Araştırma Makalesi/Research Article

Spread and Variability in the Populations of *Papaver rhoeas* and *P. dubium*

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ABSTRACT: Surveys were conducted during the 2013 to determine the prevalence and morphological differences between the poppy field - *Papaver rhoeas* L. and suspicious popy - *Papaver dubium* L. and accompanying spread of other species. Poppies are known as highly competitive weed of cultivated plants and are prevalent in working the land, wasteland, about roads, gardens etc. They are quite prevalent in the territory of Kosovo, but the information about these species are scarce. The survey was conducted in five localities for *P. rhoeas* (Lluga, Cerrce 1, Tomoc 1, 2 and Drogolevc Tomoc) and as well as in five localities for *P. dubium* (Cerrce 2, Istok, Cerrce 3, 4 and Dubrava Cerrce), north-west Kosovo (Istok municipality). Field measurements were conducted during the vegetation (May-August) for the standard unit of 1m² analyzing their proliferation, morphological characteristics and association with other plants. Based on the results obtained type *P. rhoeas* is significantly more prevalent in all localities in comparison to *P. dubium* type which has a smaller spread. However, *P. rhoeas* has been more prevalent in areas planted with wheat. Also, the results show differences between these two types for some morphological parameters investigated. While accompanying weeds have been found a total of 19 species.

Key words: Prevalence, Morphology, Field poppy, Poppy suspicious

Papaver rhoeas ve *P. dubium* Popülasyonlarında Yayılım ve Değişkenlik

ÖZET: Tarlalardaki gelincik yaygınlığını ve gelincikler (*Papaver rhoeas* L., şüpheli bir gelincik türü *Papaver dubium* L.ve beraberlerindeki diğer türlerin) arasındaki morfolojik farklılıkları belirlemek amacıyla 2013 döneminde alan çalışmaları yürütülmüştür. Gelincik bitkisi, kültür bitkileri için son derece rekabetçi bir yabancı ot olarak bilinir ve tarlalarda, çorak alanlarda, yol kenarlarında ve bahçelerde oldukça yaygındır. Kosova topraklarında da gelincik birkisi oldukça yaygındır, ancak bu türler hakkında bilgi azdır. Araştırma, kuzey-batı Kosova (Istok belediyesi) bölgesinde *P. rhoeas* için beş yerleşim bölgesinde (Lluga, Cerrce 1, Tomoc 1, 2 ve Drogolevc Tomoc) ve P. dubium içinde beş yerleşim (Cerrce 2, İstok, Cerrce 3, 4 ve Dubrava Cerrce) gerçekleştirilmiştir. Saha ölçümleri, gelincik bitkilerinin çoğalması, morfolojik özellikleri ve diğer bitkiler ile ilişkilerini analiz etmek amacı ile 1m² standart bitki örtüsü ünitelerinde) vejetasyon döneminde (Mayıs-Ağustos yapılmıştır. Elde edilen sonuçlar, *P. rhoeas* türünün daha küçük bir yayılım gösteren *P. dubium* türüne göre tüm yerleşim alanlarında istatistiki olarak daha yaygın olduğunu göstermiştir. Bununla birlikte, *P. rhoeas* buğday ekili alanlarda daha yaygın bulunmuştur. Ayrıca sonuçlar, incelenen bu iki tür arasında bazı morfolojik parametreler için farklılıklar göstermektedir. Bulunan diğer yabancı ot türü sayısı 19 olmuştur.

Anahtar Kelimeler: Yaygınlık, morfoloji, Gelincik tarlası, Şüpheli gelincik türü

Introduction

Kosovo has an area of 10,887 km² and is located in the western part of the Balkan peninsula. Kosovo is located in subMediterranean floristic region known for its rich flora in particular near natural sites (Fritsch, 1918). Based on data from the United States Agency for International Development (USAID) for biodiversity in Kosovo (Ard-bioflor IQC. Consortium 2003) found 1800 to 2500 species of vascular plants including 13 plant species stenoendemic, found only in Kosovo, while, 150-200 Balkan endemic. Kosovo has a farmland about 40% of its surface, which are very prevalent different types of weeds, this group includes the types of genus Papaver (*P. rhoeas* and *P. dubium*) which have a distribution very important in working lands. In general type P. rhoeas is significantly more prevalent especially in fields planted with wheat and ruderale countries.

With very great importance is the time of germination of P. rhoeas and competition with the relevant culture, especially wheat (Torre and Recasens, 2008). Also, *P. rhoeas* is very competitive and contributes to the reduction of grain yield (Lintell-Smith et al. 1992; Wright et al. 1997). Regarding the germination of *P. rhoeas* and *P. dubium* in laboratory conditions are not observed differences between them (Karlsson and Miblerg, 2007). However, keep in mind that kind of red poppies contain alkaloids and are exploring different types of them for the content of alkaloids (Sariyar, 2002).

Based on these data, the aim of this study has determined the prevalence and morphological differences between the poppy fields - *P. rhoeas* L. and poppy than suspicious - *P. dubium* L. and spread of other types of accompanying weeds.

Studied Region

Istok is located in north-western Kosovo, occupying northern position of Dukagjini. There is a good geographical position because its terrain has two important aspects, a sufficiently rich high mountains and fertile lands of Bjeshket e Nemura. Most of the occupied areas of Dukagjini (about 80%) that is very fertile land while the rest (near 20%) that are very rich in aspect of fauna and flora. Relief is quite brittle, with a height of 350 m (Drini I Bardh) up to 2200 m (top of Mokna). Represented mountainous highlands and high mountains, subalpine and alpine meadows, are mainly composed of less silicate carbonate, low-lying areas represented by hilly and plains dominated by carbonates. Fertile land is represented with black and redgrond. The lowland is characterized by mild continental climate with Mediterranean elements (White Drin Valley), whereas the altitude is characterized by alpine climate. The summer's seasons in generally are characterized as hot and dry and winters as cold and rainy. Average annual temperature derive from -15 C° to + 40 C°. The coldest month is January with an average temperature of 0.1 C° while ,the hottest month is July with an average of 22.2 ° C. Average annual rainfall 700-800 mm represented during the winter and spring.

Figure 1. Locations where the samples were taken -Istok municipality

Material and methods

Research was conducted during 2013, plants were collected, determined and herbaged, making comparisons with herbar in the Department of Biology, and using appropriate modern literature. Specimens are determined by systematic basic unit (type). Determination of material (samples) were taken in five localities for *P. rhoeas* (Lluga, Cerrce 1, Tomoc 1, 2 and Drogolevc Tomoc) and five localities for *P. dubium* (Cerrce 2, Istok, Cerrce 3, 4 and Dubrava Cerrce), which differ from each other in elevation, soil type, etc. ekxpositioni in north-western Kosovo (Istok municipality). populations for each locality (Fig. 1), to analyze the morphological characteristics and sociability with other plants. Then, they are researched and analyzed these morphological parameters: the length of the plant, root length, number of leaves, number of flowers, leaf length, diameter of flowers, the perimeter of flowers, fringe length, length of pistillate, the number of seeds and the length of the capsule. Statistical analyzes were calculated using the program Microsoft Word, Excel and calculate the arithmetic mean, standard deviation, standard error and variability. Were obtained from ten individuals from.

Results and Discussion

From the results obtained for certain morphological parameters and the spread of both types in surveyed localities, we can conclude that there are differences between the two types of red poppies. The height of the plant or *P. rhoeas* individuals was higher (93.4 cm) in the locality of (Lluga) while the lowest (56.2 cm) in the locality (Tomoc 2), whereas individuals of type *P. dubium* L. was higher (72.2 cm) in the locality (Cerrce 2) and lower (46.6 cm) in the locality (Cerrce 3). It is considered that higher length is at the kind *P. roheas* compared with type *P. dubium*. While, on the basis of research conducted by (Brezinova et. al., 2009) results indicate that the length of red poppies species was from 0.65-1.39 m. Whereas, the results from (Parmaksiz and Ozcan, 2011), after measuring the length of plants of the genus Papaver have found their length from 15 to 102 cm. The length of the root of *P. rhoeas* type individuals was higher (9.3 cm) in the locality (Tomoc 1), whereas individuals of *P. dubium* type was higher (10.2 cm) in the locality (Istok). Regarding the number of leaves of *P. rhoeas* individuals their number was greatest (15.8 leaves) in the locality (Lluga), whereas *P. dubium* individuals their number was higher was (22.7 leaves) locality (Istok) compared with *P. rhoeas*.

Tab.1.Morphological differences in *Papaver rhoeas* and *P.dubium* in ten localities –Istok municipality

Localities	n	Length of plant(cm)	Length of root	Number of leaves	Number of flovers	Length of leaves	Diameter of flovers	Flovers perimeter	Length of Frings(mm)	Length of pistil (mm)	Number of seeds	Length of capsula(mm)
***Papaver rhoeas* L. (poppy field)**												
Lluga	$\bar{X}$	**93.4**	**9.0**	**15.8**	**3.9**	**9.1**	**7.8**	**24.0**	**15.4**	**9.9**	**143**	**18.1**
	S	14.2	2.4	8.6	1.9	3.24	1.53	4.24	2.76	1.66	13.3	1.59
	±SX	4.5	0.7	2.7	0.6	1.05	0.48	1.34	0.87	0.50	0.2	0.50
	V	15.2	27.2	5.98	50.0	35.4	19.4	17.6	17.9	16.7	9.3	8.76
Cerrcë 1	$\bar{X}$	**91.7**	**7.5**	**11.7**	**4.1**	**7.6**	**4.3**	**13.9**	**13.2**	**10.5**	**47.0**	**11.8**
	S	8.6	3.5	3.7	1.5	2.1	1.15	3.4	3.2	1.8	36.3	2.0
	±SX	2.7	1.1	1.1	0.4	0.6	0.3	1.0	1.0	0.5	11.5	0.6
	V	9.4	47.8	32.2	37.0	28.5	26.7	24.9	24.6	17.5	77.3	17.7
Tomoc 1	$\bar{X}$	**65.0**	**9.3**	**11.6**	**2.2**	**7.9**	**3.9**	**12.6**	**11.6**	**11.5**	**91.1**	**17.6**
	S	22.3	4.6	2.9	1.0	2.6	0.6	2.4	1.7	2.2	72.3	2.2
	±SX	7.0	1.4	0.9	0.3	0.8	0.2	0.7	0.5	0.6	22.8	0.0
	V	34.3	50.1	25.6	46.8	33.5	17.2	19.1	14.7	19.1	79.2	12.6
Tomoc 2	$\bar{X}$	**56.2**	**7.6**	**11.1**	**1.9**	**10.5**	**3.1**	**10.5**	**9.0**	**11.1**	**143**	**18.1**
	S	21.5	3.9	3.3	0.9	3.7	0.6	1.6	1.9	1.7	73.3	1.5
	±SX	6.8	1.2	1.0	0.3	1.2	0.2	0.5	0.6	0.5	23.2	0.50
	V	38.3	52.2	29.8	52.1	35.9	20.9	16.8	21.5	15.4	51.2	8.7
Drogolevc	$\bar{X}$	**58.1**	**6.0**	**11.5**	**1.9**	**4.9**	**4.1**	**13.3**	**12.6**	**8.8**	**38.8**	**10.8**
	S	14.1	3.9	7.1	0.9	1.9	0.5	1.7	3.5	1.3	3.7	1.9
	±SX	4.4	1.2	2.2	0.3	0.6	0.2	0.5	1.1	0.4	1.2	0.6
	V	24.6	65.1	61.9	45.7	38.9	13.6	12.7	28.0	15.7	9.63	17.8
***Papaver dubium* L.(poppy suspicious)**												
Cerrcë 2	$\bar{X}$	**72.2**	**9.3**	**15.2**	**2.9**	**6.8**	**6.3**	**19.9**	**17.2**	**11.5**	**38.8**	**12.1**
	S	9.9	2.8	7.3	2.3	1.0	1.1	3.5	2.2	1.58	27.5	1.5
	±SX	3.1	0.9	2.3	0.7	0.3	0.4	1.1	0.7	0.5	8.7	0.5
	V	13.7	30.7	48.2	80.3	15.1	18.2	17.4	13.0	13.7	71.0	12.4
Istogë	$\bar{X}$	**61.6**	**10.2**	**22.7**	**4.3**	**8.0**	**3.9**	**12.7**	**11.0**	**11.8**	**139**	**19.2**
	S	4.45	4.3	10.8	2.3	1.3	0.8	2.6	0.6	0.6	82.7	1.5
	±SX	1.4	1.3	3.4	0.7	0.4	0.2	0.8	0.20	0.2	26.1	0.5
	V	7.2	42.2	47.5	54.6	17.1	22.3	2.6	6.0	5.3	59.5	8.0
Cerrcë 3	$\bar{X}$	**46.6**	**9.6**	**11.1**	**2.1**	**3.8**	**1.7**	**5.8**	**7.8**	**9.6**	**102.6**	**19.0**
	S	11.7	4.3	5.3	0.9	1.1	0.3	1.4	1.1	2.1	68.4	1.5
	±SX	3.7	1.3	1.7	0.3	0.3	0.1	0.4	0.3	0.6	21.6	0.3
	V	25.1	44.5	48.1	41.4	29.8	20.0	23.9	14.4	21.9	66.7	7.9
Cerrcë 4	$\bar{X}$	**48.2**	**7.9**	**12.1**	**1.7**	**4.5**	**2.7**	**9.1**	**9.6**	**11.2**	**118.2**	**18.4**
	S	8.6	3.8	7.8	0.6	1.1	0.5	1.4	1.4	1.3	53.4	1.6
	±SX	2.7	1.0	2.4	0.2	0.3	0.1	0.4	0.4	0.4	16.9	0.5
	V	17.8	48.7	65.1	39.4	24.0	28.2	15.8	14.5	11.6	45.2	8.9
Dubravë	$\bar{X}$	**47.3**	**6.0**	**10.2**	**1.4**	**5.0**	**4.4**	**14.0**	**9.3**	**8.1**	**28.5**	**11.0**
	S	18.3	3.2	7.2	0.7	1.6	1.3	4.3	2.9	2.8	3.8	1.5
	±SX	5.8	1.0	2.3	0.2	0.5	0.4	1.3	0.9	0.9	1.5	0.5
	V	38.9	53.1	70.5	49.2	31.6	30.4	30.5	31.1	35.0	13.3	14.3

Number of flowers *P. rhoeas* own kind has been greater (4.1 flower) in the locality (Cerrce 1), while the smallest (1.9 flower) in the locality (Tomoc 2

and Drogolevc), whereas individuals of type *P. dubium* highest number was (4.3 flower) in the locality (Istok), while the lowest (1.4 flower) in the locality (Dubrava). The length of the leaves of *P. rhoeas* type individuals was higher (10.5 cm) in the locality (Tomoc 2), whereas individuals of *P. dubium* type was higher (8.0 cm) in the locality (Istok). The length of the capsule type individuals *P. rhoeas* was higher (18.1 mm) in the locality (Lluga and Tomoc 2), and low (10.8 mm) in the locality (Drogolevc), whereas individuals of type *P. dubium* has was higher (19.2 mm) in the locality (Istok), while the lowest (11.0 mm) in the locality (Tomoc). These results as regards the length of the capsule does not match the results of (Brezinova et al., 2009), where the types of red poppies have achieved greater length from 23-36 (mm), while partially overlap with the results of (Parmaksiz and Ozcan, 2011), who found that the length of the capsule was 16-39 (mm).

Tab.2.Number plant to *Papaver rhoeas* L. and *P.dubium* and weed associated plant

Populations	*Papaver rhoeas* L.					*Papaver dubium* L.				
Location	1	2	3	4	5	1	2	3	4	5
Survey (1 m²)	22.0	15.0	11.0	5.0	9.0	8.0	7.0	6.0	9.0	3.0
Centaurea cyanus L.	+	-	+	-	+	-	-	-	-	-
Matricaria chamomilla L.	-	+	-	-	-	+	-	-	-	-
Sambucus ebulus L.	-	+	-	-	-	-	-	-	-	-
Capsella bursa-pastoris L.	-	+	-	-	-	+	+	-	-	-
Sinapis arvensis L.	-		-	-	-	-	-	-	+	-
Consolida orientalis Sc.	-	+	-	+	-	+	-	-	-	-
Bromus racemosus L.	-	-	-	-	+	+	+	-	-	-
Ranunculus spp.	-	-	-	-	+	-	-	-	-	-
Verbascum spp.	-	-	-	-	-	-	-	-	+	-
Lolium perenne L.	-	-	-	-	+	-	-	-	-	+
Avena fatua L.	-	-	-	-	+	-	-	-	-	-
Hordeum murinum L.	-	-	-	-	-	+	+	-	-	+
Euphorbia spp.	-	-	-	-	-	+	-	-	+	-
Trifolium dubium Sibth.	-	-	-	-	-	+	-	-	+	-
Bromus spp.	-	-	-	-	-	-	-	+	-	+
Geranium purpureum Vill.	-	-	-	-	-	-	-	+	-	+
Euphorbia cyparissias L.	-	-	-	-	-	-	-	+	-	-
Lotus corniculatus L.	-	-	-	-	-	-	-	-	+	-
Artemisia absinthium L.	-	-	-	-	-	-	-	-	+	-

While terms of the spread of other types of weeds recorded a total of 19.0 species, were dominant: *Centaurea cyanus* , *Capsella bursa - pastoris* , *consolidat orientalis* , *Bromus racemosus* and *Hordeum murinum*. However, in the survey carried out in localities for *P. rhoeas* types of weeds associated dominant were: *Centaurea cyanus and consolidat orientalis*, while the localities of *P. dubium* dominant species were: *Hordeum murinum* , *Capsella bursa - pastoris* , *Bromus racemosus* , *Trifolium dubium* , *Euphorbia* spp and *Geranium purpureum*. This shows the difference of associated species of these two types and explains their impact on some morphological parameters of the investigated species

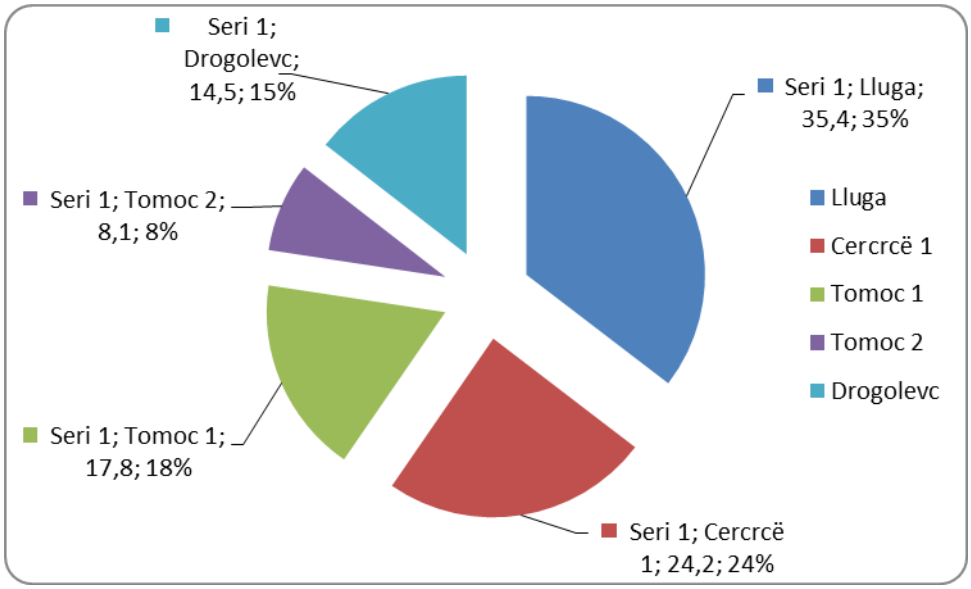

Fig.1.Distribution of Papave rhoeas in different localities(%)

While , in terms of spreading the two species investigated , *P. rhoeas* greater prevalence was on location Lluga - 35.4 % , Cerrce 1 - 24.2 % , Tomoc 1 - 17.8 % , 14.5 % and Drogolevc least locality Tomoc 2 with only 8.1 %. Type *P. dubium* had greater prevalence in location Cerrce 4 - 27.3 % , Cerrce 2 - 24.2 % , 21.2 % Istok, Cerrce 3 - 18.2 % , and at least in the locality Dubrava with only 9.1 %.

Conclusions

From investigations carried out we have come to the conclusion that the poppy fields *P. rhoeas* L. has wider spread and more stable population and frequent than doubtful *P. dubium* L. which is significantly less well represented with smaller population .These two types have also some differences between the morphological parameters.

In general, the rich soil with organic matter and mineral matters, plants have been more developed and disseminated. While the types of weeds associated were in total 19, which were dominant *Centaurea cyanus* , *Capsella bursa – pastoris* , *Consolida orientalis* , *Bromus racemosus* and *Hordeum murinum* .

References

Ard-bioflor iqc. consortium (2003). Kosovo biodiversity assessment. http://www.usaid.gov/missions/kosovo/pdf/kosovo_biodiversity_report.pdf

Brezinová, B., Macák, M., Eftimová, J. (2009). The morphological diversity of selected traits of world collection of poppy genotypes (genus Papaver). J. Central. European Agric. 10(2):183-190.

Fritsch, K. (1918). Neue Beiträge zur Flora der Balkanhalbinsel, insbesondere Serbiens, Bosniens und der Hercegowina VIII. Mitt. Naturwiss. Vereines Steiermark 54: 235-299.

Karlsson, L. M., Milberg, P. (2007). A Comparative Study of Germination Ecology of Four Papaver Taxa. Annals of Botany, 99(5):935–946.

Lintell-Smith, G., J. M. Baylis, A. R. Watkinson. (1992). The effects of reduced nitrogen and weed competition on the yield of winter wheat. Asp. Appl. Biol. 30:367–372.

Parmaksiz, I., Özcan, S. 2011. Morphological, chemical, and molecular analyses of Turkish Papaver accessions (Sect. Oxytona). Turk J Bot. 35:1-16.

Rapparini, G. (2001). Diserbo di frumento e cereali minori in pre e post-emergenza precoce. Inf. Agrario 35:53–61.

Sariyar, G. (2002). Biodiversity in the alkaloids of Turkish Papaver species. Pure Appl. Chem., 74(4):557-574.

Sherifi, E., Balalic, M. (2012). Some anatomical characters of stem and spike in different wheat genotypes. IJEES, 2(4):333-336

Sherifi, E. (2010). Cadmium and lead accumulation in alfalfa (*Medicago sativa* L.) and their influence on the number of stomata.MTAEC 9, 44(5):277-282

Torra, J., Recasens, J. (2008). Demography of corn poppy (*Papaver rhoeas*) in relation to emergence time and crop competition. Weed Science 56:826–833.

Wright, K. J., G. P. Seavers, and B. J..3906/bot-1003-39 on the yield of winter wheat. Asp. Appl. Biol. 30:367–372.

Parmaksiz, I., Özcan, S. (2011). Morphological, chemical, and molecular analyses of Turkish Papaver accessions (Sect. Oxytona). Turk J Bot. 35:1-16.

Wilson, B. J.(1997). Competitive effects of multiple weed species on weed biomass and wheat yield. Pp. 497–502 in Proceedings 1997 Brighton Crop Protection Conference—Weeds. Brighton, UK: British Crop Protection Council.