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STUDIES OF SOME PHYSICO-CHEMICAL FACTORS OF TEAK FOREST SOIL FROM KINWAT AREA, NANDED, (MAHARASHTRA)

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ABSTRACT
Kinwat Forest of Nanded district is a dry deciduous type teak forest and about 74568.162 ha. including Mahur forest. Forest soil is enriched by decayed leaves of teak plant and animal dung. Forest is away from industries and anthropogenic activities. The present work was undertaken to study some soil characteristics with reference to season. Surface soil samples were collected from Ambadi and Loni for the study of Colour, pH, Chloride, Alkalinity, Organic carbon, Organic matter, Carbonates and Bicarbonates. Soil slightly brown in colour; pH acidic , Chloride ranged from 0.008% to 0.013%, Alkalinity from 1.5 to 2.6mg/L, Organic carbon from 0.003% to 0.126%, Organic matter from 0.005% to 0.217%, Bicarbonate from 0.091% to 0.134% and Carbonates were nil. The Obtained data is compared with the season to find out seasonal impact.Details about the method, soil characteristics and seasonal impact are discussed in the text.

INTRODUCTION

Soil is one of the most important ecological factors and made up of several components like mineral particles, organic matter, soil water, soil atmosphere and biological system, these factors all together are called as "Soil complex". Soil complexes possess distinctive flora and fauna, which forms biotic component of the soil. The flora and fauna of a particular ecosystem indicates the biodiversity of that ecosystem and it is the indicator of overall good health of that ecosystem (Everard, 2004). Soil characteristics and biodiversity of the ecosystem are influenced by various factors such as land use, climate change etc. Maintenance of the soil characteristics and to raise the biomass production is a difficult task and it is a common problem for the forester (Karia and Kiran, 2004).

Climate and season changes physico –chemical characteristics of the soil (Tansley, 1949). Soil saprophytes also shows ecological and geo climatic specificity with response to environmental parameters (Orput and Curtis, 1957). Soil properties are influenced by different tree species, biotic and abiotic factors, (Holland, 1969; Norris, 1970). Pharmaceutical effluents also change the quality of soil and water (Maruthi *et al.,* 2009). Urban population is increasing due to concentration of industries and increase in employment opportunities. This results in to mass production of solid waste. Solid waste contributes to several environmental problems such as habitat destruction, pollution of surface and ground water and also changes in soil characteristics, (Jeyapriya and Saseetharan, 2010).Afforestation (Ceyhun *et al.,* 2010), Tourism, festivals and recreational stress also changes soil characteristics, (Meric *et al.,* 2010). Kinwat forest is far away from these activities; therefore the forest soil is mostly remained unchanged. Meager information is available regarding the soil status. There are also some possibilities that over the year's fertility exhaustion could have been occurred due to some high nutrient demanding species of plants, soil erosion and some anthropogenic activities. Hence this work was undertaken to study soil characteristics and seasonal impact on it.

MATERIALS AND METHODS

Study area

The Site of study is the dry deciduous type Teak forest in Nanded district of Maharashtra. Located at 18º15'-19º55' NL and 17º17'-17º15' EL. Two stations namely Ambadi and Loni were selected for the study. These stations are near about 40 km from Kinwat and 30 km away from each other. Station Loni is situated on Kinwat-Mahur Road. Whereas Ambadi is Located on Kinwat- Adilabad road .Station and season wise soil samples were collected after removing leaves, grass and waste material from April 2005 to December 2005. Collected samples were air dried, powdered and passed through 2 mm sieve and used for analysis of Colour, pH, Alkalinity, Chloride, Carbonates, Bicarbonates, organic matter and Carbon percentage. These factors were analysed by adopting standard methods as described by Trivedi and Goel, (1986).

Table 1: Seasonal impact on some physico-chemical factors of Teak forest soil from Kinwat area

Place	Date of collection (Season)	Colour	pH	Chloride %	Alkalinity (TA) mg/L	Organic carbon(% C)	Organic matter	Bicarbonate %	Carbonate
Ambadi	22-4-2005(Summer)	Slightly brown	6	0.013%	1.5	0.003%	0.005%	0.091%	Nil
Ambadi	17-9-2005(Rainy)	Slightly brown	4.5-5	0.008%	1.5	0.05%	0.095%	0.091%	Nil
Ambadi	18-12-2005(Winter)	Slightly brown	6	0.015%	2.6	0.045%	0.077%	0.158%	Nil
Loni	22-4-2005(Summer)	Slightly brown	6-6.5	0.012%	2.2	0.126%	0.217%	0.134%	Nil
Loni	17-9-2005(Rainy)	Slightly brown	4.5-5	0.011%	2	0.08%	0.143%	0.122%	Nil
Loni	18-12-2005(Winter)	Slightly brown	5.5-6	0.013%	1.9	0.031%	0.054%	0.115%	Nil

RESULTS AND DISCUSSION

Physico- chemical characteristics at Ambadi

Soil is murum type with brown colour. pH ranged from 4.5 to 6, Chloride 0.005% to 0.015%, Alkalinity 1.5 to 2.6 mg/L, Organic carbon 0.003% to 0.05%,Organic matter 0.005% to 0.095%, Bicarbonate 0.091% to 0.150% and Carbonate were nil (Table 1).

Physico- chemical characteristics at Loni (Table 1)

Soil is murum type with brown colour. pH ranged from 4.5 to 6.5, Chloride 0.012% to 0.013%, Alkalinity 1.9 to 2.2 mg/L, Organic carbon 0.031% to 0.126%,Organic matter 0.054% to 0.217%, Bicarbonate 0.115% to 0.134% and Carbonate were nil (Table 1).

Seasonal effect on Soil characteristics (Table 1)

At Ambadi pH was acidic and alkalinity was less in rainy season. Organic carbon and Organic matter more in rainy season, Bicarbonates were higher in winter and Carbonates were nil in all seasons (Table 1).

At Loni pH was acidic and alkalinity, Organic carbon, Organic matter and Bicarbonates were more in summer. Chlorides more in winter and Carbonates were nil in all seasons.

pH of soil at Ambadi and Loni indicates that soil is acidic in nature Sakesena (1955); Karia and Kiran, (2004); Meric *et al.,* (2010); Murat *et al.,* (2010) reported acidic nature of soil. Jeyapriya and Saseetharan, (2010) reported alkaline nature of soil and it was due to the presence of CO_3, HCO_3, Na, K and other alkaline matter. Maruthi *et al.,* (2009) reported alkaline nature of soil and it was due to pharmaceutical effluents. pH values indicated that soil is slightly acidic according to NBSS standards Karia and Kiran, (2004).

Chloride is an indicator of Pollution and it develops salty taste when it is about 250-500 mg/L. It is also harmless up to 1500mg/L. (Trivedi and Goel, 1986). Chloride content of Ambadi and Loni was less and up to 0.012% (average reading) and showed that soil is free from pollution.

Alkalinity ranged from 1.86mg/L to 2.03mg/L. It was very less and not harmful as it is less than 150mg/L. Values of Bicarbonates, Carbonates, Organic carbon and Organic matter were less. As this forest is undisturbed and away from anthropogenic activities such as picnic, industrial development, etc. There is no remarkable effect of season on soil.

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