Study on the influence of different drying equipment on the effective ingredients of traditional Chinese medicine pills

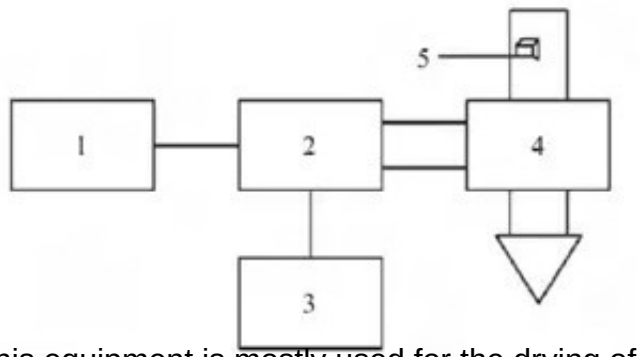
ABSTRACT: OBJECTIVE To optimize the drying equipment of traditional Chinese medicine pills. METHODS Xiangsha Liujun pills, Qiju Dihuang pills and Bushen Tuojing pills were dried by microwave drying equipment, hot air circulating oven and microwave vacuum drying equipment respectively. The best drying equipment was selected according to the drying time, moisture content and effective ingredients after drying.

Results The drying time of microwave vacuum drying was relatively short, and the loss of active ingredients was minimum. CONCLUSION The experimental results can be used as the technological basis for the selection of drying equipment for traditional Chinese medicine pills.

Key words: microwave drying of traditional Chinese medicine; traditional Chinese medicine pills; active ingredients

The company mainly produces one of the dosage forms, accounting for about 30% of all registered varieties. Because of its small size, high concentration of active ingredients, easy to take and so on, the pill products have a wide development space and a large market share.

As a new drying technology, microwave vacuum drying combines many advantages of microwave heating and vacuum drying, and overcomes the shortcomings of low efficiency of conventional vacuum drying. In the drying process of general materials, microwave vacuum drying has the advantages of low drying temperature, fast drying speed, high drying efficiency, good drying quality, strong adaptability to drying materials and sterilization function.



This equipment is mostly used for the drying of slices, extracts and food, and the drying of traditional Chinese medicine pills is seldom reported. In this experiment, Xiangsha Liujun pills

(water pills), Qiju Dihuang pills (honey pills) and Bushen Chongjing pills (concentrated water pills) were used as representatives to compare the effects of microwave drying, hot air cycling drying and microwave vacuum drying on the effective ingredients of traditional Chinese medicine pills, and to optimize the drying methods of each pill.

Tanshinone II A is the main ingredient of this preparation. According to the literature reports, tanshinone II A has remarkable effect in treating coronary heart disease, improving coronary circulation and inhibiting thrombosis. So tanshinone II A is selected as the index component to control the quality of this preparation.

According to the content determination method of Salvia miltiorrhiza in Chinese Pharmacopoeia 2010 edition, the preparation methods of the samples were investigated. The results showed that the contents of tanshinone II A obtained by the two methods were not significantly different, and the operation of ultrasonic treatment was simpler and faster than that by heating reflux and ultrasonic treatment. Ultrasound treatment was selected as the preparation method of the sample.

In addition, the treatment time and solvent amount of the ultrasonic treatment method were also investigated, and the conditions of chromatographic column, flow rate of mobile phase and column temperature of different manufacturers were investigated. Finally, the content determination method of tanshinone II A in Danshen Lishu granules was determined as the experimental method mentioned above.

This method has the advantages of simple operation, good separation effect, high sensitivity, good repeatability and accurate results. It can be used for the quality control of this product. At the same time, it lays an experimental foundation for improving the quality standard of this product and developing new clinical drugs.