Microbial fuel cell uses fruit and vegetable waste with bacteria from cow dung

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There is a huge and increasing demand for sustainable energy sources across the globe. New work in the *International Journal of Renewable Energy Technology*, considers fruit and vegetable waste as a potential resource for electricity generation. Chemists Sudha Kumari Jha and Annapurna Jha of Jamshedpur Women's College in Jamshedpur, East Singhbhum, Jharkhand, India, provide details of a microbial fuel cell that uses such waste as its feedstock with thermophilic bacteria, Clostridium cellulose and Clostridium cellulofermentans, obtained from cow dung.

Alternative energy sources are urgently needed in the face of anthropogenic climate change driven by rising levels of carbon emissions from the burning of fossil fuels. Much investigation and investment have been put into solar, nuclear, wind, geothermal, tidal, and other approaches. Fuel cells that make use of waste materials have also been a focus of this work.

The team explains how their system is essentially a bioreactor that can convert chemical energy from inorganic or organic components to electrical energy through the catalytic reactions of microbes. The anaerobic breakdown of carbohydrates present in food waste by those microbes promotes the entire process, the team explains. They tested six different microbial fuel cell setups at room temperature and found that the optimal setup was established in ten days with an 800-milliliter sample and could generate 3 volts. Additionally, the only byproduct of the process is water.

The relatively simple setup could be constructed from readily available materials even in the developed world and used with a kit containing the other components. A 3-volt power supply fed with food waste and cow dung would be useful for charging portable devices, such as smartphones and small LED flashlights.

More information: Sudha Kumari Jha et al, Generation of bioelectricity using vegetable and fruit wastes, *International Journal of Renewable Energy Technology* (2022). DOI: 10.1504/IJRET.2022.123977

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