Studies on Micronutrients present in Soil of different Ecopockets around Similipal Biosphere Reserve (SBR)

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Abstract-The micronutrient status of different ecopockets around Similipal Biosphere Reserve (SBR) were assessed for five years to measure levels of Copper, Iron, Manganese and Zinc and to assess the influence of ecopockets and soil characteristics on the growth of Host Plant Asan (T.Tomentosa) for productivity of Tasar Silkworm. This is carried out in different ecopockets to gain knowledge and share it to the farmers for betterment of their livelihood. It is observed that the micronutrients availability is less where the soil pH is higher. The conductivity of soil is slightly more in Khodambeda ecopocket.

I. INTRODUCTION

Four essential micronutrients for the growth of Host Plant are Copper, Iron, Manganese and Zinc. Copper is a very important for a plant's reproductive growth stage and affects chlorophyll production. It helps in utilization of protein. Iron is critical for chlorophyll formation and photosynthesis. Manganese is important in carbohydrate and Nitrogen metabolism. Zinc is essential for sugar regulation and enzymes that control plant growth especially root growth. Plant growth and leaf yield may be affected if any one of this essential micronutrient is lacking in the soil or is not adequately balanced with other nutrients.

One of the main soil properties affecting the availability of Copper, Iron, Manganese and Zinc is pH. These micronutrients become less available as the soil becomes more alkaline, that is, as soil pH increases.

Similipal Biosphere Reserve is the 8th Biosphere reserve declared by Govt. of India situated in Mayurbhanj district of Odisha state of India between 21^0 28' to 20^0 8' North latitude and from 86^0 4' to 86^0 36' East longitude (Dey at al., 2010). The relation of environment of SBR with that silkworm is very strong for which this Forest is considered as a natural body for this species. Tropical Tasar silkworm is reared all over the SBR region. Few important ecopockets like Kendujuani, Thakurmunda, Sarat, Jadida, Kuliana and Khodombeda where Tasar culture is carried out on the Asan (T. Tomentosa) plant as the primary Host Plant for commercial purpose by the tribal people.

Soil characteristics in different altitude of SBR are due to the effect of rate of water flow through different rivulets and rivers. The steep valley forests scarcely accumulate the decomposed biomass coming through drainage system but the undulating valleys accumulate these bio-fertilizers for which growth of vegetations are seen.

II. SOIL SAMPLING & ANALYSIS

Soil samples from different ecopockets were collected at different latitude and longitude around SBR in every month. The samples were analyzed for Copper, Iron, Manganese and Zinc including pH & conductivity.

A commonly procedure DTPA extraction with the help of AAS was used to estimate micronutrients. pH reading of the soil solution were taken with pH meter. Conductivity was measured with the help of Conductivity Bridge.

III. RESULT AND DISCUSSION

Kuliana Ecopocket possesses higher pH value in comparison to other eco pockets and its micronutrients content are therefore less in comparison to other eco-pockets. It is shown in the table-1 and 2

Table 1

Ecopockets	**pH**	**Conductivity**
	Mean ± SD	
Kendujuani	5±0.071	0.5±0
Thakurmunda	5.9±0.063	0.5±0
Sarat	5.6±0.063	0.5±0
Jadida	5.5±0.063	0.5±0
Kuliana	6±0.089	0.5±0
Khodambeda	5.4±0.063	0.525±0.022

Table 2

Ecopockets	Cu	Fe	Mn	Zn
	Mean ± SD in ppm			
Kendujuani	1.75±0.056	49.81±1.983	38.613±1.701	1.248±0.064
Thakurmunda	1.941±0.06	33.979±0.874	34.133±0.263	1.339±0.099
Sarat	2.589±0.041	49.29±0.747	33.782±0.753	1.699±0.039
Jadida	2.782±0.288	51.702±1.437	37.967±0.204	1.469±0.121
Kuliana	1.313±0.028	64.271±0.928	33.093±0.549	1.113±0.035
Khodambeda	2.01±0.015	58.373±1.708	37.954±0.156	1.485±0.007

IV. CONCLUSION

From the results it is observed that the micronutrients availability is less where the soil pH is higher which is due to increase in alkalinity of the soil.

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