

Analysis of the Quality and Drying Characteristics of Medical Herbs

Alibakhsh Kasaeian*

Department of Hydraulic Engineering, Dalian University of Technology, Dalian, Liaoning, China

Introduction

A low-cost, indirect, standalone, forced-convective solar dryer was developed to dry medicinal herbs that are sensitive to direct sunlight in light of Oman's solar radiation status. A solar panel-powered blower and air passing through a black-body solar collector were used to achieve the hot air flow. The medicinal and nutritional (physicochemical) properties of herbs may be preserved during the drying process, which also ensures food safety and hygiene. This study researched the advantages of an aberrant sun oriented drying procedure on the maintenance of value credits of mint and basil utilized in restorative applications. The results were compared to fresh herb samples because herbs used for drying could change their physicochemical properties like colour, water activity (Aw), total soluble solids (TSS), phenol content, antioxidant capacity and moisture content (MC). Many current chronic diseases, including cancer, Crohn's disease, ulcerative colitis and cystic fibrosis, are treated with medicinal herbs in Ayurveda and other eastern medical practices. Herbal remedies come in a variety of forms; Basil, for instance, is a mint-like annual that blooms throughout the summer. It has been utilized for millennia and is an essential component of numerous rituals and traditions. Because it has anticancer, radio protective, antipyretic and antioxidant properties, basil is considered a pharmacological herb.

Description

It can also be used to prevent hepatitis and gastritis. In the Lamiaceae, or mint family, mint is one of the most diverse and widespread dicotyledonous plant groups. Headaches, skin irritation, diarrhea and menstrual irritation are all treated with mint. Various sorts of therapeutic spices are filled in Oman and a large portion of them are shipped off business sectors in new structure and exposed to a critical number of postharvest misfortunes. In an effort to depreciate pathogenic bacteria, preserve the nutritional value of food, reduce agricultural waste and cut production costs, the food industry worldwide typically develops a variety of preservation techniques. Open sun drying is considered to be direct, meaning that the product is directly heated by the sun's rays. The cheapest and easiest way to dry agricultural products, including medicinal herbs, is in the open sun. When exposed to direct sunlight, herbs lose their aroma and turn a dark color, making them less appealing to consumers. Other occurrences include rodent attacks, bird droppings, pest infestations and others. During the drying process, the compounds in leaves that have a low boiling point evaporate. It should be noted that the nutritional, physical and chemical contents of dried leaves are affected by oxidation modification. The thermal breakdown of the active compounds during drying

degrades the quality of a medicinal herb. The indirect mode of solar drying, in which hot air heats the product before solar radiation heats the air has proven to be a reliable and effective method for preserving foods and aromatic plants, according to the drying industry [1,2].

Oman's solar radiation, which is the highest in the region, can still be used as a renewable energy source to dry agricultural produce, reducing waste and increasing shelf life. In addition, the government of Oman is working to encourage young people and women to participate in SMEs in the country. As a result, agricultural SMEs may benefit from drying with inexpensive solar energy. Solar drying has long been used to preserve agricultural products. However, drying can take longer than anticipated due to weather-related factors, compromising the product's quality and leading to losses. A minimal expense, roundabout sun powered dryer could be an option in contrast to the normal technique utilized. Locally, this technology could be used to increase farmers' incomes and ensure that they have access to food and nutrition. As a result, the goal of this study was to investigate how a prototype low-cost, stand-alone indirect solar dryer produced high-quality dried medicinal herbs like mint and basil. Additionally, the drying characteristics and physicochemical properties of dried herbs were evaluated in this study. The summer and winter seasons were used to carry out the experiments. The average ambient temperature and relative humidity were 44.5 percent and 42.5 degrees Celsius, respectively, during the summer and the solar radiation hours were 11 hours. The average ambient temperature and relative humidity were 30.8% and 38.3 °C, respectively, during the winter and the number of solar radiation hours was 8 h. The low-cost indirect solar dryer (four replicates), direct sun drying and shade drying, as well as two kinds of medicinal herbs (mint and basil), were used in three drying experiments. The developed indirect solar dryer's solar collector employs the black body radiation concept, which is affected by solar radiation, weather conditions and airflow settings. Additionally, the drying chamber adheres to the concept of thin-layer drying. The developed standalone indirect solar dryer was found to work well and was the first attempt in Oman to dry medicinal herbs using the black body radiation concept. All methods of drying showed negative changes in the color parameters as time passed, but indirect solar drying showed less change than direct sun and shade drying [3-5].

Conclusion

The values of the Chroma and dark green colour index, which indicate the herb's green color retention and, by extension, its physicochemical properties, were the primary focus. The water activity of medicinal herbs decreased more rapidly during the winter, reaching 0.46 for basil and 0.57 for mint, respectively. On the other hand, the water activity of mint retained more rapidly during the summer. According to reports, the water activity that works best to stop the growth of microorganisms is less than 0.6. The antioxidant capacity of dried herbs ranged from 0.61 to 0.6 mol/g dry matter. While considering the conceivable defilement of residue and bugs under sun or shade drying, this minimal expense independent sustainable power utilized drying idea can be scattered for execution in little and medium ventures in Oman. In order to shorten the drying time, enhance physicochemical quality and increase energy efficiency, the current research will investigate the factors that influence the drying process.

*Address for Correspondence: Alibakhsh Kasaeian, Department of Hydraulic Engineering, Dalian University of Technology, Dalian, Liaoning, China, E-mail: Kasaeian@edu.cn

Copyright: © 2022 Kasaeian A. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 01 October 2022, Manuscript No. Jcde-22-84828; Editor assigned: 03 October 2022, PreQC No. P-84828; Reviewed: 15 October 2022, QC No. Q-84828; Revised: 22 October 2022, Manuscript No. R-84828; Published: 29 October 2022, DOI: 10.37421/2165-784X.2022.12.476

References

1. Carsel, Robert F. and Rudolph S. Parrish. "Developing joint probability distributions of soil water retention characteristics." *Water Resour Res* 24 (1988): 755-769.
2. Derjaguin, B. V. and N. V. Churaev. "Structural component of disjoining pressure." *J Colloid Interface Sci* 49 (1974): 249-255.
3. Hurvich, Clifford M. and Chih-Ling Tsai. "Regression and time series model selection in small samples." *Biometrika* 76 (1989): 297-307.
4. Iden, Sascha C., Andre Peters and Wolfgang Durner. "Improving prediction of hydraulic conductivity by constraining capillary bundle models to a maximum pore size." *Adv Water Resour* 85 (2015): 86-92.
5. Ippisch, O., H J. Vogel and P. Bastian. "Validity limits for the van Genuchten–Mualem model and implications for parameter estimation and numerical simulation." *Adv Water Resour* 29 (2006): 1780-1789.

How to cite this article: Kasaeian, Alibakhsh. "Analysis of the Quality and Drying Characteristics of Medical Herbs." *J Civil Environ Eng* 12 (2022): 476.