STUDY OF THE KINETICS OF MOISTURE SORPTION OF A DRY CLOVER EXTRACT

Khalida Yunusova 1, Sevara Ravshanova 2

Department of Industrial Technology of Medicines, Tashkent Pharmaceutical Institute, 100015, Aybek 45, Tashkent, Uzbekistan

ABSTRACT

This report presents the results of research in the field of studying the kinetics of the moisture absorption capacity of dry extract of meadow clover for further research in the development of technology and composition of the dosage form.

Keyword: dry extract, moisture absorption, meadow clover, phytopreparation.

1. INTRODUCTION

Currently, in conditions of increasing adverse chemical effects on the body, as well as violations of the principles of balanced nutrition, there is an increase in the number of diseases of the cardiovascular system, the first place among which is occupied by atherosclerosis and its complications associated with atherosclerotic lesions of the main arteries of the heart, head, arteries of the lower extremities, aorta. We are talking about different forms of coronary heart disease (IHD), cerebrovascular diseases of an atherosclerotic nature, etc. These diseases are still the most common cause of reduced working capacity, disability and mortality in economically developed countries. Cardiovascular diseases are one of the most pressing problems of modern medicine in all highly developed countries of the world. Cardiovascular diseases rank first in the world in terms of prevalence and complications. Every second citizen in highly developed countries over the age of 50 dies from the consequences of cardiovascular diseases due to atherosclerosis [1].

One of the main directions of the development of pharmaceutical science and practice is the improvement of the technology of extraction of medicinal plant raw materials (MPR) in order to increase the yield of biological active substances (BAS), quality and expand the range of phytopreparations. When conducting research on the intensification of technological processes, the development of the technology of phytopreparations, it is relevant to use the maximum possible potential of both known medicinal plants and new promising species. At the turn of the 20th and 21st centuries, a large randomized study was conducted, which proved that when taking clover for 12 months, there was a decrease in total cholesterol and triacylglycerides compared with the control group. Thus, clover has a beneficial effect on the lipid profile, contributes to the prevention of atherosclerosis and really helps to lower the "bad" cholesterol. The phytoestrogens contained in the extract of this flower have even been included in the list of recommended medicines for metabolic syndrome [1].

It is known that the structural and mechanical properties of solid dispersed systems mainly depend on their moisture content. Residual moisture and moisture absorption properties to a certain extent are from the technological processes that are used to obtain them. And this, in turn, affects the technological indicators of solid systems. Based on the above, we studied the residual moisture content of the studied samples of the dry extract of meadow clover (Trifolium pratense L.) [1].

2. EXPERIMENTAL

2.1. Materials and methods

The kinetics of moisture absorption of the dry extract were studied by the method of S.A. Nosovitskaya with coauthors. Residual moisture was determined on a moisture meter of the Japanese company "Kett" at a temperature of 40 degrees [1].

3. RESULTS AND DISCUSSION

As indicated in the method, moisture absorption properties were studied in special climatic chambers with a relative humidity of 58, 79, 90 and 100%. These conditions were created by
using solutions of sodium bromide, ammonium chloride and purified water, respectively.

Samples of dry extract of fireweed narrow-leaved were weighed in 0.5 g each and placed in open bottles with a diameter of 2.0-2.6-3.3 cm and placed in desiccators containing saturated solutions of sodium bromide (relative humidity 58%), ammonium chloride (relative humidity 78%), zinc sulfate (90% relative humidity) and purified water (100% relative humidity). During the experiment, for 7 days, every 24 hours, the bottles were taken out, covered with lids and weighed on an analytical balance, the weight of the test substance was determined.

The obtained results of determining the kinetics of moisture sorption are presented in Figure 1.

From the above results, it should be noted that at a relative humidity of 58% within 7 days, the amount of adsorbed moisture increased in an increasing order. The amount of adsorbed moisture after 1,3,5,7 days is in the range of 14.21-19.52%; 39.86-45.23%; 56.08-65.35%; 74.12-77.63%, respectively. In a relative humidity of the environment up to 79, 90 and 100%, the moisture absorption properties of the samples under study increase. At the same time, during the period of the experiment, the amount of sorbed moisture is 90.92; 110.05 and 121.51, respectively.

In further studies, with an increase in the amount of sorbed moisture in the test samples, a change in the aggregate state of the powders was observed. Moisture sorption has worsened the technological properties of the dry extract. After three days, the samples under all conditions turned into a thick mass.

![Figure 1. Results of studying the moisture absorption properties of the powdered dry clover extract](attachment:image.png)
4. CONCLUSION

Thus, the results of the study of moisture absorption properties indicate strongly pronounced hygroscopic properties of the studied samples of dry extract of meadow clover and, naturally, prove their unsatisfactory properties in relation to tableting. The data obtained will be used in the selection of the composition and development of the technology for obtaining dosage forms and in determining the conditions and shelf life of the dry extract and dosage forms.

REFERENCES


[18] G. T. Kroyer, “Red clover extract as antioxidant active and...