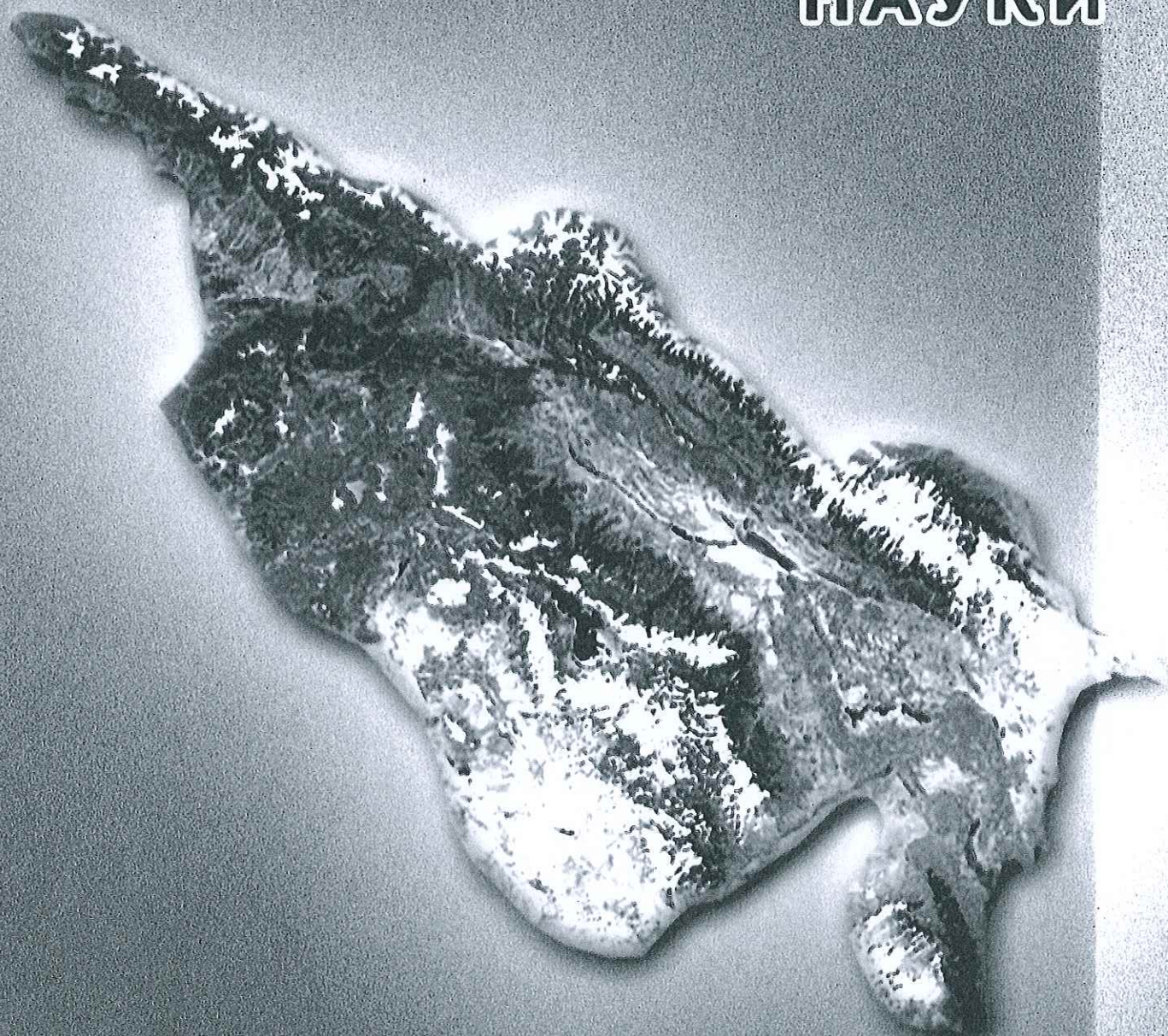


2010

ISSN 1512-1887

# ANNALS OF AGRARIAN SCIENCE

# ИЗВЕСТИЯ АГРАРНОЙ НАУКИ



[www.agrscience.ge](http://www.agrscience.ge)

Vol. 8 No. 1  
Tom 8 Hom. 1



## ANNALS OF AGRARIAN SCIENCE

The journal was founded in July 2003

The journal is published quarterly

ISSN 1512-1887

The journal publishes original theoretical and experimental scientific contributions in the fields of soil science, agroecology, agroengineering, agronomy, veterinary science and animal husbandry, forestry, technology of processing agricultural products and agricultural economics, preferentially focusing on the Southern Caucasus. Contribution from the other world regions are also welcome.

### FOUNDERS AND PUBLISHERS:

State Agrarian University (Armenia) (A. Tarverdian)

State Agrarian University (Azerbaijan) (M. Sadigov)

Federal Agency for Nature Conservation (Germany) (B. Jessel)

Georgian State Agrarian University (Georgia) (G. Javakhishvili)

### PUBLISHERS:

University of Natural Resources and Applied Life Sciences, Vienna (Austria)

Vasil Gulisashvili Forest Institute (Georgia)

Institute of Gardening, Viticulture and Winemaking (Georgia)

Scientific-Research Firm "Gamma" (Georgia)

Biological Farming Association "Elkana" (Georgia)

WWF Caucasus Programme Office (Georgia)

Regional Environmental Centre for the Caucasus "REC" (Georgia)

Fermer's Union of Georgia (Georgia)

Bureau of Soil Evaluation (Germany)

Ganja Agribusiness Association (Azerbaijan)

V. Dokuchaev Soil Science Institute (Russia)

Institute of Soil Science MSU-RAS (Russia)

European Soil Bureau Network (Italy)

### EDITOR-IN-CHIEF

T. Urushadze

### CO-EDITOR-IN-CHIEF

A. Babayev (Azerbaijan), D. Petrosian (Armenia), A. Ploeger (Germany)

### EXECUTIVE SECRETARY

T. T. Pipia

### EDITORIAL BOARD:

V. Abramian (Armenia)

E. Afrikian (Armenia)

U. Alekperov (Azerbaijan)

T. Altan (Turkey)

T. Andronikashvili (Georgia)

V. A. Babayev (Azerbaijan)

M. P. Babayev (Azerbaijan)

J. Bech (Spain)

R. Beglarian (Armenia)

W. Blum (Austria)

V. Bolshakov (Russia)

F. Borowczak (Poland)

A. Didebulidze (Georgia)

K.-H. Erdmann (Germany)

P. Felix-Henningsen (Germany)

P. von Fragstein (Germany)

M. Giulkhanian (Armenia)

E. Godjaev (Azerbaijan)

R. Gracheva (Russia)

B. Hedden-Dunkhorst (Germany)

H. R. Hemmer (Germany)

H. Hidaka (Japan)

Z. Ibragimov (Azerbaijan)

G. Javakhishvili (Georgia)

N. Karkashadze (Georgia)

A. Korakhashvili (Georgia)

I. Kruashvili (Georgia)

R. Kuliev (Azerbaijan)

T. Kurashvili (Georgia)

G. Sh. Mammadov (Azerbaijan)

G. Kvesitadze (Georgia)

W. Lawrence (Great Britain)

I. Marmarian (Armenia)

V. Mineev (Russia)

B. Mishveladze (Georgia)

Ali Mohammad (India)

A. Niewiadomy (Poland)

P. Ruzek (Czech Republic)

P. Schmidt (Germany)

E. Shapakidze (Georgia)

A. Tarverdian (Armenia)

L. Vasa (Hungary)

H. Vogtmann (Germany)

A. Voskanian (Armenia)

D. Yaalon (Israel)

V. Yavruan (Armenia)

13 km David Agmashenebeli Ave., Tbilisi, Georgia, 0631 Tel.: (995 32) 59 52 53; Fax.: (995 32) 99 88 23

E.mail: [t\\_urushadze@yahoo.com](mailto:t_urushadze@yahoo.com); [tengiz.urushadze@mailcity.com](mailto:tengiz.urushadze@mailcity.com)

Cover: Satellite Photo of the South Caucasus Countries by Company VISIBLE EARTH



---

**ECOLOGICAL AGRICULTURE AND NATURE CONSERVATION**

- Energy Assessment of Conventional and Organic Agriculture** 80  
*A.H. Babayev, F.A. Namazov*

---

**AGROENGINEERING**

- A New Principle of Crushing of Different Materials** 83  
*G.A.Javakhishvili, V.Z.Miruashvili*
- The Theory of Calculation of the Parameters of Shielding Felloe of a Mill of Intershrub Cultivation of Vinyards** 88  
*D. P. Petrosyan, A. S. Grigoryan*
- The Calculation of Constrictive and Exploitative Biofermentative Elements** 93  
*A. G. Aghasaryan*
- Increase of Metals and Welded Compounds with the Help of Influence Massive Ultrasound Waves** 97  
*L. H. Azizbekian, S. V. Gasparian, L. H. Hakopian*
- On the Calculation of the Horizontal Drainage Located in the Top Layer of a Two-Layer Ground** 100  
*S.T. Hasanov*

---

**VETERINARY SCIENCE AND ANIMAL HUSBANDRY**

- The Study of Biology and Catch Fluctuations of Big-Eye Kilka (*Clupeonella grimmi*) in South-east Part of the Caspian Sea (Mazandaran Province)** 104  
*G. Karimzadeh*
- The Identification of the Fishes of Armenia** 112  
*S.Kh. Pipoyan, E.A.Tigranyan*
- Bioacoustic Analysis of Armenian Amphibians' Mating Calls** 117  
*E. M. Yegiasaryan*
- Age Dynamics of Certain Biochemical Indices in the Blood of Goats of Different Genetic Types** 123  
*G.Yu. Marmaryan*

---

**TECHNOLOGY OF PROCESSING OF AGRICULTURAL PRODUCTS**

- Participation of Aliphatic Amino Acids in Meillard Reaction** 127  
*R.I.Kublashvili, I.G.Abdushelishvili, Z.A.Kuratashvili, B.S.Tsereteli*
- Preparation of Products of Children's Nutrition from Fruits and Berries** 132  
*A. V.Khotivari, I. V.Kupatadze, G.Z. Grigorashvili, N. Sh. Iluridze*
- Studying Technical-Chemical Indexes of Stored Quince Fruits for the Purpose of Further Processing** 138  
*G. N. Kaishauri*
- Bacteriological Researches of Amines and Ammonium Salts with 2-Hydroxyethyl Group** 141  
*A.H.Nazaretyan*

---

**FORESTRY**

- Vaccinium Myrtillus* var. *Arvinense* - a new Taxon for the Flora of Turkey** 144  
*O. Eminagaoglu, H. A. Akpulat*



## VACCINIUM MYRTILLUS VAR. ARTVINENSE - A NEW TAXON FOR THE FLORA OF TURKEY

O. Eminagaoglu\*, H. A. Akpulat\*\*

\*Artvin Coruh University

Artvin, 08000, Turkey; [eminagaoglu@hotmail.com](mailto:eminagaoglu@hotmail.com)

\*\*Cumhuriyet University

Sivas, 58140, Turkey; [askinakupulat@hotmail.com](mailto:askinakupulat@hotmail.com)

Received: 04.01.10; accepted: 22.02.10

*Vaccinium myrtillus* L. var. *artvinense* Akpulat & Eminagaoglu var. nova (Ericaceae) from Artvin district is described and illustrated. Diagnostic characters, a description and taxonomic comments on the subspecies are given and compared with the closely related *V. myrtillus*. The geographical distribution of the new variety and related species are given. IUCN threatened category and observations on the population are noted.

### INTRODUCTION

The *Ericaceae* (the heath family) consists of about 110 genera and 4000 species. Abundant and widespread throughout the temperate regions of the Northern and Southern hemispheres, it is a conspicuous element in the subarctic circumpolar vegetation and in subtropical and tropical mountains. The genus *Vaccinium* is most abundant as an epiphyte in the tropics of the New World, Malaysia, and southeastern Asia. There are about 150 to 450 species (the number varies by authority) of deciduous or evergreen shrubs (rarely trees or vines) in *Vaccinium*. The majority of species occur eastern Asia & Papua New Guinea [1-3].

Many species of *Vaccinium* are rhizomatous, thus forming multi-stemmed, rounded to upright shrubs or small trees ranging in height from 30 to 50 cm. Cranberry forms a dense evergreen ground cover about 15 cm in height. Several species of *Vaccinium* are valued for their edible fruits. Historically, Native Americans consumed blueberries fresh or dried them for winter consumption. In addition, they steeped the leaves, flowers, and rhizomes in hot water and used the tea to treat colic in infants, to induce labor, and as a diuretic [1,3].

The currently accepted scientific name of dwarf bilberry is *Vaccinium myrtillus* L. [4]. It is placed within the section *Myrtillus* [3,5,6].

The *Vaccinium* genus is taxonomically complex. Hybridization and polyploidy make delineation of species difficult [6, 7].

According to recent studies on the Turkish *Vaccinium*, this genus is represented by 4 taxa that are *V. vitis-idaea*, *V. uliginosum*, *V. myrtillus*, *V. arctostaphylos* in Turkey [8].

### OBJECTIVES AND METHODS

The new taxon was collected during the field studies of the project titled "The Phytosociological and Ecological Research on the Vegetation Structure of Sahara-Karagol National Park and its Nearest Environs" submitted by TUBITAK from Savsat, around Artvin, North-East Anatolia, Turkey, in the year of 2002 and deposited in CUFH. (Figure 1). This new variety was morphologically compared with related species, *V. myrtillus*. Authorities for all cited plant names are given according to Authors of Plant Names [9].

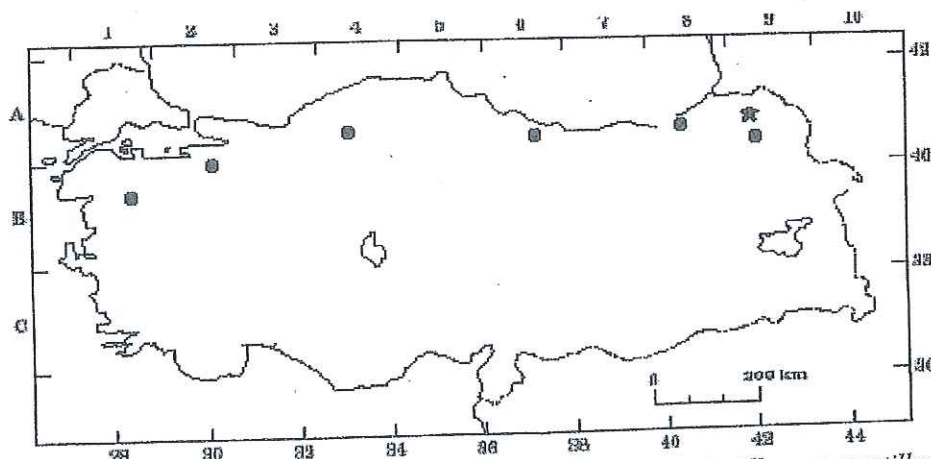


Fig. 1. Distribution of *Vaccinium myrtillus* var. *artvinense* (\*) and *Vaccinium myrtillus* var. *myrtillus* (o) in Turkey



## RESULTS AND ANALYSIS

### Taxonomical Treatment

*Vaccinium myrtillus* L. var. *artvinense* Akpulat & Eminagaoglu, var. nova (Fig. 2)

Type: Turkey. A9 Artvin, Savsat, Karagol-Sahara National Park, subalpine vegetation, 15. vii. 2000, 2100 m, 41 13 17 N- 42 29 18 E, ÖE 2279 (holo. CUFH; iso ISTE, ACUH).

A9 Ardahan, Posof, Alabalik Village, 2400 m, 13. viii. 2006, 41 22 46 N- 42 37 19 E, ÖE 5091; A8 Artvin, Merkez, Vezirköy Yaylası, 2400 m, 10.07.2007, 41 17 42 N- 41 56 15 E, ÖE 7379 (ACUH).

Diagnosis: *Afinis V. myrtillus* L. Sed ab foliis longis 15-35 x 10-20 mm (non 19-27 x 7-11 mm), fructus longus 3-4 mm (non 7-9 mm), differt.

Description: Deciduous shrublet to 45 cm; stem angled, leaves shortly petiolate, lamina ovate to elliptic, glandular hairs beneath, 1.5-3.5 x 1-2 cm, margin serrulate with reddish glandular hair. Flower single, corolla pale greenish-pink, or greenish-white, urceolate, 3-4, 5 x 5 mm. Fruit dark purple, glaucous, 3-4 mm. Fl-june, Fr-september.

Flowering and fruiting: June-September (subalpine vegetation, Birch forest, with *Betula pendula* Roth,

*Rhododendron caucasicum* Pall. and *Juniperus communis* L. var. *saxatilis* Pall., 1800-2400 m a.s.l.).

Distribution: Northeastern Anatolia (Artvin), Euro-Siberian element.

### Conservation Status

The new subspecies is an endemic taxon known from three separate localities. Extent of occurrence is about 20.000 km<sup>2</sup>, area of occupancy about 2000 km<sup>2</sup>; therefore, it should be considered as VU [10].

### Ecology

This new variety grows on high forest and subalpine zone, characteristic plants such as *Vaccinium uliginosum* L., *Rhododendron caucasicum* Pall., *Aquilegia olympica* Boiss., *Rubus caucasicus* Focke, *Veronica gentianoides* Vahl, *Solidago virgaurea* L. subsp. *alpestris* (Waldst. & Kit.) Gaudin, *Oxalis acetosella* L., *Stachys macrantha* (C.Koch) Stearn, *Daphne glomerata* Lam., *Sedum tenellum* M.Bieb, *S. spurium* M.Bieb, *Campanula tridentata* Schreber, *C. aucheri* A.DC., *Poa longifolia* Trin., *Pedicularis nordmanniana* Bunge, *Thymus praecox* Opiz subsp. *grossheimii* (Ronniger) Jalas var. *grossheimii*, *Rumex tuberosus* L. subsp. *horizontalis* (C.Koch) Rech., *Erigeron caucasicus* Stev. subsp. *caucasicus*.

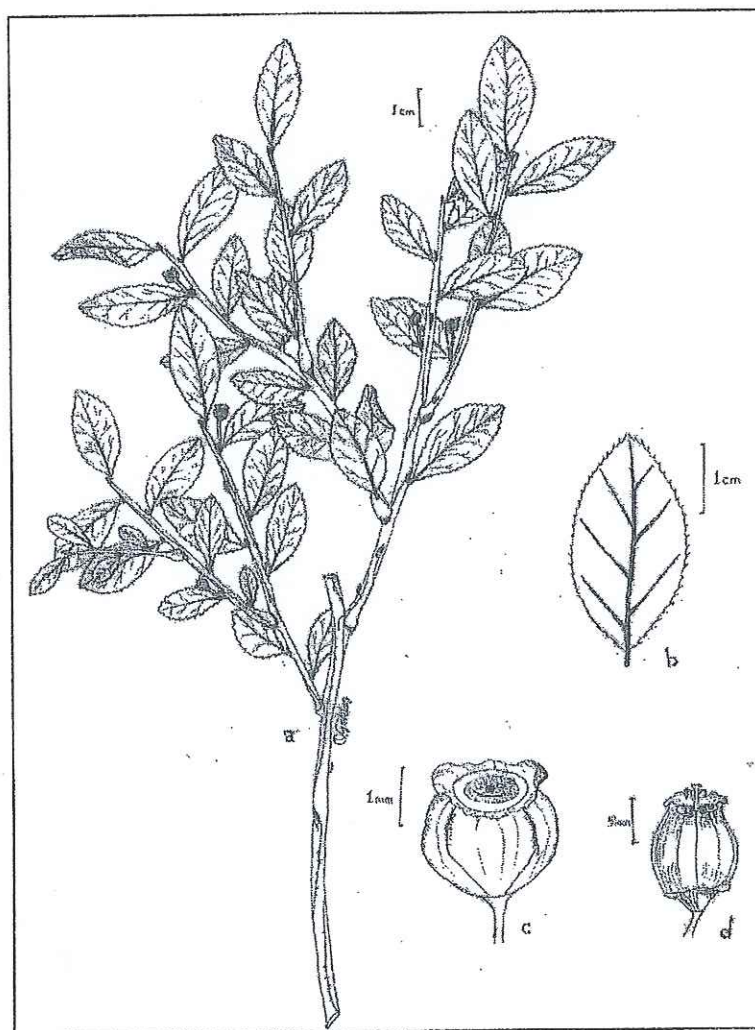


Fig. 2. *Vaccinium myrtillus* var. *artvinense* (from type).-a: Habit.-b: fruit.-c: flowers.-d: leaf



*Vaccinium myrtillus* L. var. *artvinense* Akpulat & Eminagaoglu is related to *V. myrtillus* L. Some of the taxonomic characters that distinguish *V. myrtillus* L. var.

*artvinense* from the related species of *Vaccinium* are given in table 1.

**Table.** Diagnostic characters of *Vaccinium myrtillus* var. *artvinense* and *V. myrtillus*

Characters	<i>V. myrtillus</i> var. <i>artvinense</i>	<i>V. myrtillus</i> var. <i>myrtillus</i>
Leaf size (mm)	15-35 x 10-20	19-27 x 7-11
Fruit diameter (mm)	3-4	7-9
Fruit colours	Dark purple, glaucous	Black, with a blue bloom

This new subspecies is clearly different from *Vaccinium myrtillus* in that it has smaller fruit 3-4 mm (not 7-9), larger leaf size 15-35 x 10-20 mm (not 19-27 x 7-11 mm) and leaf apices obtuse (not acute).

#### ACKNOWLEDGEMENTS

The authors would like to thanks to Oktay Göktaş for the illustration and to TUBITAK (199 O 061) for its financial support and to Zurab Manvelidze for his helping.

#### REFERENCES

1. Huxley, Anthony, ed. in chief. Mark Griffiths, ed. Margot Levy, managing ed. The New Royal Horticultural Society Dictionary of Gardening. 4 vols. // Stockton Press, New York, NY. Vol. 1, lviii, 1992, 815 pp.
2. LHBH [Liberty Hyde Bailey Hortorium]. Hortus third: a Concise Dictionary of Plantscultivated in the United States and Canada. 3rd ed. //: "MacMillan Publishing Co.", New York, 1976, 1290 pp.
3. Vander Kloet S.P. and Dickinson T.A. The Taxonomy of *Vaccinium* Section *Myrtillus* (Ericaceae) // Brittonia 51 (2), by The New York Botanical Garden Press, Bronx NY 10458-5126 U.S.A., 1999, pp. 231-254.
4. Kartesz, J.T., Kartesz, R.. A Synonymized Checklist of the Vascular Flora of the United States, Canada, and Greenland. Volume II: The biota of North America. Chapel Hill, NC // The University of North Carolina Press; in confederation with Anne H. Lindsey and C. Richie Bell, North Carolina Botanical Garden, 1980, 500 pp.
5. Odell, A. E., S. P. Vander Kloet, and R. E. Newell. 1989. Stem Anatomy of *Vaccinium* Section *Cyanococcus* and Related Taxa // Canadian Journal of Botany 67 (8):. Olson, S., M. A. Deyrup, and I. Deyrup-Olson, pp. 2328-2334, 1989.
6. Camp, W.H., On the Structure of Populations in the Genus *Vaccinium* // Brittonia 4 (2), G1942, pp. 189-204.
7. Camp, W.H., The North American Blueberries with Notes on Other Groups of *Vacciniaceae* // Brittonia 5 (3), 1945, pp. 203-275.
8. Stevens, P.F., *Vaccinium*. In Davis P.H. Davis (ed.). Flora of Turkey and the East Aegean Islands // Vol. 6, 1978, pp. 101-104.
9. Brummitt, R.K., Powell, C.E, Authors of Plants Names. Royal Botanic Gardens // Kew, ,1992, reprinted 1996, 732 pp.
10. IUCN Red List Categories and Criteria: Version 3.1, Prepared by the IUCN Species Survival Commission As approved by the 51st meeting of the IUCN Council, Gland, Switzerland, 9 February 2000, pp. 405-418, <http://www.canids.org/cap/Appendix2.pdf>