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>Advances in Solar
>Thermal Food Processing

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Conference Proceedings

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CIFP SOMESO, A CORUÑA, SPAIN

INSTITUTE OF ENGINEERING; UNIVERSITY OF ALGARVE
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CONSOLFOOD2023

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Certificate

This is to certify that Margarita Castillo Téllez participated in the **CONSOLFOOD2023 -** International Conference Advances in Solar Thermal Food Processing on 12th, 13th and 14th July 2023. The accepted work of authors ***Margarita Castillo Téllez, Beatriz Castillo Téllez, Alfredo Domínguez Niño, Gerardo Mejía Pérez, Juan E. Andrade Durán*** with title: ***Design and construction of a solar dryer with hybridization of solar technologies for drying fish*** was presented as lecture***.***

Faro, 17th July 2023

Celestino Rodrigues Ruivo
Chairman of CONSOLFOOD2023
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1-Introduction

Authors were invited to submit abstracts for consideration by the *Organizing Committee*. For each accepted abstract, the authors were invited to submit a full paper and a presentation file with audio recorded to be presented in CONSOLFOOD2023.
This document contains all of the *accepted* abstracts and full-length papers submitted for inclusion in CONSOLFOOD2023. It may be updated from time to time if papers are revised, or further full-length papers arising from submitted abstracts are received.
All of the submissions have been scrutinised by one or more members of the *Organizing and Scientific Committee*, but they have not necessarily been revised to accommodate suggestions made by the reviewers. Therefore, they should not necessarily be regarded as having been subjected to strict peer-review.

2-Getting further information

Authors may be contacted via the email address that appears under the title of each abstract or full-length paper. Where several email addresses appear, it is the convention that the name of the corresponding author bears an asterisk (*). If one name has an asterisk, please only contact that author.

3-Searching this document

All full papers and abstracts are listed in according to the programme of the conference sessions.

4-Copyright

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Luther Krueger, Big Blue Sun Museum of Solar Cooking, Minneapolis, USA

Michael Bonke – LAZOLA Initiative for Spreading Solar Cooking, Germany

Octavio García Valladares, Instituto de Energias Renovables, Universidad Nacional Autónoma de México, México

Xabier Apaolaza Pagoaga, University of Málaga, Spain

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CFD modeling and the performance evaluation of a mixed-mode forced convection solar tunnel dryer for curry and coriander leaves	Bhanudas B.Takale, Ranjit S. Patil	India
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DESIGN AND CONSTRUCTION OF A SOLAR DRYER WITH HYBRIDIZATION OF SOLAR TECHNOLOGIES FOR DRYING FISH

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Abstract: Food drying requires high energy consumption due to the latent heat of phase change required to evaporate the water contained in the products and the low efficiency of current industrial dryers. Mexico has a significant solar resource, making developing solar dryers for dehydrating food products attractive, which would benefit the industrial sector. The design and construction of a solar dryer for drying fish are presented, which can dry between 30 kg and 40 kg of product. The dryer work with three solar energy technologies: a bank of solar collectors for water heating, a bank of solar collectors for air heating, and a bank of photovoltaic solar panels so that the dryer can operate continuously during hours of insolation and up to 6 hours of operation without solar radiation or in periods nocturnal. Once the solar dryer for fishery products was built and assembled, with all its components and auxiliary systems, an experimental evaluation was carried out to evaluate the dryer's operation. The experimental tests were carried out in the Solar Food Drying Laboratory of the Faculty of Engineering of the Universidad Autónoma de Campeche, in Campeche, Campeche, Mexico, located at the geographic coordinates 18°50′11″N 90°24′12″W. When operating the solar dryer with the solar thermal water heating system with storage, average temperatures inside the drying chamber were 52°C, 57°C, and 64°C. When operating the solar dryer with the solar air heating system, the average temperatures obtained inside the drying chamber from 54.2 °C to 61.5 °C, in both cases with an average air velocity of 2.4 m/s to 10 m/s, which is acceptable since for the drying of fishery products average temperatures of 55 °C are required with average flow rates of 2.5 m/s inside the dryer. With the results obtained, it can be deduced that the tunnel-type solar dryer for 40 kg of fish products meets the necessary parameters for the drying process.

Keywords: Tunnel-type solar dryer, Hybridization of technologies, Solar irradiation, Thermal storage, Heat exchanger.