

## Biodiversity of *Lotus* spp. in Devesa of l'Albufera (Valencia, Spain)

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The Devesa of l'Albufera is an area of “restinga” of the Natural Parq of l'Albufera (Valencia, Spain), in which four ecosystems are present as strips parallel to the sea: the beach, movable dunes or first cord of dunes, “malladas” and fixed dunes. The extreme environmental conditions typical of the Devesa (soil dryness, low organic matter content and high permeability, action of the marine wind and constant mobility of the substrate) determine the presence of a particular type of vegetation (Benavent *et al.* 2004). Predominating soil types are the Calcaric Arenosols, although in the “malladas”, which exhibit greater hydromorphism, Calcaric Gleysols or Gleyic Solonchaks can be found, the latter having high salinity levels (FAO-UNESCO classification, 1988; Rubio Delgado *et al.* 1998). This system of dunes constitutes an ecosystem of great ecological value, but unfortunately it was quite modified during the Urban Developing Plan onset around 45 years ago, as a result of which, the beach and front dune cord were the most affected sectors. Since 1980, the Technical Office Devesa-Albufera (OTDA) is in charge of the management of the natural spaces of Valencia and one of its high-priority objectives is the restoration of the first dune front. This process consists of three stages: restoration of dune morphology by means of mechanical sand accumulation, dune fixing by construction of fences and plantation of native psamophile species and, finally, the adaptation of the area recovered for public use. One of the species used for dune plantation is the native legume *Lotus creticus* L., a typical component of the vegetal associations *Medicago marinae*-*Ammophiletum arundinaceae* Br.-Bl. (1931) 1933 and *Crucianelletum maritimae* Br.-Bl. (1931) 1933. The distribution and relation of *L. creticus* with other vegetal species was studied and it was found to be associated with other psamophile species (*Elymus farctus*, *Otanthus maritimus*, *Ammophila arenaria* and *Malcolmia littorea*) in movable dunes (Costa and Mansanet, 1981). Also, by means of the linear interception method, cover by *L. creticus* and the other two legumes present (*Medicago marinae* L. and *Ononis natrix* L.) was evaluated in three sectors of the first dune-front. *L. creticus* was the legume showing greater cover and reached its maximum

value in the windward sector and crest of the primary dune. Cover by *L. creticus* gradually decreased when approaching to the fixed dunes, being minimum or null in the woody plant communities. On the other hand, the “malladas” are another type of ecosystem present in the Devesa, which are located in the depressions between dunes. Soils in the “malladas” are muddy, with variable salinity levels and become flooded as a consequence of rain. In zones of medium salinity that conserve certain degree of humidity throughout the year, the vegetal alliances developed are *Juncion maritimi* Br.-Bl. 1931 and *Plantaginion crassifoliae* Br.-Bl. 1931, to both of which a *Lotus* species was associated. This species was described in the literature to be *Lotus corniculatus crassifolius* (2n=24) (Grant, 1995). However, chromosomal counts performed in our laboratory found it to have 2n=12. The location of populations of this species within the Devesa was determined and the conductivity of soils in which they are developed was analyzed and found to be very variable (0.2 to 13.0 ds/m). Finally the biodiversity study was completed by taking samples of *L. creticus* plants for the analysis of root colonization by mycorrhizal fungi and the isolation of rhizobia from root nodules of both *Lotus* species, which are currently being characterized.

## References

- BENAVENT OLMOS J.M., COLLADO ROSIQUE P., MARTÍ CRESPO R.M., MUÑOZ CABALLER A., QUINTANA TRENOR A., SÁNCHEZ CODOÑER A y VIZCAINO MATARREDONA A. 2004. La restauración de las dunas litorales de la Devesa de l'Albufera de Valencia. Ajuntament de Valencia. 65 p. [<http://www.albufera.com>].
- COSTA M. y MANSANET J. 1981. Los ecosistemas dunares levantinos: la Dehesa de la Albufera de Valencia. [The dunar ecosystems: the “Dehesa de la Albufera” of Valencia]. *Actas III Congreso Optima. Anales Jardín Botánico Madrid*, **37** (2), 277-299. [Spanish].
- FAO-UNESCO. 1988. Soil Map of the World. Revised Legend FAO. Roma.
- GRANT W.F. 1995. A chromosome atlas and interspecific-intergeneric index for *Lotus* and *Tetragonolobus* (Fabaceae). *Canadian Journal of Botany* **73**, 1787-1809.
- RUBIO DELGADO J.L., ANDREU PÉREZ V. y SANCHIS DUATO E. 1998. Los suelos de la Devesa de la Albufera. [The soils of Devesa de la Albufera]. *Revista Valenciana d'Estudis Autònoms*, **22**, 129-144. [Spanish]