REVIEW NOTE – bg-2018-251

First of all we would like to thank the reviewer for his/her constructive comments on our paper.

General comments

The Authors of the manuscript '*Potential for phenol biodegradation in cloud waters*' (bg-2018-251) isolated bacterial strains from cloud water (polluted with phenol) that are potentially capable of degrading phenol and its main degradation product (catechol). They also determined transcripts of genes coding for the enzymes responsible for phenol and catechol degradation including hydroxylase, monooxygenase and 1,2-dioxygenase. Based on these findings the Authors concluded that cloud water may be a potential environment for biotransformation of phenol by microorganisms including genus *Pseudomonas*, *Acinetobacter* and *Rhodococcus*.

In my opinion, the study is interesting and has significant scientific value and novelty; however it needs some major revision. The methods have been properly designed and the results and reliable.

Specific comments

Major points:

Comment: In 'Introduction' some information concerning toxic effects of phenol (with appropriate references) must be provided because the statement that phenol is toxic is not satisfactory

Answer: This sentence has been added in the revised version with some references.

Phenol has an environmental impact, particularly on the aquatic biota (microorganisms, protozoa, invertebrates, and vertebrates) (Babich and Davis, 1981, Duana et al., 2018). Phenol represents also a risk for human beings because it can be rapidly absorbed through the skin and by inhalation through the lungs. In particular it provokes cutaneous exfoliation and cardiac arrhythmias; it is also toxic to the liver and kidneys (Babich and Davis, 1981; Lober , 1987). For more information the National Library of Medicine HSDB Database can be searched. .

Babich, H. and Davis, D.L.: Phenol: A review of environmental and health risks, Regulatory Toxicology and Pharmacology, 1, 90-109, 1981.

Duana, W., Menga, F., Cuia, H., Linc, Y., Wangc, G., and Wuc J.: Ecotoxicity of phenol and cresols to aquatic organisms: A review, Ecotoxicol. Environ. Safety 157, 441–456, 2018.https://doi.org/10.1016/j.ecoenv.2018.03.089.

Lober, C.W.: Chemexfoliation--indications and cautions. J. Am. Acad. Dermatol. 17, 109-112, 1987.

National Library of Medicine HSDB Database -PHENOL - *https://toxnet.nlm.nih.gov/cgi-bin/sis/search/a?dbs+hsdb:@term+@DOCNO+113.*

Comment: In conclusion the statement: In conclusion, this is the first report of the potential degradation of phenol by cloud organism should be changed to (for example): In conclusion, this is the first report showing that cloud water is inhabited by microorganisms that have phenol degradation ability

Answer: the text has been changed as requested.

Comment: Page 5, line 154-155, GC-MS analysis, how the samples were evaporated (what was the temperature during evaporation? or/and was nitrogen used to eliminate solvent?)

Answer: We added. "...evaporated to 1mL using a rotary evaporator under reduced pressure; temperature of the water bath was 20°C."
Comment: Page 8, Phenol HPLC analysis, which was the limit of detection and limit of quantification of phenol?
Answer: As stated in the Material and Method section "Limit of phenol quantification was 3.8 µM. Strains are not considered active below 5 % of phenol degradation, corresponding to 5 µM."

Minor points:
All requested corrections have been made in the revised version
Abstract, line 17, correct 'particularly toxic' to 'toxic'
Abstract, line 25, please provide full name of 'PUY'
Abstract, line 25, correct '0.74 µg.L^{-1}' to '0.74 µg L^{-1}'
Introduction, line 47, correct 'high toxicity' to 'toxicity' (in fact phenol is less toxic than most of phenols of anthropogenic origin or/and numerous other xenobiotics)
Page 3, line 98, correct 'bacteria' to 'bacteria strains'
Page 4, line 107 and 113, correct 'opening' to 'cleavage'
Page 4, line 116, correct 'concentration' to 'density'
Page 6, line 187, correct 'proteins' to 'enzymes'
Page 8, line 239, correct to: '150 mm x 4.6 mm
Page 9, line 273 and 281, correct to: '2,3-dioxygenase
Page 9, line 281, correct 'opening' to 'cleavage'
Page 10, line 314, correct to: long induction periods of enzymes
Page 10, line 322-333, correct sentence
Page 11, line,338-341, correct sentence as it is not clear
Page 12, correct: 'surface water' to 'polluted surface water' as phenol does not occurs at high concentrations in natural surface waters
Comment: Page 12, line 374, please provide full name of 'INA+'
Answer: "Ice Nuclei Active"
Page 12, line 375 and 382, correct Joly et al., 2013 and Berge et al., 2014 to Joly et al. (2013) and Berge et al. (2014)
Page 12, line 388-389, correct sentence
Page 13, line 395-396, correct 'shorter molecules' to e.g 'intermediates'
Page 13, line 396, correct 'opening' to 'cleavage'
Page 13, line 409, correct 'biological and abiotic' to 'biotic and abiotic'
Page 14, line 425, correct to (for example). 'The most probably, microorganisms could participate to phenol remediation in the atmosphere'
Figure 1, correct to: '1,2-dioxygenase' and '2,3-dioxygenase'
Figure 2, correct to: ' monooxygenase'
Figure 3, correct to: ' monooxygenase' and '1,2-dioxygenase'
Figure 4B, Y-axis, correct to: 'Degradation of phenol (%)' as it is in Figure 4A
Technical comments
In the whole manuscript, 'minutes' must be corrected to 'min', 'hours' to 'h'.
Please also write (for example) '25 °C' instead of '25°C' and (for example) '1 mL' instead of '1mL'
English of the paper should be corrected in several places