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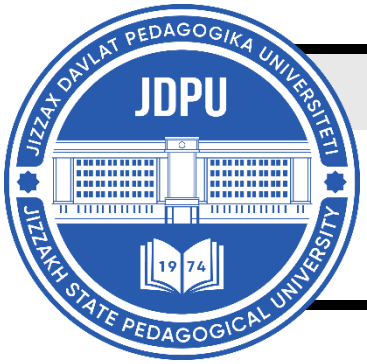
MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL



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DETERMINATION OF THE EXTRACTION METHOD OF BIOLOGICA L ACTIVE SUBSTANCES OF YANTOQ (ALHAGI MAURORUM) PLANT GROWN IN KASHKADARYA REGION

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ABOUT ARTICLE

Key words: Alhagi maurorum, extraction, food, functional, amino acid, green, flavonoid, antioxidant, antibacterial, High Performance Liquid Chromatography, water, alcohol.

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Abstract: The creation, testing and application of new types of products to the masses is based on benefiting a certain person. The technology of obtaining supplements and extracts containing biologically active substances is based on the bioactive substances in the component of the product.

In our review, the extraction method was used to extract the bioactive substances of the yantak plant (alhagi maurorum) with respect to the content of flavonoids. In the process of analysis, 16 different extraction samples were prepared and structural and quantitative analysis of flavonoids was carried out using high-performance liquid chromatography. Optimal parameters were selected according to the analysis process.

INTRODUCTION

Generally, functional foods are considered to be the same food products as traditional foods in all respects, except that it contains some biologically active additives (BFQ) as additional ingredients. [1]

Although the design of a novel food product is usually an expensive enterprise, functional foods can be practically developed from a variety of raw materials through the process of fortification or other modification of nutritional components [2].

ANALYSIS OF LITERATURE ON THE TOPIC

Recent trends in global food markets indicate that consumers are demanding foods from plant materials that are "safe", "fresh", "natural" and "nutritional value" produced and processed in sustainable ways. Such raw materials include minimally processed fresh fruits, vegetables, medicinal and aromatic plants and their waste and by-products. [3].

Currently, functional foods usually contain some plant extracts rich in BFQs produced by conventional extraction, which often have some negative thermal effects on the extraction yield and quality. shows [4].

Therefore, it is preferable to obtain the extracts by stable extractions such as microwave extraction, ultrasonic extraction, high pressure extraction, high voltage electric discharge extraction, pulsed electric field extraction, supercritical fluid extraction, among others. [5,6].

These techniques are compatible with "green" concepts and are able to provide raw materials on an industrial scale with optimal consumption of energy and chemical solvents. Produced food products must have acceptable food structure, composition and stability, which supports their traceability and authenticity [7].

MATERIALS AND METHODS

The main purpose of this review is to review the topics related to the new food processing and extraction technologies applied to yantoq (Alhagi maurorum) plant matrices as raw materials for the production of functional food products and optimal local alder development of an extraction method. Obtaining results by screening different extraction samples for flavonoids in High Performance Liquid Chromatography. Based on the results, a high level of flavonoids is determined [8,9,10].

The researches were carried out at the "Scientific Testing Laboratory" branch of TKTI Shahrisabz. Samples of Yantoq (Alhagi maurorum) plant collected in the autumn season of 2023 were collected for laboratory analysis.

RESULT AND DISCUSSION

First, to prepare the sample, it was dried in a natural wind flow for 15 days in a special place away from the sun. Dried raw materials were ground into powder in a special porcelain mortar. Water, 40%, 70% and 96% ethyl alcohol (C_2H_5OH) solutions were selected for extraction. A 5 mg sample of each solution was dissolved in 50, 75, 100 and 200 ml solvents and left for 24 hours. The sample was filtered using filter paper, centrifuged at 4000 rpm for 10 minutes. The prepared clear solution is placed in vials and placed on HPLC Agilent Technologies 1260 high performance liquid chromatography and chromatograms are obtained [11].

Chromatographic conditions:

-Chromatograph Agilent-1200 (equipped with an autodoser)

-Column Exlipse XDB C 18 (obraschenno-faznyy), 5 µm, 4.6 x250mm

-Diode array detector (DAD), 320 nm, 254 nm, 276 nm identified.

-Flow rate 1ml/min

- Eluent phosphate buffer: acetonitrile (the analysis process is carried out by the gradient method):

0-5 min 95:5,

6-12 min 70:30,

12-13 min 50:50,

13-15 min 95:5,

thermostat temperature 30^0 C, -10 µl injected amount (injection)

First, working standard solutions and then prepared working solutions were introduced into the chromatograph. Chromatograms of the extracts were obtained by High Performance Liquid Chromatogram (Figure 1,2,3,4).

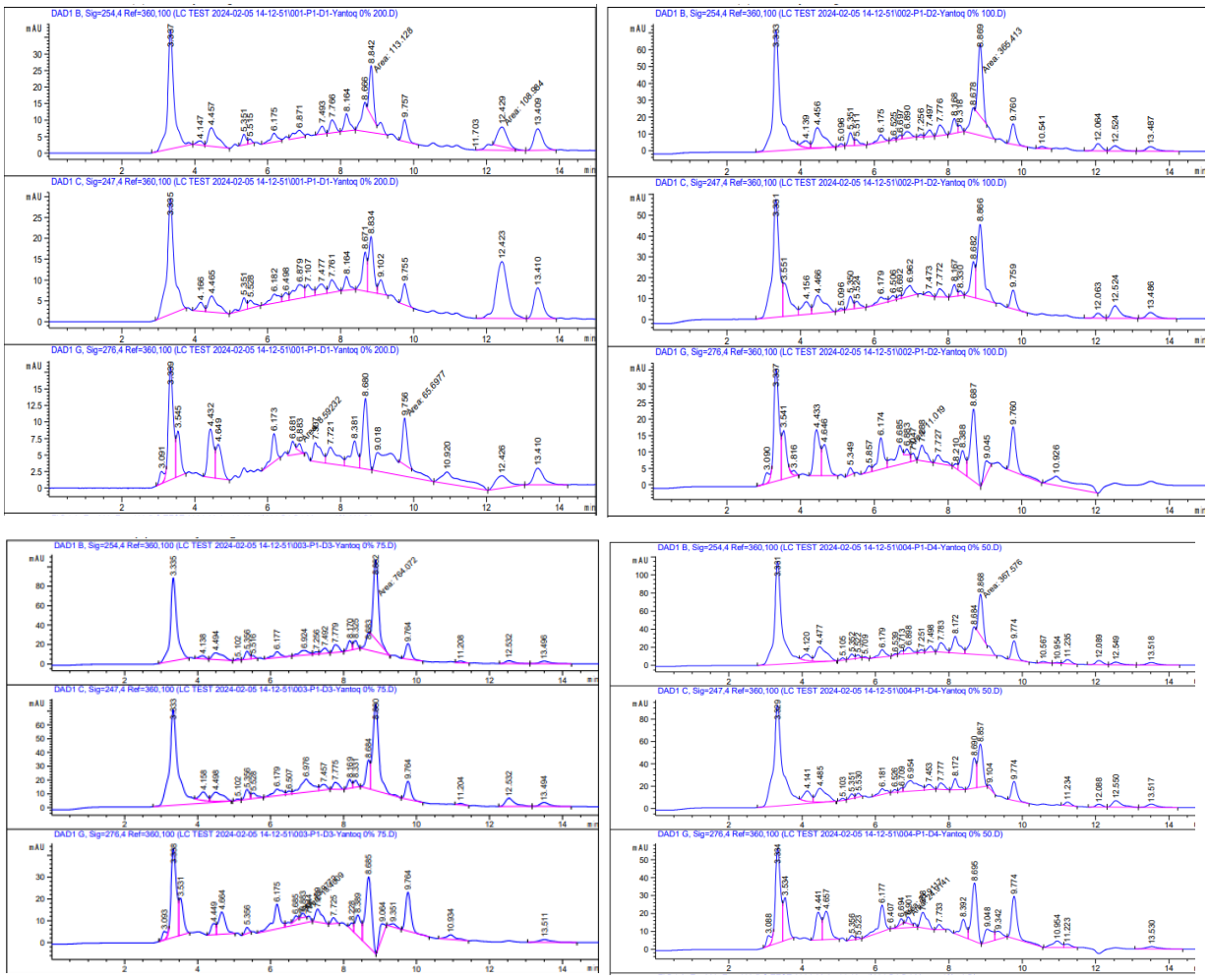


Figure 1. Chromatogram of Alhagi maurorum 5/200, 5/100, 5/75 and 5/50 extracts in water

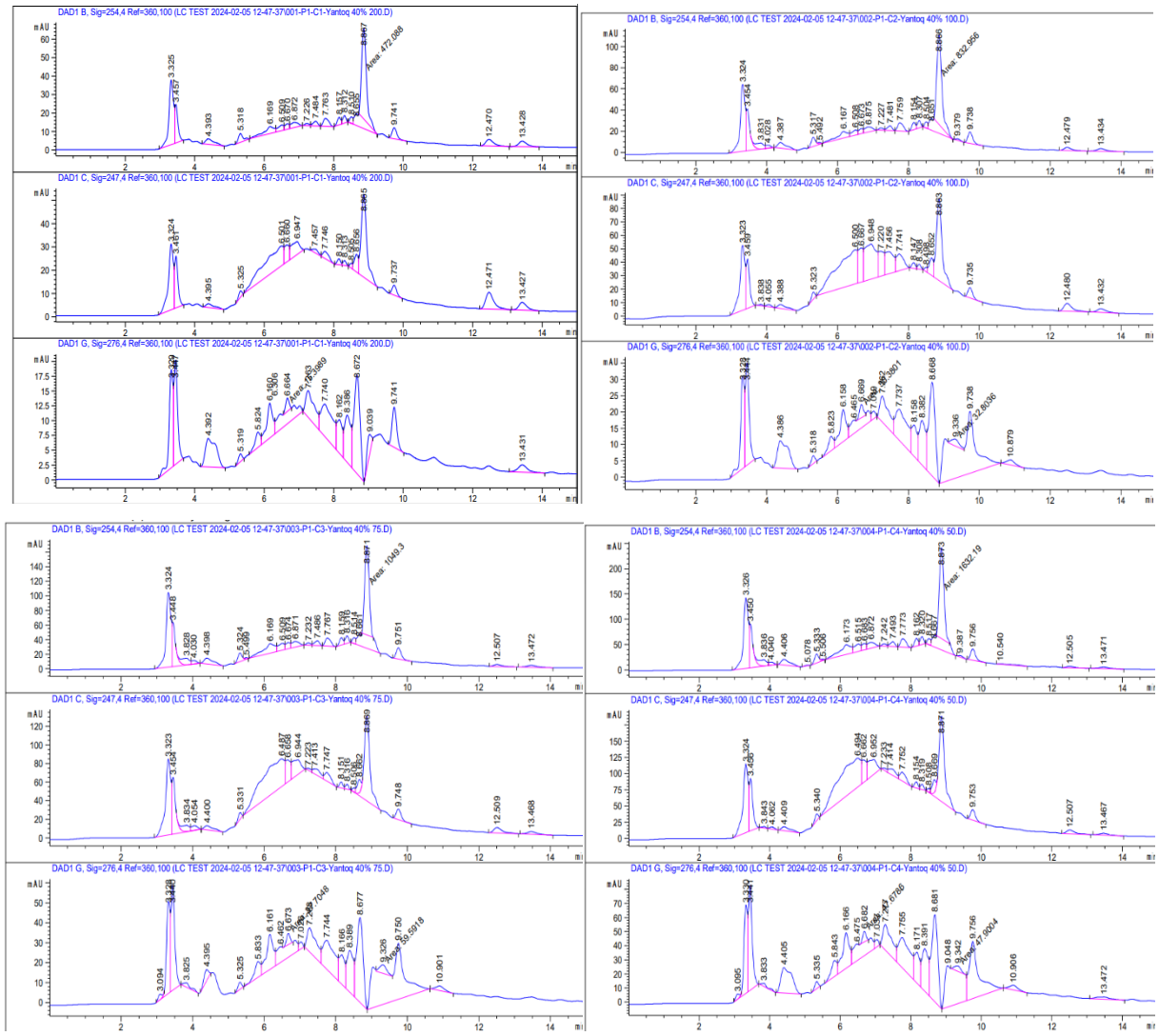
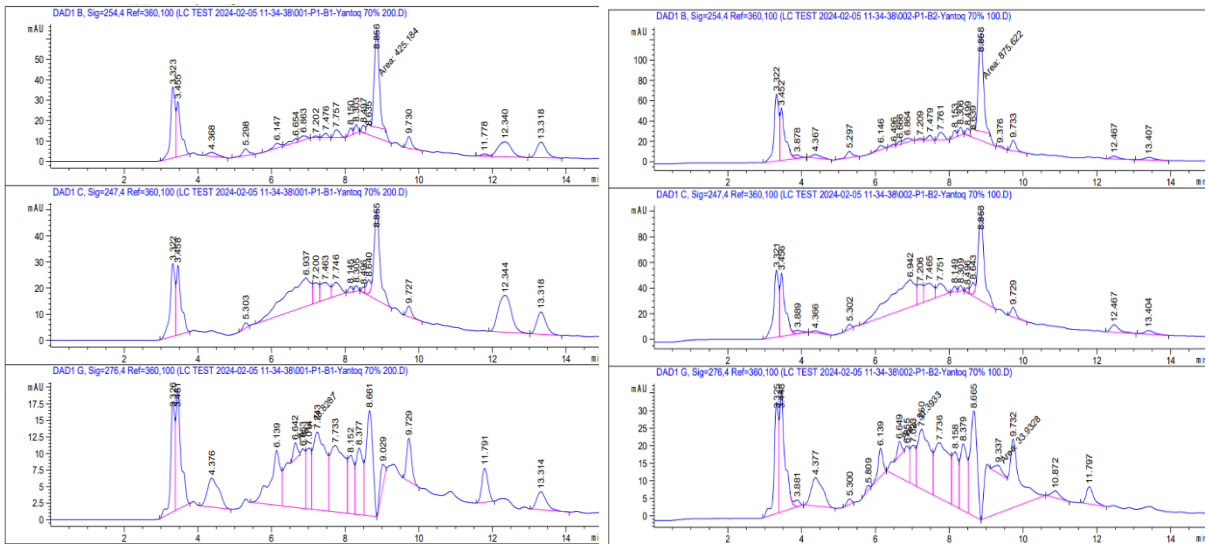


Figure 2. Chromatogram of extracts of Alhagi maurorum in 40% alcohol solution in ratio 5/200, 5/100, 5/75 and 5/50



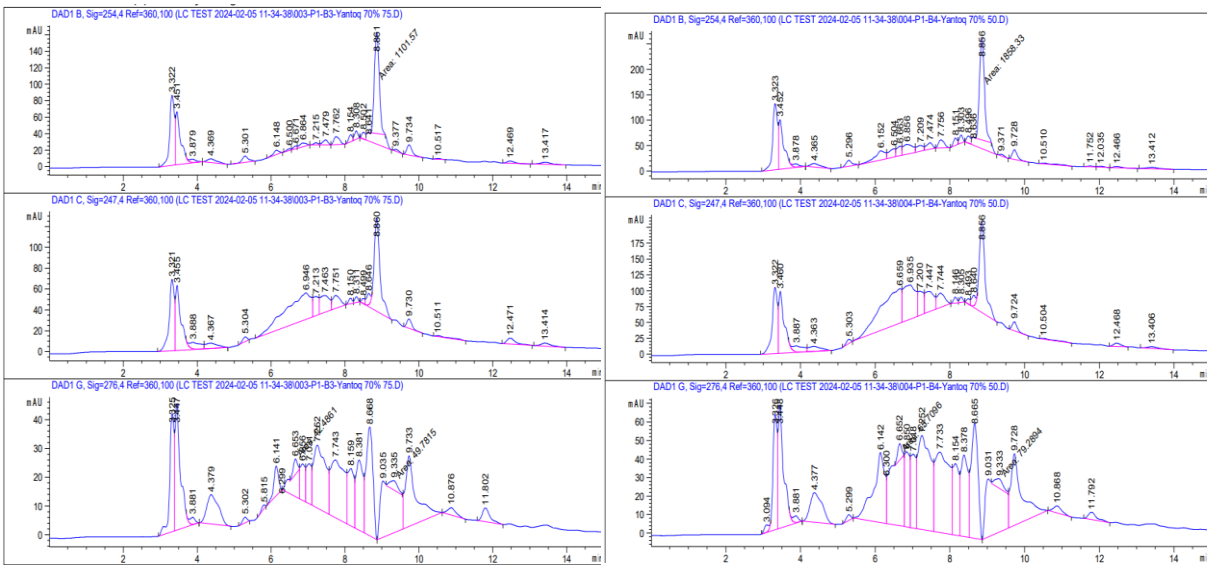


Figure 3. Chromatogram of extracts of Alhagi maurorum in 70% alcohol solution in ratio 5/200, 5/100, 5/75 and 5/50

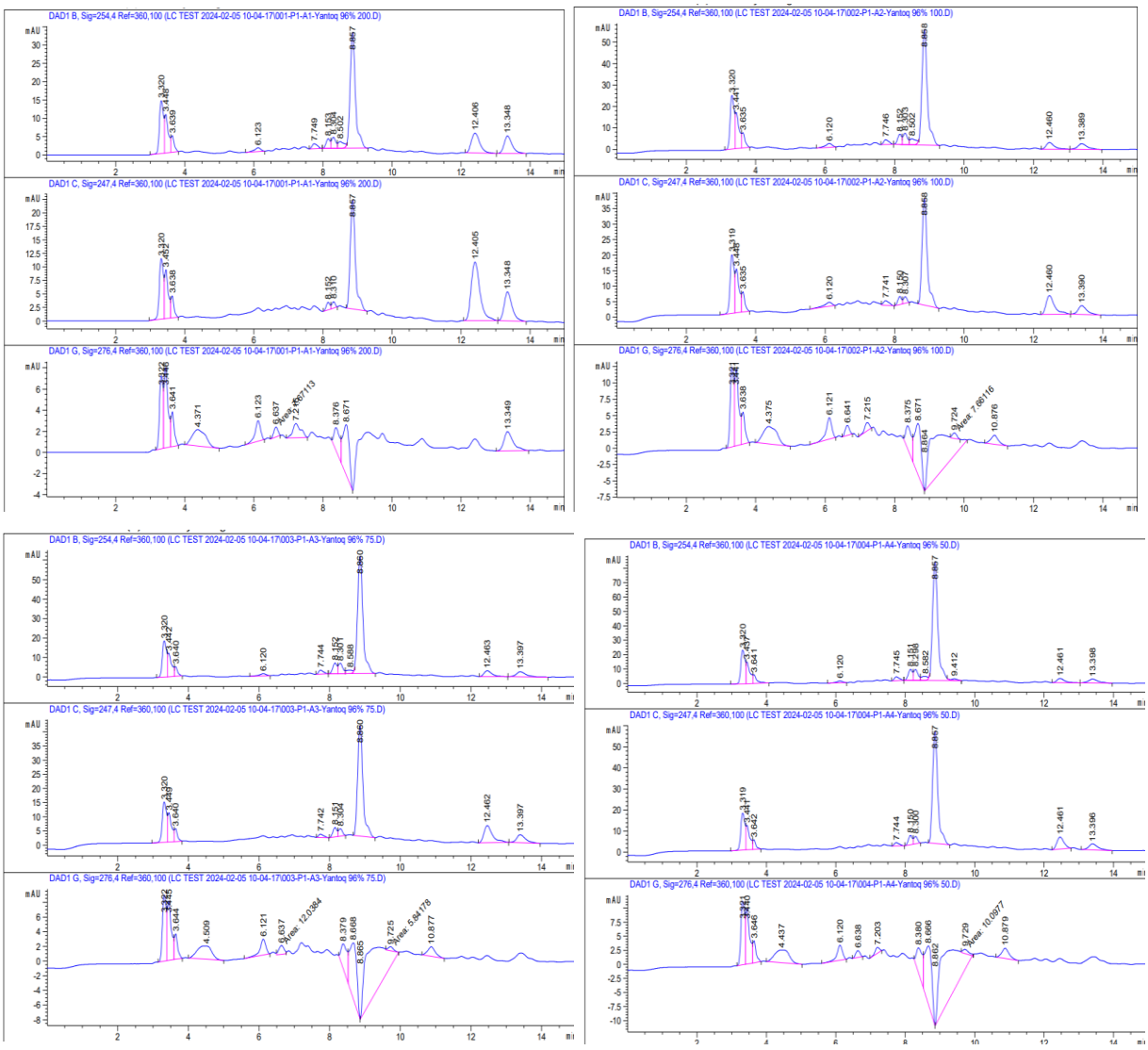


Figure 4. Chromatogram of extracts of Alhagi maurorum in 96% alcohol solution in ratio 5/200, 5/100, 5/75 and 5/50

Chromatograms of the extracts were found to be present when compared with the chromatograms of the standard solutions. Standard solutions were quantified by comparing the chromatogram AREA readings with the extract chromatogram AREA readings. Based on the results of the analysis, the following results were obtained (Table 1).

Table 1

Release of substances in different extractions of the yantok plant

	Routine	D. Quercitin	Quirstin	Existerone	Galium acid	Luthionine
Water 5/200	0,2520	0,0727	0,0856	0,0427	0,0000	0,2919
Water 5/100	0,4070	0,0818	0,0382	0,0322	0,0042	0,0695
Water 5/75	0,6380	0,0746	0,0289	0,0265	0,0043	0,0515
Water 5/50	0,2047	0,0722	0,0201	0,0336	0,0030	0,0334
Alcohol 40% 5/200	1,0517	0,0713	0,0000	0,0243	0,0052	0,1543
Alcohol 40% 5/100	0,9278	0,4227	0,0000	0,0209	0,0049	0,0605
Alcohol 40% 5/75	0,8762	0,4930	0,0000	0,0229	0,0052	0,0432
Alcohol 40% 5/50	0,9090	0,2204	0,0000	0,0229	0,0052	0,0274
Alcohol 70% 5/200	0,9472	0,0678	0,0159	0,0206	0,0000	0,5059
Alcohol 70% 5/100	0,9754	0,4750	0,0000	0,0208	0,0038	0,0580
Alcohol 70% 5/75	0,9198	0,2079	0,0000	0,0192	0,0036	0,0407
Alcohol 70% 5/50	1,0350	0,2220	0,0064	0,0217	0,0036	0,0245
Alcohol 96% 5/200	0,7581	0,0000	0,0000	0,0146	0,0000	0,2491
Alcohol 96% 5/100	0,6473	0,0042	0,0000	0,0137	0,0000	0,1375
Alcohol 96% 5/75	0,5276	0,0024	0,0000	0,0139	0,0000	0,0488
Alcohol 96% 5/50	0,4918	0,0028	0,0000	0,0127	0,0000	0,0318

CONCLUSION

Based on the results, our sample extracted with 5 mg sample in 200 ml solution in 40% alcohol gave acceptable amount of substances compared to the remaining samples (Table 1). Based on the results, it was considered appropriate to extract biologically active substances from Alhagi maurorum plant in 40% alcohol. We can see that the rutin substance has been lost in the maximum amount (Figure 5).

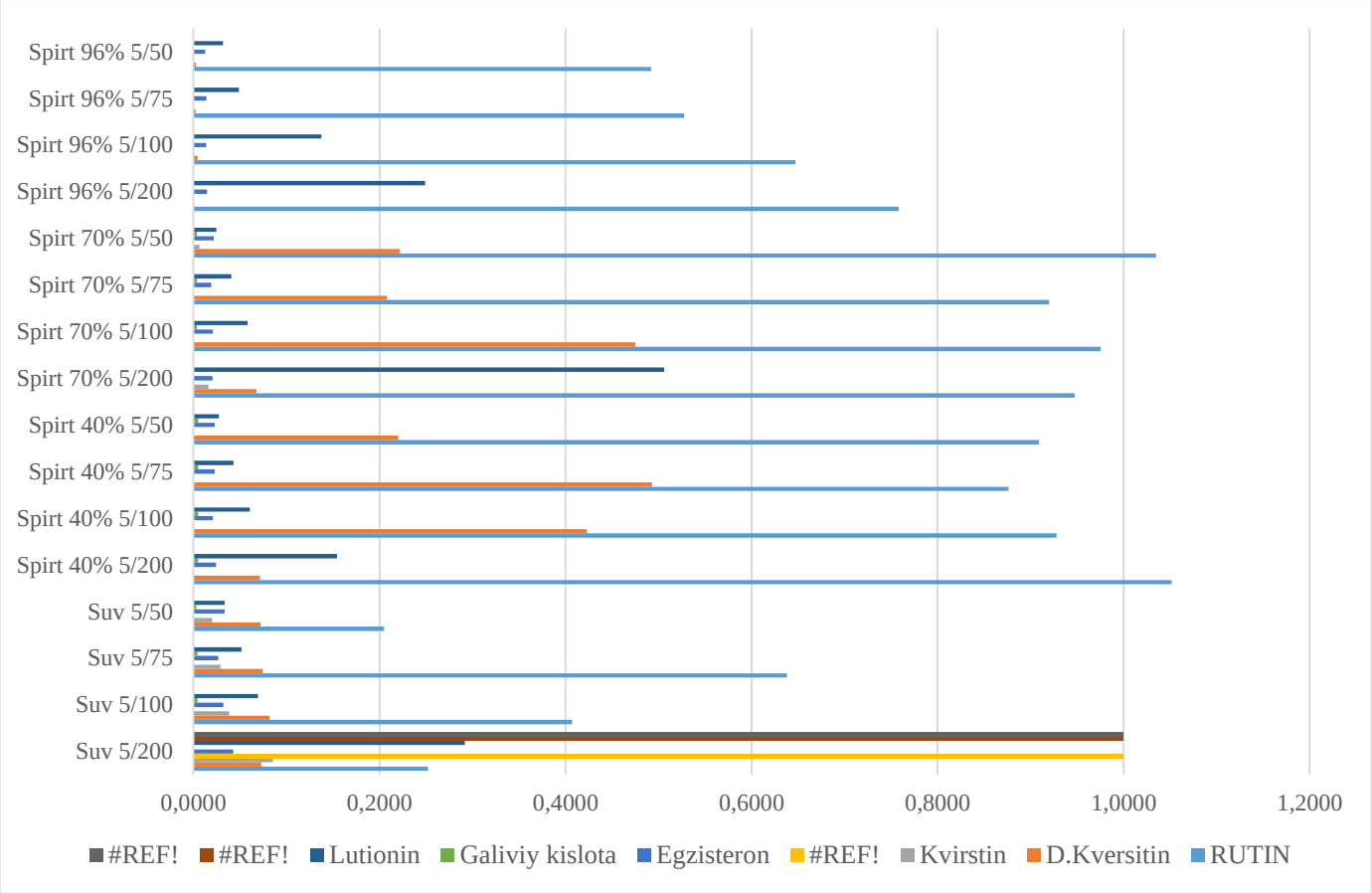


Figure 5. Diagram of the percentage of substances contained in the extracts of the yarrow plant

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