



“STUDY THE PHYSICO-CHEMICAL PROPERTIES OF SOIL OF BOUNCING LAND JALJALI MAINPAT, SURGUJA DIVISION OF CHHATTISGARH, INDIA.”

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Abstract:-

The Mainpat area located in the lap of nature in Surguja division of Chhattisgarh is called Shimla of Chhattisgarh. There is a place in this Mainpat where the ground is spongy like foam, and bounces like a mattress. This place is famous as Jaljali. The main purpose of doing research at this place is to study the reason why and how the soil of this place is different from the soil of other places, due to which the soil here is not hard but spongy like foam. We will do a Physio-chemical test of the soil here during our research. During this test, we will study the physical properties like the type of silt, percentage of sand silt clay, conductivity, resistivity, pH-value, etc. We will study the chemical properties such as the presence of Fe, Cu, Zn, Ca, Mg, S, N, and other metals. And try to conclude. Many other places in Sarguja division are similar to the wonder of nature, we will do research in the future on these places too.

Keywords: *Jaljali, Conductivity, Resistive, pH-value, Physical properties, Chemical properties, etc.*

Introduction: -

There are many places in the Surguja division of Chhattisgarh which is a wonder of nature. Similarly, there is a place in the Mainpat area which is famous as Jaljali, the land of this place is spongy like foam. This place is located 52 km away from Surguja division headquarters Ambikapur and the distance of this place is 377 from Raipur, the capital of Chhattisgarh. The geographical position of this place is as follows Latitude 22°49'17."N Longitude 83°15'9".

There is a place called Jaljali in the Mainpat area, where the ground jumps like a mattress. There is always moisture in the soil of this place, the soil here is clayey and grassroots are seen wrapped in the soil, this place is currently famous as a tourist place where people jump on the ground. And enjoy jumping on the mattress.

According to the local people, there was a water source here many years ago, due to which the land here was marshy. Which dried up over time, and the ground here became spongy like a mattress. According to geologist Dr. Ninad Bodhankar, due to liquefaction, the land here starts moving up and down. There is also a hypothesis that the internal pressure of the Earth fills the pore space (space) with water instead of solid, giving the area a marshy, spongy appearance [1][2][3]. During our research, the physical properties of the soil have been done with the following method

Electrical Conductivity:-

Soil EC refers to the electrical conductivity of a solution within a unit distance, and it represents the content of soluble salts in the matrix, also known as salinity or ion concentration. Soil conductivity is an index to measure soil water-soluble salt, and soil water-soluble salt is an important indicator of mineral nutrients in the topsoil that can be quickly utilized by plants, and is a factor to determine whether salt ions in soil limit crop growth.

The size of the EC value is closely related to the concentration of soluble salt ions in the solution. The soluble salt ions mainly come from irrigation water and fertilizer solutions. Within a certain range, the conductivity increases with the concentration of the liquid and decreases with the decrease of the concentration, often expressed in millisieverts/centimeter (mS/cm) or dS/m [5]

pH-value :-

Soil pH is a measure of the acidity or alkalinity of the soil. A pH value is a measure of hydrogen ion concentration. Because hydrogen ion concentration varies over a wide range, a logarithmic scale (pH) is used: for a pH decrease of 1, the acidity increases by a factor of 10. It is a 'reverse' scale in that very acid soil has a low pH and a high hydrogen ion concentration. Therefore, at high (alkaline) pH values, the hydrogen ion concentration is low. Most soils have pH values between 3.5 and 10. In higher rainfall areas the natural pH of soils typically ranges from 5 to 7, while in drier areas the range is 6.5 to 9. Soils can be classified according to their pH value. 6.5 to 7.5—neutral, over 7.5—alkaline, less than 6.5—acidic, and soils with pH less than 5.5 are considered strongly acidic[6]

Soil texture:-

Soil texture refers to the proportion of sand, silt, and clay in the soil. Texture influences almost every aspect of soil use. Soil texture is the relative percentages of sand, silt, and clay particles that make up the mineral (inorganic) fraction of soil. Sand particles are the largest and range from 2.0 to 0.05 mm in diameter. Silt particles are smaller, ranging from 0.05 to 0.002 mm. Clay particles are smaller than 0.002 mm. Texture affects other soil properties such as bulk density, water-holding capacity, permeability, and porosity. For example, soils that primarily consist of sand particles have high permeability and low water-holding capacity compared to soils with higher silt and clay content [4].

Material & Methods:-

We have taken a 12 cm depth of soil from the center of the bouncing land. First of all, to find out the physical properties of the soil taken from here, take a sample of the soil in a disorder, add twice the amount of distilled water to it and mix it well. So in addition to the soil, we got the roots and stems of dried grass in it, its quantity is 18% of the total sample soil. After this, we separated the dried grass root and stem and kept the solution of soil and distilled water constantly for 24 hours by taking the soil content as 100%. After analyzing the sample after 24 hours, we found

that the amount of sand in the sample was very less, about 0.4 percent, clay about 1 percent, and silt about 99 percent. So from soil texture determination, it is known that the type of soil here is silt.



The silt found here is not a common silt, generally, the silt is sticky, but the silt here is not sticky. Its properties are similar to mud volcano soil.

Sample type	pH Value	Electric Conductivity	C %	Zn%	Fe%	Mn%	Bo%
Center of bouncing land Jaljali	6.8	0.09	0.58	0.1	1.4	0.2	0.1
Out of Bouncing land	5.79	0.18	0.43	0.23	1.56	1.46	0.23
Difference	1.01	-0.09	0.15	-0.13	-0.16	-1.26	-0.13

Result & Discussion :-

The ph value of bouncing land is greater than that of out-of-bouncing land. The electrical conductivity obtained out of bouncing land is very less than that of bouncing land. Similarly, the amount of carbon is found to be high and the amount of Zn, Fe, Mn, Bo, etc. is found to be less. It is a marshy area, where water flows under the grass. There is empty space among the dead grass. Where due to the presence of water creates a vacuum and you jump over here, and the ground starts moving up and down here, Which gives you the feel of a sponge mattress[8].

Conclusion:-

Calcium, Magnesium, and Sulphate were found absent in the sample taken from the research area Jaljali and the amount of micronutrients was also very less. Micronutrient content can be more or less in any type of soil, but the absence of calcium, magnesium, and sulphate is not possible in normal soil.

In the sample stems of dried grass 18%, sand 0.3%, silt 80.8%, and clay 0.9% were found i.e. the soil here is silt. And due to the presence of dry grass roots and stems in it, it is spongy like a mattress. The silt found here is not the same as the normal silt, so this silt may be a mud volcano silt[9]. In the next paper, we will study whether the soil here is a mud volcano or not.

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