



Microcosm approach for brine impact assessment from seawater desalination on benthic assemblages

Sung Jin Yoon, Gyung Soo Park*

*Department of Marine Biotechnology, Anyang University, Incheon 417-833, Korea
Tel. +82 32 930 6032; Fax: +82 32 930 6036; email: gspark@anyang.ac.kr*

Received 25 December 2011; Accepted 10 February 2012

ABSTRACT

The brine discharge from seawater desalination has a strong impact on marine community, especially benthic community near brine outlet. The aim of this study is to examine the effect of brine discharge over soft bottom benthic community and changes of sediment quality by periodic brine exposure and water circulation confinement using small-scale benthic microcosms. Transparent acrylic cylinder (1 m in length and 0.5 m in diameter) was used to examine the changes of benthic community structure and sediment quality in microcosm. Salt bags were placed inside of microcosm and the plastic cover partially sealed the open area to maintain salinity at a certain level. Various chemical and biological parameters were analyzed using the sediment samples collected with every two-week interval for 12-week experiment. Major estimated parameters were sediment chemical oxygen demand and total sulfur concentration for sediment quality, and meio/macro-benthic community structure for biological parameters. There were significant differences in some parameters in terms of sediment quality and benthic assemblages between treatment effects. This microcosm approaches to investigate brine impacts of benthic assemblages can a useful tool for gapping between laboratory and field estimations and also to make decision for permitting the level of brine to marine ecosystem.

Keywords: Benthic microcosm; Brine discharge; Benthic assemblage; Meiofauna; Macrofauna; Community structure

*Corresponding author.