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"Evaluation Of Soil Samples For Its Physicochemical Parameters Collected From Kutch District, Gujarat"

Vinayak S.*, Bhavya S., Sai Sanchali P., Shreya P. and Suhani R.
Department of chemistry, Adani public School, Nana Kapya Mundra, Kutch, Gujarat

Corresponding Author*
Vinayak Suradkar
HOD Department of chemistry
Adani public School Mundra

Abstract:

The present study focused on the quantitative measurements of physicochemical parameters of some soil samples collected from various villages of Gandhidham, Bhuj, Mundra, Anjar, Bhachau, Mandvi and Nakhatrana talukas of Kutch district, Gujarat. Fourteen representative samples were collected and analyzed for PH, EC, TDS, Hardness, sodium, carbonates, bicarbonates, chloride RSC etc. This information will help the farmers to know amount of fertilizers to be added in soil for better production.

Key words: Kutch district, soil, physicochemical parameters.

Introduction

Soil is an important factor in the nature which provide natural habitat for plants and animals. Soil can hold water and contain many nutrients which are essential for the growth of the plants[1]. India is agricultural country. Agriculture plays an important role in the economic growth of country. When farmers harvest their crops, some of these nutrients get removed from the agricultural soil. So they are restoring the soil contents by using different kind fertilizers[2]. Soil and water are most important natural resources in cultivation of crops[3].

Soil is always responds to change in the environmental factors. The pollution of soil is common which happens due to presence of various activities and soil becomes contaminated due to the presence of manmade activities4. Several diseases are inflicted in human beings due to pathogenic forms present in the soil. The soil is a complex organization being made up of inorganic matter, organic matter, soil organisms, soil moisture etc. The soil contains approximately 50-60% mineral matter, 25-35% water, 15-25% air5. Soil testing is essential and is the first step in obtaining high yield and maximum returns from the money invested in fertilizers. The quality of soil is very essential for the growth of plants. It performs various important functions like providing water to the roots, site of accumulation of many beneficial bacteria and providing necessary nutrients to the plants etc[6]. So, it is the need of time that we should study the physico-chemical parameters of soil to know its quality.

Methods and Materials

Sample collection: Each sample was collected from active farm areas at a depth of 15-20 cm to target the root zone. Approximately 1000 grams of soil from each location were gathered and stored in labeled, airtight plastic bags to preserve their integrity until laboratory analysis.

Sample Preparation: Weigh a 1000 g of dry soil and add 1000 ml of distilled water and stir the content. After 1 hour filter the suspension using filter paper to get a clear soil extract.

Methods: The parameters like chlorides, alkalinity, total hardness, carbonates and bicarbonates were in the school's laboratory by using standard methods. The other parameters were analyzed from outside laboratory of Krishi Vigyan Kendra Mundra, Kutch Gujarat.

Results and discussions: The analysis was aimed to evaluate the micronutrient status of some selected soils of Kutch. The results of Physico-chemical properties of the soil samples are given in Table- No:1

Table NO-1: Results for physicochemical parameter

Sampling area	Sample code	EC dS/m	PH	TDS ppm	Cl^- ppm	CO_3^{--} ppm	HCO_3^- ppm	Total Alkalinity ppm	Total Hardness ppm	RSC ppm	Sodium ppm
Bhadreshwar	S_1	3.80	8.25	2432	1242	0.00	259	300	825	Negative	690
Adipur	S_2	3.60	8.62	2304	1011	15.0	503	250	600	250	833
Baladiya	S_3	3.40	8.29	2176	1080	0.00	366	120	1300	Negative	632
Bhorara	S_4	0.70	7.12	448	106	0.00	289	140	360	87.5	115
Luni	S_5	4.00	8.44	2560	1207	0.00	427	380	760	Negative	776
Samakhyali	S_6	0.39	7.43	250	98	0.00	106	150	255	0.00	57
Shinay	S_7	0.94	7.49	602	213	0.00	259	120	260	100	172
Gandhidham	S_8	0.94	7.86	602	213	0.00	289	800	560	137.5	172
Kera	S_9	0.84	7.57	538	266	0.00	122	140	925	Negative	143
Anjar	S_{10}	13.2	8.19	8448	4544	0.00	411	200	1700	Negative	2242
Mandvi	S_{11}	2.50	7.89	1600	656	0.00	488	160	700	175	519
Bharapar	S_{12}	1.05	8.11	672	319	0.00	183	400	650	Negative	143
Nakhatrana	S_{13}	0.93	7.62	595	248	0.00	213	500	650	50.0	172
Bhuj	S_{14}	1.26	7.74	806	346	0.00	259	130	600	37.5	230

The electrical conductivity of all the samples lies between 0.93 to 13.2 Ds/m. Sample S_{10} shows the highest value. The PH range was observed in the range of 7.12 to 8.89.TDS of sample S_{10} was considerably high. Chloride content was observed in the range of 98 to 4544 ppm S_{10} sample shows very high value. Carbonates in all the samples were found to nil except few samples. Bicarbonates lie in the range of 106 to 503 ppm. The total alkalinity of S8 sample was found to be 800 ppm, rest of the sample

were below this value. The total hardness for samples S3 and S10 1300 and 1700 ppm respectively. The RSC was negative for some samples and sodium ion content was highest (2242) for sample S10.

Conclusion:

Present study concludes that all soil parameters were in normal criteria of healthy soil and most of the soil samples were shown considerable variation in various parameters. The soil collected from different is good for agricultural production. Some soil samples need to treat with natural of chemical fertilizers to enhance the production.

References:

[1] W.B.Shirsath, "Quantitatively Physico-Chemical Analysis of Some Soil Samples of Satana (Baglan)Tahsil, District Nashik, Maharashtra (India)," Journal of Scientific Research, Volume 65, Issue 7, p.143,2021.

[2] Shubhashree P R and Prasanna Kumar C, "A Quantitative Analysis of an Advance Smart Soil Analyser with a Soil Tester: A Comprehensive Survey", International Journal of Engineering Research & Technology (IJERT),Vol. 7, Issue 07, p. 32,2018.

[3] S C Dandwate, "Analysis of soil samples for its physicochemical parameters from Sangamner city", GSC Biological and Pharmaceutical Sciences, Vol.12, Issue 02, p.123,2020.

[4] P M Ghare and A P Kumbhar, "Study on physico-chemical parameters of soil sample", International Advanced Research Journal in Science, Engineering and Technology,Vol. 8, Issue 9,p.171, 2021.

[5] S. S. Aswale, G. A.Pimpalshende and S. D. Raut, "Physico-Chemical Analysis of Soil Samples from Area near Wardha River, Maharashtra, India", International Journal of Scientific Research in Science and Technology, Vol.8, Issue 1, p.112,2021.

[6] Taskeen N., Mouli C. and Dr. Priya S., Physico-Chemical analysis of Soils in Ranchi, International Journal of Current Research, Vol.15, Issue 06, p.25050,2023.