

Effects of hot air and microwave drying on drying characteristics and quality of areca nut

Abstract: In order to explore the characteristics of [microwave drying equipment](#) and its effect on quality, the drying curve and rehydration curve of areca nut were studied with fresh areca nut as test sample and hot air drying as control, and the effects of different drying methods on total acid, total sugar and polyphenol content of areca nut were compared.

The results showed that the rehydration quality of P10 low power microwave drying was better than that of P30 high power microwave drying, and the nutrients were well preserved. Therefore, the low power microwave drying of P10 could replace hot air drying of Areca Catechu in the future. The research results could provide theoretical and practical guidance for industrial microwave drying of areca catechu.

Key words: [betel nut microwave drying](#); hot air drying; drying characteristics; rehydration characteristics; quality



Areca catechu is a dry mature seed of Areca catechu of palm family, also known as Ren-frequency, Binmen and Langyu. Hainan is a major areca planting Province in China, and areca industry is the largest pillar industry in the province.

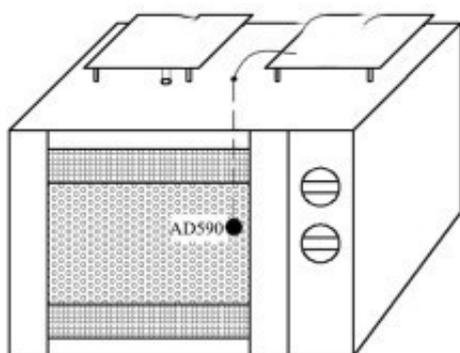
Areca catechu is one of the four southern medicines in China. It has been mostly used as medicine since ancient times. However, at present, it is mainly processed into dried Areca catechu fruits in Hainan and then transported to Hunan for further processing. The dried areca nut in Hainan is processed by the traditional hot air drying method. The dried areca nut processed by this method is hard and hard. It is harmful to consumers' mouth when chewing, and easy to cause oral lesions.

Microwave drying can make the material heated uniformly, the drying rate is fast and stable, and has little influence on the structure of the material. By comparing the microwave drying and hot air drying characteristics of areca nut and the effects of different drying methods on chewing characteristics and nutritional quality of areca nut, this study provides theoretical and practical basis for industrialized microwave drying of areca nut.

The results show that the drying time of betel nut can be shortened by low power microwave drying (microwave output power 80W) compared with traditional hot air drying. The rehydration

rate of betel nut is 65%, and the rehydration rate is good. It is easy to soften in later processing and guarantees the chewing taste of the product.

In addition, the nutrient loss of areca nut dried by low power microwave was less. After drying, the total sugar and acid content of areca nut pulp were 0.12% and 1.24%, respectively. At the same time, the polyphenol content could reach 3.48 mg/g, which was significantly different from the traditional hot air drying of areca nut 3.27 mg/g and retained the active ingredients. Therefore, low power microwave drying can provide reference for improving the drying process of areca nut in Hainan.



Schematic diagram of microwave drying temperature control system