Albanian j. agric. sci. 2013;12 (3): 425-429 *Agricultural University of Tirana*

RESEARCH ARTICLE (Open Access)

Study of plant diversity in the river upstream of Prizreni Lumbardh

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Abstract

Protecting biodiversity in natural spaces, and hence the spontaneous flora, has become nowadays one of the main aims in determining appropriate intervention strategies and territorial management. Preserving biodiversity is one of the priority objectives, the implementation of which is related to the sustainable development of society. Faced with problems created by human activities that have led to a breakdown of eco-systemic balances require a special attention not only to maintain but also for the recognition of biological assets in different areas. Recognition of the importance of biodiversity in general and in particular it is an herbal towards sustainable work study. Identification of spontaneous flora gets an even greater significance when a significant part of it in certain areas remains unknown. Her study not only descriptive value but especially ecological values, because it determines the presence of important functions in ecosystems, a better understanding of which leads to increase their sustainability. The aim of this study was the recognition of plant biodiversity (spontaneous flora) upstream of Lumbardh of Prizren, Kosovo and the impact of human activities on it. The aim of the analysis is the verification of flora present in the upstream and drawing conclusions regarding the conservation and protection of spontaneous flora.

Key words: biodiversity, spontaneous flora, vegetation, plant communities

1. Introduction

Plant biodiversity (flora spontaneous) high mountains of Kosovo are very rich and interest in botanical and ecological research. From previous studies of spontaneous flora it is known to a considerable extent, but further studies are required to meet those. In the high mountains of Kosovo are recognized numerous plant species, among which the endemic species, who have important scientific and research have been the subject of local and foreign researchers. Floristic surveys in Kosovo before the start of the first half of the nineteenth century from Boue, 1840, which examined the spontaneous flora in the vicinity of Peja. Studies of spontaneous flora on the Sharr Mountains from different authors performed: [1,2,3] contributed little to the study of the flora on this region. Specific contribution to the study of the flora of this region has given in "High Mountain Flora of Kosovo" [4], which describes some species upstream of Prizren Lumbardh. Flora upstream of Prizren Lumbardh is the various branches of evolutionary developmental. It contains elements of tertiary flora which are created in the outfall of Prizren Lumbardh, or are located here since the tertiary and the other contains the new elements which have come into Pleistocene and Paleocene [5]. A study [6] within Kosovo vegetation associations, describes some very important for this site. In the context of this study is to investigate the spontaneous flora upstream source of Prizren Lumbardh to Prevalla, altitude ranging from 1500m to 2360m on the source. On the study are identified families, genders and existing types and are defined as the dominant species of this flow. The study is comparing the spontaneous flora upstream Lumbardh of other areas of Kosova and are identified types of rare and endangered, endemic and the medical.types.

2. Material and methods

The study has been extended in upstream Lumbardh Prizren located in the Sharr Mountains from source to Prevalla and was carried out during the years 2008-2010. The study has identified existing flora in the upstream source of Prizren Lumbardh to Prevalla (families, genders and existing types). Dominant species have been identified upstream of Prizren Lumbardh and floristic richness were compared with other regions of Kosovo. The study also identified some of the rare species endangered, endemic and medical. Some human activities are identified (rearing of small ruminants, buildings etc.) and their impact on existing flora. General characteristics of the geographic area such as geographical location, geomorphology, climate and hydrographic particulars have a major impact on the

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(Accepted for publication 5 June 2013)
ISSN: *2218-2020,* *© Agricultural University of Tirana*

distribution of plant and animal species [7]. For analysis herbaceous and wood species is used floristic method Braun-Blanquet [8] and linear analysis method for recognition of herbaceous species [9]. Braun-Banquet method evaluates the eyes of different species on the surface and requires experience and deep knowledge of flora quite spontaneous. Linear analysis method for recognition of herbaceous species consists of the removal of a theoretical line network with a meter located on land (standard measurement of length 20 m) wherein at 20 cm intervals recorded species present. Respectively with this standard measurement [10] have set a different length (6.6 m long) with surveying of all species present in the predetermined distance 20 cm. Collection and treatment plants is done from May to October. Herbaceous plants were taken at the time of flowering or fruit formation to take all vegetative and reproductive organs. Woody plants were taken from the stem portion with leaves, flowers and fruits, with the aim of determining how to correct their. Plants were collected labels are placed where it is marked: locality, biotope, geological and soil type date of collection and the name of the collector. In order to determine the herbs are consulted literature sources:[11,12,13,14,15,16]. At the conclusion of the study is made of the data archiving. They are archived in electronic form with the possibility reference Excel. This study will also include assessment of human impacts on plant biodiversity upstream of Prizren Lumbardh which relate to damages to natural reserves within the study area, micro-climatic conditions change; the hydrological property damage, decrease the amount of water to Lumbardh, its pollution, impact on erosion processes; loss of aesthetic values and the values recreated tourism, and loss of ecological values.

3. Results and discussions

3.1 Analysis of spontaneous flora

During the three years of study in the sub-alpine and alpine upstream of Prizren Lumbardh floristic based on floristic methods are found a total 363 taxa, of which 50 families, 115 genus and 198 species, namely: *Polypodiophyta* 2 family, 3 genus with 3 species; *Coniferopsida* 2 families with a 3 genus of the total 5 five species; *Dicotiledonae* 38 families, 95 genus with a total of 166 species; *Monocotiledoneae* 8 families, 14 genus with a total of 24 species. Families with more species found are: by *Coniferopsida* family: *Pinaceae;* by *Dicotiledoneae* as families with more species are: *Asteraceae, Rosaceae, Scrophulariaceae, Lamiaceae, Campanulaceae, Fabaceae, Caryophyllaceae, Ranunculaceae, Brassicaceae, Primulaceae etc.*; by *Monocotiledoneae* as families with more species found is family: *Poaceae* with a total of 9 species.

Table 1. Presentation of families and number of species per family.

Family	Number of species
Polypodiaceae	1
Cupressaceae	2
Pinaceae	3
Aceraceae	2
Apiaceae	3
Aspidiaceae	2
Asteraceae	24
Betulaceae	2
Boraginaceae	3
Brassicaceae	5
Campanulaceae	9
Caprifoliaceae	1
Caryophyllaceae	8
Cichoriaceae	5
Crassulaceae	2
Dipsacaceae	2
Euphorbiaceae	1
Ericaceae	1
Fabaceae	8
Fagaceae	1
Geraniaceae	3
Gentianaceae	4
Globulariaceae	1
Hypericaceae	4
Lamiaceae	10
Malvaceae	1
Oenatheraceae	3
Oxalidaceae	1
Parnassiaceae	1
Plumbaginaceae	1
Polygonaceae	4
Polygalaceae	1
Primulaceae	5
Ranunculaceae	8

Family	Number of species
Rosaceae	15
Rubiaceae	2
Salicaceae	4
Saxifragaceae	3
Scrophulariaceae	15
Urticaceae	1
Vacciniaceae	2
Violaceae	3
Amaryllidaceae	1
Alliaceae	2
Cyperaceae	3
Iridaceae	2
Juncaceae	2
Liliaceae	3
Orchidaceae	2
Poaceae	9

During the description of each species is described habitat, proliferation upstream of Prizren Lumbardh, exposure, life forms and whose floral element belongs. For higher systematically categories are taken into account of their evolutionary and phyla-genetic development: Polypodiophyta - Fernaceae, Pinophyta - Seed-naked, Magnoliatae - Dicotiledoneae, Liliaceae - Monocotiledoneae.

Within categories: Polypodiophyta, Pinophyta, Magnoliatae, Liliaceae: families and genders are listed alphabetically.

3.2 Endemic species of spontaneous flora upstream of Prizren Lumbardh

Dianthus scardicus Wettst – Karafili i Sharrit

It is the perennial herbaceous plant with clods rare. Stem is 1.5 to 10 cm long with two or three pairs of leaves about 15 mm long and 2-3 mm wide, with three nervure. Flowers are usually solitary. A second cup with two scales, almost half of the cup, the top, with three nervure. Cup is 10-12 mm long upper is enhanced. The crown is 7-8 mm long pink, serrated less. Grows in rocky areas and grassy alpine and sub alpine zone. Diffusion of general: Kosovo (endemic to the mountains of Sharr).

Crocus scardicus Koshanin - Pashallari i Sharrit

It is the perennial herbaceous plants approximately 10 cm long. Tuber-sewer cover is thin and sensitive network. Leaves appear along with flower. Perigon is yellow, with nozzle, color lilac. Cheese has orange on the upper expanded and are divided arteries exceeding cheese. Decorative plants. Rise in sea level altitude of alpine zone, in countries where snow melts summer. Spread in Kosovo: Sharr Mountains. Diffusion of general: Kosovo (endemic to the mountains of Sharr).

Potentilla Doerfleri Wettst - Zorreca e Sharrit

It is the perennial herbaceous plants. The steam is 2-25cm, dense and visible long furry 1.5 - 2 (2.5) mm and with long hair approximately 0.15-0.2 mm. The leaves are shaped palm, small leaves 0.15-40 mm, oval-shaped serrated and jagged, with a few top, with hair, colored green or green to gray. Stem is with many flowers, cup blades are triangular-shaped spear, second cup (implied) is divided into segments linear-shaped spear, is approximately equally over the cup. Crown blades (petals) are 5-7 mm, white, shorter than sepal. The beginnings of dense fringe of hairs are folded. Increase in subalpin and alpin pasture. Spread in Kosovo: Sharr Mountains upstream of Prizren Lumbardh. Diffusion of general: Kosovo (endemic to the mountains of Sharr).

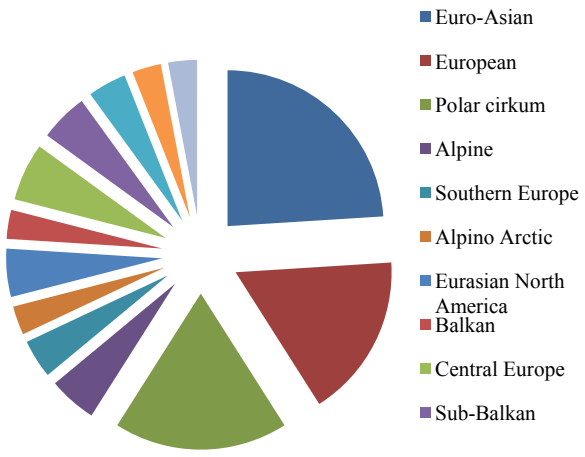

Figure 1 - Floristic elements present in more than five species in the upstream area of Prizren Lumbardh

Analysis of floristic elements

Analysis of the flora of the area upstream of Lumbardh, includes all types that are found during research. Floristic elements classification is done based on scientific literature sources [17, 18, 19, and 20]. Plant communities upstream of Prizren Lumbardh classified in several floristic elements. Floristic elements of these plants dominate the floral element: Euro-Asian with 36 species, with 28 species Balkans,

the EU is represented by 26 species, 9 species of central Europe. Circumpolar 8 species, sub-species Balkans to 7, with 7 alpine species, 6 species middle Europe, Southern Europe 6 species, 5 species Sub-Mediterranean, 5 species Alpine arctic, 5 species Alpine Euro-Asian, Eurasian of North America 5 species.

Of plant taxa identified in this study cited by [21] "High Mountain Flora of Kosovo" is: Sorbus aucuparia, Carex curvula, Ranunculus incomporabilis (the Balkan Endemic), Cerastium alpinum, Draba korabensis (Balkan Endemic), Saxsifraga glabela, Saxifrage androsaceae, Scabiosa crenata, Lingusticum albanicum etc. Taxa that grow in the area upstream of Prizren Lumbardh and that they close enough areal are: Trollius europaeus, Geum coccineum, Bruckenthal spiculifolia, Lilium albanicum, Actea spicate, Adenostylis alliariae, Scrophularia bosniaca, Cotonaster tomentosa, Linum flavum, Sedum acre, Achillea multifida, Acer platanoides, Senecio fuchsii, etc. Endemic species subalpina area upstream of the Prizren Lumbardh fall within the Balkan endemics are: Pinus peuce, Barbara balcana albanica Campanula, Campanula folios, Campanula spars, Silene roemeri, Silene Asterias, Cirsium appendiculatum, Cardamine carnosa, Geum reptans, scabiosa Portan, Silene Asterias, Thymus albanus, Geum coccineum, Scrophularia bosniaca, Viola grisebachiana, Crocus veluchensis, Lilium albanicum, etc. Kosovo steno plants in the subalpin and alpin area of upstream of the Prizren Lumbardh are: Dianthus scardicus Wettst. (Sharr Mountains Endemic) and Endemic Kosovo, Potentilla doerfleri Wettst. (Sharr Mountains Endemic), endemic Kosovo, Crocus scardicus Koshanin. (Sharr Mountains Endemic) and Endemic Kosovo. Endangered species found in Kosovo in the area upstream of Prizren Lumbardh are: Trollius europaeus, Bruckenthal spiculifolia, Geum reptans, Scrophularia bosniaca, Geum coccineum, Acte spicate, Anemone narcissiflora, Lilium albanicum, Senecio fuchsii, Dianthus scardicus, Telek speciosa, Campanula albanica, Ranunculus crenatus, etc.

From the floristic elements obviously dominate, floristic elements, Eurasian, Balcans and European which make up the largest number of species. Severe climatic conditions prevailing in the area subalpin and alpin of upstream of Prizren Lumbardh have, with respect to life forms that most plant species fall within the Hemicryptophyta (139 species), Phanerophyta (26 species), Geophyta (16 species), Terophyta (9 species), Chamaeophyta (8 species).

The influence of anthropogenic factors upstream of Prizren Lumbardh

About Lumbardh of Prizren are several large villages like Gornje Selo, Musnikovo, Sredska, Reçani etc., which have completed construction and have a substantial number of small livestock. In spring animals more harm flora of this area through grazing species, especially rare and endangered. Although the upper part of Lumbardh made within the National Park "Sharr Mountain" and is under state protection human impact on the degradation of the area is large. Mention shepherds bush burning to increase the areas of pasture, cutting firewood near the bottom Prevalla, etc. The considerable damage comes from uncontrolled accumulation of medicinal plants which presents the risk that many of these plants can even disappear.

4. Conclusions

- From the partial results of the study on plant biodiversity (vascular flora) upstream of Prizren Lumbardh from source to Prevalla conclude that:
- Were found 363 plant taxa, of which 50 families, 115 genus and a total 198 species. From *Polypodiophyta* 3 families with 3 genus and 3 species.
- From *Pinophyta - Coniferopsida* were found two families: family *Cupressaceae* with 1 genus and 2 species, *Pinaceae* family with 2 genus and 3 species.
- *Magnoliatae* have found a total of 37 families, 95 genus and 166 species.
- Families with more species that are found: *Asteraceae* with 24 species, *Rosaceae* with 15 species, *Scrophulariaceae* 12 species, *Lamiaceae* 10 species, *Campanulaceae* with species 9, *Fabaceae* 8 species, *Caryophyllaceae* 8 species, *Ranunculaceae* 7 species, *Brasicaceae* 5 species, *Primulaceae* 5 species, *Cichoriaceae* 5 species etc.
- *Liliataceae* are determined by 8 families and of these 8 families were found 24 species; *Poaceae* family is represented by 9 species, *Liliaceae* 3 species, Cyperaeae 3 species, *Alliaceae, Iridaceae, Juncaceae, Orichdaceae*, with the two species, *Amarillidaceae* with one species.
- Of endemic species found upstream of Prizren Lumbardh from source to Prevalla, were found a total of 21 species, of which 3 species are steno-endemic of Kosovo, while 18 species endemic to the Balkans.

- Subalpin and alpin area upstream of Prizren Lumbardh from source to Prevalla floral element plants dominate: Euro-Asian with 36 species, Balkans 28 species, European is representing 26 species, Central Europe 9 species, Cirkumpolar 8 species, Suballkanic 7 species, Alpine 7 species, 6 species of middle Europe, Southern Europe 6 species, 5 species Submediteran, Alpin arkitik 7 species, 5 species of alpine-Eurasian, North American -Eurasian 5 species, and other elements floristic species represented less.
- *Hemicryptophyta* constitute the largest group of species life forms with 139 species or 69%, Phanerophyta 29 species or 14%, *Geophyta* 16 species or 7%, *Terophyta* 9 species or 5%, *Chamaeophyta* 8 species or 5%.
- This plant taxa fund subalpin and alpin area's upper flow of Prizren Lumbardh from source to Prevalla is quite modest. Remains that in the future this fund supplemented by other research.
- In relation to human impacts should be checked by grazing ruminants in subalpin and alpin parts, endemic plants should be placed under state protection, and therefore fall under the control collection of medicinal plants.

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