THE OUTCROP OF THE UNDERLYING SUBSTRATUM OF THE MASPALOMAS DUNE FIELD (GRAN CANARIA, CANARY ISLANDS): A SIGN OF A SEDIMENTARY DEFICIT

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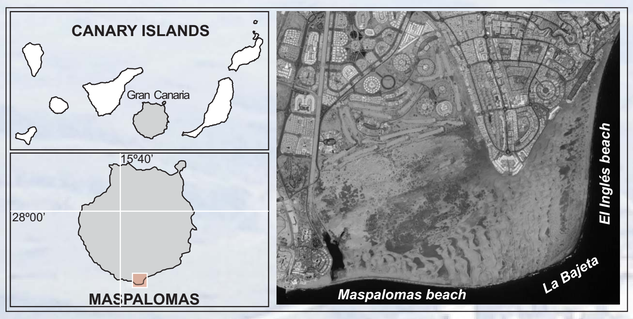
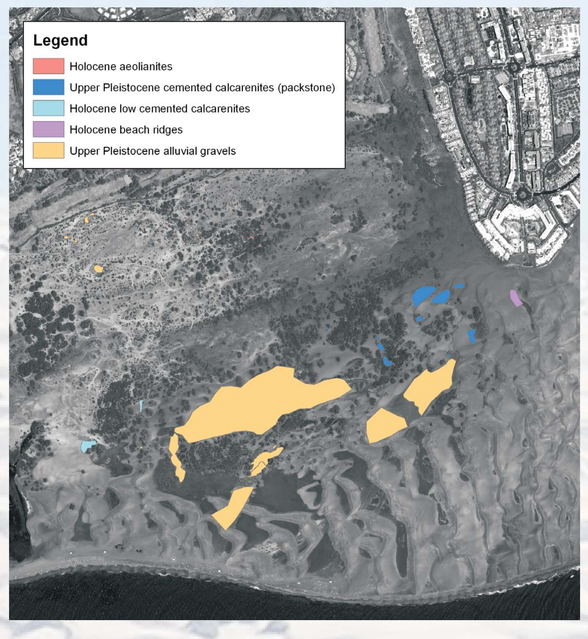


The development of the tourism in the neighbourhood of the Reserva Natural Especial de Las Dunas de Maspalomas (Gran Canaria Island) has been progressive from the Sixties of 20th Century to nowadays.
The urbanization of the El Ingles' sedimentary terrace has modified the aeolian sedimentary dynamics, generating the stabilization of the aeolian deposits in insides areas, and the appearance of geological materials that constitute the underlying basement of the dunes area.
The analysis of aerial photographies of last decades shows an increase in the exhumed surfaces of this basement from 70.000 m^2 in 1960, to 170.000 m^2 in 2000.

THE SEDIMENTARY DEFICIT



GEOLOGICAL CHARACTERISTICS OF SUBSTRATUM

Holocene beach ridges

The gravel barriers have NE-SW directions, they reach cents of metres on length and several metres of width, and they are partly capped by Maspalomas dune field. These ridges contain pebbles and cobbles of trachy-phonolitic compositions (low amounts of basaltic) and the gravels show usualy disc forms. Some of these sedimentary deposits have been modified by beach users to make wind cutter structures.

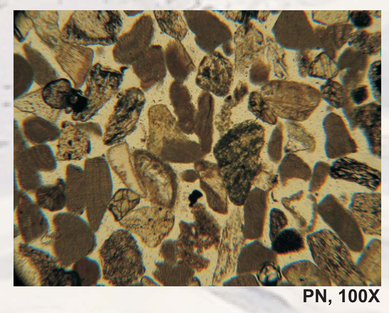
Holocene low cemented calcarenites

These deposits are mainly formed by fine sands related to old dried coastal lakes in the Maspalomas ravine mouth. These sedimentary rocks have been classified as grainstones (gravel 0.8%, sand 83.3% and mud 15.9%, as mean), these are poorly sorted, have intergranular porosity and show microsparite cement rims around grains (thickness 0.01-0.05 mm). The carbonate cement is low Mg calcite (Mg 300-9,900 ppm; Na 500-2,400 ppm and Sr 800-2,100 ppm) and it could be associated to vadose waters.

PN, 100X

Holocene aeolianites

The aeolianites deposits are grainstones of medium sands (gravel 0.4%, sand 99.3% and mud 0.3%, as mean), moderately sorted and they show planar and cross-bedding structures. These sandy deposits contain 55% of lithoclasts (olivine, clinopyroxene, alkaly feldspars, amphibole, Fe-Ti oxides, rock fragments felsic and mafic, volcanic glasses and intraclasts), 45% of bioclasts (red algaes, molluscs, foraminifera, echinoderms and bryozoans), and carbonate cement rims around grains (thickness 0.01-0.05 mm). This cement is low Mg calcite (Mg 800-11,800 ppm; Na around 200 ppm and Sr between 300 and 600 ppm) and it is also related to vadose waters.



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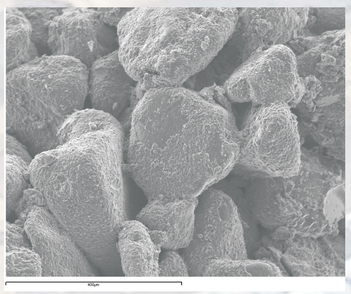
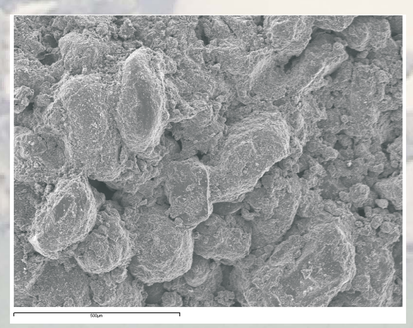
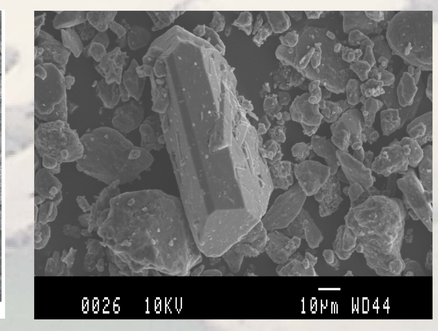
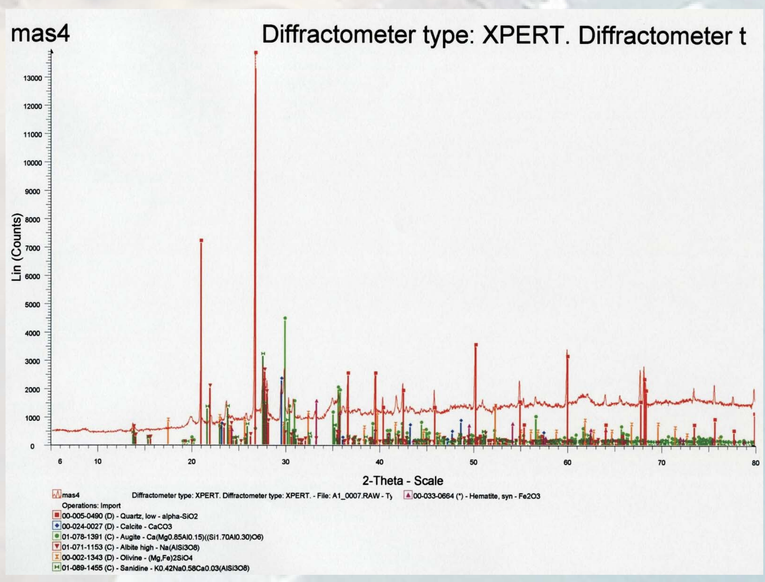


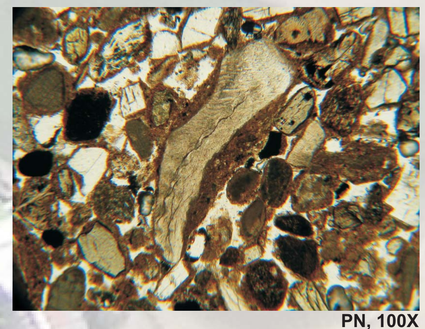




Upper Pleistocene alluvial gravels and paleosoil

The alluvial gravels are characterized by subrounded and subangular trachy-phonolitic and calcarenites pebbles and cobbles, and these deposit have a very pale brown interlayer paleosoil (10YR7/4) with a Bt <20cm, a Bk moderately developed, and quartz (transported by sahara winds), illite and kaolinite stand out in the silt fraction among other minerals. This paleosoil is a gravely muddy sand (gravel: 13%, sand: 64% and mud 23%, as mean) and it is very poorly sorted. Their sandy fraction contain lithoclasts (olivine, clinopyroxene, alkali feldspars, amphibole, Fe-Ti oxides, felsic and mafic rock fragments, volcanic glasses and intraclasts), bioclasts (red algaes, molluscs, foraminifera and bryozoans) and low Mg calcite rims around grains (thickness 0.01-0.05 mm).





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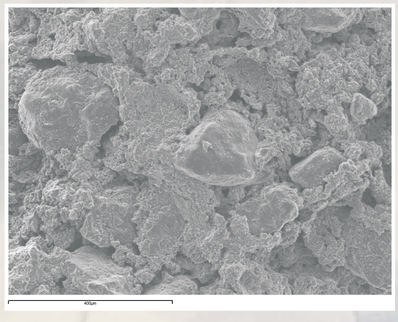

Upper Pleistocene cemented calcarenites

The cemented calcarenites have been clasiffied as packstones and they contain 37% of lithoclasts, 20% of bioclasts and 43% of micrite and sparite cements, as mean. The carbonate cements appear as micritic and sparitic zones and bands, and as microsparite rims around of some grains (thickness 0.05/0.5 mm), and they are low Mg calcite with Mg concentrations between 440 and 10,900 ppm, Na between 200 and 600 ppm, and Sr between 700 and 1,600 ppm. These limestones show channel, cavern and inter-intragranular porosities. The origin of these carbonate cements is from vadose waters.