

Large-flowered poppies of Armenia: Research for conservation

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2003

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Keywords: conservation, poppies, *Papaver*, alpine plants, endangered species, population biology, taxonomy, Armenia.

The poppies are of the most beautiful and bright components of Armenian flora. The red poppy has all rights to be considered as one of the botanical symbols of Armenia. Some of poppy species growing on the territory of Armenia are in the center of our, botanists' attention as well as the others, which need protection.

The present condition of the landscapes and biodiversity in Armenia is extremely disturbing. The poverty contributes to the deepening of the ecological crisis. Lack of information and the great needs of environmental education are serious obstacles that slow down the solution of the ecological problems.

The main goals of this project were to research some of the Red Data Book listed species, i.e. large-flowered poppies of Armenia and to make the contribution to their conservation by their study, transplantation and conservation propaganda by publishing and spreading the booklet on Armenian poppies.

In the beginning I would like to briefly introduce these species and some of the history of their research and then to clarify our results and conclusions.

The section *Macrantha* is one of the sections of *Papaver* comprising perennial species, and it is limited in its distribution to the higher altitudes of central and eastern Turkey, north and north-western Iran and Caucasus.

Three species *Papaver bracteatum*, *P. orientale* and *P. paucifoliatum* are in the flora of Armenia.

***P. bracteatum* Lindl.** - the most robust species in the section, stems 60-100 (120) cm, leaves large, up to 45cm pinnatisect, setose. Floral bracts (small green leaves under the flower) 3-8, 1,5-3cm long, buds erect during development, oval. Petals 6 (rarely 4) large, 6-10cm long, dark red with black

marking running to base. Capsule up to 3cm wide and to 4cm high, stigmatic rays 12-20.

Habitats: 1500-2500m, semi-arid slopes.

Distribution: North Iran in Alborz Mountains and Iranian Kurdistan, northern slopes of Caucasian Mountains.

This species was described by John Lindley in 1821 from the specimens grown in Chelsea Garden in England from the seeds brought from Caucasus. This species was known as an endemic to North Caucasus, but later the populations of *P.bracteatum* have been discovered in Iran.

There were registered two species of large-flowered poppies in Armenia (*P. orientale* and *P. paucifoliatum*) till 1978. Later, when some poppy specimens having bracts were collected in South Armenia, it was determined as *P. bracteatum* by Dr. Gabrieljan. The same collector discovered this poppy species again two times in the south of Armenia. Then this finding was noticed in some publications and *P. bracteatum* together with *P. orientale* and *P. paucifoliatum* has been listed as rare species in the Red Data Book of Armenia since 1990.

***P.orientale* L. (Oriental poppy)** - plants large, 40-80cm high, leaves up to 45cm long, pinnatisect, stems setose, floral bracts absent or present, small, 1-4, buds erect during development. Petals 4 or 6, deep orange "scarlet", usually with black marking. Capsule up to 2,5cm long, stigmatic rays 9-19.

Habitats: 1600-2200m , rocky grassy slopes in steppes, meadow-steppes, meadows, forest glades, juniper open forests.

Distribution: North-Western Iran, Turkey, Caucasus.

This species was described by famous Swedish naturalist and botanist Karl Linnaeus in 1753, studying the herbarium specimens. Tournefort had collected near Erzerum, gives the botanical description of oriental poppy.

It is found almost in all floristic regions of Armenia, but reduces because of natural reasons and human influence.

***P. paucifoliatum* (Trautv.) Fedde** - plants medium, comparatively slender, 30-70cm high, leaves up to 35cm, pinnatisect, stems setose, floral bracts absent. Buds pendulous during development. Petals usually 4, rarely 6, pale orange or apricot-orange, without marking. Capsule to 2cm long, stigmatic rays 8-12.

Habitats: 1900-2700m, subalpine meadows

Distribution: North-Western Iran, North-Eastern Turkey, Transcaucasus.

The scientific description of this poppy was first given in 1876 by the researcher of some floras, including also Caucasian flora, director of the Saint-Petersburg botanic garden for many years, famous botanist Trautvetter, who considered it as a subspecies of oriental poppy. However, at the beginning of the XX century thanks to Fedde scanty-leaved poppy get the status of a separate species.

In Armenia this species are found on some mountains of Central and Northern Armenia (Sevan, Aparan, Lori, Aragatz and Akhurian floristic regions) and in the south (Megri region).

The literature data on species of section *Macrantha* is insufficient. The most informative is the scientific article of P.Goldblatt (1974), which contains the results of his studies held in Turkey and Iran. The large flowered poppies haven't been purposefully studied in Armenia till this research.

The detailed investigation of large-flowered poppies in Armenia was held for the first time. Collected material and the results of this project sensible fill the gap in the field of botanical investigations of these species.

The field work was held in accordance with preliminary data on spreading of these species. Some new populations also have been discovered. And what is the most interesting is that we have observed the large scale of different morphological variations in populations of oriental poppy on the whole territory of Armenia. One can observe almost all possible and "impossible" typical and "mixed" types from "*P. bracteatum*" type to bractless "*P. orientale*" type in the same population.

Furthermore, during our field work in Sevan region we have discovered 2 specimens with up to 7-8 flowering stems, which had the flowers, differing from each other on one plant.

The variety of the forms have been studied and the seeds (more than 100 specimens) of different forms have been collected (their descriptions done).

The descriptions of plant communities done, collected large herbarium material - about 1500 specimens which are determinated and will replenish the herbarium collection of the institute.

The plants of oriental and scanty-leaved poppies transplant to the Yerevan Botanical garden.

Here I would like to introduce the substantial conclusions of the research.

Conclusions.

1. The phenomenon of exceptional polymorphism is observed in populations of *P.orientale* in Armenia. The high scale of different morphological forms in the population, which are not isolated geographically, phenologically, and ecologically, shows, that such variety is a result of hybridization within the populations of oriental poppy.
2. There are no facts of growing the poppy species *Papaver bracteatum* on the territory of Armenia. The herbarium specimens, which were collected and described as *P. bracteatum* are different forms of oriental poppy *P.orientale*. So one can consider all forms as different variations of one species - *P.orientale*.
3. The variability of the main taxonomic features of the species *P. orientale* is defined. The specimens with floral bracts more often were found in semi-arid conditions, the bractless and more delicate specimens - in forest glades of central and northern regions. We consider it connected with ecological features. The preliminary palynological analysis of the pollen of different specimens of oriental poppy shows that the pollen size is not constant and various even in one preparation.
4. On the north extremity of Geghama Mountain Range (1850m above sea level) have been discovered the unique, most robust specimens of oriental poppy - the one with 60 flowering stems (with bracts) and the other with 55 flowering stems (bractless one).
5. The main taxonomic features in populations of *P. paucifoliatum* are much more constant.
6. *P. paucifoliatum* is the replacing species, i.e. the altitudinal vicariant of *P. orientale*. The altitudes of *P.orientale* are from 1600 to 2300m, for *P. paucifoliatum* - 2200-2700m.
7. The flowering terms for *P.orientale* are in the south - about May 20 - the end of June, in central regions beginning of June - July middle, for the north - the middle of June- the end of July. For *P. paucifoliatum* in the south from the beginning of July to about August 20, in the central regions - the July and for the north - the middle of July- the end of August.
8. Both species grow in aboriginal habitats, in comparatively not damaged and less changed landscapes. The habitats of *P.orientale* are various: mountain steppes, steppe bushes, steppe-meadows, meadows, oak open forests, juniper open forests. The most typical are steppe bushes (30-60 species), steppe-meadows (70-80 species), meadows (60-75 species) and oak forest glades (50-65 species). The habitats of *P. paucifoliatum* are subalpine meadows (40-60 species in the plant communities).
9. Both these species are still found in different regions of Armenia, but they are very sensitive towards the environment influence. The threats are the: ploughing, grazing, mowing, collecting. The research shows, that the main threats are ploughing and grazing. The serious obstacle is the fact, that the conservation measures aren't included in the agricultural activity in Armenia. The condition of poppies, which grow on hay-meadows is more stable, but hay is mowed here in July - by the end

- of flowering and by the beginning of fruiting of large-flowered poppies. They usually don't live up the stage of complete seed ripening.
10. The cultivation of poppies, grew up in Yerevan Botanical garden from seeds collected at the beginning of the project, shows that the first-year shoots are very delicate and very sensitive to the environment influence especially the mechanical influence and aridity. In the nature one of the damaging factors is overgrazing. Populations situated in the pasture area suffer greatly from the destructive influence of grazing. First, trampling down greatly affects the grown-up plants, and second, poppy shoots are trampled down as well. They come to die even in conditions of week mechanical influence. Overgrazing led to the vegetation degradation and soil erosion - aridization, which has destructive influence on the habitats and affects negatively the poppies condition.
 11. The populations situated on the territories of Sevan and Dilijan National Parks, Khosrov and Shikahokh Reserve should be under the special attention, the habitat of the exceptional largest specimens of oriental poppy discovered on Geghama Mnt. Range needs special attention. The populations of these two species situated on Arailer volcano, some of Vardenis and Geghama Mnt. Range needs to be protected for their high scientific and aesthetic value (a series of other rare and endemic species grow there together with poppies). These sites may be included in the ecotouristic routes.
 12. The conservation issues should be included in the agricultural use of the landscapes. Very important is the role of ecological education and up bringing, especially in regions. The local people the first, who should be interested in conservation of the place they live.
 13. Both *P. orientale* and *P. paucifoliatum* are of the most beautiful species of Armenian flora and may be used successfully in cultivation as decorative plants. The century-old experience of our European colleagues shows the very positive results in this area. And in whole, we should pay more attention on our aboriginal species in gardening.

The polymorphism phenomenon in the populations of oriental poppy needs further karyological research for final conclusion on the species status of *P. bracteatum* and *P. orientale*.

Because of their decorative value all large-flowered poppies of Armenia are reducing. That is why their populations need to be under the control for the conservation of the species and what is not less important, for the conservation of natural course of different processes in Nature.

Notes to readers

The project, Large-Flowered Poppies of Armenia: Research for Conservation was supported by The Whitley Award Foundation for International Nature Conservation, Rufford Small Grant, 2001.

The duration of the project was from July 2001 to January 2003.

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