# DEVELOPMENT OF SPECIFICATION FOR PHARMACEUTICAL SUBSTANCE OF RED RASPBERRY LEAVES DRY EXTRACT

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# Introduction

- Today the development of medicinal products from medicinal herbal raw materials is relevant. As pharmaceutical substances finely ground plant powders and liquid, thick and dry extracts are used to obtain various dosage forms – tablets, capsules, syrups etc. Dry extracts from medicinal plant raw materials are considered as promising pharmaceutical substances for the preparation of solid dosage forms - tablets and capsules.

- One of the stages of pharmaceutical development is the development of specifications and test methods for pharmaceutical substances and finished medicinal products. The specification includes a list of quality indicators, references to test methods and associated tolerance limits, which are quantitative limits, intervals, or other criteria for the tests described.

# Purpose

- Development of specification for the pharmaceutical substance red raspberry leaves dry extract.

# Materials and methods

- Red raspberry leaves dry extract was obtained by the method of repercolation with a complete cycle at a ratio of raw materials and extraction of 1: 1. Ethyl alcohol 40% was used as an extractant.

- The resulting purified extract was concentrated using a thin-layer rotary evaporator at a temperature of 70-80 ˚C. Then the concentrated extract was dried in a thermostat at 37 ˚C to obtain a dry extract.

# Materials and methods

Standardization of the obtained red raspberry leaves dry extract was carried out in terms of description, authenticity, quantitative determination of active substances (tannins), weight loss on drying, microbiological purity, packaging, marking, shelf life.

- Determination of the loss in weight on drying was carried out in accordance with the State Pharmacopoeia of the Republic of Belarus(SP RB).
- The content of tannins in the obtained red raspberry leaves dry extract was determined by permangonatometric titration.
- To determine the authenticity of red raspberry leaves dry extract thin layer chromatography was used.
- When labeling containers, it is necessary to additionally indicate the name of the medicinal plant material, the consistency of the extract, the ratio of the starting material and the resulting extract, the extractant used to obtain the extract.
- When choosing a package the hygroscopic property of dry extracts was taken into account. Containers for storing dry extracts should be tightly sealed, protect dry extracts from moisture and be opaque.
- The shelf life of the developed red raspberry leaves dry extract was determined during storage under natural conditions applicable to climatic zone II: storage temperature (25 ± 2)˚C, relative air moisture (60 ± 5)%.
- Determination of the microbiological purity and the content of heavy metals of the obtained red raspberry leaves dry extract were carried out in accordance with the SP RB. When determining the microbiological purity of the red raspberry leaves dry extract the criterion of category C for herbal medicines containing extracts was taken into account.

# Results

**The developed specification for the pharmaceutical substance red raspberry leaves dry extract is presented in table.**

| Indicator | Norms (allowable limits) | Control method |
|---|---|---|
| Description | Homogeneous dark brown powder | Visual<br>Organoleptic |
| Authenticity | The chromatogram of the test solution shows fluorescent yellow-green zones with Rst values of about 1.6, 1.5, 1.4, 0.85 and 0.8 relative to the rutin zone in the chromatogram of the reference solution. Faint blue fluorescent zones are allowed. | SP RB II, 2.2.27 |
| Quantitation: | Not less than 3.0% tannins in terms of tannin (in terms of dry substance). | According with SP RB II p.1266 |
| Weight loss on drying: | No more than 5%. | SP RB II 2.8.17 |
| Heavy metals: | No more than 0.01% (100 ppm). | SP RB II. 2.4.8 method A |

| | | |
|---|---|---|
| Microbiological purity:<br>– the total number of aerobes (TNA);<br>– the total number of mushrooms (TNM);<br>– gram-negative bacteria tolerant to bile or bacteria of the Enterobacteriaceae family<br>– the presence of Escherichia coli in 1 g;<br>– presence of Salmonella in 25 g | SP RB II. 5.1.8<br>– acceptance criterion $10^4$ CFU/g or CFU/ml; maximum allowable number: 50,000 CFU/g or CFU/ml.<br>– acceptance criterion: $10^2$ CFU/g or CFU/ml; maximum allowable number: 500 CFU/g or CFU/ml.<br>– acceptance criterion: $10^2$ CFU/g or CFU/ml<br>– absence in 1 g<br>– absence in 25 g | SP RB II, 2.6.12, 2.6.13 |
| Package | In tightly sealed dark-colored containers in a dry, dark place. | |
| Marking | On the label, additionally indicate: the used plant raw materials, the consistency of the extract, the ratio of the starting material and the obtained extract, the solvent used in the extraction. | |
| Storage conditions | Store in a tightly sealed waterproof container, protected from light at temperatures from + 15 $^0$C to + 25 $^0$C. | |
| Shelf life | 2 years | |

# Conclusion

- According to all quality indicators included in the developed specification the pharmaceutical substance red raspberry leaves dry extract meets the requirements of the SP RB.

- Thus, on the basis of the pharmaceutical substance red raspberry leaves dry extract compositions and technologies for obtaining solid dosage forms – film-coated tablets and capsules have been developed. At this stage the compositions and technologies for producing tablets have been developed and the manufacturer's pharmacopoeial article is being developed.

# Thank you for your attention