Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 03, Issue: 06 (NOV-DEC, 2023)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Liquid Tree: The Future for Cleaner Air

(*Mayuri.D.Meghale[1], Yuvraj D. Gavali[2] and Shinde Shweta[2])
[1]B.Sc. Agri. Student, College of Agriculture, Bhanashiware
[2]Assistant Professor of Agronomy, College of Agriculture, Bhanashiware
*Corresponding Author's email: meghalemayuri@gmail.com

Imagine an aquarium with microalgae in it except that it is not really a tank, but it will act as a tree. No, this is not a still from a sci-fi movie! It is exactly how anyone who sees a liquid tree for the first time would describe it.

What is a Liquid Tree?

Liquid tree nicknamed LIQUID 3 is an urban photobioreactor. A photobioreactor is a fermenter tank for growing microorganisms that use light energy for photosynthesis. This tank contains microalgae that are set afloat in 600 litres of water. Through photosynthesis, these microalgae consume CO_2 from their surroundings and process it to release pure oxygen. The device has a built-in lightning system powered by solar panels installed on the tanks, capturing light, and converting it to electricity. This, results in an eerie green glow inside the bioreactor, allowing the microalgae to carry out photosynthesis non-stop all year round, even during winter when sunlight is scarce. The CO_2 is provided to the microalgae by means of a pump that captures polluted air and spurges it through the water to nourish the algae.

This system is equivalent to two 10-year-old trees or 200 square meters of grass. The advantage of microalgae compared to trees is that they are about 10-50 times more efficient than trees. The Bioreactors can be built and installed in a very short time and can start treating polluted air immediately.

More Glean from the Goop

Aside from its ultra-modern and cyberpunk aesthetic, the LIQUID 3 is a versatile device that doubles as a mobile charger and a bench that lights up at night, thanks to its solar panels. The microalgae employed in this project are indigenous species found in freshwater ponds or bodies of water. They can thrive in tap water and can withstand temperature extremes. The tank requires no upkeep; every month and a half, the algal biomass may be used as fertilizer for plants and the entire volume of water restocked with the required minerals added.

How Did the Liquid 3 Come into Being?

Everything began in 2020, when Serbia was ranked as the nation with the greatest rate of pollution-related fatalities across Europe. Since most of the Serbian population resides in urban areas, there was less room to establish green spaces or grow trees. The notion of a liquid tree was then put forth by Dr. Ivan Spasojevic, who was joined by a phycologist and an engineer in this intervention. It was put in place in Serbia's bustling Makedonska Street in Belgrade. The UNDP, the Ministry of Environmental Protection, and the Climate Smart Urban Development initiative recognised LIQUID 3 as one of the 11 most inventive and climate-smart solutions for its imaginative, useful, and unique design.

Tree Divides the Internet

This seemingly metropolitan solution has caused a schism on the internet. There is some rumbling that liquid trees are not the solution to the real problems caused by large-scale deforestation, nor does it reduce erosion or enrich the soil. However, much of this wrath is misplaced as Liquid tree designers say that it was not made as a replacement for trees but was designed to work in areas where growing trees would be non-viable. Initiatives like Trillion Trees are laudable, but there is something to be said for the true utility of this tiny bioreactor. The fact that they can capture useful amounts of carbon dioxide from day one is another benefit for them. Such bioreactors are expected to become widespread in urban areas around the world as the planet battles rising carbon levels in the atmosphere. Not only are they an important tool in the fight against climate change, but they also transform urban areas into sci-fi inspired cityscapes of the future.

Initiatives like LIQUID 3 are examples of how the various realms of biotechnology like microbiology, instrumentation and creative sustainable ideas come together to provide futuristic and innovative solutions to the problems of the planet.

References

1. The first algae air purifier in Serbia, 2021, https://www.undp.org/serbia/news/first-algae-air-purifier-serbia.
2. Daniela Castim, 2021, A Liquid Tree? Scientists in Serbia Make Incredible Innovation, https://worldbiomarketinsights.com/a-liquid-tree-scientists-in-serbia-make-incredible-innovation/.