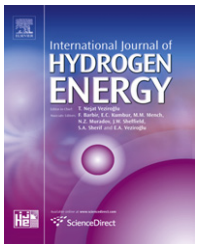
Available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/he



Letter to the Editor

Comment on: "Electricity generation by Enterobacter cloacae SU-1 in mediator less microbial fuel cell" by Samrot et al.

The authors have conducted two-chamber microbial fuel cell (MFC) tests on an *Enterobacter cloacae* strain SU-1, and show that this strain generates very high power in an MFC [1]. However, the authors' statement that "*no work has been done in pure culture without any mediator for fuel cell application using E. cloacae*" is an error. We demonstrated well over a year before their paper was submitted (27 February 2010) that both an ATCC type strain and our own isolate, *E. cloacae* strain FR, could generate power in an MFC [2]. Moreover, they show our strain FR in a phylogenetic tree in their Fig. 2, and explain in the text that their strain has a 98% match to our strain based on 16S rRNA gene sequencing, but they do not cite our previous study.

The authors claim to have produced "3 mW/sq cm" (in the Abstract and repeated in the text), or 30 W/m^2, in their experiments, but this must be an error. This is well over an order of magnitude higher than that previously obtained in any MFC study, and well above an estimated 17 W/m^2, estimated possible by mass transfer to a biocatalytic surface [3,4] or 19 W/m^2 estimated in an MFC if all resistances were removed [4,5]. To date, the highest power density that has been generated so far in a laboratory-scale air-cathode MFC that we are aware of is 6.9 W/m^2 [5]. The authors could not have achieved any value close to this with the basic H-cell design used in their tests due to its characteristic high internal resistance. We were unable to examine the accuracy of their claim on this basis, however, due to a lack of information on internal resistance for the reactor used in their study.

We would like to take this opportunity to stress the importance of providing data on internal resistances, ohmic resistances, power density and polarization data for MFC experiments. Through such information, it will be possible for other researchers to better evaluate the results presented by researchers working in this field.

REFERENCES

[1] Samrot AV, Senthikumar P, Pavankumar K, Akilandeswari GC, Rajalakshmi N, Dhathathreyan KS. Electricity generationby enterobacter cloacae su-1 in mediator less microbial fuel cell. Int J Hydrogen Energy 2010;35:7723–9.

[2] Rezaei F, Xing D, Wagner R, Regan JM, Richard TL, Logan BE. Simultaneous cellulose degradation and electricity production by *Enterobacter cloacae* in a microbial fuel cell. Appl Environ Microbiol 2009;75(11):3673–8.

[3] Logan BE. Microbial fuel cells. Hoboken, NJ: John Wiley & Sons, Inc.; 2008.

[4] Logan BE. Exoelectrogenic bacteria that power microbial fuel cells. Nat Rev Microbiol 2009;7(5):375–81.

[5] Fan Y, Sharbrough E, Liu H. Quantification of the internal resistance distribution of microbial fuel cells. Environ Sci Technol 2008;42(21):8101–7.

Farzaneh Rezaei*
Department of Biological and Agricultural Engineering, University of California, Davis, One Shields Avenue, Davis, CA 95616-5294, USA
*Tel.: +1 530 752 0764; fax: +1 530 752 2640.
E-mail address: frezaei@ucdavis.edu

Tom L. Richard
Associate Professor, Department of Agricultural and Biological Engineering, Pennsylvania State University, USA

Bruce E. Logan
Professor, Department of Civil and Environmental Engineering, Pennsylvania State University, USA

Available online 13 August 2010

0360-3199/$ – see front matter

doi:10.1016/j.ijhydene.2010.07.097