Whenever ambient fine particulate matter is collected and analyzed for organic constituents, the presence of fine particulate matter can be easily identified by the peculiar biogenic preference. The preference is for higher molecular weight odd vs. even carbon number n-alkanes and for even vs. odd n-alkanoic acids.

In order to determine the contributions of fine particulate leaf surface abrasions to the ambient PM2.5 levels, suitable source profiles have to be available. Up to now, only one traverse study has been published for leaf samples collected in Los Angeles (Rogge et al., Environ. Sci. Technol., 27, 2710-2716, 1993; Rogge et al., Environ. Sci. Technol., 25, 744-750, 1991; Hildemann et al., JGR, 101, 13,541-13,549). Today, the Los Angeles organic source profiles for leaf surface abrasions are widely used throughout the USA for source apportionment studies, despite the different distribution of plants and trees from location to location.

Here, an additional source profile for organic constituents associated with fine particulate leaf surface abrasion products has been generated for Pittsburgh, PA. Green leaves from 11 common tree species that are characteristic for the Pittsburgh area were harvested during September of 2001 and composited according to the tree distribution for that area. To simulate a wind-downwind generation process that dilutes the leaf surface abrasions, the leaf composite was placed in a clean Teflon bag and mechanically agitated while passing purified air through the bag, similar to the procedure used for the Los Angeles leaf samples. The fine waxy protrusions (d < 0.25 µm) shed from the leaf surfaces were extracted and analyzed using gas chromatography/mass spectrometry. Individual organic compounds were identified including: n-Alkanes, iso- and anteiso-n-alkanes, n-Alkanoic acids, n-Alkanals, n-Alkanes, sterols, fatty acids, phenolic type compounds, and others. Trace amounts of PAHs were identified and quantified as well.

**CONCLUSIONS**

For the Pittsburgh leaf surface abrasion sample, the EC and OC have been measured; however, PM2.5 mass is not available. Therefore, for the purpose of comparing Pittsburgh with Los Angeles profiles it was assumed that for the Pittsburgh sample 80% of the PM2.5 mass was OC.

Higher molecular n-Alkanes associated with leaf waxes show a pronounced preference for odd carbon numbered n-alkanes at both locations. Waxy n-Alkanes concentration levels for the Pittsburgh leaf abrasion sample is somewhat lower than found for Los Angeles, possibly a result of the different plant distribution as well as differences in climate between the two locations.

n-Alkanoic acids in leaf surface waxy protrusions show a strong preference for even carbon numbered n-alkanoic acids for carbon number greater than C14. Comparing the waxy profiles for leaf surface abrasion products from green leaves, it can be seen that the concentrations for higher molecular weight (C20) even carbon numbered n-alkanoic acids is about 2-3 times higher than measured in Los Angeles. A more than 4-fold increase in the mass concentration of higher molecular weight n-Alkanals (C20) is observed in dead leaf abrasion products. Possible explanations include oxidation of n-Alkanes and n-Alkanals to form n-Alkanals in the dead leaf material and/or the effect of environmental growth conditions (e.g., temperature) or leaf age on wax composition.

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In the Pittsburgh fine particulate leaf surface sample, no n-Alkanes were identified. Consequently, no comparison for these compound class is possible between the two locations. Also, only the major n-Alkanals could be identified in the Pittsburgh sample and these show somewhat lower concentrations than determined for Los Angeles. It can be concluded that the leaf surface abrasion products do occur during Fall-Spring.