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### **A Preliminary Observation on The Physical Properties of The Soils of Yadgir District, Hyderabad-Karnataka Region**

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#### **ABSTRACT**

Before attention to grow any particular crop in any particular land area the knowledge of the properties of the soil is a pre-requisite. A critical perusal of the available literatures as revealed that there is no scientific documentation on the properties of the soils of Yadgir district, Hyderabad region. In the present paper an attempt has been made to study the properties of 100 soil samples collected from different landuses of Yadgir district. The present communication deals with colour, Electrical Conductivity and pH of the 100 soil samples. It is found that the soils exhibited 12 different types of colours of which dark colour is represented by 19 soil samples, 50% of the soil studied showed alkaline nature of soil condition, whereas, Electrical Conductivity found to be less than 1 in 50% of the soils studied.

**KEY WORDS:** *soil colour, pH, Electrical conductivity.*

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## **INTRODUCTION**

One important reason for studying soil properties is to understand a general concept as to what they are and how they can and should be used. The understanding of soil properties becomes a pre-requisite for the formers in particular and in general for others. The knowledge about soils mainly comes from two important sources, one is farmers experience based on agricultural activities and certain and on scientific investigations. The soil is harbour diverse communities of an living organisms both plant and animals and their activities is in soil vary widely. Since the soil properties in general determine the type of crop to be grown in a given land area of agriculture, it is very essential to understand the soil properties. A critical perusal of the available literature has revealed that there is no systematic documentation on the physic-chemical properties of the soils of Yadgir district. Therefore in the present communication an attempt has been made. A understanding the physical properties such as colour, pH and Electrical conductivity of 100 soil samples collected from different land use of Yadgir and its surrounding areas.

## **MATERIALS AND METHODS**

Description of the study area:



**Fig:1 Study area of Yadgir dist**

Yadagiri district is located in the Northern part of Karnataka between at 16.46°N-77.08°E latitudes and 16.77°N-77.13°E longitudes, with a geographical area of 5.6 Sq.Km. The district is actually located in between Raichur and Gulberga districts. Yadagiri is the district head quarters. The district comprises of 3 taluks namely: Shahapur, Yadagiri, Shorapur.

## **SAMPLE COLLECTION METHODS**

For the present investigation a total of 100 soil samples of yadagir district were collected from identified places. The Grab method of soil sampling was carried out with the help of strail spatula from a depth of about 5-7 cm. Weighing about 1kg soil samples were collected and mixed thoroughly and kept in butter paper bags. After bringing these soil samples in to the laboratory, larger clumps were broken till they attained the uniform structure and then powdered by mortor and sieved and again stored in the butter paper bags and were given numbers, these number referred as Soil Collection Numbers. Then physico- chemical parameters such as pH, Electrical Conductivity, Organic carbon, Phosphate, Sulpher, Pottasium, Nitrogen, Zinc, Manganese, Copper and Iron have been studied. Here Colour, pH and EC will be discussed.

Colour- By Munsell colour chart.

pH- pH was determined with the help of standard pH meter. The soli samples were prepared as per the standard techniques for measurements.

Electrical Conductivity – Determined using multigrade Conductivity Bridge (immersion type cell).

## **RESULTS AND DISCUSSION**

### ***Colour***

U.S. soil survey staff 1991, has stated that “Colour is one of the most useful property for soil identification and appraisal.” It has been very well understood that the important role played by colour in all major systems of soil taxanomy, therefore, soil colour is a key stone of all major classification of soil systems. Several components contribution to soil colour. Therefore soil colour identification is an important factor in assessing the suitability of soil for a specific type of crop cultivation. Although it is very difficult to measure the accurate colour of the soil, the pedologist and geologist have been identifying the colour patterns of the soil using Munsell colour chart.

In the present study and as per the Munsell colour chart a total of 12 types of colours have been identified for the 100 soil samples studied. It is whether very interesting to note that out of the 100 soil samples studied, 19 (5, 6, 7, 8, 39, 40, 70, 71, 72, 74, 75, 76, 77, 78, 91, 97, 98, 99) samples fall under black soil category while that of 15% soil samples fall under brown soil (23, 27, 32, 33, 37, 38, 43, 44, 47, 50, 57, 68, 81, 86, 87) and further only 8% of soil samples show dark greyish brown colour. However, Olive brown & Reddish brown colour has been exhibited by 2 samples each.

***pH:***

In general soils exhibit either alkaline or acidic condition, very rarely soils shows neutral condition. The pH in soils place a significant role in controlling the chemical environment of the soil. The acidity of soil is mainly due to cations of calcium, magnesium, potassium and sodium whereas alkalinity soil is associated with high degree of saturation of base farming cations.

In the present investigation, the pH of the soils studied varied from a minimum of 7.07 to a maximum of 8.71. after the 100 soil samples studied almost 50% of the soil showed slightly alkaline condition whereas another 50% of them exhibited slightly acidic condition. during their study have recorded pH that ranged between 4 & 7. Whereas, <sup>15</sup> have recorded a pH range between 6.4 to 7.5. have recorded a pH range of 3-4 in the soil studied by them and opinioned that the acidic soils support rich species diversity of certain groups of algae. However Jadav & Balasaheb S.Nimbora 2015 have recorded pH value between 8 & 9 and have concluded that alkaline soils support luxuriant growth of Chlorophyceae members. <sup>10</sup> have also recorded pH between 7 & 8 in soils of Mysore district. In general, the present study is in partial agreement with that of the above authors.

***Electrical conductivity***

Jagadish 2000 states that electrical conductivity reduces if only NPK is added to the soil without adding farmyard manure <sup>4,6</sup> are of opinioned that Electrical conductivity increases due to increase of calcium ions from organic material <sup>13</sup>, reported that Electrical conductivity of the soils tend to increase in the application of chemical fertilizers into the soils is increased. In general several properties of soil such as salinity conditions, level of organic matter, soil structure are controlled by soil electric conductivity. Further, in soils, electrical conductivity mainly depends on the amount of moisture held by soil particles, therefore, electrical conductivity is strongly correlated with soil particle size and texture. In the present investigation, Electrical conductivity of the soils ranged between a minimum of 0.14milimohs and a maximum of 1.83 milimohs. Out of 100 soil samples studied 50% of the soils shows less than 1 milimohs, the remaining soil samples showed electrical conductivity more than 1 milimohs.

Table 1:

SL NO	MUNSELL COLOUR CHART	SL NO	MUNSELL COLOUR	SL NO	MUNSELL COLOUR	SL NO	MUNSELL COLOUR
1	Very dark brown	26	Dark brown	51	Olive brown	76	Black
2	Very dark grayish brown	27	Brown	52	Very Dark grayish brown	77	Black
3	Dark olive grey	28	Dark reddish grey	53	Very Dark grayish brown	78	Black
4	Dark olive brown	29	Dark yellowish brown	54	Dark grayish brown	79	Dark olive grey
5	Black	30	Dark grayish brown	55	Dark brown	80	Reddish brown
6	Black	31	Olive brown	56	Very Dark grayish brown	81	Brown
7	Black	32	Brown	57	Brown	82	Dark yellowish brown
8	Black	33	Brown	58	Dark olive brown	83	Dark yellowish brown
9	Black	34	Brown	59	Very Dark grayish brown	84	Dark grey
10	Yellowish brown	35	Dark grayish brown	60	Dark grayish brown	85	Dark grey
11	Red	36	Dark yellowish brown	61	Dark brown	86	Brown
12	Red	37	Brown	62	Strong brown	87	Brown
13	Reddish brown	38	Brown	63	Dark olive brown	88	Very dark grey
14	Red	39	Black	64	Dark yellowish brown	89	Very dark grey
15	Dark reddish brown	40	Black	65	Dark yellowish brown	90	Very dark grey
16	Dark reddish brown	41	Dark grey	66	Yellowish brown	91	Black
17	Dark reddish brown	42	Dark grey	67	Yellowish brown	92	Very dark brown
18	Reddish brown	43	Brown	68	Brown	93	Dark grey
19	Very dark grey	44	Brown	69	Very dark grey	94	Very Dark grey
20	Dark reddish brown	45	Dark grayish brown	70	Black	95	Dark olive grey
21	Dark brown	46	Dark grayish brown	71	Black	96	Very Dark grey
22	Dark brown	47	Brown	72	Black	97	Black
23	Brown	48	Dark grayish brown	73	Dark olive grey	98	Black
24	Dark yellowish brown	49	Dark yellowish brown	74	Black	99	Black
25	Dark brown	50	Brown	75	Black	100	Darkdark olive grey

Table 2

SL NO	PH	EC	SL NO	PH	EC	SL NO	PH	EC	SL NO	PH	EC
1	8.2	0.38	26	7.2	0.4	51	8.3	0.5	76	5.7	0.1
2	8.5	0.25	27	7.2	0.3	52	8.7	0.3	77	5.9	0.1
3	8.6	0.25	28	6.9	0.2	53	8.7	0.2	78	5.2	0.4
4	8.6	0.18	29	7.2	0.5	54	8.6	0.2	79	6.7	0.2
5	8.4	0.39	30	6.8	0.5	55	8	0.3	80	7.4	0.3
6	8.6	0.32	31	8.6	0.3	56	8.4	0.2	81	8.1	0.4
7	8.6	0.2	32	7.9	0.2	57	8.5	0.3	82	8.1	0.2
8	8.3	0.51	33	7.9	0.4	58	8.5	0.2	83	8.4	0.2
9	8.6	0.23	34	7.8	0.2	59	8.6	0.2	84	8.2	0.8
10	8.4	0.22	35	7.7	1.1	60	8.6	0.2	85	8	1
11	7.2	0.3	36	7.9	1.1	61	6.9	0.5	86	8.9	0.6
12	6.7	0.22	37	8.2	1.1	62	7.5	0.3	87	9.1	0.4
13	7.5	0.32	38	7.9	0.5	63	7.2	0.2	88	8.8	0.3
14	7.2	0.27	39	8.5	0.4	64	7	0.2	89	8.4	0.6
15	7.3	0.32	40	9	0.3	65	6.8	0.2	90	8.9	0.4
16	7.3	0.34	41	8.3	0.5	66	6.6	0.5	91	7.5	0.2
17	7.2	0.3	42	8.4	0.9	67	6.5	0.4	92	7.6	0.3
18	7.8	0.43	43	8.2	0.6	68	7.4	0.5	93	7.5	0.3
19	7.4	0.25	44	8.5	0.4	69	7.5	0.4	94	7.1	0.4
20	7	0.67	45	8.3	0.3	70	7.2	0.4	95	7.3	0.2
21	6.9	0.32	46	8.3	0.3	71	7.3	0.6	96	7.3	0.4
22	6.8	0.25	47	8.4	0.4	72	6.4	0.2	97	7.3	0.4
23	6.8	0.55	48	8.3	0.4	73	7.2	0.2	98	7.4	0.4
24	6.7	0.63	49	8.2	0.4	74	7.2	0.1	99	7.3	0.4
25	6.7	0.61	50	8.1	0.4	75	7.3	0.1	100	7.4	0.2

### SUMMARY AND CONCLUSION:

In the present communication, few physical properties like colour, pH and Electrical Conductivity of the soils of Yadgir district, Hyderabad-Karnataka region have been documented. In all 100 soil samples have been collected and studied.

As for as the colour of soil samples studied 12 different types of soil colours have been recorded, 19 number of soils showed black colour, whereas only 2 soils showed olive brown &

reddish brown colour. Dark brown colour soils indicate that the soils have high organic matter content. A red soil indicates the presence of oxidise ferric iron oxides. As for as the pH considered above 50% of soils studies showed alkaline condition and the remaining soils exhibited acidic condition. Electrical conductivity values varied between a minimum of 0.14 milimohs to a maximum of 1.83 milimohs of which claye soils has shown high conductivity values.

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