



## **DEVELOPMENT OF SOFT DOSAGE FORMS ON THE BASIS OF EFFECTIVE PHYTOCOMPONENTS AND PHYTOCOMPOSITIONS.**

Chirzad B.  
Dr. Of pharmacy  
E-mail: musik.55@hotmail.com

Stepanova E.F.  
Pyatigorsk Medical Pharmaceutical Institute of Volgograd Medical State University of the  
Ministry of Health Care of Russia  
E-mail: E.F.Stepanova@mail.ru

Ogay M.A.  
Pyatigorsk Medical Pharmaceutical Institute of Volgograd Medical State University of the  
Ministry of Health Care of Russia  
E-mail: marinfarm@yandex.ru

Ozdoev M-B.M.  
Omsk State Medical University of the Ministry of Health Care of Russia  
E-mail: ozdoev93@mail.ru

### **Abstract**

The purpose of the real work is the biopharmaceutical research of the original gel containing CO<sub>2</sub> - rhodiola rosea extract which can become promising cosmetic agent for problem skin and also original medicinal phytodrugs: the rectal suppositories containing as active components extracts of a liquorice (*Glycyrrhiza glabra*), milk thistles (*Silybum marianum*) and taurine.

**Keywords:** milk thistle, liquorice, taurine, rhodiola rosea, extracts



## 1. Introduction

*CO<sub>2</sub> - the extract containing a rhodiola rosea.*

The rhodiola rosea is adaptogeny medicinal vegetable raw materials which in addition have antioxidant, nootropic, antidepressant, immunomodulatory properties. The domestic industry issues (or produces) liquid extract of a rhodiola rosea, briquettes, the medicine "Rodozin". Rhizomes and roots of a rhodiola rosea are included in GF XI as medicinal vegetable raw materials. From cosmetics only cream of the rejuvenating action is known [1].

The main active ingredients in a rhizome of a rhodiola rosea — phenolic compounds: phenolic alcohols and their glycosides, flavonoids and tannins of group of pyrogallol (up to 20%). Phenolic alcohol p-oksifeniletanol (tyrosol) in raw materials contains in the basic in the form of a glycoside — a salidroside [8]. The maintenance of a salidroside varies from 0.5 to 1% depending on conditions of a habitat and a phase of development of a plant. Underground bodies contain still carbohydrates, organic acids, terpenoids (rosiridin, rosiridol), essential oil, sterols, aromatic connections (rosavin, rosin, rosarin), fenolkarbovy acids and their derivatives (gallic, etc.), anthraquinones, lipids (fats, wax). [2, 3]

Now the importance and a range of the soft dosage forms, especially designed on the basis of various phytocomponents become the most expressed. First of all it refers to ointments, creams and gels. At the same time the possibility of strengthening of the penetrating properties of the phytocomponents provided in these dosage forms depends on a number of conditions: one of such reasons is the possibility of use for receiving initial extraction of CO<sub>2</sub> extraction [4].

CO<sub>2</sub> extraction is a modern extracting method of removal of a complex of active ingredients, including from vegetable raw materials by means of the liquefied carbon dioxide. In CO<sub>2</sub> - extracts the carbon dioxide used as solvent derive essential oils, pitches, paraffin and pigments, and with an atmospheric pressure carbon dioxide returns to normal gaseous state and evaporates, without leaving any marks in a product. Thanks to use of carbon dioxide it is possible to receive a native complex of components with the increased concentration. [3]

Such technology gives the chance to receive liquid or dense substance as a result. Use of similar extracts gives the chance to completely exclude use of dry aromatic components, allows receiving a ready-made product with uniform substance without addition of dry spicy matters as a result [5]. The CO<sub>2</sub> extracts received thus are capable to enhance the penetrating properties of these phytocomponents therefore their use in the form of ointment phytocomposition for the subsequent use in cosmeceuticals and dermatology is expedient. [9]



Professor V.A. Kurkin and his school had first time offered receiving CO<sub>2</sub> extract of a rhodiola rosea. Conditions of CO<sub>2</sub> extraction were traditional. An exit was 1.5% [6]

However quantification confirmed as the dominating component availability of cinnamic alcohol and also the whole group of lipophilic substances – a tirozol, a roziridol,  $\beta$  - sitosterol. As for a rozavin and other glycosides, they were not found in CO<sub>2</sub> extracts. However existence of significant amounts of cinnamic alcohol in the received extract implies a possibility of use of this product in cosmetology. As for adaptogeny indicators, they presumably betray adaptogeny orientation to other medicine – dry extract. [6]

### *1.2 The rectal suppositories containing a liquorice, a milk thistle, and taurine.*

Further researches were devoted to such volume and perspective dosage form as suppository.

Rectal suppositories in most cases are considered as a dosage form of a systemic effect. It is known that the medicinal substances appointed in the form of suppositories, being soaked up through a mucous membrane of a rectum, get into a hemorrhoidal vein, from it – in the lower vena cava and then in the general blood stream, passing a protective barrier of a liver. This fact allows comparing suppositories by efficiency to intramuscular or subcutaneous injections. Other advantages of suppositories as dosage form are decrease in degree and frequency allergizing action and reduction or disappearance of side effect.

The studied suppositories have as acting the following components.

Liquorice (this Glycyrrhiza glabra. Fabaceae – Bean) has antiviral, spasmolytic, antiinflammatory property, shows hypotensive, capillary strengthening, antibacterial, expectorant, antineoplastic action; enveloping and also light laxative [7]. The activity of a liquorice is caused by the content of the following biologically active compounds: triterpenoid (glycyrrhizic acid), flavonoids (liquiritozid, kaempferol, apigenin, liquiritin, isoliquiritin, meletin, etc.) and also coumarins (umbelliferone, gerniarin, etc.).

Milk thistle (this Silybum marianum. Asteraceae – Astrovye) strengthens generation and removal of bile, increases protective properties of a liver to infections and different poisonings. Shows antioxidant activity, stimulates synthesis of structural proteins and phospholipids, stabilizes membranes and accelerates regeneration of cells of a liver. Also drugs of a thistle possess diuretic, febrifugal, carminative action, normalize digestion.

The medicines' uniqueness of milk thistle fruits is that their gepatozashchitny properties are caused by new group of the biologically active compounds (BAC) — flavolignanum, in particular Silibininum, silidianiny and silikristiny.

Taurine (2-aminoethanesulfonic acid) is mainly used in cardiology and ophthalmology as metabolic means. It is known that at prolonged use of small doses of taurine it renders antioxidant, hypoglycemic, hypolipidemic and hepatoprotective action.



### 3. Method

For confirmation of the greatest activity concerning release of the operating complex which is contained in a rhodiola rosea. received by means of CO<sub>2</sub> extraction the comparative biopharmaceutical researches in vitro by means of diffusion in gelatinous gel were conducted.

1. The dense extract received by a traditional bismatseration of 40% alcohol (in the ratio 1:8);
2. CO<sub>2</sub> extract;
3. The gel received on the basis of alcohol-water extraction by means of a complex gel former lanolin with lecithin;
4. The gel received by means of Methyl Cellulose with glycerin;
5. The gel received by means of a karpopol;
6. The gel received by means of PEG-400 and PEG-1500.

For assessment of efficiency of suppositories the biopharmaceutical researches in vitro by method of diffusion in gelatinous gel were conducted.. For this purpose cocoa butter was chosen as the basis. As a reactant in polyphenolic structures entered ferric chloride solution into the gelatin solution prepared 3%.

We received liquid extracts from roots and rhizomes of a liquorice and milk thistle fruits by a bismatseration method. For a liquorice was chosen an extragent of 0.25% ammonia solution, for a milk thistle – 70% alcohol was chosen. Further the received extracts and taurine in the ratio 6:1:3 were injected into a basis – cocoa butter.

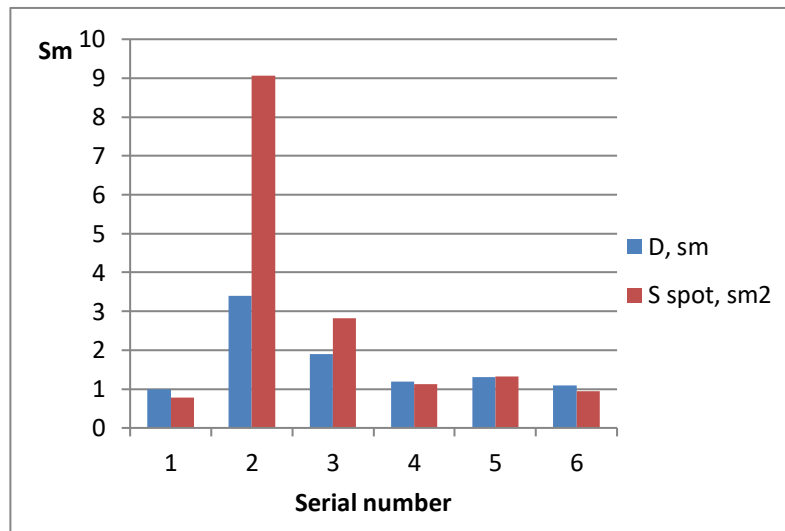
### 4. Results & discussion

Table 1 – The chart of extent of release of polyphenolic connections from a rhodiola rosea.

Serial number	D, sm	S spot, sm <sup>2</sup>
1	1	0,785
2	3,4	9,07
3	1,9	2,83



4	1,2	1,13
5	1,3	1,33
6	1,1	0,95



Thus the preliminary biopharmaceutical researches in vitro confirmed expediency of further use of CO<sub>2</sub> extract of a rhodiola rosea.

Results of biopharmaceutical researches of the suppositories containing a milk thistle, a liquorice and taurine are provided in tab. 2.

Table 2 – Results of a biopharmaceutical research of bases a diffusion method in gelatinous gel

Time, min	Release zone, mm	
	Base	
	Without base	Oleo cacao



30	1	1
60	2-3	1-2
90	3	2

## 5. Conclusions

Taking into account the use of the existing information data regarding the CO<sub>2</sub> extracts of a rhodiola rosea, gel which in the long term can be applied as dermatological and cosmetic agent was developed on the basis of CO<sub>2</sub> extract.

The most effective structure is the composition a thistle: liquorice : taurine (6:1:3). The offered complex structure can be studied from pharmacological and analytical positions for further implementation and practical use.

## 6. References

1. Chubarova A.S. (2013) Characteristic of antioxidant activity of substance of Silymarinum as a part of hepatoprotective medicines. Medical news, 3, 64-66.
2. Evseeva S.B. Phyto and mineral components for the correction of age-related skin changes / S.B. Evseeva, B.B. Sisuev // International journals applied and fundamental. Research, 2015. – № 12 (9). – C. 1658–1662.
3. Evseeva S.B. Phytocomponents in the composition of cosmetics for oily skin and acne changes / S.B. Evseeva // International journals applied and fundamental. Research, 2015. - № 10-5. - C. 874-878.
4. Kakuris V.J. Phosphate deposition during and after hypokinesia in phosphate supplemented and unsupplemented rats / V.J. Kakuris et al. // Physiological chemistry and physics fnd Medical Nmr Pacific Press, Inc. 2004. – T. 36. - № 2. - C. 109-121.
5. Kozhamzharova L.S., Kim Y.V., Ogurtsova O.N. (2015) Toxicity and antineoplastic activity of extracts of an elevated and underground part of types of the sort Glycyrrhiza L. Science yesterday, today, tomorrow: theory and practice. Materials of the International electronic Symposium, 7-15.
6. Kurkin V.A. (2015) Rhodiola rosea (golden root). Standardization and creation of drugs / V.A. Kurkin // – Samara: Ofort; SamGMU, 2015. – 240 c.
7. Makhatova B.G. Antimicrobial activity of various extracts of Verbascum songaricum against Staphylococcus aureus / B.G. Makhatova et al. // Biopharmaceutical Journal, 2017. – T. 9. - № 1. – C. 38-40.
8. Aoyama S. Stimulation of membrane permeability transition by a-Lipoic acid and its biochemical characteristics / S. Aoyama et al. // Physiological chemistry and physics fnd Medical Nmr Pacific Press, Inc. 2006. – T. 38. - № 1. - C. 1-20.



[www.mescj.com](http://www.mescj.com)

9. Yorimitsu M. Role of  $\alpha$ -Tocopherol in the regulation of mitochondrial permeability transition / Yorimitsu M. // *Physiological chemistry and physics and Medical Nmr* Pacific Press, Inc. 2004. – T. 36. - № 2. - C. 95-107.