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Microbial community and metabolism activity in a bioelectrochemical denitrification system under long-term presence of p-nitrophenol

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1 **Microbial community and metabolism activity in a bioelectrochemical**
2 **denitrification system under long-term presence of p-nitrophenol**

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10 **Abstract**

11 Bioelectrochemical denitrification system (BEDS) is a promising technology for
12 nitrate removal from wastewaters. The hazards and effects concerning p-nitrophenol
13 (PNP) towards BEDS lack enough investigations and possess great research prospects.
14 This study investigated how PNP affected the nitrate removal efficiency, microbial
15 communities, functional denitrifying genes abundances, nitrate and nitrite reductase
16 activities, diffusible signal factors (DSF) release, and extracellular polymeric
17 substances (EPS) production in the BEDS. Results indicated that nitrate removal
18 efficiency decreased with initial PNP concentration increased from 0 to 100 mg/L.
19 Phylum *Firmicutes* and class *Clostridia* were the main contributors for denitrification
20 process in this BEDS. The abundances of the denitrifying genes *nirS*, *nirK*, *napA*, and
21 *narG* all presented decreased trends with increasing PNP. In addition, the
22 concentrations of nitrate reductase (NR), nitrite reductase (NIR), and EPS obviously

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