

## ***Interactive comment on “Microbial Community Function in Electroactive Biofilm-based Constructed Wetlands” by Carlos A. Ramírez-Vargas et al.***

### **Anonymous Referee #1**

Received and published: 29 January 2019

Title: Microbial Community Function in Electroactive Biofilm-based Constructed Wetlands

#### General Comments

The paper by Carlos A. Ramírez Vargas et al. is a well-documented study describing the study on the microbial characterization of laboratory scale METland based on CLPP analysis. The study included the characterization of Microbial communities attached to two carbon-based electro-conductive materials (calcined petroleum coke from crushed electrodes – PK-A; calcined petroleum coke with low sulphur and nitrogen content – PK-LSN), in planted and non-planted set-ups.

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The paper is scientifically sound as an experimental work and fits within the objectives and scope of the journal. I have read through the article and I believe that the subject matter is suitable for publication, although minor corrections have to be included in the text in order to be published.

#### Specific comments:

1. Abstract. The abstract is perhaps too much generic. More detailed results about the results about the function of the microbial communities have to be included.

2. Introduction. A more detailed explanation on next sentence “The genetic characterization of microbial communities of constructed wetlands is desirable, however all microorganisms inside the systems must be identified, task that is time and resource consuming, and may not be of much interest from the engineering point of view” has to be included. Genetic characterization can be a source of important information on the microbial communities diversity and therefore, about the abundance of different functional groups. Even with recent Illumina sequencing techniques, a fast results can be obtained.

On the other hand, microbial molecular analyses with PCR real time of functional genes give today, relevant information about the general performance of any CW. More information and references about that aspects have to be included in that part.

3. Materials and methods. Which water flow was used?

4. Results and Discussion. Review the correct use of verbal forms in English. Rewrite this sentence: Differences on the microbial community functionality between planted and non-planted systems, studies analyzing the change in Microbial community structure in aerated constructed wetlands (Osem et al., 2007) have been reported, treating tannery wastewaters (Calheiros et al., 2009), as well as in full scale constructed wetlands treating domestic wastewaters (Zhang et al., 2010).

The section 3.3 and 3.4 has to be improved, especially in its written English. Rewrite

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this sentence “Easy degradable carbon sources, such as carbohydrates are preferred by microorganism as primary source of energy, and usually are consumed at early stages of the flow pathway inside systems (Salomo et al., 2009).” Improve this sentence: “In the case of polymers, the opposite occurred, with relative low consumption in the inlet section and higher consumption at the outlet section of the tested systems”.

Improve this sentence, “In parallel to the microbial metabolic activity, were measured the effluent water quality parameters (pH, electrical conductivity, temperature, dissolved oxygen and Redox potential), and were estimated the removal rates of organic matter (BOD<sub>5</sub>, TOC and COD), nutrients (NO<sub>3</sub>-N, NH<sub>4</sub>-N, TN and PO<sub>4</sub>-P) and TSS. . .”.

Rewrite and improve this sentence: “Given that the main removal pathway of NO<sub>3</sub>-N is denitrification a carbon source is required (Dotro et al., 2017)”.

5. Conclusions. The conclusions paragraph has to be improved in its written English.

Specific technical comments

Page 3, Line 11. Include this reference in the previous references. (Aguirre-Sierra et al., 2016).

Page 8, line 2. Add of. Promote the growth of microbial communities.

Page 9, 27. Delete in. “The uniformity in the in carbon guild. . .”.

Page 10, Line 18. Add s. “utilization of all carbon sources”.

Page 10, Line 19. Add s. “microorganisms”.

Page 10, Line 34. Add from. “electrical conductivity varied from. . .”.

Page 12, line 3. Change “The low TN removal is the results. . .”, by “The low TN removal is the result. . .”.

Page 14, line 12. Change testes.

This paper is really interesting for all researchers that are working today on the  
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study of constructed wetlands. There are really few publications reporting the microbial metabolic activity function in an electroactive biofilm-based constructed wetlands. However, the authors should improve the written English, especially in the results and discussion and conclusions sections. My recommendation is to accept the manuscript after a minor revision, and obviously, taking care about the final quality of the English in the last version of the paper.

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