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BIOLOGICAL MONITORING OF ROADSIDE PLANT (*MANGIFERA INDICA*,L) EXPOSED TO VEHICULAR POLLUTION IN INDORE CITY WITH SPECIAL REFERENCE TO M .L. B. COLLEGE , KILABHAVAN INDORE (M.P.) INDIA

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ABSTRACT

The present study gives an idea of changes taking place in plants morphology. Under the influence of urban air pollution. By the many activities of man, the composition and complex nature of environment gets changed. These activities include industrialization, population explosion construction, and transportation. In cities vehicles are major contributors of air pollution. The vehicular emissions have a very harmful effect on the ecology. The important parameters like pH, chlorophyll, Biomass, Leaf area which help study of vehicular pollution in Industrial area.

Keywords:

Vehicular pollution, chlorophyll, Biomass, species Mangifera indica,L.

INTRODUCTION

Pollution is undesirable change in the quality of our Environment (Land, Water & Air) that may adversely affects Human Life, Our Property, Trade & Commerce, Industries and the Life of the Desired Species of Plants & Animals Air is the maximum in put required [11K liters] as compared to 03 liters Water & 01Kg. Food. Air pollution has become a major problem arising mainly from industrialization and urbanization during the last few decades. Particulate matter is of great concern in relation to their adverse impact on human health and vegetation (Rai, 2013). Adverse effects of air pollution on biota and ecosystems have been demonstrated worldwide. Much experimental work has been conducted on the analysis of air pollutant effects on crops and vegetation at various levels ranging from biochemical to ecosystem levels. (Tiwari et al., 2006). Urban air pollution is a serious problem in both developing and developed countries (Li, 2003). Air pollution can directly affect plants via leaves or indirectly via soil acidification. When exposed to airborne pollutants, most plants experienced physiological changes before exhibiting visible damage to leaves (Liu and Ding, 2008). Plants that are constantly exposed to environmental are heavily affected. Vehicular pollution is one of the burning and serious environmental problems in big cities of India. As the society develops it lead to more air pollution which is a global problem

MATERIAL METHOD

The leaves were collected in the month of June-July 2014 from the roadside trees of Polo ground which is a commercial area and highly loaded by heavy traffic. This area is noted as more polluted area in our study. Another sample of leaves were collected from less polluted area is Govt.

Maharani Laxmi Bai Girls P. G. College campus Fort Indore. It is a covered area and noted as less polluted area. The study was carried out during year 2014. Leaf samples of shrubs like *Mangifera indica L.* plant species grown road side (pologround). Polluted site and non-polluted i.e., Botanical garden college campus as control site. Leaves were collected from isoecological conditions (light, water and soil) About 30 leaf samples were taken from each individual of a species plants. The leaf sample observed with the help of hand lens for studied visible injury necrosis, chlorosis, flecks, stipples, bronzing etc. Leaf lengths (cm), breadth (cm), area (cm²) were determined by using leaf area meter (CI-202, USA) and graph paper method.

RESULT AND DISCUSSION

All the investigated parameters in all the plants species of *Mangifera indica L* at more polluted site Pologround with respect to less polluted site botanical garden, which might be due to heavy air pollution in the city. Similar observations were also reported by many other workers like Silva *et al.*, (2005); Rao, (2006); Stevovic *et al.*, (2010). They all are agreed that air pollutants affect the plant growth and morphological characters adversely. The changes in color chlorosis, browning, yellowing, spotting or change in the leaf's normal pigment and shape deformed and modified leaf. Leave morphology, visible injuries and vegetation affected by air pollutants etc. work have been done nationally and internationally by Naveed *et al.*, (2010), Seyyed and Koochak (2011), In India few works have been done by Tiwary *et al.*, (2006), Saquib *et al.*, (2010), The study of dominated road side plant showed impact of vehicular Pollution. The result recorded in the data table No. 01 showed that the different physiological changes observed specially the photosynthetic pigment chlorophyll which is Present in the leaves. The leaves of more polluted site recorded reduction in chlorophyll content in the leaves of *Bougainvillia spectabilis* and *Delbergiasisoo* plant due to probably emission of SO₂ and NO₂ and other gases in the air. These gases deposited on the leaves so changes occur in pH of leaf wash and pH of cell sap of leaves Pathak *et al.* (2015) The concentration of chlorophyll 'a' pigment recorded in leaves of *Mangifera indica L* less polluted site is 3.26 mg/g and recorded in more polluted site is 2.90 mg/g, so % reduction occur 16.18% while the concentration of chlorophyll 'b' pigment recorded in leaves of less polluted site is 2.90 mg/g and in more polluted site is 1.98 mg/g, so % reduction occur 31.72%. while in total chlorophyll concentration similar trend recorded high value in less polluted area and low concentration in more polluted area. (Table No. 1). The experimental data indicates that the depletion in chlorophyll concentration is due to vehicle pollution. The parameter, pH of leaf wash, and electrical conductivity of leaf wash showed that air pollutant content like SO₂ and NO₂ and suspended particle matter affect the physiology of plants. The data indicate that in less polluted site pH of leaf wash towards neutral while in more polluted site the pH of leaf wash towards acidic.

EFFECT OF AIR POLLUTION HEALTH

Air pollution can affect our health in many ways. Numerous scientific studies have linked air pollution to a variety of health problems including: (1) aggravation of respiratory and cardiovascular disease; (2) decreased lung function; (3) increased frequency and severity of respiratory symptoms such as difficulty breathing and coughing; (4) increased susceptibility to respiratory infections; (5) effects on the nervous system, including the brain, such as IQ loss and impacts on learning, memory, and behavior; (6) cancer; and (7) premature death. Some sensitive individuals appear to be at greater risk for air pollution-related health effects, for example, those with pre-existing heart and lung diseases (e.g., heart failure/ischemic heart disease, asthma,

emphysema, and chronic bronchitis), diabetics, older adults, and children. In 2008, approximately 127 million People lived in counties that exceeded national air quality standards.

Table 1: Different Parameters of Leaves of *Mangifera indica L.*

S.N.	Parameters	Less polluted site	More polluted site	Percentage reduction %
1	Leaf area cm ²	40.12	35.40	11.16%
2	Biomass gm/m ²	25.624	27.200	6.150%
3	Leaf area Biomass ratio	1.618	1.320	18.41%
4	Chlorophyll a	3.46	2.90	16.18%
5	Chlorophyll b	2.90	1.98	31.72%
6	Total chlorophyll	6.00	4.72	21.33%
7	pH of leaf wash	6.72	6.21	7.58%
8	Electrical conductivity of leaf wash micromohas	0.53	0.30	43.39%

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