

Supplementary Materials

Supplementary Method

Preparation of the rGO complex and GF complex

Powdered GO was purchased from Royal Elite New Energy Science & Technology Co., Ltd. (Shanghai, China) and dispersed into MilliQ water, as described previously ^[1]. The GO aqueous solution was mixed with 4 fold diluted swine wastewater with distilled water to a concentration of 1 g/L. The mixture of GO and swine wastewater was added to an acrylic container of 100 L capacity without leaving any headspace. The acrylic container was partitioned to provide 1,620 cubicles in the size 3.0 cm of width × 3.0 cm of depth × 6.0 cm of height. The mixture of GO and swine wastewater was incubated statically, without any physical stimulation, at room temperature more than 14 days. Supporting Fig. 1 shows black semi-solid complexes (the rGO complexes) in the container after 14 days of incubation. The produced rGO complexes having size approximate 1.0 cm of width × 1.0 cm of depth × 2.0 cm of height were collected in a plastic bag filled with swine wastewater and stored in a refrigerator before the using. The graphite felt complex (GF complex, GFA10, SGL carbon, Wiesbaden, Germany) was prepared to inoculate with the condensed microbial cells from swine wastewater, as described previously ^[1].

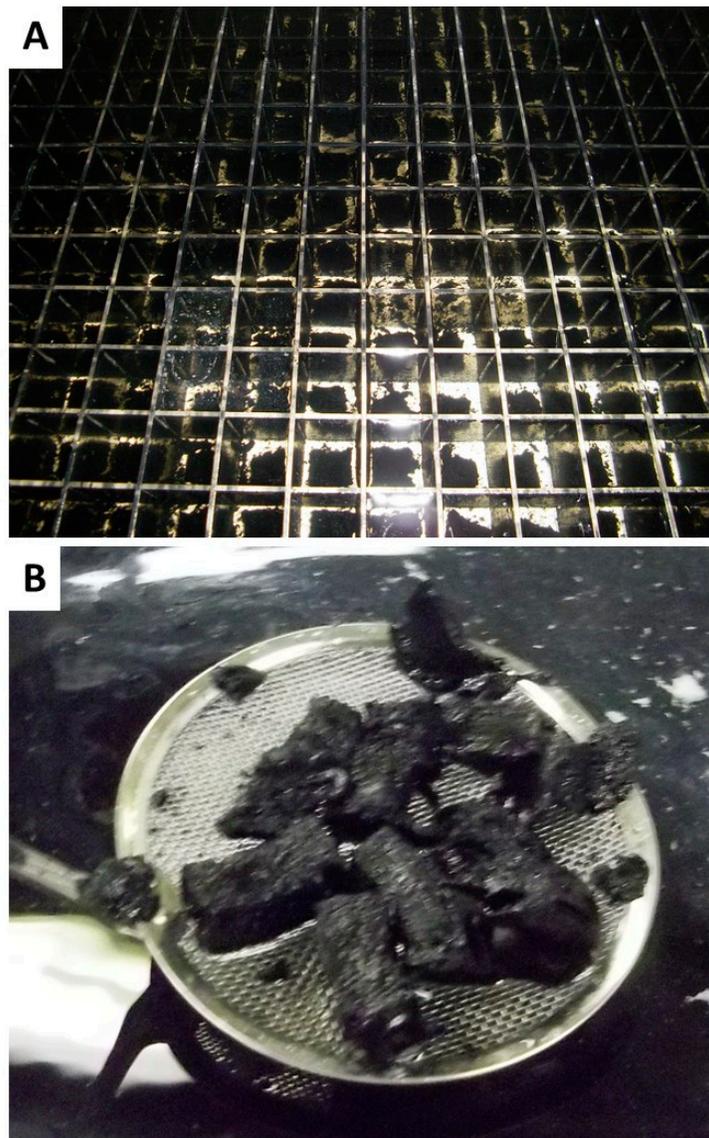


Fig. S1. The rGO complex used as anode in the MFCs. (A) The rGO complexes formed in cubicles filled with the mixture of swine wastewater and GO. (B) The rGO complexes taken from the container.

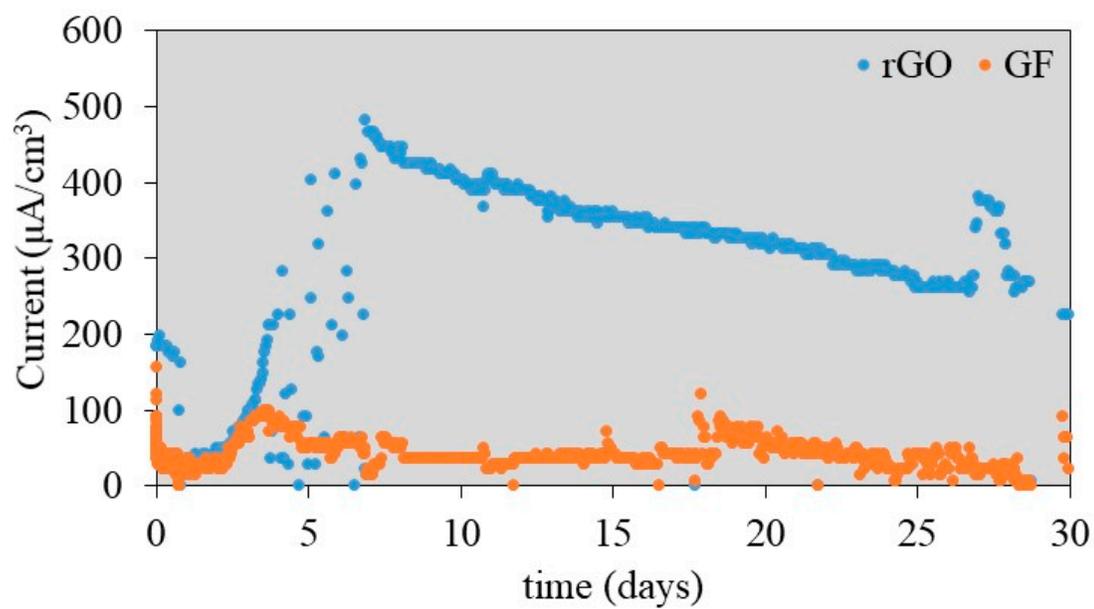


Figure 2. The comparison of the electricity generation by electrochemical cultivation using reduced graphene oxide (rGO) and graphite felt (GF).

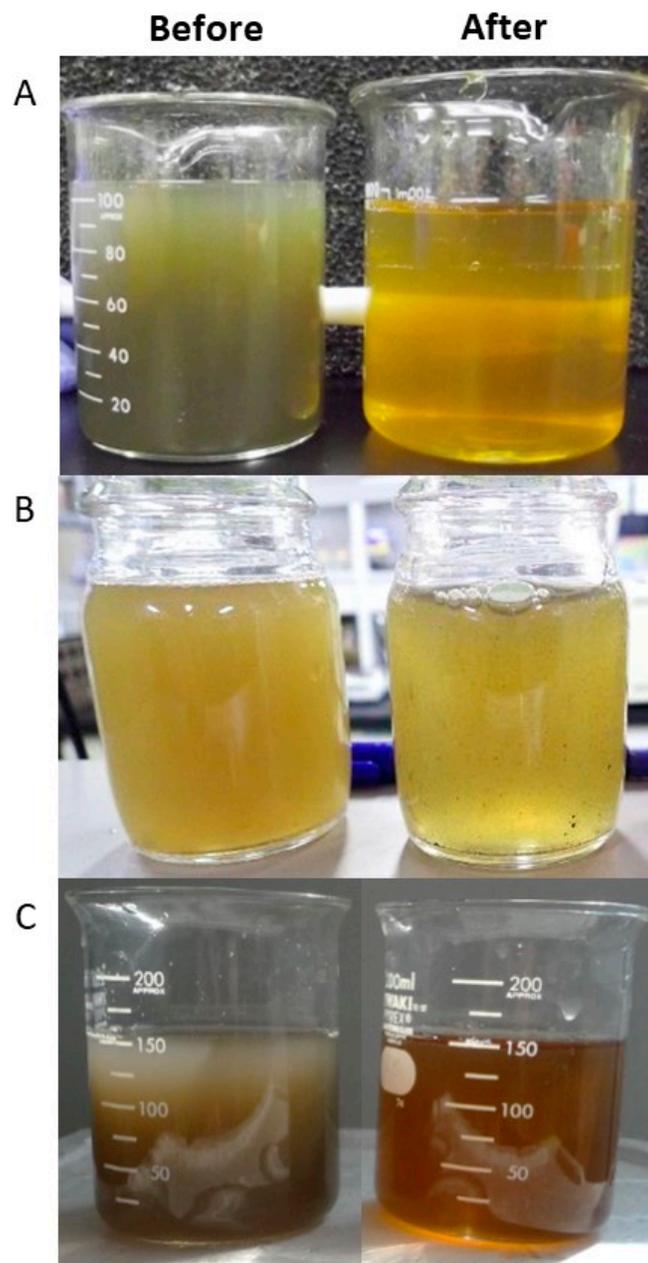


Fig. S3. Swine wastewater before and after treatment using 1.5L-MFC (A), 12L-MFC (B) and 100L-MFC (C).

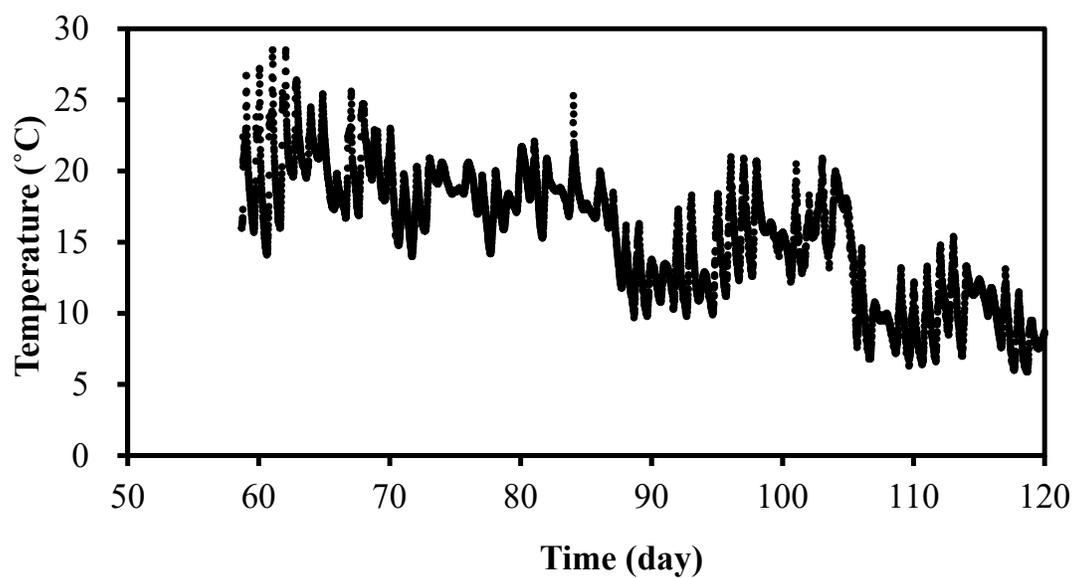


Fig. S4. Changes in water temperature in 100L-MFC set-up at a greenhouse.

Reference

[1] Yoshida N., Miyata Y., Mugita A. & Iida K. Electricity recovery from municipal sewage wastewater using a hydrogel complex composed of microbially reduced graphene oxide and sludge. *Materials*, **2016**, 9, 742.