wjpmr, 2020,6(5), 19-21

SJIF Impact Factor: 5.922

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

TECHNOLOGY OF OBTAINING DRY EXTRACT FROM GROUND PART OF *PULICARIA GNAPHALODES L.* BY PERCOLATING EXTRACTION METHOD

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Article Received on 03/03/2020 **Article Revised on 24/03/2020** **Article Accepted on 14/04/2020**

ABSTRACT

This article describes the role and advantages of the pharmaceutical forms of dry extracts obtained on the basis of medicinal plants. Based on this, the development of technology for obtaining a dry extract from the ground part of Pulicaria gnaphalodes L. was presented. According to the requirements of the State Pharmacopeia, qualitative indicators of the resulted dry extract were studied. In accordance with the requirements of dry extracts, the indicators such as description, authenticity, pH value *(4,30)*, moisture *(4,95%)* and heavy metals were studied (*0,01 %)*.

KEYWORDS: *Pulicaria gnaphalodes L.*, powder, technology, dry extract, qualitative indicators.

INTRODUCTION

Plants are close to the human body and do not cause side effects as well as easily involved in metabolic processes. In addition, the value of the healing properties of medicinal plants is that the active ingredients of the plant act in a complex way on the body, producing a synergistic effect. The positive result of such an effect is several times higher than the individual effect of each element. On this way, the most effective, safe and convenient dosage forms predominate. Medicines based on plant dry extracts fully meet these criteria. The best advantages of dry extracts are easy to use, stability of storage and availability of precise dosing. Production of dry extracts in the field of phytopreparations is a promising direction. They store less ballast substances than liquid extracts and are very simple to use and transport. They are especially a primary raw material for the reception of various dosage forms.

Purpose of the research is to obtaining a dry extract based on the ground part of the plant *Pulicaria gnaphalodes L*. and evaluating its quality.

The *Pulicaria* category belongs to the *Asteraceae* family, which has about 80 species in the world, about 50 types in Central Asia, and 5 sorts in Uzbekistan. *Pulicaria gnaphalodes L.* is a perennial plant that grows on rocky and brown soils, slopes, dry banks of ravines. It is common in Central Asia, especially in the flora of countries such as Qatar, Iran, Afghanistan, China. In Uzbekistan, it can be found in the mountains of Jizzakh and Tashkent region. It blooms in July-August and makes fruit in August-September. The ground part is used as a raw material. To prepare the raw material from the ground part of the plant is cut to a length of 2–3 cm and dried in the open air.

The plant *Pulicaria gnaphalodes L.* has long been used in folk medicine as an antifungal agent. Chemical composition of the plant researched by the staff of "The Institute of Plant Chemistry" named after Yu.Yunusov, more than 25 substances belonging to the group of diterpenoids, coumarins, sterols and phenols were isolated and identified individually.[1-2] The biological activity of the isolated substances was studied, in which hypotensive, antispasmodic, relaxant activities were determined. It was also found that the isolated phenolic substances have 5 times higher antioxidant properties than vitamin C. The main therapeutic compounds in the plant are flavonoids, which include: quercetine, hyperoside, isoquercetine, caffeic acid and rutin.[3,4,5]

Experimental Section

Materials And Methods: In order to obtain a dry extract, 5 kg of dried and pulverized ground part of *Pulicaria gnaphalodes L.* was collected from Khanbandi village, Forish district, Jizzakh region. It was placed in a percolator, 25 liters ethyl alcohol (70% at a room temperature) was poured to the raw material in a ratio of 1:5 and left for 24 hours. The resulting extract was separated and another 25 liters of 70% ethyl alcohol was added to the raw material. This process was repeated a total of 5 times. The resulting extract was evaporated in a rotary evaporator until a volume became 1.2 liters. The concentrated extract was diluted 1:1 with water. The water-alcohol extract was purified from oils and other

non-polar substances by extracting with the help of extraction benzine in a dividing column. It was accomplished 6 times, and every time with 0.5 l volume of extractant. The purified extract again was extracted 6 times with 0.5 l of chloroform, 10 times with 0.5 l of ethyl acetate, and 10 times with 0.5 l of n-butanol in a dividing column and separated into fractions. The ethyl acetate part was obtained, and until drying the solvents of extract was expelled in the rotor evaporator. The resulting amount was dissolved in 100 ml of alcohol and 100 ml of boiled water was added slowly to it, stirred and left for 24 hours. In this way, the chlorophyll and ballast substances were precipitated. The remaining extract was again expelled in a rotary evaporator and dried in a ventilated Binder oven at 50ºC. As a result, 75.0 g of dry extract was obtained.

RESULTS AND DISCUSSION

The resulting extract is a brown, distinctive, crumbly powder with a specific odor. Subsequent research consisted of determining the quality parameters of the obtained dry extract.

In order to determine the pH value, 2.5 g of dry extract was placed in a 50 ml volumetric flask and purified water was added up to the mark. The resulting solution was placed on an ultrasonic apparatus for good mixing. In the experiment, a pH meter "Five Easy" Mettler Toledo was utilized. The pH of the dry extract solution was found to be 4.30.

Following experiments were performed to determine the moisture content of the resulted dry extract. For this purpose the moisture meter-analyzer “MB 35 Halogen” was used. In this experiment, 0.5 g of the substance was tested at 105ºC for 3 min. The exploration displayed that the moisture content of the dry extract was 4.95%.

The TLC method was applied to identify the flavonoids of dry extract obtained from the *Pulicaria gnaphalodes L.* plant. Silicagel L × W 10-20 cm plate from SIGMA-ALDRICH (Germany) was utilized. 1 g of dry extract was dissolved in methanol and instilled into the plate using a capillary. It was also dropped from the standard sample at a distance of 2 cm. The plate was lowered into the system in a chloroform-methanol-water in ratio (70:23:4). After 30-40 minutes, the plate was removed and dried in air. When viewed on the UV light, 5 spots were detected. As a developer reagent was used ammonia. The flavonoids formed a brown spot. Then it was examined in the UV light at a wavelength of 250–350 nm. The R_f values of the spots were determined and compared with the standard sample R_f values. The resulting stains were found to belong to rutin, hyperoside, isoquercetin, caffeic acid, and quercetin. The results are given in Table 1.

Table 1: The Results of Detected Flavonoids In The Dry Extract.

№	Flavonoids	Determined R_f values	Standard sample R_f values
1	Routine	18	18
2	Hyperoside	54	55
3	Isoquersetine	61	61
4	Coffee Acid	68	68
5	Quercetine	89	90

Determination of heavy metals in the dry extract was carried out according to the method given in XI State Pharmacopeia. It was found that the content of heavy metals does not exceed 0.01%. The results are presented in Table 2.

Table 2: The Quality Indicators Of Dry Extract Of *Pulicaria Gnaphalodes L.*

№	Indicators	The requirement of pharmacopoeial article	Correspondence with pharmacopeial article
1	Description	Dry extract has a brown color, specific odor, crumbly powder	Suitable
2	Authenticity indicator	R_f values, which determined with TLC, should be close to the standard sample (rutin, hyperoside, isoquercetin, quercetin and caffeic acid).	Suitable
3	pH detection	Should be between 4 and 6,5	Suitable
4	Moisture detection	Should not exceed 5%	Suitable
5	Heavy metals	Should not exceed 0.01%	Suitable

CONCLUSIONS

The technology of obtaining dry extract by using percolating extraction method was developed. A technological scheme of production based on this technology was proposed. The dry extract obtained on the basis of *Pulicaria gnaphalodes L.* was found to meet the requirements of State Pharmacopeia XI edition on quality indicators. When flavonoids from the bioactive

substances of the dry extract were identified by the TLC method, they were found to contain rutin, hyperoside, isoquercetin, quercetin and caffeic acid.

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