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Title:	Exploring the possibility of Polyalthia longifolia (False Ashoka) plantation as air quality mitigation at kerbside locations
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Abstract:	Urban forestry has been promoted under the Agenda 21 (United Nations, 1993) as a means to make cities more sustainable and carbon friendly (Churkina et al. 2015). This works primarily through three pathways, which we explore using Polyalthia longifolia (False Ashoka), a tree that accounts for 5-20% of the urban plantations in Indian cities. Firstly, trees sequester carbon directly. A Polyalthia longifolia tree with approximately 3-4 cm stem diameter at breast height and a height of 3 meters (i.e. a relatively small tree trimmed for aesthetic purposes) has a canopy area of 0.9-1 m <sup>2</sup> and a LAI of 0.8 and sequesters around 8000 kg of CO <sub>2</sub> per year. However, the second and more important mechanism through which trees in hot climate contribute to making cities less carbon intensive, is, by cooling their surrounding through evapotranspiration. The same tree evaporates approximately 640,000 kg of water thus cooling its surrounding. This reduces the energy expenditure for space cooling. Thirdly, trees adsorb particles and trace gasses through the process of dry deposition. One such tree sequesters 9.6 kg of ozone per year. In this study we calibrated the DO 3 SE stomatal ozone uptake model for Polyalthia longifolia. Just like other tropical evergreen trees the tree shows maximum stomatal conductance during wet seasons but has a remarkable capability to keep up photosynthesis even at high temperatures and Vapor pressure deficits in summer. Such extreme tolerance to dry conditions has not been reported so far for any species and may be related to the tree tapping into the groundwater via a single tap root. As the stomatal conductance of this tree peaks in the early morning hours it has a strong capability to sequester other criteria air pollutants, in particular NO <sub>2</sub> .
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