

Journal of Medicinally Active Plants

Volume 4
Issue 3 Vol 4 Issues 3-4

January 2015

Medicinal Plants Used in Traditional Medicine of the Caucasus and North America

Follow this and additional works at: <https://scholarworks.umass.edu/jmap>



Part of the [Plant Sciences Commons](#)

Recommended Citation

Mamedov, Nazim; N.P. Mehdiyeva; and Lyle E. Craker. 2015. "Medicinal Plants Used in Traditional Medicine of the Caucasus and North America." *Journal of Medicinally Active Plants* 4, (3):42-66.

DOI: <https://doi.org/10.7275/R51834DS>

<https://scholarworks.umass.edu/jmap/vol4/iss3/5>

This Review is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Journal of Medicinally Active Plants by an authorized editor of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

Journal of Medicinally Active Plants

Volume 4

Issue 3 Vol 4 Issues 3-4

December 2015

Medicinal Plants Used in Traditional Medicine of the Caucasus and North America

Nazim Mamedov

University of Massachusetts, Amherst, MA, mamedov@cas.umass.edu

N.P. Mehdiyeva

Institute of Botany, National Academy of Sciences, Baku, Azerbaijan

Lyle E. Craker

University of Massachusetts, Amherst, MA

Follow this and additional works at: <http://scholarworks.umass.edu/jmap>

Recommended Citation

Mamedov, Nazim, N.P. Mehdiyeva, Lyle E. Craker. 2015. "Medicinal Plants Used in Traditional Medicine of the Caucasus and North America," *Journal of Medicinally Active Plants* 4(Vol 4 Issues 3-4):42-66.

DOI: <https://doi.org/10.7275/R51834DS>

Available at: <http://scholarworks.umass.edu/jmap/vol4/iss3/5>

This Review is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Journal of Medicinally Active Plants by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

Medicinal Plants Used in Traditional Medicine of the Caucasus and North America

N.A.Mamedov^{1*}, N.P. Mehdiyeva² and L.E. Craker¹

¹Medicinal Plant Program, Stockbridge School of Agriculture, University of Massachusetts, Amherst, MA 01003, USA

²Institute of Botany, National Academy of Sciences, Baku, Azerbaijan

*Corresponding author: mamedov@cas.umass.edu

Date received: March 23, 2015

Keywords: Caucasus, flora, folk medicine, herbs, herbal remedies.

ABSTRACT

Medicinal plants and preparations derived from plants in the Caucasus and North America regions have for a long time been used for the treatment and prevention of virtually all human afflictions. Even today, countries and people of these areas continue to test and use plants as medicine. Indeed, the study and application of medicinal plants and plant extracts has formed the basis for treatment of several diseases, pain, and other afflictions. Research has revealed that many plants synthesize and accumulate natural constituents that have active physiological and psychological effects on the human body. A number of plant extracts that have been used as medicines over hundreds of years are constituents in most modern prescription drugs. The arrays of environments within the Caucasus Mountains and North America have produced a diverse flora with an assortment of medicinal properties. Due to curative powers, a number of these plant species continue to be used in folk medicines.

INTRODUCTION

Medicinal plants are an important source of medicines for use in traditional herbal remedies and in the development of modern pharmaceuticals. During the past 30 years, constituents from a number of plants have been used in the industrial development of chemotherapeutic drugs to treat human afflictions, such as cardiovascular diseases (Sokolov, 1994-1996; Sokolov and Zamotayev, 1987; Sachdeva and Bhatia, 1980), gastrointestinal problems (Sokolov,

1994-1996; Sokolov and Zamotayev, 1987; Imperato, 1991; Richardson, 1983), respiratory afflictions (Sokolov, 1994-1996; Sokolov and Zamotayev, 1987), and cancer (Roytta, M. et al., 1987). Indeed, approximately 25 percent of drugs used in medical treatments originated from plants (Sokolov and Zamotayev, 1987; Leung, 1980).

Flora of the Caucasus are very diverse with more than 6000 known species of higher plants (Shreter, et al., 1979). Among these plant materials, an estimated 1000 species have medicinal applications used in traditional folk medicines and approximately 180 species used in scientific medicine. Many of the species used in folk medicine plant materials can be used to supplement commercial pharmaceuticals (Tolmachev, 1980; Shreter, et al., 1979).

Plants with medicinal applications are spread widely across the Caucasus range in forests, steppes, semi-deserts, deserts, grasslands, rocky exposures, and as weeds in farm fields, orchards, and gardens (Gammerman, et al., 1970). Undoubtedly, the diversity of the natural environments in the Caucasus led to the diversity of plant species within the region, more than 600 of which are collected in the wild and about 300 of which are cultivated for medical use.

Among the flora of the Caucasus, several plants and plant extracts continue to be used in the folk medicine of China, India, Korea, Tibet, and other areas. Folk medicines remain popular due to their curative properties, family traditions, and a lack of available pharmaceuticals (Sokolov and Zamotayev, 1987). These plant-based folk medicines are used in home, veterinary practice, and homeopathic products

(Sokolov, 1985-1993). Country pharmacopoeias list a number of plant species for use as medicine (Aseyeva, et al., 1985; Gammerman and Kuznetzova, 1970; Gammerman, 1976; Samilina and Severtzova, 1999; Sokolov, 1985-1993; Sokolov, 1994-1996; Shreter, et al., 1979).

The current work was to develop an informational-analytical study of the chemical composition and areas of application of some species of medicinal plants in the flora of the Caucasus and North America in official and folk medicine.

The information-analytical analysis allowed us to identify 31 species of medicinal plants (Mehdiyeva, 2006, 2008). The particular interest is a comparative analysis of the spectrum of medical applications of these 31 species in the official and traditional medicine of, not only the Caucasus and North America, but also the medicine of different countries.

Family: Alliaceae J. Agardh - Onion family

One genera (*Allium* L.) with one medicinal species identified in this family.

Allium vineale L. Crow garlic – a perennial plant that reaches a height of 40 to 80 cm. The plant range covers Western, Eastern, and Southern Caucasus, growing in meadows, on grassy slopes, and among shrubs in the subalpine and alpine zone. The plant also grows as a weed in fields and vineyards (Sokolov, 1994-1996; Grossheim, 1939-1967).

Traditional medicine use. The aerial parts of *A. vineales* were used by native North Americans as an anthelmintic for children, antiseptic, diuretic, expectorant, laxative, and tonic. The underground parts were used for treatment of dyspnea and hypertension (Moerman, 1986).

Practical applications. An ointment made from underground parts is used for treatment of felons, paronychia, and tumors (Chen and Snyder, 1989; Hartwell, 1967-1971). The above ground parts are used in food (Sokolov, 1994-1996).

Family: Asteraceae L. - Aster family

Six genera (*Ambrosia* L., *Arctium* L., *Cirsium* Hill, *Inula* L., *Leucanthemum* Hill, *Onopordum* L.) with seven medicinal species identified within the family.

Ambrosia artemisiifolia L. Common ragweed – an annual weed plant that reaches a height of 20 to 200 cm. Introduced from North America, the plant covers two regions of the Caucasus, Azerbaijan, and Georgia, growing in the foothills, among crops, along roads, ditches, and waste places (Sokolov, 1985-1993).

Traditional medicine use. The aerial parts of *A. artemisiifolia* were used for therapeutic purposes by native North Americans. In the traditional medicines of early settlers, the aerial parts of *A. artemisiifolia* were used as an astringent for dysentery, antipyretic, anthelmintic, and to induce menses. The plant was also used externally as an antiseptic, poultice, and emollient in the treatment of tumors (Hartwell, 1967-1971; Millspaugh, 1976).

Pharmacological applications. Aerial parts of the plant contain an essential oil. The roots, leaves, and pollen contain sesquiterpenoids. Anti-testicular atrophy and antibacterial action have been experimentally proven (Matz, et al., 1987; Farnsworth, et al., 1975). The collective sum of the sesquiterpenoids in the plant has prodistocidic action (Vichkanova, et al., 1971); psilostachine and dihydroparthenoid exhibit cytotoxic activity against nasopharyngeal carcinoma (Gorayev, and Sharipova, 1983; Jakhangirova and Serkerov, 2007; Chubunidze, et al., 1984). The pollen is an allergen, causing hay fever with symptoms of asthma (Ado, 1978; Millspaugh, 1976).

Arctium lappa L. Greater burdock – a biennial plant that reaches a height of 60-150 cm. The plant covers all areas of the Caucasus, growing along rivers, stream banks, waste areas, roadsides, housing, and especially in the middle mountain and subalpine zones.

Traditional medicine use. The aerial parts and roots of *A. lappa* in the traditional medicine of Russia and a vine infusion of the aerial parts are used for treatment of hemorrhoids and alopecia (Shreter, 1975). In Chinese medicine, a decoction of the aerial parts and the leaves were used as a diuretic and a complex mixture with other herbs to treat the hemorrhages, syphilis, and leprosy. The plant was also used as external treatment for skin diseases and inflammation of the mucous membranes of the

genitals. The fruit were included in prescriptions along with other plant materials for treatment of cancer, diabetes, hyper-tension, and nephritis (Tolmachev, 1980; Bazon and Aseyeva, 1984; Minayeva, 1978; Sokolov, 1985-1993; Sokolov, 1994-1996; Surina, et al., 1974.). In traditional Georgian medicine, the plant fruit are used as an antitumor agent (Sokolov, 1994-1996; Khelaya, 1987). Conversely, the roots of the plant are used in folk medicine.

Pharmacological applications. The presence of biologically active substances in the plant determines the therapeutic effect. Experimentally, the aerial parts have a tonic and an antitumor effect (Balitzki and Vorontzova, 1982; Trutneva, et al., 1971). Linarin, isolated from the aerial parts, has antiulcer, akatsetin – antispasmodic, and antiherpetic action. All the flavonoids exhibit antiviral and antibacterial activity (Vichkanova, et al., 1977; Sokolov, 1985-1993; Rendyuk, 1978; Sheluto, 1972). In homeopathy, the plant is used as a tonic, diuretic and wound-healing agent (Hoppe, 1975). The plant is poisonous and therefore must be used with caution.

Cirsium vulgare (Savi) Ten. Spear Thistle – a biennial weed plant that is 40-150 cm in height. The range of the species, similar to the previous one, covers all areas of the Caucasus. The plant grows along river valleys, thickets, meadows, wastelands, rocky slopes, roads, and houses. The species is also a weed, growing at altitudes of up to 1700 m above sea level (Sokolov, 1985-1993).

Folk medicine use. In folk medicine, the most commonly used portion of the plants include the aerial parts and roots. In traditional medicine of the indigenous populations of North America, an infusion and decoction of the aerial parts of *C. vulgare* were used for rheumatism, cancer, hemorrhoids, and bad breath (Moerman, 1986).

In Germany, the aerial parts of this plant are used internally for diarrhea (Hoppe, 1975). In traditional medicine of Russia and Poland, the plant is used internally and in the form of baths for neuroses in children and intestinal colic (Sokolov, 1985-1993; Paluch, 1984). In Tajik folk medicine, the aerial parts are used topically as a wound-healing agent (Dadabayeva, 1972).

Pharmacological applications. Aerial parts exhibit

antibacterial activity (Sokolov, 1985-1993; Palade, et al., 1974).

Inula helenium L. Elecampane – a perennial plant that is 60-250 cm tall. The plant is distributed in all regions of the Caucasus and grows in forests, meadows, steppe slopes, forest clearings, along the banks of mountain rivers and lakes, orchards and fields at an altitude of 570-2000 m above sea level (Sokolov, 1985-1993).

Traditional medicine use. Aerial parts, rhizomes and roots are used for medicinal purposes. In folk medicine of the Caucasus and other former Soviet republics, a decoction, an infusion and a tincture of the rhizomes and roots of *I. helenium* are commonly used in wound healing and as an expectorant, hemostatic, sedative, choleric, diuretic, diaphoretic, anthelmintic, and as a treatment in the diseases of the gastrointestinal tract, diarrhea, diabetes, jaundice, rheumatism, arthritis, malaria, cystitis, ascites, goiter, boils, carbuncles, septic wounds, itching dermatoses. A decoction of the rhizomes is used as an analgesic and for scabies, in powder form – for venous ulcers (Akopov, 1981; Alekperov, 1998; Aliyev, 1998; Kim, et al., 1986; Ladinina and Morozova, 1990; Minayeva, 1970; Khalmatov, 1984; Sokolov, 1985-1993; Zvik, 1988; Shantzer, 2004). Roots, leaves and flowers are used in folk medicine for the treatment of cancer (Smirnova and Kisileleva, 2007).

In folk medicine of North America, a decoction of the aerial parts is used for colds, fevers and typhoid. An infusion is typically used for lung diseases. A decoction of the rhizomes and roots is often utilized as a treatment for pulmonary tuberculosis, and flatulence, and as an expectorant and diuretic. The plant may be applied topically as a poultice for rheumatism and arthritis (Moerman, 1986). In folk medicine of Canada, the rhizomes and roots are used for angina, herpes fever, and headache (Arnason, 1981).

In traditional medicine of Azerbaijan, an infusion of the leaves and inflorescences is used as an expectorant in bronchitis, acute respiratory diseases, and pulmonary tuberculosis (Damirov, 1983). In folk medicine of Abkhazia, a decoction of the leaves and inflorescences is used in respiratory diseases, hypoxia, asthma, jaundice, ascites, and scabies (Sokolov, 1985-1993).

In the folk medicine of North America and

Kyrgyzstan, a decoction of the leaves is used as a diuretic and infusion for pulmonary tuberculosis. Dry leaves are used to treat asthmatic children and fresh leaves are applied for erysipelas, ulcers and tumors (Plekhanova and Lugovskaya, 1981; Moerman, 1986; Sokolov, 1985-1993).

Pharmacological properties. The experimental data. Wide range of pharmacological activity of *I. helenium* is associated with the presence of a large number of biologically active substances. Research results confirm the antibacterial, antifungal, antiprotozoal, fungistatic activity (against fungi - dermatophytes) of the extract of the rhizomes, roots, sum of sesquiterpenoids, and some essential oil components (alantolacton, izoalantolaktion) (Vichkanova, et al., 1971; Vichkanova, et al., 1977; Zinchenko, 1983; Kitanov and Bacheva, 1981; Sokolov, 1985-1993; Rimkene, 1986; Rubinchik, et al., 1976). Experimentally, the research showed that an extract of the rhizomes and roots exhibits antitumor and antiviral activity against influenza virus A (PP) and has insecticidal properties (Manolova and Maksimova, 1988; Sokolov, 1985-1993). Scientists believe that the anti-inflammatory action of rhizomes and roots is due to the essential oil, which has antiseptic (cystitis and urethritis) and anthelmintic properties (Shreter, 1972; Kowalewska and Lutomski, 1978).

Application in official medicine. *I. helenium* has been used in herbal medicine for many years. The roots and rhizomes of the plant are officinal. In scientific medicine, a decoction of the roots and rhizomes is used as an expectorant and disinfectant in acute and chronic respiratory diseases and flu. Alanton is a drug containing sesquiterpenoids sum and is prescribed for gastric ulcer, duodenal ulcer, and erosive gastritis (Kluyev and Babayan, 1979; Maskovski, M. D. 1985-2002; Sokolov and Zamotayev, 1987; Obolentzeva, et al., 1988). In modern allopathic practice, a decoction of the rhizomes and roots is recommended for internal use for neuroses, epilepsy, diabetes, atherosclerosis, diseases of the stomach, pancreas, liver, and gallbladder. Inhalation is prescribed for acute respiratory infections. In a mixture with fish oil and Vaseline, the plant is used topically for polyarthritis (Sokolov, 1981; Blinkov, 1983; Pashinski, 1988). A decoction is also used in gynecology, particularly in algodismenoree, amenorrhea, for the prevention of

preterm birth, and for the hypomenstrual syndrome. The infusion with honey can serve as a fortifying tonic for pregnant women (Korkhov, et al., 1987; Volyn, 1978; Mikhaylenko, 1987). In dentistry, the plant is used with periodontitis, catarrhal, and ulcerative gingivitis-stomatitis (Chekman, 1981). The infusion, decoction, and the juice of fresh leaves are used in practical medicine for improving the condition of diabetics (Kim, et al., 1986).

Leucanthemum vulgare Lam. Oxeye daisy – the perennial plant is 15-80 cm tall. The habitat covers all areas of the Caucasus and grows sparsely or in groups in meadows, forest glades, scrublands to the middle mountain zone (Sokolov, 1985-1993).

Traditional medicine use. The aerial parts of the plant are for medical purposes. In the traditional medicine of Russia, an infusion and decoction of the aerial parts are used orally as an anti-inflammatory, antispasmodic, sedative, laxative and in the treatment of coliti, and stomachalgia. The plant is also used during gastric and intestinal colic, chronic constipation, hemorrhoids, scrofula (Bluz, 1984; Galkin and Kazakov, 1980; Gammernan, 1976; Damirov, et al., 1983; Sokolov, 1985-1993), pulmonary tuberculosis, respiratory infections, fever, enuresis, headache, toothache, helminths, and neurosis (Sokolov, 1985-1993; Rubtzov, 1980).

Folk medicine use. In folk medicine of North America, the plant was used as an antipyretic, tonic, and for skin diseases (Moerman, 1986). In the Caucasus, the inflorescence and flowers are used as antispastic (Sokolov, 1985-1993).

Externally, the species is used in the form of baths and douches to treat scrofula, women's diseases, and eye diseases (Zavrazhnov, et al., 1977; Sokolov, 1985-1993). Powdered leaves mixed with animal fat are used for scabies and skin diseases. Inflorescences and flowers decoction are used as a diuretic, wound healing agent, and for treatment of gonorrhea (Sokolov, 1985-1993).

Pharmacological applications. The experimental data. Flowers contain various biologically active substances. The concept that leaves have a hemostatic effect was established experimentally (Kim and Turchin, 1986; Sagarshvili, et al., 1980;

Sagareishvili, et al., 1983).

Onopordum acanthium L. Cotton thistle – the biennial plant is 30-200 cm tall. The species is common throughout all the regions of the Caucasus and is considered as a weed. The species grows individually, in groups in forest clearings, steppe slopes, waste dumps, waste lands, fields, and in the gorges at altitudes up to 2100 m above sea level (Sokolov, 1985-1993).

Traditional medicine use. The aerial parts and roots of plant are used for medicinal purposes. The aerial parts of *O. acanthium* have been used as an emetic by the peoples of North America and in Tibetan medicine (Moerman, 1986; Sokolov, 1985-1993).

Folk medicine. In Russian folk medicine, a decoction of the aerial parts is used orally as an expectorant, anti-asthmatic, and diuretic to treat nervousness, tetanus, and carcinomas. The plant is also utilized externally in baths for gonorrhea. Juice and powder are used topically for scabies, dermatoses ulcers, and tuberculosis cutis (Kushnir, 1984; Sokolov, 1978; Sokolov, 1985-1993; Petkov, 1982; Bhattacharyya, 1980).

Aerial parts have long been used in folk medicine to treat various tumors. The plant is also effective in the rehabilitation period (after cancer surgery) in malignant tumors, skin cancer, scrofula, and purulent skin diseases (Ladinina and Morozova, 1990; Sokolov, 1985-1993). An infusion and a decoction of the aerial parts are useful in diseases of the gallbladder, respiratory infections, and for hemostasis (Akopov, 1981; Khalmatov, 1984; Hoppe, 1975). An infusion of aerial parts is helpful to the diseases of the kidneys and the bladder (Sokolov, 1985-1993).

Bulgarian phytotherapists prescribe *Onopordum acanthium* as a tonic which may stimulate the central nervous system (Petkov, 1982). In Bulgaria and France, a decoction of the roots is considered effective for lung diseases and hypo-secretion of the stomach. As an astringent (Sokolov, 1985-1993; Petkov, 1982), the plant helps treat metrorrhagia, uterine cancer, paralysis, and rheumatism. Topically (as an ointment), the plant is used for itching dermatoses (Sokolov, 1985-1993).

In the Caucasus and Bulgaria, the leaf juice of

Onopordum acanthium is widely used for long-term healing of purulent wounds, ringworm of the scalp, and abrasions (Aleksperov, 1998; Petkov, 1982). The infusion of leaves and flowers helps treat edema of various etiologies (Sokolov, 1985-1993). Decoction from the flowers has wound-healing properties in the form of lotions, which may also be used in treating eye diseases (Petkov, 1982).

Pharmacological applications. The experimental data. Various biologically active substances are found in the aerial parts of *O. acanthium*, which determine the pharmacological properties. According to microbiologists, the sum of sesquiterpenoids has a protistostatic effect and exhibits antibacterial activity (Bluz, 1984). Researchers established that the infusion of the aerial parts has cardiogenic and hemostatic properties, increasing the tone of smooth muscles (Tolmachev, 1980; Michnik, 1989; Sokolov, 1985-1993; Karl, et al., 1976).

Family: Athyriaceae Aist. - Lady fern family

One genus and one medicinal species were identified in this family.

Cystopteris fragilis (L.) Brittle blade fern – a perennial plant, 6-40 cm in height is distributed from lowlands to alpine zones in all regions of the Caucasus and grows on rocks, screes, placers, rivers and in shady coniferous forests (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. The roots and leaves of the fern are used medicinally. In folk medicine of the indigenous populations of the United States, South Africa, and India, a decoction of the roots was used as an anthelmintic (Sokolov, 1994-1996; Shreter, 1972). The leaves are used in the United States for diseases of the chest, and as a tonic, emollient, expectorant and febrifuge (May, 1978).

In folk medicine of Russia, particularly in the Crimea, the leaves are used for intestinal diseases. However, in the Urals, the plant is used as an analgesic during physical exertion and for smoking as a treatment of asthma (Rubtsov, 1971; Sokolov, 1994-1996).

Pharmacological properties. Studies have determined that an aqueous and alcoholic extract of the rhizomes and leaves exhibits bacteriostatic

activity (Stetzenko, et al., 1984). In veterinary medicine, the fresh leaves are effective topically for poultices and as a decoction when taken orally for dislocation of the shoulder joint in horses (Sokolov, 1994-1996).

Family: Berberidaceae Juss. - Barberry family

One genus and one medicinal species were identified in this family.

Berberis vulgaris L. European barberry – the shrub may grow up to 2.5 m and is distributed in the Northern part of the Caucasus. The plant grows on forest edges, bush land, mixed and deciduous forests, rocky slopes, and from lowlands to the middle mountain zone (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. Roots, the bark, branches, leaves and fruits are all used in medicine. In the Caucasus, a fruit decoction is used as a diuretic and for malaria (Damirov, et al., 1983; Umikov, 1973). In Russian folk medicine, an infusion of the roots is used for colds, stomach diseases, scurvy, antipyretic, and diaphoretic. The broth may treat fever, diseases of the eye and mouth, tuberculosis, pleurisy and increases appetite (Sokolov, 1985-1993). Furthermore, the leaves are used to treat cancer (Smirnova and Kisileva, 2007); roots and the bark are recommended to treat gout, rheumatism, liver disease, gallstones, jaundice, and inflammation of the kidneys and bladder. Barberry fruits are used for high blood pressure. A decoction of the roots can be used as medicine in healing female genital system diseases (Ladinina and Morozova, 1990).

In folk medicine of Belarus, the fruits are used for hypertension (Sokolov, 1985-1993). In China, Mongolian and Tibetan medicine is used to treat tuberculosis, diseases of the mucous membranes of various organs, and as a diuretic (Sokolov, 1985-1993). In Indian medicine, the roots are used as a laxative and antiseptic to treat general weakness, scarlet fever, and mental disorders (Sokolov, 1985-1993). The roots may also be formed into a tonic.

Pharmacological applications. The experimental data. The content of alkaloids in all parts of *B. vulgaris*, determines the pharmacological properties. In addition, literature indicates that alkaloids isolated from the

root bark of *B. vulgaris* have antibacterial activity; berbamin and oxiacantin have hypotensive action; berberine and yatorritsin have a tonic effect on the smooth muscles of the intestine; and chlorides of columbamine and palmatine have antiprotozoal activity. Azerbaijani scientists discovered that the preparation from the bark of the branches is effective in treating post-partum bleeding. An alcoholic extract of the bark and branches is very potent and contains a sum of alkaloids possessing sympathicotropic properties (Aliyev, 1998; Damirov, et al., 1975). In India, the infusion made from bark of the branches is considered to be a useful tonic. When Berberin bisulfate is isolated from leaves, *B. vulgaris* has choleretic properties. A tincture prepared from the leaves causes the contraction of smooth muscles of the uterus and vasoconstriction, accelerating blood clotting, and resulting in a moderate choleretic effect (Sokolov, 1985-1993). Animal studies have also found an antispasmodic action of the leaves. Evidence indicates the purple leaves of *Berberis* sp. are a source of vitamin E (Sokolov, 1985-1993).

The Azerbaijani scientists provided evidence that the fruits are very effective in the treatment of diabetes (Damirov, et al., 1975). Additionally, an infusion prepared from the fruits may be used as an antibacterial, sedative, and hypotensive (Sokolov, 1985-1993).

Application in officinal and practical medicine. *B. Vulgaris* roots have been historically classified as an officinal medicine in the United States and are used to treat dysentery and gastric diseases (Krochma and Krochmal, 1975). In the practical medicine of the U.S., root bark extracts are prescribed for hemorrhoids and the gall bladder (Yordanov, et al., 1970). Meanwhile, phytotherapists of Bulgaria prescribe a tincture of the roots for kidney disease, gout, rheumatism, and lumbago (Yordanov, et al., 1970).

Some literature describes how the bark of the common barberry roots is effective for treating liver, stomach, and throat tumors (Hartwell, 1967-1971). In obstetric practice, *B. vulgaris* leaves are used for atonic postpartum hemorrhage, subinvolution of the uterus, and during inflammation provoked bleedings (Maskovski, 1985-2002). In homeopathy, *B. vulgaris* root bark is also used to treat metabolic disorders, kidney disease, gout and hemorrhoids (Kiseleva, et al., 2002; Mehdiyeva, 2009).

Family: Betulaceae S.F.Gray - Birch family

One genus and one medicinal species were identified in this family.

Corylus avellana L. Common hazel – the shrub is approximately 2-5 m tall and rarely reaches 7-9 m in height. The habitat includes all areas of the Caucasus, such as river banks, lakes, thickets, and in mixed deciduous forests (especially comprised of oak, hornbeam, beech and lime). Occasionally, the plant forms thickets (Sokolov, 1985-1993; Grossheim, 1939-1967). The wood, bark, leaves, fruits, fruit oil and pollen are all used in medicine.

Use in folk medicine. In the Caucasus, the bark is used as an astringent for dysentery and antipyretic. *C. Avellana* acts as a decoction of the roots for malaria, while the broth and fruit powder may be used for colitis (Alekperov, 1998; Sokolov, 1985-1993). The leaves help treat intestinal diseases (Eristavi, 1971). The fruit oil is very effective in cholelithiasis. Furthermore, when the plant is combined with honey, rheumatism and anemia may be treated (Sokolov, 1985-1993).

Native Americans used the bark of *C. avellana* in the form of a patch and fruit oil to treat tumors (Sokolov, 1985-1993; Sokolov, 1994-1996). An ointment may also be derived from leaves and have the ability to treat cancer (Hartwell, 1967-1971). In Russian folk medicine, the leaves of hazel are used as a decoction for anemia, vitamin deficiency, and rickets (Alekseyev and Yakimova, 1975). The literature also contains data on the use of hazelnut oil fruits to treat ascariasis (Alekseyev, 1977; Damirov, et al., 1983).

Pharmacological properties. Scientific studies revealed that the essential oil and other constituent parts of the cortex have a vasoconstrictor effect. Alcoholic extracts and alkaloids isolated from the leaves exhibit antibacterial activity (Yordanov, et al., 1970; Sokolov, 1985-1993).

Application in practical medicine. A liquid called "L-2 forests" obtained by dry distillation of the wood is used to treat various skin diseases, such as eczema, neurodermatitis, streptococcus, psoriasis, and dermatophytosis. Bark infusion is prescribed for varicose veins and varicose ulcers. A decoction of the leaves may also help cure prostatic hypertrophy (Yordanov, et al., 1970; Sokolov, 1985-1993). In veterinary

medicine, pollen is used as an effective treatment against diarrhea (Sokolov, 1985-1993).

Family: Capryophyllaceae Juss. - Carnation family.

One genus and one medicinal species were identified in this family.

Cerastium holosteoides Fries or *C. caespitosum* Golib Common mouse-ear – a perennial plant, approximately 10-30 cm in height, is distributed throughout the Caucasus. Frequently, *C. holosteoides* grows in meadows, bushes, along river banks, shingles, weedy places, and across mountain belts (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. In North America, the roots are used in the treatment of malignant tumors (Hartwell, 1967-1971).

Family: Euphorbiaceae Juss. - Spurge family

One genus and one medicinal species were identified in this family.

Euphorbia maculata L. Spotted spurge – an annual plant, 10-20 cm in height, has a habitat covering the regions of Azerbaijan and Georgia. The general distribution includes Western Europe and North America. The plant grows up to the middle mountain belt, throughout weedy places, along roads, and sea shores.

The milky sap is used in the United States and Mexico as an anti-carcinogenic and to destroy warts (Hartwell, 1967-1971).

Family: Fabaceae Lind L. Leguminosae Juss.- Bean family

Three genera and three medicinal species were identified in this family.

Amoria repens L. C. Presl. *Trifolium repens* L. Dutch clover – a perennial plant, 10-40 cm in length, is distributed in all regions of the Caucasus. The plant frequently grows in wet meadows, along streams, ditches, gravel, and to the top of mountain belts (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. The aerial parts and roots are primarily used for medicinal purposes. In the folk medicine of Russia and Ukraine, aerial parts of *A.*

repens are applied topically for treatment of felons, an infusion is used to treat bronchial asthma, headaches, and dizziness. The plant is also used as a general tonic, analgesic, antitoxic, diuretic and wound-healing agent. In Siberia, a water-alcohol tincture of the inflorescences and flowers is used in epilepsy, hernia, pulmonary tuberculosis, gynecological disease, colds, gout, poisoning, suffocation, and externally, as an anti-inflammatory poultice and paronychia (Sokolov, 1985-1993).

In the United States, aerial parts of *A. repens* are prescribed as an anti-carcinogenic in the form of compresses and ointments. In Germany, the aerial parts are used for gynecological diseases. The inflorescence and flowers treat rheumatism, gout and glands tumors (Sokolov, 1985-1993; Hoppe, 1975).

The experimental data. The aerial parts of *A. repens* have a strong P-vitamin activity, are bactericidal with respect to mycobacteria, and have a vasoconstriction effect (Sokolov, 1985-1993).

Trifolium pratense L. Red clover – a perennial plant, 20-50 cm tall, has a habitat covering all the areas of the Caucasus. The plant grows in meadows, grassy slopes, woods, gravel, and the subalpine zone (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. The roots and aerial parts of the plant are used in folk medicine.

The people of Caucasus used the infusion of the aerial parts of *T. pratense* for the treatment of gynecological diseases. The tincture of flowers is used to treat gout and poisonings. The water-alcohol tincture may treat pulmonary tuberculosis, gynecological problems, and hernias. Flowers are used externally as a wound-healing agent as well as paronychia, ear and eye diseases (Sokolov, 1985-1993).

The U.S. and UK utilize a decoction externally in the form of patches, compresses, and poultices prescribed for malignant tumors (Hartwell, 1967-1971). For example, the aerial parts of *T. pratense* are prescribed as an anti-sclerotic for headaches and dizziness. The plant is also used as an antiseptic, antiscorbutic, anti-rickets, astringent, antimalarial, and diuretic agent. Boiled roots are useful for hernias, inflammation of the appendages and as an antitumor agent (Sokolov, 1985-1993; Smirnova and Kisileleva, 2007). Fresh leaves that are

used externally have hemostatic and wound-healing effects. Decoctions of the leaves are used topically and are effective for abscesses, burns, an antitumor agent, emollient, anti-inflammatory and as an analgesic agent. In folk medicine, the roots, leaves, aerial parts, and inflorescences are used to treat cancer (Ladinina and Morozova, 1990; Volyn, 1978; Smirnova and Kisileleva, 2007).

Pharmacological properties. The pharmacological activity of *T. pratense* is associated with the presence of a large number of biologically active substances. Scientific studies found that alcohol precipitated a fraction of the aqueous extract, which inhibits the growth of malignant tumors in rats (Sokolov, 1985-1993; Frainshtat, et al., 1980). The sum of flavonoids collected from the aerial parts has anti-atherosclerotic action and delays the development of hypercholesterolemia (Dorofeyenko, 1975; Kameoka, et al., 1977).

Vicia angustifolia Reichard Common vetch – Annual plant, 15-80 (90) cm tall. The species is distributed in all the regions of the Caucasus, up to the middle mountain zone. The plant grows in meadows, bushes, and as a weed in crops (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. Native Americans primarily used the plant as an analgesic agent for headache (Moerman, 1986).

Pharmacological properties. Researchers determined that the leaves are active against yeast cells (Sokolov, 1985-1993).

Castanea sativa Mill. Chestnut – a tree up to 30-35 m in height and 1.5-2 m in diameter with a wide spreading crown. The range of the plant includes the Caucasus, Western, Eastern and Southern Transcaucasia. The plant grows in deciduous forests, mainly on the northern slopes at altitudes of 800-1800 m above sea level and forms groves along the canyons and mountain valleys (Sokolov, 1985-1993; Grossheim, 1939-1967). The leaves, fruits, the pollen and the peels of *C. sativa* are used in medicine.

Use in folk medicine. In the Caucasus folk medicine, the fruit is used as a diuretic and boiled for dyspepsia. Fruit oil is also used for medical purposes.

The cupule is used as an astringent (Aleksperov, 1998; Sokolov, 1985-1993; Umikov, 1973). Information about the use of the pollen of *Castanea sativa* for stagnation in the liver, prostatitis and varicose veins is found in literature. Pollen also regulates blood circulation and improve the composition of blood (Kayas, 1975).

Pharmacological properties. The aqueous extract of *Castanea sativa* has antibacterial activity. Preparations of leaves have tonic, astringent and styptic properties. The species is used to treat fever and malaria during strong coughs of varying origin, respiratory diseases and rheumatism (Sokolov, 1985-1993).

Use in official medicine. *Castanea sativa* leaves are officinal in the U.S. and are used in homeopathy (Sokolov, 1985-1993).

Family: Hypericaceae L. -St. John's wort family

One genus and one medicinal species were identified in this family.

Hypericum perforatum L. St. John's wort – a perennial plant 30-100 cm in height that is distributed in all regions of the Caucasus. The plant grows in forests, shrubs, meadows, rocky slopes, subalpine meadows, mountain forests, steppes, crops, up to the medium, but rarely on the upper mountain zone (Sokolov, 1985-1993; Grossheim, 1939-1967). The aerial parts may also be used in medicine.

Use in folk medicine. St. John's wort has been used to treat external wounds for over a thousand years. The first information about the healing properties of *H. perforatum* was found in the works of Hippocrates, Theophrastus, Paracelsus, Phapius, and Abu Ali Ibn Sina (Avicenna) (Sokolov, 1985-1993).

In Azerbaijan, the aqueous extract of *H. perforatum* is used inside for light and medium forms of diabetes. Infusion of flowers used internally for intestinal disorders, such as an analgesic for pain in the abdomen and a tonic and sedative for diseases of the nervous system (Aleksperov, 1998; Damirov, et al., 1983).

In North America, the plant is used for wound healing (Sokolov, 1985-1993). In traditional Indian medicine, *H. perforatum* is commonly used for treatment of snakebite wounds (Sokolov, 1985-1993).

In French folk medicine, the plant is widely used for burns (Sokolov, 1985-1993). In folk medicine of Bulgaria, the species has long been used for increased gastric acidity, gout, sciatica, rheumatism, hemorrhoids, nocturnal enuresis in children, diarrhea and nervous disorders (Sokolov, 1985-1993). On the British Isles, the plant is used for lesions of the skin and as an anthelmintic (Vickery, 1981). In traditional medicine of Russia, the juice from the aerial parts of *H. perforatum* are used to treat asthma, colds, gastric and duodenal ulcers. An aqueous infusion is also used for the prevention of scurvy (Nikolayev, 1979; Sokolov, 1985-1993; Shantzer, 2004). St. John's wort is used in folk medicine for the treatment of cancer (Smirnova and Kisileleva, 2007). In folk medicine of Lithuania and Ukraine, an infusion of *H. perforatum* is used for the treatment of cancer of the liver, stomach, ovaries, and goiter (Sokolov, 1985-1993). In Moldova, the infusion is used in chronic colitis, and tincture for gingivitis and stomatitis. For Uzbek folk medicine, the ash of the plant in cottonseed oil is used to prepare an ointment for the treatment of skin diseases (Sokolov, 1985-1993).

According to previous studies, leaves of *H. perforatum* heal wounds, malignant ulcers, and have a diuretic effect. Infusions made from the flowers are used orally for coughs, dyspnea, ascites, congestive heart failure, and externally, for the treatment of rheumatism (Sokolov, 1985-1993). Emulsions are often used for treating burns, pityriasis leg ulcers (Churolinov, 1979), gastric ulcer, and duodenal ulcers. The fruits are used as an emollient, laxative, and for the antibacterial activity (Ladinina and Morozova, 1990;). In veterinary practice, *H. perforatum* is used as anthelmintic agent (Sokolov, 1985-1993).

Pharmacological properties. The experimental data. *H. perforatum* pharmacological activity is due to the presence of a large number of biologically active substances such as flavonoids, alkaloids, essential oils, vitamins C and E, coumarins, tannins, saponins, nitrogen compounds, phenols, phenol carboxylic acids, catechins, and anthraquinones. Scientific studies suggest that 10% broth has bacteriostatic properties against dysentery bacteria.

According to experimental data, infusions and extracts of the aerial parts stimulate the heart and increase blood

pressure. Researchers determined that the volatile fraction and the juice have protistocidic and bacteriostatic properties, and an acetone extract of the ripe pericarp has a bacteriostatic effect on *Staphylococcus*, *Streptococcus*, *Salmonella* and *Shigella* (Kitanov and Bacheva, 1981; Sokolov, 1985-1993).

Application in official medicine. St. John's wort is one of the most popular medicinal plants. The plant is GRAS and is included in the pharmacopoeias of many countries. In the former USSR, a drug named Novoimanin was developed from the plant. The species was prescribed topically for treatment of infected wounds, burns, abscesses, ulcers, pioderminis, mastitis, rhinitis, pharyngitis, and sinusitis (Kluyev and Babayan, 1979). In the form of aerosols, the plant was used for pneumonia and pneumoempyema (Maskovski, 1985-1988). Furthermore, the species has a positive effect in the treatment of pulmonary tuberculosis and tuberculous laryngitis. (Sokolov, 1985-1993). St. John's wort also has the ability to lower blood pressure and treats acute catarrh of the upper respiratory tract.

A medication made in Czechoslovakia named "Florists" is used for the treatment of gynecological diseases (Matzku and Kreicha, 1981). In Romania and Poland, St. John's wort is used for neurasthenia, neuralgia, wound healing, and as a haemostatic. In France, the plant is used for stimulating the activity of the heart, tissue regeneration, and as a diuretic. In Germany, a drug with a tonic effect was produced with the assistance of St. John's wort (Maskovski, 1985-1988; Sokolov, 1985-1993).

In homeopathy, *H. perforatum* is prescribed for acute pains of neuralgic character and nerve trauma. Lastly, St. John's wort may be used in the treatment of thrombophlebitis and venous leg ulcers (Kiseleva and Tzvetaeva. 2002; Sokolov, 1985-1993).

Family: Juncaceae Juss. - Rush family

One genus and two medicinal species were identified in this family.

Juncus bufonius L. Toad rush – an annual plant that is 10-50 cm tall and is distributed in all regions of the Caucasus. The plant may be found on sandbanks along rivers, ditches, fields, damp and shady areas (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. The aerial parts of the plant are used in medicine. In North America, these portions are used orally as a means of stimulating the central nervous system, as a diuretic, and externally as a lotion for skin diseases (Moerman, 1986). In Tibetan medicine, the aerial parts of *J. bufonius* are believed to be useful in obstetric practice for women's diseases. In folk medicine of Russia (Siberia), the plant is used as a diuretic in nephrolithiasis, a laxative, analgesic agent, and as a lactogenic (Grinevitch, 1990; Sokolov, 1994-1996). In the Caucasus, the fruits of *Juncus bufonius* are used in ascites, diarrhea and metrorrhagia (Sokolov, 1994-1996).

The experimental data. The protistocidic activity (Fruentov, 1987; Williams and Harborne, 1975) of this plant is associated with the presence of carotenoids, flavonoids and steroids in the above-ground parts of the plant.

Juncus effusus L. Soft rush – a perennial plant 50-100 cm in height. The habitat covers all the areas of the Caucasus. The plant grows in bogs, marshy meadows, river banks, and in ditches from the lowlands up to the subalpine zone (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. The aerial and underground parts of the plant are used for therapeutic purposes. A decoction of the aerial parts of *Juncus effusus* is used in North America to increase salivation. Additionally, the plant contributes to infusion in the form of lotions, which are used for disorders of the musculoskeletal system in children (Moerman, 1986).

In Japanese medicine, *J. effusus* aerial parts are used for gonorrhea (Shreter, 1975). In traditional medicine of Russia (Far East), an infusion of the aerial parts of this plant is used as an analgesic, diuretic for urolithiasis and nephritis, and disurethric phenomena. A decoction of the core of the stems is utilized for pleural effusion, respiratory diseases, and urolithiasis. Applications are typically applied to ulcers and boils. The underground parts of the plant are effective as a diuretic and a haemostatic agent (Shreter, 1975; Bhattacharyya, 1980; Mody, et al., 1982).

In the Caucasus, the underground parts and flowers of *J. effusus* are used in the form of infusions as a diuretic for nephrolithiasis, dysuria, ascites,

diarrhea, and metrorrhagia (Sokolov, 1994-1996). In homeopathy, a tincture from the underground parts is used in diseases of the kidneys, urinary tract, and gall stones (Shreter, 1975).

Family: Lamiaceae Lindl - Mint family

One genus and one medicinal species were identified in this family.

Stachys palustris L. Marsh woundwort – a perennial plant 60-110 cm in height. The weed is distributed in all regions of the Caucasus. The plant grows in forests, forest edges, wet meadows, river banks, and among the bushes. The aerial parts and the roots are used in medicine (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. In folk medicine of the Caucasus, the leaves of *S. palustris* are used as a wound-healing agent, treatment of sore throat, and scrofula (Sokolov, 1985-1993). In traditional medicine of Russia, *S. palustris* has a wide and diverse application. Aerial parts of the plant are an effective sedative during hysteria, epilepsy, and hyperkinesis. The plant is also used as a choleric, anti-toxic, anti-exudative, anti-inflammatory, and diuretic. An infusion of the aerial parts is used to treat hypertension, heart failure, stroke, fainting and flatulence (Zavrazhnov, et al., 1977; Sokolov, 1985-1993). Grass is also used for the treatment of cancer (Smirnova and Kisileleva, 2007).

Pharmacological properties. The experimental data. The spectrum of *S. palustris*' pharmacological activity is believed to be due to the presence of a large number of biologically active substances. Research indicates that the extract of the flavonoids sum and phenol carboxylic acids has sedative and hypotensive properties (Sokolov, 1985-1993; Frumentov, 1987; Maly, 1985). The volatile fraction exhibits antibacterial activity. The results of research showed that the liquid extract has inflammatory properties due to the α -adrenolytic and myotropic action (Sokolov, 1985-1993). Scientists also discovered that the aerial parts exhibit antihypoxic activity in various forms of hypoxia. The extract also results in nematocidal and antifungal activity (Sinyudina, et al., 1990).

Experimentally, researchers noticed that a decoction,

tincture, and extract of *S. palustris* possess antidiabetic properties (Barnaulov, 1989). Experiments in rats and mice showed that the aboveground part of plant has hepatoprotective properties (Rumyantzeva and Gudivok, 1993).

Use in practical medicine. In modern medical practice of Western Europe, *S. palustris* is used as a wound healing agent and in the U.S. as an antispasmodic, emetics and dysmenorrhea (Sokolov, 1985-1993).

Family: Orchidaceae Juss. - Orchid family

Four genera and four medicinal species were identified in this family.

Corallorhiza trifida Chatel Yellow coralroot – a perennial plant 10-30 cm tall that is distributed in two regions of the Caucasus (Azerbaijan and Armenia). The plant grows in damp shady forests and scrublands in the middle and upper mountain belt (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. Above ground and underground parts of the plant are used in medicine. Native Americans used the aerial parts of *Corallorhiza trifida* as a diaphoretic and sedative (Shreter, 1975).

In traditional medicine of Russia (Far East), an infusion of the aerial parts is used as an antihypertensive and rheumatic. The underground parts are used as a sedative, antipyretic and for fevers (Sokolov, 1994-1996; Frumentov, 1987; Shreter, 1975).

Cypripedium calceolus L. Lady-slipper orchid – a perennial plant 20-50 cm tall with a range covering two areas of the Caucasus: Azerbaijan and Armenia. The plant grows in sparse forests, shrubs, and forest meadows (Sokolov, 1994-1996; Umikov, 1973).

Use in folk medicine. Aboveground and underground parts of the plant are used in medicine. In North America, the aerial parts of this plant are used for pulmonary tuberculosis and scrofula (Moerman, 1986). The underground parts are utilized in the treatment of kidney disease, women's diseases, diabetes, respiratory infections, headache, and fatigue. The plant is used as an antispasmodic, antipyretic, and anthelmintic (Lawler, 1984; Moerman, 1986). In folk medicine of Russia (Far East, Transbaikalia), an infusion of the aerial parts of *C.*

calceolus helps treat epilepsy, headaches, and metrorrhagia (Fruentov, 1987). The plant contributes to a broth for neuroses in children, jaundice, and gastritis. The plant is often used as a diuretic and antispasmodic. In Transbaikalia and Tibetan medicine, the aerial parts are considered very useful for women's diseases, gonorrhea (Khundanova, et al., 1979), and as a diuretic and cordial. According to research, underground parts of the plant act like *V. officinalis* L., which is a sedative and analgesic (Sokolov, 1994-1996; Samarin, et al., 1976; Fruentov, 1987; Schmalle and Hausen, 1979).

In Mongolian medicine, researchers believe that the above-ground parts are effective in hypertension and blood diseases. Conversely, the flowers are more effective in treating anuria by normalizing the activity of the kidneys and are also used as a cardiac (Khaidav, et al., 1985).

Goodyera repens (L.) R. Br. Dwarf rattlesnake plantain – a perennial plant, 8-35 cm in height that covers all areas of the Caucasus and can be found in coniferous and mixed forests in the middle and upper mountain belt (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. In folk medicine of North America, the aerial parts are used orally for the diseases of the stomach, bladder, kidneys, eyes, women's diseases, scrofula, and to improve appetite. Externally, the plant is used for detoxification of snake bites (Lawler, 1984; Moerman, 1986). In folk medicine of Russia (Far East), the plant is used as an emollient and antiscorbutic (Shreter, 1975).

Orchis fragrans (Pollini) L. Show orchis – the perennial plant that grows 30-50 cm in height located in the Caucasus is only distributed in Talysh (Azerbaijan). The plant grows in the coastal strip of the Lankaran lowland thickets (Sokolov, 1994-1996; Grossheim, 1939-1967). The underground parts of the plant are used in the United States as a means of stimulating the central nervous system (Lawler, 1984).

Family: Phytolaccaceae R.Br. - Pokeweed family

One genus and one medicinal species were identified in this family.

Phytolacca americana L. American pokeweed –

the perennial plant grows 1-3 m tall. In the Caucasus area, the habitat spans across the Western, Eastern, and Southern Transcaucasia. The plant is an adventive species from North America, growing near roads, dwellings, and forms thickets (Sokolov, 1985-1993; Grossheim, 1939-1967). Aerial parts and roots of the plants are typically used in medicine.

Use in folk medicine. In folk medicine of North America, Mexico, Cuba and some European countries, *P. americana* is used to treat a variety of tumors (Hartwell, 1967-1971). In the folk medicine of the Caucasian, the roots are used as an emetic, antirheumatic, and treatment of syphilis. Aerial parts are used for skin diseases, fever, and as a laxative (Sokolov, 1985-1993).

Pharmacological properties. Interestingly, pharmacological tests exhibit preparations containing fitolaccsin. The plant also depresses the central nervous system and stimulates the respiratory center. Research results show that saponins of the plant act against amoebas in vitro; the essential oil of the roots has fungistatic activity against *Microsporon lanosum* in vitro; and the aerial parts have antibacterial activity. A tincture of fresh roots in a 1:10 dilution is included in the preparations "Merifit", "Anginol", which also contain the infusion of the leaves. The treatments are used for diseases of the vocal cords, tonsillitis, and pharyngitis. The drug "Akofit" is used for radiculitis (Gammerman, 1976; Sokolov, 1985-1993).

Application in official medicine. Preparations from *P. americana*. The plant is officinal in Japan and is included in the British Pharmacopoeia. Fitolaccin is used in rheumatism, syphilis, and in cholagogue (Sokolov, 1985-1993). In the United States, practical medicine, *P. americana* is used as a purgative and for skin diseases (Sokolov, 1985-1993; Woo, 1974). In homeopathy, the aerial parts are used in the treatment of diphtheria (Millsaugh, 1976), and preparations of fresh roots are used for laryngitis, sore throat, for the treatment of vocal cords, rheumatism, sciatica, and diphtheria (Sokolov, 1985-1993).

Family: Plantaginaceae Juss.-Plantain family

One genus and one medicinal species were identified in this family.

Plantago ovata Forssk Desert Indian wheat – an annual or biennial plant that is 3-20 cm tall. The plant

grows only in eastern Caucasus on dry sand and debris slopes (Sokolov, 1985-1993; Grossheim, 1939-1967). The seeds of this plant are used in medicine.

Use in folk medicine. In the Caucasus, *Plantago ovata* seeds are used for conjunctivitis (Sokolov, 1985-1993).

Use in traditional medicine. In Russia, the seeds are believed to be useful as an effective wound healing agent (Vulf and Maleeva, 1969). In Indian medicine, the seeds are to be useful against diarrhea, for gonorrhea, hemorrhoids, kidney, and bladder diseases (Leung, 1980). The literature contains information on the appointment of *P. ovata* seeds for rheumatism, respiratory infections, bacillary and amoebic dysentery (Vulf and Maleeva, 1969; Sokolov, 1985-1993). In the United States and Western Europe, the plants are appointed as a laxative for chronic constipation, sedation and emollient (Leung, 1980).

Family: Poaceae Barnhart-Grass family

Two genera and two medicinal species were identified in this family.

Hordeum glaucum Steud Smooth barley – the annual plant grows 13-80 cm tall and is considered a weed. The species grows from the lowlands to the lower and middle mountain zones in all areas of the Caucasus. The plant is a part of the semi-desert ephemeric flora, occurring at roadsides, pastures, along the edges of crops, in waste places, dry meadows, and coastal sands (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. Native Americans used the plant for diseases of the blood (Moerman, 1986). In folk medicine of the Caucasus, this species is used for diarrhea and as an antitumor agent (Alekperov, 1998; Grossheim, 1939-1967).

Setaria pumila (Boir.) Schult Yellow foxtail – an annual plant, 4-50 cm in height that grows in all regions of the Caucasus. The species grows in fields, plantations, along roadsides, in settlements, on river sands, gravels, in the woods, and up to the middle mountain zone (Sokolov, 1994-1996; Grossheim, 1939-1967).

Use in folk medicine. In North America, the aerial

parts are used for skin diseases and the fruits are edible (Moerman, 1986).

Family: Rosaceae Juss.-Rose family

One genus and one medicinal species were identified in this family.

Geum allepicum Jacq. Common avens – a perennial plant, 20-80 cm tall. Except for Dagestan, the plants are distributed in all regions of the Caucasus, growing along river banks, in sparse forests, forest edges, grassy slopes, along roads, in housing, and up to the middle mountain zone (Sokolov, 1985-1993; Grossheim, 1939-1967).

Use in folk medicine. The aboveground and underground plant parts are often used in treatments. In Tibetan medicine, individuals believe that the aerial parts of *G. allepicum* are used for tachyarrhythmia and gynecological diseases (Sokolov, 1985-1993; Khundanova, et al., 1979). In traditional medicine of Russia (Siberia), a decoction of the aerial parts is used for dizziness, sore throat, malaria, insomnia, and as a hemostatic, antipyretic. The plant, which also grows in the elevated areas, is effective for gastrointestinal diseases (Sokolov, 1985-1993), hepatitis, kidney disease (Zvik, 1988), the dermatitis, and scrofula. In the traditional medicine of Nanai people, the plant is topically applied to treat pyoderma (Vostrikova, et al., 1974). A decoction of the plant leaves was used by Native Americans as a veterinary medicine for horse spasms, cramps, and colic (Millspaugh, 1976; Moerman, 1986).

In the folk medicine of Russia, the leaves are used for the treatment of respiratory diseases, bruises, tumors, abscesses, and stomatitis (Fruentov, 1987). The flowers have antipyretic, laare, choleric, anti-emetic, and tonic effects. Flowers also used in the production of decoctions, infusions, tinctures and, powders that are used in treatment of liver diseases, gall bladder problems, hemorrhoids, nocturnal hyperhidrosis, and to strengthen labor (Sokolov, 1985-1993).

Native Americans use the decoction of the underground parts against convulsions, false croup, and pneumonia. Rhizomes infusion assembly with other plants can treat vomiting (Moerman, 1986). In Tibetan medicine, rhizomes are used for diarrhea (Sokolov,

1985-1993).

Decoction and tincture in folk medicine in Russia is used as hemostatic, antipyretic, astringent, laxative, securing, analgesic and anticonvulsant (Akopov, 1981; Sokolov, 1985-1993). This species has been widely used internally for rheumatism, scrofula, rickets, and epilepsy (Grinevitch, 1990). Externally, the plant is used for infected wounds and ulcers (Fruentov, 1987).

Family: Viburnaceae Rafin. - Water elder family

One genus and one of medicinal plant were identified in this family.

Viburnus opulus L. Guelder rose – this shrub grows to a height of 4 m within a habitat that covers most areas of the Caucasus. The plant, singly or in small groups, flourishes in undergrowth on the edges of forests, river valleys, lake shores, marshes, cliffs, canyons, lower and middle mountain zones, (Sokolov, 1985-1993).

Use in folk medicine. The fruit, bark, inner bark and roots are used in medicine. Native Americans used a decoction of the roots for respiratory infections in children, for kidney diseases, to regulate the heart, and as a tonic for women during childbirth. A decoction of the bark was used as an analgesic, laxative, for fevers, and laryngitis. The plant is given to obese people that have difficulty breathing. An infusion lotion made from the bark is considered helpful for diseases of the eye (Moerman, 1986).

In Russian folk medicine, the fruit is used for psoriasis (Sokolov, 1991), and (in complexes) for thrush in children (Loyevski, 1991). A decoction of the bark is used for respiratory diseases, women's diseases, as a sedative, haemostatic, and anticonvulsant for the neuroses, hysteria, and epilepsy. The species also treats hypertension, acts as a contraceptive, and is used externally as an antiseptic. A decoction of the leaves and fruits is used locally during dermatomycosis of the scalp (Zavrazhnov, 1977; Ladinina and Morozova, 1990; Sokolov, 1985-1993). In traditional medicine of Russian, the fruit juice is used for cancer treatment (Smirnova and Kisileleva, 2007).

Pharmacological properties. The experimental data. Research results indicate that the aqueous extract of the bark is active against the Herpes virus (Smirnova

and Kisileleva, 2007; Shapiro, 1989) and acts as an antihypoxic agent for the treatment of hypoxia (Pastushenkov and Lesiovskaya, 1991). Viburnin, which is isolated from the bark, has cardiotonic, vasoconstrictor, analgesic, haemostatic, and antiseptic properties. The species also increases diuresis (Turova and Sapozhnikov, 1984). The plant has a 10% leaf infusion, a liquid extract and a hypotensive, sedative and hemostatic effect. Fruit juice in the experiment exhibits antibacterial activity against the agent of dysentery and anthrax and bactericidal activity against the pathogen of European foulbrood. Phytoncides, isolated from the leaves have antibacterial properties, exhibit protistocidal, and show antibacterial activity (Sokolov, 1985-1993).

Application in official medicine. Bark of *V. opulus* is officinal raw material. The plant's extract is a hemostatic in metrorrhagia (Maskovski, 1985-2002).

In practical medicine, a bath of barks decoction is effective in pseudo-furunculosis in children (Yagodka, 1991). When experiencing complications, the bark decoction is used in treatment for bronchial asthma (Tovstukha, et al., 1991). The broth and the bark extract are used against menorrhagia, menopause (Mikhaylenko, et al., 1987; Sokolov, 1985-1993), inflammatory and hemostatic hemorrhoids, and diseases of the gastrointestinal tract (Sokolov and Zamotayev, 1987). Infusion of the bark is prescribed as a sedative and hypotensive agent in the neuroses, hysteria, epilepsy, and hypertension (Sokolov, 1985-1993). The species can be used for complex treatment of diabetes (Kim and Turchin, 1986) in the form of irrigation and drops. Inhalation may also be used for chronic catarrhal IOI acute rhinitis and for the prevention of acute tonsillitis, laryngitis, and traheobronhite (Sokolov, 1983). Fresh fruits in the form of an infusion are used as a tonic, diaphoretic, laxative, edema of cardiac, renal origin, hypertension, nervousness, gastritis, colitis, liver diseases, and dermatitis (Sokolov, 1985-1993; Sokolov and Zamotayev, 1987).

Viburnum fruit are recommended for people working in conditions of radiation and living in territory contaminated with radionuclides (Kevra, 1993; Boiko-Alaux, et al., 1988). Fruit juice is effective in vasculitis and impetigo (Yagodka, 1991). Poultices are used for treatment of breast cancer (Molchanov, et al., 1992)

and broth for menorrhagia (Korchan and Kulzemza, 1992). In homeopathy, the essence of the bark is prescribed for dysmenorrheal and as an antispasmodic (Sokolov, 1985-1993). In veterinary medicine, the bark and fruits of *Viburnum* sp. are used for FMD (Chikov, 1989).

Analyses indicate the majority of studied medicinal plant species in the flora of the Caucasus and North America contain flavonoids, carbohydrates, steroids, alkaloids, phenol carboxylic acids, vitamin C, tannins, and fatty oils (Figure 1). A significant number of species also contain saponins, coumarins, anthocyanins, and essential oils. The species with the lowest number of constituents primarily contain sesquiterpenoids, nitrogen and sulfur compounds, polyacetylene compounds, carotene, and other chemicals.

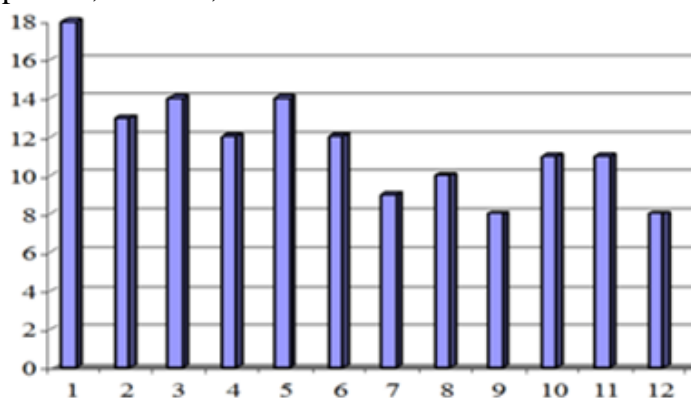


Figure 1. Biologically active constituents in medicinal plants: 1-Flavonoids; 2-Alkaloids; 3-Carbohydrates; 4-Phenol carboxylic acid; 5-Steroids; 6-Vitamin C; 7-Coumarins; 8-Saponins; 9-Anthocyanes; 10-Tanins; 11-Fatty oil; 12-Essential oil

The above content described biologically active compounds that determine the therapeutic effect of these medicinal herbs. Therefore, in the analysis, we grouped the plants used in folk and official medicine according to their therapeutic properties. The analysis indicated that the majority (45.16%) of medicinal plants exhibit a diuretic effect.

A significant portion of the plants (19.36-32.26%) can be utilized as a sedative, tonic, anti-inflammatory, laxative, diaphoretic, wound-healing, hemostatic, analgesic, anti-spasmodic, expectorant, anthelmintic, and antibacterial agent. A smaller number of species are characterized by antineoplastic, antiseptic, emollient, analgesics, bracing, cholagogue, vasoconstrictors, sedatives, and other radioprotective properties (Figure 2).

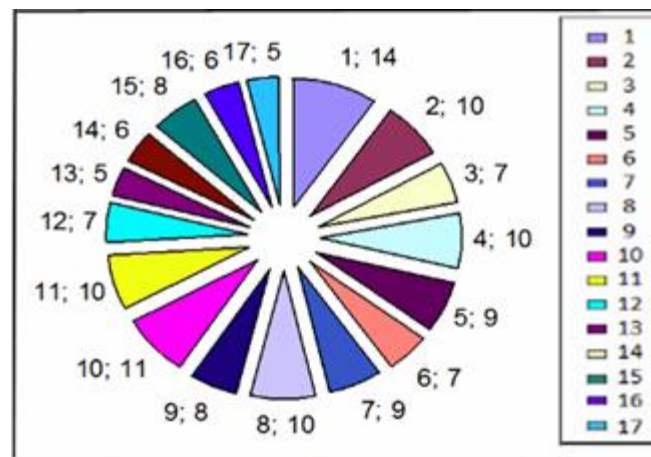


Figure 2. Quantitative allocation of medicinal plant species by biological activity. 1-diuretic; 2-sedative; 3-hemostatic; 4-tonic; 5-laxative; 6-diaphoretic; 7-antipyretic; 8-anti-inflammatory; 9-astringent; 10-antibacterial; 11-anthelmintic; 12-analgesic; 13-antitumor; 14-expectorant; 15-wound healing; 16-spasmodic; 17-antiseptic.

An analysis of the biological effects allows grouping of plants arbitrarily in accordance with their most important pharmacological actions (Figure 3). The majority of the medicinal plants (35.48-41.94%) are used for skin diseases, rheumatism, gastric and women's diseases. Smaller portions of the species (22.58-29.03%) are used for treatment of malignant tumors, scrofula, kidney diseases, tumors and hemorrhoids. The smallest portions of plants (16.13%) are used for liver diseases, diarrhea, intestinal diseases, septic wounds, neurosis, and other medical problems.

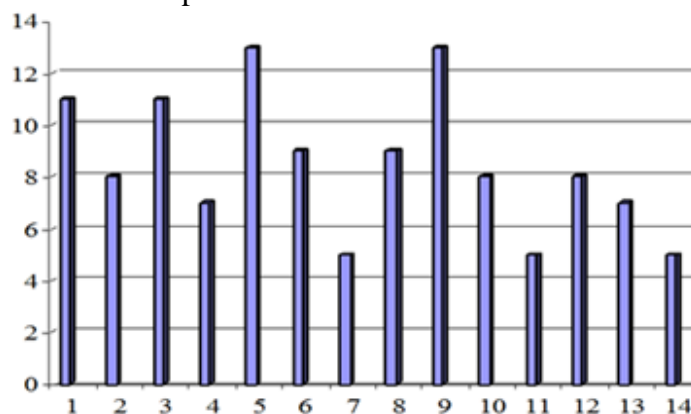


Figure 3. Quantitative allocation of medicinal plant species by therapeutic groups: 1-stomach; 2-kidney; 3-female; 4-liver; 5-rheumatism; 6-malignant tumors; 7-intestinal; 8-scrofula; 9-dermal; 10-tumor; 11-septic wounds, ulcers; 12-hemorrhoids; 13-diarrhea; 14-neurosis.

CONCLUSIONS

In folk and official medicine, the most commonly used parts of the plant include the above ground parts (grass - 21 Flowers - 13 leaves - 13 species) and the roots (9 species).

Analysis in the course of this study demonstrates that the majority of species represented contain flavonoids, carbohydrates, steroids, alkaloids, phenol carbonic acids, vitamin C, tannins, fatty oils, saponins, coumarins, anthocyanins, and essential oils. During the study, researchers discovered that the main types of therapeutic actions of the species studied are diuretic, sedative, tonic, laxative, antipyretic, anti-inflammatory, antibacterial, and anthelmintic.

The informational-analytical study analyzes the chemical composition and the range of applications of some species of medicinal plants in the flora of the Caucasus and North America in official and folk medicine. Investigating the plants of different countries allows scientists to predict their possible value when searching for new therapeutic agents with the desired biological activity.

ACKNOWLEDGMENT

The authors thank Dr. M. Getia from the Institute of Pharmacochimistry in Tbilisi, Georgia for valuable consultations during preparation of this paper.

REFERENCES

(Please note, the original references are in the native language, the starred * references are an English translation of the original).

Адо, А.Д. 1978. Общая аллергология. 2-е изд. М. 464 с.

*Ado, A.D. 1978. *General Allergology*, 2nd ed. Moscow. 464 p. (in Russian).

Акопов, И.Э. 1981. Кровоостанавливающие растения. Ташкент, 296 с.

*Akopov, I.E. 1981. *Styptic Plants*. Tashkent. 296 p. (In Russian).

Алекперов, Ф.У. 1998. Письменные источники X-XVIII вв. об охране здоровья в средневековом Азербайджане: Автореф. дис. ... д-ра истор. наук. - Баку, - 390 с.

*Alekperov, F.U. 1998. *Knowledge about Health in Medieval Manuscripts of Azerbaijan in 10th -18th*

Centuries. Abstract of Ph.D. Thesis in Historical Sciences. Baku. 390 p. (in Russian).

Алексеев, Б.Д. 1977. Растительные ресурсы Дагестана. Махачкала, 100 с

*Alekseyev, B.D. 1977. *Plant Resources of Daghestan*. Makhachkala. 100 p. (in Russian).

Алексеев, Г.А., З.П. Якимова. 1975. Лекарственные растения на территории Чувашии. Чебоксары, 229с.

*Alekseyev, G.A. and Z.P.Yakimova. 1975. *Medicinal Plants in the Territory of Chuvashiya*. Cheboksari. 229 p. (in Russian).

Алиев, Н.И. 1998. Лекарственные растения Азербайджана и фитотерапия. – Баку: Элм, 343 с.

*Aliyev, N.I. 1998. *Medicinal Plants of Azerbaijan and Phytotherapy*. Elm. Baku. 343 p. (in Russian).

Arnason, T., R.J. Herda, and T. Johns. 1981. Use of Plants for-food and Medicine by Native Peoples of Eastern Canada. *Can. J. Bot* 59(11):2189-2325.

Асеева, Т.А., К.Ф. Блинова, Г.П. Яковлев. 1985. Лекарственные растения тибетской медицины. Новосибирск: Наука, -160 с.

*Aseyeva, T.A., K.F. Blinova, and G.P.Yakovlev. 1985. *Medicinal Plants of Tibetan Medicine*. Nauka. Novosibirsk. 160 p. (in Russian).

Балицкий, К.П., А.П. Воронцова. 1982. Лекарственные растения и рак. Киев, 375с.

*Balitzki, K.P. and A.P.Vorontzova. 1982. *Medicinal Plants and Cancer*. Kiyev. 375 p. (in Russian).

Барнаулов, О.Д. 1989. Противодиабетические свойства лекарственных растений новые лекарственные препараты из растений Сибири и Дальнего Востока. Томск, С.17-18.

*Barnaulov, O.D. 1989. Antidiabetical properties of medicinal plants. In: *New Medicinal Preparations from Plants of Siberia and Russian Far East*. Tomsk. pp. 17-18 (in Russian).

Базарон, Э.Г., Т.А. Асеева . 1984. «Вайдурья-онбо»-трактат индо-тибетской медицины. Новосибирск. 118с.

*Bazaron, E.G. and T.A. Aseyeva. 1984. “*Vaydurya-onbo*” – Manuscript of Indo-Tibetan Medicine. Novosibirsk. 118 p. (in Russian).

Bhattacharyya, J. 1980. Structure of effusol: A new phenolic constituent from *Juncus effuses*.

- Experientia 36(1):27-28.
- Блинков, И.Л. 1983. Лекарственные растения в клинике. М., 62 с.
- *Blinkov, I.L. 1983. *Medicinal Plants in Clinics*. Moscow. 62 p. (in Russian).
- Блуз, К.И. 1984. Фитотерапия панкреатитов у детей 1-я респ. конф. по мед. ботанике. Киев, С. 187.
- *Bluz, K.I. 1984. Phytotherapy for pancreatitis in children. *In: First National Conference on Medicinal Botany*. Kiev. 187 p. (in Russian).
- Boiko-Alaux V., A. Carnat, J.L. Lamaison, and P. Bastide. 1988. Catechic tannins, angioprotective principles from *Viburnum opulus* L. *Plantes Medicinales Et Phytotherapie* 22(4):242-246.
- Чекман, И.С. 1981. *Лекарственные растения в стоматологии*. Кишинев, 192 с.
- *Chekman, I.S. 1981. *Medicinal Plants in Stomatology*. Kishinev. 192 p. (in Russian).
- Chen, S. and J.K. Snyder. 1989. Diosgenin-bearing molluscicidal saponins from *Allium vineale*. *J. Org. Chem.* 54(15):3679-3689.
- Чиков, П.С. 1989. Лекарственные растения. Справочник. 2-е изд. М., 429 с.
- *Chikov, M.V. 1989. *Medicinal Plants - Directory*, 2nd ed. Moscow. 429 p. (in Russian).
- Чубунидзе, В.В., Л.В. Берадзе, Л.Д. Бочоридзе. 1984. О химическом составе эфирного масла *Ambrosia artemisiifolia*. *Химия природ.соедин.* № 4. С. 529-530.
- *Chubunidze, V.V., L.V. Beradze, and L.D. Bochoridze. 1984. About chemical content of essential oil from *Ambrosia artemisiifolia*. *Chemistry of Natural Products* No.4:529-530 (in Russian).
- Чуролинов, П. 1979. Фитотерапия в дерматологии и косметике. София, 147 с.
- *Churolinov, P. 1979. *Phytotherapy in Dermatology and Cosmetics*. Sofia. 147 p. (in Russian).
- Дадобаева, О. 1972. Словарь гаучных и местных названий лекарственных растений Северного Таджикистана. Душанбе, 130с.
- *Dadabayeva, O. 1972. *Dictionary of Scientific and Local Names of Medicinal Plants from Northern Tajikistan*. Dushanbe. 130 p. (in Russian).
- Дамиров, И.А., Л.И. Прилипко, Д. З. Шукюров. 1983. *Керимов Ю.Б. Лекарственные растения Азербайджана*. 2-е изд. Баку, 319 с.
- *Damirov, I.A., L.I. Prilipko, D.Z. Shukurov, and Y.B. Kerimov. 1983. *Medicinal Plants of Azerbaijan*, 2nd ed. Baku. 319 p. (in Russian).
- Дорофеев, Г.Н. 1975. Влияние изофлавонов на липидный обмен при гиперхолестеринемии. *Биол.науки*. № 3. С.35-38.
- *Dorofeyenko, G.N. 1975. Effect of isoflavanoids on lipid metabolism during experimental hypercholesterolia, *Biological Sciences* No.3:35-38. (in Russian).
- Эристави, Л.И. 1971. О растениях народной медицины Грузии, перспективных для изучения. Всесоюзная науч.конф. «О расширении использования природных ресурсов лекарственных растений с учетом изучения опыта народной медицины». Тбилиси, с.56-60.
- *Eristavi, L.I. 1971. Plants from folk medicine of Georgia useful for research, National Scientific Conference. Study of resources of medicinal plants based on experience of folk medicine. Tbilisi. pp. 56-60. (in Russian).
- Farnsworth, N.R., A.S. Bingel, G.A. Cordell, F.A. Crane, and H.S. Fong. 1975. Potential Value of Plants as Sources of New Antifertility Agents. *J. Pharm. Sci* 64(4):535-598.
- Фрайнштат, П.Д., С.А. Поправко, Н.С. Вульфсон. 1980. Вторичные метаболиты клевера. *Биоорг. химия*. Т. 6, № 11. С.1722-1732.
- *Frainshtat, P.D., S.A. Popravko, and N.S. Vulfson. 1980. Secondary metabolites of clover. *Bioorganic Chemistry* 6(11):1722-1723. (in Russian).
- Фруентов, Н.К. 1987. Лекарственные растения Дальнего Востока. изд.3-е. Хабаровск. 350 с.
- *Fruentov, N.K. 1987. *Medicinal Plants of Far East*, 3rd ed. Khabarovsk. 350 p. (in Russian).
- Галкин, М.А., А.Л. Казаков. 1980. Дикорастущие полезные растения Северного Кавказа. Ростов-н/Д, 128 с.
- *Galkin, M.A. and A.L. Kazakov. 1980. *Wild Growing Useful Plants of Northern Caucasus*.

- Rostov. 128 p. (in Russian).
- Гаммерман, А.Ф. 1976. *Лекарственные растения: Растения-целители* Под ред. 2-е изд. М., 389 с.
- *Gammerman, A.F. 1976. *Medicinal Plants: Plants-Healers*, 2nd ed. Moscow. 389 p. (in Russian).
- Гаммерман, А.Ф. 1976. *Гром И.И.* Дикорастущие лекарственные растения СССР. М., 272 с.
- *Gammerman, A.F. 1976. *Wild Growing Medicinal Plants of USSR*. Moscow. 272 p. (in Russian).
- Гаммерман, А.Ф., И.А. Дамиров, М.О. Каррыев, Г.П. Яковлев. 1970. Лекарственные растения научной медицины СССР, не включенные в Фармакопею. Ашхабад, 185 с.
- *Gammerman, A.F., I.A. Damirov, M.O. Karriyev, and G.P. Yakovlev. 1970. *Medicinal Plants of USSR Not Included in Pharmacopeia*. Ashkhabad. 185 p. (in Russian).
- Гаммерман, А.Ф., М.А. Кузнецова. 1970. Народные лекарственные растения Ярославской области и их использование в других областях лесной зоны 1-й Всесоюз. Съезд фармацевтов. М., С. 368-377.
- *Gammerman, A.F. and M.A. Kuznetzova. 1970. Medicinal Plants of Yaroslavl District and Their Uses in Other Districts of Forest Region. First National Congress of Pharmacists. Moscow. pp. 386-377. (in Russian).
- Горяев, М.И., Шарипова Ф.С. 1983. Растения, обладающие противоопухолевой активностью. Алма-Ата, 174 с.
- *Gorayev, M.I. and F.S. Sharipova. 1983. *Plants with Antitumor Activity*. Alma-Ata. 174 p. (in Russian).
- Гриневич, М.А. 1990. Информационный поиск перспективных лекарственных растений. Л., 141с.
- *Grinevitch, M.A. 1990. *Informational Search for Perspective Medicinal Plants*. Leningrad. 141 p. (in Russian)
- Гроссгейм, А.А. 1939-1967. *Флора Кавказа*. Т.1-7. Л.: Наука
- *Grossheim, A.A. 1939-1967. *Flora of Caucasus*. Volumes 1-7. Leningrad. Nauka. (in Russian).
- Hartwell, J.L. 1967-1971. Plants used against cancer. 30(4):379-436; 31(2):71-170; 32(1):79-107; 33(1):97-194; 34(1):103-160; 34(2):204-255; 34(4):386-437.
- Hoppe, H.A. 1975. *Drogenkunde*. Volumes 1-2. Berlin, Vol.1, 1311 p.
- Imperato, F. 1991. A new xanthene from the fern *Cystopteris Fragilis*. *Lloydia* 54(2):603-605.
- Джахангирова, И.Р., С.В. Серкерев. 2007. Перспективы исследования *Ambrosia artemisiifolia*, сесквитерпеновые лактоны сцитотоксической активностью Азербайджанский фармацевтический и фармакотерапевтический журнал. № 1. с. 34-38
- *Jakhangirova, I.R. and S.B.Serkerov. 2007. Perspective studies of *Ambrosia artemisiifolia* containing Sesquiterpene lactones with cytotoxic activity. *Azerbaijani J. of Pharmacy and Pharmacotherapy*. No. 1:34-38. (in Russian).
- Kameoka, H., C. Wang, and K. Tokimitsu. 1977. Terpenoids in the essential oil from the flower of *Trifolium repens* L. *Agr. and Biol. Chem* 41(9):1785-1786.
- Karl, C., G. Mueller, and P.A. Pedersen. 1976. On the phytochemistry of the flowers of *Onopordon acanthium* L.(cotton thistle). *Dtsch. Apoth. Ztg.* 116(3):57-59. *Chem.Abstrs.* 84(147639).
- Кайяс, А. 1975. Пыльца: Сбор, свойства, применение. Бухарест, 90 с
- *Kayas, A. 1975. *Pollen: Collection, Characteristics, Uses*. Bucharest. 90 p. (in Russian).
- Кевра, М.К. 1993. Растения против радиации. Минск, 350 с.
- *Kevra, M.K. 1993. *Plants Against Radiation*. Minsk. 350 p. (in Russian).
- Хайдав, Ц., Б. Алтанчимэг, Т.С. Варламова. 1985. Лекарственные растения в монгольской медицине. 2-е изд. Улан-Батор, 391 с.
- *Khaidav, Z., B. Altanchimeg, and T.S.Varlamova. 1985. *Medicinal Plants in Mongolian Medicine*. 2nd ed. Ulan-Bator. 391 p. (in Russian).
- Халматов, Х.Х. 1984. Основные лекарственные растения Средней Азии. Ташкент, 195 с.
- *Khalmatov, Kh.Kh. 1984. *Main Medicinal Plants*

- of Central Asia*. Tashkent. 195 p. (in Russian).
- Хелая, Н.А. 1987. Лекарственные растения грузинской рукописи XVI-XVII вв. «Карабадини полезный» Растит.ресурсы. Т.23, вып. 4. С.501-511.
- *Khelaya, N.A. 1987. Medicinal Plants in Georgian Manuscript of 16th-17th Centuries. *Karabadini Useful*. Plant Resources 23(4):501-511. (in Russian).
- Хунданова, Л.Л., Т.А. Суркова, Б.Б. Батуев. 1979. Некоторые результаты изучения лекарственных растений индо-тибетской медицины 14-й Тихоокеанский конгр.: Здравоохранение медицинские науки. М., С. 210-211.
- *Khundanova, L.L., T.A. Surkova, and B.B. Batiyev. 1979. Study of medicinal plants from Indo-Tibetan medicine, 14th Pacific Oceanic Congress: Health and Medicinal Science. Moscow. pp. 210-211. (in Russian).
- Кит, С.М., И.С. Турчин. 1986. Лекарственные растения в эндокринологии. Киев, 80 с.
- *Kim, S.M. and I.S.Turchin. 1986. *Medicinal Plants in Endocrinology*. Kiev. 80 p. (in Russian).
- Кит, С.М., Л.М. Будневская, В.С. Кит. 1986. Растения, применяемые при сахарном диабете Растит. ресурсы. Т.22, вып. 3, С.405-415.
- *Kim, S.M., L.M. Budnevskaya, and V.S. Kim. 1986. Plants used for treatment of diabetes. Plant Resources 22(3):405-415. (in Russian).
- Киселева, Т.Л., Е.В. Цветаева. 2002. Номенклатура производящих растений и сырья для производства гомеопатических лекарственных средств в России. М. 122 с.
- *Kiseleva, T.L. and Y.V.Tzvetaeva. 2002. *List of Plants and Raw Material for Homeopathic Production in Russia*. Moscow. 122 p. (in Russian).
- Китанов, Г.М., К. Бачева. 1981. Фитохимично проучване и анализ на разпространени в България видовете *Hypericum* L. Фармация (НРБ), год 31, бр. 1, с. 21-25.
- *Kitanov, G.M. and K. Bacheva. 1981. Phytochemical studies and analysis species of *Hypericum* L. growing in Bulgaria. Pharmatzia (NRB) 31(1):21-25. (in Bulgarian).
- Клюев, М.А. 1979. Лекарственные препараты, разрешенные к применению в СССР. М., 351с.
- *Kluyev, M.A. and E.A. Babayan. 1979. *Medicinal Preparations Allowed for Use in the USSR*. Moscow. 351 p. (in Russian).
- Корчан, В. И., К. Б.Кулемза. 1992 Тайны народной медицины: Из практики народных лекарей В.И.Корчана, К.Б.Кулемзы. М., 1992.240 с.
- *Korchan V.I. and K.B. Kulemza. 1992. *Secrets of Folk Medicine: from Practice of Traditional Healers V. I. Korchan and K. B. Kulzemza*. Moscow. 240 p. (in Russian).
- Корхов, В.В., М.Н. Мац, М.Х. Хамидов. 1987. Растительные препараты в акушерстве и гинекологии. Ташкент, 127 с.
- *Korkhov, V.V., M.N. Matz, and M.Kh. Khamidov. 1987. *Herbal Preparations in Midwifery and Gynecology*. Tashkent. 127 p. (in Russian).
- Котов, А.Г., П.П. Хворост, Н.Ф. Комисаренко. 1989. Девясил высокий и его биологически активные вещества Новые лекарственные препараты из растений Сибири и Дальнего Востока. Томск, с.87.
- *Kotov, A.G., P.P. Khvorost, and N.F. Komissarenko. 1989. Elecampane and his biologically active compounds. In: *New medicinal preparations Siberian and Far East plants*. Tomsk. 87 p. (in Russian).
- Kowalewska, K. and J. Lutomski. 1978. Flavonoids in inflorescences elecampane (*Inula helenium* L.) Herba Pol. 24(3):107-113.
- Krochmal, A. and C. Krochmal. 1975. *A Guide to the Medicinal Plants of the United States*. New York. 289 p.
- Кушнир, В.М. 1984. Фитотерапия мочекаменной болезни 1-я респ.конф. по мед. ботанике. Киев, с.192.
- *Kushnir, V.M. 1984. Phytotherapy of urinary stone disease. First National Conference on Medical Botany. Kiev. 192 p. (in Russian).
- Ладынина, Е.А., Р.С. Морозова. 1990.

- Фитотерапия. - Л.: Медицина, Издание 2-е, дополненное, 303 с.
- *Ladinina, Y.A. and R.S. Morozova. 1990. *Phytotherapy*. Meditzina. Leningrad. 2nd ed. 303 p. (in Russian).
- Lawler, L.L. 1984. *Ethnobotany of the Orchidaceae - Orchid Biology*. Ithaka. London. 3:27-149.
- Leung, A. 1980. *Encyclopedia of Common Natural Ingredients Leased in Food, Drugs and Cosmetics*. New York. 409 p.
- Leung, A. and S. Foster. 1996. *Encyclopedia of Common Natural Ingredients Used in Food, Drugs and Cosmetics*, 2nd ed. New York. 649 p.
- Лоевский, Ф.М. 1991. Полный простонародный лечебник доктора изящных наук, философии и медицины Лоевского Ф.М. М., 221 с.
- *Loyevski, F.M. 1991. *Folk Medicine Healing Book of Fine Science - Philosophy and Medicine Doctor*. F.M.Loyevski, Moscow. 221 p. (in Russian).
- Maly, E. 1985. Paper Chromatography of the Essential Oils Occurring in the *Genus Stachys*. J. Chromatogr 333(1):288-289.
- Манолова, Н., В. Максимова. 1988. Лечебни растения инхибитори на вируси. София, 148 с.
- *Manolova, N. and V. Maksimova. 1988. *Medicinal Plants Against Viruses*. Sophia. 148 p. (in Bulgarian).
- Машковский, М.Д. Лекарственные средства: 10-е изд. М., 1985. Т. 1. 624 с.; Т. 2. 575 с.; 11-е изд. М., 1988. Ч. 1. 624 с., Ч. 2. 573 с.; 12-е изд., М., 1993; 14-е изд., 2002.
- *Maskovski, M.D. 1985-2002. *Medicinal Preparations*, 10th – 14th ed. Moscow. (in Russian).
- Мац, М.Н., В.Ф. Богаткина, Ю.С. Вишняков. 1987. Контрацептивная активность экстракта из *Ambrosia artemisiifolia* L. Растительные ресурсы. Т.23, вып.1. С.125-129.
- *Matz, M.N., V.F. Bogatkina, and Y.S. Vishnakov. 1987. Contraceptive properties of *Ambrosia artemisiifolia* L. extract. Plant Resources 23(1):125-129. (in Russian).
- Мацку, Я., И. Крейча. 1981. Атлас лекарственных растений. Изд. 3-е. Братислава, 461 с.
- *Matzku, Y. and I. Kreicha. 1981. *Atlas of Medicinal Plants*, 3rd ed. Bratislava. 461 p. (in Russian).
- May, L.W. 1978. The Economic Uses and Associated Folklore of Ferns and Fern Allies. Bot. Review 44(4):491-528.
- Мехтиева, Н.П. 2006. Сравнительный анализ компьютерного банка данных лекарственных растений районов Ленкоранской зоны Азербайджана. Известия. Биологические науки. № 5-6, с.23-35.
- *Mehdiyeva, N.P. 2006. Comparative analysis computer data of medicinal plants from Lenkoran zone of Azerbaijan. News: Biological Sciences. No. 5-6:23-35. (in Russian).
- Мехтиева, Н.П. 2008. Сравнительный анализ лекарственной флоры Малого Кавказа (в пределах Азербайджана) Доклады НАН Азербайджана. №4, с.63-70
- *Mehdiyeva, N.P. 2008. Comparative analysis of medicinal plant flora of Caucasus Minor (at the border of Azerbaijan). Report of National Academy of Sciences of Azerbaijan No. 4:63-70. (in Russian).
- Мехтиева, Н.П. 2009. Лекарственные растения флоры Азербайджана, применяемые в гомеопатии. Традиционная медицина. № 1. с.12-20
- *Mehdiyeva, N.P. 2009. Medicinal plants of Azerbaijan used in homeopathy. Traditional medicine. No. 1, pp. 12-20. (in Russian).
- Мичник, О.В. 1989. Исследование химического состава татриика колючего с целью получения лекарственных препаратов Новые лекарственные препараты из растений Сибири и Дальнего Востока. Томск, С. 112.
- *Michnik, O.V. 1989. Study of chemical composition of cotton thistle for new medicinal preparations. In: *New Medicinal Preparations from Plants of Siberia and Far East*. Tomsk. 112 p.. (in Russian).
- Михайленко, Е.Т., В.Е. Радзинский, К.А. Захаров. 1987. Лекарственные растения в акушерстве и гинекологии. Киев, 136 с.
- *Mikhaylenko, Y.T., V.Y. Radzinski, and K.A. Zakharov. 1987. *Medicinal Plants in Midwifery and Gynecology*. Kiev. 136 p. (in Russian).
- *Millspaugh, Ch.F. 1976. *American Medicinal Plants*.

- New York. 806 p.
- Минаева, В.Г. 1970. Лекарственные растения Сибири. Изд. 4-е. Новосибирск, 272 с.
- *Minayeva, V.G. 1970. *Medicinal Plants of Siberia*, 4th ed. Novosibirsk. 272 p. (in Russian)
- Минаева, В.Г. 1978. Флавоноиды в онтогенезе растений и их практическое использование. Новосибирск, 253 с.
- *Minayeva, V.G. 1978. *Flavonoids in Ontogenesis of Plants and their Practical Uses*. Novosibirsk. 253 p. (in Russian).
- Mody, N.V., I.I. Mahmoud, J. Finer-Moore, and S. W. Pelletier. 1982. Constituents of *Juncus effuses*. *Lloydia* 45(6):733-737.
- Moerman, D.E. 1986. Medicinal Plants of Native America. Techn.Rep. 19. Univ.Michigan Mus. Anthropol. Ann. Arbor. Vol. 1:1-534; Vol. 2: 535-910.
- Молчанов, Г.И., И.Ф. Сучков, М.С. Лукьянчиков. 1992. Радиация: Питание и фитотерапия. М., 80 с.
- *Molchanov, G.I., I.F. Suchkov, and M. S. Lukyanichkov. 1992. *Radiation: Nutrition and Phytotherapy*. Moscow. 80 p. (in Russian).
- Николаев, В.Г. 1979. Некоторые растения, применяемые народной медициной в СССР, при симптомах бронхиальной астмы Раст.ресурсы, т.15, вып. 2, с. 298-307.
- *Nikolayev, V.G. 1979. Some Plants Used in Folk Medicine of USSR in Symptoms of Bronchial Asthma. *Plant Resources* 15:298-307. (in Russian).
- Оболентцева, Г.В., В.И. Падалко, А.И. Кобзарь. 1988. К механизму действия препарата алантон 2-я респ. конф. по мед. Ботанике. Киев, С. 281-282.
- *Obolentzeva, G.V., V.I. Padalko, and A.I.Kobzar. 1988. About working mechanism of preparation alanton. Second National Conference on Medicinal Botany. Kiev. pp. 281-282. (in Russian).
- Palade, M., M. Neacsu, and E. Coman. 1974. Cintrubutii la studiul fractiunii lipidice din *Cirsium arvense* (L.) Scop., var. setosum M.B., f.ruderales Beck, Farma (RSR) 2(4):233-240.
- Paluch, A. 1984. *Świat roślin w tradycyjných praktikach leczniczych wsi polskiej*. Wrocław. 353 p.
- Пашинский, В.Г. 1988. Использование лекарственных растений в комплексной терапии заболеваний. Томск, 100 с.
- *Pashinski, V.G. 1988. *Uses of Medicinal Plants in the Complex Therapy of Diseases*. Tomsk. 100 p. (in Russian).
- Пастушенков, Л.В., Е.Е. Лесиовская. 1991. Растения – антигипоксанты. (Фитотерапия). СПб., 96 с.
- *Pastushenkov, L.B. and Y.Y.Lesiovskaya, 1991. *Plants – Antihypoxants (Phytotherapy)*. St. Petersburg. 96 p. (in Russian).
- Петков, В. 1982. *Съвременна фитотерапия*. София, 517 с.
- *Petkov, V. 1982. *Modern Phytotherapy*. Sofia. 517 p. (in Bulgarian).
- Плеханова, Н.В., С.А. Луговская. 1981. Девясилы Киргизии, их состав и лекарственные свойства. Фрунзе, 43 с.
- *Plekhanova, N.V. and S.A. Lugovskaya. 1981. *Inula Species of Kirgizstan, Their Chemical Composition and Medicinal Properties*. Frunze. 43 p. (in Russian).
- Рендюк, Т.Д. 1978. Изучение растений рода бодяк как источников получения линарина и акацетина: Автореф. дис. ...канд. фармац. Наук. М. 200с.
- *Rendyuk, T.D. 1978. *Study of Plants from Thistle Genus as Sources for Obtaining of Linarin and Akacentin*. Ph.D.Thesis in pharmacy. Moscow. 200 p. (in Russian).
- Richardson, P. and M.E. Fhaddeus. 1983. Mangiferin and isomangiferin in *Acystopteris*, *Cyetopteris*, *Gympocarpium* and *Woodsia*. *Lloydia* 46(5):747-749.
- Римкене, С.П. 1986. Биологические особенности дикорастущих видов лекарственных растений Литовской ССР, содержащих полифенолы: Автореф. дис. канд.биол.наук. Вильнюс, 220 с.
- *Rimkene, S.P. 1986. *Biological Characteristics of Wild Growing Medicinal Plants of Lithuanian SSR Containing Polyphenols*. Ph.D. Thesis in Biological Sciences. Vilnius. 220 p. (in Russian).
- Roytta, M. K.M. Laine, and P. Harkonen. 1987.

- Morphological studies on the effect of taxol on cultured human prostatic-cancer cells. *Prostate* 11(1):95-106.
- Рубинчик, М.А., К.С. Рыбалко, Р.И. Евстратова, О.А. Коновалова. 1976. Сесквитерпеновые лактоны высших растений как возможный источник новых антипротозойных препаратов. *Растит. ресурсы*, Т.12, вып. 2. С.170-181.
- *Rubinchik, M.A., K.S. Ribalko, R.I. Yevstratova, and O.A. Konovalova. 1976. Sesquiterpene lactones from vascular plants as prospective source of new anti-protozoa preparations. *Plant Resources* 12(2):170-181. (in Russian).
- Рубцова, Н.И. 1971. *Дикорастущие* полезные растения Крыма, Ялта, 280 с
- *Rubtzov, N.I. 1971. *Wild Growing and Useful Plants of Crimea*. Yalta. 280 p. (in Russian).
- Рубцов, В.Г. 1980. Зеленая аптека. Л., 240 с.
- *Rubtzov, V.G. 1980. *Green Apothecary*. Leningrad. 240 p. (in Russian).
- Румянцева, Ж.Н., Я.С. Гудивок. 1993. Поиски гепатопротекторов среди препаратов растительного происхождения *Растит.ресурсы*, Т.29, вып. 1. С.88-97.
- *Rumyantzeva, Zh.N. and Y.S. Gudivok. 1993. Search for hepatoprotectors among preparations of plant origin. *Plant Resources* 29(1):88-97. (in Russian).
- Sachdeva, S.K. and M.S. Bhatia. 1980. Chemotaxonomic studies in *Cynodon dactylon* (L.) Pers. Complex. *Proc. Indian Acad.Sci. Plant Sci.* 89(3):193-195.
- Сагареишвили, Т.Г., М.Д. Алания., Э.П. Кемертелидзе. 1980. Фенольные соединения *Leucanthemum vulgare* *Химия природ.соед.* № 4. С. 567-568.
- *Sagareishvili, T.G., M.D. Alania, and E.P. Kemertelidze. 1980. Phenolic compounds of *Leucanthemum vulgare*. *Chemistry of Natural Products*. No. 4:567-568. (in Russian).
- Сагареишвили, Т.Г., Н.Е. Замбахидзе, Э. П. Кемертелидзе. 1983 4-Метилстерины из *Leucanthemum vulgare*. *Химия природ.соед.* № 2. С. 240.
- *Sagareishvili, T.G., N.Y. Zambakidze, and E.P. Kemertelidze. 1983. 4-Methylstyrenes from *Leucanthemum vulgare*, *Chemistry of Natural Products* No.2:240. (in Russian).
- Самарин, В.П., Н.П. Строкова, А.И. Никонов. 1976. Оприменении растений в народной медицине Челябинской области Экологические и физиологические особенности растений Южн. Урала. Челябинск, Вып. 7. С.24-29.
- *Samarin, V.P., N.P. Strokova, and A.I. Nikonov. 1976. Using plants in traditional medicine of Chelyabinsk district, *Ecological and physiological properties of plants from Southern Ural, Chelyabinsk*. No. 7:24-29. (in Russian).
- Самылиной, И.А., В.А. Северцева. 1999. *Лекарственные растения Государственной фармакопеи* Под ред. М.: АНМИ, 448 с.
- *Samilina, V.A. and V.A. Severtzova. 1999. *Medicinal Plants of State Pharmacopeia*. ANMI. Moscow. 448 p. (in Russian).
- Schmalle, H. and B.M. Hausen. 1979. A new sensitizing quinine from lady's slipper orchid (*Cypripedium calceolus*) *Naturwissenschaften*. 66(10):527- 528.
- Шанцер, И.А. 2004. Растения средней полосы Европейской России. Полевой атлас. М., 423с.
- *Shantzer, I.A. 2004. *Plants from Middle Region of European Part of Russia. Field Atlas*. Moscow. 423 p. (in Russian).
- Шапіро, Д.К. 1989. Біологічно активні речовини плодів перспективних форм камени звичайної Фамац.журнал. №1. С. 55-58.
- *Shapiro, D.K. 1989. Biologically active compounds from fruits of guelder rose, *Pharmaceutical Journal* No. 1:55-58. (in Ukrainian).
- Шелюто, В.Л. 1972. Изучение флавоноидов некоторых представителей рода *Cirsium*: Автореф.дис. канд.фармац.наук. М., 180 с.
- *Sheluto, V.L. 1972. *Study of Flavonoids from Genus Cirsium*, Ph.D. Thesis in Pharmacy Sciences. Moscow. 180 p. (in Russian).
- Шретер, Г.К. 1972. Лекарственные растения и растительное сырье, включенные в отечественные фармакопеи. М., 120с.
- *Shreter, G.K. 1972. *Medicinal Plants and Plant*

- Material included in National Pharmacopeia.* Moscow. 120 p. (in Russian).
- Шретер, А.И. 1975. Лекарственная флора советского Дальнего Востока. М., 328 с.
- *Shreter, A.I. 1975. *Medicinal Flora of Soviet Far East*. Moscow. 328 p. (in Russian).
- Шретер, А.И., Д.А. Муравьева, Д.А. Пакалин, Ф.В. Ефимова. 1979. Лекарственная флора Кавказа. Москва. Медицина. 368с.
- *Shreter, A.I., D.A. Muravyova, D.A. Pakalin, and F.V. Yefimova, 1979. *Medicinal Flora of Caucasus*. Meditzina. Moscow. 368 p. (in Russian).
- Синдина, И.Б., В.П. Конюхов, Е.Л. Кудрова. 1990. Нематодная и антифитанцидная активность видов сем. Lamiaceae Фитонциды. Бактериальные болезни растений: В 2-х ч. Киев; Львов, Ч. 1. С. 127.
- *Sindina, I.B., V.P. Konyukhov, and Y.L. Kudrova. 1990. Anti-nematode and phytoncide properties of species from Lamiaceae family, Phytoncides. Bacterial diseases of plants. Lvov. Vol 1:127. (in Russian).
- Смирнова, Ю.А., Т.Л. Киселева. 2007. Лекарственные растения, применяемые в народной медицине для лечения онкологических заболеваний. Традиционная медицина 2005-2007. М.
- *Smirnova, Y.A. and, T.L. Kisileleva. 2007. Medicinal plants used in traditional medicine for treatment of oncology diseases, In: *Traditional Medicine 2005-2007*. Moscow. (in Russian).
- Соколов, П.Д. 1978. *Лекарственные растения в акушеро-гинекологической практике*. Свердловск, 113 с.
- *Sokolov, P.D. 1978. *Medicinal Plants in Midwifery and Gynecological Practice*. Sverdlovsk. 113 p. (in Russian).
- Соколов, П.Д. 1981. *Лекарственные растения в лечении больных некоторыми заболеваниями периферической нервной системы*. Киев, 20 с.
- *Sokolov, P.D. 1981. *Medicinal Plants for Cure Peripheral Nervous System Diseases*. Kiev. 20 p. (in Russian).
- Соколов, П.Д. 1983. *Лекарственные растения в оториноларингологии*. Киев, 64 с.
- *Sokolov, P.D. 1983. *Medicinal Plants in Otolaryngology*. Kiev. 64 p. (in Russian).
- Соколов, П.Д. 1991. *Лечебник: Из опыта народной древневосточной и современной медицины*. М., 94 с.
- *Sokolov, P.D. 1991. *Healing Plants: From Experience of Folk Medicine of the Ancient East and Conventional Medicine*. Moscow. 94 p. (in Russian).
- Соколов, П.Д. 1985-1993. *Растительные ресурсы СССР. Цветковые растения, их химический состав, использование*. Л.: Наука. Т.1-7.
- *Sokolov, P.D. 1985-1993. *Plant Resources of USSR. Vascular Plants: Their Chemical Composition and Uses*. Leningrad. Nauka. Volumes 1-7 (in Russian).
- Соколов, П.Д. *Растительные ресурсы России и сопредельных государств*. Цветковые растения, их химический состав, использование. Санкт-Петербург: Наука. 1994-1996. Т. 8. 560с.; Т.9. 571 с.
- *Sokolov, P.D. 1994-1996. *Plant Resources of Russia and Adjacent States. Vascular Plants: Their Chemical Composition and Uses*. St Petersburg. Nauka. Vol.8, 560 p., Vol. 9:571 p. (in Russian).
- Соколов, С.Я., И.М. Замотаев . 1987. Справочник по лекарственным растениям: Фитотерапия. 2-е изд. М., 511 с.
- *Sokolov, S.Y. and I.M. Zamotayev. 1987. *Directory of Medicinal Plants: Phytotherapy*, 2nd ed. Moscow. 511 p. (in Russian).
- Стеценко, Н.М., Н.Д. Михновская, Л.А. Геведзе. 1984. Антимикробные свойства интродуцированных папоротников Растит.ресурсы. Т. 20, вып. 1. С. 100-106.
- *Stetzenko, N.M., N.D. Makhnovskaya, and L.A. Gevedze. 1984. Antimicrobial properties of introduced ferns, Plant Resources 20(1):100-106. (in Russian).
- Сурина, Л.Н., М.И. Сурина, И.Ф. Спиридонова. 1974. Целебные растения Тюменского края. Свердловск, 76 с.
- *Surina, L.N., M.I. Surina, and I.F. Spiridonova. 1974. *Healing Plants of Tyumen District*. Sverdlovsk. 76 p. (in Russian).

- Толмачев, А.И. 1980. *Атлас ареалов и ресурсов лекарственных растений СССР*. М., 1980. 327 с.
- *Tolmachev, A.I. 1980. *Atlas of Areas and Resources of Medicinal Plants of USSR*. Moscow. 327 p. (in Russian).
- Товстуха, Е.С., В.А.Бабин, Н.Д. Мухтарова.1991.Некоторые вопросы фитотерапии аллергических заболеваний Фармакология и токсикология. Киев, Вып. 26. С.56-59.
- *Tovstukha, Y.S., V.A. Babin, and N.D. Mukhtarova. 1991. Some questions in phytotherapy of allergic diseases. Pharmacology and Toxicology. Kiev. No. 26:56-59. (in Russian).
- Трутнева, Е.А., Я.А. Алешкина, Э.Е. Алешинская, С.С. Никитина, А.Б. Николаев. 1971. Результаты фармакологического исследования ряда растений, применяющихся в народной медицине. Лекарственные растения: Фармакология и химиотерапия. М., с.140-159.
- *Trutneva, Y.A., Y.A. Aleshkina, E.Y. Aleshinskaya, S. S. Nikitina, and A. B. Nikolayev. 1971. Phramacological study of some plants used in traditional medicine. Medicinal Plants: Phramacology and Chemotherapy. Moscow. pp. 140-159. (in Russian).
- Турова , А.Д., Э.Н. Сапожников. 1984. Лекарственные растения СССР и их применение. 4-е изд. М., 304 с.
- *Turova, A.D. and E.N.Sapozhnikov. 1984. *Medicinal Plants of USSR and Their Uses*. 4th ed. Moscow. 304 p. (in Russian).
- Умиков, Н.Д. 1973. Плоды, ягоды, овощи, злаки и пряности. Изд. 3-е. Тбилиси, 227 с.
- *Umikov, N.D. 1973. *Fruits, Berries, Vegetables, Grasses and Spices*. 3rd ed. Tbilisi. 227 p. (in Russian).
- Вичканова, С.А., М.А.Рубинчик, В.В. Адгина. 1971.Антимикробная активность сесквитерпеновых из растений сложноцветных Лекарственные растения: Фармакология и химиотерапия. М., С.230-238.
- *Vichkanova, S.A., M.A. Rubinchik, and V.V. Adgina. 1971. Antimicrobial activity of sequiterpenoid lactones of aster family. In: *Medicinal Plants: Pharmacology and Chemotherapy*. Moscow. pp. 230-238. (in Russian).
- Вичканова, С.А., В.В. Адгина. 1977. *Изосимов С.Б.* Антибактериальные и антифунгальные свойства лактонов Растит.ресурсы. Т. 13, вып. 3. С. 428-435.
- *Vichkanova, S.A., V.V. Adgina, and S.B.Izosimov. 1977. Antibacterial and antifungal properties of lactones. Plant Recourses 13(3):428-435. (in Russian).
- Vickery, A.R. 1981. Traditional uses and folklore of *Hypericum* in the British Isles. Econ. Bot 73(3):289-293.
- Волынский, Б.Г. 1978. *Лекарственные растения в научной и народной медицине*. 5-е изд. Саратов, 1978. 359 с.
- *Volyn, B.G. 1978. *Medicinal Plants in Conventional and Traditional Medicine*, 5th ed. Saratov. 359 p. (in Russian).
- Вострикова, Г.Г., Л.А. Востриков.1974. Медицина народа Дерсу. 2-е изд. Хабаровск, 60 с.
- *Vostrikova, G.G. and L.A. Vostrikov. 1974. *Medicine of the Dersu People*. 2nd ed. Khabarovsk. 60 p. (in Russian).
- Вульф, Е.В., О.Ф. Малеева. 1969. Мировые ресурсы полезных растений. Л., 566с.
- *Vulf, Y.B. and O.F. Maleeva. 1969. *World Resources of Useful Plants*. Leningrad. 566 p. (in Russian).
- Williams, C.A. and J.B. Harborne. 1975. Luteolin and daphnetin derivatives in the *Juncaceae* and their systematic significance. Biochem. Syst. and Ecol. 3(3):181-190.
- Woo, W.S. 1974. Steroids and pentacyclic triterpenoids from *Phytolacca americana*. Phytochemistry 13(12):2887-2889.
- Ягодка, В.С. 1991. Лекарственные растения в дерматологии и косметологии. Киев, 268 с.
- *Yagodka, V.S. 1991. *Medicinal Plants in Dermatology and Cosmetics*. Kiev. 268 p. (in Russian).
- Йорданов, Д., П.Николов, А.Бойчинов. 1970. Фитотерапия. Изд.2-е. София, 342 с.
- *Yordanov, D., P. Nikolov, and A. Boychinov.

1970. *Phytotherapy*. 2nd ed. Sophia. 342 p. (in Russian).
- Завражнов, В.И., Р.И. Китаева, К.Ф. Хмелев. 1977. Лекарственные растения Центрального Черноземья. 3-е изд. Воронеж, 448 с.
- *Zavrazhnov, V.I., R.I. Kitayeva, and K.F. Khmelev. 1977. *Medicinal Plants of Central Chernozem Region*. 3rd ed. Voronezh. 448 p. (in Russian).
- Зинченко, Т.В. 1983. Газохроматографический метод определения сесквитерпеновых лактонов в подземных органах *Inula helenium* L. Растит. ресурсы. Т. 19, вып. 4. с. 544-548.
- *Zinchenko, T.V. 1983. Gas chromatography in study sesquiterpene lactones of underground part of *Inula helenium* L. Plant Resources 19(4):544-548. (in Russian).
- Цвык, М.В. 1988. Из опыта народной медицины Звенигородского района Черкасской области 2-я респ. конф. по мед. ботанике. Киев, С. 414.
- *Zvik, M.V. 1988. From Experience of Folk Medicine in Zvenigorod Region of Cherkassk District. 2nd National Conference on Medicinal Botany. Kiev. 414. (in Russian)