



Contribution to the study of coastal floristry biodiversity in Oran

Haddad Fatma Zohra¹, Frih Faiza¹, Nouredine Benaissa¹, Zitouni Boutiba¹, Ionela Dobrin²

¹Department of Biology, University of Oran, Laboratory Network for Environmental Monitoring (LRSE), Oran, Algeria

²Department of Plant Science, Faculty of Agriculture, University of Agricultural Science and Veterinary Medicine, Bucharest, Romania

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Abstract

According to Eurostat report data (EU Statistical Office) the enormous impact of tourism on ecosystems would be one of the most important causes of biodiversity degradation in the Mediterranean countries. The Red List of IUCN (International Union for Conservation of Nature) records today some 16120 endangered species in the world. In this context we conducted this study of the coastal dunes vegetation in Oran, a subject whose work remain incomplete, and in the order to validate the presence of plant species threatened, vulnerable or likely to be so designated. A sampling was conducted during the year 2014 .All samples were identified using several reference books, including the new flora of Algeria of Santa and Quezel (1962-1963). Based on 25 surveys conducted in the study area, 90 species have been recorded, belonging to 16 families whith species that deserve protection as *Cakile maritima* and *Ephedra distachya*.

Introduction

The coast is the interface between land and sea. It is a place of great biological and landscape diversity, subject to strong natural pressures (materialized by erosion) and human pressures. Over the years, urbanization has eroded nature, dunes, ponds and forests. Coastal overexploitation generated net disturbance of coastal ecosystems and a significant degradation risk of ecological resources and deterioration of coastal landscapes. Marine erosion, urbanization in all its forms, over-fishing and climate change are the main causes.

Indeed, Two-thirds of the Algerian population is currently living on the coastal strip which represents only 4% of the national territory. Today, some 160 urban agglomerations, including 3 of the 4 major cities are located in the coastal area. over 51% of industrial units are situated on the coast and particularly in the metropolitan area of Algiers, where 25% of industrial units in the country are located and much pressure is applied on agricultural land structures which recorded significant losses generated by the urban and economic development (MADRDR 2007).

Marsat-El Hadjaj is a Mediterranean coast area with its specific ecological features and coveted space where farming, tourism and socio-economic activities compete, as well as a rapid urbanization, which has weakened its coastline whose wealth is a natural and economic potential of a big importance (Amadou, 1988).

It is in this context that we conducted this study and in order to evaluate the flora richness of this area as a part of a future monitoring program who will allow us to follow the flora evolution.

Materials and methods

Description of study area

The study area (Fig.1) is administratively attached to Oran. It is located at the eastern end of this city, between Bethioua (Oran city) east and Fornaka

(Mostaganem city) west, between longitude $0^{\circ} 08' 18''$ West and latitude $35^{\circ} 47' 18''$ North. It consists of a single homogeneous terrestrial entity as a coast dune. The area of coastal dunes is limited: in the north by the sea; in the east by the cliff and Hill marabout Sidi Mansour; ; in the south by National Highway Oran, Mostaganem till Macta bridge and by Macta river and in the west by the mouth of this river (Simonneau, 1951). The study area covers a surface of approximately 1 km^2 so 3 km long and 0.3 km wide.

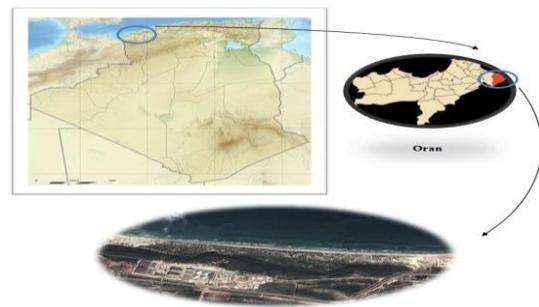


Fig. 1. Geo location Map of the study area.

The area climate is semi-arid with temperate winter and extreme temperature range of 30.6°C recorded in August and a dry period of 6 months ranging from May to October. In our regions, where summer drought is marked, spring (March to June) offers a favorable observation period because most of the annual production (often 2/3) occurs during this period. We can therefore more easily enter a large number of species and appreciate the contribution of the dominant species in spring return.

Sampling Technique

The vegetation analysis involves sampling plots to choose quadrants on which the population is homogeneous. The objective is to obtain the most representative floristic composition picture (tending to completeness) of the considered perimeter. A preliminary survey is necessary to highlight the repetition of certain plant combinations.

According to this survey, aerial maps and various informations on the general environmental

conditions (climatologie, soil science, history of vegetation ...), we have chosen a protocol that meets our needs. Five transects were established perpendicular to the shoreline over distance long enough to cover all vegetation (Fig.2). In relatively

homogeneous environment, a range of less than 0.5 km between transects is suggested. Transect width can vary from about a meter to a line without thickness.



Fig. 2. Disposition of transects.

Each transect is divided into segments. The segments are defined from the coastline by pointing upwards riverside. The distances between each segment are reduced or increased depending on the riverside environment complexity.

Five successive readings for each transect were conducted over an average area of 2 x 2 m. A total of 25 coasts surveys were conducted in the north-south direction and all species present at the survey time were identified in the field, or at the laboratory for those requiring binocular observations. Identifying taxa was made using the « Nouvelle flore d’Algérie » from Quezel and Santa (1962-1963), la Flore du Sahara of Ozenda (1977), la Flore d’Afrique du nord de Maire (1952), la Flore descriptive et illustrée de la Corse (1937).

Result and discussion

Floristic composition

Based on 25 surveys conducted in the study area, 90 species have been recorded, belonging to 16 families with one species considered as protection status

species (*Ephedra distachya*). Fig. 3 shows the different families percentage we met in our study area.

On the 16 families we met, 3 clearly dominate the coastal flora, particularly: Asteraceae (22 species), Amarantaceae (19 species), Poaceae (15 species). These families alone account for 56 species or 62.21% of the total number. The other families (12) contributing to 37.79% of the total workforce. Among them, 6 are single species (Fig. 3).

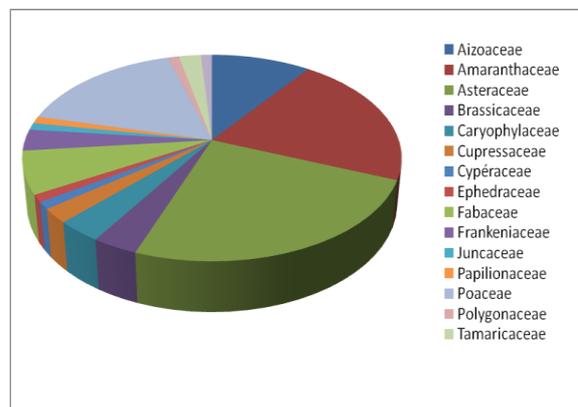


Fig. 3. Floristic composition.

These three families importance can be explained by their Mediterranean geographic distribution and their adapting ability to diverse habitats and unstable conditions. (Taleb *et al.*1994-1998). This can be confirmed by the results reported in the study made by Simonneau (1952), and Dubuis and Simonneau (1960).

Ethological spectrum

The 90 species constituting Marsat-El Hadjaj coastal flora belong to five biological types (Table 1): therophytes, geophytes, hemicryptophytes, chamaephytes and phanerophytes.

Table 1. Global ethological spectrum.

Nbr.	Bio Type	species Nbr.	contribution in %
1	Th	46	51,11%
2	He	21	23,33%
3	Ch	12	13,33%
4	Ge	8	8,88%
5	Ph	3	3,33%
Total		90	

According to Raunkiaer (1934), a plant species biological type is defined by buds positions that survive the unfavorable season, relative to ground level. We note that most biological types are present in our study area. The study of biological spectrum (Tabale.1), which is the biological type percentage, shows that therophytes (51.11%) and hemicryptophytes (23.33%) are very dominant. The therophytes abundance can be explain according to Hammada *et al.*(2004) by the fact of the presence of a seasonal dip habitats that are more favorable to annual plants development with rapid germination and growth.

Biogeographic distribution

Species origin is very diverse. Mediterranean element in a broad sense is by far the largest contingent (Fig.4). His frequency reached 65.55%, more than half of the collected species. Cosmopolitan elements

represent 18.88%, while all other elements account for the remaining 15.55%.

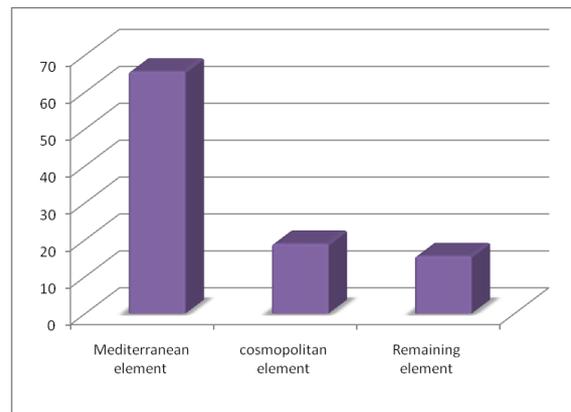


Fig. 4. Biogeographic spectrum of taxa.

The Mediterranean element is conventionally considered particularly adapted to strong disturbance regimes and stress conditions induced by the unpredictable Mediterranean climate fluctuations (VIDAL, 1998).

Conclusion

Algerian west coast reveals a wealth biodiversity in terms of natural heritage: spaces, diversity of types and remarkable vegetation (forest and dune). This exceptional heritage, situated in an environment constantly subject to disturbances, must be protected from an extinction risk due to urbanization expansion, but also to simple mismanagement and exploitation of its resources. These coastal sites are home to several rare species that deserve protection as *Cakile maritima*, *Ephedra distachya*.

After this study, 90 plant species at Marsa-El-Hadjaj were inventoried and described; they are divided into 16 families. Asteraceae which represent 24.44% of the total species are numerically the most abundant, followed by Amaranthaceae with 21.11%, the Poaceae with 16.66% and Aizoaceae and Fabaceae with 10% and 6.66% respectively. Finally Cupressaceae, Cyperaceae, Caryophyllaceae, Ephedraceae, Brassicaceae, Frankeniaceae, Papilionaceae, Polygonaceae, Tamaricaceae, Urticaceae and Juncaceae numerically very small.

Our study showed that the area is especially rich in Mediterranean and cosmopolitan species with a rate of 65, 55% and 18 88% respectively, depending on the biogeographical type classification.

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