
Preface

Georgia, an ancient Christian country, occupies the central and southwestern parts of the Caucasus – an isthmus between the Black and the Caspian Sea. In the west, it is contiguous to the Black Sea, in the east to the intermountain depression of the River Mtkvari (=Kura) in the Caspian Lowlands (the Transcaucasian Depression), the northern border follows the high mountain tops of the Greater Caucasus, the southern one crosses the Lesser Caucasus (in the eastern part) and separates the Lesser Caucasus from the adjacent mountain ranges of northeastern Asia Minor. Politically, Georgia borders on the Russian Federation (to the north), Azerbaijan (to the east), Turkey (to the southwest) and Armenia (to the southeast). The borders have changed several times during the history of Georgia, especially in the earlier stages of the formation of the Georgian nation.

Kavkasioni, i.e. the Greater Caucasus range, rises up to 5,068 m (Mt. Shkhara, highest mountain within Georgia) and 5,633 m a.s.l. (Mt. Elbrus, in the Russian Federation), i.e. over 1,000 m above the eternal snow-line. Mountain passes at an altitude of 2,200–3,000 m a.s.l. were used as trade-routes from the earliest times. In the mountains of Kavkasioni, permanent settlements are found up to an altitude of 2,500 m a.s.l. Though the Lesser Caucasus mountains reach an altitude of 3,304 m a.s.l., there are no glaciers and no eternal snow.

The natural conditions of the so-called intermontane lowlands of Georgia, consisting of the Colchic Lowlands (adjacent to the Black Sea, in West Georgia) and the foothills between Kavkasioni (in the north) and the Lesser Caucasus (in the southwest), including the Mtkvari Valley (resp. Kura valley, in East Georgia), are favourable for settlement and mixed farming.

In the east, the Colchic Lowlands are surrounded by the Imeretian Elevation which connects the Greater Caucasus with the Lesser Caucasus. The highest part of it, the Surami range, divides the country into two major natural geographical regions: Eastern and Western Georgia, the first having been called Iberia and the latter Colchis by ancient Greek and Roman writers.

Diversity of climate and relief of Georgia has been highly important for its economic development since the early stages of human activities. Numerous rivers (more than 25,000), which promoted intensive agriculture, eliminated the need for irrigation systems, having proved so essential in the economy of the Ancient East (Egypt, Babylon). Besides, these rivers served as trade routes. Due to their rapid current, the rivers were used for transportation of timber (especially in Colchis).

Georgia is rich in various mineral resources. In the mountains of Georgia, copper was extracted, essential for non-ferrous metallurgy, which by that time reached a high level of development. Rich iron deposits prompted the progress of ferrous metallurgy. Magnetic sands along the Black Sea were of particular importance. Rivers, containing gold dust, were known during the Greek Epoch.

Vakhushti Bagrationi, the prominent Georgian historian and geographer of the eighteenth century, distinguished two botanical and agricultural zones within Georgia: the mountainous and the lowland one. Since the Neolithic Revolution, these two zones represented one closely integrated system. The lowlands were characterized by rich harvest of grain crops, vineyards and orchards. In the mountainous areas, the harvest of grain crops was much poorer, and vineyards and orchards were absent.

Georgia covers an area of 69,500 km². The population is 5.5 million (two third being Georgians). The Georgians call themselves 'kartveli' (sing.) and 'kartvelebi' (pl.), hence the name of the country in Georgian language is 'Sakartvelo'. The Georgian language belongs to the group of Kartvelian languages, included in the family of Iberian-Caucasian languages. It is suggested that the Georgian language is related to Anterior-Asian languages, the Basque language (the Basque country lies partly in Spain, in the northern part of the Iberian peninsula, close to the Pyrenees). Connections to the Indo-European languages, however, are uncertain. Written Georgian dates back to the third century B.C. (to the reign of king Parnavaz).

Christianity, adopted as the official religion in 337 A.D., promoted the unification of Georgia and the development of written Georgian language.

In ancient times, Georgian tribes were known as skilful farmers, cattle-breeders and metallurgists. Various archaeological discoveries, as well as ancient oriental and Georgian manuscripts testify to an early economical, social, and cultural development of the Georgian people. According to these data, the leading branches of economy of the country must have been: (1) agriculture (field crop cultivation, vine making, horticulture, vegetable growing, etc.); (2) cattle breeding; (3) domestic craft (weaving, woodwork, blacksmith work, textile production, pottery, ceramics, etc.). Georgians developed plough-land cultivation and various forms of irrigation (especially in the mountain areas) aiming to increase crop capacity of natural grasslands (2–3 harvests per season). Of the 16 species of wheat, 11 are represented in Georgia.

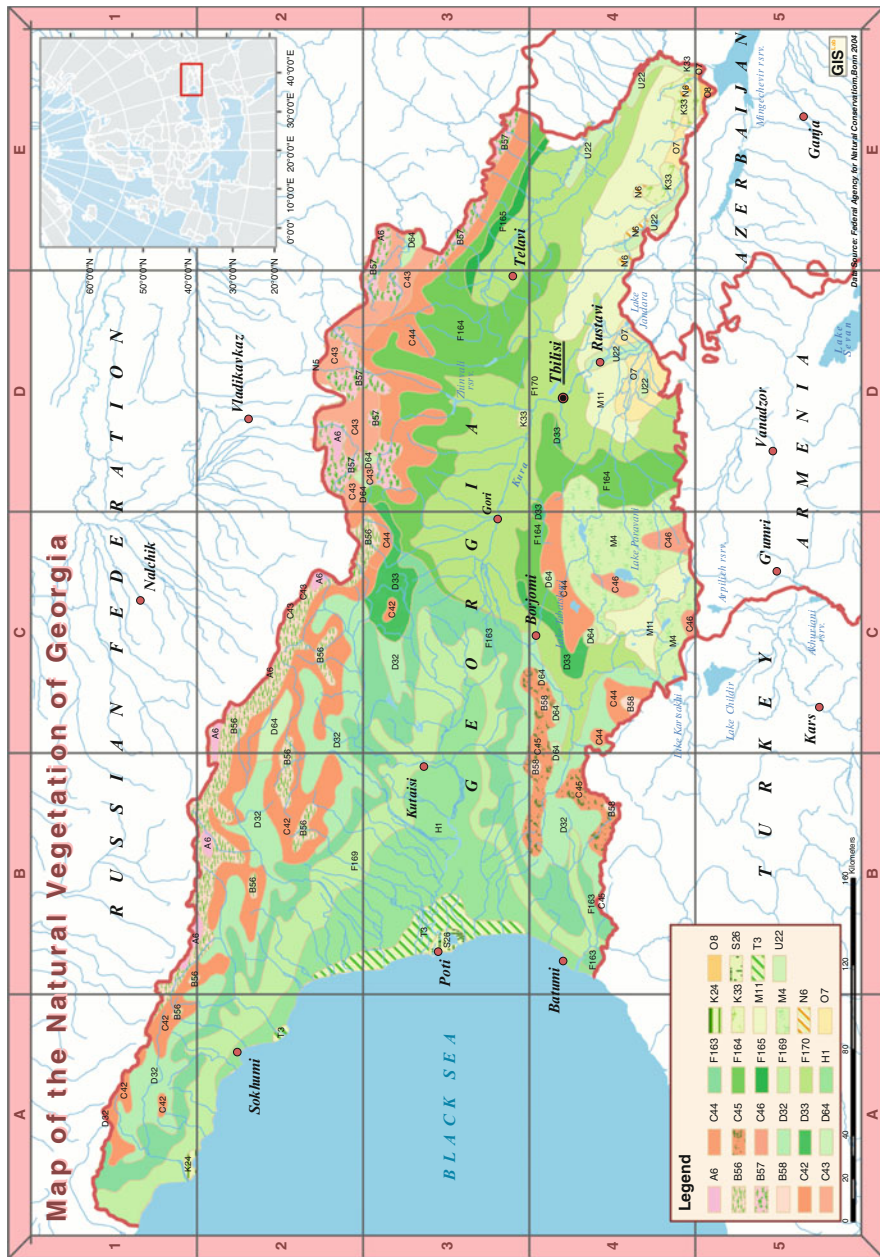
Ancient Georgian manuscripts and special medical books ('Karabadini') contain information on various herbs. The first serious scientific information concerning the vegetation of Georgia was given by Vakhushti Bagrationi (eighteenth century). According to several historical sources and notes of foreign travellers, the plants from different parts of Georgia and from other countries were cultivated in the park of Georgian kings in Legvta Khevi (now Botanical Garden of Tbilisi). In the eighteenth century, foreign scientists became interested in the extreme diversity of Georgian vegetation and flora. In 1852, on the basis of rich collections of Caucasian plants, the Caucasian Museum was founded. In the beginning of the twentieth century, all the branches of botanical science (anatomy, physiology, taxonomy, floristics, phytosociology, etc.) started to develop in Georgia. The

Institute of Botany, which belongs to the Academy of Sciences, was opened in 1933. The book *Vegetation of Georgia* by N. Ketskhoveli was published in 1935 and 1960. Long-standing expeditions to different parts of the Caucasus and of Georgia, as well as monographic studies of separate taxa served as a basis for the eight-volume *Flora of Georgia*. In 1971, the first volume of the totally revised second edition of *Flora of Georgia* appeared (16 volumes (1971–2011) have already been published so far). Key to Plants of Adjara by Dmitrieva (1959) and four volumes of the Flora of Abkhazia by Kolakovsky (1980–1986) are also worth mentioning here. Later, it was decided to publish *The Vegetation of Georgia* under the editorship of the present author (Nakhutsrishvili 1990–1991). A brief description of the vegetation cover of Georgia by R. Kvachakidze was published in 2009. The books *Forest Vegetation of Georgia* by A. Dolukhanov and *The History of Flora and Vegetation of Georgia* by I. Shatilova et al. were published in 2010 and 2011, respectively. Until its complete publication, the author of the present book decided to characterize briefly the main types of vegetation of Georgia and to publish it in English. This present publication bears a special purpose: During the 75-year period of isolation of the USSR and of Georgia in particular, it was not so easy for foreign scientists to get adequately acquainted with the interesting plant life of Georgia and to compare the Caucasian flora and plant communities with those of other countries. Today, Georgian botanists are collaborating with scientists from many other countries.

The Number of Plant Taxa

The flora of Georgia comprises about 4,150 species of vascular plants, of which 260 species are endemic, while the flora of the Caucasus comprises 6,350 species of vascular plants, of which 1,600 species are endemic.

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Expanded Legend

A6 Caucasian open vegetation of lichens and mosses (*Rhizoplaca chrysoleuca*, *Thamnolia vermicularis*, *Pohlia elongata*, *Dicranum elongatum*), with scattered vascular plants on rocky habitats (*Saxifraga ruprechtiana*, *Primula bayernii*) and on scree (*Cerastium kasbek*, *Delphinium caucasicum*, *Symphyloloma graveolens*, *Scrophularia minima*, *Lamium tomentosum*)

B56 West Caucasian alpine grasslands (*Geranium gymnocaulon*, *Nardus stricta*, *Festuca djimilensis*), calcareous rocks with *Geum speciosum*, *Carex pontica* and small herb communities (*Sibbaldia semiglabra*, *Ranunculus brachylobus*), alternating with shrub (*Rhododendron caucasicum*), rock and scree vegetation

B57 East Caucasian alpine grasslands (*Festuca varia* subsp. *woronowii*, *Nardus stricta*, *Carex tristis*, *Kobresia capilliformis*) with *Alchemilla elisabethae* and small herb communities (*Sibbaldia parviflora*, *Campanula biebersteiniana*), alternating with shrub, dwarf shrub (*Rhododendron caucasicum*, *Dryas caucasica*), rock and scree vegetation

B58 North Lesser Caucasian alpine grasslands (*Festuca varia* subsp. *woronowii*, *Nardus stricta*, *Carex tristis*, *Bellardiachloa polychroa*, *Scabiosa caucasica*) with *Agrostis lazica*, *Bromopsis variegata* and small herb communities (*Carum caucasicum*, *Campanula tridentata*) with *Gentiana pontica*, alternating with shrub (*Rhododendron caucasicum*), rock and scree vegetation

C42 Southwest Caucasian krummholz and open woodlands (*Betula litwinowii*, *Fagus orientalis*, *Acer trautvetteri*) with *Betula megrelica*, *Quercus pontica*, scrub (*Rhododendron caucasicum*) with *Rhamnus imeretina* (on carbonate rocks with *Coryllus colchica*), tall-forb communities (*Heracleum ponticum*) with *Delphinium pyramidatum* (on carbonate rocks with *Heracleum aconitifolium*, *Ligusticum arafloe*) and grasslands (*Calamagrostis arundinacea*, *Betonica macrantha*, on carbonate rocks with *Woronowia speciosa*, *Carex pontica*)

C43 Northeast Caucasian krummholz and open woodlands (*Betula litwinowii*, *Acer trautvetteri*, partly *Pinus kochiana*) with *Betula raddeana*, scrub (*Rhododendron caucasicum*, *Juniperus communis* subsp. *hemisphaerica*), tall-forb communities (*Heracleum sosnowskyi*, *Delphinium flexuosum*) and grasslands (*Festuca woronowii*, *Bromopsis variegata*), alternating with dry grasslands (*Festuca ovina*, *Carex humilis*)

C44 Southeast and Lesser Caucasian krummholz and open woodlands (*Betula litwinowii*, *Acer trautvetteri*, *Quercus macranthera*), scrub (*Rhododendron caucasicum*), tall-forb communities (*Heracleum sosnowskyi*, *Aconitum orientale*) and grasslands (*Festuca varia* subsp. *woronowii*, *Calamagrostis arundinacea*, *Geranium ibericum*)

C45 West Lesser Caucasian krummholz and open woodlands (*Betula litwinowii*, *Fagus orientalis*, *Acer trautvetteri*) with *Quercus pontica*, *Betula medwedewii*, scrub (*Rhododendron caucasicum*) with *Rhododendron ungerii*, tall-forb communities (*Ligusticum alatum*, *Milium schmidtianum*) with *Heracleum cyclocarpum*, *H. mantegazzianum* and grasslands (*Agrostis planifolia*, *Geranium platypetalum*) with *Euphorbia oblongifolia*, *Astragalus bachmarensis*)

C46 East Lesser Caucasian krummholz and open woodlands (*Quercus macranthera*, *Acer trautvetteri*, *Betula litwinowii*), scrub (*Juniperus communis* subsp. *hemisphaerica*, *J. sabina*), grasslands (*Festuca varia* subsp. *woronowii*, *Bromopsis variegata*, *Anemonastrum fasciculatum*) with *Trifolium bordzilowskyi*, partly tall-forb communities (*Milium effusum*, *Gagea orientalis*) alternating with dry grasslands (*Festuca ovina*, *Carex humilis*) with true steppes (*Festuca valesiaca*, *Stipa tirsia*, *S. pulcherrima*), partly with thorn-cushion mountain vegetation (*Astragalus aureus*)

D32 West Caucasian fir, spruce-fir and beech-fir forests (*Abies nordmanniana*, *Picea orientalis*, *Fagus orientalis*) with evergreen understorey *Rhododendron ponticum*, *Prunus laurocerasus*, *Ilex colchica*), often alternating with Oriental beech forests (*Fagus orientalis*)

D33 Caucasian fir, spruce-fir and beech-fir forests (*Abies nordmanniana*, *Picea orientalis*, *Fagus orientalis*) without evergreen understorey, partly alternating with Oriental beech forests (*Fagus orientalis*)

D64 Caucasian pine forests (*Pinus kochiana*), partly alternating with birch forests (*Betula litwinowii*, *B. raddeana*) and spruce forests (*Picea orientalis*)

F163 East Euxinian-Caucasian Oriental beech forests (*Fagus orientalis*) partly with *Picea orientalis*, mostly with evergreen understorey (*Prunus laurocerasus*, *Rhododendron ponticum*, *Daphne pontica*) with *Hedera colchica*, *Ilex colchica*, *Ruscus colchicus*

F164 Caucasian Oriental beech forests (*Fagus orientalis*) with *Carpinus C. caucasica* partly with *Picea orientalis*, without evergreen understorey partly alternating with oak-hornbeam forests (*Carpinus betulus*, *Quercus iberica*)

F165 East Caucasian submontane to montane hornbeam-maple-Oriental beech forests (*Fagus sylvatica subsp. orientalis*, *Acer velutinum*, *Carpinus caucasica*) with *Hedera pastuchowii* in combination with hornbeam-chestnut-oak forests (*Quercus iberica*, *Castanea sativa*, *Carpinus caucasica*)

F169 East Euxinian oak and hornbeam-oak forests (*Quercus iberica*, *Carpinus orientalis*, *C. caucasica*), alternating with hornbeam-chestnut-Oriental beech forests (*Carpinus caucasica*, *Fagus orientalis*, *Castanea sativa*) with evergreen understorey

F170 Transcaucasian oak forests (*Quercus iberica*), hornbeam-oak forests (*Quercus iberica*, *Carpinus caucasica*) and Oriental hornbeam-oak forests (*Quercus iberica*, *Carpinus orientalis*), with *Sorbus torminalis*, partly in combination with shibliak communities (scrub)

H1 Colchic lowland to submontane mixed oak forests (*Quercus imeretina*, *Q. hartwissiana*, *Zelkova carpinifolia*, *Carpinus caucasica*, *Castanea sativa*, *Fagus orientalis*) with evergreen understorey species (*Rhododendron ponticum*, *Prunus laurocerasus*), alternating with oak and hornbeam-oak forests (*Quercus iberica*, *Carpinus betulus*) in the submontane belt

K24 West Caucasian *Pinus pityusa*-forests with *Carpinus orientalis*, *Cistus creticus*, *Ruscus aculeatus*

K33 Transcaucasian colline-montane juniper open woodlands (*Juniperus polycarpus*, *J. foetidissima*), partly in combination with *Pistacia mutica* – open woodlands

M4 Transcaucasian altimontane herb-grass- and meadow steppes (*Stipa tirsia*, *S. pulcherrima*, *Festuca ovina*, *Carex humilis*, *Poa densa*, *Bromopsis variegata*, *Onobrychis altissima*, *O. transcaucasica*, *Aster ibericus*, *Scutellaria orientalis*)

M11 Pre- and Transcaucasian Stipa-steppes (*Stipa tirsia*, *S. pulcherrima*, *S. pontica*) with *Onobrychis transcaucasica*, *Botriochloa ischaemum* – steppes with *Onobrychis kachetica*, *Medicago coerulea*, *Polygala transcaucasica*, alternating with tomillares (*Thymus tiftsiensis*, *Scutellaria orientalis*) and thorn-cushion communities (*Astragalus denudatus*, *A. microcephalus*)

N6 East Transcaucasian thorn-cushion vegetation (*Astragalus caucasicus*, *A. microcephalus*, *Acantholimon lepturoides*, *A. fominii*) and tomillares (*Salvia garedji*, *Thymus tiftsiensis*)

O7 East Transcaucasian wormwood deserts (*Artemisia lerchiana*) with ephemeroids (*Poa bulbosa*, *Catabrosella humilis*)

O8 East Transcaucasian *Salsola nodulosa* and *Salsola ericoides* – deserts with ephemeroids (*Poa bulbosa*, *Catabrosella humilis*), with *Artemisia lerchiana*

S26 Colchic herb-rich tall sedge fens with *Carex acuta*, *Cladium mariscus*, *Ludwigia palustris* in combination with Sphagnum-mires (*Sphagnum austinii*, *S. papillosum*) with *Rhododendron luteum*, *Osmunda regalis*, *Rhynchospora caucasica*

T3 Colchic alder carrs (*Alnus barbata*) in combination with alluvial forests (*Alnus barbata*, *Fraxinus excelsior*, *Pterocarya pterocarpa*), tall reed vegetation (*Phragmites australis*, *Typha latifolia*) and sedge swamps (*Carex* spp.)

U22 Transcaucasian hardwood alluvial forests (*Quercus pedunculiflora*, *Ulmus minor*) in combination with poplar and willow alluvial forests (*Populus x canescens*, *P. nigra*, *Salix excelsa*) as well as *Tamarix ramosissima*-scrub

Source: The map is given according to Bohn et al. (2003), where the Caucasus part was prepared by D Bedoshvili, A Dolukhanov, M Ivanishvili, G Nakhutsrishvili, N Zazanashvili.



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