

## **Long-term analysis of the role of *Traganum moquinii* plants in the foredune formation of an arid dunefield (Maspalomas, Gran Canaria, Canary Islands).**

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In recent decades, important environmental changes have been detected in dune systems around the world. Vegetation on the foredune provides stability to the coastal dunefields, capturing and accumulating sediments, which is an important function among other ecosystem services. For this reason, vegetation has been used as an indicator when studying anthropogenic and natural processes in the foredunes, especially when an increase of the vulnerability has been detected. Foredunes of arid dunefields have been little studied. They present significant differences with respect to the foredune of other climatic zones. *Traganum moquinii* is the predominant plant species in the foredune of arid dunefields around the Canary Islands (including South Morocco, Mauritania and other close archipelagos, like Cape Verde). This bush species plays an important geomorphological role: its interaction with the aeolian sedimentary processes generates nebkhas, shadow dunes and arid parabolic shaped dunes. The objective of this work is to show the morphometric evolution of the foredune of an arid dunefield of the Canary Islands, Maspalomas (Gran Canaria), as well as explaining the function of *Traganum moquinii* on it. One morphometric variable (number of nebkhas) and six morphologic variables of *Traganum moquinii* species (density, mean distance between *Traganum moquinii* individuals, number of *Traganum moquinii* individuals in line one, mean diameter of *Traganum moquinii* individuals in line one, mean distance between *Traganum moquinii* individuals in line one, density *Traganum moquinii* individuals in line one) have been measured in ten observation plots, from the 1960s to the present, through detailed historical aerial photographs and orthophotos, using GIS. The morphometric changes have been identified, and the variables have been related from statistical analysis to detect the function exerted by *Traganum moquinii* species in the foredune. The change in the number of nebkhas enables the characterization of three types of foredune environments, which lie N-S. Measured variables in the first line of the foredune present significant relations with the number of nebkhas. The changes detected and the relationships observed between variables are related with natural processes and anthropogenic impacts. This information can be useful for arid coastal dune systems management, as well as restoration tasks in arid foredunes.