PROMOTION OF BIOWASTE REDUCTION ACTIONS, SENT TO LANDFILL, THROUGH COMPOSTING, AT ISEL-ECO-CAMPUS

INTERNATIONAL CONFERENCE OF FEE ECOCAMPUS

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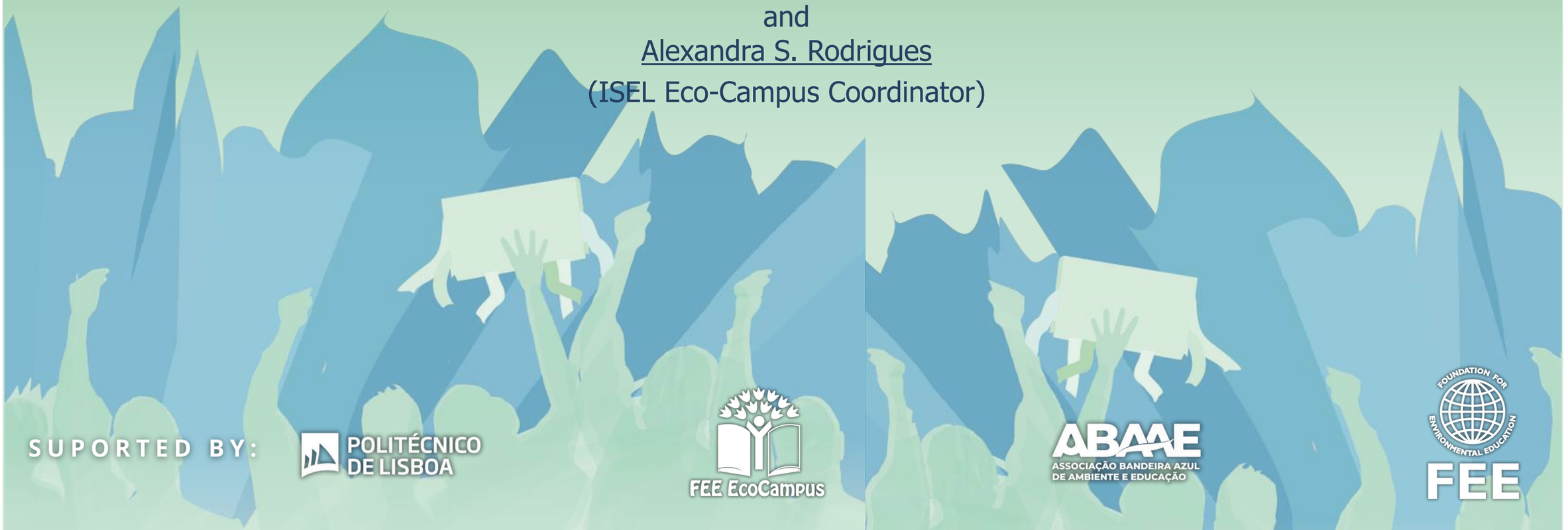

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From Eco-School to Eco-Campus

ISEL, is an Eco-school since 2020 and has been promoting a series of initiatives that aim to raise awareness about environmental impacts, circular economy, and climate change.

ISEL was distinguished in October 2022 with the Eco-Campus award, being part of the first 10 higher education institutions, in Portugal, distinguished with this award.

ISEL eco campus

From Eco-School to Eco-Campus

The program allows us to understand the challenges that need to be overcome and some paths to follow.

What about Waste Production?

Combating Climate change requires a change in the behaviour of all of us, as society.

It is essential to promote and disseminate the 5R's policy: Rethink, Refuse, Reduce, Reuse, Recycle.

The excessive consumption and disposal of materials, associated with a huge extraction of resources, have a negative impact on nature, and leads to the production of a large amount of municipal solid waste, sent to landfill or incineration, increasing even more the environmental impact.

Biowaste Production

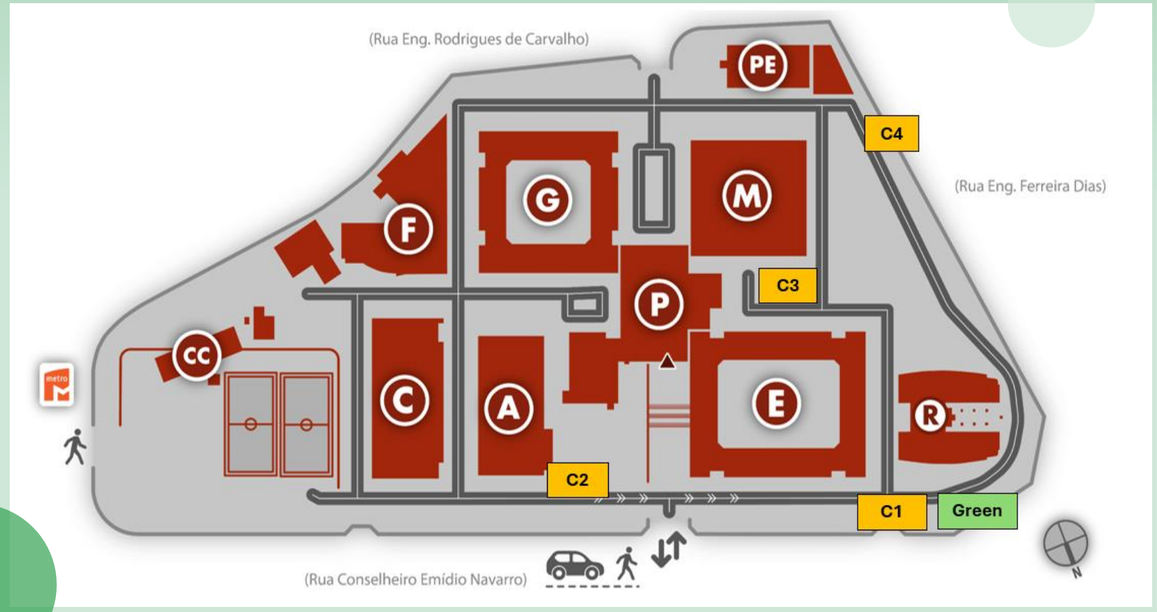
Despite the attempts to reduce the production of municipal solid wastes (MSW), waste has increased in European Union over the last fifteen years, from 500 kg per capita in 2004 to 513 kg per capita in 2022.

In Portugal, the MSW production varies from 445 kg to 513 kg per capita, in 2004 and 2022, respectively (Eurostat, 2024).

In Portugal, the fraction of biowaste in MSW represents about 39% (2022).

From Eco-School to Eco-Campus

To reduce the biowaste sent to landfill, the school joined the Lisbon Composting Program, promoted by the municipality, having installed 8 domestic composters in 4 different Campus spots, and built a composter for garden waste.



Composters Installation

The set of composters has been used to deposit some biowaste resulting from food consumed on campus, as well as to deposit garden waste, such as leaves, branches, and grass.

The compost produced is subsequently distributed in several green areas to promote soil regeneration and nourish the plants in the institution's gardens, contributing to improve biodiversity and promote circular economy.

Awareness campaigns and introduction in curricula

Since 2021, ISEL has developed several awareness campaigns about recycling waste and biowaste and the composting process was promoted in Campus.

The installed composters, in addition to serving to raise awareness among the community and to support initiatives of the ISEL-Eco-Campus Program, have also been used in master's classes in Environmental Engineering, with several theses being carried out on this topic, using, and studying the matter collected in the composters.

Composting process evaluation

For the composting tests, samples of the composter’s contents were collected 1 to 2 times a week, to measure the pH, temperature, total, fixed, and volatile solids.

To measure the temperature inside the composters, five points were selected, four points along the sides and a central point. The temperature in the three composters and ambient temperature were measured for 160 days.

Composting process evaluation

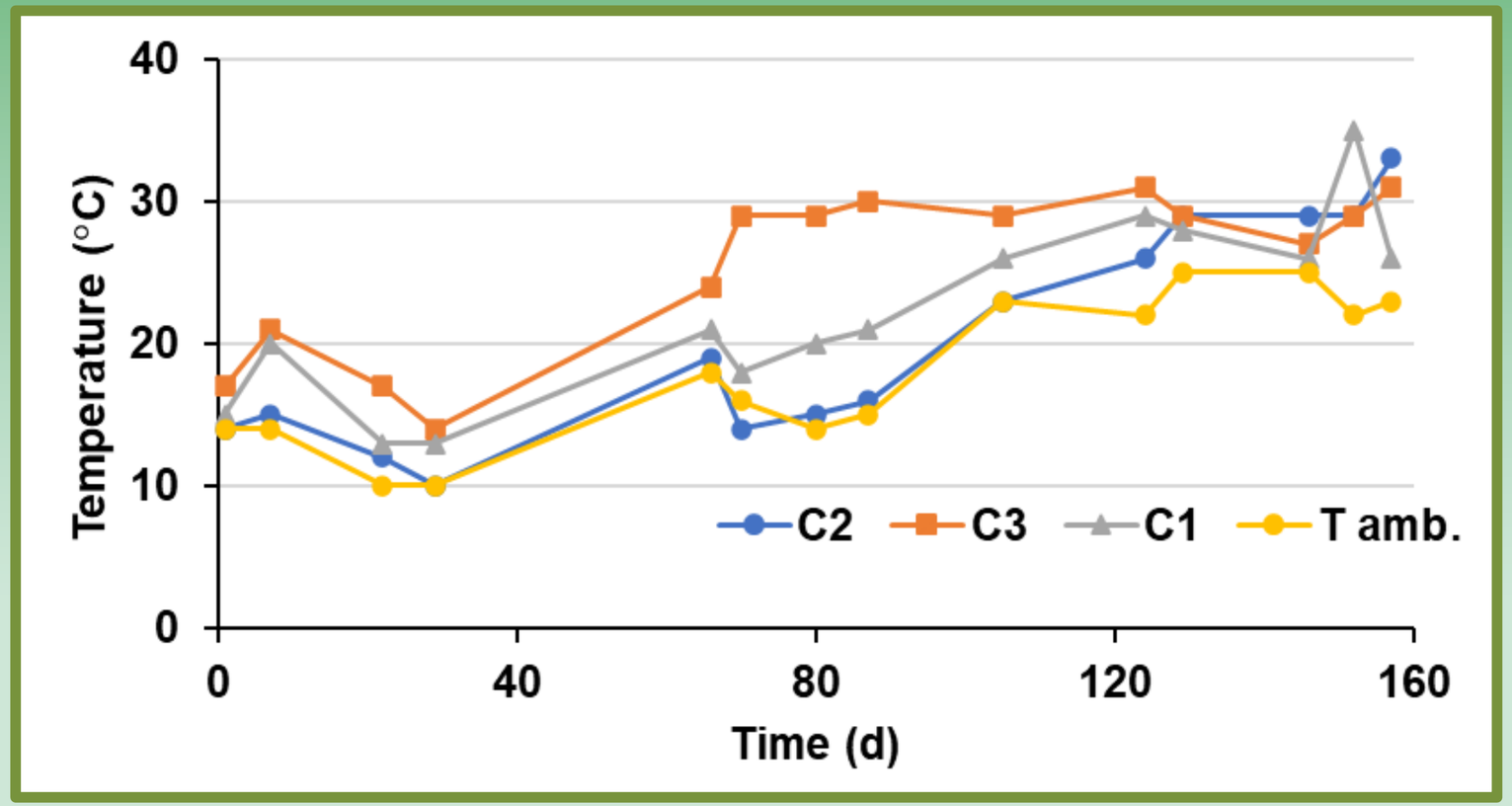


Figure 1 - temperature profiles in composting tests

Temperature measured at the composters central point

C1 - students' residence, C2 - students bar, C3 - school canteen

Composter C3 presented higher temperatures, probably due to the greater amount of residue deposited, consequently a greater amount of organic matter was available for biodegradation reactions.

None of the composters reached the temperature characteristic of the thermophilic phase (55ºC) of the composting process.

Composting process evaluation

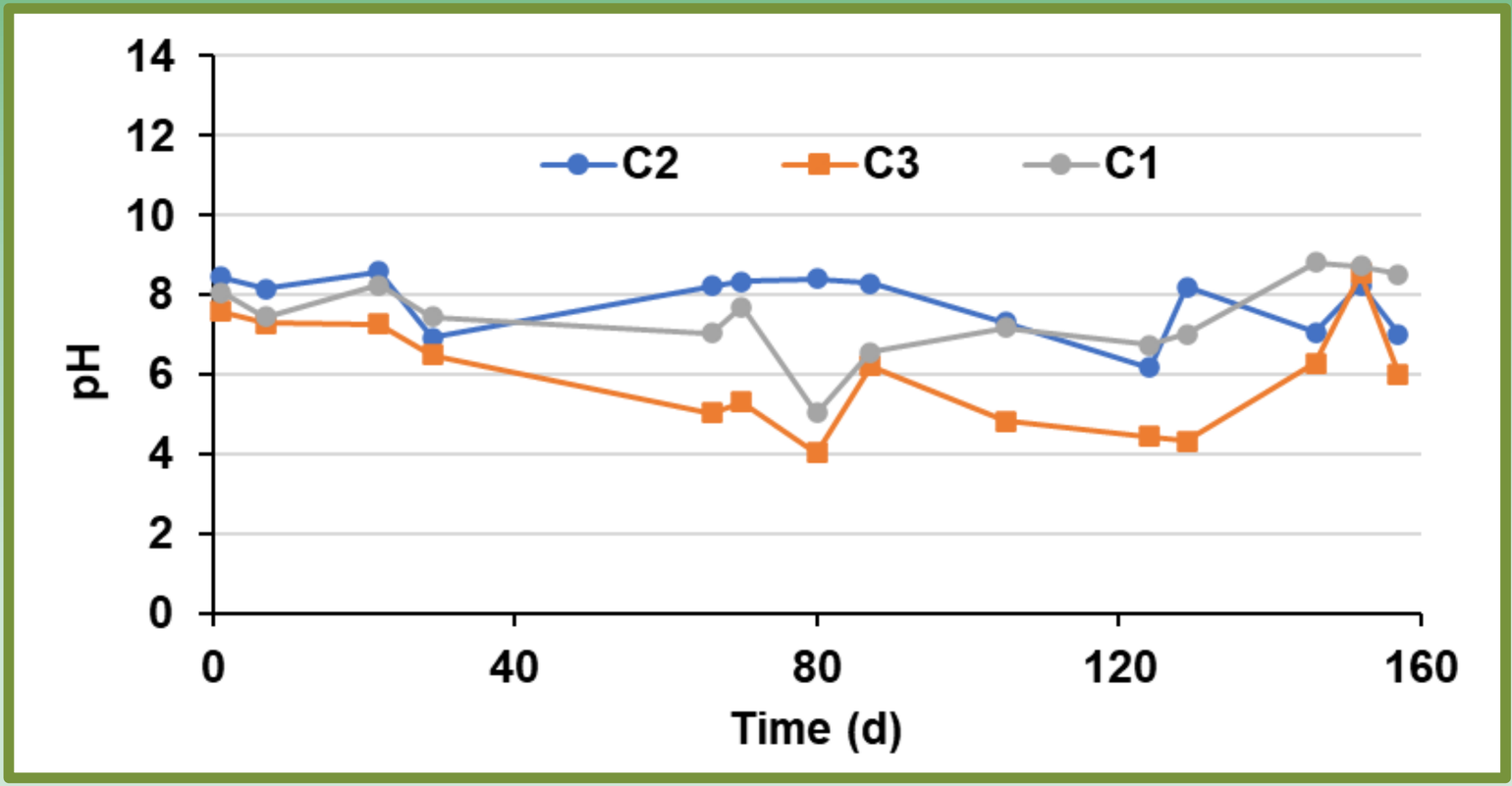


Figure 2 - pH profiles in composting tests

pH measured at the composters pile, using the quartile method

C1 - students' residence, C2 - students bar, C3 - school canteen

The C3 composter has the lowest pH profile, which is in accordance with the temperature profile and the highest amount of organic matter.

All composter presented a pH between 4 and 9, which is the usually range for composting process.

Composting in the Campus - evaluation

Strengths

The results revealed that is possible to carry out domestic composting involving students, professors and staff.

It was possible to produce compost to use in the Campus.

Promotion of circular economy.

Opportunities

Involve more students and use the School as a living lab.

Composting in the Campus - evaluation

Weaknesses

The success it’s highly dependent on participants procedure, and it is a relatively slow process.

The food waste presents several contaminates, so it is necessary to carry out frequent awareness campaigns to reach as many people as possible.

Threats

Lack of students to participate in the project and it ends.

Contribution to the Sustainable Development Goals

The work under development intends to contribute to the 17 Sustainable Development Goals (SDGs), namely:

- to improve scholar population's education about sustainable development (SDG 4);
- to enhance waste management and reduce the environmental impact of cities (SDG11);
- to promote responsible consumption and production, an efficient use of natural resources and reduce waste generation (SDG 12);
- to promote climate action (SDG 13).

Acknowledgement

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THANK YOU

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