

SERBIA

Gymnasium Paraćin

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# CLIMATE BOX

## 3rd International Schoolchildren's Festival

### MOZARIUM (MOSSARIUM)

### MOSES -THE GREEN CARBON DIOXIDE SINK

#### Introduction

The importance of the project, its goals, and the problems it addresses in today's world, faced with air pollution, clearly indicates, that we must look for solutions to environmental problems. The rise in air temperature, the greenhouse effect, and increasingly unpredictable weather indicate that the climate is rapidly changing. This project shows that plants can be the solution.

The small, closed ecosystem called the “Mozarium” demonstrates how plants improve air quality by absorbing carbon dioxide, producing oxygen and thereby helping reduce the carbon footprint.

The goal of this project is to show how important plants are and how increasing green areas and photosynthesis can help in the fight for a more stable climate and a cleaner environment. Growing plants outdoors but also in closed spaces would show responsibility towards nature and the protection of human health.

#### The problems to be overcome are:

- high concentrations of emitted gases that pollute the air in urban areas;
- lack of greenery that would mitigate the effects of pollution;
- unavailability, complexity and high price of air purifiers.

“Mozarium”, a closed biosphere, is an easy, simple and practical way to actively participate in the preservation of our planet.

#### General key parts, methods, results and conclusions

“Mozarium” is a decorative glass container for growing moss - a moss garden.

To create the “Mozarium” and measure its environmental impact, the following materials are needed:

a glass container, gravel, soil, moss, and aloe vera, IQAirVisual Pro device and thermometer.

After placing some pebbles, soil, and moss in a glass container, we obtain a small decorative air purifier. The measurement can begin!



#### We wanted to check:

- 1) how this small, closed biosphere affects the environment during the day and
- 2) whether it can reduce the concentration of carbon dioxide in the room.

#### Results

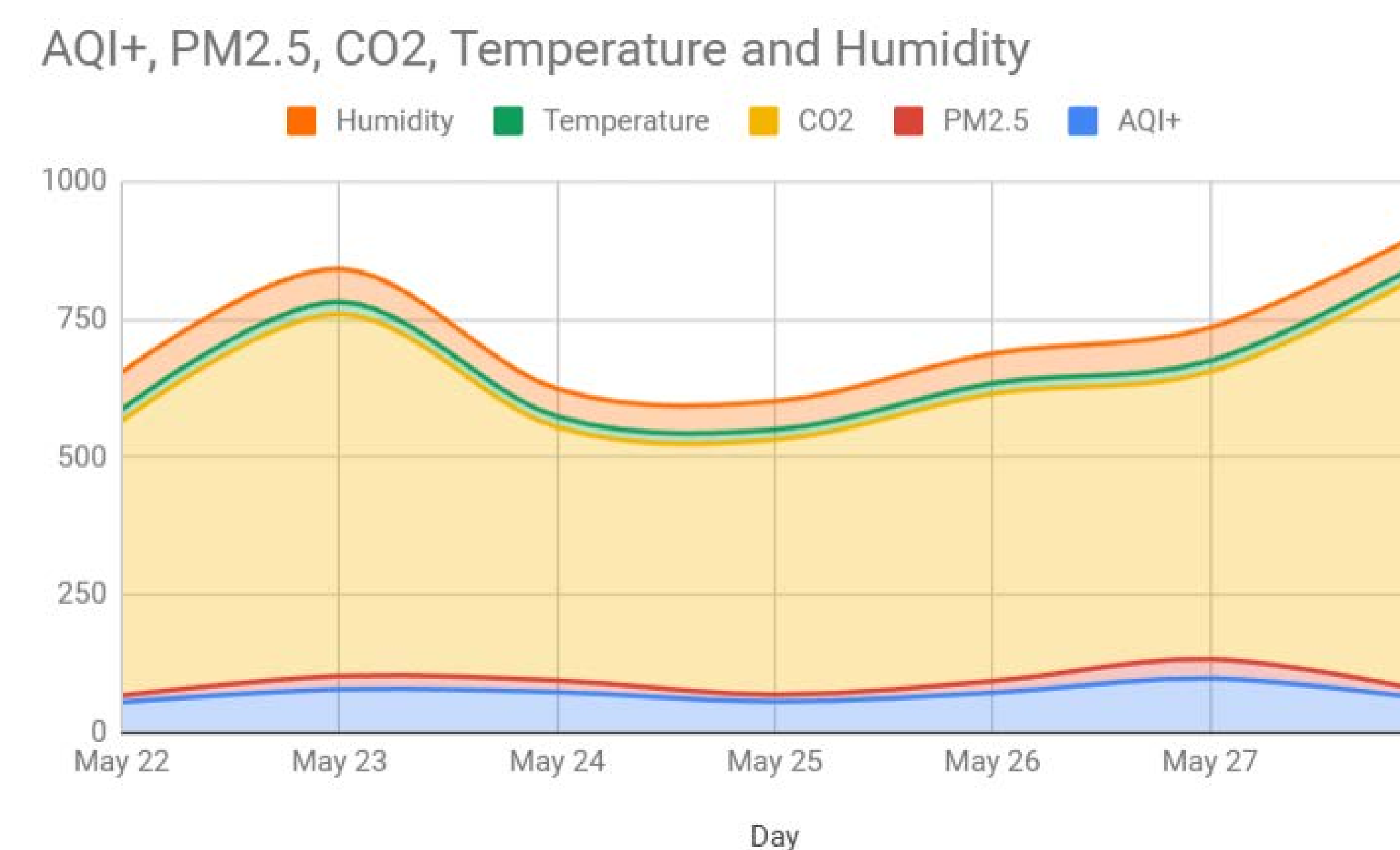
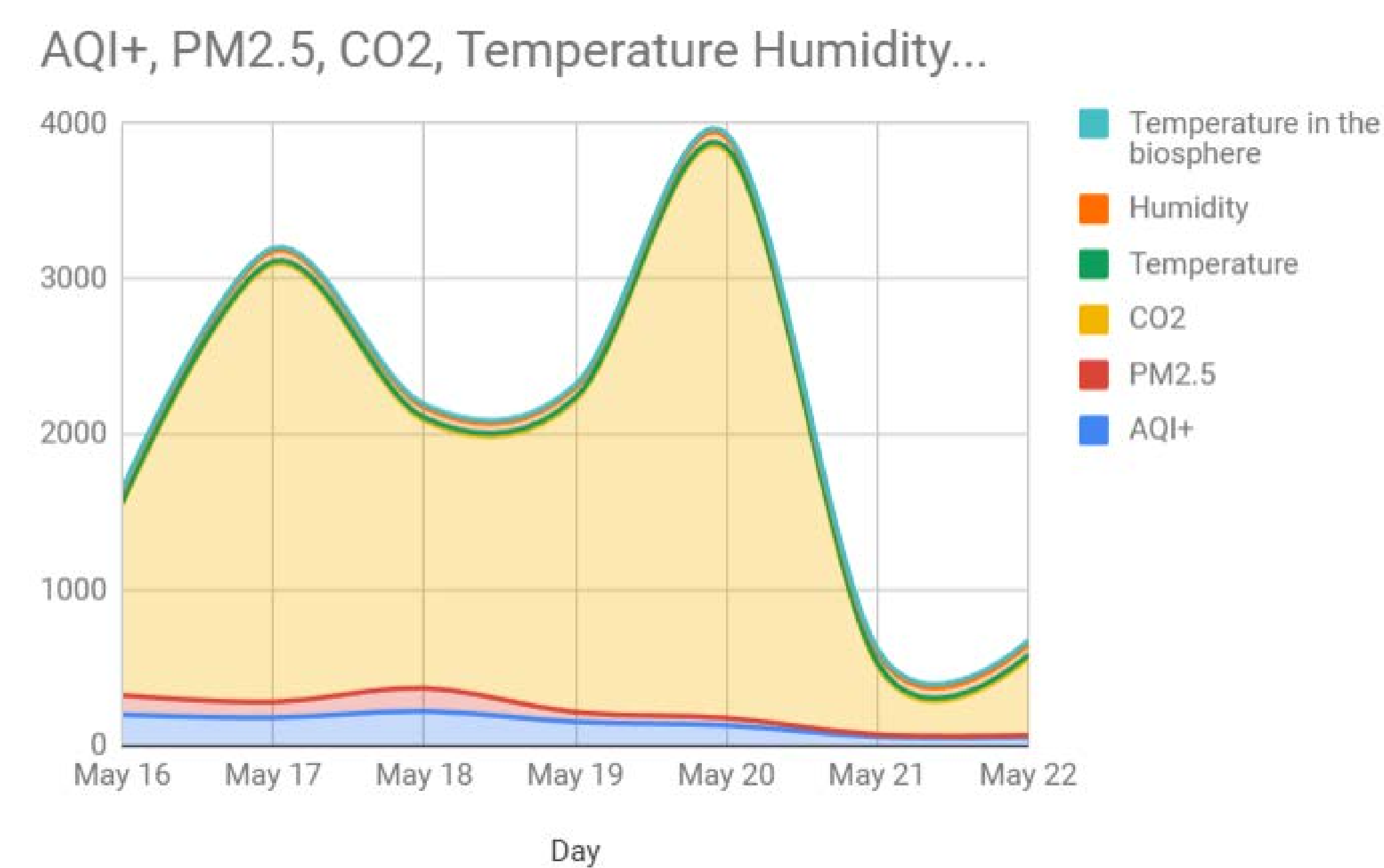
Measurements were taken using the IQAirVisual Pro device for CO<sub>2</sub>, AQI+, and PM2.5 parameters under two conditions: (a) when the “Mozarium” was closed and (b) when it was open.

The data show a significant drop in the concentration of CO<sub>2</sub> in the gas inside the container:

(a) in the closed Mozarium the concentration didn't fall below 1200 ppm;

(b) in the open “Mozarium”, the concentration dropped significantly, below 800 ppm.

AQI+ pollution levels decreased, and the concentration of PM2.5 particles was significantly lower



#### Data from measuring air parameter values when the Mossarium closed

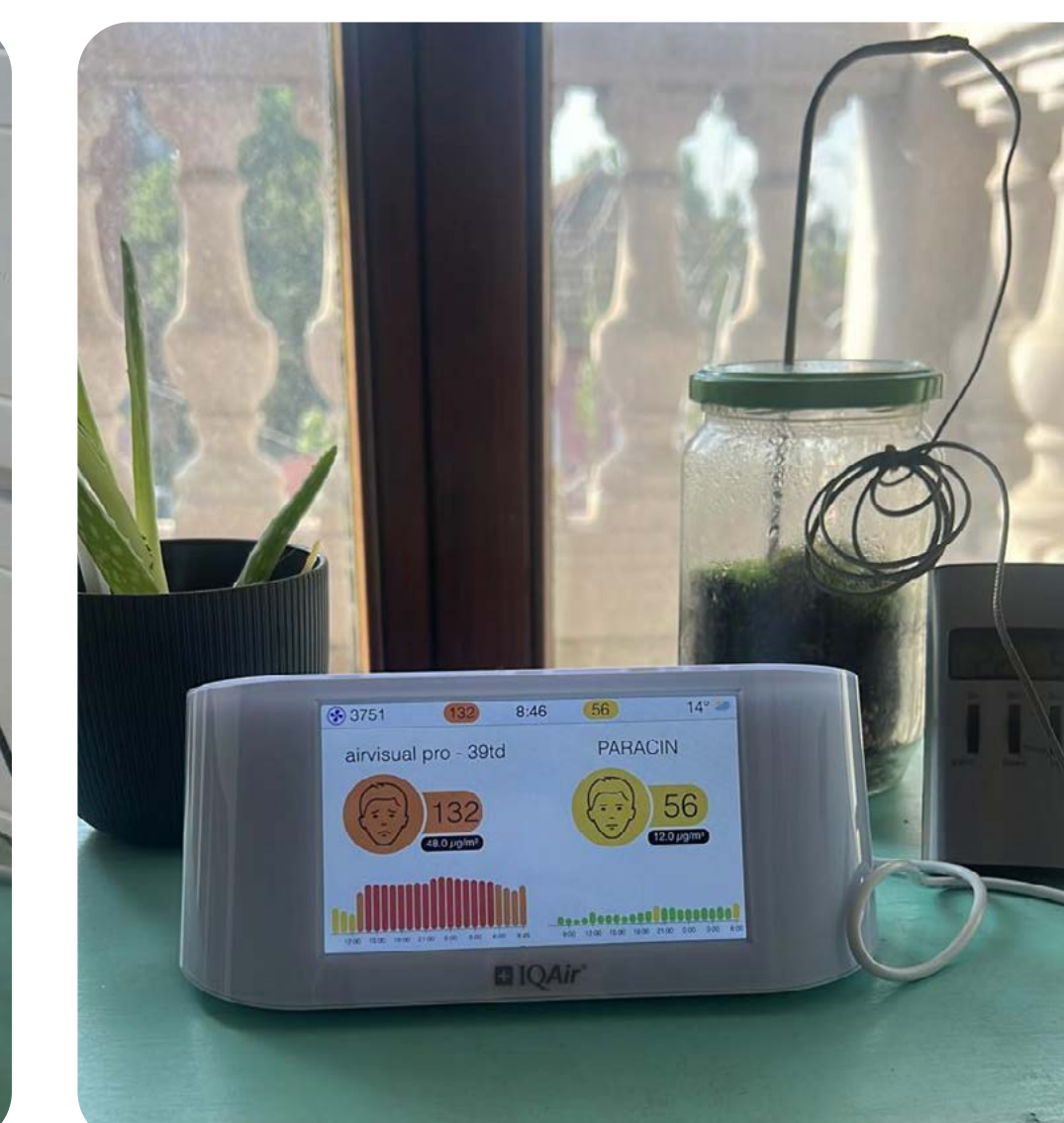
Day	AQI+	PM2.5	CO <sub>2</sub>	Temperature	Humidity	Temperature in the Mossarium
16.5	200 US	125 µg/m³	1227 ppm	19.5°C	59%	20°C
17.5	182 US	100 µg/m³	2813 ppm	19°C	67%	19°C
18.5	223 US	148 µg/m³	1720 ppm	19.8°C	64%	20°C
19.5	155 US	61.6 µg/m³	2002 ppm	19.7°C	62.9%	19°C
20.5	132 US	48 µg/m³	3647 ppm	20.4°C	66%	22°C
21.5	59 US	13.5 µg/m³	443 ppm	19.8°C	65.1%	23°C
22.5	56 US	11.9 µg/m³	498 ppm	20.8°C	67.1%	24°C

#### Data from measuring air parameter values after opening the Mossarium

Day	AQI+	PM2.5	CO <sub>2</sub>	Temperature	Humidity
22.5	56 US	11.9 µg/m³	498 ppm	20.8°C	67.1%
23.5	79 US	24.3 µg/m³	656 ppm	22°C	60%
24.5	74 US	21.2 µg/m³	459 ppm	19.5°C	50.1%
25.5	57 US	12.5 µg/m³	462 ppm	18.3°C	51.6%
26.5	73 US	21.1 µg/m³	521 ppm	18.7°C	53.9%
27.5	99 US	34.6 µg/m³	521 ppm	20°C	60.1%
28.5	61 US	14.6 µg/m³	761 ppm	21.3°C	54.3%

#### Conclusion

The total area covered by moss on Earth, equal to the area of China, removes 6.43 billion tons of CO<sub>2</sub> annually. “Mozarium” has a similar effect and can be an effective way to reduce carbon dioxide concentrations in the spaces where we live and work. It is practical, it is easy to make, anyone can form it according to their taste, they can find the materials in their surroundings.



**Another advantage:** mosses can survive in extreme conditions; they are resistant to a large number of plant diseases and pathogens. We are witnessing the development of a new moss biotechnology: companies in Europe have noticed the advantage of moss in the fight against climate change and pollution and are proposing it for wider application. In their products, moss filters up to 82% of dust particles thanks to electrostatic binding (moss is negatively charged, while dust is positively charged). Half of the dust particles are converted into biomass by moss, a quarter is broken down by bacteria, and the rest is stored in the sediment.

Everyone could do their part by creating a small ecosystem in their home and thus reducing their ecological footprint. It may be small, but even the smallest actions can help solve this global problem.

#### Key findings

“Mozarium” represents a practical contribution as a concrete, small ecosystem that participates in the reduction of carbon dioxide concentration and contributes to the reduction of the carbon footprint; consists of a glass container, pebbles, soil and moss; everyone can make it according to their taste, it is simple, suitable for any place because mosses tolerate bad conditions and are resistant to a large number of plant diseases and pathogens.

#### A call to action

Build your own “Mozarium”, a green carbon sink! Create a green corner in your room. Let clean air snuggle into the soft moss!

#### Partnership:

- Local self-government,
- Local media in Paraćin and the surrounding area