

FLORISTIC ANALYSES OF THE AREAL OF PUNICA GRANATUM L. IN ALBANIA

Arselida Koçi

The Faculty of Natural Science, Department of Biology and Chemistry,
University “Luigj Gurakuqi”, Shkodër

Abstract

The wild pomegranate (*Punica granatum L.*) is a member of the monogenus family; *Punicaceae*. It is a valuable plant that grows from Hani i Hotit in the north till Milot in the center of our country, between the altitudes 0-700m over the sea level. The study of the area of this plant is based on the floristic analyses. Floristic analyses include family richness, biologic and chorological spectra and threatening level. For the determination of areal of *Punica granatum L.* several expeditions are done during the period June-August 2012 in 10 stations. 117 species which are present in this study correspond to a richness of 39 families. Biological spectra include 30% Hemichryptophytes, 27% Terophytes and 21% Phanerophytes. Chorological spectra show higher number of Euro-Mediterranean species (27%), Mediterranean species (21%), Euro-Asiatic species (15%) and European species (8%). This areal has 8 species which belong to the category of endangered species (E) according to the IUCN list: *Salvia officinalis* (Common Sage), *Satureja montana* (Winter Savory), *Origanum vulgare* (Oregano), *Laurus nobilis* (Laurel Common), *Juniperus oxicedrus* (Prickly Juniper), *Juniperus communis* (Common Juniper), *Juglans regia* (Persian Walnut) and *Hypericum perforatum* (Grammock). Floristic analyses, during the period June-August 2012, show that this areal of the wild pomegranate is poor in number of species and consequently poor in number of families. This is mainly a result of its habitat, kserofitic soil and stones and although as a result of low Abundance-Dominance values. Further studies will complete these analyses in order to determinate of *Punica granatum* associations.

Key words: *Punica granatum*, floristic analyses, family richness, biological spectra, chorological spectra, threatening level.

Introduction

The wild pomegranate (*Punica granatum L.*) is a member of the monogenus family; *Punicaceae*. Its origin comes from the area lying from Iran to Himalaya in northern India and had been cultivated and naturalized over the whole Mediterranean region since ancient times (Morton J.F. 1987; Stover E., and Mercure E.W., 2007). *Punica granatum L.* is one of the important endemic plants of Iran, growing in most regions throughout the country, in arid and semiarid regions due to its ability to adapt to adverse ecological conditions. (Rahimi H., *et al.* 2012). It is a valuable plant that grows from Hani i Hotit in the north till Milot in the center of our country, between the altitudes 0-700m over the sea level (Koçi A., & Mersinllari M., 2012). Wild pomegranate populations are more widespread in subzones of north-western of Albania, starting from Kruja, continuing in Milot, in the Mati River valley, in Zejmeni, Balldreni, and Shengjini hilly areas, in the villages of Shkodra, in the Malesia e Madhe, Koplík and Kastrati valleys. In these subzones wild pomegranate is found in the form of natural dense shrub forestry up to 700 m above the sea level (Xhuveli L., 2012). The objective of this study was to give larger information about the vegetation of the areal where the wild pomegranate is distributed and to determine some characteristics of this vegetation. This information can be used in the future to determine *Punica granatum* associations.

Materials and methods

This study was based on the previous works related to the determination of the distribution of the specie *Punica granatum L.* in our country (Koçi & Mersinllari 2012). This study of the area of this plant is based on the floristic analyses. Floristic analyses include family richness, biologic and chorological spectra and risk level. For the determination of areal of *Punica granatum L.* several expeditions are done during the period June-August 2012 in 10 stations: 1- Shirokë, 2- Zogaj, 3- Rosek, 4- Drisht, 5- Oblike, 6- Gur i Zi,



Fig.1. Relevè areas

7-Grudë Fushë and 8-Bajzë – in Shkodra Region; 9- Torovicë and 10- Mal i Bardhë – in Lezha Region (Fig. 1) The observations and the relevès were made according to the “Marshrut” method and using the method of Braun-Blanquet of the Zurich-Montpellier school. The determination of the species and family richness, in the areal of *Punica granatum*, was made according to Flora e Shqipërisë, Flora ekskursioniste e Shqipërisë (Anonymous 1984-1996; Anonymous 1983). To determine Raunkiaer’s life forms classification for the biological spectra and the chorological spectra I was based on “Udhëheqës fushor i Florës së Shqipërisë” (Vangjeli 2003). With regard to the level of threatening for the species the areal of the study I was based on the according to the IUCN list in the “Red Book” (Vangjeli *et al.* 1995).

Results

In order to give a clearer idea on the study the main data of flora in terms of numbers, i have presented only the major elements in a simple table (Tab. 1), according to the following criteria: the first column includes those species that were present in the areal *Punica granatum*; the second column include families which the specie belong; the third column includes the biological spectra; the fourth column includes the chorological spectra; whereas the fifth one includes those species that are part of IUCN list.

Tab.1. Elements of the floristic analyses of the pomegranate areal

Specie name	Family	Life form	Chorology	Threat level
<i>Achillea nobilis</i>	Asteraceae	H	Eu	
<i>Aegilops neglecta</i>	Poaceae	T	Med-Turan	
<i>Alyssum murale</i>	Cruciferae	H	SubBalk	
<i>Arbutus unedo</i>	Ericaceae	Ph	Med	
<i>Artemisia annua</i>	Asteraceae	T	EuAz	
<i>Arum italicum</i>	Araceae	G	Med	
<i>Asparagus acutifolius</i>	Asparagaceae	G	Med	
<i>Asphodeline liburnica</i>	Liliaceae	G	Med	
<i>Asphodeline lutea</i>	Liliaceae	G	Med	
<i>Asphodelus albus</i>	Liliaceae	G	Subbalt	
<i>Asphodelus ramosus</i>	Liliaceae	G	Med	
<i>Avena fatua</i>	Poaceae	T	EuAz	
<i>Bellis annua</i>	Asteraceae	T	Med	
<i>Briza media</i>	Poaceae	H	Eu-Siberi	
<i>Bromus madritensis</i>	Poaceae	T	EuMed	
<i>Calamagrostis epigejos</i>	Poaceae	H	Eu-Siberi	
<i>Calamintha nepeta</i>	Labiatae	H	EuMed	
<i>Carpinus orientalis</i>	Corylaceae	Ch	Pontike	
<i>Catapodium rigida</i>	Poaceae	T	EuMed	
<i>Celtis australis</i>	Ulmaceae	Ph	EuMed	
<i>Centaurea calcitrapa</i>	Asteraceae	H	EuMed	
<i>Chenopodium vulvaria</i>	Chenopodiaceae	T	EuMed	
<i>Cichorium intybus</i>	Asteraceae	H	Kozmopol	
<i>Cirsium arvense</i>	Asteraceae	G	EuAz	
<i>Clematis flammula</i>	Ranunculaceae	L	EuMed	
<i>Clematis vitalba</i>	Ranunculaceae	L	EuKaukaz	
<i>Clematis viticella</i>	Ranunculaceae	L	EuAz	
<i>Convolvulus arvensis</i>	Convolvulaceae	G	Kosmopolit	
<i>Corylus avellana</i>	Corylaceae	Ph	EuKaukaz	
<i>Crataegus monogyna</i>	Rosaceae	Ph	Paleotemp	
<i>Cynanchum acutum</i>	Asclepiadaceae	PhL	Paleotropik	
<i>Cynoglossum officinale</i>	Boraginaceae	H	Eu	
<i>Cynosurus echinatus</i>	Poaceae	T	EuMed	
<i>Dactylis glomerata</i>	Poaceae	H	Paleotemp	

<i>Daucus carota</i>	Umbelliferae	T	Paleotemp	
<i>Dittrichia viscosa</i>	Asteraceae	H	EuMed	
<i>Echium italicum</i>	Boraginaceae	H	EuMed	
<i>Echium plantagineum</i>	Boraginaceae	T	EuMed	
<i>Erica arborea</i>	Ericaceae	NPh	Med	
<i>Eryngium campestre</i>	Umbelliferae	H	EuMed	
<i>Euphorbia characias</i>	Euphorbiaceae	G	Med	
<i>Euphorbia cyparissias</i>	Euphorbiaceae	H	EuAz	
<i>Foeniculum vulgare</i>	Umbelliferae	H	Med	
<i>Fraxinus ornus</i>	Oleaceae	Ph	EuMed	
<i>Galanthus nivalis</i>	Amaryllidaceae	G	?	
<i>Galium aparine</i>	Rubiaceae	T	EuAz	
<i>Geranium lucidum</i>	Geraniaceae	H	EuMed	
<i>Geranium molle</i>	Geraniaceae	T	EuAz	
<i>Haynaldia villosa</i>	Graminaceae	T	EuMed	
<i>Hieracium villosum</i>	Asteraceae	H	Eu	
<i>Hordeum murinum</i>	Poaceae	T	Circkumbor	
<i>Hypericum perforatum</i>	Guttifera	H	Subkozmozp	E
<i>Juglans regia</i>	Juglandaceae	Ph	EuAz	E
<i>Juniperus communis</i>	Cupressaceae	Ph	Circkumbor	E
<i>Juniperus oxycedrus</i>	Cupressaceae	Ph	P	E
<i>Laurus nobilis</i>	Lauraceae	Ph	Med	E
<i>Ligustrum vulgare</i>	Labiatae	NPh	EuAz	
<i>Medicago minima</i>	Fabaceae	T	EuMed	
<i>Medicago sativa</i> subsp. <i>falcata</i>	Fabaceae	H	K	
<i>Melica ciliata</i>	Poaceae	H	EuMed-Turan	
<i>Mercurialis annua</i>	Euphorbiaceae	T	Paleotemp	
<i>Micromeria juliana</i>	Labiatae	Ch	Med	
<i>Nigella arvensis</i>	Ranunculaceae	T	EuMed	
<i>Nigella damascena</i>	Ranunculaceae	T	EuMed	
<i>Olea europea</i>	Oleaceae	Ph	Med	
<i>Origanum vulgare</i>	Labiatae	H	EuAz	E
<i>Orlaya grandiflora</i>	Umbelliferae	T	Eu	
<i>Paliurus spina-christi</i>	Rhamnaceae	Ph	EuJL-Pont	
<i>Parietaria officinalis</i>	Urticaceae	H	EuAz	
<i>Petrorhagia saxifraga</i>	Caryophyllaceae	H	EuMed	
<i>Phillyrea latifolia</i>	Oleaceae	Ph	Med	
<i>Phleum echinatum</i>	Poaceae	T	Med	
<i>Pinus pinea</i>	Pinaceae	Ph	Bal	
<i>Plantago lanceolata</i>	Labiatae	H	EuAz	
<i>Poa nemoralis</i>	Poaceae	H	Circkumbor	
<i>Poa pratensis</i>	Poaceae	H	Circkumbor	
<i>Prunus cocomilia</i>	Rosaceae	Ph	Med	
<i>Pulicaria dysenterica</i>	Asteraceae	H	EuMed	

<i>Punica granatum</i>	Punicaceae	Ph	MedAz	
<i>Pyrus amygdaliformis</i>	Rosaceae	Ph	Med	
<i>Pyrus communis</i>	Rosaceae	Ph	Az	
<i>Quercus cerri</i>	Fagaceae	Ph	Eurimedit	
<i>Quercus frainetto</i>	Fagaceae	Ph	Eu	
<i>Quercus robur</i>	Fagaceae	Ph	Eu-kaukaz	
<i>Quercus coccifera</i>	Fagaceae	Ph	Eu	
<i>Quercus trajana</i>	Fagaceae	Ph	Subbalk	
<i>Rosa canina</i>	Rosaceae	NPh	EuAz	
<i>Rosa sempervirens</i>	Rosaceae	NPh	Med	
<i>Rubia tinctorum</i>	Rubiaceae	H	AzP	
<i>Rubus ulmifolius</i>	Rosaceae	NPh	EuMed	
<i>Rumex crispus</i>	Polygonaceae	H	Subkozmp	
<i>Rumex longifolius</i>	Polygonaceae	H	Eu-Az	
<i>Salvia officinalis</i>	Labiatae	Ch	Med	E
<i>Salvia verticillata</i>	Labiatae	H	Eu	
<i>Sanguisorba minor</i>	Rosaceae	H	Eu-Az	
<i>Satureja montana</i>	Labiatae	Ch	Med	E
<i>Securigera securidaca</i>	Fabaceae	T	EuMed	
<i>Sedum hispanicum</i>	Crassulaceae	T	Eu	
<i>Sideritis romana</i> subsp. <i>purpurea</i>	Labiatae	T	Med	
<i>Sisymbrium officinale</i>	Cruciferae	T	Paleotemp	
<i>Sonchus asper</i>	Asteraceae	H	EuAz	
<i>Sonchus oleraceus</i>	Asteraceae	T/H	EuAz	
<i>Spartium junceum</i>	Fabaceae	Ph	EuMed	
<i>Teucrium chamaedrys</i>	Labiatae	Ch	EuMed	
<i>Teucrium polium</i>	Labiatae	Ch	Med	
<i>Thymus capitatus</i>	Labiatae	Ch	Med	
<i>Torilis arvensis</i>	Umbelliferae	T	EuMed	
<i>Tragopogon pratensis</i>	Asteraceae	H	EuSiber	
<i>Trifolium angustifolium</i>	Fabaceae	T	EuMed	
<i>Trifolium campestre</i>	Fabaceae	T	Paleotemp	
<i>Trifolium stellatum</i>	Fabaceae	T	EuMed	
<i>Verbascum pulverulentum</i>	Scrophulariaceae	H	EuQJ	
<i>Verbascum sinuatum</i>	Scrophulariaceae	H	EuMed	
<i>Veronica arvensis</i>	Scrophulariaceae	T	Subkozmp	
<i>Vicia lutea</i>	Fabaceae	T	EuMed	
<i>Vicia villosa</i> subsp. <i>Varia</i>	Fabaceae	T	EuMed	
<i>Vitex agnus-castus</i>	Verbenaceae	Ph	Med	

117 species which are present in this study correspond to a richness of 39 families. Biological spectra include 30% Hemichryptophytes, 27% Terophytes and 21% Phanerophytes. Chorological spectra show higher number of Euro-Mediterranean species (27%), Mediterranean species (21%), Euro-Asiatic species (15%) and European species (8%). This areal has 8 species which

belong to the category of endangered species (E) according to the IUCN list: *Salvia officinalis* (Common Sage), *Satureja montana* (Winter Savory), *Origanum vulgare* (Oregano), *Laurus nobilis* (Laurel Common), *Juniperus oxicedrus* (Prickly Juniper), *Juniperus communis* (Common Juniper), *Juglans regia* (Persian Walnut) and *Hypericum perforatum* (Grammock).

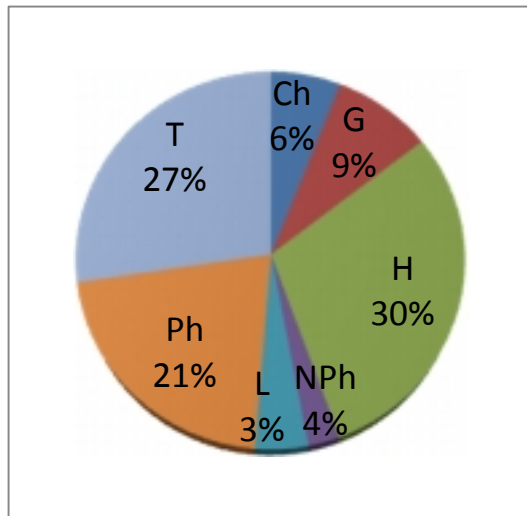


Fig.2. Chart of life forms.

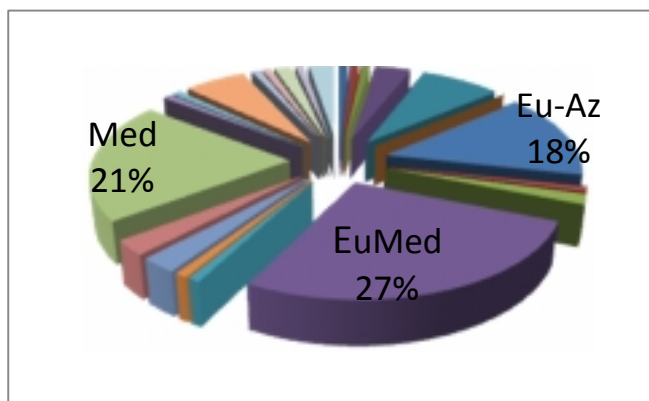


Fig.3. Chart of chorological forms.

Conclusions

Floristic analyses, during the period June-August 2012, show that this areal of the wild pomegranate is poor in number of species and consequently poor in number of families. This is mainly a result of its habitat, kserofitic soil and stones and although as a result of low Abundance-Dominance values. During the expeditions several damaged areas of *Punica granatum* are observed, mainly near the villages. The implementation of traditional and new management practices will be suitable for decreasing the damaged areas.

Reference

- Anonymous (1984-1996). *Flora of Albania*. Tirana. Vol 1, pp: 457, Vol 2, pp: 436, Vol 3, pp: 341, Vol. IV-In edition.
- Demiri M. (1983). *Flora ekskursioniste e Shqipërisë*. Tiran . ShBLU. pp. 985,
- Koçi, A. & Mersinllari, M. (2012). *Data on the areal of pomegranate in Albania*. International Journal of Ecosystems and Ecology Science (IJEES), Vol. 2/3, pp 64-69.
- Morton, J.F. (1987). *Pomegranate. Punica granatum L. In: Fruits of warm climates*. Miami, FL, USA, pp 352–355
- Rahimi, H. *et al.* (2012). *A Comprehensive Review of Punica granatum (Pomegranate) Properties in Toxicological, Pharmacological, Cellular and Molecular Biology Research*. Iranian Journal of Pharmaceutical Research 11 (2): 385-400
- Stover, E. & Mercure, E.W. (2007). *The pomegranate: a new look at the fruit of paradise*. HortScience 42(5):1088–1092
- Vangjeli J. (2003). – *Udhëheqës fushor i Florës së Shqipërisë*. pp. 598, Akademia e Shkencave. Tirane.

Vangjeli, J., *et al.*(1995). Red book. Tirana, pp: 169.