

Production of Premium Quality Cinnamon Bark Powder Using Cryogenic Grinding

Authors : Monika R. Bhoi, R. F. Sutar, Bhaumik B. Patel

Abstract : The objective of this research paper is to obtain the premium quality of cinnamon bark powder through cryogenic grinding technology. The effect of grinding temperature (0, -20, -40, -60, -80 and -100°C), feed rate (8, 9 and 10 kg/h), and sieve size (0.8, 1.0 and 1.5 mm) were evaluated with respect to grinding time, volatile oil content, particle size, energy consumption, and liquid nitrogen consumption. Cryogenic grinding process parameters were optimized to obtain premium quality cinnamon bark powder was carried out using three factorial completely randomized design. The optimization revealed that grinding of cinnamon bark at -80°C temperature using 0.8 mm sieve size and 10 kg/h feed rate resulted in premium quality cinnamon bark powder containing volatile oil 3.01%. In addition, volatile oil retention in cryogenically ground powder was 88.23%, whereas control (ambient grinding) had 33.11%. Storage study of premium quality cryogenically ground powder was carried out under accelerated storage conditions (38°C & 90% R.H). Accelerated storage of cryoground powder was found to be advantageous over the conventional ground for extended storage of the ground cinnamon powder with retention of its nutritional quality. Hence, grinding of spices at optimally low cryogenic temperature is a promising technology for the production of its premium quality powder economically.

Keywords : cinnamon bark, cryogenic grinding, feed rate, volatile oil

Conference Title : ICNFST 2021 : International Conference on Nutrition and Food Science Technology

Conference Location : Montreal, Canada

Conference Dates : May 24-25, 2021