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Title:	Auto-feeding microbial fuel cell inspired by transpiration of plants
Authors:	Patil, Sunil A. (/jspui/browse?type=author&value=Patil%2C+Sunil+A.)
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Abstract:	Inspired by the transpiration process in plants, we report an auto-feeding microbial fuel cell (AF-MFC), in which the fuel (substrate solution) is fed automatically through a process similar to transpiration in natural plants without using any external equipment and applying extra power. The AF-MFC consisted of a bioanode, an air–cathode, hydrogel electrolyte, and a glass capillary feeding channel. The auto-feeding process was realized by the fact that evaporative loss of water from the air–cathode of the AF-MFC reduces pressure in the hydrogel electrolyte; which, in turn, pulls substrate solution to the AF-MFC to maintain hydration of the hydrogel electrolyte. The AF-MFC was able to generate a stable voltage of 0.55 V across a 1000 Ω resistor and a maximum power density of 1182 ± 115 mW m−2 (normalized to the projected area of air–cathode) and 295.5 ± 28.8 W m−3 (normalized to the total volume of the MFC). This study thus provides a new way to fabricate self-sustaining portable MFCs and greatly simplifies the feeding system of the MFCs.
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