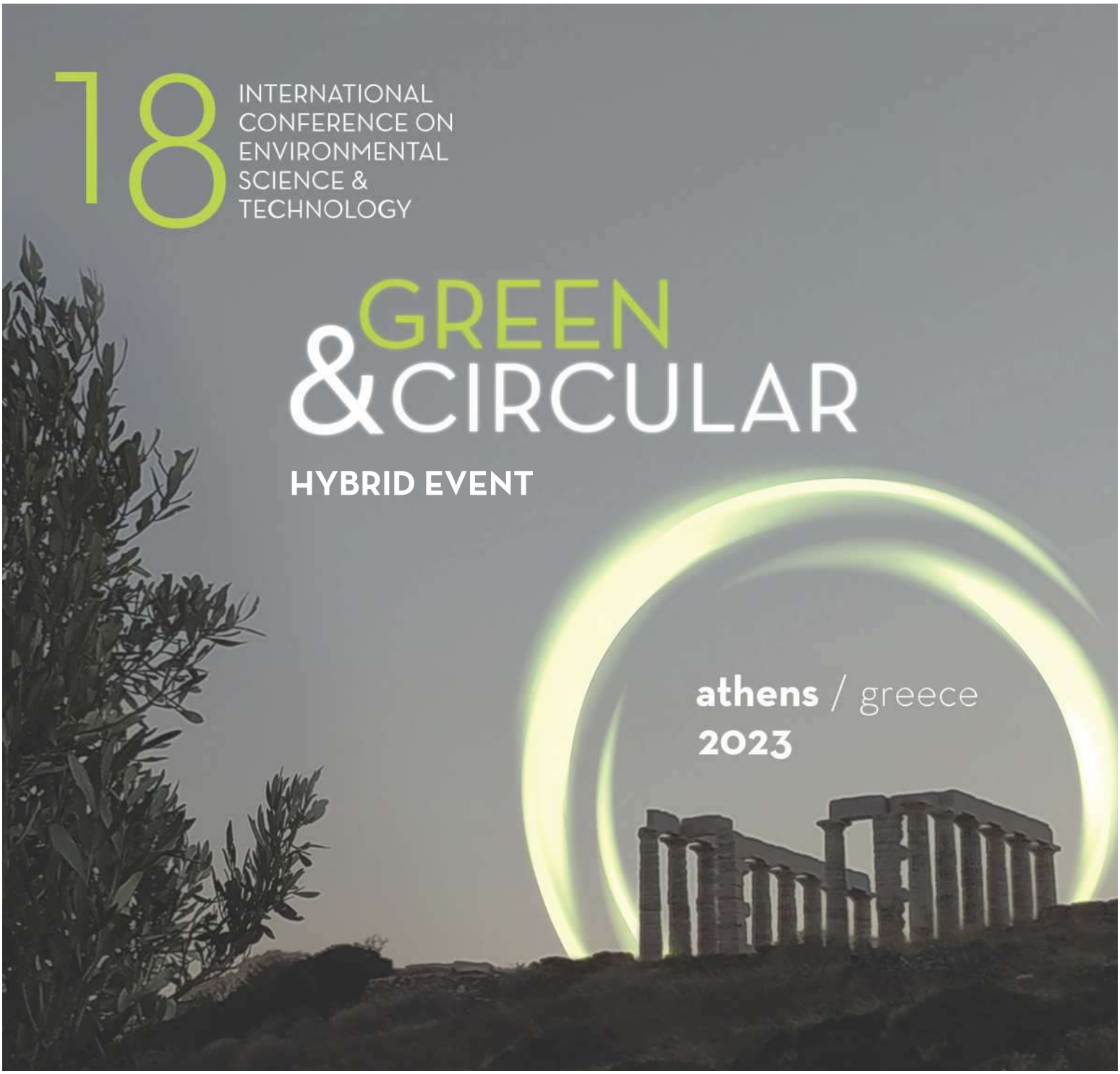

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Prince Sultan Bin Abdulaziz International Prize for Water

Recognizing Innovation

Winners for the 10th Award (2022)

Creativity Prize

1) The team led by Thalappil Pradeep (Indian Institute of Technology, Madras, India)
for the creation and successful deployment of environmentally friendly "water positive" nanoscale materials for the affordable, sustainable and rapid removal of arsenic from drinking water. Team members include Avula Anil Kumar, Chennu Sudhakar, Sritama Mukherjee, Anshup, and Mohan Udhaya Sankar.


Dr. Thalappil Pradeep

2) The team led by Dionysios D. Dionysiou (University of Cincinnati, USA)
for the development of innovative advanced oxidation technologies and nanotechnologies for environmental applications, particularly in the removal and monitoring of emerging contaminants. Team members include Wael H.M. Abdelraheem, Abdulaziz Al-Anazi, Jiong Gao, Ying Huang, and Vasileia Vogiazi.


Dr. Dionysios D. Dionysiou

Surface Water Prize

Dennis D. Baldocchi (University of California Berkeley, USA)
for the development and implementation of effective models to understand, evaluate and predict evapotranspiration and water-use efficiency in various environments under climate change conditions.


Dr. Dennis D. Baldocchi

Groundwater Prize

Linda M. Abriola (Brown University, USA)
for pioneering research on toxic Dense Non-Aqueous Phase Liquids (DNAPLs) in groundwater, ranging from the simulation of their fate to effective methods for cleaning contaminated sites.


Dr. Linda M. Abriola

Alternative Water Resources Prize

The team of Menachem Elimelech (Yale University, USA) and Chinedum Osuji (University of Pennsylvania, USA)
for wide-ranging advances in nanostructured materials for next-generation water purification, focusing on implementation issues like manufacturing, sustainability, self-assembly, and biofouling.


Dr. Menachem Elimelech


Dr. Chinedum Osuji

Water Management and Protection Prize

The team led by Matthew McCabe (KAUST, Thuwal, Saudi Arabia)
for employing CubeSat constellations in the sustainable management and security of linked water-food systems, along with estimates of agricultural water use at unprecedented spatial and temporal resolutions and with global coverage. Team members include Bruno Aragon (KAUST) and Rasmus Houborg (Planet Labs, USA).


Dr. Matthew McCabe

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Drought stress effect on crop development and chemical composition of field grown Scolymus hispanicus L. plants

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ABSTRACT

Lavender, (Lavandula angustifolia Mill.; Lamiaceae) is a native species of the Mediterranean basin and has a wide range of medicinal uses and biological functions. The aqueous extracts, essential oils, and herbal formulations have long been utilized in traditional medicine, hygiene products, and cosmetics. The present study evaluated the effect of four different biostimulant products (Tr1: vegetable proteins + amino acids + 5% carboxylic acids; Tr2: vegetable proteins + amino acids + seaweed extracts; Tr3: 0,3% Stabilized Orthosilicic Acid; Tr4: 35% CaO and 35% SiO2 + Calcium Mobilization and Translocation Factor + 1% Mo, 15% Bo and 30% Zn; and the control treatment (Tr5: no biostimulants added) on field grown Lavandula angustifolia plants under three irrigation levels (I1: 164 , I2: 219 and I3: 274 mm). Lavender seedlings were transplanted in the field on April 2022, at the experimental farm of University of Thessaly, in Velestino, Greece. Each experimental plot included 15 plants and was replicated three times (n=3; 45 plants per treatment). Harvest took place on September 2022 by removing the antennas from each plant. All the antennas from the same plot were pooled in a batch sample for the quantification of essential oil yield with a Clevenger apparatus after air-drying at 42 °C. Our findings demonstrated that a decrease to the water supply (irrigation + precipitation) up to 16% and 31% resulted in a decrease of the fresh weight by 32% and 72%, respectively. Specifically, the fresh weight decreased from 1220 to 832 and to 338 kg ha-1 in the case of I3 to I2 and I1, respectively. Furthermore, irrigation has a considerable detrimental impact on the content of essential oils. Particularly, the highest irrigation dose (I3) resulted in a decrease in essential oil concentration compared to I1 treatment (from 1.86% to 0.99%). Additionally, a statistically significant difference amongst the tested biostimulants was discovered, with Tr4 emerging as the biostimulant with the higher essential oil yield (1.67%). In conclusion, our results indicate that deficit irrigation combined with biostimulants application is a sustainable tool that can ensure fresh biomass yield and high essential oil yield in lavender plants.

KEYWORDS: Golden thistle; deficit irrigation; drought stress; nutritional value; wild edible species

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