CHAPTER 4

MATERIAL AND METHODS

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The forests of Patharia hills were selected as the main site for the purpose of present investigations. These forests are in close proximity to the university campus and a large number of ecological studies of diverse nature have already been conducted by various workers in these forests.

4-1 Sampling:

Mineral contents in the various plant parts described below were determined in the trees of various CBH classes. It was planned to take trees of minimum to maximum girths. Hence a number of trees of a series of different girths, such as 10 cm, 25 cm, 50 cm, 75 cm and 100 cm were selected. But due to a large number of practical difficulties in selecting a tree of an exact CBH, any tree falling in a particular girth class was considered for sampling. Only healthy trees of each girth class were taken and hallow, damaged or knarled trees were avoided. Few trees of each girth class were marked and samples were taken from these on fixed dates of each month.

Each tree was identified to be composed of ten plant parts which were as follows:

1. Stem dead bark
2. Stem living bark
3. Stem wood
4. New twigs
5. Old twigs
6. Leaves
7. Branch bark
8. Branch wood
9. Root bark
10. Root wood

These samples were easily possible in the upper four CBH classes. Some parts among these were not found in 10 cm CBH class, hence in this class, parts were reduced to six which are as follows:

1. Stem bark
2. Stem wood
3. Twigs
4. Leaves
5. Root bark
6. Root wood

The fraction, stem dead bark included that part of stem which was easily detachable from its surface and was actually dead. Thus, this portion mostly included cork. Rest of the part between stem dead bark and wood was included in living bark. Thus this plant part consisted of entire tissue beyond the secondary xylem except cork, i.e. cambium, secondary phloem
cortex etc. Rest of the portion of stem was considered as stem wood. In case of branch bark and root bark entire tissue beyond the secondary xylem was included. The fragment of new twigs included the twigs of current year whereas 2-3 year old twigs were considered as old twigs.

Stem dead bark was scratched by knife. Leaves, new twigs and old twigs were hand plucked. Stem wood, branch bark, branch wood were collected with the help of an axe and borer. For the collection of root wood and root bark, firstly roots were dug out up to a considerable depth and then samples were collected with the help of an axe.

Sampling of materials was done from July 1974 to June 1975. After collecting all these samples they were first labelled then kept in the polythene bags and brought to laboratory.

Samples were oven dried at 80°C for about 24 hours when they attained a constant weight. In case of hard samples, viz. wood portions and bark portions etc., oven drying was done for more than 24 hours until the samples became totally free from moisture.

After drying the samples in the oven, they were ground in the electric grinder or in mortar and pestle to obtain a fine powder. Leaves and bark were first cut into pieces and then directly ground. Wood, twigs etc. were first ground in the mortar and pestle and then powdered in the electric
grinders. Finally, powdered samples were stored in the polythene bags or in glass bottles.

4-2 Chemical analysis:

Oven dried powdered samples were then analysed for nitrogen, phosphorus, potassium, calcium and sodium. The composite samples of each part were prepared for each month as described below:

The oven dry plant materials of all the ten plant parts of different trees were mixed together with their corresponding parts. After that grinding was done as described above. The powdered composite samples so obtained were used in chemical analysis.

Nitrogen was determined colorimetrically by nesslerization followed by the method described by Misra (1966). Digestion of the material was done prior to nesslerization in sulphuric acid using selenium powder as a catalyst.

Phosphorus was determined colorimetrically followed by the method described by Jackson (1958). Potassium, calcium and sodium were determined by flame-photometer. For P, K, Ca and Na wet digestion was performed using mixture of sulphuric, nitric and perchloric acids.