

Centaurea section *Centaurea* in the Caucasus

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ABSTRACT: Distribution of *Centaurea hajastana*, *C. tamaniana*, *C. ruthenica* and *C. rasdorskyi* of the section *Centaurea* in the Caucasus were studied.

KEYWORDS: Flora of Armenia, *Centaurea*, mountain steppes

One of the peculiarities of the Armenian flora is the abundance of species and sections of the genus *Centaurea*. There are about 70 species of this genus belonging to 25 sections on the territory of Armenia (GABRIELYAN and FAJVUSH 1989), which considerably exceeds the figures in the remaining parts of the area (WAGENITZ 1986). It should be remembered that due to its nature history Armenia is a center of species formation for many other genera (*Astragalus*, *Cousinia*, *Pyrus*, etc.), along with the genus *Centaurea*. It is situated on the border between the two largest phytochorea of the world - Boreal and Ancient Mediterranean sub-kingdom (TAKHTADZHAN 1986), which facilitated migration processes in flora formation and apparently was the reason of balance in the development of its autochthonous and alochthonous tendencies (FAJVUSH 1990).

As a confirmation let us regard the distribution of the representatives of the section *Centaurea* in the Caucasus.

1. *C. hajastana* Tzvel., an Armenian endemic growing in the *Stipa-Festuca* steppes of the Shirak floristic region. It differs from the other species of the section by its tough dark-green leaves, the shape of the lobes, wide horizontally flattened capitulum, very much concave at the bottom, few rows of phyllaries (3-4), structure of central and marginal flowers and the pappus with the innermost row equal to the outer in length.

2. *C. tamaniana* Agababyan grows in Shirak and Daralagez floristic regions in steppes or in the community of steppe shrubs

(AGABABYAN 1989). The species belongs to the *Ruthenicae* series and being closely related to *C. ruthenica* has the following essential distinctions: great leafiness in the middle part of the plant (8-17 leaves), numerous narrow almost linear segments of the leaves 3-6 mm wide, almost globose capitulum concave at the bottom in the ripe ones (not oblong and ovate as in *C. ruthenica*), the phyllaries have a narrow, 2-3 mm wide membranous border, ripe achenes are almost black, pappus is dark, asymmetrical, shorter than the achene and the innermost row with very short bristles.

3. *C. ruthenica* Lam. The most polymorphic and widespread species (from Romania to Western provinces of China) among the representatives of this section. It grows in Armenia in the Erevan and Zangezur floristic region as well as in Nakhichevan ASSR. The comparison of samples of *C. ruthenica* from Armenia (Urtz mountain-ridge) and European part of the USSR, the Urals, the Don steppes, Iran, Afghanistan and Middle Asia did not reveal any taxonomically important variation. There is a number of more or less constant features preserved even in such a variable species as *C. ruthenica* is: the plant has no more than 5-6 leaves the segments of which are more or less lanceolate, capitula are oblong ovate with 5-6 rows of phyllaries completely without appendage or membranous border. The study of flower morphology showed good diagnostic characters, such as the length of the segments of flowers and staminodies of the marginal flowers, the middle part of filaments is rather papillose. The achene and the pappus are light-brown as a rule, the bristles of the inner row are not of the same length and make 2/3 of the length of the outer one.

4. *C. rasdorsky* Karyagin. This species grows in the beardgrass (*Bothriochloa ischaemum*) steppes in Shemaha (Aserbaydzhan) neighbourhood. As a rule, the plant is not high and has 4-5 capitula. It differs from *C. ruthenica* and *C. tamaniana* by phyllaries with wide membranous appendage, and from *C. hajastana* by oblong-linear segments of the leaves and small-sized capitula (10-16 x 14-22 mm).

We carried out a special study of local florulas limited by natural borders (TOLMACHEV 1986) in which all species of the section *Centaurea* were represented.

The first florula (I) is a site of spear-grass on Urts mountain ridge (Armenia) where *Stipa tirsia* is dominant and *S. pennata* and *S. capillata* grow abundantly, *Centaurea ruthenica* being a codominant. In addition to the latter species, *C. pseudoscabiosa* ssp. *glehnii*, *C. squarrosa* grow here together with other interesting species like *Dianthus libanotis*, *Astragalus strictifolius* etc. On the neighbouring sites not included into

the flora studied grow rare species *Centaurea vavilovii*, *C. fajvuscii*, *C. xanthocephala*, *Tomanthea carthamoides*, *Cheirolepis persica*, *Rheum ribes* etc.

The second florula (II) is a site of *Stipa-Festuca* steppes (*Stipa transcaucasica*, *S. lessingiana*, *S. capillata*, *Festuca valesiaca*) in the Shirak plateau near the Arteni mountain (Armenia) where *Centaurea hajastana* is a codominant and rare endemic species of *Centaurea takhtajanii*, along with other species *C. pseudoscabiosa* ssp. *glehnii*, *C. carduiformis*, *Tomanthea phaeopappa*, *Cousinia brachyptera*, *Eryngium campestre* etc. are abundant.

The third florula (III) is a small gorge on Shirak ridge the slopes of which are covered with steppe shrubs (*Spiraea crenata*, *S. hypericifolia*, *Rosa spinosissima*) among which *C. tamaniana* grows. On the less steep slopes groups of relict steppes are represented, with *Stipa pulcherrima* and *Asphodeline taurica* predominating. *Centaurea tamaniana* and very rare species *Asperula affinis*, *Allium decipiens*, *Paracaryum laxiflorum* etc. also grow here.

The fourth florula (IV) is a site of *Stipa-Festuca* steppes (*Stipa pennata*, *Festuca valesiaca*) in Eghegnadzor region in the neighbourhood of Khachik village where *Centaurea tamaniana* is also a codominant. *Centaurea pseudoscabiosa* ssp. *glehnii*, *C. iberica*, *C. depressa*, *C. squarrosa* and *Linaria kurdica*, *Campanula glomerata*, *Agropyron repens* are also very abundant here.

As a result of the study the composition of these florulas was recorded and its analysis made. The florulas should be considered natural, as they are restricted by their natural limits, they are comparable by their areas and abundance of the species in each (from 90 to 130).

In the course of the analysis some of the characteristic features and links of the florulas were ascertained. Thus, on the one hand, the florula with *C. tamaniana* on Shirak ridge (III) stands out clearly with its systematic structure, where *Fabaceae* family is rather weakly represented (it is on the 9th place in the family list and on the third or the fourth place in other florulas). Whereas *Rosaceae* and *Apiaceae* families are much more strongly represented. This fact reflects a greater influence of the Caucasian flora on this part of Armenia (TAKHTADZHAN 1986, FAJVUSH 1987). On the other hand, chorological analysis revealed its quite considerable resemblance to the steppe flora of Khachik (IV) with *C. tamaniana*. The boreal species are particularly abundant in these floras (19.8 and 20.4 %). The florulas with *C. ruthenica* (I) and *C. hajastana* (II) are also rather close to

each other and at the same time there is little difference between them and florula IV, both in the systematic and chorological structure as a whole.

On the whole, in the Caucasus *C. tamaniana* coincides with florocoenotype of mountain steppes and steppe shrubs, *C. ruthenica* and *C. hajastana* with florocoenotype of mountain steppes and the group of formations of *Stipa-Festuca* steppes. As to *C. rasdorsky*, it grows in beard-grass (*Bothriochloa ischaemum*) steppes the syntaxonomic position of which is still disputable. We classify communities with *Bothriochloa ischaemum* predominating under florocoenotype of the steppes and agree with RUBTSOV (1948) that they are among the most ancient within the steppe sites of Transcaucasia and most closely related to those prosteppes which might have existed on the southern shore of Tethys in Asia Minor as far back as in Miocene.

As a result of our studies an assumption can be made that very polymorphic *C. ruthenica* originated from related Mediterranean species and was fairly widespread in European steppes on calcareous soils, which is characteristic of steppe plants as far back as in Pleistocene, and probably at the same time it penetrated into Transcaucasian steppes. Considering its relatively wide amplitude of ecological distribution in the area, we may presume that in Transcaucasia it grew not only in feather-grass steppes harbouring it up to the present time, but spread into the neighbouring communities as well. It is most probable that it penetrated into more arid areas (such as beard-grass steppes) during one of the pluvial phases. Later, as a result of adaptation to specific conditions of the habitat, these plants transformed into *C. rasdorsky*.

Apparently before the glacial period (or in one of the interglacials) *C. tamaniana* appeared surviving till nowadays in the Vaik steppes and in the community of steppe shrubs in Shirak (abundance in this community of Boreal and Caucasian species is noteworthy). It is interesting that florocoenotype of steppe shrubs possibly originated in Neogene parallel to the formation of steppes (KAMELIN 1979), and the gorge on Shirak ridge where *C. tamaniana* grows is a kind of refuge in which not only separate relict species but also complete communities were preserved (though changed greatly as a result of the activity of Man). For example, sites of mountain steppe with *Stipa pulcherrima* and *Asphodeline taurica* were discovered here, being very close to relict steppes of the Crimea, Northern Caucasus and Dzhavakhetia (KHINTIBIDZE, 1990).

As to *C. hajastana*, in all probability it is a younger species, which is also documented by its morphological features. It came into

being after the whole Armenian steppe zone disintegrated into separate parts under the influence of anthropogenic factors and a change of the majority of feather-grass steppes into spear-grass-sheep fescue and sheep fescue steppes. It can be supposed that the floristic complex has not been stabilized yet after the basic transformation and intensive changes in it are still taking place, especially in the representatives of the genus *Centaurea*.

References

- AGABABYAN M. V. (1989): *Centaurea tamaniana* (Asteraceae)- a new species from Armenia. - Biol. Zh. Armen. 42(3): 186-190.
- FAJVUSH G. M. (1987): Analysis of spectra of families and genera in floristic regions of Armenia. - Bot. Zh.. (USSR), 72: 1595-1604.
- FAJVUSH G. M. (1990): On the autochtonal and allochtonal processes in the development of steppe flora in the Armenian SSR. - Biol. Zh. Armen. 43(3): 220-225.
- GABRIELYAN E. Tz. and FAJVUSH G. M. (1989): Floristic links and endemism in the Armenian Highlands. In: The Davis and Hedge Festschrift, p. 191-206. Edinburgh.
- KAMELIN R. V. (1979): Kukhistansky okrug gornoy Sredney Asii. Leningrad.
- KHINTIBIDZE L. S. (1990): Kserofilnye floristikheskye kompleksi Juzhnoy Grusii. Avtoreferat Dokt. diss. Tbilisi.
- RUBTSOV N. I. (1948): K poznanyu borodatshevikh cenosov USSR. Byull. Moskov. Obshch. Ispyt. Prir. 4: 83-89.
- TAKHTADZHAN A. L. (1986): Floristic regions of the world. Berkeley.
- TOLMACHEV A. I. (1986): Metody sravnitelnoy floristiki i problemy florigeneza. Novosibirsk.
- WAGENITZ G. (1986): *Centaurea* in South-West Asia: patterns of distribution and diversity. - Proc. Roy. Soc. Edinburgh, 89 B: 11-21.

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