TECHNOLOGY OF CONVECTION DRYING OF MEDICINAL PLANTS

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Abstract. *Convective drying of products is one of the most common ways of drying. The development of such equipment - a fairly promising direction. Technological features of the process allows to preserve the original properties of the product. In addition, the task of producing new qualities in the finished product. you need the appropriate equipment to achieve these goals. Further drying is considered from the standpoint of the most simple and economical process for the preservation of medicinal raw materials, which ensures the safety of almost all the biologically active substances. If the drying process is considered from the technological point of view, a process of removing the liquid, which is in the medicinal material. The freshly harvested raw drug usually contain 70-90% moisture, and dried in - about 10-15%. The drying process and performance drying units morphological features depend on raw material, its initial moisture content, the total surface of the material being dried, as well as humidity, temperature and coolant flow rate. This article describes methods of convective drying of medicinal plants - in drying removal of moisture from the surface due to the diffusion of moisture from the inside of the material to the surface. These two processes need to be in strict compliance, otherwise possible drying, warping the material surface and the deterioration of its quality. We consider different methods of drying of vegetable raw materials. Shows staged authors technology for each herb. As medicinal plant raw material mainly used in the pharmaceutical and medicine in dried form. It is only used in certain types of fresh state after collection.*

Keywords: *drying, herbs, convection, humidity, temperature, quality, method.*

Medicinal plant material is mainly used in the pharmaceutical and medicine in dried form. It is only used in certain types of fresh state after collection. Drying is considered from the standpoint of the most simple and economical process for the preservation of medicinal raw materials, which ensures the safety of almost all the biologically active substances. If the drying process is considered from the technological point of view, a process of removing the liquid, which is in the medicinal material. The freshly harvested raw drug usually contain 70-90% moisture, and dried in - about 10-15%. The drying process and performance drying units morphological features depend on raw material, its initial moisture content, the total surface of the material being dried, as well as humidity, temperature and coolant flow rate. Drying of medicinal plants is carried out today by two methods:

1. Drying without artificial heating. With this method, there are two methods, namely air-cured, which is carried out in the shade outdoors or sun-drying, a process which takes place in the solar dryers or in the open air.

2. Thermal drying or artificial drying by heating.

Air-Cured method used for drying herbs, leaves, flowers. To carry out such a drying is simple enough, one has only to expand the raw material under a canopy or in a specially designed drying sheds. But it is preferable to dry the raw material on special shelves with frames covered with cloth or a rare metal mesh. This method of drying of medicinal plants is rather slow when compared to drying under the eaves in the open air, but in such a manner, the raw material of better quality.

Solar drying method is used in areas with dry, hot climate. Generally it is used in drying of roots, bark, roots and other underground parts. Solar drying is good for raw materials, which contain tannins. The advantage of solar drying method is a rapid dehydration. To avoid wetting the raw material when the solar drying, it is necessary at night to clean the room or hide a thick cloth.

The thermal method of drying plant for medicinal purposes is used for drying the raw material of various morphological groups. This method is best because it can be used regardless of the weather conditions and the area of blanks, as well as it provides rapid dehydration. Depending on the method of supplying heat to heat drying thermoradiative separated and convection. Convective drying of

products is one of the most common ways of drying. The development of such equipment - a fairly promising direction. Technological features of the process allows to preserve the original properties of the product. In addition, the task of producing new qualities in the finished product. you need the appropriate equipment to achieve these goals.

For convective drying herbs authors have developed some rules and guidelines. Subject to the drying process Below is the final product obtained by the methods retain all himicheseie useful properties and biologically active substances.

1. Raw material which contains oils, dried at a temperature of 30-35° C in the 10-16 cm layer to prevent evaporation of the essential oils.

2. Raw material which contains glycosides, - 50-60° C. This allows you to quickly inactivate the enzymes that destroy glycosides.

3. Raw material which contains alkaloids - 50° C.

4. Raw material which contains ascorbic acid, - 55-65° C.

Each of the methods of drying plant raw herbs attar addition, it is necessary to expand a thin layer, and then inverted regularly. You should also seek to minimize the degree of grinding of raw materials.

The drying process is considered complete after when stems, roots, bark, roots break when bent and do not bend; juicy fruit do not stick together and fall apart when pressed; flowers and leaves are ground to a powder.

Heat transfer product for a given method of convective drying is carried out by means of heated drying agent and air.

All installations for drying products by convective share common principles and fairly simple structure.

When convective drying physical nature of the process is reduced to the removal of moisture from the material due to the difference in the partial pressures of the material $P = \frac{M}{П}$ in the environment $P = \frac{C}{П}$. The drying process is provided that $P = \frac{M}{П} > P = \frac{C}{П}$. In case of equality of the partial pressures $P = \frac{M}{П} = P = \frac{C}{П}$ comes a state of equilibrium, and the drying process is terminated. When this is established in the material moisture equilibrium called W_p. If the material is dried to a moisture content below the equilibrium, that inevitably occurs a condition where $P = \frac{M}{П} < P = \frac{C}{П}$ and the material starts to be wetted. This process is called sorption. Typically drying is carried out until the equilibrium moisture content.

During drying the moisture removal from the surface due to the diffusion of moisture from the inside to the surface of the material. These two processes need to be in strict compliance, otherwise possible drying, warping the material surface and the deterioration of its quality.

Thus, in convective drying moisture moves to the surface due to the moisture gradient, temperature gradient slows down the process somewhat. Due to the temperature difference between the surface and the inside material is moisture into motion in the direction of a temperature reduction. Equilibrium moisture, and consequently the flow of the drying process depends on the properties of the material being dried, the nature of connection with moisture and environmental parameters. Contact with moisture material may be mechanical, physical-chemical and chemical.

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