


**Faculty of Applied Sciences
Sabaragamuwa University of Sri Lanka**

OUT OF THE PRESS
Our publications - June

Volume 2 Issue 5

06th July 2022



PEER-REVIEWED JOURNAL

ARTICLES

The Effect of Movement Pattern in Flight Phase for Long Jump Performance

J. P. Sachini Jayaneththi and A. W. Suraj Chandana

ABSTRACT

During the execution of long jump, three different air dynamics are being used, each with its own effect on performance. The purpose of this investigation was to examine the body surface area changes in the frontal plane with the time during the flight phase of long jump performances. The data that support the findings of this study were collected through six national senior male long jumpers at the national trial in Sri Lanka. Each three of the techniques was studied with two of its best performers. The performances were recorded in the frontal and sagittal planes employing two cameras (100 Hz). The coordinates of each athlete's center of gravity were analyzed for each frame starting from take-off to the landing phase utilizing the human movement analyzing software. The space calibration was completed from the frontal plane and sagittal planes separately. The changes of surface area and the performances of the three techniques were negatively correlated ($p < 0.05$). Consequently, in order to optimize the performance of the long jumper, body surface area on the frontal plane need to minimize into 21 positions out of 50 frames in the execution of flight phase.

About the Journal

European Journal of Science, Innovation and
Technology

<http://ejsit-journal.com/index.php/ejsit/article/view/117>

Our Scholar

Dr. A. W. Suraj Chandana

Senior Lecturer

surajchandana@appsc.sab.ac.lk





CONFERENCE PROCEEDINGS

An ingredient identification algorithm for plant-based, sustainable and healthy protein formulations

Chathudina Janitha Liyanage, Uditha Karunathilaka, Rasangani Sabaragamuwa

ABSTRACT

The demand for protein ingredients has increased dramatically over the last few years. This ever-rising interest stems from the growing global population and the associated social- economical changes such as urbanisation, increased income, the concept of healthy diet and changes in dietary patterns with an increased focus on sustainability. As a result, food processors can no longer depend on common and traditional recipes to fulfil evolving customer requirements. Most food processors are currently seeking alternatives to the less sustainable animal-based protein ingredients in existing cuisines and formulations by switching to plant-derived, algae-derived and insect-derived proteins, etc. However, the research and product development has turned out to be costly and time-consuming, involving a great deal of lab work. The potential of incorporating artificial intelligence as an aid to overcome such formulation barriers and to expedite product development has been well identified by the food science research community. This study aims to introduce a novel algorithm to identify the potential for substituting more sustainable raw materials for existing protein ingredients in a food formulation. Raw beef was used as the anchor ingredient for developing the algorithm. The nutritional composition of raw beef was established using alternative and more sustainable ingredients. In this study, 16 plant-based ingredients that can serve as viable protein sources were analysed. Nutrient profile data of the selected ingredients were extracted from the public food composition databases FAO/INFOODS and USDA-FoodData Central and arranged into a comma-separated value file. The analytical hierarchical process decision-making approach and the k-nearest neighbours algorithm were used to process the data. Several portions of each ingredient combination were evaluated, considering the essential amino acid profile. AHP was used to identify the next most viable ingredient for supplying the least-fulfilled amino acid in the formulation. The identified formulation quantities of proteins were used to calculate the overall nutrient composition of the food formulation. The k-nearest neighbours algorithm was used to identify the most closely matching ingredient mix for beef comprising alternative and more sustainable (plant-based) ingredients. By this approach, 153 different combinations (formulas) were identified, and four dominant ingredients were also identified from the results based on the fulfilment of the essential amino acid profile. The preliminary results indicate the algorithm is a viable approach to identifying the initial ingredient combinations required for formulating novel and sustainable protein-based recipes as substitutes for existing animal protein-based recipes. Furthermore, it would be useful to identify the potential for using neglected and underutilised crops to produce value-added products in the sustainable protein industry for healthy diet formulations.

About the Conference

ONE – Health, Environment, Society – Conference
Brussels, Belgium
21-24 June 2022

Our Scholars

Mr. Chathudina Janitha Liyanage
Senior Lecturer
janitha@appsc.sab.ac.lk



Dr. Rasangani Sabaragamuwa
Senior Lecturer
rasangi@appsc.sab.ac.lk



PROMOTION OF GEO-TOURISM IN IRON SMELTING SITES OF SAMANALAWEWA, BALANGODA, SRI LANKA

Dhulmy S Bandara, Greesha U Malkekuli, Ravi Madushan, Sachinka M Dissanayake, Lalendra V Ranaweera, Nuwan S Wanniarachchi, E.P.N. Udayakumara

ABSTRACT

In the tourism sector of Sri Lanka, terms such as geo conservation, geo-diversity, and geo-tourism are novel. Implementation of the required strategies to promote the geo endowment of Sri Lanka has the potential to enhance international recognition. This study was carried out along with a proposal for the implementation of the geo-tourism site focusing on the wind-powered iron smelting sites in Samanalawewa, Balangoda, Sri Lanka. The uniqueness, distinct culture, natural splendor, and the well-known hospitality of this area makes it an ideal tourist destination. Many tourists are attracted to the area mainly due to the ecotourism or the natural splendor of the entire Belihuloya region. The awareness among both local and foreign communities on the specific geological site is poor thus gaining less attention from the visitors to the area. Similarly, the information gathered during the field excursions shows that there is a high potential to initiate the industry and bring back the global recognition that existed earlier. The remnants of the iron smelted sites are found even today. The sites have been even scientifically investigated with the intervention of foreign scientists for the uniqueness of the techniques used. The industry is believed to have prevailed with the interconnection of geomorphology, community and the technological aspects. It has proven the use of unique geomorphology of the area to acquire the perfect wind direction to power the furnaces. The significance of the industry was found to be remarkable since well-known Damascus steel has been exported from Sri Lanka. This steel is recognized as a special type due to the properties given to the tools or weapons made. Till today the story behind the wind-powered iron smelting in the Samanalawewa area and the evidence that persisted are bound to the community of the area and not revealed outside. Most of the areas are defunct today and the villagers have dropped their interest in the field. Thus, the conveyance of the awareness to the people out and emphasizing the importance is identified as a key requirement with the prevailing invaluable geological assets. With a view to achieving this objective, an investigation was done and a management plan is proposed consisting of the collection of information from documented records, preparation of the maps, field visits to a selected site of interest, preparation of the management plan and the designing of sightseeing guide.

About the Conference

Oxford Geoheritage Virtual Conference
United Kingdom (6-9 June 2022)
<https://youtu.be/7BTNpoSSDlc>

Dr. Nuwan S Wanniarachchi
Senior Lecturer
nuwan@appsc.sab.ac.lk



Our Scholars

Dr. Lalendra V Ranaweera
Senior Lecturer
laliwr@appsc.sab.ac.lk



Prof. EPN Udayakumara
Professor
udayaepn@appsc.sab.ac.lk



GEODIVERSITY ELEMENTS OF WAULPANE CAVE, SRI LANKA

Dadayakkarage N S Wanniarachchi

ABSTRACT

The 90% of Sri Lanka is underlined by metamorphic rocks. Different types of rock in Sri Lanka make her rich in Geodiversity. Two of such rocks are marble with coarse grains, dolomite along with calcite, and calc-silicate gneisses. The literature shows the time of formation of these rocks is older than 550 Ma (Proterozoic). Even though the rocks are as earlier as Proterozoic in genesis, the weathering is believed to be after the Pleistocene ice age. The secondary formation of caves after weathering effect of marble and calc- silicate gneisses have left the remarkable karst geodiversity at Waulpane cave. The Waulpane cave is one of the most attractive places for local and foreign tourists. It is an isolated cavern situated at the Waulpane Village in Ratnapura District, Sri Lanka. The elements of geodiversity of this cave are formation processes, rock types, karst elements, and intrinsic beauty. The cave basement is Precambrian metamorphic gneisses. Therefore, the process of formation of the cavern can be identified as a mixture of fluvial weathering and Karst solution. The original rock has been completely redeposited by the karst formation. This secondary formation has created several remarkable karst landforms such as caverns, swallow holes/ shafts, springs, an underground waterfall, karst windows, cave travertines, and several erosion remnants. The inside of the cave is obviously very dark and filled with bats and cockroaches. The outside of the cave is also darker even in broad daylight may be due to the surrounding thick vegetation and its unique formation. Geodiversity and intrinsic beauty have given the Waulpane cave a unique place in geotourism in Sri Lanka even though the term is novel. Villagers are the current guardians of this cave and they would guide tourists to the cave with their experience. Waulpane cave is not only a tourist place but also a natural laboratory for students and researchers who study Earth Science.

About the Conference

Oxford Geoheritage Virtual Conference

United Kingdom

6-9 June 2022

Our Scholar

Dr. Nuwan S Wanniarachchi

Senior Lecturer

nuwan@appsc.sab.ac.lk

