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Short Communication

STUDY OF SALINITY IN SELECTED AREAS OF SAMBHAR TOWN

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ABSTRACT
Salinity is one of the major abiotic stress that adversely affects the crop productivity and its quality. Due to this, large areas of arable lands are substantially or partially unproductive. This paper contains the results of a study carried out at Sambhar Town in Jaipur district. Sambhar is internationally known as world heritage due to availability of salinity and birds for different kinds. Water samples were collected from three different locations. pH, Total alkalinity, Total hardness, Calcium hardness, Chloride, Nitrate, Total dissolved solids and Fluoride were estimated. pH varies between 7.8-7.9, Total alkalinity between 210.0 mg/l to 215.0 mg/l, Total hardness between 465.0 mg/l to 480.0 mg/l, Calcium hardness between 200.0 mg/l to 210.0 mg/l, Magnesium hardness between 270.0 mg/l to 272.0 mg/l, Chloride between 940.0 mg/l to 946.0 mg/l, Nitrate as (NO_3^-) between 122.0 mg/l to 125.0 mg/l, TDS between 2450.0 mg/l to 2455.0 mg/l and Fluoride between 1.1 mg/l to 1.2 mg/l.

KEYWORDS: salinity, physical characterstics, chemical characteristics, agricultural fields.

INTRODUCTION

Salinity is an widespread environmental problem, particularly in arid and semi-arid regions of the world, where rainfall leaches salts out of soils in humid regions, and salt problems are rare and transitory. In general, the term salinity includes all the problems due to salts present in the soil and interfere the growth of most crop plants. The common cations associated with salinity are Na^+, Ca^+, and Mg^+. High salinity is one of the most important environmental factors that produce osmotic stress and limit plant growth and crop productivity (Cicek and cakirlar, 2012; Meloni *et al*., 2004; Hendawya *et al*., 2005). Most crops are sensitive to salinity caused by high concentration of salts in the soil. Soil affected by salinity makes it hard for the plants to absorb all the nutrients necessary to be healthy. The main concern is that excess salinity in soil water can decrease availability of water for plants and cause different kinds of stresses in plants. Several studies were carried out on the effect of salinity on the growth, metabolism, and yield of the plants results of the several studies revealed that high salt levels have negative effects on plant growth and crop yield productivity. The principal effect of salinity in soils is injurious to plants *i.e*. high osmotic pressure of the soil solution, which reduces the availability of the water to plants. On the other hand how concentrations of Nacl had a negative effect on agronomic parameters and limited the growth of plants, and salt injury symptoms e.g. chlorosis were clearly visible in the plants at high Nacl concentrations (Taffouo *et al*., 2008; Majafian et al.,2008; Kachout *et al*., 2009; Amirjani,2010; Manel et al.,2011).
Study area Sambhar town has been selected as study area. Sambhar is a small town, located at a distance of 60 kms in the west of jaipur, on jaipur-ajmer highway. Sambhar is famous for the largest saline lake in India. Due to this fact, sambhar is also known as salt lake city. Sambhar is located in the central region of rajasthan (latitude 26˚52'N-27˚02'N and longitude 74˚54'E-75˚14'E). Sambhar has been designated as a ramsar site in the year 1990. Several migrating birds visit the water body during the winter. The maximum temperature of Sambhar is 49˚C and minimum temperature is 23˚C and in winter 02˚C. The important crops grown in this town are Wheat, Mung, Moth, Cowpea, Guar, Bajra, etc. The objectives of the present study are to analyze the physico-chemical properties of saline water used for irrigation in Sambhar town. This can help to find out tolerance against salinity in crop plants species.

MATERIALS & METHODS

For the present study water samples were collected from three different locations of Sambhar town in Jaipur district. Water samples were collected in cleaned and washed glass bottles and brought to the laboratory for analysis, using standard techniques for physico-chemical parameters. Physico-chemical analysis were conducted for physico-chemical parameters like pH, Electrical conductivity, TDS (total dissolved solids), Total hardness, Calcium hardness, Magnesium hardness, Chloride, Nitrate and Total alkalinity were determined by standard methods given in APHA(1998).

RESULT & DISCUSSION

The physico-chemical properties of saline water (collected from three different locations of Sambhar town in Jaipur district) were analyzed in the present study. Results revealed that pH of water samples collected from the study area varied from 7.8 to 7.9. During the study period maximum pH was noted in the Area 2. Electrical conductivity of water samples ranges between 3.60 to 4.20 ds/m, total dissolved solids varies between 1.70 to 2.87 ppt (parts per trillion), chloride concentration (salinity) varies

from 940.0 to 946.0 mg/l and highest noted in the Area 2. Total alkalinity of water samples varies between 210.0 to 215.0 mg/l, total hardness varies from 465.0 to 480.0 mg/l, calcium hardness ranges from 200.0 to 210.0 mg/l, magnesium hardness varies between 270.0 to 272.0 mg/l, nitrate varies from 122.0 to 125.0 mg/l and fluoride varies between 1.1 to 1.2 mg/l. Table 1.

TABLE 1: physico-chemical analysis of water samples collected from areas of Sambhar town.

S.No.	Parameters	Area 1	Area 2	Area 3
1	pH	7.8	7.9	7.8
2	E.C. (ds/m)	3.60	4.20	3.65
3	Turbidity	Nil	-	-
4	Total Alkalinity (mg/l)	210	215	210
5	Total Hardness (mg/l)	470	480	465
6	Calcium Hardness (mg/l)	200	210	200
7	Magnesium Hardness (mg/l)	270	270	272
8	Chloride (Salinity in mg/l)	940	946	945
9	Nitrite	Nil	-	-
10	Nitrate (mg/l)	124	125	122
11	T.D.S (ppt)	1.70	2.87	1.78
12	Fluoride (ppm)	1.2	1.2	1.1

E.C (Electrical conductivity), TDS (total dissolved solids), ppt (parts per trillion)

CONCLUSION

In the present study, results revealed that the highest salinity was found in the Area 2 of Sambhar town. Crop plants are reported to be sensitive to salinity both in our country and at global level. The results of this study will be helpful and suggest as what measures can be taken against this menace in our study area.

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