South Western Journal of Horticulture, Biology and Environment
P-ISSN: 2067- 9874

Vol. 1, No. 1, 2010
pp. 21 - 27

VARIABILITY OF DECORATIVE MORPHOLOGICAL CHARACTERISTICS IN THE SPECIES *Papaver rhoeas* OF SPONTANEOUS VEGETATION

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Abstract: *Spontaneous vegetation provides unlimited possibilities for the selection of valuable individuals from ornamental point of view. Field poppy (Papaver rhoeas), herb and dried fruit have decorative potential. The present work aimed variability of decorative morphological characters in plants collected from the spontaneous flora. Variability was studied using the percentage distribution and coefficient of variability. The limits of variation were high for number of capsules per plant (16-125), followed by the number of branches per plant (4-23). Coefficient of variability ranged from 10.12% to 50.9% for plant height number of capsules per plant. Existence of variability in the genetic material studied has indicated the possible use in selection programs.*

Key words: *morphological diversity, poppy, spontaneous vegetation, ornamental plants*

INTRODUCTION

In Oltenia there are numerous wild species with potential ornamental value, to which research may influence the selection of ornamental plants (Mitroi et al., 2009). There is a worldwide sustained idea of commercial operation in wild vegetation, an important resource for decorative wild flowers industry (decorative wildflower industry), (Davis, 1992; Lamont, 2001; Chimonidou 2005; Gâteblé 2009). In the south-west of Scotland, many species of spontaneous flora were tested in order to make attractive urban lawns, which require minimum maintenance works for use in parks (Hitchmough, 2000).

Variability of morphological characters, studied in many species of spontaneous flora is quite large, a fact confirmed by other authors (Malaviya, 1996; Brezinová et al. 2009; Tetenyi, 1995).

It is considered that the recorded variability within species propagated by seeds depends on the genetic characteristics and environmental conditions. Research on morphological variability of the species *Carex spicata* showed that populations of this species from different communities produce different ecotypes, with fixed genetic characteristics adapted to conditions caused by habitat (Janyszek, 2008). Using morphometric differences, Selin (2000, 2008) examined variability within populations of *Papaver radicatum*. Miklošíková et al., 2005 studied the economic characteristics of the population variability of *Papaver somniferum*. The infraspecific classification of the wellknown opium poppy (*Papaver somniferum*, Papaveraceae) is based on a few morphological characteristics such as capsule dehiscence, shape of stigmatic lobes, and colour of flowers and seeds (Dittbrenner et al., 2008).

As regards culture selection in poppy, Németh et al. (2009), indicated that in European countries, a new strategy was worked out for cultivation of poppy (*Papaver somniferum* L.).

The countries according to their traditions can be interested in pharmaceutical processing, culinary production, or growing plants of ornamental type.

The purpose of this study was to assess the variability of morphological traits to plant poppy (*Papaver rhoeas*) of spontaneous vegetation in pedo - climatic conditions in Oltenia region.

MATERIAL AND METHOD

The material used in research comes from spontaneous flora. Plants were harvested in Oltenia, the species *Papaver rhoeas*, in which biometric observations were made. *Papaver rhoeas* (common names include corn poppy, corn rose, field poppy, Flanders poppy, red poppy and red weed) is a species of flowering plant in the poppy family, Papaveraceae. This poppy, a native of Europe, is notable as an agricultural weed and as a symbol of fallen soldiers. The following characteristics were seen: plant height and diameter, number of branches and number of capsules per plant, diameter at the top of the capsule and the capsule height. The data were statistically analyzed using statistical analysis program. To analyze variability statistics were used the following parameters: coefficient of variability and frequency distribution (histogram) and regression coefficient determination (Botu et al., 2003).

RESULTS AND DISCUSSIONS

Field poppy (*Papaver rhoeas*) is an annual herb, herbaceous, 20-90 cm high, with stems often branched.

The fruit is an oval or slightly flattened capsule, with the persistent stigma (bow aspect). Dried fruit has ornamental value (Popescu, 2009).

Analyzing the morphological characters of plants and dried fruits, plants from spontaneous flora, a great variability of them was observed (foto 1 and 2). Table 1 shows the average values of morphological characteristics of plants and dried fruit, standard deviations, minimum and maximum values for these characteristics.

Photo 1: Morphological characters (variability of plants)

Photo 2: Morphological characters (variability of dried fruits)

Table 1

Key statistics of the morphological characteristics studied in the poppy plants and dried fruit

No	Characteristics studied	Mean	SD*	Range	CV** (s%)	Limits of variation
1	Plant height [cm]	74.7	7.576	29	10.14	60-89
2	Plant diameter [cm]	57.68	12.905	50	22.37	30-80
3	Branch of plant [no]	13.58	4.366	19	32.15	4-23
4	Capsules of plant [no]	50.28	25.595	109	50.9	16-125
5	Capsule height [cm]	1.46	0.179	0.7	12.29	1.1-1.8
6	Capsule diameter [cm]	0.950	0.157	0.5	16.56	0.7-1.2

Confidence Level (95.0%); *SD= Standard Deviation
**CV= coefficient of variation

The data show large variations of plant characteristics and dried fruits from one plant to another, great variability in terms of plant diameter, number of branches and number of capsules per plant and a medium in terms of variability characteristics dried fruit (capsule). The average value recorded for plant height was 74.7 cm and 57.68 cm in diameter.

Highest variability was obtained from plant diameter, recorded as confirmed by the standard deviation (SD = 12.9) for this feature, the difference between the maximum and minimum (range = 50) and coefficient of variability (s% = 22.37) (Table 1).

Number of branches per plant and number of capsules per plant had a coefficient of variation above 30%, so the average is not representative of those characteristics, variability analysis will use the percentage distribution. The limits of variation for these features were large, between 4 and 23 for number of branches per plant and between 16 and 125 for the number of capsules per plant (Table 1). Brezinová et al. (2009) considers that the number of capsules in poppy (*Papaver* sp.) is a genetically characteristic influenced by the number of plants per unit area and nutrients. Characteristics of dried fruit are one of selection criteria, since they are the main decorative element of interest in order to use them for making floral arrangements in various combinations with wild flowers cultivated in the dry state (immortelle) or fresh.

From measurements performed on the height and diameter capsule, less variability was recorded for the capsule height (SD = 0.179, s% = 12.29). The mean values recorded were 1.46 cm and 0.96 cm for height capsule diameter. Calculating the percentage distribution of plants, according to parameter „number of branches", it was found that most individuals fall within the size class 14.85 - 17.57 (36 %), followed by 9.42 - 12.14 class (26 %) which means that 66% of individuals studied have a number of branches between 9 and 17 (Table 2).

The number of capsules, 40% of individuals studied had a number of capsules 31 to 47 (Table 2). The main decorative element, however, remains the dried fruit (capsule), whose dimensions determine largely decorative value. For height and diameter of dried fruit, histogram analysis indicates that most of the dried fruits have a height between 1.4 and 1.5 cm (28%) and a top diameter between 0.98 and 1.06 cm (40%).

Calculation of regression coefficients (r) and determination (R2), highlighted the relationship between some of the examined morphological characters (Table 3).

Thus analyzing, calculating and determining the regression coefficient indicates a positive correlation between average number of branches and the average number of capsules per plant, the coefficient of determination

(R2 = 0.519) show that the percentage of 52%, the average number of capsules is determined by the average number of branches per plant (Figure 1).

Table 2

Variability of morphological characters (percentage distribution) of plants and decorative elements (capsule) to the species *Papaver rhoeas*

Number of branches		Number of capsules		Capsule height		Capsule diameter	
Bin	*Cumulative %*	*Bin*	*Cumulative %*	*Bin*	*Cumulative %*	*Bin*	*Cumulative %*
	2.00	16	4.00	1.1	2.00	0.7	10.00
6.71	8.00	31.57	22.00	1.2	18.00	0.77	10.00
9.43	18.00	47.14	62.00	1.3	28.00	0.84	20.00
12.14	44.00	62.71	76.00	1.4	42.00	0.91	38.00
14.86	48.00	78.28	88.00	1.5	70.00	0.98	38.00
17.57	84.00	93.86	92.00	1.6	82.00	1.06	78.00
20.28	96.00	109.43	96.00	1.7	98.00	1.13	90.00
More	100.00	More	100.00	More	100.00	More	100.00

Table 3

Correlation and determination coefficients between the main physical characteristics of fruit plants and the species *Papaver rhoaes*

Features	Diameter		Number of branches		Number of capsules		Capsule height	
	r	R^2	r	R^2	r	R^2	r	R^2
Plant height	+0,711	0.506	+0,268	0.072	+0,29	0.085	-	-
Diameter plant	-	-	+0,555	0.308	+0,49	0.247	+0,278	0.077
Number of branches	-	-	-	-	+0,72	0.519	-0.279	0.008
Number of capsules	-	-	-	-	-	-	+0,138	0.019
Capsule diameter	-	-	-0.091	0.008	+0.48	0.231	+0,363	0.132

For selection purpose it would be useful a quick estimation method of decorative party size (capsule) and it would be gotten by knowing that there are correlations between plant characters.

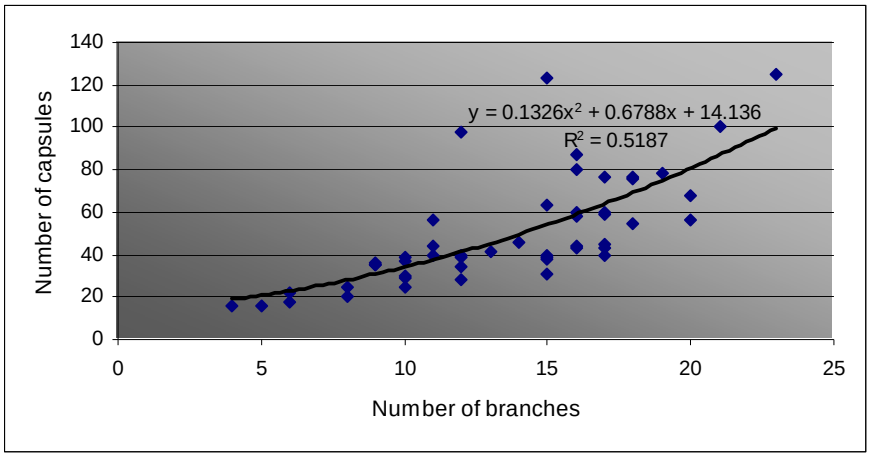

Figure 1: Correlation between the number of branches per plant and number of capsules

The tightest correlation involving capsule characteristics (for plants studied) was found between capsule diameter and number of capsules per plant (R2 = 0.231) and between height and diameter of the capsule (r = 0.363), indicating that approximately 13% of variation capsule height variations could be caused by capsule diameter (R2 = 0.132) (Table 3).

The obtained results showed a great variability in the populations studied, variability useful in screening programs for individuals in terms of ornamental value.

In conclusion, such changes of characteristics for plants and fruits indicate a potential in the selection of plants' used as dried flowers (dried flower arrangements). Spontaneous flora can be a real source for the selection of dried flowers and decorative potential.

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