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TECHNOLOGY OF EXTRACTING DRY EXTRACT FROM THE ROOT OF CAPPARIS SPINOSA PLANT

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Abstract
The first phase of the research focused on obtaining dry extracts from the roots of the Capparis spinosa plant and developing a technology.
Extraction of biologically active substances from plant raw materials is a complex process and depends on a number of factors. These are the type and concentration of the extractant, the degree of fineness of the raw material, the method of extraction, the ratio of raw material and extractant, and so on.

Keywords: Capparis spinosa, percolation, polyphenol
Due to the fact that the main biologically active substances in the plant Capparis spinosa are polyphenols - in the selection of the optimal factors, attention was paid to the completeness of the separation of polyphenols. It is known that polyphenols are highly soluble in ethyl alcohol. Therefore, it is advisable to use ethyl alcohol as an extractant, but its concentration has been determined experimentally.
To obtain a dry extract, Capparis spinosa root was crushed at a distance of 5-6 mm. Ethyl alcohol was diluted to 40, 60 and 70%. The liquid extract was obtained by percolation, the extractant was evaporated and the extract was dried to a moisture content of 5%. The yield of the resulting dry extract was determined.
The results obtained are shown in Figure 3.1.
According to the results obtained, the yield of the extract was the lowest when 40% ethyl alcohol was used. For example, the yield of extract from the root was 12%, and from the root - 9.8%. As the concentration of the extractant increased, so did the yield of the extract. However, when 60% and 70% ethyl alcohol were used, the yield of the

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extract differed. In other words, the yield was 20% and 21% in the extract from the root, and 17 and 18.5% in the extract from the root. Hence, in our subsequent research, we found it appropriate to use 70% ethyl alcohol.

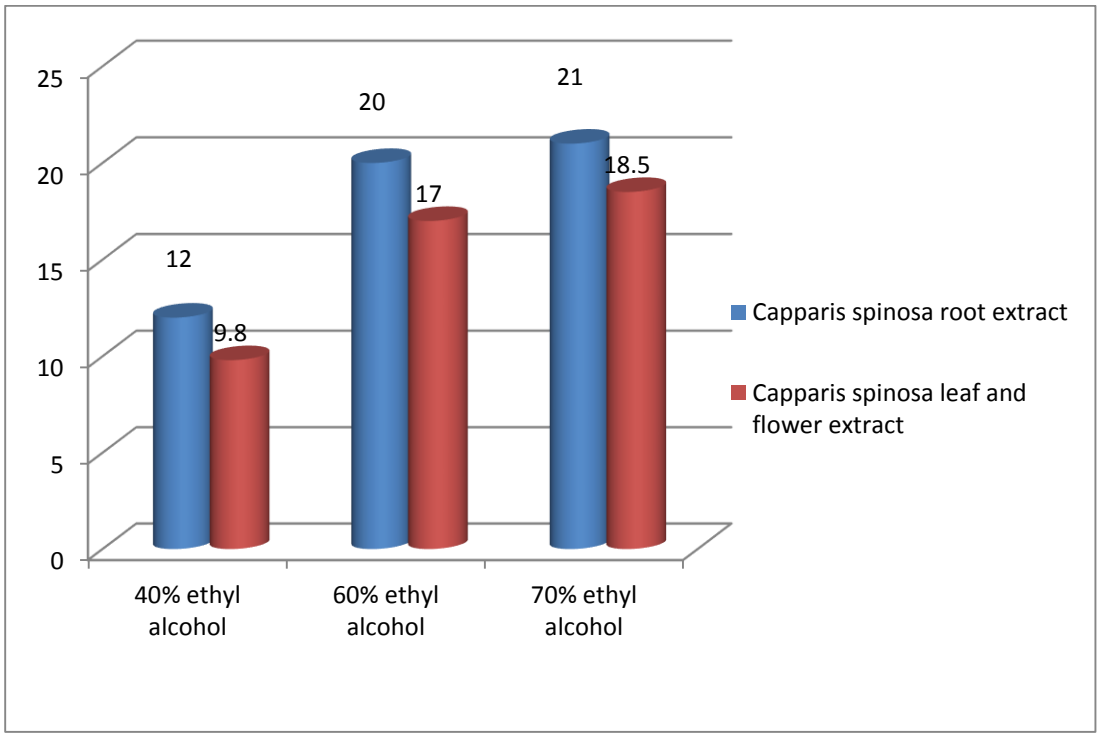

Figure 3.1. Yield of dry extract when using ethyl alcohol of different concentrations

Another factor in the next phase of research was the fineness of the raw material. To do this, the roots of Capparis spinosa were crushed in the following sizes: 2-3 mm, 5-6 mm, 7-8 mm. According to the literature, the smaller the raw material, the more complete the release of biologically active substances. However, in some cases, too much crushed raw material leads to poor quality extracts.

Extraction was performed using percolation and 70% ethyl alcohol. The results obtained are shown in Figure 3.2.

As can be seen from this diagram, the fineness of the raw material has a significant effect on the yield of the dry extract. The lowest yield of the extract was demonstrated using raw materials with a fineness of 7-8 mm. The yield of extract from the root of Capparis spinosa was 19%, and when using the root -15%.

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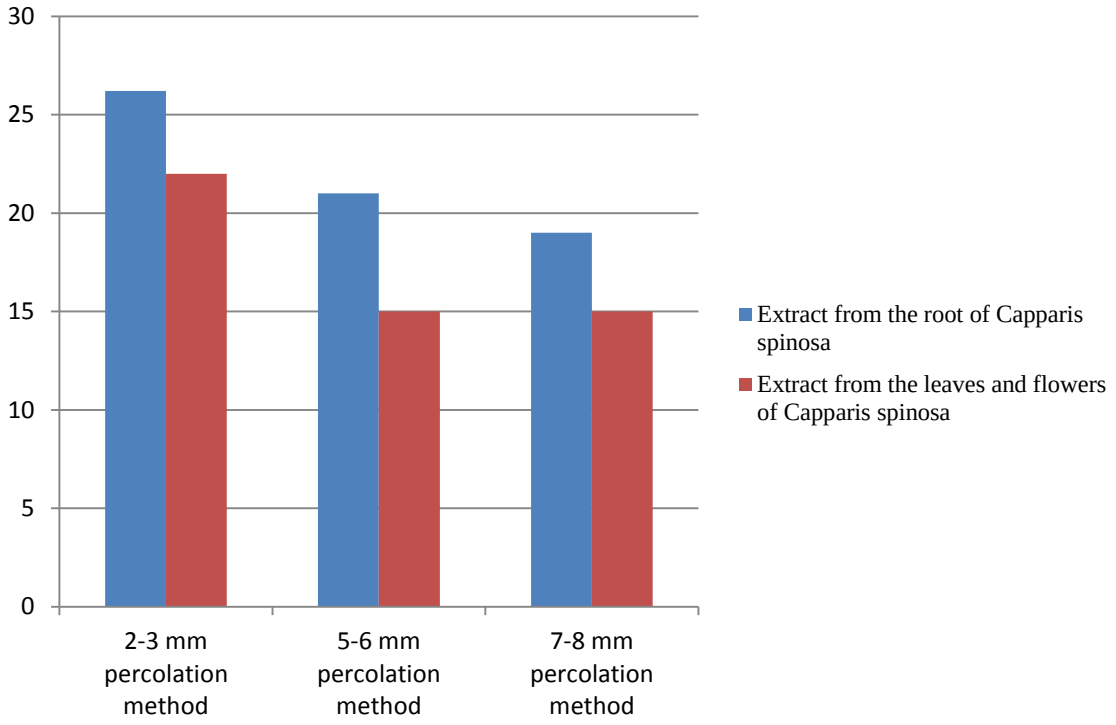

Figure 3.2. The effect of dry extract on the yield of the product

When the fineness of the product was 5-6 mm, the yield of the extract from the root did not change, and in the extract from the root was 21%. The most moderate degree of fineness was 2-3 mm. The yield of Capparis spinosa root extract was 26.2% and 22% of root extract.

Thus, for further studies, the fineness of the raw material was set at 2-3 mm.

In the third phase of the research, the goal was to scientifically substantiate the method of extracting. Percolation and repercolation methods were used. The fineness of the raw material was 2-3 mm, the extractant was 70% ethyl alcohol.

The percolation extract was performed as follows: Capparis spinosa root (root) was crushed to a size of 2-3 mm, the mouth was placed in a wide container and moistened with 60% ethyl alcohol. The plant material and extract were mixed well and left for 4 hours to feed. The crushed raw material was transferred to a percolator, filter paper was placed to prevent the product from floating, and it was pressed with porcelain pieces. The tap of the percolator is opened during the injection of the extractant into the percolator to remove air. The leaking extractant was put back into the percolator. The percolator tap was then closed and 70% ethyl alcohol was added until a "glassy surface" was formed, ie the raw material was covered by 1-2 mm. The percolator was

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covered with polyethylene and left for 24 hours. Another percolator was then placed on top of this percolator and percolated until the biologically active substances in the plant material were depleted. It was incubated for 7 days to purify the separation from foreign matter and filtered through a filter. The resulting liquid extract extractant was evaporated in a vacuum evaporator, then dried until 5% moisture remained. The technological scheme of extraction by percolation is shown in Figure 3.3.

Another method used is the repercolation method. In it, the factors were selected as percolation. The technological scheme is shown in Figure 3.4.

Pieces of capparis spinosa plant (root or rhizome) crushed in 2-3 mm size were placed in 3 glass jars, tightly closed, divided into 3 equal parts, 70% ethyl alcohol was poured on it, mixed with a glass rod, the mouth was closed, Leave to simmer for 5–6 hours. In time, the crushed raw material was transferred to 3 percolators with 3-4 layers of gauze on the bottom layer. The raw material was covered with filter paper and covered with pieces of porcelain. 70% ethyl alcohol is poured from the above container into the first percolator until a "glassy surface" is formed.

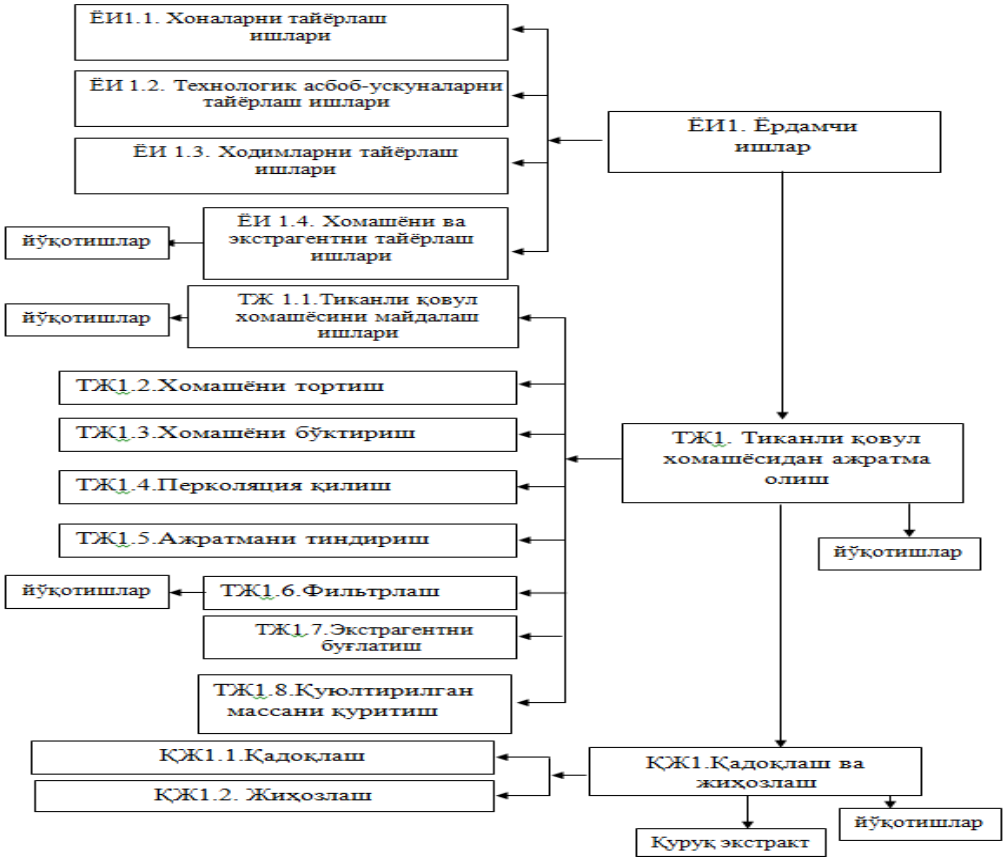

Figure 3.3. Technological scheme of percolation of dry extract of Capparis spinosa

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The tap of the first percolator was then opened and percolated at the specified speed until a "mirror surface" was formed on the second percolator. It was noted that 70% of the ethyl alcohol entering the first percolator and the discharge from the tap should be at the same rate. Separation from the second percolator was used to percolate the product in the third percolator. At the same time, after the formation of a "glassy surface" in the third percolator, its tap was fully opened and the separation was collected. Since only pure 70% ethyl alcohol enters the first percolator during the process, this percolator is removed from the work process when the biologically active substance in the raw material is exhausted. The pure extractant is then lowered into the second percolator and then into the third percolator. In the third, when the biologically active substances are depleted, the liquid extract obtained is precipitated to remove foreign substances.

The resulting liquid extract was evaporated in a vacuum evaporator, then dried to a moisture content of 5%. The technological scheme of obtaining the extract by the method of repercolation is shown in Figure 3.4.

The yield of dry extracts obtained by percolation and repercolation method was determined. The results obtained are presented in Table 3.1.

Table 3.1.

Yield of dry extracts obtained from Capparis spinosa raw material by percolation and repercolation method

№	Extraction method	Dry extract yield
1	Percolation method	26,2
2	Repercolation method	26,6

Based on the results obtained, the dry extract yield was almost indistinguishable (26.2% and 26.6%) when using both methods. Therefore, in order to save time, it was recommended to conduct further research by percolation.

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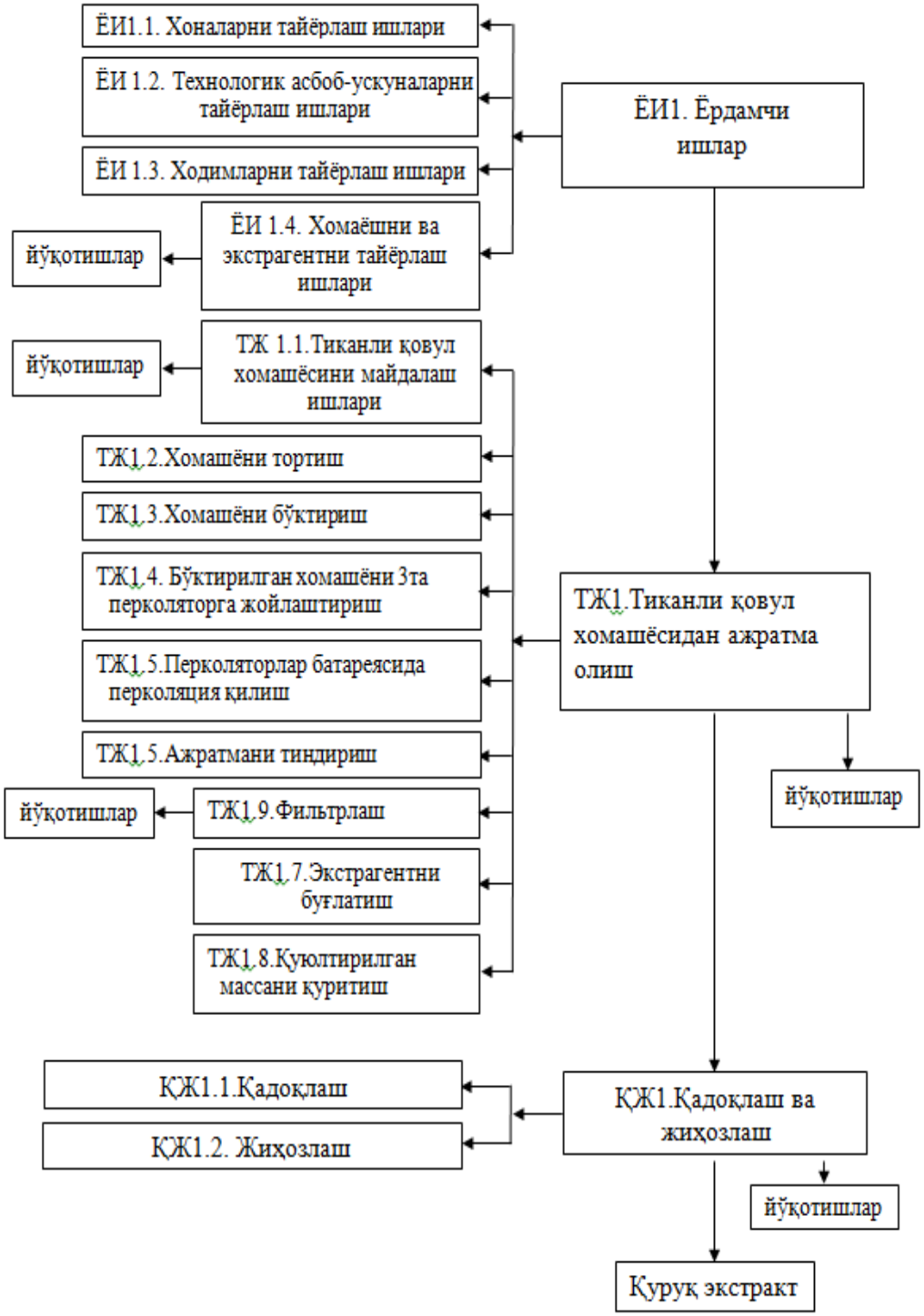

Figure 3.4. Technological scheme of obtaining dry extract of Capparis spinosa by repercolation method

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Another factor influencing the release of biologically active substances from plant raw materials is the ratio of raw materials and extractants. To select this ratio, 1: 5, 1:10, 1:20 and 1:30 dry extract of Capparis spinosa raw material with a fineness of 2-3 mm and 70% ethyl alcohol were obtained. The yield of these extracts was determined. The results obtained are shown in Figure 3.5

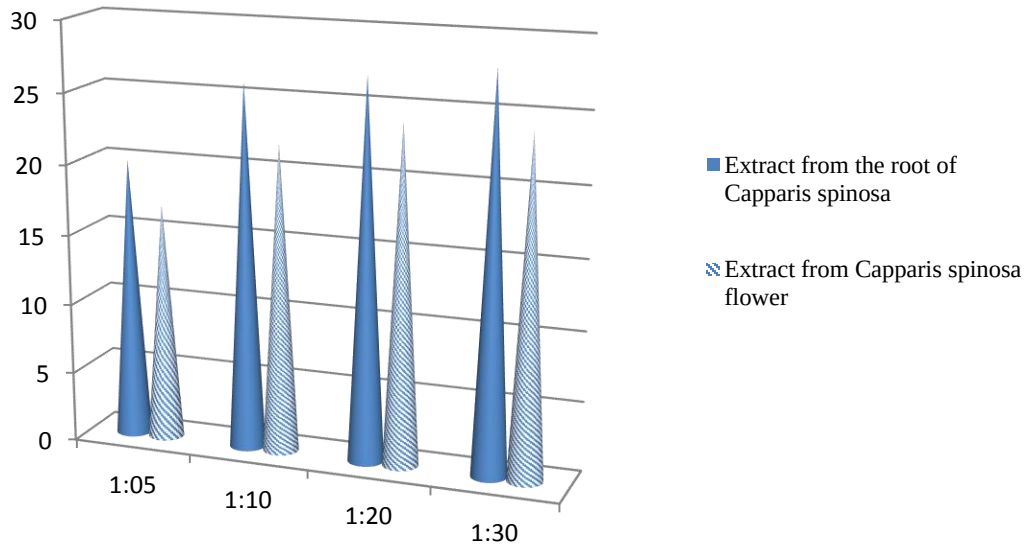

Figure 3.5 Influence of Capparis spinosa raw material and extractant ratio on dry extract yield

The results show that as the amount of extractant increases relative to the raw material, so does the yield of the extract. For example, when the ratio was 1: 5, the yield of the extract from the root of Capparis spinosa was 20%, and only 17% from the root. Doubling the amount of extractant increased the yield of the extract from the root to 26% and from the root to 22%. The amount of extractant increased by 20% and 30 times compared to the raw material, the amount of dry extract increased by 1-2%, but since this increase was not a large number, it was decided to save the ratio of raw material and extractant to 1:10.

Experiments have shown that the fineness of the raw material is 2-3 mm. 70% ethyl alcohol was selected as the extractant, and the most moderate ratio of raw material and extractant was set at 1:10. The study selected the optimal method for obtaining dry extracts from the roots of Capparis spinosa - percolation.

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References

1. Levizou, E; P. Drilias; A. Kyparissis (2004). "Exceptional photosynthetic performance of Capparis spinosa L. under adverse conditions of Mediterranean summer." Photosynthetica.**42**: 229–235
2. Pardayeva Maftuna Ilhomovna, & Akbarov Nurislom Akhtamjon ugli. (2021). ROSEHIP AND ITS HEALING PROPERTIES. JournalNX - A Multidisciplinary Peer Reviewed Journal, 7(04), 65–67. Retrieved from https://repo.journalnx.com/index.php/nx/article/view/2839
3. Sharofovna, Kucharova Inobat, and Akbarov Nurislom Akhtamjon Ugli. "Homocysteine: Effect on biochemical processes in the human body." ACADEMICIA: An International Multidisciplinary Research Journal 11.4 (2021): 607-612.
4. Akbarov Nurislom Axtamjon o'g'li, & Muxitdinova Maxfuza Kamolovna. (2021). CALENDULA AND ITS HEALING PROPERTIES. Eurasian Journal of Academic Research, 1(2), 1048–1050. http://doi.org/10.5281/zenodo.4910757
5. Kucharova Inobat Sharofovna, & Akbarov Nurislom Akhtamjon ugli. (2021). HOMOCYSTEINE: EFFECT ON BIOCHEMICAL PROCESSES IN THE HUMAN BODY. EURASIAN JOURNAL OF ACADEMIC RESEARCH (ISSN 2181-2020), 1(1), 992–996. http://doi.org/10.5281/zenodo.4742449
6. Nurislom Akbarov. (2021). Miraculous Biology. International Journal of Academic Health and Medical Research, Volume 5(Issue 2), 96–97. http://doi.org/10.10101/ijahmr.v5i2.9697