Faculty of Applied Sciences
Sabaragamuwa University of Sri Lanka

Out of the Press

Our publications - July

Volume 4 Issue 6

06th August 2024

Conference Proceedings

DFST

Exploring the suitability of FTIR-ATR spectroscopy coupled with chemometrics to discriminate between turmeric grown in major growing areas in Sri Lanka

Y.G.G.K.D.M. Prasangika, B.A.T. Amalka, K.M. Binduhewa, D.C.K.K. Dissanayaka, T.C. Kananke

Abstract

Turmeric (*Curcuma longa*) is a widely used spice in Sri Lanka that has been recognized for its culinary, medicinal, and cosmetic applications, often subjected to economic adulteration. As an initial step for adulteration detection, this study was conducted to develop a rapid and cost-effective method to differentiate the turmeric powder based on their growing districts in Sri Lanka (Ampara, Gampaha, Kalutara, Kandy, Kurunegala and Matale) using fourier transform infrared (FTIR) spectroscopy coupled with attenuated total reflection (ATR) and chemometrics that can be further used to develop a FTIR-ATR screening method to detect turmeric powder adulterations. Initially, six turmeric powder samples were prepared from turmeric rhizomes obtained from major six growing districts in Sri Lanka. Spectral data of six turmeric powder samples were preprocessed with standard normal variate (SNV), multiple scatter correction (MSC), first derivative (FD), and a combination of SNV, MSC, and FD to noise reduction, normalization, and baseline correction. Principal component analysis (PCA) and orthogonal partial least square discriminant analysis (OPLS-DA) were deployed for the whole spectrum range (450-5500 cm^{-1}) to discriminate between the turmeric samples. The results of the OPLS-DA modeling interpreted that turmeric samples of six regions were correctly classified 100% without preprocessing of data with a higher coefficient of determination (R^2) and cross-validated coefficient of determination (Q^2) values, respectively 0.999 and 0.843. The higher R^2 and lower systemic error values indicate that the discrimination model is precise and accurate for the differentiation of turmeric powder samples. The variable importance projection (VIP) scores were denoted the significant wavenumber regions that were notably performed to discriminate the turmeric powder according to their geographical location including 450-1684 cm^{-1}, 2878-3006, and 3188-3395 cm^{-1}. This study revealed the applicability of the FTIR-ATR spectroscopy coupled with chemometrics for the differentiation of turmeric in different growing regions in Sri Lanka based on their compositional variations.

About the Conference

8th International Research Conference of Uva Wellassa University (IRCUWU2024)

24 & 25 Jul 2024

Uva Wellassa University, Badulla, Sri Lanka

Our Scholar

Dr. TC Kananke

Senior Lecturer

thilini@appsc.sab.ac.lk

Development of human resources to competitive rural tourism in Sri Lanka: A case study based on Mudaliwatta village

T.S. GunasekaraQ, R.D.A.M. Somarathna, R.M.B. Rajapaksha

Abstract

In the early part of the coming century, tourism will surpass every other industry as the world's largest. It is a rapidly growing business and a booming source of cash in numerous developing countries and Sri Lanka is among them. The tourism industry has two infrastructures: hard and soft. Human resources are a sub dimension of the soft infrastructure, and in developing countries, the human element is the most essential of all. The purpose of this research was to identify the role of human resources for sport and recreational tourism in Mudaliwatta Village as already it was proposed as a tourism village in Kandy. The research adopted a qualitative methodology that occupied interviews with stakeholders aged above 25 years. The results of the study have clearly provided the evidence on massive inadequacy of the quality of human capital required to develop and sustain sport and recreational tourism products in Mudaliwatta village. It revealed that there was only one physiotherapist available in the village, two individuals were exclusively engaged in tour guiding while only a few had undergone the training provided by the Department of Tourism in Kandy. It was evident that there was a lack of qualified and experienced professionals to conceptualize, programme and implement sports, adventure and recreation activities to attract tourists based on the rural destinations identified. In conclusion, it is essential to take immediate actions to invest in capacity building in tourism in this village. More specifically, the recruitment, and training and retention of professionals in the industry should be facilitated through partnerships with recognized vocational training institutions, while absorbing mentoring and learning from established tourism destinations. If the human resource challenge is addressed, Mudaliwatta village can diversify and enrich their tourism offerings, providing better visitor experiences, and maximum economic benefits to the villagers. This study demonstrated that human resources remained as the lifeblood of the future of tourism infrastructure in the less developed countries. This can only be accomplished by fostering partnerships with qualified vocational training institutions, mentorship, and learning from established tourism destinations.

About the Conference

8th International Research Conference of
Uva Wellassa University (IRCUWU2024)

24 & 25 Jul 2024

Uva Wellassa University, Badulla, Sri Lanka

Our Scholar

Mrs. RDAM Somarathna

Lecturer (Prob.)

madu@appsc.sab.ac.lk