Tamm Project: Low-Cost Mineral Filter for Water Treatment, Made From Reusing Ochre Granite Waste From the Ornamental Stone Industry

Silva, Lucas (School: EEEP Antonio Rodrigues de Oliveira)

The ornamental stone industry is responsible for the production of granites and marbles, but not all extracted material is used, as waste is discarded into nature due to its lack of added value. In parallel with the industry's irregular disposal, the Northeast faces water-related challenges. Water is essential for life, yet its potability is a global crisis. In light of these issues, this research aims to develop a low-cost treatment method using the reuse of such waste to improve access to potable water. During the methodology, a survey was conducted on the discarded samples in the region, where crushing and necessary analyses were carried out, with Ocre Itabira granite yielding the best results. To enhance the adsorbent's retention rates, the surface area was increased through acid treatment, and its efficiency was validated using adsorption tests. Following this process, the filter assembly began, consisting of layered materials: the first made of a silicone-based polymer, the second of ocre, followed by layers of different types of sand and stone. Subsequently, water treatment was performed, and its efficiency was verified through physical, chemical, and biological analyses of both raw and treated water. The study concluded that this project is a viable alternative for the reuse of contaminated water, effectively removing impurities and making it safe for consumption. To promote awareness, workshops, lectures, and community actions were conducted in the research locus.

Awards Won: