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Floristic Diversity Study on the Middle Upstream of Lumbardh River on Prizren Valley from Prizren till Reçan

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Abstract: The sustainability of ecosystems depends on the level of biodiversity present in them and the phyto-diversity plays an irreplaceable role. It is represented by the community of spontaneous plant species that constitute the flora of an area. Study of specific phytocenosis areas remains a permanent objective of research in the field of conservation biology. Ecosystem diversity has created a rich visible flora in fluvial spaces. Floristic analysis of different ecological zones allows the recognition of the natural flora of these areas. Conducting the studies will enable evaluation as the richness and diversity of plant species which constitute important environmental information. Many spaces with rich diversity of flora are still unsearched. One such area is in the valley of Lumbardh of Prizren, which has a relatively small range; it presents a high diversity of flora. This study aimed to identify the flora of this valley, the recognition of native species, mainly in the course of the medium with a stretch from the city of Prizren to the village Reçan, about the recognition, distribution and current situation of plant species. Recognition of richness floristic of this territorial space will constitute a valuable material for the identification of ecological values representing, storing and it's best management.

Keyword: *biodiversity, phyto-diversity, flora spontaneous species, resource richness, species.*

Introduction

An important role in the ecological, operation and sustainability of fluvial ecosystems play not only abiotic components such as water quality, salinity levels, leakage, the presence of dissolved gases, but also biotic ingredients. A high degree of interaction between these components enhances the sustainability of ecosystems. Through the biotic ingredients, the floristic, phyto-diversity, has very special ecological role. The presence of phyto-diversity (species) along the water flow creates ecotonals areas where is carried a high degree of interaction with the surrounding ecosystems. The degree of interaction depends on the level of diversity and the presence of different morphological forms which differentiate into water leakage especially in relation to height. Morphological diversity favors the development, preservation of habitat and biodiversity increase (Jungwirth *et al.*, 2003).

Rich biodiversity of fluvial spaces performs a variety of ecological roles in relevant ecosystems in the abiotic environment by consolidating river banks, protecting them from erosion, enrichment with humus that promotes recycling and increased function elements of ecosystems. It improves the microclimatic conditions and moderates the meteorological values. But it increases the ecological roles of biotic environment by creating suitable habitats for a large number of host organisms in these spaces. A an important ecological role is to create spaces with high landscape values for use by human activities and relaxation tourism. But fluvial spaces are increasingly used by man for various economic purposes such as pasture for livestock, agricultural and urban activities affecting on that way on their phyto-diversity. These activities have created fragmentation of the territory directly impacting on biodiversity and fauna. This highlights the importance of conservation and protection. Phyto-diversity of the river valley of Lumbardh is very rich in species, where a significant number have already been studied, but there are still many other species unexplored, the study of which is of particular interest not only in view of botanical, but also ecological functions.

This reachness species resource (phyto-diversity) and morphological diversity which is found on the river flow is a result of the heterogeneity of ecological conditions (climate, soil and altitude above

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sea level) and adaptability to them of the plants. The geographical features of the area, the weather, soil and hydrological conditions have a significant impact on the distribution of plant and animal species (Shukriu, 1979). Averages see level height ranges 412 to 500 m, while in the mountainous area, where the Lumbardhi river originates passes over 2000 m. It is surrounded by Sharri Mountains and has a rich network of rivers and dense, where the main river is Lumbardhi which flowinto White Drin River. Rivers flowing from Sharri Mountains are very fast and deep and narrow fissures, which often form canyons, as is the gorge of Duvska. The climate is Alpine continental, but also penetrates the Adriatic Mediterranean currents through the Drini Bardhe river canyon that favor the adaptation and development of various forms of plant which occurs through morphological diversity.

The average annual temperature is 12.5^0C, with the lowest temperature of 1.3^0C in January and the highest temperature of 23.2 ° C in July. There are about 229 frost-free days. The average value of rainfall in the area varies from 670 to 1200 mm/year and average values of relative humidity are 60-70%. Solar radiation in the vegetation period runs 458 kcal/ cm^2/day and average wind speed is 2.8 m/s (Cavolli, 1997). The study was conducted in the Lumbardh river valley which belongs to the municipality of Prizren which is situated in southern part of Kosovo. The Lumbardhi river passes through the city of Prizren, it springs from mountain areas in 2360 m above sea level, it is a fast stream flow, with a length of 35.5 km and 226 km^2 watershed. Its watershed represent a silicate glacial basin of high mountains where springs the Lumbardh of Prizren, which has created a valley with high geological, hydrological, biogeographic, flora, fauna and landscape values and a rich panorama matrix.

The purpose of this study has been the recognition of existing flora, families, genius and species, in the valley of Lumbardh of Prizren, in the middle flow from Prizren to Reçan, the humen impact on this flow and recommendations making regarding protection from damages species. The study was done from period of March to September 2014, during that time there were done many field explorations which have provided interesting results for phyto-diversity of this territory.

Material and Methods

The study involved on the mid valley of the river flow of Lumbardh from Prizren to Reçan and is realized from period of March till September 2014. The study has identified the phyto-diversity of this valley, the families, genius and plant species. During this study are registered a large number of plant as endemic and medicalspecies. There are evaluated the valley geographical characteristics as geographic location, geomorphology, climate and hydrological conditions (Shukriu, 1979). The method used to identify plant species was used that of Braun-Blanquet (1949). The plant species have been recorded and herbarized beginning from month of March with the beginning of vegetation until month of September. Herbaceous plants are collected at time of flowering or fruits and with particular care are gather all the vegetative and reproductive organs. For woody plants were taken stem with leaves parts, flowers and fruits, with the aim of determining them. The collected plants are herbarized by standard methods for herbarization. At the end of month of September the plant is dane the plantdetermination, according to the sources of literature (Demiri, 1983; Rexhepi, 2000; Millaku, 1993; Horvat, 1949; Vangjeli et al. 2000; Diklic & Nikolic, 1970-1977; Mitrushi, 1966; Pajazitaj Q. 2004; Tutin *et al*.1980).

Results and Discussion

Based on analysis of data obtained in the territory regarding the geographic characteristics of the valley as geographic location, geomorphology, climatic conditions and hydrological this study shows that valley Lumbardh characterized by a rich geomorphology territory which has allowed the development of different morphological diversity forms of herbaceous plant, bushes and forest. This valley is characterized by an alpine continental climate with constant penetration of the Mediterranean currents from the Adriatic see through the White Drin River which create micro climate zones that favour the development of many plant species, in the middle flow of the Lumbardhi River. The water presence has favored the development of many forms of plant, which perform multiple ecological roles. Based on the Braun-Blanquet floristic method (1949), during the period from March until the end of September, there are found these data flora: 46 families, 123 genus and 157 species, of which we can cite: 3 families of Pteridiofita, 4totalgenus of 4 species. a) Equisetaceae 1 family, 1 genus with a total of 1 species; b) Cupresaceae 1 family, 1 genus of 1 species; c) Polipodyaceae 1 family, 2 genus

2 species d) Dicotiledonae 39 families, 111 genus with a total of 136 species; e) Monocotiledonae 4 families, 10 genus with a total of 17 species. From all plantgroups the families with the most species found are: from Pteridiophyta plants the Polypodiaceae family. Equisetaceae family: Cupresaceae from dicotiledone family with a larger number of species are families: Asteraceae, Rosaceae, Fabaceae, Convolvulaceae, Oleaceae, Betullaceae, Ranunculaceae, Brassicaceae, Primulaceae, etc. Lamiaceae. By monocotiledonet family with more species are family: Poaceae, Liliaceae, etc. Orichidaceae.

Table 1. Overview of families and the number of species per family

No.	Families	Spices Number	No.	Families	Spices Number
1	Equisetaceae	1	24	Plantaginaceae	1
2	Polypodiaceae	2	25	Scrophulariaceae	1
3	Cupressace	1	26	Solanaceae	1
4	Asteraceae	24	27	Fagaceae	2
5	Rosaceae	15	28	Plantanaceae	1
6	Fabaceae	13	29	Vitaceae	2
7	Ranunculaceae	4	30	Euphorbiaceae	2
8	Lamiaceae	9	31	Cornaceae	2
9	Linaceae	2	32	Caprifoliaceae	2
10	Boraginaceae	2	33	Urticaceae	2
11	Brasicaceae	8	34	Papaveraceae	1
12	Betullaceae	3	35	Salicaceae	3
13	Poligonaceae	2	36	Aceraceae	2
14	Apiaceae	4	37	Moraceae	3
15	Oleaceae	3	38	Juglanaceae	1
16	Betullaceae	4	39	Araliaceae	1
17	Ulmaceae	1	40	Primulaceae	2
18	Crasulaceae	2	41	Violaceae	1
19	Campanulaceae	3	42	Hipericaceae	1
20	Convolvulaceae	5	43	Liliaceae	2
21	Malvaceae	2	44	Dioscoraceae	1
22	Gentianaceae	1	45	Orichidaceae	1
23	Aristolochiaceae	1	46	Poaceae	10

Table 2. Families, genius, specieson the middle flow of Lumbardhi River from Prizren untill Reçan

PTERIDOPHYTA- BIMËT ME SPORE

1. FAM. EQUISETACEAE*(Ekuizetore)*
1.Equisetum Arvense L. (*Këputja e arave*)

2.FAM. POLYPODIACEAE*(Fierore)*
1.Pteridium aquilinum. Kuhn. *(Fiershqipe)*
2.Polypodium vulgare L. *(Fieri i murit)*

GYMNOSPERMAE- FARËZHVESHURA

3.FAM.CUPRESSACE *(Selviore)*
1. Juniprus Communis L.(*Dëllinja e zezë*)

ANGIOSPERMAE -FARËVESHURA MAGNOLIATE (DIKOTILEONEAE)

4. FAM .ASTERACEAE*(Kompozite)*
1.Centaurea jaceae L. *(Kokqeli)*
2. Centaurea alba L.*(Kokqeli alba)*
3.Xerantheum inapertum L.*(Kserantemi i paqelur)*
4.Cicorium intybus L.*(Ckore lulukorja)*
5.Inula salicina L. *(Omani shelgor)*
6. Inula britannica L. *(Omani Britanik)*
7.Anthemis tincotria L.*(Syviqjangjyruese)*

16. FAM. BETULLACEAE
1.Alnus glutinosaL.Geartn*(Verriizi)*
2.CarpinusorientalisMill. (*Shkoza e zezë)*
3.Coryllus avellana L.(*Lajthia*)
4.Betulla alba L.*(Mështekna e bardhë)*

17. FAM. ULMACEAE
1.Ulmus CampestrisL. *(Vidhi)*

18. FAM. CRASULACEAE
1.Sedum acre L. (*Rrushëqyqja e athët)*
2. Sedum telephium L. *(Rrushëqyqja e telefit)*

19. FAM. CAMPANULACEAE
1.Campanula rapunculoides L.*(Lulekëmbana)*
2.Campanula sparsa L. *(Lulekëmbana)*
3. Campanula spatulata Sbith.*(L. shpatullore)*

20. FAM. CONVOLVULACEAE
1.Calystegia sylvatica L.(Kit) Griseb.*(G.pyjor)*
2. Convovulusarvensis L. *(Dredhja e arës)*
3.Convovulus althaeoides L. *(Dredhja)*
4.Convolvulus cantabrica L.*(Dredhjakantabris)*
5.Cuscuta europea L. *(Kuskuta europiane)*

8.Lucanthemum vulgare L.(Lulebardha e rëndomt)
9.Carduus nutans L.*(Freshkulli)*
10.Achillea millefolium L. *(Barpezmi mijëfletësh)*
11.AchilealinguilataWaldst. et Kit *(B. gjuhëzor)*
12.Achileagrandiofolia L. *(B. gjethëmadhë*)
13.Bellis perennis L.*(Luleshqerrashumëvjeare)*
14. Tusilagofarfara L.*(Thundërmushka)*
15. Tanacetumvulgare L. (*Karajpeli)*
16.Tanacetum corymbosum L. (*Karajpelivasakor)*
17. Echinopssphaerocephalus L.*(Einopsikokëruzullor)*
18.Tragopogon Pratensis L.*(Lulebrigja livadhit)*
19.Eupatorium cannabium L.*(Eupatori)*
20.Bellis perennis.L*(Luleshqerra)*
21.Taraxacum officinale. Weh*(Luleshurdha mjekësor)*
22.Bellis annua L. *(Rrezngushtu)*
23.Hieracium pilosella L. *(Këmasha me paklesh)*
24.Arctium llappa L. *(Rrodhja)*

5. FAM. ROSACEAE

1. Pyruseleagrifolia Pallas. *(Dardhukëlagjethehunap)*
2. PyruspyrasterBurgs.*(Dardhukëla)*
3.Pyrus communis L. *(Dardha)*
4. Prunusspinosa L.*(Kulumbria)*
5.Prunus Avium L. *(Qërshija e egër)*
6. Mespilus germanica L.*(Mushmolla e dimrit)*
7. Malus sylvestris L. *(Molla e egër)*
8. Crataegus monogyna Jascq.(*Murrizi njëbërthamësh)*
9. Rosa canina L.*(Trëndafili i egër)*
10.Rosa pendulina L.*(Trëndafili i varës)*
11.Rosa arvensis L. *(Trëndafili i arës)*
12.Sorbus aria L. *(Vadha)*
13.Fragaria vesca L.*(Luleshtrydhja erëmyshku)*
14.Cydoniaoblonga Mill. *(Ftoi)*
15.Rubusulmifolius Schott.*(Manaferrafermanë)*

6. FAM. FABACEAE

1.Anthyllis vullneraria L. (*Antili Shërues*)
2.Melilotus alba Med.(*Makthiibardhë)*
3.Ononisspinosa L. *(Kalmuthigjembor)*
4.Lathyrustuberosum L.*(Vingjrazardhokore)*
5.Trifolium incarnnatum L.(*T. ngjyrëmishi)*
6.Trifolium pretense L.*(Tërfili i livadhit)*
7. Trifolium repens L. *(Tërfili i Zvarritës)*
8. Vicia sativa L. *(Grashtina kultivuar)*
9. Robinia pseudoacacia L. *(Shallëgemi)*
10. Medicago sativa. L. *(Jonxha)*
11.Medicago polymorpha L. (*Jonxhashumëtrajtshe*)
12.Colutea arborescent L. *(Fshikëkarta)*
13. Coronilla varia L. *(Milëza e ndryshme)*

7. FAM. RANUNCULACEAE

1.HelleborusodorusËaldst et Kit. *(Shpendra)*
2.Nigella damascena L.*(Nigella e Damaskut)*
3.Thalictrum flavum L.*(Pipanolla e verdhë)*
4.Clematis vitalba L.*(Kulpra e egër)*

8. FAM. LAMIACEAE

1.Ajuga reptans L. *(Ajugazvarranike)*
2.Mentha langifoliaL.Huds*(M. gjethegjatë)*

21. FAM. MALVACEAE

1.Alcea pallid (Willd).(*Mëllaga e butë e zbetë)*
2. Malva Sylvestris.L.(*Molla e egër*)

22. FAM. GENTIANACEAE

1.Centarium Verna L.(*G.pranverore)*

23. FAM. ARISTOLOCHIACEAE

1.Aristolochia clematitis L. *(Petriku kulpër)*

24. FAM. PLANTAGINACEAE

1.Plantago media L. (*Gj.ndërmjemë)*

25. FAM. SCROPHULARIACEAE

1.Digitalis lanata Eher. *(Luletogëza leshtake)*

26. FAM. SOLANACEAE

1.Solanum dulcamara L. *(Idhnakthi i idhët)*

27. FAM. FAGACEAE

1. Quercus robur L. *(Dushku)*
2. Castanea sativa Miller.(*Geshtënja)*

28. FAM. PLANTANACEAE

1.Plantanus orientalis L.*(Rrapi)*

29. FAM. VITACEAE

1.Vitis sylvestris. L.*(Hardhia e egër)*
2. Vitis vinifera. L. *(Hardhia)*

30. FAM. EUPHORBIACEAE

1.Euphorbia palustris L.*(Qumështorja ligatinës)*
2.Euphrbia myrsinites L.(*Qumështorja mërsinë)*

31. FAM. CORNACEAE

1.Cornus sanguine L. *(Thanukla)*
2. Cornus mas L.*(Thana)*

32. FAM CAPRIFOLIACEAE

1.Sambucus ebulus L.*(Qingla)*
2.Sambucus nigra L. *(Shtogu)*

33. FAM. URTICACEAE

1.Urtica dioica L. (*Hithore dioike*)
2.Parietaria officinalis L.*(K.mjekësor)*

34. FAM. PAPAVERACEAE

1.Papaver rhoeas L. *(Lulëkuqja)*

35. FAM. SALICACEAE

1.Populus tremula L.*(Plepiiegër)*
2.Salix alba L. *(Shelguibardhë)*
3.Salix Caprea L. *(Shelguiegër)*

36. FAM. ACERACEAE

1.Acer tataricum *L. (Ulëza)*
2.Acer monssulanum L. *(Krekëza)*

3.Salvia verticulataea L. *(Sherebelaqerthullake)*
4.Satureja montana L. (*Trumëza)*
5.Galeopsis speciosa Mill. *(Galeopsi i hijshëm)*
6.Clinopodium vulgare L.(*Statureja vulgaris Fritsh)*
7.Origanum vulgare L.(*Rigoni zakonshëm)*
8.Lamium bifidum L.(*Hithëbuta bigëzuar)*
9.Micromeria albanica L. (*B. shqiptar)*

9.FAM. LINACEAE
1.Linum perenne L. *(Liri shumëvjeqar)*
2.Linum hirsutum L. *(Liri qimeashpër)*

10. FAM. BERBERIDACEAE
1.Berberis vulgaris L.*(Mëlqinja e rëndomtë)*
2. Mahonia aquifoliumNutt. *(Mahonija gjetheajshe)*

11. FAM. BORAGINACEAE
2. Symphytum tuberosum L.*(K. Zardhokore)*
3. Onosma echioides L. *(Ç. si selligë)*
4. Anchusa officinalis L. *(Gj. Mjekësore)*

12.FAM. BRASICACEAE
1.Arabis turrita. L. (Arabësi kullë)
2.Berteroa Incana L.*(Shtrapëri)*
3.Peltaria alliaceae. Jasq (*P. hudhëurore)*
4.Roripa lippipenzensis. Wulf. Reichenb (*R.e lipicës)*
5.Lunaria rediviva L. (*Lunaria e përtrituar)*
6.Capsella bursa pastoris L. (*Shtrapëri)*
7.Cardamine hirsute L.(*Kardamini çimeashpër)*
8.Thlapsi praecox Wulfen. (*T.i hershëm)*

13. FAM. POLYGONACEAE
1.Rumex acetosella L. (*Lëpjata majoshe)*
2.Rumex crispus L.(*Lëpjata kaqurrele*)

14. FAM – APIACEAE
1.Erigium campestre L. (*Gjëmbardhi i fushës)*
2.Smyrnium perfoliatum L. *(S. i përgjethur)*
3.Orlaya grandiflora L. *(Orlaja lulemadhe)*
4.Daucus carrota L. *(Karrota e egër)*

15. FAM. OLEACEAE
1.Fraxinusornus . L. (*Frashëriibardhë)*
2. Fraxinus excelsior L.*(Frashëri)*
3.Ligustrum Vulgare L.*(Voshtra e rëndomtë)*

37. FAM. MORACEAE
1. Morus alba L. *(Mani i bardhë)*
2. Morus nigra L. *(Mani i zi)*
3. Ficus carica L. *(Fiku)*

38. FAM. JUGLANACEAE
1. Juglansregia L. *(Arra)*

39. FAM. ARALIACEAE
1. Hedera helix L. *(Urthi)*

40. FAM. PRIMULACEAE
1.Cyklamenneapalitanum Ten. (*B.gjetheurithi)*
2.Primula vulgaris Huds. *(A.rëndomtë)*

41. FAM. VIOLACEAE
1. Viola odorata L.*(Manushaqja)*

42. FAM. HYPERICACEAE
1.Hypeicum perforatum L. *(Lulebalsami)*

LILIATE (MONOCOTILEDONE)

43. FAM. LILIACEAE
1.Allium sphaerocephalum L.(*Q.kokeerruzullor*)
2. Allium flavum L. *(Qepa e verdhë)*

44.FAM. DIOSCORACEAE
1.Tamus communis L. (*Pejza rrushë gjarpëri)*

45.FAM. ORCHIDACEAE
1.Orchis morio L.*(Salepi morio)*

46. FAM. POACEAE
1. Lolium perenne L. (*Egjra shumëvjeqare)*
2. Hordeum murinum L.(Elbi i minjëve)
3. Dactylis glomerata L. (*Telishi)*
4. Bromus squarresus L. (*Bari luspak)*
5.Bromus arvensis L. *(Bari i arës)*
5. Bromus hordeaceus L.*(Bari bultosh)*
6. Bromus racemosus L. *(Bari me vilë)*
7. Cynosurus echinatus L. (*Bishtqeni gjembak)*
8. Poa pratensis L. (*Flokëza e livadhit)*
9. Poa bulbosa L. (*F. qepore)*
10.Phleum pretense L. (*Fleumi i livadhit)*
11.Sesleria Comosa L.*(P.me baluke)*
13.Seslariaautumnalis(Scop). *(P.vjeshtës)*

Conclusions

Based on the study conducted in the middle area of Lumbardhi River flow from Prizren untill Reçan it shows that there is a high presence of plant species such as grasses, shrub, timber, endemicand medicinal plants. A significant part of them are in the form of phytocenosis realizing multiple ecological roles. Results of this study show that are found: 46 families, 123 genus and 157 species, of which we may cite: a) Equisetaceae 1 family, 1 genus and 1 species; b) Cupresaceae 1 family, 1 genus and 1 species; c) Polipodiaceae 1 family, 1 genus and 2 species; d) Dicotiledonae 39 families, 111 genus and 136 species; e) Monocotiledonae 4 families, 11 genus and 17 species. From all plants groups the families with the largest number of species found are: Pteridiophyta, the family of Polipodiaceae; Ecuisetaceae the family of Cupresaceae. From thedicotiledonaea family with the largest number of species are families: Asteraceae, Rosaceae, Fabaceae, Convolvulaceae, Oleaceae,

Betullaceae, Ranunculaceae, Brasicaceae, Primulaceae, Lamiaceae. From the monocotliledonet family with the largest number of species were: Poaceae, Liliaceae, Orichdaceae. The phytocenozes in the flow of Lumbardh River plays an important ecological role in the landscape of this valley enhancing the panorama quality which enables a number of tourist activities in the area. The phytodiversity of this river flow in some areas is found damaged and threatened by various activities of local communities as uncontrolled construction, logging, grazing and burning in some areas.

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