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Traditional Herbal Therapy for Some Cardiovascular Diseases in Bulgaria

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Abstract

Traditional medicine is a cultural heritage. Herbs are the basic remedy in Bulgarian traditional medicine, the empirical knowledge of medicinal plants being passed down from generation to generation primarily by word of mouth. Most of the plants are used in Bulgarian traditional medicine (BTM) on the grounds of the experience gained over the centuries. As for the treatment of diseases of the cardiovascular system, the data contained in some Bulgarian handwritten remedy books published in the late 19th and early 20th century show that our people empirically used medicinal plants the pharmacological activity of which is proven today through experimental and clinical studies. Thus far, science has not discovered the mechanism of pharmacological action of a lot of the herbs that people used. The researches in this direction are still going on. Bulgarian herbal therapy makes its contribution to world science.

Keywords: Bulgarian traditional medicine, traditional use of herbs, heart disease.

1. Introduction

Traditional medicine is a cultural heritage under the Cultural Heritage Law (prom. in State Gazette No. 19 of 13.03.2009). There is a multitude of synonyms and definitions used for characterizing traditional medicine experience (folk medicine, ethnomedicine, traditional medicine). The published strategy of the World Health Organization (WHO, 2002-2005) specifies that traditional (folk) medicine makes use of experience acquired over the centuries. According to the Bulgarian people, traditional herbal medicine “is the knowledge, experience and practice of a large number of people who have studied the properties of a lot of herbs in the past and have bequeathed them to their descendants” (Karamitrev, 1934). According to some authors (Modern phytotherapy, 1982), what is characteristic of traditional medicine is that the empirical knowledge of medicinal plants and other remedies and methods used has been passed down from generation to generation primarily by word of mouth, a small part thereof being preserved in written sources (handwritten remedy books). Herbs are the basic remedy in Bulgarian traditional medicine (Modern phytotherapy, 1982). People have used them for treatment of all diseases known thereto (Materials for Bulgarian Botanical Guide, 1939), including heart diseases. Currently, in our country there is a renewal of the interest in the use of plant products (Bachev et al., 2018; Bachev et al., 2018a).

The diseases of the blood circulation organs (BCOs): ischemic heart disease, including acute myocardial infarction, other forms of ischemic heart disease; other heart diseases; cerebrovascular diseases (NSI) have been the leading causes of death in Bulgaria for decades. CVDs* are regarded as

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* Cardiovascular diseases

a serious public health problem due to the high morbidity and mortality rates (WHO, 2007). In North America (Canada) it is natural health products that are mainly used in the treatment of heart diseases (Basu, et al., 2007). Today the experimental and clinical studies provide data regarding the efficiency of using herbs in cardiovascular diseases (Sara et al., 2006).

Because of the importance of BCOs diseases as socially significant ones, the purpose of this publication is the study of the treatment of cardiovascular diseases with herbs in BTM as presented in several handwritten remedy books published in the late 19th and early 20th century.

2. Materials and methods

2.1. The method used is a documentary one – exploration of Bulgarian handwritten remedy books published in the late 19th and early 20th century which deal with the treatment of some CVDs with herbs in BTM.

3. Results and discussion

In certain handwritten Bulgarian herbal remedy books* published in the late 19th and early 20th century, some of those cardiovascular diseases which our people used to treat with herbs are referred to as: heart diseases (vitium cordis, heart valve problems), heart palpitation, weak heart, atherosclerosis, hypertension. Depending on the pharmacological activity of the plants used by our people for the treatment of CVDs, the diseases they were used for can be presumed. Some of the herbal prescriptions published in the remedy books specify the composition and weight of the plant ingredients used and the way of preparing the herbal drug, and give instructions on its dosage. Other prescriptions specify the herbal collection only. In most cases herbs were prepared in the form of decoction and were drunk cold (Urumov, 1926; Pan Noev, 1932; Kalchev, 1992), before or after a meal; they were also taken internally in the form of tinctures (Pan Noev, 1932) and infusions (Pan Noev, 1932; Materials for Bulgarian Botanical Guide, 1939). Our people knew the poisonous plants and recommended that they be used in strictly fixed doses, the handwritten remedy books specifying that a certain plant is poisonous (100 medicinal herbs; Pan Noev, 1932; Materials for Bulgarian Botanical Guide, 1939).

3.1. Heart palpitation

Our people has defined heart palpitation as a separate nosological entity (Kalchev, 1992). It is explained by plethora (hypertension), nervousness, drinking coffee, tea, spirits (Kalchev, 1992) as a disease of the nervous system (Materials for Bulgarian Botanical Guide, 1939). According to contemporary science, heart palpitation is an anomaly of cardiac activity. In most cases heart palpitation is due to a heart disease – cardiac insufficiency, myocardial ischemia; other diseases – diseases of the thyroid gland, hypoglycaemia, anaemia, fever; dehydration; use of stimulants – caffeine, nicotine, alcohol; intensive physical activity; stress, strain, fear; pregnancy; menopause; heart palpitation after a meal (Alijaniha, et al., 2015; What can be the causes of heart palpitation? ARS MEDICA.bg). Our people have empirically, yet rightly, oriented itself in the causes of heart palpitation and has used medicinal plants giving the respective pharmacological effect. The medicinal plants used by our people in heart palpitation can be divided into several groups on the basis of the biologically active substances contained therein:

3.1.1. Medicinal plants used in heart palpitation caused by cardiac insufficiency

Our people used lily-of-the-valley (*Convallaria majalis* L.) (Kalchev, 1992) and pheasant's eye (*Adonis vernalis* L.) in heart palpitation which is most probably caused by chronic cardiac insufficiency, this being due to the fact that both plants contain cardiac glycosides (Asenov, Nikolov, 1988). The tincture of the lily-of-the-valley blossom is recommendable in “nervous heart palpitation” (Pan Noev, 1932).

3.1.2. Medicinal plants used in heart palpitation caused by stress, strain, fear

Most probably, in “heart palpitation as a disease of the nervous system” our people used medicinal plants with a sedative action (Modern phytotherapy, 1982) – roots and rootage of valerian (*Valeriana officinalis* L.), (Kalchev, N., 1992; Materials for Bulgarian Botanical Guide, 1939), decoction of motherwort (*Leonurus cardiaca* L.), (Materials for Bulgarian Botanical Guide, 1939), lemon balm (*Melissa officinalis* L.), “decoction of the seed capsules of field poppy” (*Papaver rhoeas* L.); tea from the leaves of rue (*Ruta graveolens* L.), sweet woodruff (*Asperula odorata* L.),

* The authors do not claim to have covered all the CVDs and herbs used for them in BTM

([Materials for Bulgarian Botanical Guide, 1939](#)). In the course of their clinical studies, some authors have established that lyophilized water extract of lemon balm can be used for the treatment of benign palpitation, as lemon balm slows down cardiac activity ([Alijaniha et al., 2015](#)). An extract and an alkaloid fraction of rue (*Ruta graveolens* L.) produce a potential antiarrhythmic effect in the treatment of supra ventricular tachyarrhythmia in experimental studies ([Khorri et al., 2008](#)).

3.1.3. Medicinal plants used in heart palpitation after a meal.

Medicinal plants with gas-gone action ([Modern phytotherapy, 1982](#)) are applied by our people, most probably, in heart palpitation caused by problems of the digestive system – summer savory (*Satureja hortensis* L.), lovage (*Levisticum officinale* Koch.) ([Materials for Bulgarian Botanical Guide, 1939](#)), peppermint (*Mentha piperita* L) “in frequent heart palpitation caused by improper condition of abdominal organs” ([Materials for Bulgarian Botanical Guide, 1939](#); [Pan Noev, 1932](#)). Apart from its sedative action, valerian also has its favourable effect in meteorism ([Modern phytotherapy, 1982](#)).

3.1.4. Medicinal plants used in heart palpitation caused by anaemia.

In this case our people applied plants containing the microelement iron – decoction of the root or leaves of dwarf nettle (*Urtica urens* L.) ([Materials for Bulgarian Botanical Guide, 1939](#)). Experimental data related to the application of common nettle (*Urtica dioica* L.) in heart palpitation show that it lowers the heart rate in non-cholinergic and non-adrenergic ways ([Legssyer et al., 2002](#)).

3.1.5. Medicinal plants used in heart palpitation in the period of menopause.

In BTM, infusion of leaves and blossoms of garden sage (*Salvia officinalis* L.) is used in heart palpitation ([Materials for Bulgarian Botanical Guide, 1939](#)). Authors confirm that garden sage (*S. officinalis*) is traditionally used for relieving the symptoms occurring in the period of menopause, such as hot waves, insomnia, night sweats, dizziness, headache and heart palpitation ([Bommer et al., 2011](#)).

3.1.6. Other medicinal plants and herbal collections used in BTM for treatment of heart palpitation.

The following are also used in BTM in heart palpitation: decoction of the bark of young branches of aspen (*Populus tremula* L.) ([Materials for Bulgarian Botanical Guide, 1939](#); [Urumov, 1926](#)); herbal collection of common mallow (*Malva sylvestris* L.), wormwood (*Artemisia absintium* L.) and valerian (*Valeriana officinalis* L.) ([Modern phytotherapy, 1982](#); [Urumov, 1926](#)). Common mallow has spasmolytic action ([Modern phytotherapy, 1982](#)), wormwood is used in meteorism ([Modern phytotherapy, 1982](#)), while valerian has sedative action and produces favourable effect in meteorism ([Modern phytotherapy, 1982](#)), which provides grounds for presuming that the said herbal collection is mainly used in our traditional medicine in “heart palpitation after a meal”.

3.2. Heart diseases

Most handwritten remedy books under consideration do not specify heart diseases as separate nosological entities. One of the remedy books we deal with sets out that heart diseases relate to heart valve problems (*vitium cordis*) ([Urumov, 1926](#)).

3.2.1. Heart valve problems

Heart valve problems can affect one or all of the four valves of the heart. They emerge in the process of aging, however, they might be caused by congenital anomalies or specific diseases or physiological processes, including rheumatic heart diseases and pregnancy ([Nkomo et al., 2006](#); [Kovacs et al., 2008](#)). The symptoms depend on the type and the extent to which the valve apparatus of the heart is affected. In heart valve problems ([Urumov, 1926](#)), heart diseases ([Pan Noev, 1932](#)) our people applied a mixture of the roots of valerian and rue (*Ruta graveolens* L), which have a sedative effect; nettle roots (*Urtica dioica* L.), ([Urumov, 1926](#)), herbal collection of lemon balm and mullein (*Verbascum phlomoides* L.), ([Urumov, 1926](#); [Pan Noev, 1932](#)). Valerian also produces favourable antistenocardiac effect in cardiospasm, while rue shows hypotensive action in experimental models of animals ([Modern phytotherapy, 1982](#)). In experimental studies, water extract of nettle has hypotensive action, lowers the heart rate, influences vascular contractility and provokes aortic vasoconstriction, which is due to the activation of alpha1-adrenergic receptors ([Legssyer et al., 2002](#)). According to authors’ data, lemon balm has an antiarrhythmic and protective effect upon the heart ([Akhondali et al., 2015](#); [Joukar et al., 2016](#)).

3.2.2. Heart diseases

In cases of heart diseases (Pan Noev, 1932) that were most probably related to chronic cardiac insufficiency, BTM applied tinctures of lily-of-the-valley blossom (Pan Noev, 1932) and rue stalks and leaves (weak dose). The handwritten remedy books specify that rue is poisonous (100 Medicinal Herbs). Studies confirm that in Taiwan the overground part of rue is applied in traditional medicine for treatment of circulatory disorders (Miguel, 2003). In heart diseases, BTM also applies decoction of the blossom of hawthorn (*Crataegus monogyna* Jacq) (Materials for Bulgarian Botanical Guide, 1939). According to experimental and clinical data, hawthorn has diverse effects on the cardiovascular system – positive inotropic effect, anti-inflammatory effect, anticardiac remodelling effect, coronary dilatation effect, endothelial protective effect, antiarrhythmic effect, lipid lowering effect, hypotensive effect; a very good effect has been established in the treatment of patients with myocardial lesion, coronary insufficiency and heart block, the mechanisms being most probably due to a flavonoid mixture contained in hawthorn (Modern phytotherapy, 1982; Wang et al., 2013, Chang, Zuo, 2002). According to a clinical study, hawthorn preparations are effective in the early stages of congestive cardiac insufficiency (Wang et al., 2013). According to some authors, the positive inotropic effect of hawthorn extract is related to the cAMP^{*}-independent mechanism. Probably, hawthorn extract increases the force of contraction by inhibition of the sodium pump (Schwinger et al., 2000). It is established that hawthorn extracts also have an anticardiac remodelling effect (Frey, Olson, 2003). In addition, according to some authors, the vasodilating effect of hawthorn extracts relates to the induction of the NO[†]-ergic mediator system (Brixius et al., 2006). According to other authors, the vasodilating action of hawthorn on both the coronary circulation and the peripheral vasculature might be due to the inhibition of the angiotensin converting enzyme (ACE) (Miller, 1998). Preliminary research evidences the cardioprotective effects of hawthorn in the in vivo models of ischemia/reperfusion (Veveeris et al., 2004). Experimental studies confirm the antiarrhythmic activity of hawthorn (Makdessi et al., 1999) and its lipid-reduction action (Wang et al., 2013); clinical studies evidence the hypotensive activity of hawthorn extract (Belz et al., 2002).

3.3. Weak heart

Probably, what our people meant by “weak heart” was chronic cardiac insufficiency (CCI).

Cardiac insufficiency develops when, as a result of a decrease in the cardiac output, the heart is unable to provide the required amount of blood to all the organs in accordance with their needs (Lambev, 2010). Depending on the swiftness of its occurrence, cardiac insufficiency (CI) might be acute or chronic. CCI develops over a long period of time and there are several types of it (Cardiology, 2010), however, it is highly probable that our people could not tell them apart. Here are some of the symptoms of chronic cardiac insufficiency: fatigue, shortness of breath as a result of exertion, nighttime cough, heart palpitation, swelling of the ankles in the evening which disappears in the morning, and, in later stages, hepatomegaly, pleural effusion (Cardiology, 2010). The causes of CI might result from a number of health conditions, which affect the cardiovascular system and increase the risk of its occurrence – coronary artery disease, valve conditions, risk factors such as smoking, diabetes mellitus, arterial hypertension, familial history (Cardiology, 2010). In this case it is fully explicable to apply medicinal plants “for strengthening the activity of the heart (a cardiac)”, (Materials for Bulgarian Botanical Guide, 1939), these plants being rich in cardiac glycosides (Asenov, Nikolov, S., 1988). Cardiac glycosides produce a positive inotropic effect, a negative chronotropic effect, a positive bathmotropic and a negative dromotropic effect as well as certain diuretic action, and have a narrow therapeutic window (Lambev, 2010). Those plants used by our people in cases of weak heart which are rich in cardiac glycosides are: decoction of the rootage of lily-of-the-valley (*Convallaria majalis* L.), (Materials for Bulgarian Botanical Guide, 1939), infusion of pheasant’s eye (*Adonis vernalis* L.), (Pan Noev, 1932). Purple foxglove (*Digitalis purpurea* L), as well as the other *Digitalis* species, which constitute basic raw stuff for the manufacture of cardiac glycosides in pharmaceutical industry, were also used by our people as cardiacs. For instance, the infusion of their leaves “was used for strengthening and regulating the activity of the heart as well as a potent diuretic agent and also against shortness of breath”. In the remedy books our people pointed out that these plants are poisonous (Materials for Bulgarian

* Cyclic adenosine monophosphate

† Nitric oxide

[Botanical Guide, 1939](#)). Our people also used infusion of the leaves and blossoms of mallow (*Malva silvestris* L.) for strengthening the activity of the heart ([Materials for Bulgarian Botanical Guide, 1939](#)). Today's experimental studies show the cardioprotective effect of mallow (*Malva sylvestris* L.) on myocardial ischemia/reperfusion in rats ([Zuo et al., 2007](#)). In cases of weak heart, BTM also applied Iceland moss (*Cetraria islandica* L.), ([Urumov, 1926](#)). According to some authors, Iceland moss (*Cetraria islandica* L.) has an influence upon symptoms such as heart or chest pain ([Pieroni, et al., 2014](#)). In cases of weak heart, BTM recommends that raw garlic (*Allium sativum* L.) is eaten or garlic juice is drunk ([Pan Noev, 1932](#)). Experimental and clinical studies confirm the ancient experience of people regarding the role of garlic in the prevention of cardiovascular diseases. Garlic reduces cardiovascular risk, decreases low-density lipoproteins (LDL), inhibits thrombocyte aggregation and has hypotensive, antioxidant and antibacterial effects ([Ginter, Simko, 2010](#); [Modern phytotherapy, 1982](#); [Banerjee et al., 2002](#); [Mousa, Mousa, 2007](#)). The cardioprotective action of garlic in the form of food is presumed to be mediated via the generation of hydrogen sulphide (H₂S). Experimental studies confirm the effect of garlic as an inhibitor of the rate of progression of coronary calcification ([Ginter, Simko, 2010](#)).

3.4. Hypertension

Hypertension is an important risk factor for CVDs. High arterial pressure (AP) is ranked first among the 26 most common risk factors as a cause of death in all regions of the world ([Torbova et al.](#)). Elevated blood pressure is the most frequent, easily detectable and reversible risk factor for myocardial infarction, apoplexy, cardiac insufficiency, auricular fibrillation, aortic dissection, atherosclerosis ([Freedman, Cohen, 2016](#); [Daskalov, et al., 2008](#)). Hypertension is said to be present in cases of systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg ([Tabassum, Ahmad, 2011](#)). Elevated blood pressure is categorized by types: primary (essential) and secondary hypertension, which is due to identifiable causes such as diabetes and lesion of the kidneys, etc. ([Sara et al, 2016](#)).

In hypertension, garlic (*Allium sativum* L) is used as food ([Pan Noev, 1932](#)) in BTM. The therapeutic effects of garlic have been known for centuries in different cultures ([Qidwai, Ashfaq, 2013](#), [Frishman et al., 2009](#)). The hypotensive effects of garlic are related to several mechanisms ([Shouk et al., 2014](#)). They are grounded on the biologically active substances contained in garlic – allicin, S-allylcysteine, diallyl disulfides, diallyl trisulfides, methyl thiosulfonate ([Ried et al., 2013](#), [Banerjee et al., 2002](#); [Qidwai, Ashfaq, 2013](#)). The hypotensive effect of garlic is explained by some authors as resulting from the influence upon the NO-ergic mediator system (NO is a potent vasodilator) ([Banerjee et al., 2002](#); [Mousa, Mousa, 2007](#)), and the inhibition of ACE* activity ([Mousa, Mousa, 2007](#); [Sendl, et al., 1992](#)). In BTM, decoction of common horsetail (*Equisetum arvense* L.) was regarded as a good remedy for high blood pressure ([Materials for Bulgarian Botanical Guide, 1939](#)). It is for the same purpose that our people also applied decoction of wallpepper (*Sedum acre* L.), its hypotensive effect being proven in experimental studies ([Modern phytotherapy, 1982](#)).

The favourable effect of medicinal plants in hypertension, atherosclerosis and other vascular complications is connected with their antioxidant activity ([Montezano, Touyz, 2014](#)).

3.5. Atherosclerosis

Atherosclerosis is a disease of medium and large arteries, which occurs under the action of numerous factors – genetic, behavioural, environmental. It is clinically manifested as coronary (ischemic) disease of the heart, cerebrovascular and peripheral vascular disease. In atherosclerosis ([General Practitioners' Guide..., 2006](#)) the elevated cholesterol is deposited in the connective tissue of arterial walls. In BTM, decoction of wallpepper (*Sedum acre* L.) was applied against atherosclerosis ([Materials for Bulgarian Botanical Guide, 1939](#)). Some authors confirm that wall pepper was used in atherosclerosis by other people as well ([Duke, 2002](#)). In BTM, decoction of common horsetail (*Equisetum arvense* L.) was regarded as a good remedy for atherosclerosis ([Materials for Bulgarian Botanical Guide, 1939](#)). According to some authors, common horsetail has antibacterial, antifungal, antioxidant, analgesic, anti-inflammatory, antidiabetic, antitumor, cytotoxic and anticonvulsant effects ([Asgarpanah, Roohi, 2012](#)). In BTM, raw garlic (*Allium sativum* L) in the form of food is also recommendable in atherosclerosis ([Pan Noev, 1932](#)). Garlic decreases low-density lipoproteins (LDL) and has a favourable effect in atherosclerosis ([Ginter,](#)

* Angiotensin converting enzyme

Simko, 2010). In BTM, rue (100 medicinal herbs); decoction of hawthorn blossoms (*Crataegus monogyna* Jacq); woodsorrel (*Oxalis acetosella* L.); mistletoe (*Viscum album* L.) (1–2 grains three times a day because of its toxic action) ([Materials for Bulgarian Botanical Guide, 1939](#)) were also applied in atherosclerosis.

3.6. Pains in the heart – most probably, they relate to acute coronary syndrome ([Alexander et al., 2007; Alexander et al., 2007](#)), arrhythmias.

In cases of pains in the heart, BTM recommended drinking decoction of wormwood (*Artemisia absintium*, L), rosemary (*Rosmarnus officinalis* L.), common horsetail (*Equisetum arvense* L.) ([Materials for Bulgarian Botanical Guide, 1939](#)).

3.7. Oedema (Swelling).

A disease in which liquid is gathered and accumulated in tissues and body cavities ([Materials for Bulgarian Botanical Guide, 1939](#)), one of the symptoms of chronic cardiac insufficiency (CCI) ([Cardiology, 2010](#)). In BTM, the following plants with diuretic effect were used in oedema ([Modern phytotherapy, 1982](#)): silver birch (*Betula pendula* L), ([Karamitrev, 1934; 100 Medicinal Herbs](#)), wild strawberry (*Fragaria vesca* complex), common juniper (*Juniperis communis* L.), (100 medicinal herbs), common horsetail, decoction of the root, leaves and blossoms of asparagus (*Asparagus officinalis* L.), decoction of sweet woodruff (*Asperula odorata* L.), kidney beans (*Phaseolus vulgaris* L), common dandelion (*Taraxacum officinale* Web) ([Materials for Bulgarian Botanical Guide, 1939](#)), pheasant's eye (*Adonis vernalis* L) ([Pan Noev, 1932](#)), common speedwell (*Veronica officinalis* L.), elecampane (*Inula helenium* L), live-ever (*Helichrysum arenarium* DC.), rosemary ([Materials for Bulgarian Botanical Guide, 1939](#)).

3.8. Medicinal plants BTM used in inflammation of veins

In phlebitis, BTM applied tinctures of crushed fruits of horse chestnut (*Aesculus hippocastanum* L.) in alcohol ([Materials for Bulgarian Botanical Guide, 1939](#)). Obviously, it is the seeds of horse chestnut and not its fruits that are envisaged here. In contemporary phytotherapy, horse chestnut is applied in varicose symptom complex ([Modern phytotherapy, 1982](#)).

3.9. Pirin tea (ironwort), (*Sideritis scardica* Griseb) is an endemic plant in the Balkan Peninsula. It is applied in stenocardia ([Modern phytotherapy, 1982](#)). According to contemporary published data, the plant has an antioxidant effect ([Koleva, 2007; Kratchanova et al., 2010](#)), which is attributable to the polyphenol compounds contained therein ([Kratchanova et al., 2010](#)).

4. Conclusion

In traditional medicine, herbs are applied on the basis of centuries-long human experience in the treatment and prophylaxis of diseases. As for the treatment of diseases of the cardiovascular system, the people empirically used medicinal plants the pharmacological activity of which is proven today through experimental and clinical studies. Thus far, science has not discovered the mechanism of pharmacological action of a lot of the herbs that people used. The researches in this direction are still going on. Bulgarian herbal therapy makes its contribution to world cultural heritage.

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