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STUDY OF INDICATORS OF THISTLE SEED COMPOSITION AS A COMPONENT OF CHOCOLATE MASS

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Chocolate mass has numerous consumer appeals that make it popular and desirable in the food industry, including its rich, smooth flavor and melt-in-your-mouth texture. But many types of chocolate have a high sugar content, which can affect the health of consumers' teeth and their excess weight. In addition, chocolate contains cocoa butter, which is a source of saturated fat, and a high intake of saturated fat may be associated with the risk of cardiovascular disease [1]. Innovations in the formulation of chocolate masses can help manufacturers attract the attention of consumers who are looking for new flavors and health-oriented products. Oil seeds attract attention as a component of chocolate masses. It contains a significant amount of useful substances, such as polyunsaturated fatty acids, proteins, fiber, vitamins, minerals and antioxidants [2]. Among the oil crops, milk thistle attracts special attention, which is a source of valuable oil characterized by a high amount of polyunsaturated fatty acids, protein and dietary fiber, as well as a complex of biologically active substances (flavolignans, flavonoids, essential oils, sterols, vitamins, etc.) [3, 4].

It should be noted that, despite the rather well-studied composition of milk thistle seeds, comprehensive information on the chemical composition of its seeds is practically absent in scientific and technical sources, with limited data on the activity of its enzyme complex. Given the high content of milk thistle oil prone to enzymatic oxidation [5], it is of interest to develop ways to reduce the activity of native lipases and lipoxygenases in order to inhibit the processes of hydrolytic and oxidative destruction of the lipid complex. The obtained data should rationalize the production technology of chocolate masses with the addition of thistle seeds, which is an urgent task.

The purpose of the work is to determine the parameters of thistle seed

composition. The obtained data will be useful for the use of milk thistle seeds as a health-promoting component in chocolate mass.

A number of indicators of milk thistle seeds, which influence the quality of chocolate mass made with its addition, were studied, namely:

– quality indicators (weight of 1000 seeds, pest infestation, garbage admixture, moisture, mass fractions of crude protein, lipids, fiber, as well as acid and peroxide number of lipids);

– fatty acid composition of lipids.

It was determined that milk thistle seeds have a fairly small mass of 1000 seeds compared to such oil crops as sunflower and soybean, and are not infected by pests. This indicates the possibility of energy-saving grinding of seeds for use in chocolate mass technology. In comparison with the mentioned cultures, milk thistle seeds have a rather low moisture content and a low content of waste admixture, which consists mainly of spoiled seeds. This fact, in turn, confirms the technological expediency of using this oil raw material in the technology of confectionery products, in particular, chocolate mass, due to the low cost of hydrolytic processes in the raw material and the finished product. Thistle seeds have a fairly high content of such components as crude protein and lipids, which makes it a valuable ingredient for enriching sugary confectionery products. But the analytical numbers of lipids extracted from milk thistle seeds are quite high compared to sunflower and soybean seeds, which indirectly indicates the active flow of enzymatic hydrolysis and oxidation processes. This fact suggests the feasibility of inactivating seed enzymes that lead to hydrolytic and oxidative processes. It was determined that the lipid component of thistle seeds contains saturated fatty acids – 16.83 %, unsaturated – 25.6 %, and polyunsaturated – 57.10 % of the total amount of fatty acids. Thus, this seed can be a significant source of polyunsaturated fatty acids in products with a saturated fatty acid composition, in particular, chocolate mass.

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EVALUATION OF HYGROSCOPIC PROPERTIES OF TAJIKISTAN-GROWN SALVIA SCLAREA DRY EXTRACT

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Clary sage *(Salvia sclarea L.)* possesses a diverse biological activity (antioxidant, antiinflammatory, antimicrobial, anaesthetic, wound-healing) which is due to various components, making part of the raw material: essential oil, flavonoids, tannins, and alcaloids. A great attention is currently paid to the neurotropic properties of *Lamiaceae raw materials*, including the representatives of *Salvia* L genus [1].

At the Department of Pharmaceutical Technology and Pharmacology of the Tajik National University a dry extract of clary sage growing in Tajikistan (DECS) has been obtained. Currently, hard gelatin capsules containing DECS are being developed. The anxiolytic activity of DECS has been screened using the elevated plus maze test, which demonstrated a moderate anxiolytic effect.

The hygroscopicity of dry extracts of medicinal plants is in many cases a critical parameter in the technological process of producing capsules and storing the drug. Based on this, the hygroscopic properties (ability to absorb moisture) of DECS were studied at various levels of relative air humidity [2, 3].

The evaluation of hygroscopicity (tendency to dampness) was carried out according to the method of determining the loss in mass at drying after keeping a weighing bottle with a sample of DECS in a desiccator with a relative air humidity of 100%, 75% and 40% at a temperature of (22±2)^{o}C. Relative air humidity was created respectively by water and saturated solutions of sodium chloride and sodium bicarbonate.

At certain time intervals, DECS samples were taken and the moisture content was determined. Initially, before the experiment, the DECS was kept in a drying cabinet for 24 hours at 45°C.

During the process of keeping the DECS substance at 100% air humidity, 2 hours after the beginning of the experiment, the weight of the sample doubled, and after 8 hours the extract dissolved.

The data in Fig. 1 show that the most intense moisture absorption is observed during the first hour of the experiment, reaching 6.18% and 8.6% at air humidity of 40% and 75%, respectively. During the second hour, a fairly high moisture absorption is also observed, which gradually stabilizes over the next 5 hours of the experiment, reaching 11.8% and 15.1%.