

A comparative study on the physico-chemical analysis of Raw water and Packaged drinking water in two places of Warangal District

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ABSTRACT

Raw water and Packaged drinking water samples were collected from Ashoknagar and Narsampet areas in Warangal District, Telangana State have been studied. Water samples were collected between 7 AM and 9AM every month. Water samples collected for the purpose of estimation of various parameters were brought to the laboratory and subjected to analysis immediately as far as possible. Estimation of parameters such as PH, Total dissolved solids, Alkalinity, Nitrates, Chlorides, Sulphates, Borates etc., were carried out. Most of the physico-chemical parameters of Packaged drinking water were within ISI and WHO permissible level. However Raw water samples were exceeded the recommended permissible levels. So Raw water is not recommended for human consumption.

Key words: Water quality, physico-chemical parameters

INTRODUCTION

Water is considered as most important resource for all living beings on this planet. Water has several unique properties which render it as most comfortable medium for animal life. All living organisms on the earth need water for their survival and growth. Earth is the planet having about 70% of water. But due to increase human population, industrialization, use of fertilizers in the agriculture and man-made activity, it is highly polluted with different harmful contaminants. Therefore, it is necessary that the quality of drinking water should be checked at regular time interval to avoid several water borne diseases. The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life.

The quality of water effects the species composition, abundance, productivity and physiological conditions especially, the indigenous population of aquatic organisms. (Wetzel RG, 2001). The alteration in physico-chemical parameters leading to eutrophication has become widely recognized problem of water quality deterioration. In recent years increase in human population, demand for food, land conversion and use of fertilizer have led to faster degradation of many fresh water resources. (Ray D *et al.*, 1999 and Carpenter RS, 2005). Water for human consumption must be free from organisms and chemical substances in large concentration may affect health. Water quality depends on factors such as geological morphology, vegetation and land use (Mishra *et al.*, 2013 and Olyemi *et al.*, 2010). The presence of pathogenic microbes effects the quality of water (subhadradevi *et al.*, 2003). The poor quality of water leads to many adverse effects on human health (Tyagi *et al.*, 2000). Therefore it is necessary that the quality of water checked at regular time interval.

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MATERIAL AND METHODS

The water samples were collected during the study period 2011-12 (Raw water and Packaged drinking water) from Ashoknagar and Narsampet areas of Warangal District to study the physico-chemical parameters. The water samples were collected in glass bottles and stored at 4°C. The P^H of the water samples were measured by electrometric methods and other physico-chemical parameters were analyzed by standard methods given in APHA, 1989 (Coppuccino, 1996).

RESULTS AND DISCUSSION

Variations of the physico-chemical parameters:

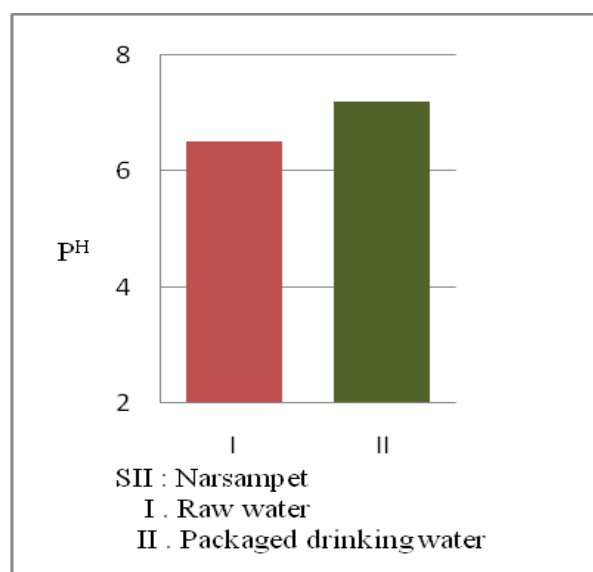
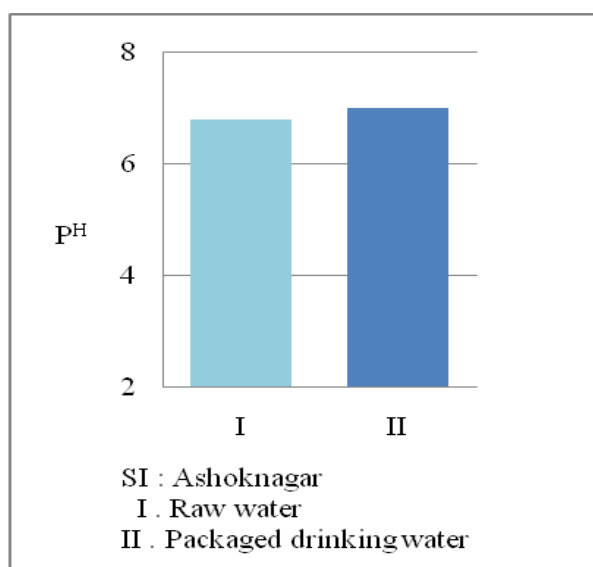
Variations of the physico-chemical parameters are shown in table-1. In the present investigation, the P^H of Raw water in Ashoknagar and Narsampet is about 6.0

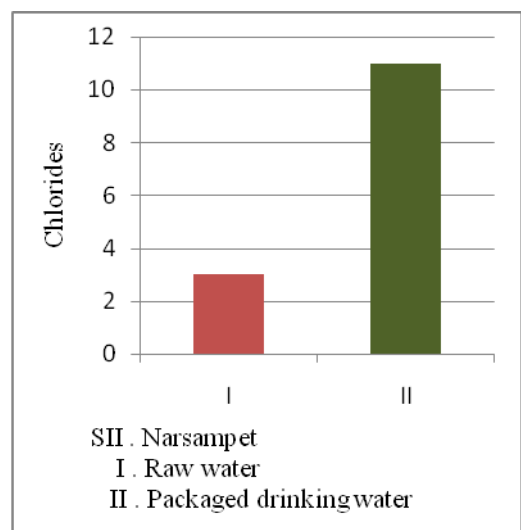
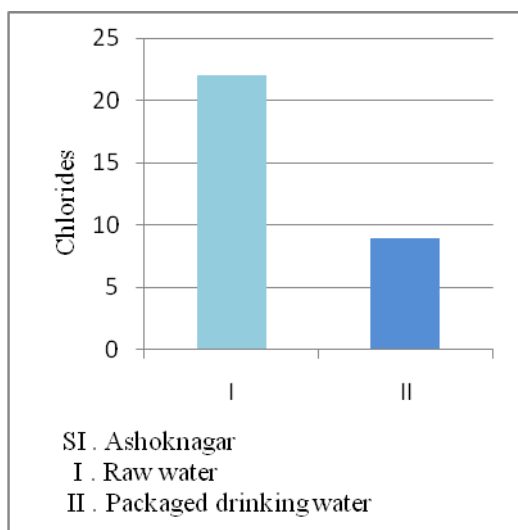
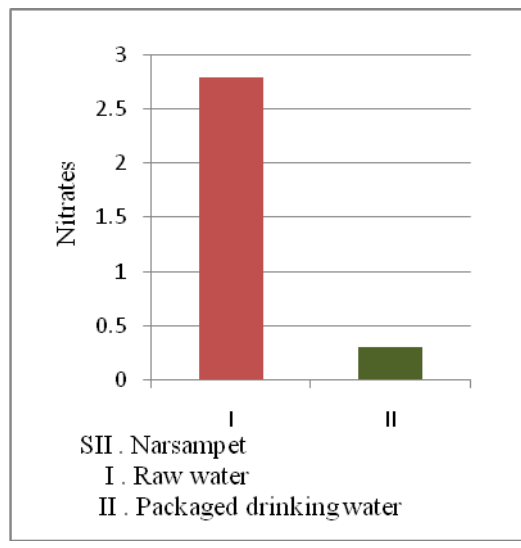
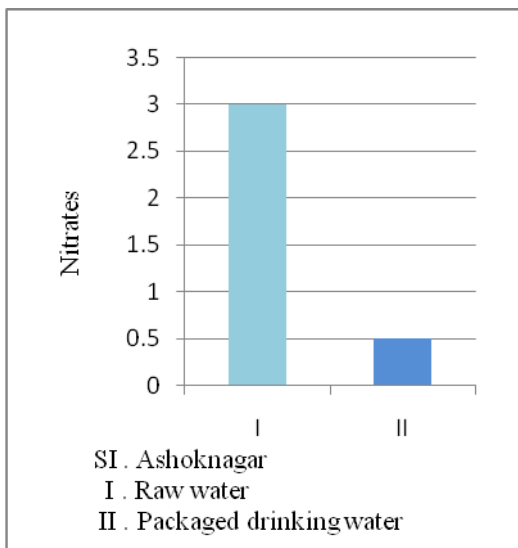
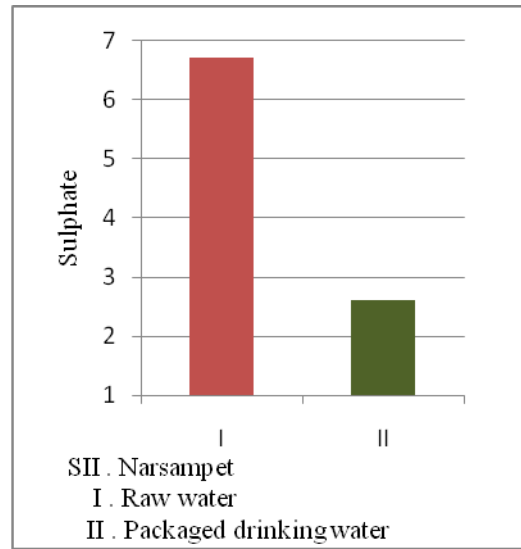
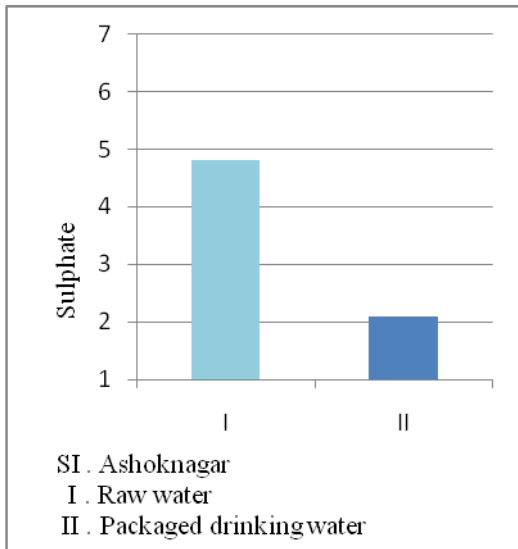
and 6.5 and P^H of Packaged drinking water is about 7.0 and 7.2. The permissible limit of P^H of water is about 6.5 to 8.5 (ISI). The P^H of the both samples were within the permissible limit (Joshi *et al.*, 2002 and Tyagi *et al.*, 2000). The amount of Total dissolved solids of both samples were in the permissible level as per ISI. Colour, Odour and Turbidity are same for the both samples (Subhadradevi *et al.*, 2003).

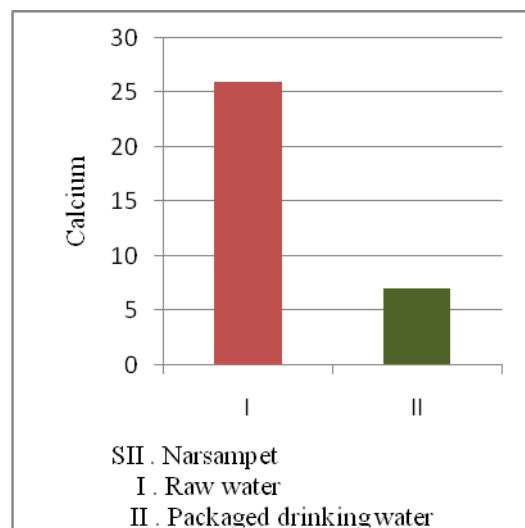
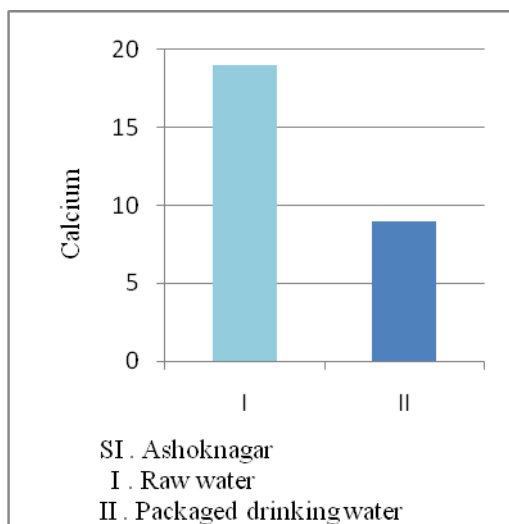
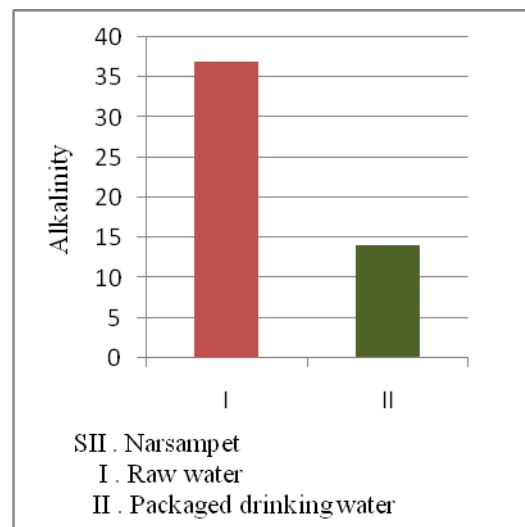
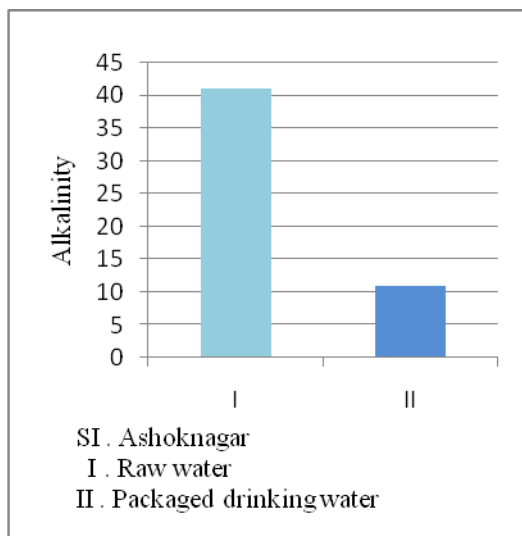
In the Raw water samples taken from Ashoknagar (station-I) and Narsampet (Station-II) contain Nitrates (SI-3PPM, SII-2.8PPM), Chloride (SI-22 PPM, SII-3PPM), Sulphates (SI-4.8 PPM, SII-6.7 PPM), Calcium (SI-19PPM, SII-2.6 PPM), Alkalinity (SI-41PPM, SII-37PPM) respectively. Packaged drinking water samples contain Nitrates (SI- 0.5PPM, SII-0.3PPM), Chlorides (SI-9 PPM, SII-11PPM), Sulphates (SI-2.1PPM, SII-2.6PPM), Calcium (SI-9PPM, SII-7PPM), Alkalinity (SI-11 PPM, SII-14PPM) respectively.

Table-1. Variations of the physico-chemical parameters.

Sl. No.	Physico Chemical Parameter	Ashoknagar		Narsampet	
		Raw Waster	Packaged Drinking Water	Raw Waster	Packaged Drinking Water
1.	Colour	Below 2 Hazan Units	Below 2 Hazan Units	Below 2 Hazan Units	Below 2 Hazan Units
2.	Odour	Acceptable	Acceptable	Acceptable	Acceptable
3.	Turbidity	< 3 NTU	< 2 NTU	< 4 NTU	< 2 NTU
4.	P ^H	6.8	7.0	6.5	7.2
5.	Barium	-	-	-	-
6.	Copper	-	-	-	-
7.	Mangnese	-	-	-	-
8.	Iron	-	-	-	-
9.	Sulphate	4.8PPM	2.1PPM	6.7PPM	2.6 PPM
10.	Nitrates	3 PPM	0.5PPM	2.8 PPM	0.3 PPM
11.	Chlorides	22 PPM	9 PPM	3 PPM	11 PPM
12.	Alkalinity	41 PPM	11 PPM	37 PPM	14 PPM
13.	Calcium	19 PPM	9 PPM	2.6 PPM	7 PPM







By comparing these values, it is stated that Nitrates, Chlorides, Sulphates, Calcium and Alkalinity are more in Raw water than in Packaged drinking water. Similar observations are made by Basavaraja *et al.*, (2011), Mishra, M.K (2013), Ahuja Sangeetha (2015), Asadi,S.S (2007), Bhadja (2013), Dabrased Prashanth (2015), Gupte *et al.*, (2014), Jain M.K *et al.*, (2011), Jayabhaye U. Metal (2008), Jyothi Choudhary (2014), Kaur, H *et al.*, (2015), Khan, Muzaffar Uzarmauffat (2014), Pawar *et al.*, (2015), Sinha, A.D *et al.*, (2013).

CONCLUSION

The present study reveals that the concentration of the physico-chemical parameters are very much higher in Raw water samples than the Packaged drinking water collected from Ashoknagar and Narsampet, Warangal District. Some effective measures are urgently needed to improve the Raw water quality. A periodic survey is also recommended to maintain the water quality.

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Conflict of Interests

Authors declare that there is no conflict of interests regarding the publication of this paper.

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