribution in defining the base of the Versilian stage. Moreover, new aimed dates on lagoon sediments, that well approximate the sea level, will be helpful to single out some steps of the RSL during the Late Quaternary in the Versilian area.

**References**

