

Physicochemical Properties of Soil Samples from Etapalli Tahsil

Rajiv Bhujangrao Dange

Assistant Professor, Department of Chemistry

Bhagwantrao Arts and Science College, Etapalli, Gadchiroli, India

Abstract: *The soil gives us food to all living organisms in different form. The present work is to analyze the physicochemical properties of soil from the different villages of the Etapalli Tahsil. There are six villages selected and from each five samples are taken. The physicochemical properties like availability of pH, Electrical Conductivity, Organic Carbon and Phosphorous are to be analyze.*

Keywords: Soil Analysis, physicochemical properties

I. INTRODUCTION

Soil is a natural body differentiated into horizons of minerals and organic constituent usually unconsolidated of variable depth, which differ from the parent material below in morphology, physical properties and constitution, chemical properties, composition and biological characteristics (Kathale, 2015). The formation of soil is explained as it is natural weathering process that rocks get converted into smaller pieces due to internal chemical reaction occurs between rocks and water (Arjun, 2013). The characteristics of soil from Manja river site area is suitable for the cropping (Pawale, 2014). The Physico-Chemical parameters give valuable information in agricultural field for the increase of economy of farmers and also the management of soil (L Jaishree, 2008) and (K Kanimozhi, 2011). The collection of samples is according to Indian Standard Sampling Procedure (Agriculture, 2011). The water pollutants can affect river and it shows its effect on soil pollution (Ninad Marathe, 2021). The limiting material and suitable inorganic fertilizer definitely increase the soil fertility (Chandak Nisha, 2017). The samples are taken from Krushnar (A), Jivangatta (B), Marpalli (C), Doddi (D), Tambda (E) and Barsewada (F) villages of Etapalli Tahsil. These samples are collected in polythene bags. All the samples are collected in May-2024. Soil testing is useful to identify the problems related soil like which fertilizer is to be used and which nutrients to be given to soil (Khan, 2018).

II. MATERIAL AND METHOD

From the Etapalli Tahsil there are 6 villages are taken for the study. The Soil samples are taken from different places in Summer-2024, from each village there are 5 samples to be taken in polythene bag the samples are taken from 0 to 20 cm depth.

1) pH: The soil pH decides that the soil is acidic or alkalinity. If the pH of soil is less than 6 then it is considered as acidic soil, if the pH means in the range of 6 to 8.5 then it is said to be normal soil, and the pH about 8.5 said to be alkaline soil. Now the pH of soil samples collected from different sample points are calculated by using pen type pH metre.

2) Electrical conductivity: Electrical conductivity of soil sample indicate the amount of soluble salt ions present in the soil. Hence the measurement of electrical connectivity gives the information of ions present in the soil. If the value of electrical conductivity high it shows it contain high number of ions present. The electricity conductivity is measured by method given by (Kathale, 2015).

3) Organic Carbon: The fertility of soil depends upon the organic carbon. The organic carbon from soil requires to plant for their growth. The organic carbon increase in soil, the soil is very fertile soil. The organic carbon is determined by weight digestion method (Walkley, 1934).

4) Phosphorous: There are 17 is ancient nutrient required by plants for their growth and development. The Phosphorus is second essential element required to plant. Available Phosphorus in a soil represent a fraction of total Phosphorus which is susceptible to plant uptake during their growth. The plants take a Phosphorus in H_2PO_4 and $H_2PO_4^{2-}$ forms.

The Phosphorus exist in soil in both organic and inorganic fraction. The organic section of phosphorus like nucleic acid and inositol phosphate do not contribute to the Phosphorus nutrition of plant in our soil as they are low in organic matter. Among the inorganic fraction calcium, ferrous and Aluminium phosphate are in equilibrium with water soluble phosphorus therefore the organic Phosphorus fractions is considered useful index of the available Phosphorus in the soil. The available Phosphorus in soil can be calculated by using Bray's method 1945.

The interpretation of soil properties

Parameters	Interpretation	
pH	< 4.6	Extremely acidic
	4.6 - 5.5	Strongly acidic
	5.6 - 6.5	Moderately acidic
	6.6 - 6.9	Slightly acidic
	7	Neutral
	7.1 - 8.5	Moderately alkaline
	>8.5	Strongly alkaline
Electrical conductivity dS/m	0-2	Salt Free
	4-8	Slightly Saline
	8-15	Moderately Saline
	> 15	Highly Saline
Organic Carbon in (%)	<0.5	Low
	0.5-0.75	Medium
	> 0.75	High
Phosphorous In Kg/ha	< 10.0	Low
	10.24.6	Medium
	>24.6	High

Reference: Methods Manuel Soil Testing in India 2011

III. RESULT AND DISCUSSION

The analysis of physicochemical properties of soil samples collected from Krushnar (A), Jivangatta (B), Marpalli (C), Doddi (D), Tambda (E) and Barsewada (F) villages with 5 sample from each village of EtapallioTahsil. The obtained result for each religion is given in following table-I.

Name of Village	Sample Number	pH	Electrical Conductivity (dS/m)	Organic Carbon (%)	Phosphorous (Kg/ha)
Krushnar (A)	A ₁	6.80	0.36	0.30	16
	A ₂	6.85	0.40	0.31	18
	A ₃	6.90	0.38	0.32	16
	A ₄	6.89	0.39	0.25	17
	A ₅	6.86	0.42	0.26	20
Jivangatta (B)	B ₁	6.90	0.52	0.40	22
	B ₂	6.91	0.59	0.35	24
	B ₃	6.91	0.39	0.25	24
	B ₄	6.92	0.55	0.26	23
	B ₅	6.93	0.56	0.28	21
Marpalli (C)	C ₁	6.81	0.61	0.35	20
	C ₂	6.83	0.58	0.40	23
	C ₃	6.88	0.59	0.36	24
	C ₄	6.89	0.65	0.38	22
	C ₅	6.93	0.68	0.33	23

Doddi (D)	D ₁	6.91	0.51	0.32	21
	D ₂	6.92	0.53	0.25	22
	D ₃	6.95	0.55	0.27	23
	D ₄	6.96	0.49	0.25	22
	D ₅	6.85	0.45	0.2	20
Tambda (E)	E ₁	6.90	0.49	0.29	18
	E ₂	6.92	0.47	0.30	20
	E ₃	6.93	0.46	0.32	22
	E ₄	6.85	0.45	0.30	23
	E ₅	6.86	0.51	0.28	22
Barsewada (F)	F ₁	6.82	0.55	0.35	21
	F ₂	6.81	0.59	0.34	20
	F ₃	6.88	0.69	0.32	20
	F ₄	6.89	0.54	0.38	17
	F ₅	6.92	0.58	0.28	18

The calculated data for the soil physico-chemical properties from the different villages of Etapalli Tahsil shown in table-I. The pH value of sample shows between 6.80 to 6.90 reading this indicate the soil has slightly acidic nature. The value of pH is highest for sample number D4 is 6.96 while lowest for sample number A1 is 6.80.

The value of electrical conductivity of sample shows between 0.36 to 0.68 reading, this indicate the soil is salt free in nature. The highest value of electrical conductivity 0.68 for sample number C5 and lowest value of the electrical conductivity is 0.36 for sample number A1.

The value of organic carbon of samples taken is obtained between the 0.25 to 0.40 reading this indicate the soil contains low percentage of organic carbon. The highest value of organic carbon is for sample number B1 and C2 while the lowest value of organic carbon is for A4, B3 D2 and D4. The use of artificial fertilizers and there is need of irrigation for sustainable development of farmer (Thorat, 2021).

The value of phosphorus obtained from soil samples is taken from 16 to 24 reading. This indicates the soil contain Phosphorus in medium form. The highest value of phosphorus is 24 for sample number V2, V3 and C3 while the lowest value of phosphorus is 16 for sample number A1 and A3. The Proper concentration of Phosphorous is required to plant for its growth (Leonardi, 1999).

IV. CONCLUSION

The physico-chemical properties of soil sample taken from different villages of Etapalli Tahsil. All the results of obtained was shown in table-I, and if we compare this result with standard soil testing parameters the soil present in this region is slightly acidic, salt free, presence of organic carbon is moderately and phosphorus is in medium form.

REFERENCES

- [1]. Agriculture, D. o. (2011). *Method of Manual-Soil Testing in India*. Government of India.
- [2]. Arjun, S. P. (2013). Heavy Metals Contamination in Soils Near Siddheshwar Dam Maharashtra. *Research Journal of chemical Science*, 6-9.
- [3]. Chandak Nisha, M. B. (2017). Analysis of Soil samples for its Physiochemical Parameters from Kadi City. *Raman Science and Technology Foundation*, Vol-3 36-40.
- [4]. K Kanimozhi, A. P. (2011). *Archives of Applied Science Research*, 525-536.
- [5]. Kathale, N. (2015). *Text Book of Inorganic Chemistry*. Nagpur: Rajni Prakashan.
- [6]. Khan, A. I. (2018). Analysis of Soil Quality Using Physicochemical Parameters with Special Emphasis on Fluoride from Selected Sites of Sawai Madhopur Tehsil Rajasthan. *International journal of Environmental Sciences and Natural Resources*, 12(5) 125-132.
- [7]. L Jaishree, S. A. (2008). *International Journal of Chemical Science*, 255-261.

- [8]. Leonardi. (1999). Soil Phosphorous Analysis as an Integrative Tool for Recognizing Buried Ancient Plough Soils. *Archaeol Science*, 26: 343-352.
- [9]. Ninad Marathe, B. P. (2021). Analysis of Physicochemical Parameters of Soil from Patalganga River Maharashtra India. *International Journal of Science and Research*, 1332-1337.
- [10]. Pawale, N. M. (2014). Characteristics of Soil and Contamination of Heavy Metals from Catchment Area Manajra River in Biloli Taluka Nanded Maharashtra . *Scientia Research Library Journal of Applied Science*, 78-85.
- [11]. Thorat, C. J. (2021). Physicochemical Analysis of Soil from Kadegaon Tehsil. *International Journal of Innovative Research in Technology*, Vol-8(7) 68-73.
- [12]. Walkley, J. A. (1934). An Examination of the Detjareff Method for Determining Soil Organic Matter and a Proposed Modification of the Chromic Acid Titration Method. *Soil Science*, 37: 29-38.