Epicuticular wax concentration on Syzygium myrtifolium leaves

ABSTRACT

The pollution issues are a pervasive and increasing threat to human and forest ecosystem. Plants have been recognised as a method to reduce pollution. However, leaf is the most sensitive organ to pollution where changes in leaf morphological, physiological, anatomical and biochemical can occur. This study was conducted to determine the quantity of epicuticular wax on Syzygium myrtifolium leaves in urban, suburban and industrial areas. Three trees were selected in each of the study sites and new leaves on the branch was marked. 5 g of samples were collected for analysis. Leaf surface particles were extracted by using 20 ml of chloroform in conical flask and was left overnight for hardening where weight were recorded. Data analysis showed that the mean epicuticular wax ranged from 267.2-680.7 µg/m2 with a mean increment of 309.6-950.7 µg/m2 /yr. The epicuticular wax concentration on S. myrtifolium leaves was significantly higher in industrial areas compared to those in the urban and suburban areas. S. myrtifolium at industrial areas are in the open and subjected to direct sunlight and also responding to stress caused by the air pollutions. The low concentration of epicuticular wax was recorded on S. myrtifolium leaves in urban area. These trees are subjected to high concentration of pollutants especially from exhaust emissions and possible is due to the aerosol deposition which have been carried by the wind. This initial study reveal that the level of physiological stress on the trees in industrial, suburban and urban areas are at a different scale where the levels of air pollution is different. Understanding the tree traits are important to capitalize their role as bio filters. This study provide the baseline data for future study where the relationship between the particulate matters deposited on the tree canopy and the tree trait could be explained.

Keyword: Epicuticular wax; Industrial area; Suburban area; Syzygium myrtifolium; Urban area