

MORPHOLOGICAL CHARACTERS VARIABILITIES OF SOME POPULATIONS OF SPECIES *POLYGALA MAJOR* JACQ.

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Abstract

Four populations with different localities are compared in terms of morphology to determine which of two subspecies of Polygala major they appertain. All four populations are belonging to P. major subsp. major and fruit and seed characters show that.

INTRODUCTION

Polygala major is a xero-xeromesophilous, subthermophilic and oligotrophic species, frequent encountered in meadows and bushes from the steppe area to the sessile oak floor [4]. Like the other species of the genus *Polygala*, plants may contain bitter substances, saponins, tannins and polygalic acid, and are considered poisoned plants in the grassland [1], but also with medicinal properties [3].

Called by the Romanian people *iarbă lăptoasă* (The Milkwort), *apărătoare* (The Protector), *seceruici* (The Reaper) (due to inflorescence aspects), or *șopârliță* (The Lizard) [2], *Polygala major* species consists of populations that can show a number of characters different from that the typical one. In Flora RPR are described seven different forms as wing shape, flowers size and color and length of the bracts [9]. In the Illustrated Flora of Romania and some other papers there are described two subspecies: *major*, and *anatolica* (Boiss. et. Heldr. in Boiss.) Ciocârlan respectively, that differs in carpophores length and in strophiole shape [4, 5]. In other works subsp. *anatolica* is considered like a distinct species from *P. major* [6, 8]. In Romania, till now, the spreading area of the populations of the subspecies / species *anatolica* is limited, according to the references, to the Dobrudja regions [5, 7, 8], while the spreading area of the subsp. *major* is much greater [4, 7].

To emphasize the variability of morphological characters in the *P. major* populations in our country, we proposed to make some observations on these characters in individuals belonging to different grassland areas populations.

MATERIAL AND METHODS

Plants were harvested from meadows in Botosani, Buzau (localities: Aldeni, Bisoca) and Calarasi. The photos were taken with a digital camera DCM-LZ7

Panasonic type. Details of morphology of leaves, wings, fruit and seeds were revealed using a binocular magnifier. The data obtained were compared with descriptions in literature.

RESULTS AND DISCUSSION



Fig. 1. Botosani population



Fig. 2. Buzau (Aldeni) population



Fig. 4. Calarasi population



Fig. 3. Buzau (Bisoca) population

All four selected populations consist of perennial plants with woody taproot. From the basal lignified area of the stem starts many ascending or erect shoots (Figures 1, 2, 3, 4).

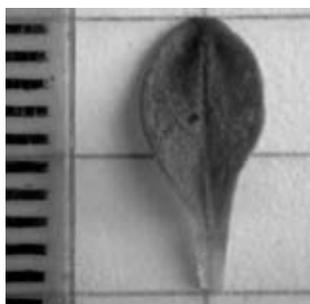


Fig. 5. Botosani population-basal leaf



Fig. 6. Botosani population-basal leaves series



Fig. 7. Calarasi population-basal leaves series

To the Botosani, Calarasi populations, basal leaves are obovate or elliptic-lanceolate (Figures 5, 6, 7), average length of 10 and 19 mm respectively (Table 1). The stems ones are narrow, long, linear-lanceolate in shape, ranging in size from 17 to 28 mm in Botosani population and from 16 to 19 mm in Calarasi population (Figures 8, 9) (Table 1).



Fig. 8. Botosani population-stem leaves series



Fig. 9. Calarasi population-stem leaves series



Fig. 10. Buzau (Bisoca) population-stem leaf



Fig. 11. Buzau (Bisoca) population-wing and fruit

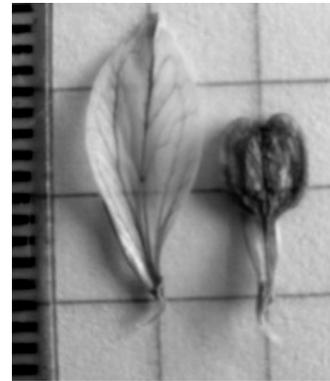


Fig. 12. Buzau (Aldeni) population-wing and fruit

Plants of the populations harvested of grassland in Bisoca and Aldeni show no leaves in basal area (Figures 2, 3), but only stem leaves, lanceolate or linear in shape (Figure 10) that are between 20-39 mm in length to the Aldeni population and between 27-32 mm to the Bisoca population, respectively (Table 1).

Wings (internal sepals) are elliptical or obovate in shape and have prominent veins: the midvein, branched towards the top, is thicker than the laterals veins; those are slightly curved and out branched. The wings are longer than the capsule to the fructification, between 12 mm in length to the Bisoca population and 16.5 mm to the Aldeni population (Table 1). The literature is referred to wing length in *P. major* subsp. *major* (*P. major* respectively) as being between 10 to 15 mm [6], or up to 17 mm [9].

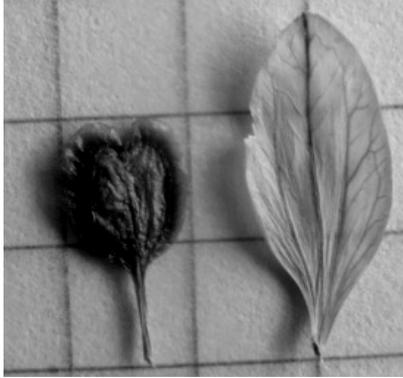


Fig. 13. Botosani population-wing and fruit

The obcordate and wide winged capsule has an average length of 8 mm to the Aldeni population (Buzau), 9 mm to the Bisoca population (Buzau) and Calarasi, and 10 mm to the Botosani population (Table 1). The carpophore average length is 4 mm in Aldeni (Buzau), Botosani



Fig. 14. Calarasi population-wing and fruit



Fig. 15. The lateral lobes of the seed (Bisoca population)



Fig. 16. The central lobe of the seed (Bisoca population)

Calarasi populations and 3mm in Bisoca population (Table 1) (Figures 11, 12, 13, and 14). The literature states a 3-4 mm in length for the carpophore to *P. major* subsp. *major*, longer than half the length of the fruit respectively, while to the subsp. *anatolica*, the carpophore can reach up to 3 mm in length, being shorter than half the length of the fruit [4].

All four populations formed ovate seeds, surface covered with attached bristles, provided with an unequal trilobate strophiole, central lobe being shorter than the lateral ones (Figures 15, 16, 17, 18).

Comparing the data on the morphology and size of wings, fruits and seeds observed in all four observed populations with the literature data shows that they fall within the limits of variation for *P. major* subsp. *major*.



Fig. 18. Central lobe of the seed (Botosani population)



Fig. 17. Lateral lobes of the seed (Botosani population)

Table 1

Variation of morphological characters of *Polygala major* jacq. populations

Population	Basal leaves - average length (mm)	Stem leaves - length (mm)	Wings - average length (mm)	Fruit	
				average length (mm)	carpophore - average length (mm)
Buzau - Aldeni	-	20 - 39	16.5	8	4
Buzau - Bisoca	-	27-32	12	9	3
Botoșani	10	17 - 28	14	10	4
Călărași	19	16 - 22	13	9	4

CONCLUSIONS

1. All four populations are composed of perennial plants with lignified roots and stems.
2. The length of stem leaves, lanceolate or linear in shape, is highly variable, in a large range.
3. The wings to the fructification are greater than the capsule.
4. The average length of carpophore is equal to or less than half of the fruit ones.
5. Seeds show strophiole central lobe shorter than the lateral ones.
6. All four populations include plants from the *Polygala major* subsp. *major* (Boiss. et. Heldr. in Boiss.) Ciocârlan.

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