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Morphological Diversity of Georgian Forms of *Prunus cerasifera* Ehrh.

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ABSTRACT. Form diversity, discovered in diploid (2n=16) forms of *Prunus cerasifera* Ehrh. (Georgian tkemali) and in the process of investigation, represents a favorable initial material for evolving polyploid forms in this species. *© 2007 Bull. Georg. Natl. Acad. Sci.*

Key words*: diploidy, polyploidy, hybridization, Prunus cerasifera.*

The great intraspecific diversity of particular species belonging to the genus *Prunus* may become a reason for describing new subspecies according to morphological features, thus complicating the systematization of the genus. The situation becomes more difficult owing to the fact that these species and forms are not separated territorially. This creates favorable conditions for their hybridization. Accordingly, the features forming the basis for systematization of this group, are not specific to a particular species and reveal the tendency to be discovered in another species too. This makes form diversity more abundant.

At the same time, there is a wide range of vertical and horizontal dissemination among the species of the genus *Prunus*. Because of this, ecologically different representatives occur very often here.

The outstanding researchers of this plant group (N. Kovalev and K. Kostina) consider that it is practically impossible to find two trees that would be identical by their morphological-genetic and physiological features [1].

Vavilov's regularity on the homological rows, elaborated according to the analysis of a vast material, is based on the parallelism of modifications of particular species forms [2].

Hence the importance of studying the intraspecific and hereditary forms of the wild ancestors of cultivated plants, in connection with the problem of their origin.

The purpose of the author's investigation was to study in detail the representatives of the genus *Prunus*, spread in Georgia. Special attention was paid to Kartli region, as the main base of horticulture, where form diversity was more anticipated. The wild representatives of this genus were the main subject of interest.

Prunus cerasifera Ehrh Tkemali is a widely spread culture in the Ksani and Liakhvi valleys. Its various forms are met here, like trees, bushes, with and without thorns, with small and big, bare or downy leaves. Fruits may be round, oblong, flat, sharpened or curved, with or without furrow. As to taste they are acid, sweetish or sweet. The color of fruit varies from black to blue, bluish, dark red, red, reddish, violet, pink, yellow and bright yellow. The stones may be round, oblong, plane, with smooth or furrowed surface, sometimes with evident wing. Flesh is juicy or dry, hardly or easily removed from the stone. It should be noted that most of Kartlian tkemali are easily separated from the stone, which is rare in this species.

A detailed study of the material from the Kartli expedition made clear that sharp differentiation of the species of this genus is unfeasible. Presented here is a whole spectrum of forms from typical wild ones, with small stone, and different transition forms.

The karyological study of the Kartli expedition material has revealed polyploid tkemali (2n=48) together with diploid ones (2n=16) [3]. These varieties of tkemali have 2n=48 chromosomes and by some morphological features are similar to typical diploid forms.

The polyploid forms of tkemali are not interspecies hybrids. This fact is proved by the morphological differences between them. At the same time, they are similar to diploid plants, which are distinguished for their polymorphism. Besides, these polyploid forms of tkemali do not possess any features of other species of this genus, have fertile pollen and are highly productive.

As the Kartli expedition appeared to be so productive, the author decided to study Georgian plums too. Investigations were made both in western (Racha-Lechkhumi, Imereti, Upper and Lower Svaneti) and eastern (Samtskhe-Javakheti, Kartli, some Kakheti districts, Tianeti) regions of Georgia.

Samtskhe-Javakheti proved to be poor in plum species as compared to other regions. There were mainly small-fruited forms and very rarely big-fruited ones. Unripe flesh is easily separated from stone, which is very rare in wild forms of tkemali. Another wild plant – blackthorn (*P. spinosa* L.) was discovered only in some places as a single plant.

Racha-Lechkhumi is rich in fruit-trees. Tkemali is distinguished for polymorphism here. Small-, middle- and big-fruited forms, also big- and small-leaved, thorn and thornless forms were found here. Fruit was also of different shape – round, elliptic, etc. Blackthorn is absent in Lechkhumi; in Racha it was described by Bregadze only in some places [4].

Svaneti is the highest mountain region of Georgia, where the climatic and soil conditions are favorable for fruit-trees dissemination. Of the plum genus tkemali is a culture of the genus *Prunus* widely spread in Lower Svaneti, but its formal constitution is poor, compared with Upper Svaneti.

In Upper Svaneti tkemali species are distinguished for great polymorphism. Form diversity changes with the altitudinal gradient here. At 650-1200m above sea level tkemali forms are more abundant than at higher altitudes (1400-1500 m a.s.l.).

Among Svanetian tkemali the author met small- and big-fruited plants, tree- and bush-forms, thorny and thornless, big- and small-leaved individuals with pubescent or bare petiole. Fruit may be long, oblong, round, flat and sharp, with or without furrow. Fruit has acid, sweetish or sweet taste. The stone may be round, oblong, plane, with smooth or rough surface. Fruit color ranges from black, bluish, reddish, to red, pink, yellow and almost white. Flesh may be dry or juicy, mainly easily removed from the stone. The last fact must be highlighted, because this is rare among tkemali species, and is characteristic of Svanetian and Kartlian tkemali species.

Karyological investigations of Svanetian tkemali revealed polyploid forms (2n=48) [5]. This fact is interesting because the other wild representative of the genus *Prunus* – blackthorn (*P. spinosa*) L. does not occur in Svaneti.

The polyploid forms of tkemali, discovered in Svanetian cultivated flora, undoubtedly have evolved from morphologically different diploid forms.

The form diversity, characteristic of diploid tkemali forms, represents suitable material for the evolution of polyploid forms.

ბოტანიკა

Prunus cerasifera Ehrh. ქართული ფორმების მორფოლოგიური მრავალფეროვნება

ე. ბაიაშვილი

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(წარმოდგენილია აკადემიის წევრის გ. ნახუცრიშვილის მიერ)

შესწავლილია საქართველოს სხვადასხვა რეგიონებში მოზარდი ტყემლის (Prunus cerasifera Ehrh.) მორფოლოგიური მრავალფეროვნება. დაკვირვებების საფუძველზე გამოტანილია დასკვნა, რომ დიპლოიდურ (2n=16) ფორმებში შენიშნული დიდი მრავალფეროვნება კარგ საწყის მასალას უნდა წარმოადგენდეს ამ სახეობაში პოლიპლოიდური ფორმების წარმოშობისათვის.

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