

Phytochemisrty and Nutritions in Ukrainian National Scientific Center of Medicinal Substances

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Abstract

The plants are a unique depository of vitally important bio-active compounds which are completely compatible with human organisms. For this reason, in many cases the herbal remedies are more preferable versus synthetic ones. What is more, in some cases they are the only ones which could be used. In this talk, the results of studies and development of herbal remedies and nutritions are presented. Studies and development have been done at National Scientific Center of Medicinal Substances, Kharkov, Ukraine.

The plants are a unique depository of vitally important bio-active compounds which are completely compatible with human organisms. In contrast to synthetic medicines, herbal remedies made from plants have less toxicity and small allergic effect. For this reason, in many cases the herbal remedies are more preferable versus synthetic ones. What is more, in some cases they are the only ones which could be used.

The State Pharmacopeia in Russia and Ukraine includes both synthetic medicine and plenty of medical herbs, herbal extracts, purified herbal complexes, etc.

I have worked in "the Laboratory of investigation of phytopharmaceutical products" of the most famous and oldest pharmaceutical Institution in Ukraine, the National Scientific Center of Medicinal Substances (NSCMS, Kharkov, Ukraine), which has over 85 years experience in developing both synthetic and herbal medicines. In NSCMS more than 40% of Ukraine's stock-list medicine have been invented. The mainstream of Center's work is focused on a study of natural substances and medicinal plants. Based on those studies, a lot of new herbal remedies and nutritions (bio-active supplements or dietary supplements) were created. The NSCMS can make a complete set of medicine investigations. That includes as follows.

- 1) Investigation of natural substances and their pharmacological effects.
- 2) Elaboration of technological processes for pharmaceutical manufactures on the base of GMPs.
- 3) Development of pharmaceutical analysis.
- 4) Elaboration technical and technological documentation.

In the Center a lot of medicines for treatment and prophylaxis of diseases of heart, kidney, GI track, liver, etc. have been developed. Most of those medicines have been accepted by the State Pharmacopeia for medicinal practice. Among created medicines, I would like to mention the following.

- 1) The **cardiotonic** medicines based on Foxglove (Latin name *Digitalis lanata*).
 - a) Natural complexes of cardiac glycosides such as "Digoxinum", "Digitoxinum", "Celanidum", and "Lanatosidum" (Latin names).
 - b) Semi-synthetic glycoside (Latin name "Medilasidum") which are obtained by methylating of digoxin.
- 2) The **choloretic** medicine "Flacuminum" (Latin name) which is a natural complex of flavonoid's aglicons extracted from the leaves of Smoke-trees (Latin name *Cotinus coggygria*).
- 3) Both **anti-inflammatory** and **anti-ulcer** medicine "Allanton" (Latin name) extracted from the roots of Elecampane (Latin name *Inula helenium*).
- 4) The **nephrolithiasis** medicine "Marelinum" (Latin name) which includes the extracts of madder (Latin name *Rubia tinctorum*), Field-Horsetail (Latin name *Equisetum arvense*), Goldenrod (Latin name *Solidago canadensis*), *Ammi visnaga* (Latin name), Lily-of-the-valley (Latin name *Convallaria majalis*) and salicylamide.

In addition to the drastic medicines, it has also been created preventive medicines which are closer to nutritions. They are medicines with **mild laxative** effect. As an example, I would like to mention

"Laminarinum" (Latin name) extracted from Sea-Kale, (Latin name *Laminaria*).

"Cafiolum" which contains leaves and fruits of Senna (Latin name *Cassia acutifolia*), pulp of fruits of Plums (Latin name *Prunus domestica*) and Fig tree (Latin name *Ficus carica*), and liquid petrolatum.

The **anti-ulcer** remedy has also been developed on the base of Chamomile (Latin name *Matricaria chamomille*) and the Japanese-pagoda-tree (Latin name *Sophora japonica*).

Studies of herbal medicines are still in progress. In recent years, we have focused on developing "Bio-active Supplements" (BAS or BS). The definition "Bio-active supplement" could be used as an equivalent to nutritions. As an example, I would like to mention Siberian cedar and Sea-buckthorn.

Siberian cedar's (Latin name *Pinus sibirica*) nuts is an essential food product and natural source of Cedar Oil.

In terms of calories, nutrient index and digestibility coefficient, Cedar nuts exceed meat, bread, eggs, cream, etc. For normal functions, human organisms need macro- and micro-elements which participate in biochemical processes. In Cedar nuts the content of such elements is very high. That makes the Siberian cedar's nutmeat an unique source of mineral substances. Since the old days, the people of Siberia have used the cedar nuts as medicine for treating different diseases such as tophus, gastrointestinal tract dis-function, liver disease, gallbladder diseases, etc.

The cedar nuts are also used as a source of a high quality oil, the Cedar Oil. Cedar oil has widely been used as folk medicine. It has excellent organoleptic properties and unique content of bio-active compounds. Cedar oil can be use as an excellent treatment for tuberculosis, atherosclerosis, hight blood pressure.

After the cedar oil extracted, the cedar nut's waste still keeps an active protein-carbohydrate complex. For this reason, our laboratory has prepared a project to develop new nutritions based on utilizing the cedar nut's waste in combination with various herbal extracts, for instance, Flaxseed (Latin name *Radiola*), Sea-Buckthorn (Latin name *Hippophae rhamnoides*), Balm (Latin name *Melissa*), Sage (Latin name *Salvia*), ect.

On the basis of the defatted waste products of cedar's nuts it has been proposed a new group of nutritions for treating and preventing various disease. At present those new nutritions have only preliminary names such as "Cedar #".

"Cedar 1" could be used for preventive measures against flu or cold-disease. It contains an ascorbic acid and extracts of Flaxseed (Latin name *Radiola rosea*), Magnolia-vine (Latin name *Schizandra chinensis*), *Eleutherococcus senticosus* (Latin name), Ginseng (Latin name *Panax ginseng*).

"Cedar 2" could be used for preventive measures against GI tract diseases. It contains extracts of Lemon-Balm (Latin name *Melissa officinalis*), Sage (Latin name *Salvia officinalis*), Nettle (Latin name *Urtica dioica*).

"Cedar 3" could be used for preventive measures against cardiovascular diseases. It contains extracts of Valeriana (Latin name *Valeriana officinalis*), Redhaw Hawthorn (Latin name *Crataegus sanguinea*), Common Balm (Latin name *Melissa officinalis*).

"Cedar 4" could be used for preventive measures against neuropathy and nervosism which contains extracts of Hop (Latin name *Humulus lupulus*), Balm (Latin name *Melissa*), Allheal (Latin name *Valeriana officinalis*), Cardiac Motherwort (Latin name *Leonurus*

cardiaca).

"Cedar 5" is bio-active nutrient consisting of a large protide group. This nutrient can be used under conditions when one has an intensive physical activity.

Another amazing plant which is used for production of nutritions is Sea-Buckthorn.

At all the times, **Sea-Buckthorn** (Latin name *Hippophae rhamnoides*) has been used for production of the sea-buckthorn's oil (brown oil). This oil contains a big amount of carotinoids and other lipids. In addition to lipid fraction, Sea-Buckthorn has vitamins, pectins, micro- and macro-elements. Seeds of sea-buckthorn contain so called "white" oil. These oils have a different fatty acid content. In recent years, we have used all substances of this plant for developing new nutritions.

In our Lab (Laboratory of investigation phytopharmaceutical products) we conduct a study and development of nutritions which have a large variety of pharmacological effects. The main idea which leads us is an idea of complex treatment of the human organism. We see the general scenario as follows.

- 1) As a first step, a patient takes nutritions which are able to clean up the entire human body from toxic compounds.
- 2) After that, one can use nutritions which are able to affect some specific human's body systems or organs (directed medicinal effect).
- 3) After human body got stabilized, one can use health-improving nutritions (health care nutritions).

Conclusions.

I have briefly described the directions of work of my institute and laboratory in the field of health care. Unfortunately, the Ukrainian economy is going down resulting the lack of funds for science. However, National Scientific Center of Medicinal Substances still has a very high scientific potential.

We know that the United States pays close attention to the development and use of nutritions. My colleagues and I are very interested in a sort of "International Collaborations" at any level, "person-to-person" or "Institute-to-Institute". We still have a lot of ideas which could be realized together.

Thanks all of you for your attention.