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Study of sedimentary dynamics by means of foraminiferal analysis in Gran Canaria (Canary Islands-Spain)

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The Canary Islands, Spain, are located in the eastern subtropical region of the Atlantic Ocean. Quaternary sedimentary deposits of the Canary Islands include extensive aeolian deposits and beaches. A good example is Las Canteras beach, located in the inner part of El Confital Bay, on the northeastern coast of Gran Canaria Island. This is an urban sandy beach, nearly 3 km long, and constitutes the main tourist area of Las Palmas de Gran Canaria city. For that reason it has a great socio-economic importance. In this context, the building of the town has affected the natural dynamics of the sediments, which arrive from the bottom of the Confital Bay pulled by waves and currents; after drying on the beach, grains are blown towards the south by trade winds. Since 1960 the beach front was rebuilt, and a new seawall and higher buildings were constructed. The result is that the wind is not able to blow the sediments over such fence, and therefore grains accumulate on the beach face. Due to the shoreline configuration and the presence of a natural offshore sandstone bar, the north sector of the beach is very well sheltered from prevailing northern waves. Nevertheless, this bar is not continuous along the whole beach, and the south end of the beach is completely exposed to incident waves. This sandstone bar separates the upper shelf environment and the submerged beach. Until now, coastal dynamics studies of Las Canteras beach have considered the dynamics of the system based on its sedimentology and geomorphology, while the present work is the first one that uses foraminiferal analysis for the study of the sediment dynamics. Sediment samples from three different coastal environments were collected for this study:

- 1) from upper shelf offshore of the sandstone bar, collected by means of a box corer, which allows the recovery of sediments with minimal disturbance,
- 2) from the submerged beach collected by scuba-diving, and
- 3) from the foreshore collected with a hand-held corer.

Samples were washed through a 63 μm sieve and treated with Rose Bengal to differentiate living individuals. The remaining dry sediment was floated using CCl_4 . Foraminifera were picked from the dried float, separated, and identified. In order to determine relationships between the three environments we have used the foraminiferal content of the samples as natural tracers of sediment transport. The degree of relationship between different samples has been considered by means of a quantitative cluster analysis, performed by NTSYSpc2 program. This technique yields a very good knowledge of the sedimentary system since it considers the upper shelf, submerged beach, and foreshore integrated as a whole.