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Study on potability of water from Abna river at Nimar region of Madhya Pradesh

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ABSTRACT

*In the present work, water samples were collected monthly from October 2011 to September 2012 in duplicate totaling 72 water samples. The three sampling locations were: BABRI BAN (**BB**), THE KISHOR KUMAR MUKTIDHAM (**KKM**) & CHHAIGAON DEVI (**CHD**).Quality of water is an important factor in development and use of ground water as resources. Various physico-chemical parameters like Temperature, Turbidity, pH, Hardness, Calcium, chloride, Iron, Fluoride, Carbon-dioxide and Total dissolved solids have a significant role in determining the potability of drinking water (WHO 1971).*

Key words: Potability, Abana River, Nimar region, M.P.

INTRODUCTION

The present study deals with above parameter to find out potability of water from Abna River, 1 k.m. away from Khandwa city. Khandwa district lies between 21^0 5" to $22^0$9" N latitude and $78^0$1" to $79^0$49" E Longitude. It is bounded on east by Betul, Hoshangabad districts of Bhopal division and Amravati (Maharashtra) district. On the south by Burhanpur district and Amravati (Maharashtra), on the west by West Nimar and in North by Dewas district.

MATERIALS AND METHODS

Water samples were collected monthly in duplicate Total 72 water samples were collected from the study area collected in two liter plastic canes and analyzed for different physicochemical parameters like Temperature, pH, Turbidity, Carbon dioxide, Acidity, Alkalinity, DO, hardness, Calcium, chloride, Iron, Fluoride and Total dissolved solids by following standard techniques given in APHA, AWWA & WPCF 1976..

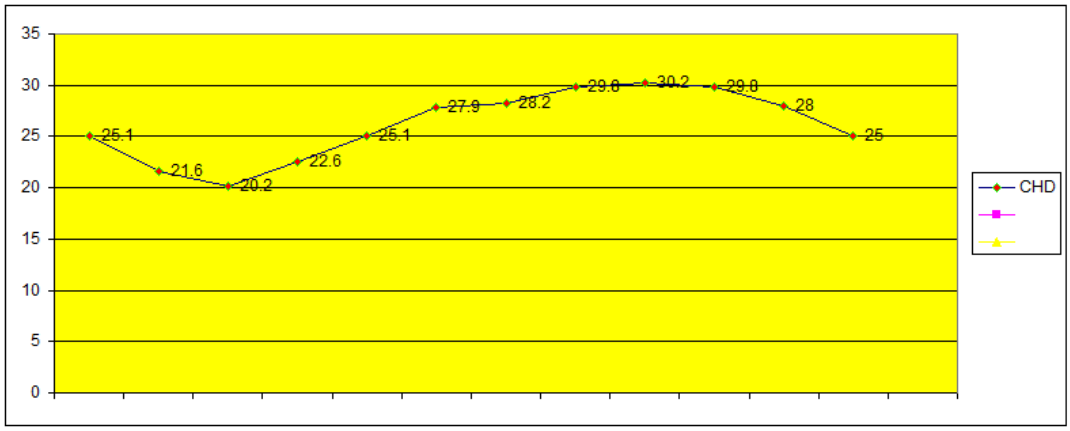
RESULTS AND DISCUSSION

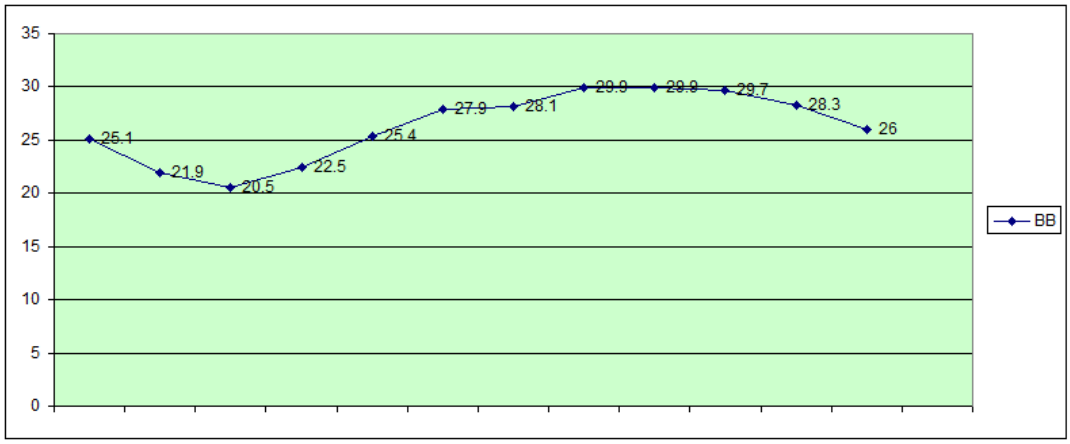
The mean value (+_SD) of different parameters of water sample take from CHD, BB, and KKM are given in Table –

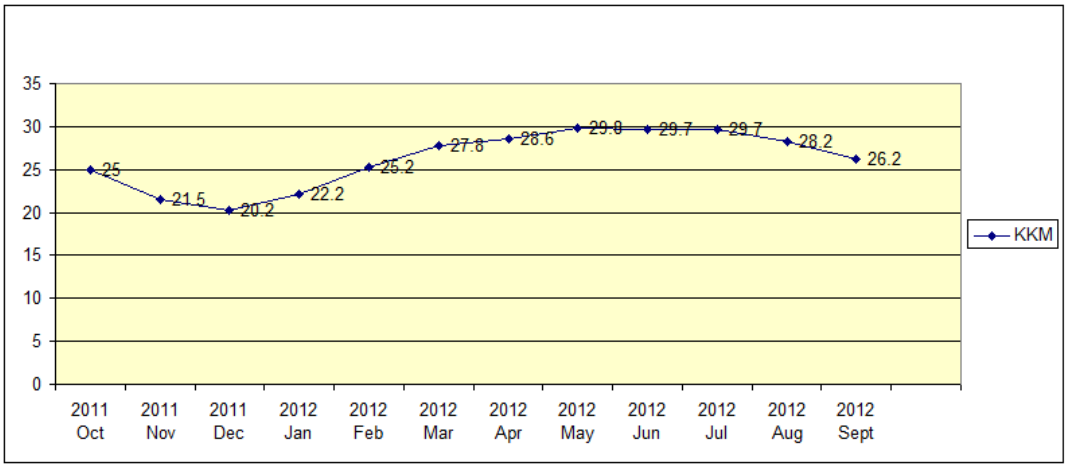
Table: Physico – Chemical Properties of Water collected from three sites during October 2011 to September 2012

S.No	Parameters	CHD	BB	KKM
1	Temperature(^{0}C)	25.2+5	25.2+4.7	25.15+4.65
2	pH	7.58+0.74	7.44+0.6	7.45+0.55
3	Turbidity(NTU)	35+30	35.5+34.5	22.5+17.5
4	Free Carbon-di-oxide mgL^{-1}	0.77+0.56	0.89+0.78	0.70+0.59
5	Alkalinity mgL^{-1}	156+44	169+31	124+56
6	Calcium mgL^{-1}	72+48	33+17	35.5+24.5
7	Total hardness mgL^{-1}	275+225	159.5+95.5	167.5+122.5
8	Chloride mgL^{-1}	22.5+7.50	28+22	27+17
9	Iron mgL^{-1}	0.035+0.08	0.031+0.06	0.036+0.07
10	Fluoride mgL-1	0.047+0.07	0.052+0.08	0.050+0.08

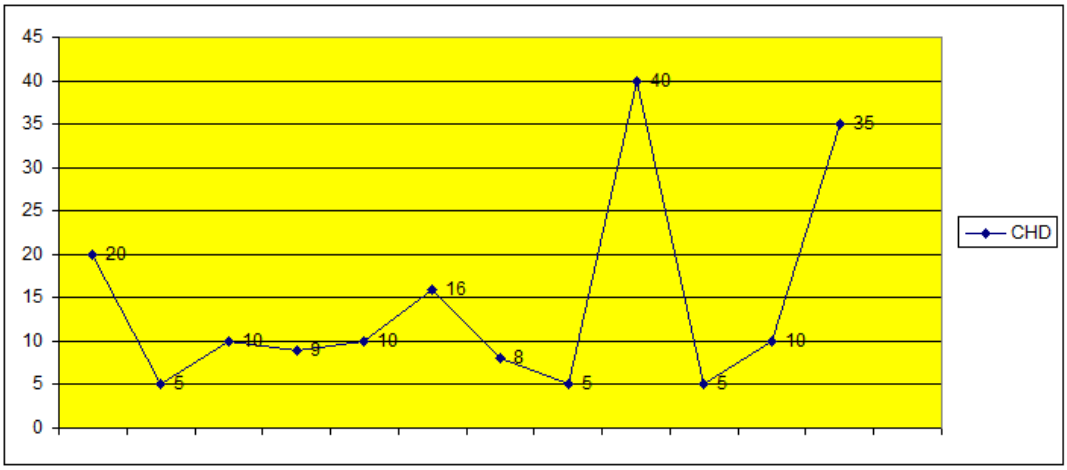
Graphs: - showing seasonal variation of physical and chemical parameters during the year October 2011 to September 2012 -- Temperature in ^{0}C

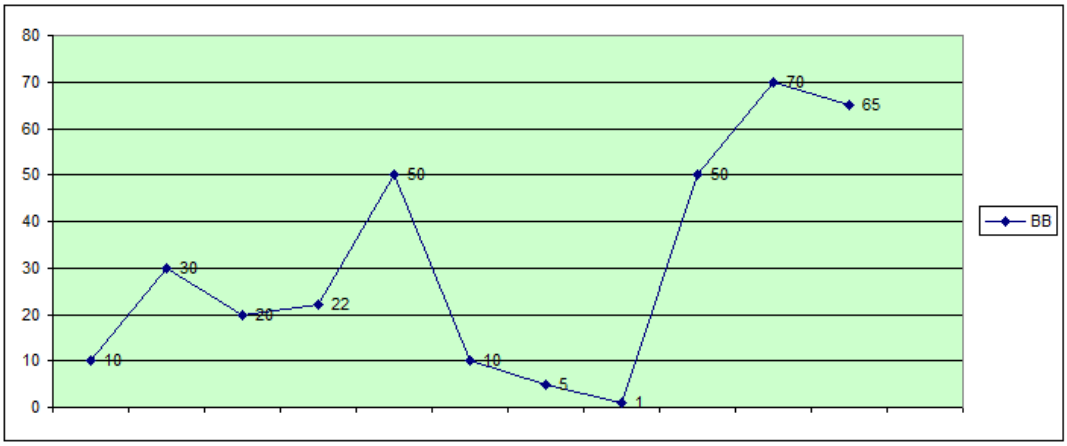


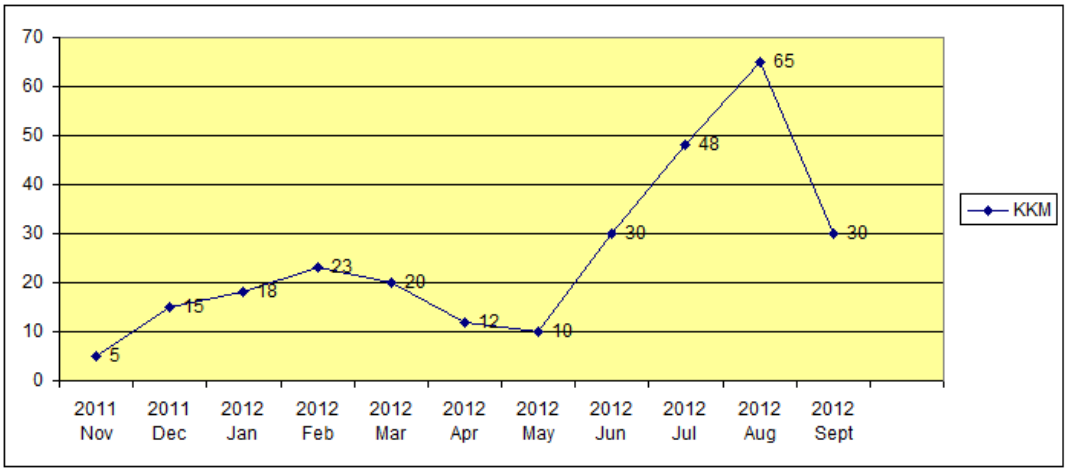




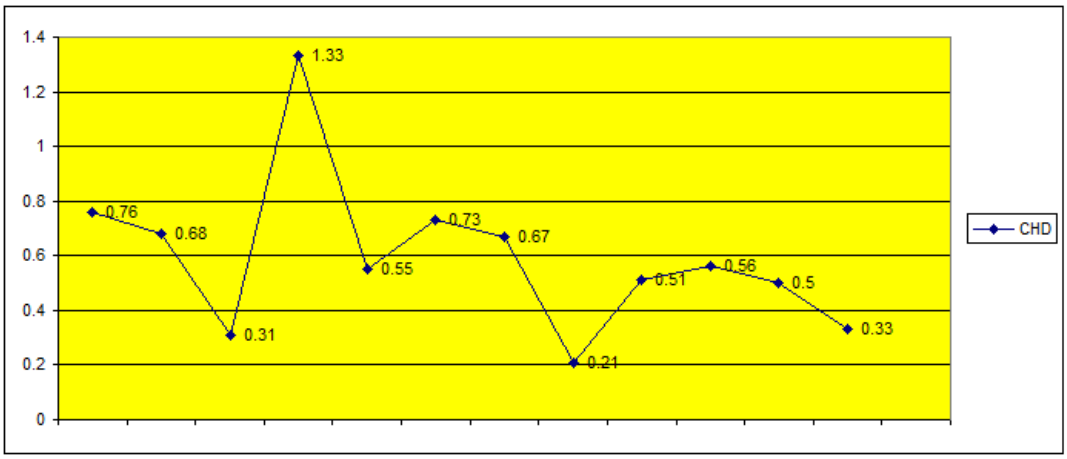
Turbidity in NTU

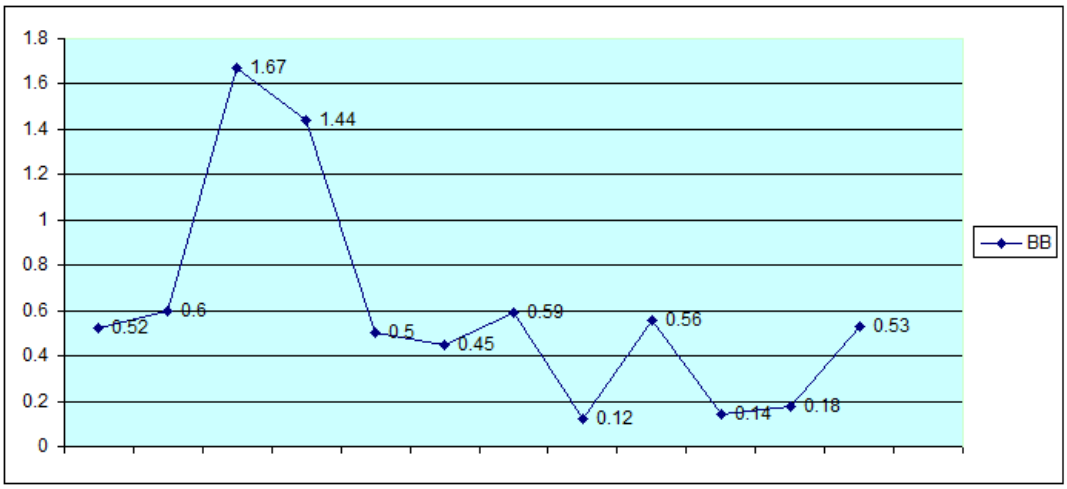


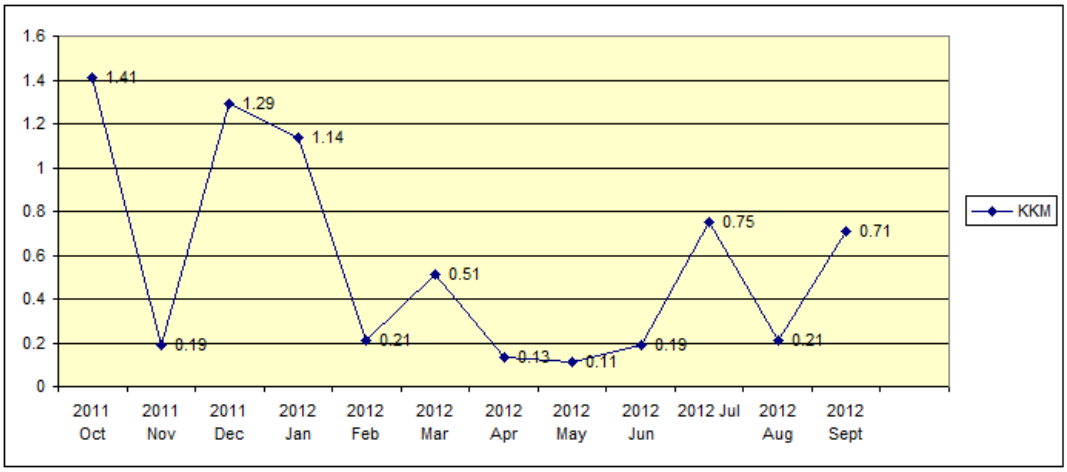




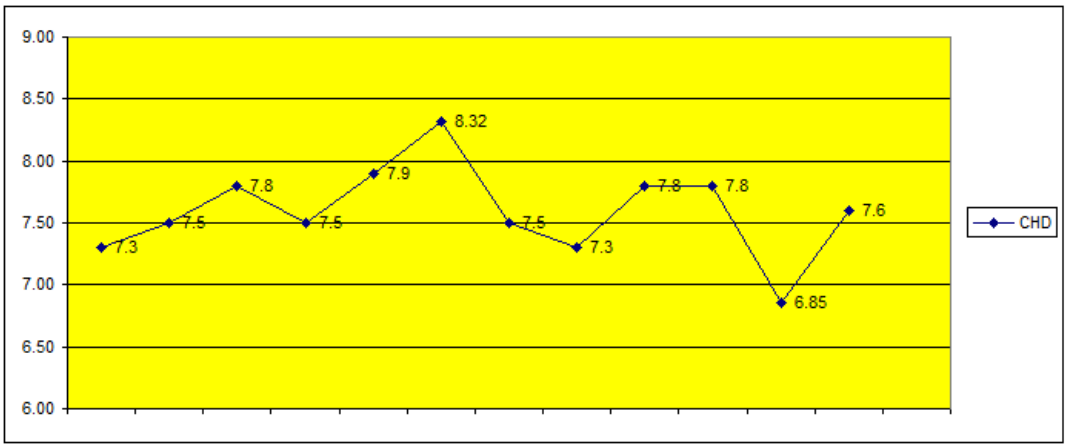
Free Carbon-di-Oxide in mg/lit

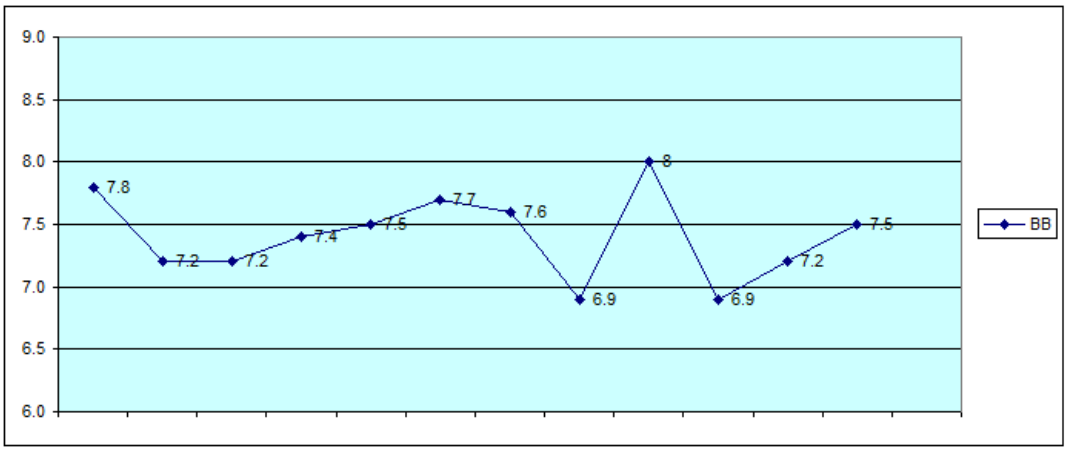


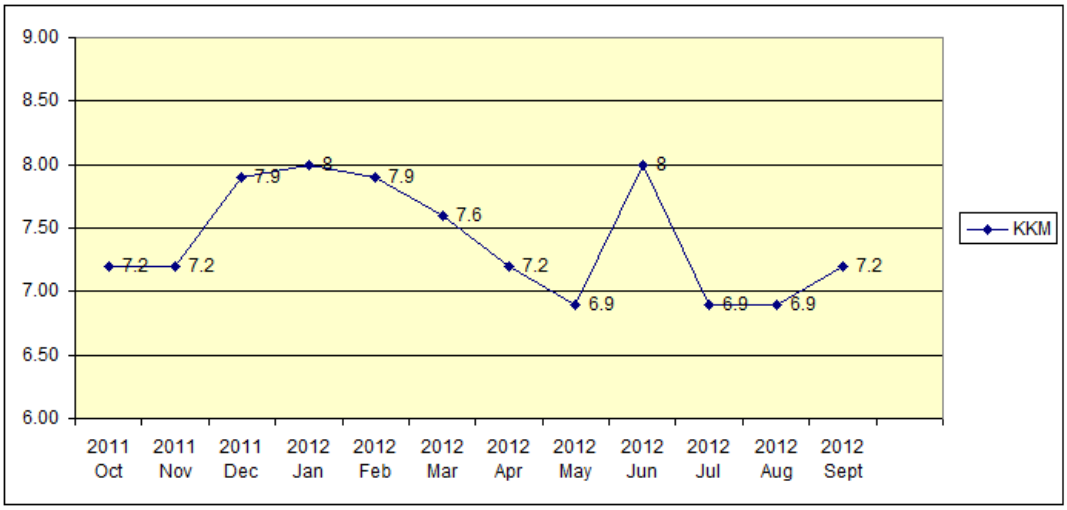




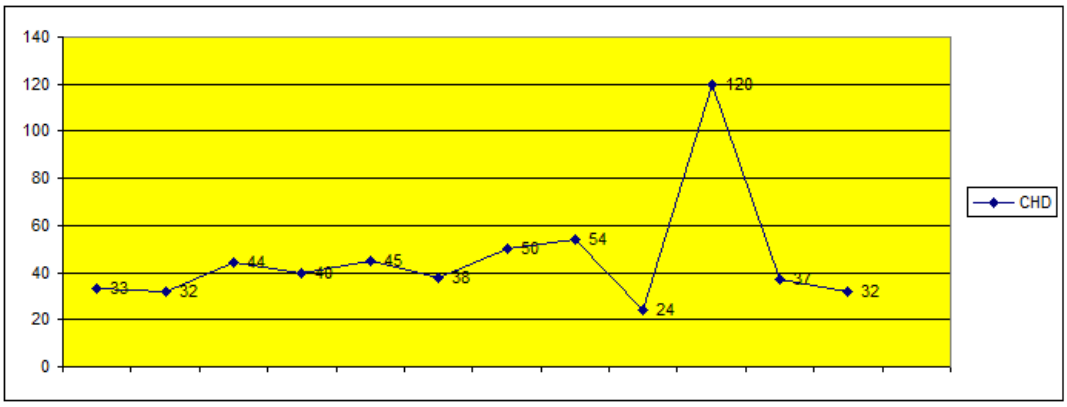
Hydrogen Ion Concentration(pH)

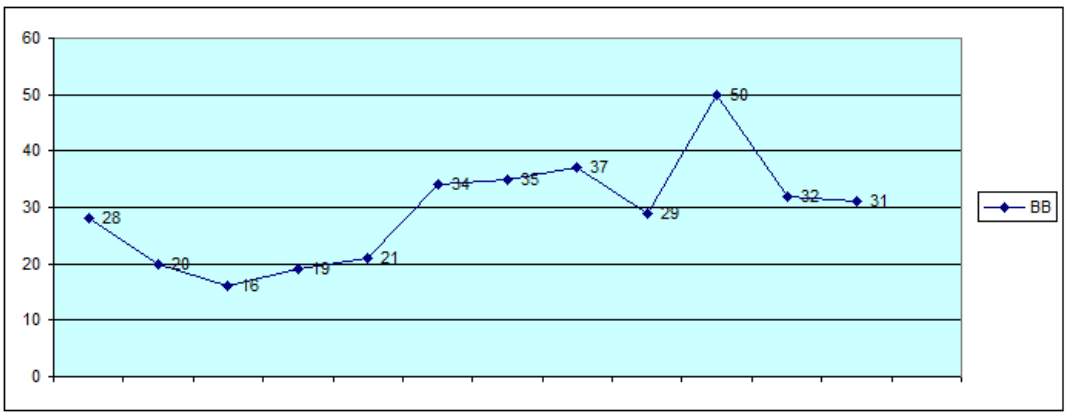


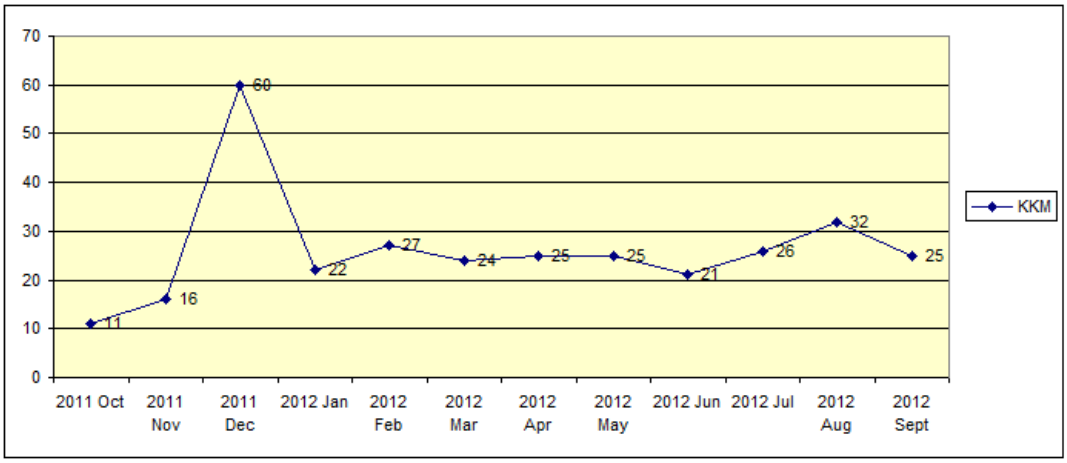




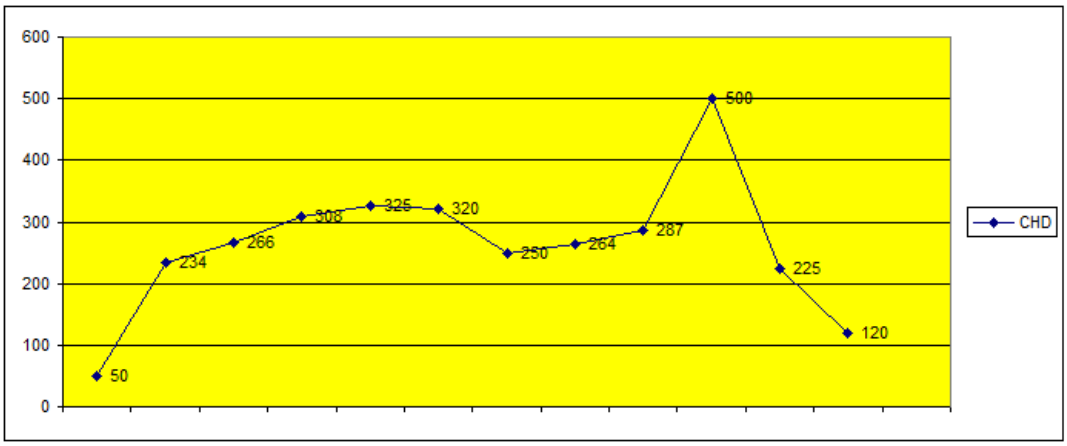
Calcium in mg / lit

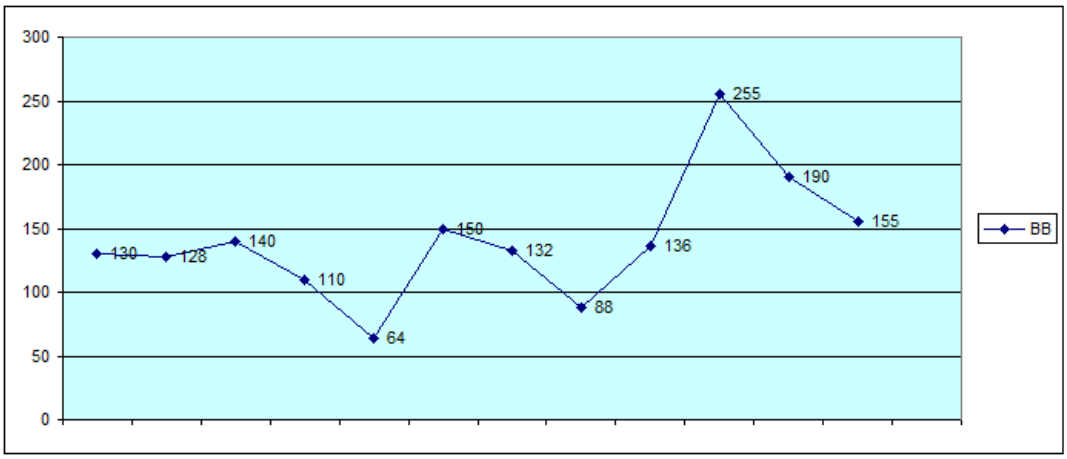


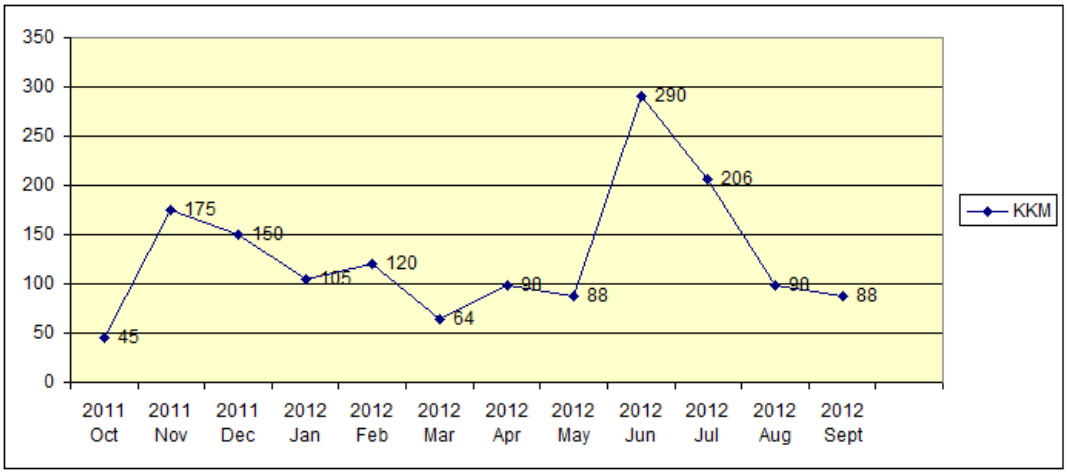




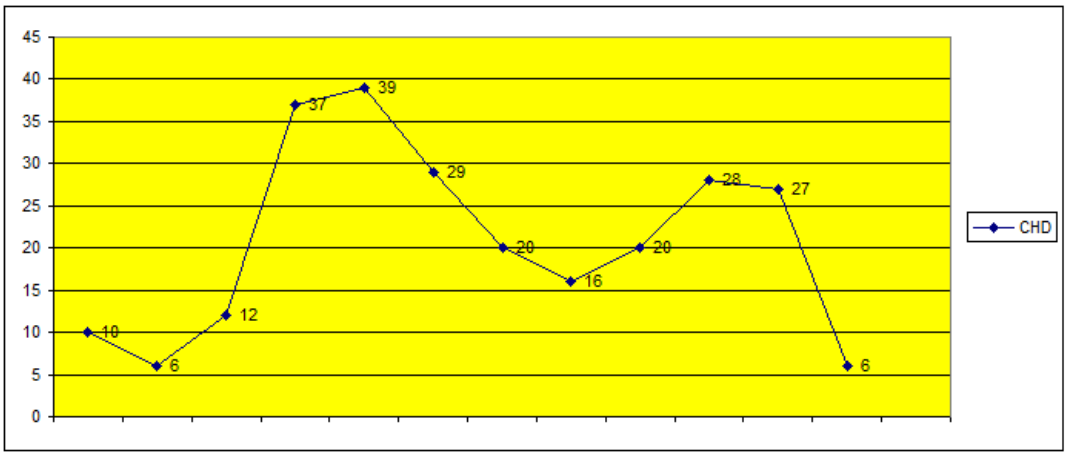
Total Hardness in mg/lit

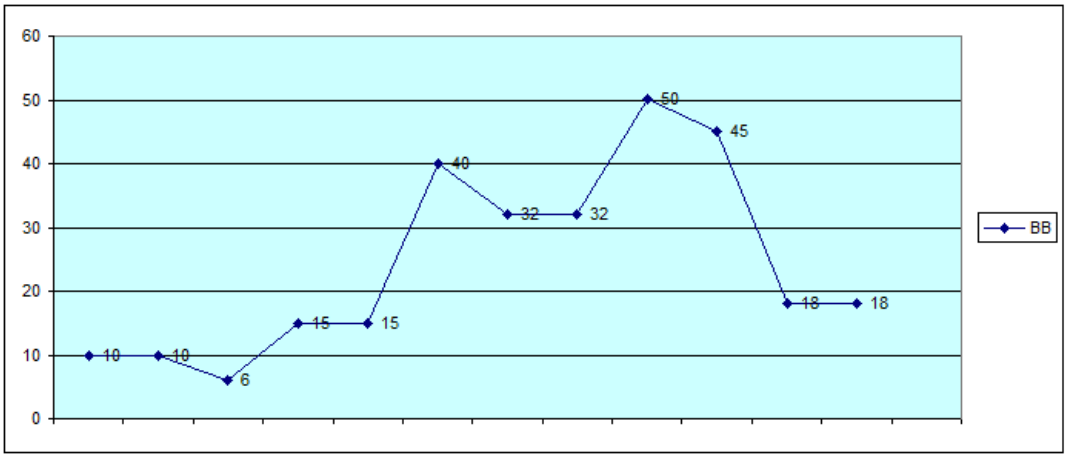


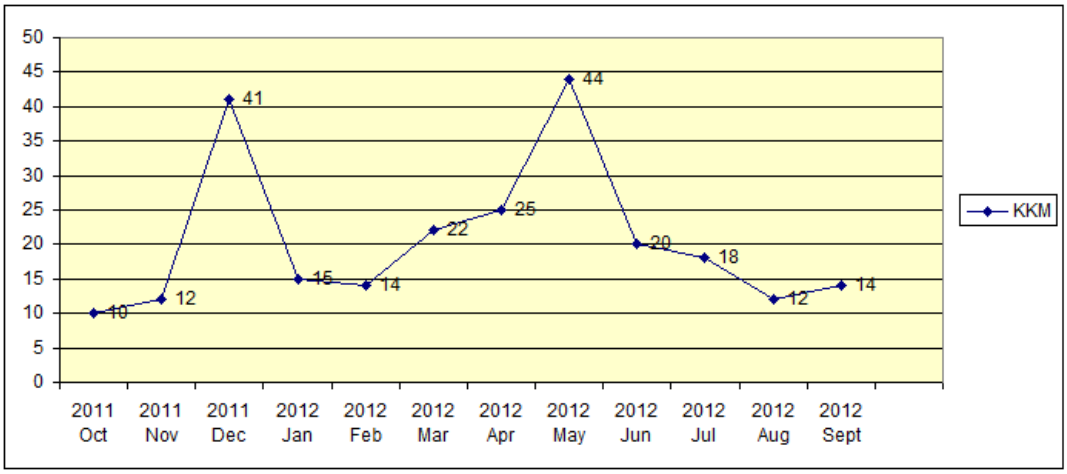




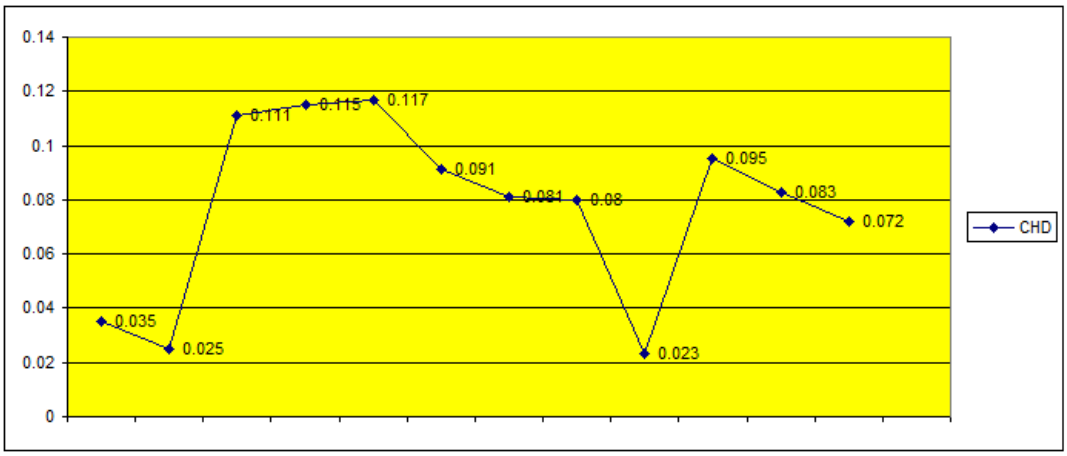
Chloride in mg/lit

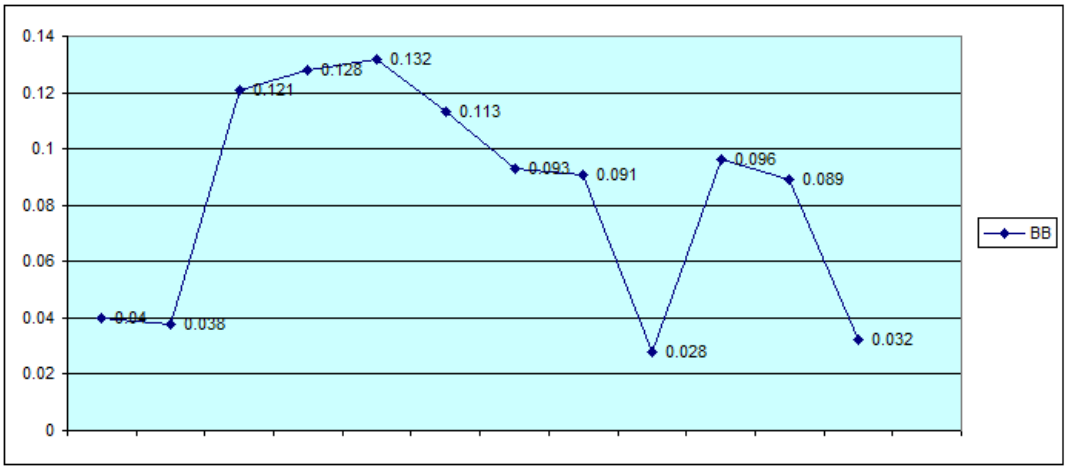


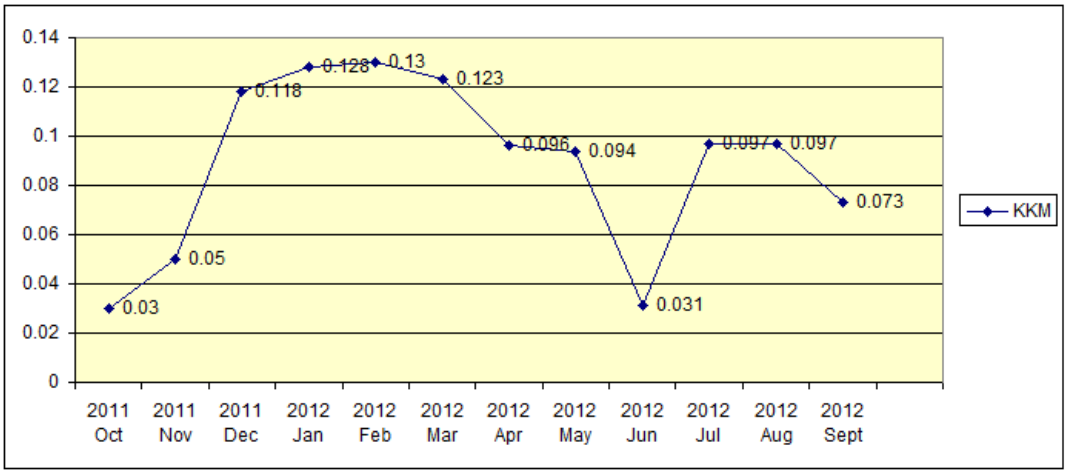




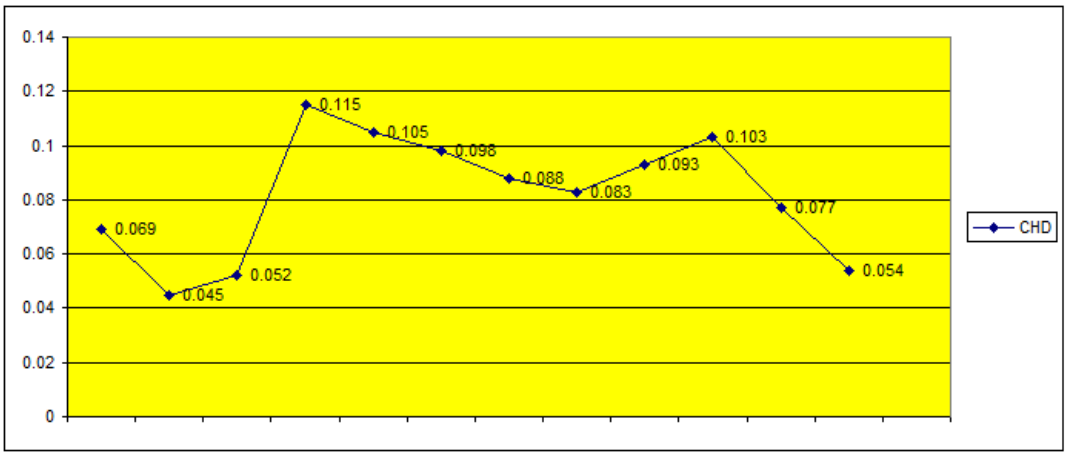
Fluoride in mg/lit

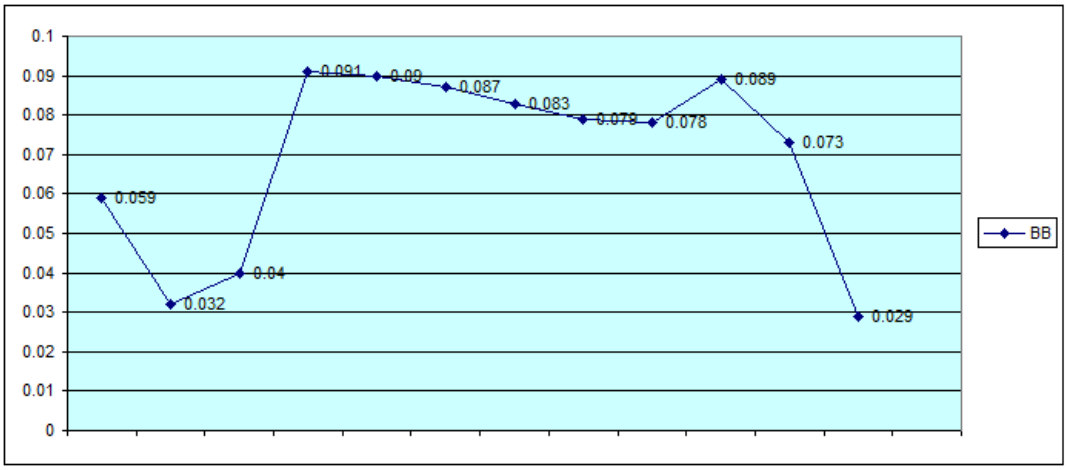


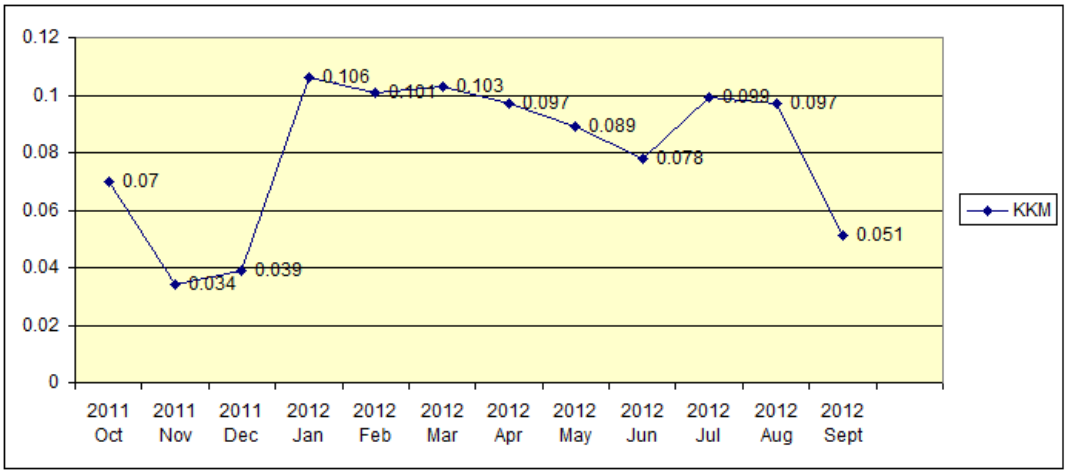




Iron in mg/lit







•Temperature: -The average temperature was CHD 25.2+5; BB 25.2+4.7 and KKM 25.15+4.65 temperature of sampling stations were varied with time of collection and month of year. WHO did not recommend any definite temperature value for drinking water.

• Turbidity: - The water of BB showed maximum turbidity due to presence of phytoplanktons, but these values were within limit recommended by WHO the minimum turbidity in KKM water may be because of running water.

• pH value: - The pH value detected in water of Abna River was within the permissible limit of 7.44 to 8.32. WHO has not recommended any range of acidity / alkalinity for the drinking water. The pH of sample was with in limit.

• Hardness: - Calcium is also responsible for the hardness of water (Bouwer, 1978). The CHD water showed more calcium and hardness in comparison to water from other sources. The concentration of calcium and hardness of all the three sources were within the permissible limits with respect to sampling date, it was noted that maximum amount of calcium was observed in rainy months.

• Chloride: - The chloride concentration was different with respect to sampling location and sampling month the concentration of chloride in BB water showed high range in comparison to water from other sources. However, water of all the three sources showed minimum permissible amount of chloride.

• Iron: - The iron concentrations were not significantly different of all the three sources iron is an essential element in human nutrition the amount of iron of all the three sources were lower in comparison to the standard set by WHO.

• Fluoride: - the amount of fluoride in KKM and CHD water was lower in comparison to the standard set by WHO However BB water showed minimum permissible amount of fluoride.

•Free carbon-dioxide: - the presence of bicarbonates and carbonates plays an important role in making water hard and corrosive (Khanna, 1984). However, WHO has not recommended any limit of carbon-dioxide in water in present study KKM and CHD water showed less amount of carbon-dioxide as compared to BB.

• TDS (total dissolved solids) :- EPA (1976) standard that total dissolved solids (TDS) in water are present mainly in the form of sodium, potassium, calcium, magnesium, carbonates, bicarbonates, chlorides nitrates and sulphates considering the WHO standard the present study showed deficiency of the TDS in the water from all the sources.

CONCLUSION

Analysis of water sample from the study area indicates that the drinking water is potable.

Acknowledgement
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