Evaluation of Air Pollution Tolerance Index of Certain Plant Species Grown Alongside National Highway–22, India

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Abstract—*Air pollution is a major problem arising mainly from industrialization, unplanned urbanisation, alarming increase in vehicle fleet and population growth. With rapid development of human civilization the number of automobiles has increased, which ultimately deteriorates the air quality. Plants play an important role in monitoring and maintaining the ecological balance by actively participating in the cycling of nutrients and gases, provide enormous leaf area for the impringement, absorption and accumulation of air pollutants to reduce the pollution level in the air environment. The response of plants to air pollution at physiological and biochemical levels can be understood by analyzing the factor that determine resistance and susceptibility. So the study of Air Pollution Tolerance Index (APTI) was conducted on National highway- 22 from Parwanoo to Solan, falling in Solan district of Himachal Pradesh, India. The leaf samples collected from four species namely Grewia optiva, Toona ciliata, Melia azedarach and Woodfordia floribunda of uniform size, age, spread and common in occurrence on both sides of the highway were used to determine their Air Pollution Tolerance Index (APTI). Four physiological and biochemical parameters, which are leaf relative water content (RWC), ascorbic acid content (AA), total leaf chlorophyll (TChl) and leaf extract pH were used to compute the APTI values. The trend of APTI recorded for various species was Melia azedarch > Grewia optiva > Woodfordia floribunda > Toona ciliata. The APTI also varied with seasons of the year. The highest APTI was noticed in rainy followed by winter and summer season. The study indicated Melia azedarach as most tolerant and Toona ciliata as most sensitive species to air pollution.*

Keywords: *National highway-22, Air pollution tolerance index (APTI), Seasonal variation, Melia azedarch, Toona ciliata, Grewia optiva, Woodfordia floribunda.*