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Research Article

DETERMINATION OF THE COMPOSITION AND TECHNOLOGICAL PROPERTIES OF THE SUBSTANCE FOR IMMUNACEA BIO TABLETS

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ABSTRACT

Studied technological properties of the substance based on Echinacea purpurea juice. Based on the experiments conducted, excipients were selected for improving the technological properties of the pressed mass and suggesting the optimal composition for "Immunacea bio" tablets with immunomodulatory effects.

KEYWORDS

Bulk density, flowability, angle of repose, compaction coefficient, compressibility, force of ejection of tablets from the matrix and static humidity.

INTRODUCTION

The most popular dosage form used in medicine is tablets . A solid dosage form that is usually obtained by compression. Tableting is based on the use of the properties of powdered medicinal substances to be

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compacted and strengthened under pressure. In this case, the weakly structured material turns into a coherently dispersed system with a certain porosity value. At the same time, the tableting process is influenced by the technological properties of the substance, such as fractional composition, bulk density, flowability, angle of repose, compaction coefficient, compressibility, force of ejection of tablets from the matrix and static humidity. To obtain tablets, meeting the requirements of quality standards is the study of the technological properties of the pharmacologically active substance [1,2].

The correct choice of excipients during the tableting process gives the tablet mass the necessary technological properties that ensure dosing accuracy, mechanical strength, disintegration and stability of the tablets during storage [3].

Purpose of the study Determination of the composition and technological properties of a substance based on Echinacea purpurea juice, for "Immunacea bio" tablets with immunomodulatory effects .

Materials and methods The fractional composition or percentage distribution of powder particles by size has a certain influence on the degree of its flowability, and therefore on the rhythmic operation of tablet machines, the stability of the mass of the resulting tablets, the accuracy of the dosage of the medicinal substance, as well as the quality characteristics of the tablets. The fractional composition of the substance based on the juice of Echinacea purpurea was determined using the sieve method. The dried juice of Echinacea purpurea is a brownish-green powder with a peculiar odor.

Bulk density is the mass per unit volume of freely poured powder and depends on the density and humidity of the substance, the shape and size of the particles, and their placement. Based on the bulk density value, the nature of the excipients used and the volume of the matrix channel of tablet machines are predicted, because Dosing of tablet masses in them is carried out by volume. Determination of bulk density was carried out using a volumetric meter and a stainless steel vessel with a volume of 100 ml .

Flowability is the ability of a powdered material to crumble under its own gravity and ensure uniform filling of the matrix channel. Material that has poor fluidity in the funnel sticks to its walls, which disrupts the rhythm of its flow into the matrix. This causes the target weight and density of the tablets to fluctuate. The flowability of the mass was determined using a VP 12A device.

An indirect characteristic of flowability - the angle of repose - the angle α between the generatrix of the cone of bulk material and the horizontal plane is determined from the equation tg (α) = cone height/(0.5 × base diameter). Flowability was also determined by the flow rate through the nozzle using a VP 12A device. The interactions between particles that affect the bulk properties of a powder also affect the flow of the

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material. A free-flowing powder is characterized by less interaction between particles and the values of bulk density and density after shrinkage will be close. For less flowable materials, large differences between bulk density and shrinkage density are observed. Therefore, fluidity can be assessed by the powder compaction coefficient.

Compressibility – ability of powder particles to cohesion under pressure, i.e. the ability of particles, under the influence of forces of an electromagnetic nature and mechanical engagement, to mutual attraction and adhesion with the formation of a stable, strong compact. When determining the compressibility of a powder (granulate), a sample weighing 0.3 or 0.5 g is pressed into a matrix using punches with a diameter of 9 mm and 11 mm on a hydraulic press at a pressure of 120 MPa.

To push a pressed tablet out of the matrix, force is required to overcome friction and adhesion between the side surface of the tablet and the matrix wall. Antifriction substances were selected taking into account the magnitude of the buoyancy force. When determining the ejection force, a sample of powder weighing 0.3 was pressed into a matrix with a diameter of 9 mm on a hydraulic press at a pressure of 120 MPa. The pressed tablet is ejected using the lower punch. At the same time, the buoyancy force was recorded on the pressure gauge of the press[4,5].

The results of studying the physicochemical and technological properties of dried Echinacea purpurea juice are presented in Table 1.

Table 1.

The results of studying the technological properties of the substance - dried juice of Echinacea purple herb

No.	Technological properties	Unit	results
1	Factional composition +1000 μm - 1000 μm +500 μm - 500 μm +250 μm - 250 μm +125 μm - 125 microns -100 μm	%	 0.00 0.00 1.20 23.10 23.20 45.1
2	Flowability	10^{-3} kg/s	1.5
3	Bulk density	kg/m ^{3}	508.00
4	Angle of repose	C°	65
5	Compaction factor		1.7
6	Compressibility	N	12
7	The force of ejection of tablets from the matrix	MPa	3.2
8	Residual moisture	%	5.0

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As can be seen from Table 1, the technological properties of the substance turned out to be unsatisfactory, which makes it impossible to obtain tablets of proper quality from such material . To improve the technological properties of the original drug substance and obtain tablets of appropriate quality with maximum therapeutic effect and minimal side effects, it is necessary to conduct appropriate research on the selection of the rational composition and optimal technology of the tablets being developed.

Based on the selected optimal combination of factor levels, the following composition for Immunacea bio tablets was proposed[6] .

Compound:

Echinacea purple herb juice dried	80 mg
Microcrystalline cellulose	15 9.0 mg
Magnesium stearate	2.5 mg
Aerosil	5.0 mg _
Sodium saccharin	0.875 mg
Vanillin	1.25 mg
Cherry flavor	1.375 mg
Average weight	**2 50 mg**

CONCLUSION

Based on a study of the technological properties of the substance from the dried juice of Echinacea purpurea, the optimal composition was proposed for tablets "Immunacea bio" with immunomodulatory effects.

REFERENCES

1. Зупарова З. А., Исмоилова Г. М. Сравнительный анализ содержания полисахаридов в эхинацеи пурпурной выращиваемой в различных регионах //Innovations in life sciences. – 2023. – С. 148-149.
2. Зупарова З.А., Хайдаров В.Р., Исмоилова Г.М., Миррахимова Т.А. ИЗУЧЕНИЕ АССОРТИМЕНТА ИММУНОМОДУЛИРУЮЩИХ И ИММУНОСТИМУЛИРУЮЩИХ ЛЕКАРСТВЕННЫХ СРЕДСТВ В 2016-2021 ГГ., ЗАРЕГИСТРИРОВАННЫХ В РЕСПУБЛИКЕ УЗБЕКИСТАН // Ремедиум. 2021. №4. URL: https://cyberleninka.ru/article/n/izuchenie-assortimenta-immunomoduliruyuschih-i-immunostimuliruyuschih-lekarstvennyh-sredstv-v-2016-2021-gg-zaregistrirovannyh-v (дата обращения: 12.01.2024).

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3. Вельмяйкина Е. И., Куркин В. А., Климова Л. Д., Бер О. В. Исследование по созданию иммуномодулирующего лекарственного средства сиропа с настойкой эхинацеи пурпурной // Известия Самарского научного центра РАН. 2009. №1-6. URL: https://cyberleninka.ru/article/n/issledovanie-po-sozdaniyu-immunomoduliruyuschego-lekarstvennogo-sredstva-siropa-s-nastoykoy-ehinatsei-purpurnoy (дата обращения: 12.01.2024).
4. Зупарова З. А., Хайдаров В. Р., Исмоилова Г. М. ПОЛУЧЕНИЕ СУХОГО ЭКСТРАКТА ИЗ ЭХИНАЦЕИ ПУРПУРНОЙ МЕТОДОМ ПОЛИЭКСТРАКЦИИ И ИЗУЧЕНИЕ НЕКОТОРЫХ ФИЗИКО-ТЕХНОЛОГИЧЕСКИХ СВОЙСТВ ТЎҚ ҚИЗИЛ ЭХИНАЦЕЯДАН ПОЛИЭКСТРАКЦИЯ УСУЛИ БИЛАН ҚУРУҚ ЭКСТРАКТ ОЛИШ ВА УНИНГ ФИЗИК-ТЕХНОЛОГИК ХОССАЛАРИНИ ЎРГАНИШ //O'ZBEKISTON FARMATSEVTIK XABARNOMASI. – 2021. – С. 23.
5. Куркин Владимир Александрович, Климова Любовь Дмитриевна, Вельмяйкина Екатерина Ивановна, Первушкин Сергей Васильевич, Желонкин Николай Николаевич, Бер Ольга Владимировна, Сохина Анна Аркадьевна Исследование по созданию иммуномодулирующего лекарственного средства таблеток с экстрактом эхинацеи // Известия Самарского научного центра РАН. 2014. №5-2. URL: https://cyberleninka.ru/article/n/issledovanie-po-sozdaniyu-immunomoduliruyuschego-lekarstvennogo-sredstva-tabletok-s-ekstraktom-ehinatsei (дата обращения: 12.01.2024).
6. Z. A. Zuparova, & G. M. Ismoilova. (2024). Determination of Some Technological Properties and Authenticity of Immunacea Bio Tablets. Best Journal of Innovation in Science, Research and Development, 3(1), 29–35. Retrieved from https://www.bjisrd.com/index.php/bjisrd/article/view/1371