Data Article

Microbiological dataset of rural drinking water supplies in Zahedan, Iran

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A B S T R A C T

The residual chlorine and microbial quality of drinking water in the Zahedan villages by a number of 1221 samples from all 168 villages were collected between 2014–2015. Then the samples were evaluated using 9-tube fermentation methods and portable chlorine method test. Based on the microbial coliform and fecal coliform indices, the data indicated that the maximum and minimum controlling of the bacteria in the distribution network were in the winter (90.62%) and autumn (85.56%), respectively. Also in the reservoirs, the maximum and minimum controlling of the bacteria were in winter (93.49%) and autumn (87.35%), respectively. The residual chlorine was prepared in almost all of seasons.

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### Value of the data

- The water microbial controlling is very important for prepared the safe drinking water.
- The data are shown that the microbial water quality commonly prepared in Zahedan, Iran and they have consumed safe water.
- The reason for the higher percentage of desirable chlorine in the city of Zahedan in summer is that in the warm seasons, up to 1 mg/l of primary chlorine is due to the prevention of the prevalence of waterborne diseases.
- The data are indicated that the operator must more considerate to chlorination of drinking water in autumn season rather than other seasons.
- Is the data recommended to the reservoir and distribution of drinking water system need to be improving in the chlorination time.

### 1. Data

The residual chlorine and microbial quality of drinking water in the Zahedan villages by a number of 1221 samples from all 168 villages were collected (Table 1). Table 2 shows that the Chlorometric data of drinking water resources of Zahedan villages. Table 3 shows that The Turbidity data in drinking water sources of Zahedan villages. Data indicated that the maximum and minimum controlling of the bacteria in the distribution network were in the winter and autumn respectively (Table 4). Also in the reservoirs, the maximum and minimum controlling of the bacteria were in winter and autumn respectively (Table 4). And Table 5 shows that the data of HPC microbial population count in reservoirs of Zahedan villages, Table 6 Comparison of desirable microbial index and free chlorine.

| Season   | Number of villages covered | Number of Turbidity tests | Number of chlorometric tests | Number of microbial tests | Number of HPC tests | Number of temperature tests |
|----------|----------------------------|----------------------------|-------------------------------|---------------------------|---------------------|-----------------------------|
| Spring   | 168                        | 320                        | 36,207                        | 296                       | 75                  | 320                         |
| Summer   | 168                        | 370                        | 37,046                        | 339                       | 90                  | 370                         |
| Fall     | 168                        | 340                        | 36,870                        | 303                       | 90                  | 340                         |
| Winter   | 168                        | 310                        | 36,440                        | 283                       | 100                 | 310                         |

### Table 1

The microbial data of drinking water resources of Zahedan villages.
Table 2
The Chlorometric data of drinking water resources of Zahedan villages.

| Season | Total number of chlorometric tests | Desirable percentage |
|--------|-----------------------------------|----------------------|
| Spring | 36,207                            | 97.4                 |
| Summer | 37,046                            | 92                   |
| Fall   | 36,870                            | 96.68                |
| Winter | 36,440                            | 99.29                |
| Total  | 146,563                           | 96.34                |

Table 3
The Turbidity data in drinking water sources of Zahedan villages.

| Season | Total number of tests | > 1NTU | 1-5,NTU | 5 < NTU | Desirable percentage from a health perspective | Desirable percentage from an aesthetic |
|--------|-----------------------|--------|---------|---------|-----------------------------------------------|----------------------------------------|
| Spring | 320                   | 280    | 32      | 8       | 87.5                                          | 97.5                                   |
| Summer | 370                   | 317    | 41      | 12      | 85.6                                          | 96.75                                  |
| Fall   | 340                   | 290    | 36      | 14      | 85.27                                         | 95.5                                   |
| Winter | 310                   | 275    | 29      | 6       | 88.7                                          | 98                                     |
| Total  | 1340                  | 1162   | 138     | 40      | --                                            | --                                     |

Table 4
The microbial data of distribution network of Zahedan villages.

| Season | Microbiological test of network | Microbiological test of reservoirs |
|--------|---------------------------------|------------------------------------|
|        | Total number | Clean number | Coliform | Fecal coliform | Desirable percentage | Total number | Clean number | Coliform | Fecal coliform | Desirable percentage |
| Spring | 204            | 180          | 21       | 3              | 88.23                  | 92             | 84           | 6         | 2              | 91.3                  |
| Summer | 236            | 206          | 27       | 3              | 87.28                  | 103            | 93           | 8         | 2              | 90.29                 |
| Fall   | 216            | 185          | 26       | 5              | 85.56                  | 87             | 76           | 8         | 3              | 87.35                 |
| Winter | 160            | 145          | 13       | 2              | 90.62                  | 123            | 115          | 7         | 1              | 93.49                 |
| Total  | 816            | 716          | 87       | 13             | --                     | 405            | 368          | 29        | 8              | --                    |

Table 5
The data of HPC microbial population count in reservoirs of Zahedan villages.

| Season | Number | ≤ 100 | > 100- ≤ 200 | > 200- ≤ 250 | > 250- ≤ 500 | > 500 | Mean | Minimum | Maximum |
|--------|--------|-------|--------------|--------------|--------------|-------|------|---------|---------|
| Spring | 75     | 54    | 12           | 9            | --           | --    | 76.72 | < 1     | 237     |
| Summer | 100    | 77    | 13           | 8            | 2            | --    | 87.36 | < 1     | 329     |
| Fall   | 90     | 69    | 10           | 8            | 2            | 1     | 95.72 | < 1     | 623     |
| Winter | 100    | 90    | 5            | 5            | --           | --    | 70.49 | < 1     | 226     |

Table 6
Comparison of desirable microbial index and free chlorine.

| Season | The desirability of chlorine | The desirability of microbial |
|--------|-------------------------------|------------------------------|
| Spring | 99.24                         | 98.31                        |
| Summer | 99.45                         | 98.52                        |
| Fall   | 99.4                          | 97.35                        |
| Winter | 99.31                         | 98.93                        |
| Mean   | 99.35                         | 98.27                        |
2. Experimental design, materials and methods

2.1. Study area description

Zahedan city is located in Sistan and Baluchistan province of Iran encompassing an area of about 55.7 km² (Fig. 1) and its aquifers are located in South-East Iran between the latitudes 29° 30’ 45” N and longitudes 60° 51’ 25” E [1,2]. The subjected study area is a semi-flat plain region with a gentle slope toward the south has a warm, temperate climate with an annual average of 18.3 °C in which the highest and lowest temperatures are 42.5 °C and −12.6 °C, respectively [3,4].

2.2. Determination of microbial contamination in drinking water

In order to evaluate the microbial quality of drinking water in villages of Zahedan city, 168 villages were selected as a comprehensive sample of all villages in this city. Between 2014–2015, 1221 microbial samples were prepared from the water facilities installed in these villages, and the microbial test was performed by MPN, P-A or MF methods and turbidity, temperature, and HPC tests based on the standard method [5–17].

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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.2018.08.049.

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