



Degradation processes on eolianites and micromorphology on the Southwestern coast of Portugal (Alentejo)

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Carbonate dunes occur in the middle southwestern Portuguese coast and in the Algarve coast over a distance of 300km. They are being studied within the CarDune Project - Carbonate Dunes as Palaeoclimatic Records in the Littoral of Portugal (PPCDT/CTE-GEX/59643/2004) . One of the aims of this Project is to define the degradational processes of the eolianites, namely by karstification, in order to deepen the knowledge of Portuguese eolianites. To pursue this objective, a heritage carbonate dune field was selected - the Malhão carbonate dune field (south west coast). Over the Palaeozoic turbidites basement, the eolianite covers today 28km², is cut into the cliff and reaches 3km inland. This Pleistocene dune field is correlated to a low sea level. It was colonized by vegetation (recognized by root carbonate concretions) and has been submitted to lithification by carbonates provided by shell dissolution. The sea covered the present-day western part of this field and a shore platform was developed. With the subsequent sea retreat, another heritage dune field (not carbonate) partially covered the older one and the all coastal area suffered tectonic uplift (the shore platform reaches today over 15m high). The heritage shore platform cut into the eolianites, exhibits different patterns of micromorphology generated by distinct processes and conditioning factors. To approach this subject, an accurate field survey was carried out, with a total station (NIKON DTM 522) in order to model the micromorphology (with ArcGis software). The eolianite structure was analysed (aeolian structure and fracture pattern) as well as the textural parameters of 27 samples. Each sample was oven-dried at 60 degrees Celsius, weighted with a 0,01g accuracy and submitted to calcimetry. A series of standard sieves (from -2 to 4.5 phi or 4.0mm to 0.044mm) was

used for grain size analysis and the textural parameters were calculated according to the method of moments with SEDMAC/SEDPC software. Four major microforms' assemblages were defined. They represent a particular combination of degradation processes and conditioning factors. The accurate micromorphological survey of the four major microforms' assemblages showed 25 homogeneous areas, each of them defined by a particularly dominant process and several conditioning factors. In the case studied, the degradation processes can be natural or anthropogenic. The natural processes are heritage or acting today. The present-day natural processes are: (i) physical (rock fall, rill erosion and haloclasty); (ii) chemical (karstification) and (iii) biological (both physical- mechanical and chemical). The carbonated dunes were used as lithic resources. The extraction and production of millstones (abandoned in the beginning of the last century) is an example of an anthropogenic process. The eolianite was also used for construction.