Data in Brief 9 (2016) 429–432

Contents lists available at ScienceDirect

Data in Brief

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

Data Article

Data on metals (Zn, Al, Sr, and Co) and metalloid (As) concentration levels of ballast water in commercial ships entering Bushehr port, along the Persian Gulf

Farshid Soleimani [a], Sina Dobaradaran [a,b,c,*], Abdolreza Hayati [d], Maryam Khorsand [e], Mozhgan Keshtkar [a]

[a] Department of Environmental Health Engineering, Faculty of Health, Bushehr University of Medical Sciences, Bushehr, Iran
[b] The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr University of Medical Sciences, Bushehr, Iran
[c] Systems Environmental Health, Oil, Gas and Energy Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr University of Medical Sciences, Bushehr, Iran
[d] Urban Water and Wastewater Company, Bushehr Province, Iran
[e] Department of Environmental Engineering Bushehr branch, Islamic Azad University, Bushehr, Iran

ARTICLE INFO

Article history:
Received 23 July 2016
Received in revised form
30 August 2016
Accepted 13 September 2016
Available online 20 September 2016

Keywords:
Ballast water
Bushehr
Commercial ships
Metals
Metalloid
Persian Gulf

ABSTRACT

In this article, we determined the concentration levels of metals including Zn, Al, Sr, and Co and metalloid of As of ballast water in commercial ships entering Bushehr port, along the Persian Gulf. Ballast water samples were taken from commercial ships entering Bushehr port from 34 ports around the world during 15 February and 25 August 2016. The concentration levels of metals and metalloid were determined by using a graphite furnace absorption spectrometer (AAS).

* Correspondence to: The Persian Gulf Marine Biotechnology Research Center, Boostan 19 Alley, Imam Khomeini Street, Bushehr, Iran. Fax: +98 7514763448.
E-mail addresses: s.dobaradaran@bpums.ac.ir, sina_dobaradaran@yahoo.com (S. Dobaradaran).

http://dx.doi.org/10.1016/j.dib.2016.09.017

Specifications Table

Subject area	*Chemistry*
More specific subject area	*Metals and metalloid of ballast water*
Type of data	*Table, figure*
How data was acquired	*Graphite furnace absorption spectrometer (AAS) method (Varian, SpectrAA 240, Australia).*
Data format	*Raw, analyzed*
Experimental factors	*Each sample was collected in a 100 ml sterile container, placed in a cooler at −4 ° C, and transported to the laboratory in the same day they were obtained from the ships tanker. Samples acidified with nitric acid, and kept for analysis.*
Experimental features	*Determine the concentration levels of metals including Zn, Al, Sr, and Co and metalloid of As in ballast water in commercial ships entering the Bushehr port.*
Data source location	*Bushehr harbor, Iran*
Data accessibility	*Data is with this article.*

Value of the data

- Data can be used as a base-line data for metals and metalloid contents in ballast water of commercial ships.
- Data shown here may motivate further studies on evaluate risk associated with ballast water discharge.
- Data show that ballast waters discharged by ship tankers in harbors are the main source of metal contamination for sea waters and coral reef in the discharge areas.
- Data confirmed stricter inspection and supervision as well as permanent monitory program (with respect to ballast water treatment) are necessary for management of ballast water in harbors.

1. Data

In the data, as shown in Table 1, the concentration levels of Zn, Al and Co of ballast water in commercial ships ranged from 1.23 to 6.58, 0.74 to 3.8 and 1.49 to 12.3 ppb respectively. The concentration levels of Sr was not detected (ND) in all examined samples. The concentration levels of As ranged from 0.11 to 1.84 ppb. The highest Zn concentration level was 6.58 ppb in sample S_6 (Kuwait - Kuwait), whereas the lowest Zn concentration level was 1.23 ppb in sample S_{17} (Muscat- Oman). The highest and lowest concentration levels of Al were 3.8 and 0.74 ppb in samples S_{34} (Nagoya - Japan) and S_{11} (Kandla port - India) respectively. The highest and lowest content levels of Co were 12.3 and 1.49 ppb in samples S_{22} (Navlakhi - India) and S_{26} (Salalah - Oman) respectively. Finally, the highest concentration level of As was 1.84 ppb in sample S_{22} (Navlakhi - India) and the lowest level was 0.11 ppb in sample S_{12} (Ajman port - Emirate).

2. Experimental design, materials and methods

Ballast water samples were taken from commercial ships entering Bushehr port along the Persian Gulf during 15 February and 25 August 2016. Samples were from 34 different ports (see Fig. 1). Each sample was deposited in a 100 ml sterile container, placed in a cooler at −4 °C, and transported to the laboratory at the same day that they were obtained from ship tanker. Samples acidified with nitric acid, and kept for analysis. The concentrations levels of metals and metalloid were determined by using a graphite furnace absorption spectrometer (AAS) method [1] (Varian, SpectrAA 240, Australia).

Table 1
Concentration levels (ppb) of metals (Zn, Al, Sr, and Co) and metalloid (As) in ballast water of commercial ships.

Samples code	Location of harvesting ballast water	Zn	Al	Sr	Co	As
S_1	Dammam - Saudi Arabia	2.35	1.23	0	2.12	0.23
S_2	Davao - Philippines	2.45	1.24	0	2.24	0.56
S_3	Phuket - Thailand	6.33	1.56	0	3.21	0.41
S_4	Duqm - Oman	2.36	0.87	0	6.53	0.26
S_5	Jawaharlal Nehru Port - India	3.56	0.89	0	2.35	0.23
S_6	Kuwait - Kuwait	6.58	2.31	0	4.29	0.34
S_7	Jebel ali-Emirate	2.39	1.74	0	4.36	0.25
S_8	Mumbai - India	2.47	1.68	0	5.14	1.01
S_9	Shuwaikh - Kuwait	3.64	1.88	0	3.23	0.64
S_{10}	Hamriya - Emirate	3.15	2.05	0	3.45	0.33
S_{11}	Kandla port - India	2.09	0.74	0	2.56	0.64
S_{12}	Ajman port - Emirate	3.47	1.93	0	2.87	0.11
S_{13}	Mina rashid - Emirate	4	1.45	0	1.92	0.75
S_{14}	Singapore - Singapore	1.97	1.68	0	4.34	0.64
S_{15}	Port said - Egypt	2.36	1.37	0	3.17	0.96
S_{16}	Antwerp- Belgium	2.88	0.96	0	5.26	1.09
S_{17}	Muscat- Oman	1.23	1.23	0	3.31	1.23
S_{18}	Portsmouth - U.K	3.33	1.29	0	3.56	1.23
S_{19}	Basra - Iraq	2.35	1.78	0	4.56	0.45
S_{20}	Aden - Yemen	3.21	1.56	0	8.96	0.56
S_{21}	Suez - Egypt	5.12	2.11	0	8.69	1.56
S_{22}	Navlakhi - India	6.35	2.23	0	12.3	1.84
S_{23}	Bangkok - Thailand	3.15	3.11	0	3.39	0.34
S_{24}	Sohar - Oman	2.94	2.59	0	3.15	0.36
S_{25}	Shanghai - Chain	3.47	3.41	0	2.49	0.25
S_{26}	Salalah – Oman	2.64	1.97	0	1.49	0.19
S_{27}	Laem chabang - Thailand	3.35	1.8	0	4.11	0.48
S_{28}	Hong kong - Chain	3.16	2.64	0	3.94	0.36
S_{29}	Busan - South Korea	3.98	1.39	0	3.68	0.27
S_{30}	Shenzhen - Chain	4.15	1.78	0	2.58	0.34
S_{31}	Kaohsiung - Taiwan	3.27	2.41	0	3.47	0.26
S_{32}	Manila - Philippines	1.67	2.31	0	4.61	0.34
S_{33}	Jeddah - Saudi Arabia	3.74	3.12	0	4.39	0.18
S_{34}	Nagoya - Japan	3.31	3.8	0	3.22	0.47

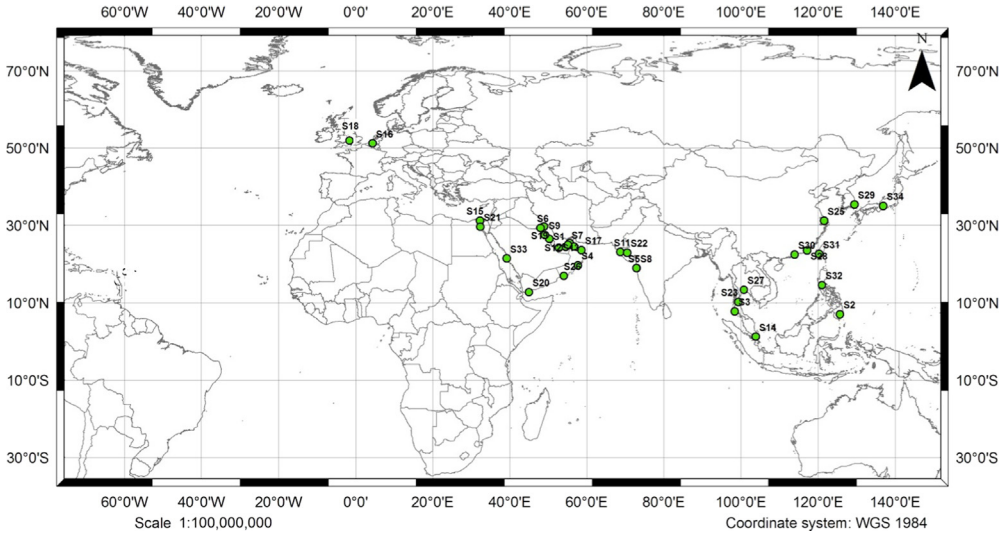

Fig. 1. The geographical location of all ports that their ships arriving in the Bushehr port.

Acknowledgments

The authors are grateful to Bushehr University of Medical Sciences, Iran for their financial support (Grant no 1884) and the laboratory staff of the Environmental Health Engineering Department for their cooperation. The funder had no role in study design, data collection analysis, or preparation of the manuscript.

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2016.09.017.

Reference

[1] S. Dobaradaran, I. Nabipour, R. Saeedi, A. Ostovar, M. Khorsand, N. Khajeahmadi, R. Hayati, M. Keshtkar, Association of metals (Cd, Fe, As, Ni, Cu, Zn and Mn) with cigarette butts in northern part of the Persian Gulf, Tob. Control (2016) 052931.