Tropentag, September 15-17, 2021, hybrid conference

"Towards shifting paradigms in agriculture
for a healthy and sustainable future"

Drying Behaviour of Moldavian Dragonhead (*Dracocephalum moldavica*) and Blue Fenugreek (*Trigonella caerulea*) with Regards to Processing Temperature and their Quality

Ziba Barati, Supaporn Klaykruayat, Joachim Müller

University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany

Abstract

Moldavian dragonhead (*Dracocephalum moldavica*) and blue fenugreek (*Trigonella caerulea*), which are growing well in a subtropical climate, contain health-promoting ingredients such as phenolic compounds, flavonoids, essential oils, pigments and vitamins. In this study, the effect of different drying temperatures on the drying behaviour and some quality parameters of Moldavian dragonhead and blue fenugreek was examined. The plants were harvested at the experimental station of the University of Hohenheim (Stuttgart, Germany) in July 2020. The drying experiment was conducted at different processing temperatures of 40, 55, and 70 °C using a high precision laboratory dryer designed at the Institute of Agricultural Engineering, University of Hohenheim. Air velocity and absolute humidity of the air were held constant at 0.2 m s^{-1} and 10 g kg^{-1}, respectively. To establish drying curves, weight loss from the samples was recorded at constant intervals of 5 min. Furthermore, the quality of dried samples was investigated in terms of colour, total phenolic content and flavonoids. The results show that the moisture content decreased gradually until the desired moisture content of 10 % was reached. By increasing the temperature, the total drying time decreased remarkably. It was determined that the colour values of both plants were substantially influenced during the drying process. Moldavian dragonhead dried at 40 °C had the highest total phenolic (55.4 ± 1.7 mg g^{-1} of dried sample) and flavonoids content (42.9 ± 0.8 mg g^{-1} of dried sample) compared to those dried at 55 and 70 °C. There was a significant difference in the amount of total phenolic and flavonoids in Moldavian dragonhead dried at different temperatures ($p < 0.05$). However, there was no considerable change in total phenolic and flavonoids of blue-fenugreek dried at different temperatures. It was concluded that the drying temperature can affect quality parameters of some medicinal and aromatic plants and therefore must be chosen according to the plant and the intended processing.

Funding: This research was funded by the German Federal Ministry of Food and Agriculture (BMEL) and the Agency of Renewable Resources (FNR) under project number FKZ:22021317.

Keywords: Colour, drying, flavonoids , medicinal and aromatic plants, total phenolic content

Contact Address: Ziba Barati, University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Garbenstr.9, 70599 Stuttgart, Germany, e-mail: barati@uni-hohenheim.de