Chapter – II

MATERIALS AND MEHTODS

2.1. INTRODUCTION

The determination of organic ions is a pressing problem for the environmental pollution, analysis to monitor the quality of soil and effluent. The toxicity of many environmental pollutants to plants is of the prime concerned in relation to maintain the sufficient production of both food and energy.

2.2. MATERIALS AND METHODS

The soil samples were collected in Cuddalore district, Tamil Nadu, South India. The samples were collected in the depth of 0-30cm from the surface of soil, which were taken in sterilized polythene bags. The temperature was recorded on the field. The collected soil samples from the field were dried by spreading out on a plastic tray under a shady area. Coarse aggregate, stones and pieces of roots, leaves and undecomposed organic materials were removed and large lumps of moist soil were broken by hand. Samples were mixed during drying process to complete exposure of fresh surfaces. The dried soil samples were crushed thoroughly using pestle and mortar, finally sieved through a 2mm sieve. Crushing was continued until the soil had retained on the sieve
contained no aggregates. Any material larger than 2mm was discarded. Samples were allowed to dry and stored in plastic bags. They graded in to stones (>2mm) and soil (<2mm). The field soils were stirred with distilled water (1:5) ratio, the pH and electrical conductivity were determined using pH meter and digital conductivity meter (Black et.al., 1982 and Thomas, 1982). The quality of soil was quickly evaluated in terms of soil quality index (SQI) using LabVIEW version 6.0 was presented in chapter-III.

The industrial effluents were characterized by various physico-chemical parameters such as pH, total dissolved solids (TDS), total suspended solids (TSS), oil and grease (OG), chloride, Biochemical oxygen demand (BOD) and chemical oxygen demand (COD). The BOD and COD were the two important parameters reflecting the degree of pollution of industrial effluents. The methodological aspects of statistical multiple regression analysis and ANFIS modelling were used to predict the BOD and COD of industrial effluents elaborately presented in chapter IV. The effluents samples were collected from textile and plastic industry and analyzed as per standard procedure highlighted in chapter –V.

The leaves and stem of amaranthus dubius Linn. plants were collected and treated various concentration of cadmium, iron and manganese in soils. The estimation of macro and micro nutrition by chemical methods were time consuming and large amount of sample was
needed for the analysis. Because of the non-specificity of the methods, easy operation and short time was required for the analysis of several elements of stretch, the spectroscopy method came in handy. One of the important applications of spectroscopy could be the diagnostic value to establish variation in organic contents in plants. So FTIR technique was used to study the influence of methods on organic constituents in plants were explained in chapter –VI. The extinction co-efficient (K) values were calculated using FTIR studies with different age presented in chapter –VI.