



**NATIONAL UNIVERSITY OF PHARMACY**  
**TECHNOLOGY OF DRUGS DEPARTMENT**



Discipline “Pharmacy-based technology of drugs”

*The topic of the lecture :*

# **“Infusions and decoctions from extracts-concentrates. Mucilages”**

a lecture for English students of 3<sup>rd</sup> course  
in the speciality “Pharmacy” for foreign students

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# THE PLAN OF THE LECTURE

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1. Author's formulas.
2. Characteristic and formulation of mucilages.
3. Formulation of aqueous extractions using the extract-concentrates.
4. Quality control, storage and improvement of water extracts.

## QUESTIONS FOR SELF WORK

1. Nomenclature of thick, dry and liquid extracts.
2. Methods of preparation (maceration, percolation, repercolation, circulation and extraction, ultrasound and turbo-extraction).





# REFERENCES:

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1. **Tikhonov A.I., Yarnykh T.G., Yuryeva A.B., Garkavtseva O.A. Chemist's Technology of Drugs: The manual for students of higher schools / Ed. by A.I. Tikhonov and T.G. Yarnykh. – Kharkiv: NUPh; Original, 2011. – 424 P**
2. **Tikhonov A.I., Yuryeva A.B., Zuykina S.S. Chemist's technology of drugs. Infusions and decoctions. A lecture for English students of the 3-rd year, speciality "Pharmacy": a handbook for out-of-class work of students / Edited by acad. A.I. Tikhonov. - Kh.: PH of NUPh, 2009. – 28 p.**
3. **Dry, liquid and soft medicinal forms. A textbook for English students in speciality "Pharmacy" / A.I. Tikhonov, T.G. Yarnykh, A.B. Yuryeva, L.N. Podorozhna, S.S. Zuykina; Ed. by A.I. Tikhonov. – Kharkiv: NUPh; Original, 2011. – 208 p.**
4. **Tikhonov A.I., Yarnykh T.G., Yuryeva A.B., Podorozhna L.N., Zuykina S.S. Biopharmaceutics. Lectures for English students on the speciality "Pharmacy": a handbook for the out-of-class work of students/ edited by acad. A.I. Tikhonov. – Kharkiv: NUPh, Original, 2011. – 140 p.**

# 1. AUTHOR'S FORMULAS

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## *Formulation multi-component infusions and decoctions*

**Rp.: Infusi radicibus Valerianae ex 10.0**

**Infusi foliorum Menthae ex 4.0 - 200 ml**

**Coffeini-natrii benzoatis 0.4**

**Analgin 0.6**

**Natrii bromidi 3.0**

**Magnesii sulfatis 0.8**

**Misce. Da. Signa. Use 1 table spoon 3 times a day.**

Extraction is preparing simultaneously in one infuser, because both kinds of raw material contain essential oils.

Quantity of water will be:  $200 + (10.0 \times 2.9) + (4.0 \times 2.4) = 238.6 = 239$  ml.

After finishing up to necessary volume, dissolve all registered components and filter in the bottle for dispensing.



# 1. AUTHOR'S FORMULAS

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Rp.: Infusi radices Althaeae ex 10,0  
Infusi herbae Leonuri ex 20.0  
Infusi foliorum Farfarae ex 20.0  
Decocti corticis Viburni ex 25.0 - 1000 ml  
Misce. Da. Signa. Use 2 table spoon 4 times a day.

**Amount of water divide into 3 parts:**

**For infusion of Althaeae:**

$200 \text{ ml} \times 1.3 = 260 \text{ ml}$

**For cortex of Viburni:**

$250 \text{ ml} + (25.0 \times 2) = 300 \text{ ml};$

**For infusion of a Leonuri herb and leaves of Farfarae:**

$1000 \text{ ml} - (260 + 300) + (20.0 \times 2.9) + (20.0 \times 2) = 648 \text{ ml}$

**Total volume of multicomponent water extraction should be:**

$200 + 250 + 550 = 1000 \text{ ml}.$



## 2. CHARACTERISTICS AND FORMULATION OF MUCILAGE

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Mucilages (Mucilagines) are dense viscous solutions of HMC or substances like polysaccharides.

The requirement coefficient show, how the amount of the raw material and water should be increased to obtain a required amount of an extract.

The requirement coefficients for ALTHEA root infusion

The ratio of the raw material and aqueous extraction	The requirement coefficient
1: 100	1.05
2: 100	1.10
3: 100	1.15
4: 100	1.20
5: 100	1.30





## 2. CHARACTERISTICS AND FORMULATION OF MUCILAGE

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### The including of medicinal substances in aqueous extractions

Rp.:      Infusi radicis Althaeae      ex      4.0 - 100 ml  
         Natrii benzoatis                              3.0  
         Natrii hydrocarbonatis                      2.0  
         Liquoris Ammonii anisati                      3 ml  
         Sirupi simplicis                              10 ml  
         Misc. Da. Signa. 1 restaurant spoon 3 times a day.



The mixture from the raw material containing a mucilage, with substances soluble in water, aromatic substance – ammonia anise drops, which is specific for including, and a viscous liquid – the sugar syrup.

Place 4.8 g of the powdered Althea root, into auxiliary bottle add 120 ml of the purified water and infuse at the room temperature within 30 minutes while stirring frequently by a glass stick. When the time is over, the infusion is strained through a double gauze layer into a measuring cylinder and not press of the raw material, add some water through the raw material till 100 ml. The obtained infusion is put into the auxiliary bottle, where 2.0 g of sodium hydrocarbonate is dissolved at first, then add sodium benzoate and straine into the bottle for dispensing. In a small bottle measure 10 ml of a simple syrup and 3 ml of ammoniac anise drops, mix while shaking and add to the prepared infusion.



### 3. FORMULATION OF AQUEOUS EXTRACTIONS USING THE EXTRACT-CONCENTRATES

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*Extracts - concentrates are the special group of extracts for preparation of infusions and decoctions*

According to the consistence they can be

liquid

dry

**Dry extracts** – concentrates obtained in the following case: evaporate liquid extracts and include additional substances (like lactic sugar or dextrin or their mixture) with active substance in ratios 1:1 or 1:2.

**There are such dry extracts:**

**Althea root (1:1), Adonis (1:1), Thermopsis (1:1),  
Convallaria (1:1), Digitalis (1:1).**

**There are such liquid extracts- concentrates:**

**Valeriana (1:2), Leonuri (1:2), Adonis (1:2).**





### 3. FORMULATION OF AQUEOUS EXTRACTIONS USING THE EXTRACT-CONCENTRATES

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**The dry extracts-concentrates should be dissolve in water, strain and mix with the concentrated solutions of salts. During the direct mixing of the concentrated solutions of salts with dry extracts-concentrates may be obtained a settling.**

Rp.: Infusi radice Althaeae ex 5.0 - 100 ml

Natrii benzoatis 1.5

Elixiri pectoralis 1.5 ml

Misce. Da. Signa. Use 1 dessert spoon 2 times a day.

WCP (reverse side)

Extract-concentrate of Althea root dry (1:1): 5.0

Solution of Sodium benzoate 10% (1:10):

$1.5 \times 10 = 15 \text{ ml}$

Purified water:  $100 - 15 = 85 \text{ ml}$

% of dry extract-concentrate of Althea root :

$85 \text{ ml} - 100\%$

$5.0 - x; \quad x = 5.9\% > 3\%. \text{ VIC} = 0.61$

Purified water:  $85 \text{ ml} - (5.0 \times 0.61) = 82 \text{ ml}$

Measure 82 ml of the purified water in the bottle, dissolve 5.0 g of the Althea dry (1:1) extract-concentrate, straine in the bottle for dispensing and add 15 ml of the sodium benzoate concentrated solution (1:10) measured by the burette system. Then weigh 1.5 g of the pectoral elixir in the small vessel and measure approximately 2 ml of the mixture obtained, mix and add to the total volume in the bottle for dispensing.



### 3. FORMULATION OF AQUEOUS EXTRACTIONS USING THE EXTRACT-CONCENTRATES

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**Rp.: Infusi rhizomatis cum radicibus Valerianae ex 5.0 - 200 ml**

**Coffeini-natrii benzoatis            0.6**

**Tincturae Convallariae            5 ml**

**Misce. Da. Signa. One tablespoon 3 times a day.**

Take a double amount of an extract – concentrate from the liquid extract-concentrates instead of the amount of the plant raw material indicated in the formula.

The opalescence mixture consists of the infusion from the raw material volatile oils and caffeine sodium benzoate, a strong-effective substance soluble in water.

#### Technology:

Measure 184 ml of water, 6 ml of 10 % caffeine-sodium benzoate solution (1:10), 10 ml of the liquid valerian extract-concentrate (1:2) and 5 ml of the Convallaria tincture in the bottle for dispensing.





## 4. QUALITY CONTROL, STORAGE AND IMPROVEMENT OF WATER EXTRACTS

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- Water extracts, as well as all liquid medicines containing water extracts, should be dispensed only freshly prepared because of their little stability with the labels: **«Keep in a cool place»** and **«Shake well before use»**.
- The quality control is carried out following the same parameters as ones for other liquid medicinal forms, namely, the correspondence of the formula and **WCP, colour, taste, odour, the absence of mechanical inclusions (transparency), deviation in the volume, packing, registration for dispensing**.
- The general directions of improving the formulation of infusions and decoctions are: **the extension of the assortment of extract-concentrates; application of modern methods of extraction of the plant raw material using ultrasound, ionizing radiation, adding surface active substances; introducing the means of mechanization of auxiliary operations; developing the equipment of a new design.**

# Conclusions

1. Author's formulas has been considered
2. Formulation of aqueous extractions using the extract-concentrates has been studied
3. Quality control and storage of aqueous extractions was reviewed
4. Perfection of infusions and decoctions preparation was analyzed







**Thank you for  
attention!**