J. Int. Environmental Application & Science, Vol. 12(4): 339-344 (2017)

The Floristic Biodiversity of the Vlora Bay[#]

Rodeta Pllumi[*], Erjona Selko

University "Aleksandër Xhuvani" Faculty of Natyral Sciences, Departament of Biology, Rruga "25 Nëntori",121/E, 1, Elbasan 3001, Albania

Received September 22, 2017; Accepted 12 December, 2017

Abstract: Vlora is a seaside, rugged and varied region that has influenced the flora diversity of this area. The forests, meadows and pastures of Vlora offer favorable environmental conditions for plant growth. The object of this study is the flora and vegetation of the Vlora bay, which includes the following areas: (i) Mediterranean forest and grits area, (ii) Sandstone and dune area and (iii) The coastal and mountainous rocky area. The more specific objectives of our study are: Identification of the general flora and make a florist list, Identification of floristic biodiversity of the area as well as the segregation of rare species of practical and scientific importance, Compilation of different spectrum (systematic, biological, floristic) of plant species for study areas. For the study we used the physiognomic and floristic methods. During the study we have worked according to a methodology divided into three phases: a) Preparatory phase (preparatory work), b) Field work phase (collected material in nature) and c) Laboratory stage (data processing in laboratory or cabinet). Characteristic of the Vlora area are persnece of Black pine (*Pinus nigra*), which is found in Llogara, also known for two endemic species: *Hypericum haplopylloides*, *Leucojum valentinum* subsp. *vlorensis.* Based on the study we noticed that the most widespread biological forms are Hemycryptophyte, Phanerophyte and Therophyte. The most widespread floristic element is the Euro-mediterranean, Steno-mediterranean and Balkans. The most widespread families are Lamiaceae, Asteracea and Fabaceae. Based on the findings the survey has scientific, economic and curative values.

Keywords: *Pinus nigra*, plant associations, endemic species, Llogara, Vlora

Introduction

Flora has a great value, as they are the basis for maintaining natural balances, and as a consequence of human development. Their early study started as a need for the medical values they have, to develop in the time with profound botanical studies on scientific values.

The bay of Vlora offers a variety of geological forms, reliefs, rich hydrous network, interweaving of continental and Mediterranean climatic factors, creation of microclimate, etc. which create the conditions for the development and housing of a valuable flora for genofond, as well as for the creation of interesting communities of plant, and the existence of diverse natural habitats.

It also presents scientific interest in floristic, geobotanical studies and is visited by local and foreign botanists who have had a great contribution to the study of the flora of the area. Also, the bay has many practical, relaxing, landscaped, cultural, historical, tourist value etc,. Flora represents the entirety of plant species that populate a certain territory. Its entirety is the reflection of ecological factors, climatic, evolutionists, etc., which have constantly influenced the environment. Vegetation represents the entirety of plant associations in a given territory. Herbal incorporation includes a whole set of herbivores that are grown together in a given territory and which present a pooling ability between them. This means that some species grow together non-casually in different places and environments. Each phytocenosis has a special structure. In this context, the bay of Vlora is distinguished for a high biodiversity of vegetation.

Material and methods

The studied area

The bay of Vlora is included in the Vlora district. It is located in the southwest of Albania, with a northern longitude 40° 28'04 and eastern longitude 19 ° 29'02 ". The relief of the Vlora Bay is made up

**Corresponding: E-mail: pllumirodeta@gmail.com, Tel: +355694418672*

[#]This paper has been presented at Alblakes3-2017, Elbasan, Albania

of high rocky mountains, mainly in the southeast and west, which are included in the Karaburun Peninsula. The low sand zones extend to the eastern and northeastern part. To the south of the bay lies the Dukat Field, which is bordered by the mountain relief, the sea and the lagoon of Pashaliman. It is characterized by a cold and wet winter, with a total rainfall of 954.9 mm / year. Summer is dry and hot and the maximum temperature exceeds 40 (mostly in June, July, August and September). In average values, 125 days of observation and 77 days of obscurity have been recorded. The average water temperature from January to August ranges from 2 to 17 degree. Annual average temperature in Vlora reaches 16.8 degree. In July and August the average temperature reaches 30 degree. In January and February the average reaches 6 degree, while snow is a rare phenomenon in this coastal region. Mostly precipitation falls in the form of rain.

Places where the expeditions were made: Llogora, Kampi –Uji i Ftohtë, Plazhi i Vjetër –Pylli i Sodës, Kuzum Baba and Uji i Ftohtë – Jonufër

Floral study methods

Several approaches are used to study flora, which certainly have their characteristics. In our conditions, two are more popular: the physiognomic and floristic method (Xhulaj M., 2005 Buzo K, 2000). The physiognomic method that is also called structural is based on the external morphological construction of the plant cover, in the life forms or at its maturation. According to this method the plants are grouped into several groups based on the distance of growth buds from the surface of the soil. These groups are:

Ph - Fanophyte; **Ch**- Chamaephyte; **H** - Hemycryptophyte; **K**-Cryptophytes; **T** - Therophyte

This elaborated classification provides data on the climatic conditions of the region being studied. The floristic method is the main method based on the indetification of plant species in phytocenoses or different plant environments. The path followed in this process is divided into several stages: Conduct field surveys; Evaluation of quantity and coverage of species and Determination of species found in the territory taken in analysis.

To carry out the survey, we first have to choose the country, which is such that it is typical and as varied as possible. Dimensions of surveys vary according to the life forms of the plant species, especially the dominant ones.

Method of work

The study is carried out according to a methodology divided into three stages: **a)** Preparatory phase (preparatory work). **b)** Field work phase (collection of data in nature). **c)** Laboratory phase of work (data processing In a laboratory or cabinet). (Xhulaj M., 2005)

a) Preparatory stage (preparatory work)

This stage consists of: Knowledge of the nature of the study; - Data about the current work in this area, especially for the valley of Shkumbini and Vlora bay, provide by the Forest Company, the community, etc; Data about the general characteristics of the area such as the physical, geographical, ground and climatic conditions; Collection of material base (map), preparation of survey files and the plan of performing field expeditions

b) Field work stage (data collection in field).

This stage has to do with the conduction of field surveys according to the marsh method, carrying out in nature in different seasonal periods (spring, summer and fall). This is accomplished in order to catch as many phenophases and as many plant species as possible.

The test surfaces for each parcel are selected taking into account the different aspects of the vegetation at the points taken in consideration: 1 m2, 25 m2 to 100 m2.The survey sheet is supplemented, according to the respective methodology, with the following data: date of survey, place of performance, height, contrast, surveyed surface, type of rock and earth, scientific and albanian name of plant species, geographic element and life form for each species, quantity indices - overlay, herbal floor, phenophase, etc., according to the relevant methods. The herbal material is collected, processed and labeled according to records that correspond to field surveys and is stored in the botanical section.

c) Laboratory phase of work (data processing In a laboratory or cabinet)

For each phytocenosis, the general prediction is: structure, environment, dominant, list of species, determination of presence, phytocenosis status, causes, etc.

The results of the study provide estimates of ecological, environmental, floral diversity etc.

Work outcomes

The main habitats of the areas

Mediterranean forest and shrubby zone

In the Bay of Vlora the Mediterranean forest also presents a great variety. In its determination we will rely on the dominant pine tree (*Pinus halepensis*). The elements of this mediterranean forest are mainly mediterranean bushes such as: *Myrtus communis, Erica arborea, Paliurus aculeatus, Carpinus orientalis hornbeam, Rubus ulmifolus,* creepy trees as well as *Hedera helix* (Fig.1) *, Smilax aspera* etc. Mainly in swamps among the forest we can also find: *Salicornia fruticosa, Halimione potulacoides*.

In the Llogara National Park can be found the forest formation with the fir of Macedonia (*Abies borisii-regis*). This structure is divided into the shrub floor which includes *Buxus sempervirens, Ilex aquifolium, Crataegus heldreichi* and the herbaceous floor that includes *Helleborus odorus, Fragaria vesca, Asplenium trichomanes, Ranunculus sp.*

Figure 1. *Hedera helix*

The oak zone

In Vlora Bay, the oak vegetation is represented by the *Oleo-Ceratonion* and *Quercion ilicis* alliances.

Plant Associations of the *Oleo-Ceratonion* alliance are grown mainly in very dry rocky locations, near the sea side, exposed to marine waves. Among the species here we can mention: *Ceratonia siliqua, Myrtus communis, Thymus capitatus*, etc.

The *Quercion ilicis* alliance is predominantly spread in limestone and rocky places, as well as near the shores protected by winds. Here we will include :

❖ *Quercus ilex* grouping found in association with *Quercus coccifera.* Their natural extension is in Sazan, Karaburun and Llogora (near Kaprol).

❖ *Quercus coccifera* grouping are widespread in rocky locations. They can be found in Jonufër, Kaninë, Dukat and Llogora. Characteristics are also the types: *Smilax aspera species, Pisracia lentiscus.*

❖ *Quercus macrolepis* grouping located in Karaburun, which is the northernmost border of its spread and is developed on rocky limestone slopes. The most common types are: *Phlomis fruticosa* (Figure 2)*, Thymus capitatus, Origanum vulgare, Dactylis glomerata, Salvia officinalis* etc. In these areas there are many medical types.

Figure 2. *Phlomis fruticosa*

Coastal flora and mountain flora of the Vlora Bay

The bay of Vlora is characterized by a rich variety of habitats: sandy, rocky coastal, mountainous.Coastlines have a xeromorphic structure and the main types of vegetation are:

- Marine vegetation

There are 90 species of algae (43 Rodophyta, 25 Chlorophyta, 22 Phanerophyta) and 4 marine fanerogamas (*Zostera nana*), *Posidonia oceanica*, *Halophila stipulacea and Cymodocea nodosa* in the Bay of Vlora. The green algae (Caulerpa prolifera), accompanies these fanerogams up to the depth of 40-50 m.

- The vegetation of sand dunes

Plantations of sand dunes represent a characteristic element of the Vlora bay and have an extension from the shedding of Vjosa to the Old Beach, in the form of a narrow strip. Among the species we can found, we mention:, *Salsola kali, Cakile maritima, Echinophora spinosa, Enyngium maritimum (*Fig.3) , *Cyperus capitatus* etc.

Figure 3. *Enyngium maritimum*

- Shores of waters vegetation

The main stretch of this area is on the estuary of Vjosa, on the shores of the Orikum lagoon, places with high groundwater levels as well as by canals. On the shores of the lagoons we can found accompanying species, mainly halophytes: *Juncus maritimus, Inula crithmoides, Atriplex hastata, Limonium vulgare* etc.

- **The flora of coastal and mountainous rocky**

The flora of coastal and mountainous rocky environments is a distinct biological type. It includes species that live in rocks and are xeromorphic.

The predominant species are: *Crithmum maritimum, Limonium anfractus, Brasica oleracea* as well as many species of genus Sedum (Fig.4), Sempervivum etc.

Figure 4. *Sedum album*

Conclusions

At the end of our work we managed to create a general view of the vegetation and the flora elements of the studied areas.

Vlora Bay is an area of high biodiversity. During the study, we noted the following differentiated vegetation zones: Mediterranean forest and grits area, Sandstone and dune area and The coastal and mountainous rocky area.

In the 1st zone, the most widespread biological forms are Therophyte, Phanophyte, Hemycryptophyte.The largest number of species belong to the families: Lamiaceae, Fabaceae, Brassicaceae.We notice these floristic elements: Eurasian, Mediterranean and Cosmopolitan.

In 2nd zone we mostly distinguish these biological forms: Hemycryptophyte, Phanophyte, Geophyte, Hydrophyte.Among the most common families we notice: Boraginaceae, Poaceae, Chenopodiaceae. In the floral spectrum we notice these types: Mediterranean, Euro-mediterranean, Cosmopolitan, Subcosmopolitan

In the 3rd zone, the largest number of biological forms belongs to the form: Hemycryptophytes, Chamaephyte, Geophyte and a little Phanerophyte.

✓ The highest percentage shown in the chart below (Figure 5) refers to families: Lamiaceae, Hypericaceae, Cupressaceae.

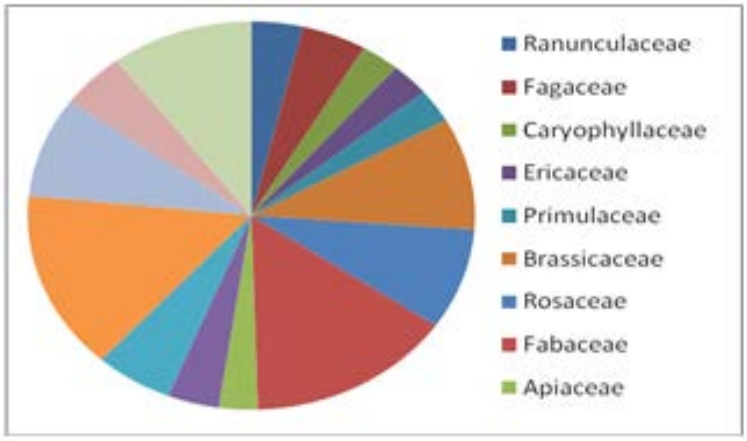

Figure 5. The systematic spectrum of vegetation in the Vlora bay

✓ The most widespread florist elements shown in the chart below (Fig.6) are: Euro-mediterranean, Mediterranean, Endemic, Subendemic

✓

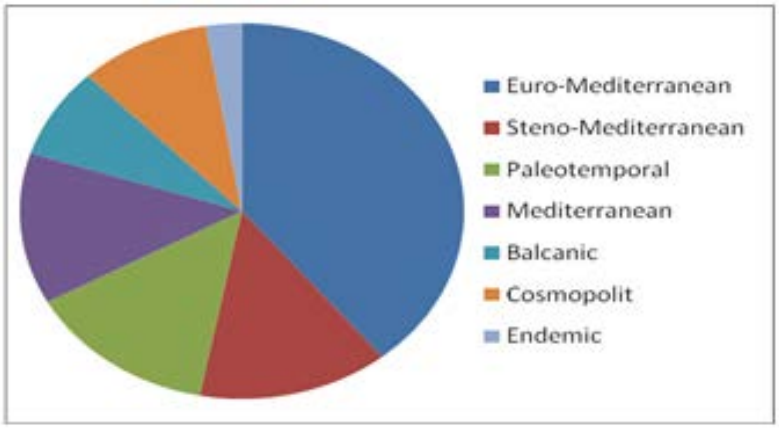

Figure 6. The floristic elements of vegetation in the Vlora bay

✓ The largest number of biological forms according to the chart below (Fig.7) belongs to the forms: Hemycryptophyte, Phanerophyte and Therophyte.

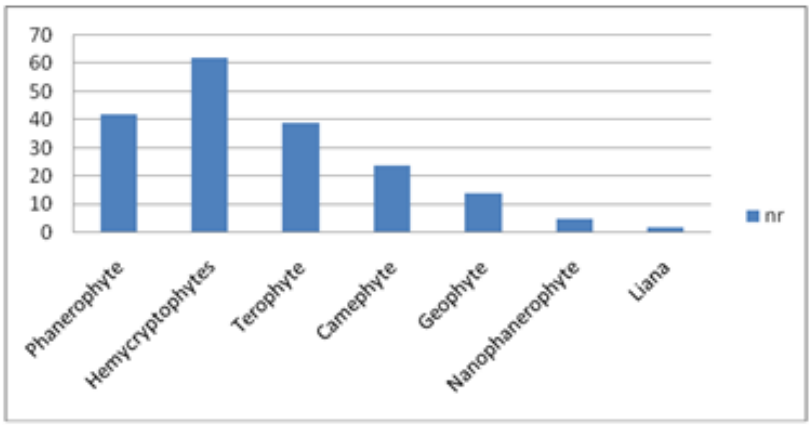

Figure 7. Biological forms of vegetation in the Vlora bay

Recommendations

- We need to be constantly aware of many natural resources that the Vlora bay offers and we must always protect them.
- Pay attention to the protection of endemic and endangered species, mainly to the prevention of their risk.
- Cooperate to add protected surfaces.
- Preserve the environment around us at all times and be aware of the great values it represents.

References

Buzo K, (2000) Gjeobotanika. Tiranë.
Buzo K, (1991) Bimësia e kullotave dhe livadheve natyrore të Shqipërisë. Tiranë.
Christopher D, CookK, (1974) Water plants of the world.
Demiri M, (1983) Flora ekskursioniste e Shqipërisë. Tiranë.
Demiri M, (1983) Flora ekskursioniste e Shqipërisë.Tiranë
Kabo M, (1998) Gjeografia fizike e Shqipërisë, vol. 2. Tiranë.
Mersinllari M, Naqellari P, (2006) Praktikum i botanikës dhe metodika e përcaktimit të bimëve (Fanerogamet).Tiranë.
Mersinllari M, (2001) Të dhënat për florën dhe vegjetacionin e pellgut të Prespës dhe të Ohrit. Studime biologjike 5-6: 522-525. Tiranë.
Naqellari P, (2000) Biodiversiteti, bimët e rralla dhe endemike në rajon. Together for a cleaner environment.Elbasan.
Qiriazi P, (2006) Gjeografia fizike e Shqipërisë, vol. 2. Tiranë.
Ruci B, (1983) Buletini i shkencave të natyrës. Tiranë.
Xhulaj M, (2005) Udhëheqës për praktikat mësimore në botanikë. Tiranë.
Xhulaj M, Kashta L, (2003) Botanika 2 (Sistematika e bimëve) Kriptogamet. Tiranë.
Xhulaj M, Ruci B, (2000) Botanika 2 (Sistematika e bimëve) Fanerogamet .Tiranë.