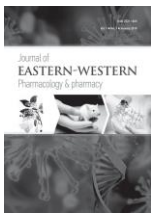

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SOME TECHNOLOGICAL STUDIES FOR OBTAINING AN EXTRACT FROM *ARTEMISIA MACROCEPHALA* J.

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KEYWORDS

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ABSTRACT

Background: In the framework of the governmental policy on pharmaceuticals, it is necessary to prepare extracts from raw materials of plants, to obtain suitable pharmaceutical formulations, and to study the biologically active substances of extracted drugs and preparations to increase the consumption of herbal medicinal products and to manufacture products to replace imports in our country. Therefore, we have aimed to obtain a suitable extract from the raw material of *Artemisia macrocephala* Jacquem and to conduct the qualitative and quantitative analysis of some biologically active substances of the medicinal plant.
Methods: The raw material of *Artemisia macrocephala* Jacquem. was used in the study. The upper part of the medicinal plant was extracted by remaceration, repercolation, and circulation techniques in distilled water, 40% and 70% ethanol (1:10). The qualitative analysis of total flavonoids was determined by thin layer chromatography, and the quantitative analysis was performed spectrophotometrically.

Results: The total flavonoid content of wormwood (*Artemisia macrocephala* J.) was 0.91±0.01% when extracted in 70% ethanol by circulation method.

Conclusion: According to the results, it is considered that it is more appropriate to extract the raw material of *Artemisia macrocephala* J. by circulation method in 70% alcohol.

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1. INTRODUCTION

In traditional Mongolian medicine, wormwood (*Artemisia macrocephala* J.) is believed to have the ability to remove heat, detoxify, and cure throat diseases. In Mongolian and Tibetan medicine, a decoction prepared from the above-ground parts of *Artemisia macrocephala* J. is taken orally for pneumonia and flu, and gingivitis, tonsillitis, nasal and oral mucosa, and other respiratory diseases. And pulmonary tuberculosis is especially prevalent during typhoid and cold episodes, its liquid extract is used as a gargle and internally.

One of the main problems is to implement some of the objectives of the government pharmaceutical policy, such as increasing the consumption of herbal medicinal products and manufacturing products to replace imports in our country. For this reason, it is necessary to prepare extracts from plant raw materials, obtain suitable pharmaceutical forms, and study the biologically active substances of the extracted drugs and preparations. Therefore, the basis of this research was aimed to extract the above-ground part of *Artemisia macrocephala* J., which is widely used in medicine, and to determine the content of some biologically active substances.

2. MATERIALS AND METHODS

2.1. Materials and chemicals

In this study, an aerial part of *Artemisia macrocephala* J. was used as a raw material and the study was conducted in Mongolian University of Pharmaceutical Sciences. To obtain a suitable extract, the raw materials were extracted by remaceration, repercolation and circulation methods in distilled water, 40% and 70% of ethanol.[3]

2.2. Qualitative analysis of flavonoids of the plant extract

The qualitative analysis was conducted by thin-layer chromatography. Firstly, 5 µl of each solution of test sample, standard rutin, and quercetin was dropped on a silica gel plate (Silica gel 60 F254, Germany) and then placed in a solvent system of ethyl acetate-formic acid-glacial acetic acid and water (100:11:11:26). The chromatogram was determined by comparison with the standard substance solution after spray-drying with 3% alcohol solution of aluminum chloride.[4]

2.3. Qualitative analysis of total polyphenolic compounds in the plant extract

Thin layer chromatography was also applied for qualitative analysis of total polyphenolic compounds in the plant extract. Firstly, 0.5 g of *Artemisia macrocephala* J. was taken into a 50 ml flask and added 30 ml of 70% ethanol. Then, it was connected to a rotary cooler and kept in a water heater at 70-80°C for 20-30 minutes. After that, the extract was cooled to room temperature and filtered through filter paper. The prepared extract was then dropped onto a silica gel 60 F254 plate parallel to the standard substance. After drying, the plates were placed in a chromatographic chamber with a solvent system of benzene-ethyl acetate-formic acid-acetone (5:5:2:0.5). After 7-9 cm of chromatography, the plate was removed from the chamber, air-dried, and the chromatogram was sprayed with a 3% ferric chloride alcohol solution, which revealed dark blue spots at the same level as the standard substance.

2.4. Analysis method for total flavonoid of the plant extract

1.0 g of the sample was weighed and put in a flask and added 2 ml of 2% aluminum chloride solution. Then, it was diluted with a solution of 95% alcohol (Solution A) and the absorbance of the solution was measured at 401 nm in a spectrophotometer after 30 minutes.[5-6]

3. RESULTS

3.1. Qualitative analysis of total flavonoid: Extracts were obtained from *Artemisia macrocephala* J.

The extracting procedure was performed with distilled water and 40 and 70% ethanol. The qualitative analysis of flavonoids in the extract was carried out by thin-layer chromatography in the solvent system of ethyl acetate-formic acid-glacial acetic acid-water (100:11:11:26) (Figure 1).

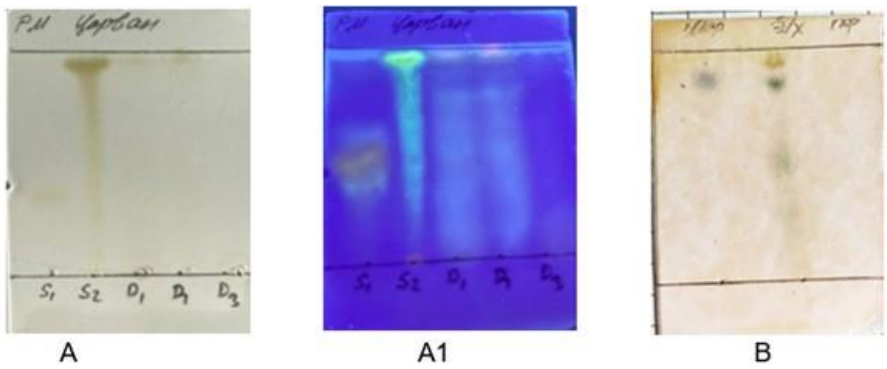

Figure 1. Thin layer chromatogram for extracts obtained from *Artemisia macrocephala* J. A, A1. Flavonoids, B. Polyphenols

As a result, the raw material of *Artemisia macrocephala* J. in distilled water and 40% and 70% ethanol extract had the same level as standard rutin (Rf=0.4) and the same level as quercetin (Rf=0.8). A yellow spot at the level indicates the presence of flavonoids.

The most sensitive wavelength for the determination of flavonoids in water and 40% and 70% ethanolic extracts of *Artemisia macrocephala* J. was 404 nm.

3.2. Qualitative analysis of polyphenolic compounds in the plant extract

As a result of the study, the 70% ethanol extract of the raw material of *Artemisia macrocephala* J.) showed a dark blue spot at the same level as the standard substance gallic acid (Rf=0.8), which was a polyphenolic compound. Results of obtaining a suitable plant extract: The raw material of *Artemisia macrocephala* J. was extracted in 40% and 70% ethanol by remaceration, repercolation, and circulation methods. The total flavonoid content of each extracted plant was detected (Table 1).

Table 1. Measurements of total flavonoids contained in the extract obtained from *Artemisia macrocephala* J.

Extractor liquid	Extraction techniques	Total flavonoids (%)
Water	Remaceration	0.31+0.1
	Repercolation	0.41+0.01
40 % ethanol extract	Remaceration	0.59+0.06
	Repercolation	0.39+0.08
70% ethanol extract	Remaceration	0.71+0.02
	Repercolation	0.64+0.02
40% ethanol extract	Circulation	0.33+0.1
70% ethanol extract	Circulation	0.91+0.01

The content of flavonoids was 0.59±0.06% in the extract obtained by remaceration with 40% ethanol, 0.39±0.08% in the extract obtained by repercolation method with 40% ethanol, and 0.33±0.1% in the extract obtained by circulation method with 40% ethanol. From this result, remaceration and circulation techniques were suitable for extracting the raw materials. Flavonoid content was 0.91±0.01% after using the circulation technique, which indicated that it was more suitable to extract the raw materials.

4. DISCUSSION

In this study, we took a liquid extract from *Artemisia macrocephala* J. and analyzed qualitatively and quantitatively the total flavonoid and polyphenol compounds as some biologically active substances. Nandintsetseg S. Purevsuren S. Narantuya S. produced the standard indicators of Tsarvan-4 tang, and the total flavonoids transferred to apigenin were 2.93±0.31%.[7] In our study, the raw material of (*Artemisia macrocephala* J.) was extracted in 40% and 70% ethanol, and the total flavonoid content of the extract was determined. As a result of this study, the total flavonoid content of 70% ethanol extract was 0.91±0.01%.

In conclusion, these results showed that the appropriate extracting solution for *Artemisia macrocephala* J. was 70% ethanol.

Conflicts of Interest: The authors declare no conflict of interest.

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