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Generic assumption vs. actual stem carbon content in three selected street tree species in urban setting of Colombo, Sri Lanka

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Current interest on removal of anthropogenic CO_2 emissions from urban areas through plants, arises with the potential of trees in urban environments to sequester atmospheric carbon and offset the increasing CO_2 concentrations within the cities. Prediction of carbon stocks in trees that indicate their relative capacities is based on estimations founded on assumptions. The widely used assumption is that the carbon content of stems accounts for 50% of the biomass. Present study investigates the extent to which the organic carbon estimates based on this assumption, for *Mudhuca longifolia* (Mee), *Cassia fistula* (Ehala) and *Pongamia pinnata* (Karanda), the most abundant species in Colombo Municipal Council area, deviate from the actual content of organic carbon in their stems. Streets with highest abundance of these species were selected for sampling (purposive method). Sixty individual trees of each species were randomly selected from the selected streets. Tree diameter at breast height (DBH), total height, crown height, and crown diameter were measured. Stem core samples were collected and the core carbon content per unit biomass was measured using loss on ignition method. The core carbon content was extrapolated to estimate the total carbon content in the stems by multiplying with the tree biomass. Carbon content of the stems were also calculated using the assumption of 50% of biomass is composed of carbon. Both values were compared using One way ANOVA followed by Tukey's pairwise comparison. For *M. longifolia*, *C. fistula* and *P. pinnata*, results showed that stem carbon content only had a statistically significant relationship with DBH. Furthermore, there was a significant difference between the assumed and estimated carbon contents ($P<0.05$) in the stems of the three species. It was revealed that the assumption of 50% of the biomass to be composed of carbon, results an underestimation of the true carbon content of the stems.

Keywords: Stem **c**arbon content, biomass, urban environment, carbon sequestration