ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889,
2023-5.384 ResearchBib IF: 8.848 / 2024

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-2, ISSUE-1

STUDYING THE WET ABSORPTION KINETICS OF THE DRY EXTRACT OF "HYPOSEDAF"

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Annotatsiya. "Giposedaf" quruq ekstraktining gigroskopik darajasi o'rganildi. Tadqiqot Yevropa farmakopeyasida tasvirlangan texnikaga muvofiq va O'zR DF 1-j. maqolasida keltirilgan sharoitda amalga oshirildi. Bundan tashqari, nam yutish kinetikasi S.A.Nosovitskaya tomonidan taklif qilingan va modifikatsiya qilingan og'irlik usulida olib borildi. Olingan natijalarga ko'ra, tahlil qilingan ekstrakt "gigroskopik" moddalar guruhiga kiradi, hamda uning nam yutish kinetikasi tashqi muhitning nisbiy namligi va namuna yuzasi maydoniga to'g'ridan-to'g'ri bog'liqligini aniqlandi.

Kalit so'zlar: quruq ekstrakt, gigroskopiklik, gravimetrik usulda, tashqi muhit namligi, namuna yuza maydoni.

Аннотация. Изучена гигроскопичность сухого экстракта «Гипоседафа». Исследование проводили в соответствии с методикой, описанной в Европейской Фармакопее (Ph. Eur. 7.0, vol. 1 general texts 5.11) и в условиях, описанных в статье ГФ РУз Том 1. Кроме того, кинетику влажного поглощения проводили весовым методом, предложенным и модифицированным С.А. Носовицкой. По полученным результатам анализируемый экстракт относится к группе «гигроскопических» веществ и установлено, что кинетика его влагопоглощения находится в прямой зависимости от относительной влажности внешней среды и площади поверхности образца.

Ключевые слова: сухой экстракт, гигроскопичность, гравиметрический метод, внешняя влажность, площадь поверхности образца.

Annotation: Hygroscopicity of dry extract "Hyposedaf" was investigated. The study was conducted in accordance with the methodology described in the European Pharmacopoeia and in accordance with its own DF 1-J. made under the conditions set out in the article. In addition, the kinetics of moisture absorption S.A.Nosovitskaya proposed and conducted a modified weighing method. Based on the results obtained, it was found that the analyzed extract belongs to the group of "hygroscopic" substances, and its moisture absorption kinetics directly depends on the relative humidity of the external environment and the surface area of the sample.

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Keywords: dry extract, hygroscopicity, gravimetric method, ambient humidity, sample surface area.

Relevance. Mankind has long used medicinal plants to treat various diseases. Medicinal plants are considered the most important means of treatment and have a centuries-old tradition in our country of treating various diseases based on medicinal plants [4,5].

Given the high cost of synthetic drugs and the abundance of negative side effects, an urgent problem is the creation of medicines derived from plant raw materials. This is one of the main issues in the production of inexpensive, plant-based preparations that replace imported drugs and have high bioefficiency. One of the ways to solve this problem is the rational use of medicinal plants [6,7,8]. Knowledge of the hygroscopicity of the extract is necessary to ensure the quality of the dosage forms produced on its basis. Therefore, in the Tashkent Pharmaceutical Institute, a dry extract with a hypotensive effect was obtained by maceration, which was conditionally called "Hyposedaf". This resulting "Hyposedaf" was designed to study the kinetics of moisture absorption by dry extract.

Material and methods. Material and methods. Dry extract "Hyposedaf" obtained by maceration was selected as the research material. The appearance of the dry extract is light brown with a characteristic taste of Tahir and a special aroma. Quality indicators meet the specified requirements of the DF and DF XIV edition (RF) of the Republic of Uzbekistan [1,3,9].

Hygroscopicity of the analyzed extract in accordance with the technique described in the European Pharmacopoeia and the Republic of Uzbekistan DF 1-J., 2nd ed. ("5.11. Section "definition" in the articles of the pharmacopoeia. Hygroscopicity.") under the conditions set out in the article (Ph. Eur. 7.0, vol. 1 general texts 5.11) and its Kinetics of moisture absorption S.A.Nosovitskaya proposed and carried out a modified weighing method [1,2,7,10].

In this method, to determine hygroscopicity, a weighted (transparent) dry extract of "hyposedaf" in an amount of 1 g was placed in a pre-weighted box with a height of 15 mm and a diameter of 50 mm. This bux, on the other hand, was placed in a desiccator in which a saturated solution of ammonium chloride was stored. This desiccator is left in a thermostat (type SHS–80-01spu) for 24 hours at 250 C, then the sample is weighed again and hygroscopicity is determined by the difference in weight.

The hygroscopicity of the substance was calculated as a percentage by the formula:

$$\mathbf{Gigr._{subs.}} = \frac{m_3 - m_2}{m_2 - m_1} \times 100\%$$

m_1– the trunk weighs with a lid, g;

m_2– the trunk weighs with a lid and a substance sample, g;

m_3– the weight after 24 hours with the cover of the Bix and the substance sample, g.

The study showed that the dry extract of "Hyposedaf" absorbed 12.2% of moisture in 24 hours, which means that it belongs to the group of "Hygroscopic" substances according to the European Pharmacopoeia (in the range from 2% to 15%). After it was proved that the dry extract "Hyposedaf" has a high hygroscopicity, its kinetics of moisture absorption was determined as Carried out by the gravimetric method proposed and modified by S.A. Nosovitskaya. This

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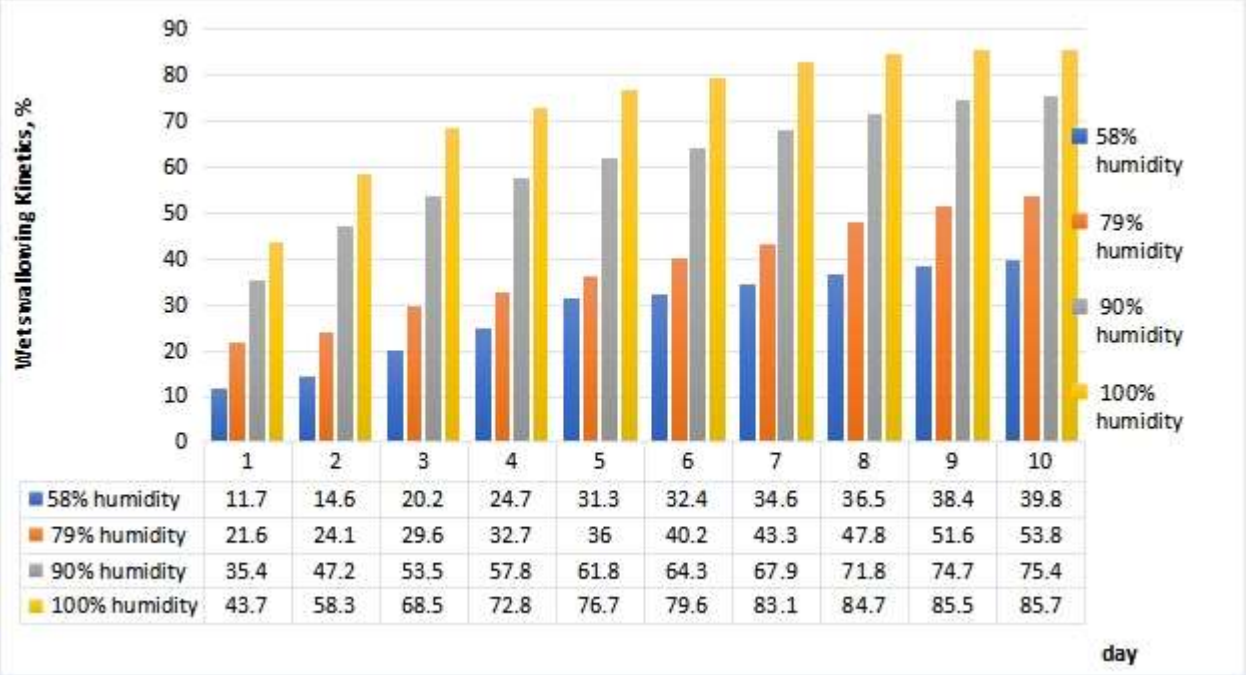
indicator took into account two different factors: the humidity of the external environment and the surface area of the dry extract sample. [10].

The humidity of the external environment was created artificially. To do this, the bottom of the exicators was filled with saturated solutions of purified water (100%), zinc sulfate (90%), ammonium chloride (79%) and sodium bromide (58%) [3,7]. Samples of "Hyposedaf" dry extract from 1 g (a clear drawer) were placed in buoys and found to weigh at the same time for 10 days. The increase in weight was calculated using the above formula in percentage terms.

The results obtained 1-figure also brought.



	1	2	3	4	5	6	7	8	9	10
58% humidity	11.7	14.6	20.2	24.7	31.3	32.4	34.6	36.5	38.4	39.8
79% humidity	21.6	24.1	29.6	32.7	36	40.2	43.3	47.8	51.6	53.8
90% humidity	35.4	47.2	53.5	57.8	61.8	64.3	67.9	71.8	74.7	75.4
100% humidity	43.7	58.3	68.5	72.8	76.7	79.6	83.1	84.7	85.5	85.7

figure-1. The dependence of wet absorption kinetics of dry extract "Hyposedaf" on the humidity of the external environment

According to the information presented in the figure, dry extract "Hyposedaf" has a high degree of wet absorption, and the amount of moisture ingested directly depends on the humidity of the external environment. During the study period, at the conclusion of Day 1 at all relative humidity, the weight of the buoks is 11.7%, 21.6%, 35.4%, 43.7% increased to. In this case, the dry extract in the 1st Bix has lost its solubility, while the samples in the 2-4 bixes have liquefied and become a dark mass. The amount of moisture absorbed for the next days decreased, for example, the sample in the Exciter, where 58% moisture was created, sorbed 0.9% -5.4% moisture every day from the second day until the end of the experiment, at the end of the 10th day, this figure was equal to 39.8%.

With a relative humidity of 79%, the Daily weighting of the sample mass ranged from 1.2% to 5.2%, and at the conclusion of the experiment, it was revealed that this sample had absorbed 53.8% moisture. That is, a 1.37-fold increase in relative humidity led to a 1.29-fold increase in sorbed humidity.

The 3rd and 4th samples (relative humidity 90% and 100%) of the dry extract of "Hyposedaph" sorbed the most moisture. For example, by the end of the second day their mass had increased to 47.3% and 58.3% respectively, compared to 64.3% and 79.6% at the end of the 6th day of the experiment, and 75.4% and 85.7% by the end of the 10th day. Thus, a 1.54-and

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1.71-fold increase in relative humidity led to a 1.78-and 2.03-fold increase in wet-absorption kinetics of dry extract, respectively.

As can be seen from the results obtained. The higher the humidity level of the external environment, the higher the moisture content absorbed by the dry extract “Hyposedaf”.

At the later stage of our research, the wet absorption kinetics of dry extract “Hyposedaf” were also studied in relation to the surface of the sample being analyzed. The studies were carried out in the Exciter, where a relative humidity of 58% was created for 10 days. Different diameter buxes were used to define different values of this factor: d1=2.8 sm, d2=3,5 sm, d3=3,9 sm. Thus, the surface area of dry extract samples is respectively 6,15 sm^2, 9,62 sm^2, 11,94 sm^2 organized.

The results obtained are presented in the form of a diagram in Figure 2.

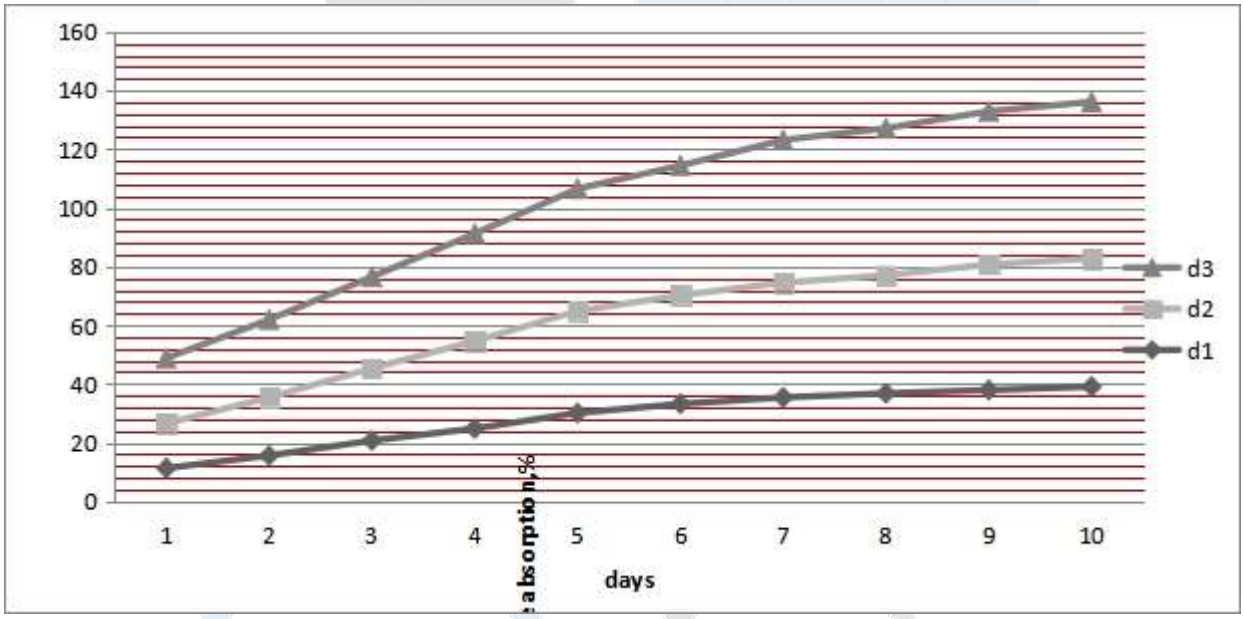

Figure 2. Dependence of wet absorption kinetics of dry extract “Hyposedaf” on the surface area of the sample

Based on the results obtained, samples stored in medium to large diameter buoys were liquefied by absorbing 15.1% and 23.3% moisture at the end of the first day, respectively. But a specimen stored in a small Bux suffered this event only at the conclusion of the second day: in doing so, it sorbed 15.8% moisture. By the end of the experiment, the mass of the dry extract in the Buks, with a diameter (d1) of 2.8 cm, increased by 38.3%, at the end of the 7th and 5th day this amount of moisture was absorbed in the d2 and d3 Buks. A sample in a medium-sized Bix sorbed 39.8% moisture at the conclusion of day 10, while a dry extract sample with the largest surface area – absorbed such amounts of moisture on the 6th day of research.

Thus, a 1.48-and 1.85-fold increase in the sample surface area led to an increase in the amount of moisture ingested by 1.22 and 1.38 times, respectively. The data obtained from the studies have proven that the dry extract ”Hyposedaf” has a high hygroscopic property, and that this property directly depends on the relative humidity of the external environment and the area of the sample surface.

Conclusion. It has been proven that the dry extract “Hyposedaf” has a high hygroscopic property, as well as that this property directly depends on the relative humidity of the external environment and the area of the sample surface. That is, taking into account the hygroscopicity of

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the dry extract, using auxiliary substances that reduce this property, it was the capsule that showed the feasibility of developing a drug form.

Literature used:

1. State Pharmacopoeia Of The Republic Of Uzbekistan. Toskent -2021. Volume 1, part 1-2.

2. European pharmacopeia 7.0, vol. 1 (general texts 5/11).

3. D.Y.Jalilova, E.S.Karieva. The study of the moisture-sorption properties of the dry extract “Helmintabs" // Pharmaceutical Journal.-Tashkent.-2020.-No. 1.- pp.77-80.

4. Turdieva Z.V., Mirakilova D.B., Azizov.U.M. Hypotensive medicinal product based on unabi fruits // Collection of the II International scientific and practical conference “Abu Ali ibn Sino and innovations in modern pharmaceuticals".-Tashkent, 2019 April 25. -pp.78-80.

5. Mol G.S. Studying the features of the modern pharmaceutical market of antihypertensive drugs //International Journal of Experimental Education. - 2015. – № 5-1. – pp. 143-144.

6. Mammadova Z.D., Fateeva T.G., Parfenov V.A. Headaches in patients with arterial hypertension and hypertensive crises // Neurological Journal.-2013.-No. 2.-pp.28-32.

7. R.K.Sadykova., E.S.Karieva. The study of factors affecting the hygroscopicity of the dry extract of the Samarkand immortelle // Collection of materials of the XI All-Russian scientific conference of students and postgraduates with international participation "Young pharmacy - the potential of the future".-St. Petersburg.-2021- Vol.1.-p.223-226.

8. Karpov Yu.A., Shubina A.T. Possibilities of optimization of hypotensive therapy: chronotherapy of nocturnal arterial hypertension //Atmosphere. Cardiology news.-2017.-No. 1.-pp.18-23.

9. State Pharmacopoeia of the Russian Federation, XIV ed., Moscow (2018); [Electronic resource],URL: https://femb.ru/record/pharmacopea14.

10. Nosovitskaya S. A., Borzunov E. E., Safiulin R. M. Production of tablets. — M.: Medicine, 1969.— 135 p.