



The comparative study of the conductance and total dissolved solids of tap water in Prithwi Narayan Campus coming from Murdy river and Kiwi mineral water supplied in Pokhara Valley.

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Abstract— The two major chemical tests of tap water coming directly from Murdyriver at P.N.campus Q.No.33 were tested. The parameters were conductance of water and the total dissolved solids in water. The same tests of Kiwi mineral water were done and compared between them. The conductance measurement and total dissolved solids tests were done by a standard E-1 portable TDS & EC meter made in India. It has high performance design with fast numerical display and accurate result. Its full measure range capacity of conductance is 0 to 9999 $\mu\text{s}/\text{cm}$ at temperature range 1-80° C. The conductance of tap water coming from Murdyriver was found to be 138 $\mu\text{s}/\text{cm}$ and TDS was found to be 69 mg/l at 19° C on 2022 march 10. (Non – rainy season in Pokhara). The conductance of Kiwi mineral water was found to be 82 $\mu\text{s}/\text{cm}$ and TDS was found to be 38 at 19° C on 2022 march 10. The both parameters were more in the tap water coming from murdy river than the kiwi mineral water supplied in pokhara market. These readings were within the permissive levels of ranges laid down by WHO and indian standard for drinking water (1500 $\mu\text{s}/\text{cm}$ for conductance and 500 mg/l for TDS) in the both samples.

Keywords— Aquaculture, binary, Conductance, hydroelectricity, total dissolved solids,

Number: 10.14704/nq.2022.20.7.NQ33173

Neuro Quantology 2022; 20(7):1402-1404

INTRODUCTION

As we know that water is so essential substance for us that without this we cannot keep alive. Therefore we can tell it as elixir of our life. Any part of our body even a cell cannot survive without water. It always makes our body, heart and soul, prosperity and wealth neat and clean. It saves from different diseases.^[1] It is also necessary for photosynthesis of plant which is main source of oxygen production in the world. The molecular formula of water is H₂O so its chemical name is hydrogen oxide. This is the binary compound of hydrogen and oxygen. It is polar and universal solvent. ^[2] ^[3] Due to the excess negativity of the oxygen atom with respect to hydrogen atom there is partial negative charge on O-atom while partial positive

charge on the hydrogen atom. This nature provides the property being it as polar solvent.^[4] It is widely used in all over the world as the solvent as it can dissolve mostly inorganic materials as well as various organic materials so it is called as universal solvent. Water is used mainly for various purposes other than drinking like Aquaculture, irrigation, swimming, washing, as coolant, solvent, shipping and for production of hydroelectricity etc. water extracts are used as medicines. ^[5] The water quality guidelines provide a Limit Value for each parameter of drinking water. ^[6] It is necessary that the quality of water should be checked at regular interval of time, because due to use of contaminated water, human population suffers from various water borne diseases. ^[7] The availability of good



quality of water is an indispensable feature for preventing diseases and improving quality of life. It is necessary to know details about different physico-chemical parameters.^[8]

Sources of drinking water

Ground water: The water emerging from some deep ground water may have fallen as rain for many decades flowing as rivers, lakes ponds and springs.

Rain water: water obtaining from rain.

Under ground water: water obtaining from borings and hand pipes.

Well water: water which is collected in a well is also used for various purposes.

Canals: man made rivulets.

A. Generated water extracted from air: It is a new technology that can provide high quality drinking water by extracting water from the air by cooling the air.

B. Harvested water and fog collection: water collection is done from the atmosphere can be used in areas with significant dry seasons and in areas where there is fog even when there is little rain.

C. Water from sea: sea water is purified by distillation and another method by reverse osmosis.

Experimental methods

Collection of the samples: sampling of the Kiwi drinking water from the jar of 20 liters and from the tap water in Prithwi Narayan campus Q.no. 33 were done in sterilized separate bottles for the further proposed chemical tests. The source of the tap water in the campus is coming from Murdyriver. The samples were taken in march 1st week 2022 A.D.

The conductance measurement and total dissolved solids were done by a standard E-1 portable TDS & EC meter made in India. The meter is professional instrument with multifunction, can be used to testing water TDS & conductivity including the temperature. It has high performance design with fast numerical display and accurate result. Its full measure range capacity of the conductance is 0 to 9999 $\mu\text{s}/\text{cm}$ at temperature range 1-80^o C (in 32- 176^o

F). similarly, the full range of total dissolved solids is 0 to 9999 mg/l at temperature meter range 1-80^o C (in 32- 176^o F). Its accuracy is +2 & -2. Weight 55 gm. Size 154x30x14 mm.

To measure the chemical parameters, we have to put on the TDS & EC meter. After few seconds the display screen shows the 0000 on LCD screen of the meter which displays the temperature in the lower part of the screen. Samples were kept in the two different neat and clean beaker. The samples were kept in the both beaker and coded as Kiwi and PNC. 100 c.c. Water samples were kept in these beakers. The immersion part which contains agile titanium alloy electrode was immersed in the 1st sample up to immersion line the reading started and after few seconds become constant then in the mean time hold button was switched then the meter was taken out. Then, shift button was kept on which showed the conductance reading as well as TDS. They were noted for the both samples

Results and discussion

As the conductance and total dissolved solids are main two parameters having great concern of the drinking water. The conductance shows the proportional reading to the no of ions present in the samples of the drinking water. The more no of ions present indicates the excessive pollution of the soluble substances hence we have to compare the reading to the permissive levels of the readings laid down by WHO or Indian drinking water standard. Similarly TDS (total dissolved solids also indicates the pollutants present in the drinking water when we compare with the recommended readings.

In the tap water sample which is directly coming from Murdy river has the value of conductance as 138 ($\mu\text{s}/\text{cm}$) and TDS as 69 mg/l which is within the permissive levels of drinking water parameter laid down by WHO as well as Indian drinking water given in my table hence viewing these chemical parameters water is fit for dinking. Similarly the both parameters of kiwi mineral water have been found as 82 ($\mu\text{s}/\text{cm}$) and 38 mg/l. It is because that during processing of mineral water, ions and TDS have been removed up to certain extent. So the tap water coming from Murdyriver has more conductance and TDS. The research also shows that the conversion of the

tap water into mineral water needs less effort. The permissive level of the conductance measurement and TDS laid down by Indian standard is 1500 $\mu\text{s/cm}$ and 500 mg/l correspondently⁹ and WHO also are the same.¹⁰

| Samples and permissive levels | Conductance ($\mu\text{s/cm}$) | Total dissolved solids (mg/l) |
|--|----------------------------------|-------------------------------|
| Tap water, PNC Source – Murdy river | 138 | 69 |
| Kiwi mineral water Source- boring water | 82 | 38 |
| Permissive level of WHO | 1500 | 500 |
| Permissive level of Indian standard | 1500 | 500 |

Table. 1 The readings of the experimental values from the TDS & EC meter at 19°C.

Conclusions

1. The conductance of tap water coming from Murdyriver is 138 $\mu\text{s/cm}$ and TDS is 69 at 19°C on 2022 march 10. (Non – rainy season in Pokhara)
2. The conductance of Kiwi mineral water is 82 $\mu\text{s/cm}$ and TDS is 38 at 19°C on 2022 march 10.
3. Both of the water samples have the conductance and the TDS are within permissive levels of drinking water according to WHO and Indian standard. Therefore both water samples are chemically fit for drinking viewing two parameters.
4. The river water has more conductance and TDS than the mineral water.

5. These waters do not need chemical treatment for drinking purposes for these parameters.
6. The conversion of the tap water to mineral water needs less effort viewing these two main parameters.

ACKNOWLEDGMENT

The authors are grateful department of chemistry P.N.Campus and Applied Sciences and humanities department I.T.S Engineering college for providing related important information and encouragement.

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