

RESEARCH ARTICLE

UDC 582.734; 582.734.3

The genus *Rosa* L. (Rosaceae) in the flora of Nakhchivan Autonomous Republic (Azerbaijan)

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Based on the long-term studies conducted in the Nakhchivan Autonomous Republic (2004-2017) and the literature data, the composition of *Rosa* L. genus was investigated and its distribution zones were specified. It has become clear that 34 species of hips are spread in the area that, 30 of them are wild, and 4 of them – *R. centrifolia* L., *R. chinensis* Jacq, *R. damascena* Mill., *R. multiflora* Thunb. are used for greenery of parks and gardens in cultivated conditions. In recent years, as a result of the effects of climatic and anthropogenic factors on the territory of the autonomous republic, wild species of *Rosa* L. genus have been found to be in danger. Therefore, considering their rare and endangered species of *Rosa karjaginii* Sosn., *R. nisami* Sosn., *R. sosnovskyana* Tamamsch., *R. rapinii* Boiss. & Bal., *R. pimpinellifolia* L., *R. tuschetica* Boiss. have been put "Red book" of Nakhchivan Autonomous Republic, *Rosa azerbaijdzhanica* Novopokr. et Rzazade, *Rosa karyagini* Sosn. və *Rosa nisami* Sosn. species have been put "Red Book" of Azerbaijan Republic and there have been shown protection ways.

Key words: *Rosa* L., wild and cultivated species, rare species, distribution areas, Red Book of Azerbaijan Republic, Red Book of Nakhchivan Autonomous Republic

Introduction

The species of *Rosa* L. genus are widely spread in the temperate and subtropical climatic zones of the world, particularly in the Northern Hemisphere, Southern Africa, India and Mexico. There are over 200 wild species. However, there are thousands of varieties, forms and hybrids around the world of that genus known as the cultivated roses. This plant is cultivated very old time. Earlier in the 4th century, rose paintings were found on silver coins in the excavation of the Altai Province. Teofrast describes multipetalled roses 300 years before our era in Greece. Currently 25,000 varieties and forms of roses are known throughout the world and new varieties are being gotten (Askerov, 2006). That genus have been worked by V.G.Ghrshanovsky in the work of "Flora of Azerbaijan" (Ghrshanovsky, 1954).

On this work, there have been given description of 34 wild species spreading in Azerbaijan (taking into account the recent nomenclature changes) and 6 cultivated species. Later V.G.Ghrshanovsky (1953, 1958), G.G.Gadzheva (1969, 1982, 1983), A.Iskenderov (1975, 2005) have studied the species of the genus spread in Azerbaijan. The scientists described 7 new species (*R.zakatalensis*, *R.mandenovii*, *R. abutalybovii*, *R. iljinii*, *R.jaroschenkoi*, *R.iassaevii*, *R.gadjjevii*) in different years for science and have found 4 species (*R. oplisthes*, *R. gallica*, *R. transcaucasica*, *R. subafzeliana*) for the flora of Azerbaijan. Thus, at present 45 wild species are recorded in the flora of Azerbaijan. According to the forms of life, the hips are foliated, some of which are climbing plants. According to the life forms, the hip species are shrub, some of them (*Rosa multiflora*) are climbing plants. There are thorns on trunks and branches. Leaves are bipinnate with 5-7 leaves. The number of petal and sepal are 6. The leaves of sepal and petal are adjacent to the edge of the receptacle. Depending on the species the colours of petals are white, pink, yellow, dark-yellow. There are many stamens, they are adjacent or partly adjacent to the side of the hypantin. The pistils are located in the inside of hypantin, lower from the stamens and bottom of the hypantin. There are many pistils too, ovary is freely located in receptacle. The styles are long, extend from the hypantin to the outside, so that the stigma is outside. The fruit is nut fruit. When the fruits ripen the wall of the receptacle is pulped and covers the fruits. Depending on the species of the pulped receptacle is different (red, dark-orange, orange).

There is made rose water from the petals of hip species, there is made jam, they are used for the treatment of many diseases because of the fruit contains "C". Rose species are one of the most widely cultivated ornamental plants in Azerbaijan. Very valuable rose oils are extracted from the petals of rose species in perfume industry.

The hips genus (*Rosa* L.) includes to the family of *Rosaceae* Juss. The findings of species content of *Rosa* L. genus are found in the monograph (Ghrshanovsky, 1958) by V.G.Ghrshanovsky "The Roses. Phylogeny and Systematics. Spontaneous species of the European Union in the USSR, the Crimea and the Caucasus. The usage experiences and perspective". As a result of the analysis carried out by the author, 111 species of wild and cultivated hips were spread in the USSR, the Crimea and the European part of the Caucasus.

S.Ya.Sokolov, O.A.Svyazeva, V.A.Kubli on the book of "The areal of trees and bushes of USSR" (1980) there have been reported over 150 species during examination of the *Rosa* L. genus.

In the 50 years of XX century A.İ.Galushko (Galushko, 1959, 1962, 1967) has studied the taxonomic composition of the hips species spread in Caucasus, G.G.Gadzhieva (1969) and A.Iskenderov (1975) in Azerbaijan. According to V.G. Ghrshanovsky (1958), there have been spread 36 wild and 6 cultivated *Rosa* L. species in the areas of Azerbaijan. It is evident from the analysis of literature data, the composition of the *Rosa* L. genus in the Nakhchivan Autonomous Republic has not been sufficiently studied.

According to the work of "Flora of Azerbaijan" (Ghrshanovsky, 1954), 19 species of hips have spread in the Nakhchivan Autonomous Republic. Additionally, taking into account that, 3 species are located in neighboring regions, there have been given the fact of possibility of being found in the autonomous republic. However, after the publication of "Flora of Azerbaijan" (Ghrshanovsky, 1954) work, 10 dozens new species (Sofiyeva et al., 1970; İbragimov, 2012, 2015; Talibov, İbragimov, 2013, 2017; Gadzhieva, 1982; Gurbanov, 1996; İbragimov et al., 1982; İbragimov, 2005; İsaev et al., 1977) were found in the autonomous republic and added to flora.

J.P.Mandenova notes in the article of "Revision of *Rosa* species in Turkey" (Mandenova, 1970) that there is a need to conduct of clarifications approaching with the suspicion of *R. tuschetica* species have spread in the South Caucasus. However, herbarium materials collected around the villages of Tivi (1800 m) and Pazmari (1300 m) villages of the Ordubad region confirmed that this species were spread throughout the South Caucasus, including in the Nakhchivan Autonomous Republic.

In the 1972-1980 years researches based on the *Rosa* L. genus spread in autonomous republic and the analysis of herbarium samples there have been given new species: *R. Sosnowskyana*, *R. hraciziani*, *R. tschaturdagii* Chrshn., *R. vanheurckiana* Crep. and *R. elasmacantha* st. sp. (İsaev et al., 1977).

From them *R. hraciziana* species was collected on 15 of June 1972 for the first time, from the edge of the Nakhchivanchay river of Bichanak village of Shahbuz district of Nakhchivan Autonomous Republic (1800 m) (İsayev, Nuriyev).

In the work of "Flora of Azerbaijan" (Ghrshanovsky, 1954), *R. tschatur* species was not specified for the Nakhchivan Autonomous Republic. However, V.G.Ghrshanovsky noted in his monograph (1958) that, it has spread on the territory of the autonomous republic, based on herbarium materials collected from the territory of Bichanek (Lomakin) (10.VIII.1885) and Nurgut (İsayev, Prilipko) villages (26.VII.1934). Also, herbarium materials collected during the researches carried out by P.M.İsayev and others (İsaev et al., 1977) proves once again that the *R. tschaturdagii* species has spread in Nakhchivan Autonomous Republic.

According to P.M.İsayev and others (İsaev et al., 1977), *R. vanheurckiana* Crep. (= *R. atropatana*) are widely spread in the mountainous areas of the autonomous republic.

This species was first collected in Urmus village of Ordubad district on 15.VIII.1933 (Karyagin, İsayev, No1112-1115 BAK), and from Kukudagh of Shahbuz region (2300 m) on 4.VII.1970. It should be noted that I.P.Mendenova's data (Mandenova, 1980) also indicated that this species have been spread in the flora of Turkey.

R. elasmacantha Trautv. was first described by the herbarium collected from the West Transcaucasia (Abkhazia). Although S.V.Yuzepchuk (1941) and V.G.Ghrshanovsky (1954) were presented that species as independent species, the probability of spreading in the Caucasus was questionable, due to the lack of new materials. According to the data by the A.İ.Galushco (1967), this species is spread in the North Caucasus.

G.G.Gadzhieva (1983) gave information on the widely spread of *R. elasmacantha* Trautv species in the Greater Caucasus, including in Azerbaijan, based on the materials stored in the Herbarium of the Botany Institute of ANAS and samples collected by herself. This species was first mentioned in the work by R.M.İsayev and others (İsaev et al., 1977) for the flora of Nakhchivan Autonomous Republic. However, *R. elasmacantha* Trautv. species were not found in the autonomous republic during the researches.

During the investigations carried out by A.Sh.İbragimov and others (İbragimov et al., 1982), *R. brotherorum* Chrshan., *R. buschiana* Chrshan. species have been given as new species for the flora of Nakhchivan Autonomous Republic. *R. brotherorum* Chrshan. Species have been given from the middle, subalpine and alpine zones, Arachi, Lakatagh, Demirli, Kola, Duman, Salvarti, Kuku, Kechaldagh, Shikhyurdu, Yaghlidara; *R. buschiana* Chrshan. species is collected from middle and upper mountain ranges, Aghdagh, Kazangildaghi, Arachi dagh and Camal gala.

R. brotherorum Chrshan., *R. buschiana* Chrshan. species are widely spread in subalpine and alpine zones of the Guba region and in the Eastern part of the Greater Caucasus as shown in "Flora of Azerbaijan" (Ghrshanovsky, 1954).

According to G.G.Gadzhieva (1982), there are 29 species of *Rosa* L. in the Nakhchivan Autonomous Republic.

According to T.H.Talibov and A.Sh. Ibragimov (2008), 33 species of *Rosa L.* genus have been spread throughout the autonomous republic, five species of them are found in a cultivated form.

As you can see, although there are some information about the species belonging to the genus of *Rosa L.* spread throughout the autonomous republic on the results of researches carried out at different times and on the literature data, but their species content is still undetermined, natural resources and their utilization remain untouched.

Materials and Methods

As a research material, there were taken hips species belonging to the *Rosa L.* genus from all the botanical-geographical zones of the Nakhchivan Autonomous Republic, which were collected by us during field surveys. At that time, classical and modern botanical floristic, systematic methods were used in the processing of the collected herbarium materials.

In order to clarify the current situation of the representatives of *Rosa L.* in the Azerbaijan Republic flora, there have been given attention to the herbariums kept at their Herbarium Fund of the Botany Institute of Azerbaijan National Academy of Sciences (BAK), Bioresources Institute of Nakhchivan branch of Azerbaijan National Academy of Sciences, Nakhchivan State University, there have also been comparative analysis of herbarium samples concerning of organizations and various Institutions placed on their web sites. There have been determined the content of the *Rosa L.* genus fulfilling of field expeditions during 2004-2017.

"Trees and shrubs of Azerbaijan" (Sofiyeva et al., 1970), "Higher plants of Azerbaijan" (Askerov, 2006), "Flora of Azerbaijan" (Ghrshyanovsky, 1954), "Trees and shrubs of the USSR" (Saakov, Fisher, 1954), "Flora of the Caucasus" (Grossheim, 1952), "Dendroflora of the Caucasus" (Makhatadze, 1965), "Flora of the USSR" (Yuzepchuk, 1941), Talibov, Ibrahimov (2008) and Mammadov et al., (2016) had been utilized for determining of species.

On the identification of systematic taxa, there have been used S.K. Cherepanov (1995) and the determination of the areal there have been used the book of "Areas of trees and shrubs of the USSR" (Sokolov et al., 1980).

For each locality the coordinates and the altitudes were determined by using GPS.

Results and discussion

In order to clarify the current state of the hips species (*Rosa L.*) in the flora of Nakhchivan AR, the attention has been paid to the herbariums stored in the fund of Nakhchivan State University, Bioresources Institute Nakhchivan Branch of ANAS, pictures of herbarium samples placed on the site of different institutes and organizations have been analyzed and there has been identified the species composition of *Rosa L.* genus by implementing field studies in 2004-2017.

Based on the latest data from Academician T.H.Talibov and A.M.Ibragimov (2008) and herbarium examples collected during regular expeditions, we have determined that 33 species of *Rosa L.* genus have been spread throughout the autonomous republic. Four species of them are now widely cultivated in courtyard areas.

Below we give some information about the wild hips species spread in the flora of Nakhchivan Autonomous Republic, based on V.G.Ghrshyanovsky's (1958) systems. Specification of the names of species had been given by S.K.Cherepanov (1995). Since the botanical characteristics of the species had been given in different literature, we have only give information about the spread area of the species.

Section: *Caninae* Crep.

1. *Rosa canina L.* 1753, Sp. Pl, 491; 1941, Yuzepchuk, Flora of the USSR, 10: 502; 1952, Grossheim, Flora of the Caucasus, 5: 116; 1954, Ghrshyanovsky, Flora of Azerbaijan, 5: 151; 1958, Ghrshyanovsky, 177.

Type: Described from Europe: "in Europa". Tun in London.

R. canina L. species have spread on the grassy slopes, woods, plains, banks of river and bushy areas of Batabat massive, Bichanek, Kuku, Kechili villages of Shahbuz region, Arachigdag (Khaznadara), Shurud villages of Julfa region, Khurs, Alaghi, Pargha, Bist, Dirnis villages of Ordubad region. It is mesophytes. It is included to the Western Palearctic geographic areal types. *R. canina L.* is spread in the Nakhchivan Autonomous Republic, the most common species of region.

2. *R. corymbifera Borkh.* 1790, Borkhausen, Vers. Forstbot. Beschr.: 319; 1941, Yuzepchuk, Flora of the USSR, 10:503; 1952, Grossheim, Flora of the Caucasus, 2,5:118; 1954, Ghrshyanovsky, Flora of Azerbaijan, 5:152; 1958, Ghrshyanovsky, 184.

Type: Described from Germany. The lectotype of the species is not indicated.

R. corymbifera Borkh. have spread in Arachigdag area (Khaznadara) of Julfa region, along the bank rivers, woody glade of Bichanek village of Shahbuz region, Lower Endemich, Bilav, Bist, Dirnis villages of Ordubad region. It is mesophytes. It is included to the European geographic areal types. It has many variations and varieties.

3. *R. teberdensis Chrshan.* 1951, Ghrshyanovsky, Notulae systematicae ex herbario Academiae scientiarum URSS, 14:198; 1952, Grossheim, Flora of the Caucasus, 5:116; 1954, Ghrshyanovsky, Flora of Azerbaijan, 5:152; 1958, Ghrshyanovsky, 210.

Type: Described from Ciscaucasia, the left bank of the Teberda river, near the village of Verchnaya Teberda, 25.08.1947 (A.G. Borisov). Type in Leningrad.

R. teberdensis Chrshan. have spread on grassy slopes and bushy areas around the Boyahmad, Leketagh, Teyvaz, Arafsa villages of Julfa region, Nurgut, Bist villages of Ordubad region. It is mesophytes. It is included to the Caucasus geographic areal types.

4. *R. brotherorum* Chrshan. 1953, Ghrshanovsky, Notulae systematicae ex herbario Academiae scientiarum URSS, 15:143; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:155; 1958, Ghrshanovsky, 233.

Type: Described from the Caucasus, Kabarda, glaciem Besengi, 26.07.1892, fr., V. Lipsky. Type in Leningrad.

R. brotherorum Chrshan. have spread on stony and grassy slopes in subalp and alpine valleys. It has spread in Arachi, Leketagh, Demirli, Kola, Duman of Julfa region, Salvarti, Kuku, Kechaldagh of Shahbuz region, Shikh-Yurdu, Deveboynu, Yaghlidere areas of Ordubad region. It is mesophytes. It is included to the Caucasus geographic areal types.

5. *R. orientalis* Dupont ex Ser. (*R. atropatana* Sosn.) 1944, Sosnovsky, News of the Azerbaijan branch of the USSR Academy of Sciences, 10:22; 1952, Grossheim, Flora of the Caucasus, 5:123; 1958, Ghrshanovsky, 234.

Type: Respublica Nachitschevan, Urmus ad rupes in regione subalpina sicca, 08.1933, I. Karyagin et I. Isaev. Type in Baku.

R. orientalis Dupont ex Ser. have spread in mountainous areas of Nakhchivan Autonomous Republic. It has found in dry and stony places of Urmus, Paragha, Khurs and Nurgut villages of Ordubad region. It is mesophytes. It is included Atropathan geographic areal types.

6. *R. tomentosa* Smith. 1800, Smith., Fl. Brit., 2:539; 1941, Yuzepchuk, Flora of the USSR, 10:488; 1952, Grossheim, Flora of the Caucasus, 5:122; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:156; 1958, Ghrshanovsky, 251.

Type: Described from England. Type in London.

R. tomentosa Smith. have spread across the slopes, thin forests and between bushes of Unus, Tivi, Bist, Paragha villages of Ordubad region, Leketagh, Teyvaz, Boyahmed villages of Julfa region, Kechili, Bichanek, Aghbulag villages of Shahbuz district. It is mesophytes. It is included to the European geographic areal types.

7. *R. chomutoviensis* Chrshan. & Laseb. 1952, Ghrshanovsky, Botanical Journal, 9 (4):60; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:158; 1958, Ghrshanovsky, 292.

Type: Described from Ukraine (Khamutovskaya steppe). Type in Kiev.

R. chomutoviensis Chrshan. & Laseb. have found in sparse forests formed by the presence of hips. It has spread in Gilanchay, Vanand, Bilav, Bist, Nurgut, Khurs villages of Ordubad region, Alinja area of Julfa region and Garababa villages of Shahbuz region. It is mesophytes.

8. *R. floribunda* Stev. 1819, Fl. Taur-Cauc. 3:343; 1941, Yuzepchuk, Flora of the USSR, 10:497; 1952, Grossheim, Flora of the Caucasus, 5:116; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:159; 1958, Ghrshanovsky, 296.

Type: Described from Crimea: "in Tauriae herbis campestribus: in collibus circa Bosphorum" Lectotypus (Buzunova, hacloco): "Sympheropol, 1841 (№1060308-H)" (Syntipi-H., LE, MW).

R. floribunda Stev. have spread in the shrubs, stony-gravel slopes around the Alinja of Julfa region, Garababa, Kuku, Ayriinj, Bichanek, Agbulag villages of Shahbuz district. It is mesoxerophyte.

9. *R. tuschetica* Boiss. 1872; Bois. Fl. Orient., 2:673; 1941, Yuzepchuk, Flora of the USSR, 10:499; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:160; 1958, Ghrshanovsky, 311.

Type: "Hab. in regione subalpine et alpine Tuschetiae et Daghestania prope Beshita, Diklo 6000`-8000` (Rupr. exs. sub *R. rubiginosa*)". Type in Geneva. Isotypus in Leningrad.

R. tuschetica Boiss. have spread in mountain ranges of Nakhchivan AR, subalpine and alpine zones, nearby of forests. It is found in gravel-stony and grassy slopes around Bichanek, Aghbulag villages of Shahbuz region, Nurgut villages of Ordubad district. It is xeromesophyte. It is included to the Caucasus geographic areal types. Natural resources are limited because they are spread in small areas in small amount. It has been included to the Red Book of Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its protection, rational and sustainable usage.

10. *R. azerbaijhanica* Novopokr. et Rzazade. 1947, Reports of the Academy of Sciences of the Azerbaijan SSR, 3(5):217; 1952, Grossheim, Flora of the Caucasus, 5:124; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:161; 1958, Ghrshanovsky, 317.

Type: Described from the Kelbajar region of the Republic of Azerbaijan. Type in Leningrad.

R. azerbaijhanica Novopokr. et Rzazade. have spread on stony slopes, from the middle mountain zones to the high mountain zones. It has spread on stony slopes around the Kuku, Kechili, Bichanek villages of Shahbuz region. Natural resources are exhausted since small amounts are spread in small areas. It is included to the "Red Book" of Azerbaijan Republic (2013) for its conservation, rational and sustainable usage. It is rare and endemic species of Azerbaijan.

11. *R. pulverulenta* Bieb. 1808, Fl. Taur-Cauc. 1:399; 1941, Yuzepchuk, Flora of the USSR, 10:499; 1952, Grossheim, Flora of the Caucasus, 5:120; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:161; 1958, Ghrshanovsky, 313.

Type: Described from the Caucasus: "Habitat in collibus circa acidulam Narzana Caucasi subalpini" Holotypus: "Ex Caucaso Cabardinico, circa Narzana Lecta a. 1803" (LE).

R. pulverulenta Bieb. have spread on stony slope of Kuku, Kechili, Bichanak villages of Shahbuz region, Leketagh villages of Julfa region. It is Xerophyte. It is included to the Atropatan geographic areal types.

12. *R. nisami* Sosn. 1944, Sosnovsky, News of the Azerbaijan branch of the USSR Academy of Sciences, 10:22, 1952, Grossheim, Flora of the Caucasus, 5:121; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:162; 1958, Ghrshanovsky, 318.

Type: Respublica Azerbajdzhan, distr. Chanlar, in processu m-tis Jaghdashdagh, in silva, 1300-1400 m. 16.08.1994, L. Priligko. Type in Baku.

R. nisami Sosn. have spread in woods and bushes around Kuku, Batabat, Bichanek villages of Shahbuz region, Bilev, Behrud, Paragha, Bist, Urmus, Nasirvaz villages of Ordubad district. It is mesophytes. It is included to the Atropathan geographic areal types. Natural resources are exhausted since small amounts are spread in small areas. It is included to the Red Book of Azerbaijan (2013) and the Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its conservation, rational and sustainable usage. It is a rare species of Azerbaijan.

13. R. sachokiana P. Jarosch. 1945, Reports of the Academy of Sciences of the ArmSSR 2:52; 1952, Grossheim, Flora of the Caucasus, 5:121; 1954, Ghrshanovsky, Flora of Azerbaijan, 165; 1958, Ghrshanovsky 319.

Type: Azerbaidzhan. Distr. Schemacha: 1) inter p. Taza-Zarat et p. Kara-Jatach, 19.08.1928; 2) prope pasc. Padar-Jazdach, 26.06.1928; 3) Inter pasc. Israfil et Navagi, 14.08.1928, leg. M. Sachokia. Type in Baku.

R. sachokiana P.Jarosch. have spread on dry slopes and bushes around Unus, Tivi, Bist, Nasirvaz, Gilanchay villages of Ordubad region, Teyvaz, Boyahmed villages of Julfa region, Kechili, Bichanek, Aghbulag villages of Shahbuz region. It is xerophyte. It is included to the Alban geographic areal types.

14. R. marschhalliana Sosn. 1943, News of the Azerbaijan branch of the USSR Academy of Sciences, 3:66; 1952, Grossheim, Flora of the Caucasus, 5:119; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:165; 1941, Yuzepchuk, Flora of the USSR, 10:505; 1958, Ghrshanovsky, 320.

Type: Described from Georgia (Kaishaur). Type in Leningrad.

R. marschhalliana Sosn. have spread in stony-gravel slopes and bushy areas around Chalkhangala villages of Kangerli region, Buzgov villages of Babek region, Alinja of Julfa region, Garababa, Bichanak villages of Shahbuz region, Gilanchay village of Ordubad region. Sometimes it is also found in the subalpine zone. It is mesophytes. It is included to the Caucasus geographic areal types.

15. R. karjagini Sosn. 1944, News of the Azerbaijan branch of the USSR Academy of Sciences, 10:23; 1952, Grossheim, Flora of the Caucasus, 5:121; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:166; 1958, Ghrshanovsky, 322.

Type: Respublica Nachitshevan, 2-3 km ad N a Urmus (Ordubad regione), in fissuris rupium regionis subalpiniae, 13.08.1933, pseudocarp. immat. Leg. J. Karjagin. Type in Tbilisi. Isotypus in Baku.

R. karjagini Sosn. The species was originally designated according to the samples collected from Urmus village of Ordubad district. It has spread in bushes, on stony-gravel slopes around Garababa, Kolani villages of Shahbuz region, Alinja, Abrugunis villages of Julfa region, Ganza, Urmus, Bist, Khurs villages of Ordubad region. It is mesophytes. It is included to the Atropathan geographic areal types.

Natural resources are exhausted since growing as lonely in small and disadvantages areas. It is included to the Red Book of Azerbaijan (2013) and Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its conservation, rational and sustainable usage. It is a rare species of Azerbaijan.

16. R. zangezura P. Jarosch. 1945, Reports of the Academy of Sciences of the ArmSSR, 11 (4):115; 1952, Grossheim, Flora of the Caucasus, 5:121; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:167; 1958, Ghrshanovsky, 323.

Type: Distr. Goris. evicin. opp. Goris in fruticetis et in pratis stepposis montanis, 1200-2000 mt. 25.07.1944, leg. P. Jaroschenko et A. Ivanova. Type in Erevan.

R. zangezura P. Jarosch. have spread in bushes, stony-gravel slopes and gardens around Demirchi, Khanliglar, Alishar villages of Sharur region, Alinja, Abrugunis villages of Julfa region, Paragha villages of Ordubad region. It is mesophytes. It is included to the Atropathan geographic areal types.

17. R. iberica Stev. ex Bieb. 1819, Fl. Taur-Cauc. 3:345; 1941, Yuzepchuk, Flora of the USSR, 10:494; 1952, Grossheim, Flora of the Caucasus, 5:120; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:168; 1958, Ghrshanovsky, 326.

Type: "Habitat circa oppidum Krzchinval Iberae occidentalis. Type in Helsinki. Isotypus in Leningrad.

R. iberica Stev. ex Bieb. have spread in the forests, plains, mountain slopes, river valleys, stony and rocky slopes and bushes around the Aylis, Bilav, Behrud villages of Ordubad region. It is xerophyte. It is included to the Minor Asia-Caucasus geographic areal types.

Section: Cinnamomeae DC.

18. R. boissieri Crep. 1869, in Bull. Soc. Bot. Belg. 8:340; 1941, Yuzepchuk, Flora of the USSR, 10:490; 1952, Grossheim, Flora of the Caucasus, 5:124; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:169; 1958, Ghrshanovsky, 329; 1977, Gadzhieva, Iskenderov, Proceedings of Azerbaijan National Academy of Sciences, 1:7.

Type: "Vallée de Djemil (Lasistan) vers 2000 m d'altitude". Type in Geneva.

R. boissieri Crep. have spread on dry, rocky, gravel-stony slopes around Gazanchi, Nahajir, Milakh villages of Julfa region and Shahbuz villages of Shahbuz district.

19. R. sosnovskyana Tamamsch. 1949, Notulae systematicae ex herbario Academiae scientiarum URSS, 11:90; 1952, Grossheim, Flora of the Caucasus, 5:116; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:170; 1958, Ghrshanovsky, 335.

Type: Distr. Akhty, supra pag. Makravank ad marginem silvae quercinae. 6.09.1942, S. Tamamschian, F. Fedorov et Hr. Tokmadzian. Type in Erevan.

R. sosnovskyana Tamamsch. have spread the forest area, between the bushes around Arafsa (Khazinadara) of the Julfa region, Batabat massive, Bichanek villages of Shahbuz region, Khurs, Nurgut villages of Ordubad region. It is

mesophytes. It is included to the Caucasus geographic areal types. Natural resources is limited because of growing in smaller areas as individual. It is included to the Red Book of Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its protection, rational and sustainable usage.

20. *R. buschiana* Chrshan. 1951, Notulae systematicae ex herbario Academiae scientiarum URSS, 14:192; 1952, Grossheim, Flora of the Caucasus, 5:115; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:171; 1958, Ghrshanovsky, 362.

Type: "Ossethia meridionalis partum lepidosum antimontium vulcani Fidar-choch, 03.08.1988, V. Darbin. Type in Leningrad.

R. buschiana Chrshan. have spread on grassy slopes in alpine and subalpine valleys. It have spread on Ereji dagh, Jamal tower of Julfa region, Gapidjig, Soyugdagh, Yaglidere, Gamigaya, Khazaryurt and Kazangol mountain areas of Ordubad region. It is mesophytes. It is included to the Caucasus geographic areal types.

Section: Luteae Crep.

21. *R. rapinii* Boiss. & Bal. 1859, Diagn. Pl. nov. ser: 2, 6:72; 1872, Boiss. Fl. Or. 2:672; 1942, Sosnovsky, in the Messages of the Academy of Sciences of the Georgian SSR, 3 (7):688; 1952, Grossheim, Flora of the Caucasus, 5:112; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:172; 1958, Ghrshanovsky, 403; 1972, Nilsson in Davis, Fl. Turkey, 4:114.

Type: "Prope Ushak, Phrygia"

R. rapini Boiss. et. Bal. have spread in dry, gravelly stony slopes around Chalkhangala villages of Kangarli region, Buzgov villages of Babak region, Gazanchi, Nahajir, Milakh villages of Julfa region, Garababa, Bichanek, Ayriinj villages of Shahbuz region, Arafsa, Gazanchi villages of Julfa region, Tivi and Paragha villages of Ordubad district. It is xerophyte. It is included to the Pre-Asian geographic areal types. Supply of resources is limited because of growing in smaller areas as individually. It has been included to the Red Book of the Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its protection, rational and stable usage.

22. *R. foetida* Herrm. 1762, Dissert. Rosa, 1941, Yuzepchuk, Flora of the USSR, 10:477; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:173; 1958, Ghrshanovsky, 404; 2005, Iskenderov, Reports of the Academy of Sciences of the Azerbaijan SSR, 4:113.

Type: Described by cultivated specimens.

R. foetida Herrm. have spread on stony slopes and bushes around Gazanchi, Arafsa, Milakh, Boyahmad, Lakatagh, Teyvaz villages of Julfa region. It is mesophytes. It has been included to the Red Book of Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its protection, rational and sustainable usage. It is included to the Pre-Asian geographic areal types.

23. *R. haemisphaerica* Herrm. 1762, Dissert, 18; 1941, Yuzepchuk, Flora of the USSR, 10:481; 1952, Grossheim, Flora of the Caucasus, 5:112; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:173; 1958, Ghrshanovsky, 406.

Type: Described on cultural patterns. Type unknown.

R. haemisphaerica Herrm. have spread on dry, rocky, gravelly-stony slopes around Gazanchi, Nahajir, Milakh villages of Julfa district and Shahbuz villages of Shahbuz region.

Section: Pimpinellifoliae DC.

24. *R. pimpinellifolia* L. (*R. spinosissima* L.) 1753, Sp. Pl. ed. 1:491; 1941, Yuzepchuk, Flora of the USSR, 10:470; 1952, Grossheim, Flora of the Caucasus, 5:112; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:174; 1958, Ghrshanovsky, 408.

Type: Described from Europe. Type in London.

R. pimpinellifolia L. have spread in Bichanek, Ayriinj, Kuku, Batabat, Ayrigar of Shahbuz region, Lakatagh, Atragunus, Arafsa, Alinjachay areas of Julfa region. It is mesoxerophyte. It is included to the Southern Paleoarctic geographic areal types. Supply of resources is limited because of growing in smaller areas as individually. It is included to the Red Book of Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010) for its protection, rational and sustainable usage.

25. *R. tschatydagi* Chrshan. 1953, Notulae systematicae ex herbario Academiae scientiarum URSS, 15:118; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:174; 1958, Ghrshanovsky, 413; 1977, Isaev et al., *Proceedings of Azerbaijan National Academy of Sciences, Biological and medical sciences*, 1:9.

Type: Tauria in monte Tschatyrdag, planities inferior, in rupestribus, 14.07.1949, leg. Poshidaeva. In Herb. Horti Nikitensis nom. W.M. Molotovii conservatur.

R. tschatydagi Chrshan. have spread in the forest area, among the bushes, rocky-gravelly soils around Arafsa (Khazinadara) of Julfa region, Batabat, Bichanek, Kuku village of Shahbuz region, Khurs, Nurgut, Tivi, Paragha of Ordubad district. It is xerophyte.

26. *R. hraciana* Tamamsh. 1949, Notulae systematicae ex herbario Academiae scientiarum URSS, 11:92; 1952, Grossheim, Flora of the Caucasus, 5:114; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:176; 1958, Ghrshanovsky, 419.

Type: Distr. Akhty, Ad ripam dextram fl. Zanga. Inter pp. Akhpara et Kahssy. In declivibus qraminosis inter molem lapidum (Armenice: Czingil.), 06.09.1942, S. Tamamschian.

Described from Armenia. Type in Erevan.

R. hraciana Tamamsh. It has been described for the first time in 1974 on the basis of the herbarium samples collected from stony, gravel slopes at 1850 m high of Bichanek village. It has spread in the forests, dry grassy, rocky slopes

and bushy areas around Bichanek, Kuku villafes of Shahbuz region, Bist, Urmus, Nasirvaz villages of Ordubad region. It is xerophyte. It is included Atropathan geographic areal types.

27. *R. afzeliana* Fries. 1816, in Liljebl., Utk. Svensk Fl., 715; id. Fl. Hall., 86; 1941, Yuzepchuk, Flora of the USSR, 10:501; Grossheim, Flora of the Caucasus, 5:117; 1958, Ghrshanovsky, 244; *R. canina* L. subsp. *virens* (Wahlenb.) Smite, 1996, Fl. Balt. Countr. 2:54.

Type: Described from Scandinavia Type in Stockholm.

R. afzeliana Fries. species was shown for the mountainous areas of Nakhchivan Autonomous Republic of Azerbaijan and Guba area of Greater Caucasus. A.Sh.Ibragimov has found and gathered species samples from the mountain steppes, grassy and shrubs of Nakhchivan AR. This species is found in the Caucasus, South Caucasus, Balkans, Minor Asia, European part of the former USSR. It was described in Georgia for the first time. That species is very similar to *R. subafzeliana* Chrshan. and differs from it with some signs.

28. *R. kazarjanii* Sosn. 1942, News of the Armenian branch of the USSR Academy of Sciences, 8:22; 1952, Grossheim, Flora of the Caucasus, 5:115; 1954, Ghrshanovsky, Flora of Azerbaijan, 5:175.

Type: Described from Armenia. Type in Erevan.

R. kazarjanii Sosn. have spread on grassy slopes, bushes and woody glades of higher and subalp mountain zones. It has found in Batabat massive (bank of the lower lake) of Shahbuz region, Alinja Castle of Julfa region, Gavik and Kola forests of Arafsa villages of Julfa region. It is mesophytes. It is included to the Atropathan geographic areal types.

29. *R. subafzeliana* Chrshan. 1954, Flora of URSR, 6:234, 583; 1958, Ghrshanovsky, 244; 1968, Klastersky, Fl. Europ. 2:29; 1996, Smite, Fl. Balt. Countr. 2:55.

Type: Described from the Ternopil region of the Ukrainian SSR (Zalishchyky). Type in Lvov Science and Natural History Museum, Academy of Sciences of Ukraine.

R. subafzeliana Chrshan. have spread on stony, gravel slopes, bushes and woody glades around Arafsa and Boyahmad villages of Julfa region.

30. *R. villosa* L. (*R. pomifera* Herrm.). 1753, Sp. Pl., 491; 1968, Klastersky, Fl. Europ. 2:31; 1941, Yuzepchuk, Flora of the USSR, 10:489; 1958, Ghrshanovsky, 226; 1996, Smite, Fl. Balt. Countr. 2:59.

Type: Described from South. Europe ("in Europa australi"; LINN No 652.16).

R. villosa L. have spread in bushes, forest glades, sparse woods, ravines, nearby the waterfall of the middle and higher mountain zones. It is found around the Arafsa village of Julfa district (Arajigdagh, Vanlidere, Khazinadara, and Shadara valley). It is mesophytes. It is included to the Mediterranean Sea geographic areal types.

Conclusions

According to the analysis of the herbarium materials collected during the expeditions during 2004-2017 and the literature data, the composition and the distribution zones of *Rosa* L. species spread in the Nakhchivan Autonomous Republic were determined. It has become clear that, 34 species of hips are spread in the area, 30 of them are wild, and 4 of them - *Rosa centifolia* L., *R. chinensis* Jacq., *R. damascena* Mill., *R. multiflora* Thunb. are used in greenery of parks and gardens in cultivated conditions.

In recent years, as a result of the effects of climatic and anthropogenic factors on the territory of the autonomous republic, there have also been found a danger of destruction in a number of precious species that constitute the genepool of wild hips in nature. Therefore, as a result of research conducted by T.H.Talibov and A.Sh.Ibragimov (2008) considering rare and endangered species of *Rosa foetida* Herrm. (EN A2acd; B1b(iii,iv)c(ii,iii)), *R. karjagini* Sosn. (CR A3c; C2a(i)), *R. nisami* Sosn. (EN B2ac(iii)), *R. sosnovskyana* Tamamsch. (VU A2cd; B1b(iii)c(ii)), *R. rapinii* Boiss. & Bal. (VU D1)), *R. pimpinellifolia* L. (EN B2ac(iii)), *R. tuschetica* Boiss. (VU B1b(iii,iv)c(ii)) have been put "Red book" of Nakhchivan Autonomous Republic (Talibov, Ibrahimov, 2010), *Rosa azerbaijdzhanica* Novopokr. et Rzazade (EN B2ab(ii,iii,iv,v)), *R. karyagini* Sosn. (NT) və *R. nisami* Sosn. (NT) species have been included "Red Book" of Azerbaijan Republic (2013) and there have been shown protection ways.

The composition of *Rosa* L. genus spreading in Nakhchivan Autonomous Republic is rich in endemic species. From them *Rosa brotherorum*, *R. buschiana*, *R. hraciziana*, *R. marschalliana*, *R. orientalis* (*R. atropatana* Sosn.), *R. sachokiana*, *R. tuschetica*, *R. zangezura*, *R. sosnovskyana* species of Caucasus, *R. nisamu*, *R. karjagini* species are endemic for Azerbaijan.

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Citation:

Ibrahimov, A.M., Talibov, T.H., Matsyura, A.V. (2018). The genus *Rosa* L. (Rosaceae) in the flora of Nakhchivan Autonomous Republic (Azerbaijan). *Acta Biologica Sibirica*, 4 (4), 95-102.

Submitted: 18.09.2018. Accepted: 03.11.2018

crossref <http://dx.doi.org/10.14258/abs.v4.i4.4881>



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