

Evaluating Air Pollution Tolerance Index (APTI) of Some Plants Species in Bengaluru City

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Abstract In the present era, the rapid growth of industrial science and technology has improved the human lifestyle as a part of developing countries. On the other hand, we are gradually facing immense trouble in terms of pollution. Now more than ever, the timing is right to take the required action to combat air pollution. Although to varying degrees, plants provide significant coverage for the absorption, impingement, and air pollutants accumulation to lower pollutants. The "Air Pollution Tolerance Index" is a green technology-based tool used for analysing air pollution in one specific area which leads to developing an idea about air quality. The inherent ability of trees to reduce pollution is known as APTI, and urban communities are now quite concerned about this issue. While trees with a lower APTI are used to determine the level of pollution in the air, those with a high tolerance index can cope with pollutants in the air and can be utilised as a source to reduce pollution. The objective of the study is to determine the inherent quality of plants to tolerate air pollution and identify the plant species for pollution mitigation. The APTI is based on an examination of four biochemical characteristics that are directly impacted by air pollution: total chlorophyll, pH of the leaf extract, relative water content, and levels of ascorbic acid, were measured. Because of urbanisation, which has increased a variety of human activities and resulted in a reduction in green space and constant population growth, Bengaluru's air quality has worsened. The results indicate that, all the biochemical parameters show the deterioration with the increase of intensity of pollution. Tolerant plant species serve as suitable sinks to survive the air pollution and the sensitive plant species may be used as a bio-indicator of air quality.

Keywords APTI, Ascorbic Acid, Total Chlorophyll Content, Relative Water Content, pH, Bengaluru City

1. Introduction

In the present era, the rapid development of industrial science and technology has improved the human lifestyle as part of developing countries; on the other hand, we are gradually facing immense trouble in terms of pollution. Now more than ever, the timing is right to take the required action to combat air pollution. Although to varying degrees, plants cover significant surface area for absorption, impingement and collection of air pollutants to lower the harmful elements in the environment. The continuous influence of air pollution on plant species is another environmental concern. By exchanging gases and acting as a sink for air pollution, plants are a key contributor to air quality improvement. Plants, the backbone of every ecosystem, are also the species most likely to suffer consequences from exposure to air pollution.

Additionally, the impacts are often seen on leaves, typically the most plentiful and prominent main receivers of several air contaminants. When exposed to pollutants, plants face numerous symptoms through catalyst reactions, respiration, chemical process, stomata behaviour, membrane disruption, and ultimately death. The air pollutants in the plants make the colours of the leaves yellow, a phenomenon called Chlorosis, or turning the leaves brown- Necrosis, chlorophyll pigment is reduced, chromosomal damage, biochemical alterations, mutations,

