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Physico-Chemical Analysis of Soil on the Banks of Gomati River in Sultanpur District (U.P.)

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Abstract

This paper expresses the assesment of Physico-Chemical analysis of soil on the banks of Gomati river at eight sites in 25 March 2005. These sites are as Richhghat (S1), Thauraghat (S2), Bhaddaurghat (S3), Golaghat (S4), Paparghat (S5), Sakhaulighat (S6), Diyaraghat (S7), and Dhopaghat (S8). The sampling at each station was performed periodically due considerations have been taken for population density, industrial growth, agricultural activities and Socio-Economic status of the catchment area in selection of sites.

Introduction

The word soil is derived from a Latin word 'solum' meaning earthy material in which plants growth. The soil pollution is an important pollution problem as the agricultural fields near the city, it used for production of corn seed and vegetables. Soil pollution is due to improper habits, improper disposals of solids and liquid wastes, as well as from falling of dust particles from industries, located in the city. In our country soil has suffered from pollution because of two practices-

i- Excess use of Fertilizer and

ii- Improper disposal of urban wastes on land.

Thus the soil is highly polluted in the city with toxic chemicals and heavy metals, which may reach the food chain, and endanger to human life. Due to chemical fertilizer meat the chemical need of the soil but there may be lack of humus to give soil its necessary texture. Similarly many kinds of pesticides and insecticides cling tough (tenaciously) to particles of soils for many years and do not vaporize. It is washed away Or decomposed earlier. There remaining part goes into the soil polluting plant leaves, roots, fruits etc and it is transmitted to animals and human beings. The polluting soils have-

a- Pathogenic organisms exerted by human being and at last transmitted to him.

b- Pathogenic organisms of animals transmitted to human through soil.

c- Eatables and

d- Enteric bacterial and protozoa contamination of the soil.

By the studies it is clear that soil pollution is a common phenomenon in urban areas due to increasing at a dreadful rate indiscriminate dumping of city garbage, industrial wastes using sewage water for irrigation and without scientific use of chemical fertilizer and insecticides. In the rural areas of developing countries like our country, soil is free from toxic and other harmful substances, pesticides and canal irrigation etc, have made the soil polluted. Some wrong social habits like open drains, garbage disposal of domestic wastes and died laboratories are not less responsible for contaminating the village lands. There are two reason have been found to this environmental degradation,

a- technological development and

b- pollution growth.

Experimental

The area under investigation includes nearly 10-20 kilometers between each sites have been selected. The physico-chemical properties of soil have been studies and the prospects of pollution and purification have been assessed. The nature and type of soil at the banks of Gomati river at different sites have been observed by direct bearing on the productivity of the

soil and for deciding on reclamation measures. The pH is determined by pH meter and the elements such as, Sodium, Potassium, iron and calcium etc. can easily be determined by the instrument flame photometer and A.A.S. (Atomic Absorption Spectrophotometer) for determination of total carbon, chlorine and nitrogen etc. Various titration techniques involving different reagents for applied. Carbon, chlorine, nitrogen analyzers are used for the analysis of carbon, chlorine and nitrogen in the soil.

The soil of each Sample was measured in the following table.

Table of Soil Characteristics

Site No.	Location	pH	Moisture Content (%)	Grainsize			Texture Class	Colour	Chlorine (%)	Nitrogen (%)	Organic Carbon (%)	Water soluble salts (%)	Potassium (ppm)	Sodium (ppm)	Iron (ppm)	Calcium (ppm)
				Sand (%)	Silt (%)	Clay (%)										
S1	Kotih Ghat	8.9	7.53	12	24	64	clay loam	Darkbrown	0.034	0.068	0.517	0.627	0.42	0.35	5.11	2.79
S2	Thauri Ghat	10.7	9.74	33	28	39	clay loam	Darkbrown	0.067	0.089	0.713	0.782	0.65	0.48	5.92	3.21
S3	Bhaddaur Ghat	7.8	7.64	52	23	25	Sand loam	Greyishbrown	0.038	0.058	0.626	0.638	0.52	0.42	5.21	2.74
S4	Gola Ghat	7.1	8.27	70	15	15	Sand loam	Yellowish brown	0.042	0.063	0.574	0.479	0.48	0.41	4.71	2.68
S5	Papar Ghat	8.2	6.92	69	18	13	Sand loam	Yellowish brown	0.043	0.054	0.512	0.498	0.54	0.46	2.72	4.68
S6	Sakhauli Ghat	9.8	8.67	55	21	24	sand loam	Lightbrown	0.048	0.076	0.628	0.557	0.42	0.44	2.65	4.98
S7	Deyara Ghat	7.9	7.2	50	16	34	Sand loam	Lightbrown	0.053	0.028	0.712	0.436	0.46	0.51	2.85	2.71
S8	Dhopap Ghat	7.4	6.9	42	18	40	Mixed (Claysand) loam	Brown	0.046	0.052	0.694	0.487	0.49	0.48	3.21	2.82

Results and Discussion

The reference sites show the surface properties of soil at sultanpur district is such that it may cause appreciable adsorption leading to simple reduction of pollution. The soil samples have been taken from cultivated lands in vicinity of the sites S1,S2,S3,S4,S5,S6,S7 and S8 putting for physico-chemical analysis and variation in the values of parameters of pollution.

The lowest value of sodium contents is 0.35 ppm at Site S1 and and highest value of this parameter having value 0.51 ppm appears at site S7. The largest contents of water soluble salts and organic carbon are seen at site S2 having value 0.782 to 0.713 with a zig-zag change the minimum values of there parameters at site S4 having value 0.479 ppm to 0.574 ppm.

The maximum percentage 64% of the clay is observed at site S1 and minimum 13% of the clay is observed at site S5 in all the study sites in the bank of Gomati river in Sultanpur District Some textures comes at sites S1 and S2 clay loam class but some textures at sites S3,S4,S5,S6 and S7 comes under sand loam class and some of them are (clay sand) mixed loam is found at site S8.

The table shows that the highest value of pH (10.7) at site S2 and the lowest value (7.1) at site S4. The inferences may be traced out that soils of sultanpur district are all alkaline in nature. it can be concluded that the content of iron is maximum (5.92 ppm) at site S2 and minimum (2.65 ppm) at site S6. The most moistures texture is observed at S2 (0.74) and least one is found at site S8 having value (6.9). The minimum and maximum value of ca, k, sand, slit, chlorine and nitrogen are varies from (2.68-4.68), (0.42-0.65), (12-70), (15-28), (0.42-0.67) and (0.028-0.089) respectively at all sites. However the concentrations of phosphorous were found negligible.

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