



## Research Article

### PHYSICO-CHEMICAL ANALYSIS OF SELECTED AGRICULTURAL SOIL SAMPLES IN KOMMANGI PANCHYTHI, CHINTAPALLI MADAL, VISAKHAPATNAM

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#### ABSTRACT

In the present study to investigate the physico- chemical properties of Rice and Turmeric soil at ten different sites of Kommangi panchayat in Chintapalli mandal. The soil parameters like soil pH, EC, Organic Carbon, Nitrogen, Potassium and Phosphorous content were analyzed. It was found that there was a marked variation in nutrients and parameters of various sample point in different farmers field. The results of the study show the low levels of Nitrogen, Phosphorous and Potassium in both sites. Also the organic matter is low during the study area.

## INTRODUCTION

Soil properties that are sensitive to changes in the management can be used as indicators. General soil is unconsolidated thin, variable layer of mineral and organic material usually biologically active that covers rest of the earth land surface. In Indian agriculture occupies an eminent position in global cultivation of rice, wheat, sugarcane, pulses and vegetables. Now a day's in India large numbers of fertilizers are used instead of manures. Due to this the crop productivity is increases speedily but the quality of soil support decreases. Soil testing is the only way to determine the available nutrient status in soil and the only way we can develop specific fertilizer recommendations. Application of fertilizers by the farmers in the fields without prior knowledge of soil fertility status might result in adverse effects on soils as well as crops both in terms of nutrient deficiency and toxicity either by the adequate or over use of fertilizers (Sharma 2004). Soil sampling is perhaps the most vital step for any soil analysis. As a very small fraction of the huge soil mass is used for analysis, it becomes extremely important to get a truly representative soil sample of the field.

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Soil test based nutrient management has emerged as a key issue in efforts to increase agricultural productivity and production since optimal use of nutrients, based on soil analysis can improve crop productivity and minimize wastage of these nutrients, thus minimizing impact on environmental leading to bias through optimal production. Deficiencies of primary, secondary and micronutrients have been observed in intensive cultivated areas. The present study was aimed to investigate the analysis of physicochemical in agriculture soil (Rice and Turmeric ) at Kommngi panchty , Chintapalli dist., in A.P. Physical parameters like pH, Electrical Conductivity(EC), Organic Carbon (%), Salinity, Soil Texture, Color and Chemical parameters of Nitrogen, Phosphorus, Potassium were analyzed.

## MATERIALS AND METHODS

### Study Area

The soil samples were collected from the area Kommngi panchty in Chintapalli mandal. The Chintapalli mandal is located on the north eastern part of Visakhapatnam district in Andhra Pradesh State of India. It lies between 17° 44' 22"<sup>1</sup> north latitude to 18° 04' 29" east to 82° 38' 04" east. The climate conditions are very cool in the area on account of green vegetation and thick forest.

Table 1. Physicochemical Parameters of Soil Samples

S.No	Parameters	R-1	R2	R3	R4	R5	T1	T2	T3	T4	T5
1	Soil Nature	SCL	SCL	SCL	SCL	SCL	SCL	SCL	SCL	SCL	SCL
2	pH	6.8	6.9	6.9	6.4	6.7	6.4	6.3	6.7	6.6	6.8
3	E.C	0.2	0.17	0.15	0.14	0.11	0.14	0.12	0.15	0.11	0.15
4	Salinity	0.2	0.17	0.15	0.14	0.11	0.11	0.09	0.11	0.09	0.11
5	Organic Carbon (%)	0.32	0.24	0.22	0.34	0.24	0.24	0.28	0.30	0.32	0.32
6	Available Nitrogen (Kg/H)	148	170	156	158	162	172	158	142	146	152
7	Phosphourus (Kg/H)	18	15	18	38.5	18	115.4	144.3	118.2	28.9	110.4
8	Potassium (Kg/H)	11.34	4.32	62.6	62.1	172.2	18.9	7.56	3.78	35.12	232.42

The temperature gets down with the onset of south west monsoon and tumbles with a mean minimum of 4° c by January after which there is reversal trend till the temperature reaches means maximum of 34° C by end of may that is April to June are the warmest months. This tribal area with rain season account for 90% rainfall an average rainfall of 1178 mm. The in this area were dependent on agriculture.

### Soil sampling

Soil samples were collected randomly at 0 to 20 cm depths with ten plots, ten samples from each plot, respectively. In well sterilise polythene pouches. Rice and Turmeric soil samples were air dried .Then they are ground using mortar and pestle and passed through 2 mm sieved. Sieved samples were mixed and stored for subsequent physical, chemical analysis.



Fig. 1. (Chiti babu G.) Rice field  
(Nuakaraju K)Turmeric field

### Soil sample were collected from following Farmers fields

- Sample 1(R-1) was collected from Mr. Balaraju J. Rice field.
- Sample 2 (R-2) was collected from Mr.Narayana M. Rice field.
- 3. Sample 3(R-3) was collected from Mr. Chiti babu G. Rice field.
- Sample 4 (R-4) was collected from Mr. Gangayya J. Rice field.
- Sample 5 (R-5) was collected from Mr. Venkata Rao G. Rice field.
- Sample 6 (T-1) was collected from Nagaraju V. Turmeric field.
- Sample 7 (T-2) was collected from Lingalu T. Turmeric field
- Sample 8 (T-3) was collected from Simhachalam G. Turmeric field
- Sample 9 (T-4) was collected from Chittibabu G. Turmeric field
- Sample 10 (T-5) was collected from Nuakaraju K .Turmeric field

The collected samples were analyzed for major Physical and Chemical soil quality parameter like PH, Electrical Conductivity (EC), and Organic Carbon (OC), Nitrogen (N), K and P analysis by standard method (DIRD Pune 2009).

## RESULTS AND DISCUSSION

The physicochemical observations of ten soils of rice and turmeric field samples were presented in Table-1. The nature of soil in study area was Sand Clay Loam from all samples. In the present study, pH ranges from 6.3 to 6.9 the soil pH is slightly acidic in all soils. The pH of soil is one of the most important parameter. At basic or low acidic pH soils usually cultivated rice (Chandra Sharma 2015). Soil EC is an important characteristic that can be used for nutrient availability and the soluble salt present in the soil. The conductivity values ranges from 0.11 to 0.2  $\mu$ S/cm. The electrical conductivity of R5 and T4 is value was less capered to sample of R1area. Madhava Sarma (2015) studied crops vary to the degree of sensitivity to salts, but most crops tolerate levels of 1.1 or less with no effect on yield. Excess salinity may cause moisture stress within the plant. However, too pure of can also be detrimental. Water with too few salts can lead to surface soil dispersion and soil crusting. Salinity is a measure of the total amount of soluble salts in soil. As soluble salt levels increase, it becomes more difficult for plants to extract water from soil. Salinity values above 2 dS/m begin to cause problems with salt sensitive plants, and values above 4 dS/m are problems for many garden and landscape plants (Vernon Paren 2010).

The salinity values ranges from 0.09 to 0.2 dS/cm. The salinity value was less capered to sample of area. The Organic Carbon (%) ranges from 0.22 to 0.32 %. Soil organic carbon is remarkably low in study area. This shows the potential of Poor soil organic carbon (SOC) reduces microbial biomass, activity, and nutrient mineralization due to a shortage of energy sources. Soil organic carbon results in less diversity in soil biota with a risk of the food chain equilibrium being disrupted which can cause disturbance in the soil environment (E.G., plant pest and disease increase, accumulation of toxic substances (Venkata Ramana 2015). Available nitrogen (N) ranges between 142 to 172 kg/ha. Available phosphorus (P) ranges between 15 to 118.2 kg/ha. Available potassium is ranged between 4.32 to 232.42 Kg/ha. Most in all the samples, less amount is present in agricultural soil.

### Conclusion

The physicochemical parameters are important to agricultural for plant growth. From the results of the work, it can be concluded that the pH of soil samples were slightly acidic, conductivity, organic carbon and NPK values of all soil samples were found to be very less. In all samples were in lower amount so fertilizers containing were added for proper growth and development of crop.

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