SUMMARY

Title of research project   : **"Studies on monitoring Suspended Particulate   Matter using urban plants and understanding their Green Belt Potentials.**

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Deptt.   : **Botany**

 University/College where work   : **Rizvi College of Arts, Science and Commer**

 has progressed

Effective date of starting of the   : **1st September 2011**
  project

1. The amount of dust is never constant in the atmosphere. It keeps changing with respect to variations in place, time, season, climate, etc. During the field work it was noticed that foliar dust recorded of various plant species differ at different sites and no plant behaves same at all sites i.e. the plant which is the best dust capturer at one site may be the worse in holding dust at other sites. Hence, each plant behaves independently at various sites without any trend or pattern. This may also because of varying wind speed, humidity, proportion of vehicular and industrial exhausts, etc.

2. In order to determine the best plant for capturing and retaining the atmospheric dust, screening of dust to the plants in a constant system (surrounding) was required. A special dust fumigation chamber was fabricated to analyze the plants under controlled and simulated conditions. Using this Dust Chamber, plants were exposed to Ponds Talcum powder (safer substitute to dust) in still or controlled condition and then focused to windy or simulated condition. The constant dust fall followed by the constant wind speed was the helpful idea to discover the best dust capturing and/or dust retaining plant on the field in the city.

3. The plants were screened to dust under controlled (or still) and simulated conditions. The amount of dust was estimated to determine the dust capturing and dust retaining capacities of the plant species. The tendency to hold dust on leaf surface was measured in terms of DRI (Dust Retention Index). Many plants were found to get higher DRI values without fan but some were showing higher DRI values even with fan. The plants that receive and hold more dust without running fan are said to be good dust capturers whereas those plants which hold more4. DRI values are percentage values of Dust captured and Dust retained on the foliar surfaces of various species. A list of plant species, herbs, shrubs, trees with their DRI will help in planning the type of plants to be grown along road dividers, residential areas, highways and gardens. *Ficus benghalensis* L., *Ficus benjamina* L. var. *nuda* (Miq.) M. F. Barrett *Lantana Camara* L. *Mangifera indica* L., *Muntingia calabura* L. *Pedilanthus*

tithymaloides Poit. *Trema orientalis* (L.) Blume, *Ziziphus jujuba* Mill.. *Ervatamia divaricata* (L.)Burk with curled leaves,

Clerodendrum inerme (L.) Gaertn are some plants with high Dust retention indices. However wind plays an vital role in the dust capturing capacities.

5. The city of Mumbai is and was undergoing several changes with the introduction of mass rapid transport systems, construction activities of buildings, flyovers and highway renewal. The plants during the study reflected the same with high amounts of dust in areas with constructions activities or around the viscintiy of such areas. Identification of four plant species as effective dust captures would help in placing plants at critical sites for continuous monitoring. Areas like Borivali near western express highway, Lalbahadur shastry marg in Mulund, Likning road, S.V.road in Santacruz and Khar are critical sites as regards to high dust foliar dust values particulate loading also increases with increasing traffic, as was observed at several sites. Therefore it is suggested to have green belt around road dividers with plants which can be trimmed as well as with high DRI. Plantations with a big canopy alternating with a shorter one are suggested. *Ficus benjamina* and *Pedilanthes tihymalides*, *Nerium odorum* and *Bougainvillea species* for example.

6. Around industrial areas the situations become complex with several industries placed together. Green belt development in such areas should focus on the utility of the area and the principle should be that the installation factory shouldn't be seen and the trees should encircle the factory around 50 M.

Choice of plants for roadsides including traffic island should be in accordance with the width of the road. There should be a formation of screen between traffic and roadside residences. The plants should include shrubs and trees, with intermixing of ornamental herbs like *Aralia*.

7. Different areas have different Elemental composition when EDS studies were done.

dust even with fan (simulated condition) are called good dust retainers.