International Journal of Research in Agricultural Sciences
Volume 8, Issue 3, ISSN (Online): 2348 – 3997

Flora of Trebeshina Mt. in Southern Albania

Dhimiter Peci [1*], Alfred Mullaj [1] and Arsen Proko [2]
[1] Research Center of Flora and Fauna, Faculty of Natural Sciences, Tirana University, Albania.
[2] Faculty of Forestry, Agricultural University of Tirana, Albania.
*Corresponding author email id: dhimiter.peci@fshn.edu.al

Date of publication (dd/mm/yyyy): 30/06/2021

Abstract **– Trebeshina Mountain is located in Southern Albania it represent an important ecosystem particularly for its community that use its resources. Few previous studies draw attention on the importance of the knowledge of floristic diversity of vascular plants grown in this area. In this study we aimed to provide the first large scale data on floristic composition of the Trebeshina Mountain, to construct a database of species and evaluate their biological form, floristic spectra, flowering period and their conservation status. There were identified 63 families belonging to 211 genera, in high dominance were species of Asteraceae family. The life forms identified in the flora of Trebeshina Mt. showed the type H > G > Ph > T > Ch while the most of the species were of Mediterranean strict type, flowering in the period between end of spring and summer. Moreover, out of plant species in Trebeshina Mt. were identified 21 threatened species, included in the Red List of Albania, drawing attention to their further conservation. The provided data would contribute to increase knowledge about the area and ensuring sustainable use of its floristic diversity.**

Keywords **– Trebeshina Mt., Floristic Analysis, Vascular Plants, Conservation Status, Albania.**

I. INTRODUCTION

The Trebeshina Mountain is located 18 km North West of the city of Permet, in the Southern Albania. It is bordered to Kelcyra Gorge in the South, Deshnica River in the East, to the West it is bordered to Mt. Shendelli and to Gllava Mt. in the North. The mountain is oriented in South West- North East. It has a length of about 20 km and a surface area of around 35.06 km^2. The highest peak is Dean with height 1987 a.s.l. The climate in this mountain has Mediterranean characteristics, and its main geological formations are calcareous, greyish –brown and silty (Peci et al., 2021). A few floristic data on Trebeshina Mt. are previously described by Peci et al. (2020) and Peci et al, (2021). The aim of this study was to inventory the flora of Trebeshina Mountain, providing first large scale data on floristic diversity and distribution on this Mountain. The provided data would contribute to increase knowledge about the area and ensuring sustainable use of its floristic diversity.

II. MATERIAL AND METHODS

The survey was carried out during in two years. The releves were performed base on the quadrat method where different sampling surfices were applied in different vegetation types, as for herbacous flora (25 m^2), for shrublands (100 m^2) and of forests (200 m^2). The species identification was performed based on the Flora of Albania (I-IV) (Paparisto et al., 1988; Qosja et al., 1992, 1996; Vangjeli et al., 2000) and Excursion Flora (Vangjeli J., 2015). The life forms are represented in the system of Raunkiaer (1934), chorologic form was assessed based on Vangjeli J., (2015). The conservation status of plants was evaluated using the Red List of Albania (2013).

III. RESULTS AND DISCUSSION

During this floristic survey were identified in total 63 families and 211 genera. The majority of genera were represented by 1-3 species. The most represented family were Asteraceae (13%), Fabaceae (8%), Rosaceae (7%), Lamiaceae (7%), Poeaceae (5%), Caryophyllaceae (4%), Lineaceae (4%), followed by Brassicaceae,

Boraginaceae, Ranunculaceae and Plantaginaceae, each represented by 3% of the total species. The other 53 families identified in Trebeshina Mt. were represented by less than 3%, accounting for 38% of the total species. Families found in Trebeshina Mt. and their occurrence in percentage is given in the figure 1. The higher number of species belonging to families of Asteraceae, fabaceae, Roseaceae, Lamiaceae also indicates their ability to adapt the ecological and climatic conditions of this area.

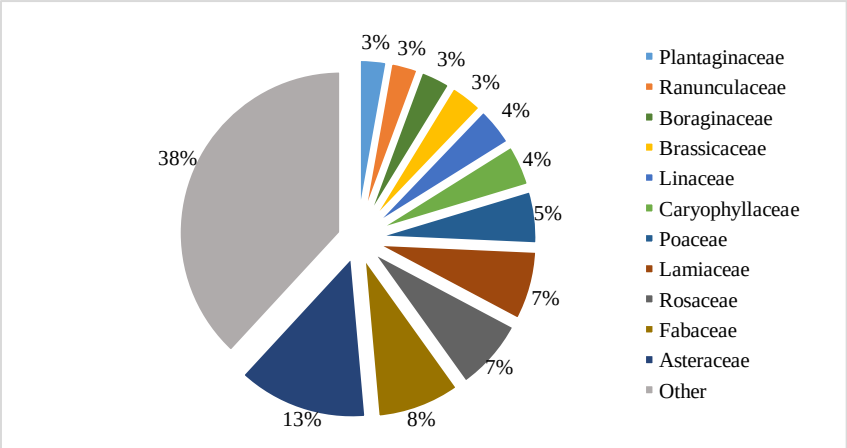

Fig. 1. Distribution of families in Trebeshina.

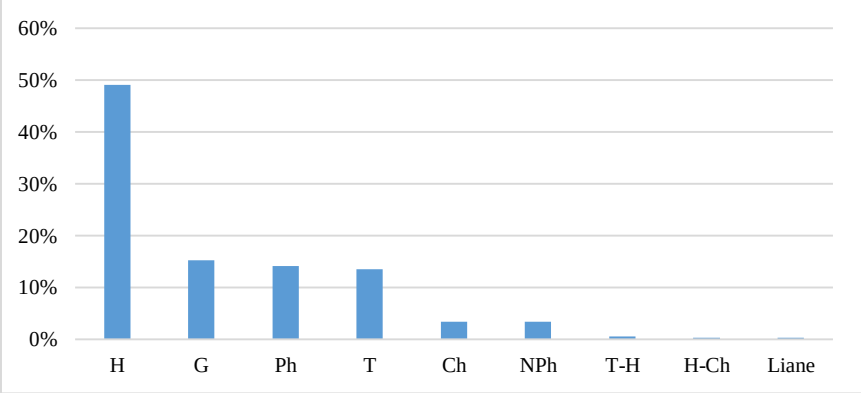

Fig. 2. The percentage of life forms in Trebeshina Mt.

Life Form

The analysis of life forms showed a dominance of Hemicryptophytes (49%), followed by Geophytes (15%), Phanerophtes and Therophytes with 14%, respectively. Chamaephytes and Nano-Phanerophytes were represented by more or less 3%. There were identified two species Therophyte to Hemicryptophyte (*Centaurea cyanus*, *Sonchus oleraceus*), while life forms such as Hemicryptophyte to Chamaephyte (*Dorycnium pentaphyllum*) and Liane (*Clematis vitalba*) were represented only by one species each. The life forms identified in the flora of Trebeshina Mt. showed the type H > G > Ph > T > Ch, their distribution in percetange is presented in the figure 2. High presence of Hemicryptophytes are characteristic of high elevation, the same result was reported for the Valmar Mountainrange in Albania (Meco et al. 2018).

Conservation Status

The conservation status evaluation of plant species was based on IUCN criteria and Red List of Albania (2013). In total there were identified 21 threatened species that represent 6.7% of total species with conservation

status in Albania. Threatened species were classified into different categories (Table 2) such as 21 species (40.9%) were endangered (EN), four species (18.1%) were vulnerable (VU), and three species (13.6%) fall under critically endangered (CR) category.

Table 2. List of species with conservation status.

No.	Species	Conservation Status
1	*Tilia platyphylos*	CR (A1c)
2	*Agrimonia eupatoria*	LR(cd)
3	*Asperula scutellaris*	LR (cd)
4	*Athamanta macedonica*	EN (A1b)
5	*Centaurea zuccariniana*	EN(A1b)
6	*Cirsium tymphaeum*	EN (B2c)
7	*Achillea fraasii*	CR (B3c)
8	*Convallaria majalis*	CR (B2c)
9	*Digitalis lanata*	LR (cd)
10	*Dryopteris filix-mas*	LR (cd)
11	*Helichrysum plicatum*	EN (A1b)
12	*Hypericum perforatum*	EN (A1b)
13	*Juglans regia*	EN (A1b)
14	*Juniperus oxycedrus*	VU (A1b)
15	*Origanum vulgare*	EN (A1b)
16	*Prunus avium*	VU (A1b)
17	*Salvia officinalis*	VU (A1b)
18	*Senecio thapsoides*	LR(nt)
19	*Herniaria parnassica*	EN (A1b)
20	*Sideritis raeseri*	EN (A1c)
21	*Valeriana officinalis*	VU (A1c)

Biogeographical types of Species in Trebeshina

Analysis of phytogeographical structure revealed 23 different elements, belonging to nine large centers. Species of Euroasian origin were in higher number with 27.4% with Europ-Asian (EuAs) strict (12.15 %), Europ-Caucasian (EuCaucas) (9.04%), Europ-Siberian (EuSib) (4.8) and Pontic (1.41 %). The second most represented group were species of Mediterranean origin with 25.42 % which comprised Mediterranean strict (Med) (23.16%, European-Mediterranean (EuMed) (1.98%) and Sub-Mediterranean (SubMed) (0.28%). Species of European origin comprised 17.8 % of total species, the majority of species within this chorological group were South East European (SEEu) (12.99%), European (Eu) (4.52%), Central-European (CEu) (0.28%). Species of Balkan origin accounted for 7.63%, they comprised species of strict Balkanic origin (Balk) (3.11%), Sub-Balkanic (SubBalk) (3.39%) and Ilyrice (0.85%). The other biogeographical types such as Boreal (Alpine and

Circumborean), Endemic (Sub-Endemic), Cosmopolitan (Sub-Cosmopolitan and Cosmopolitan), Atlantic (Atlantic and Sub-Atlantic), Asian, West-Asian, and Paleotemperatean were less than 5% represented, however these species contributes in diversity and richness of phytogeographic potential of the studied area (Belgacem et al. 2020). The dominance of Euroasian species were also observed in other mountains in Albania (Meco et al., 2018). The chorological spectra of species in Trebeshina Mt. is given in the figure 3. In the table 1 are given the chorological centers of distribution of flora in Trebeshina Mt.

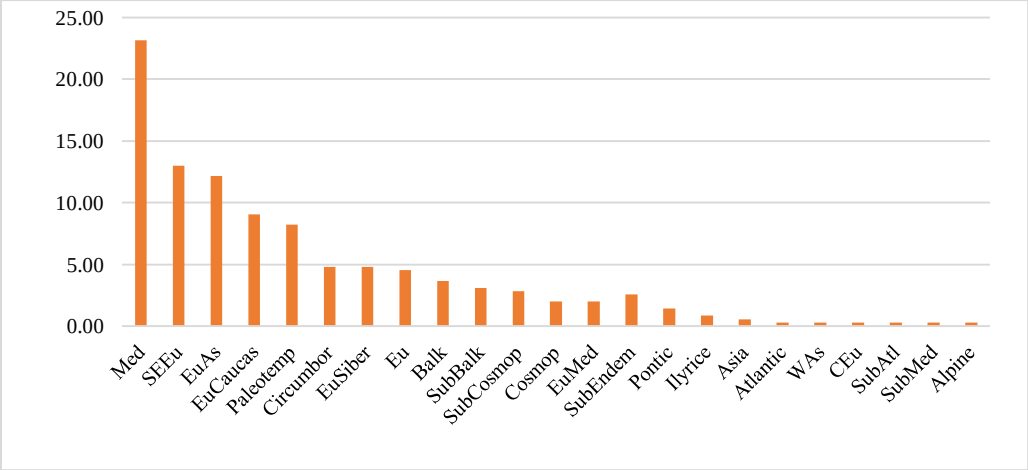

Fig. 3. Chorological spectra of species in Trebeshina Mt.

Table 1. The chorological centers of distribution of flora in Trebeshina Mt.

No	Chorological Element	Percentage
Euroasian		
1	Europ.-Asian	12.1
2	Europ.-Caucasian	9.04
3	Europ. Siberian	4.80
4	Pontic	1.41
Mediterranean		
1	Mediterranean	23.16
2	Europ.-Mediterranean	1.98
3	Sub-Mediterranean	0.28
European		
1	South East European	12.99
2	European	4.52
3	Cental-European	0.28
Balkan		
1	Balkanic	3.67
2	Sub-Balkanik	3.11
3	Ilyrice	0.85

No	Chorological Element	Percentage
Boreal		
1	Alpine	0.28
2	Circumborean	4.80
Cosmopolitan		
1	Sub-Cosmopolitan	2.82
2	Cosmopolitan	1.98
Endemic		
1	Sub-Endemic	2.26
Atlantic		
1	Atlantic	0.28
2	Sub-Atlantic	0.28
Other		
1	Asian	0.56
2	West-Asian	0.28
3	Paleotemperate	8.19

Flowering Phenology

The flowering period analysis of species in Trebeshina revealed 42 flowering periods (Figure 4). The Majority of species bloom during the periods May-June and June-August with 15.4% and 12.1% blooming on these periods, respectively. On each of the periods April-June, May-August, April-May and May-June flower 7-9% of species. While in each of other periods flower less than 5% of species as shown in the Figure 4.

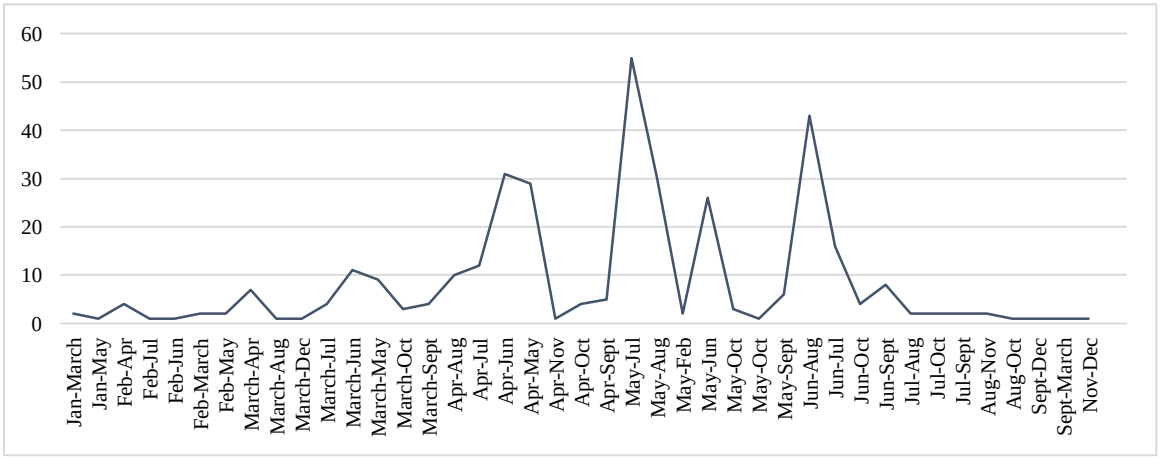

Fig. 4. Flowering period of species in Trebeshina.

The flowering period varies according to climate, temperatures, and elevation. These data will be useful in future conservation programs for these species, especially those classified as endangered (Peci et al., 2021). The majority of threatened species in Trebeshina Mt. flower on the period June-August and May-July with 36.3% and 22.7%, respectively.

IV. CONCLUSIONS

Our study contributes to increase the knowledge on floristic composition and diversity in Mt. Trebeshina. The most dominant family was Asteraceae followed by Fabaceae, Rosaceae and Lamiaceae. There was observed a high dominance of Hemicryptophytes, due to high elevation and the types of organic matter of the area. The analysis of phytogeographical structure revealed nine large centers, where species of euroasian origine dominated especially in the high altitudes, however it confirmed the typical Mediterranean type where strict Mediterranean species were in higher percentage, particularly in lower part of the mountain due to the impact of Mediterranean climate favored by the occurrence of nearby rivers Vjosa and Deshnica. The majority of species bloom during the period between May-August. The survey revealed 22 with particular status of conservation, increasing attention to their protection.

REFERENCES

[1] Vangjeli J., Mullaj A., Ruci B., Qosja XH. 1996. Flora of Albania, 4, Pg 502.
[2] IUCN 2016. The IUCN Red List of Threatened Species. Version 2016-3. http://www.iucnredlist.org
[3] Raunkiaer C., 1934. The life forms of plants and statistical Geography. Claredon, Oxford
[4] Paparisto K, Demiri M, Mitrushi I, Qosja Xh, Vangjeli J, Ruci B, Mullaj A. 1966. V3: Flora of Albania V. 1. Biological Research Institute, Albania
[5] Paparisto K, Demiri M, Mitrushi I, Qosja Xh, Vangjeli J, Ruci B, Mullaj A. 2000: Flora of Albania V 4. Biological Research Institute, Albania
[6] Meco M., Mullaj A., Barina Z. 2018. The vascular flora of the Valamara mountain range (SE Albania), with three new records for the Albanian flora. Fl. Medit, 28:5-20 doi: 10.7320/FlMedit28.005
[7] Vangjeli, J. 2015. Excursion Flora of Albania. Hardcover, Koeltz Scientific Books, Konigstein/Germany, ISBN 978-3-87429-477-5, 661.
[8] Peci Dh., Mullaj A., Proko A. 2020. Endemic and Subendemic plant species in Mt. Trebeshina in Southern Albania; Their status and threats. Proceeding of International symposium of Environment Science and Engineering Research, Manisa, Turkey. ISBN 978-605-83522-2-3
[9] Peci Dh., Mullaj A., Proko A. 2021. Phytoecological Study on Asteraceae Family of Trebeshina Mt. in Southern Albania. IJRAS. V. 8 (3): 140-149.
[10] Belgacem N., Okkacha H., Benchohra M., et al. 2020. Floristic diversity of the Tagdempt region, Tiaret Mountains, Algeria. Acta Ecologica Sinica. doi.org/10.1016/j.chnaes.2020.06.007

AUTHOR'S PROFILE

First Author
Dhimiter Peci, Botanists at Research Center of Flora and Fauna, Faculty of Natural Sciences, Tirana, Albania. His research interests are focused on studying of flora and vegetation.

Second Author
Prof. Dr. Alfred Mullaj, Botanists at Research Center of Flora and Fauna, Faculty of Natural Sciences, Tirana, Albania.

Third Author
Prof. Dr. Arsen Proko, Lector and Researcher in Plant Phytosociology, Systematics and Botanic, Biodiversity and Nature Conservation, Faculty of Forestry, Agricultural University, Tirana, Albania.