

Variation of Carbonaceous Aerosols on Foggy Days in and Around Special Episodic Events

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The present study deals with the impact of special episodic events like firework activities on the variation of carbonaceous aerosols on foggy days during, in, and around Diwali at three different sites. The data were segregated on the basis of land use pattern viz. JNU (dense vegetative), VN (residential) and AN (industrial) in Delhi, India. The average organic carbon [OC (99.24 $\mu\text{g}/\text{m}^3$)] and elemental carbon [EC (24.31 $\mu\text{g}/\text{m}^3$)] concentrations, found to be highest at VN, depicts high influence of firework activities during Diwali including other significant sources like vehicular and commercial activities. The MOZART model-simulated vertical profile of EC and OC over Delhi also suggests that EC and OC concentrations increase drastically in the lower atmosphere during the Diwali period, and then a gradual decline is reported during the post-Diwali period. During post-Diwali, OC and EC concentrations showed a drastic decline during the day as compared to night, due to scavenging of aged particles from firework emissions during the morning hours. This study is the first of its kind to identify the nature of carbonaceous aerosols during foggy days which can be studied with respect to firework activity. In addition to a detailed illustration about the impact of firework activities, this study also helps to comprehend the role of fog in scavenging of aged particles.

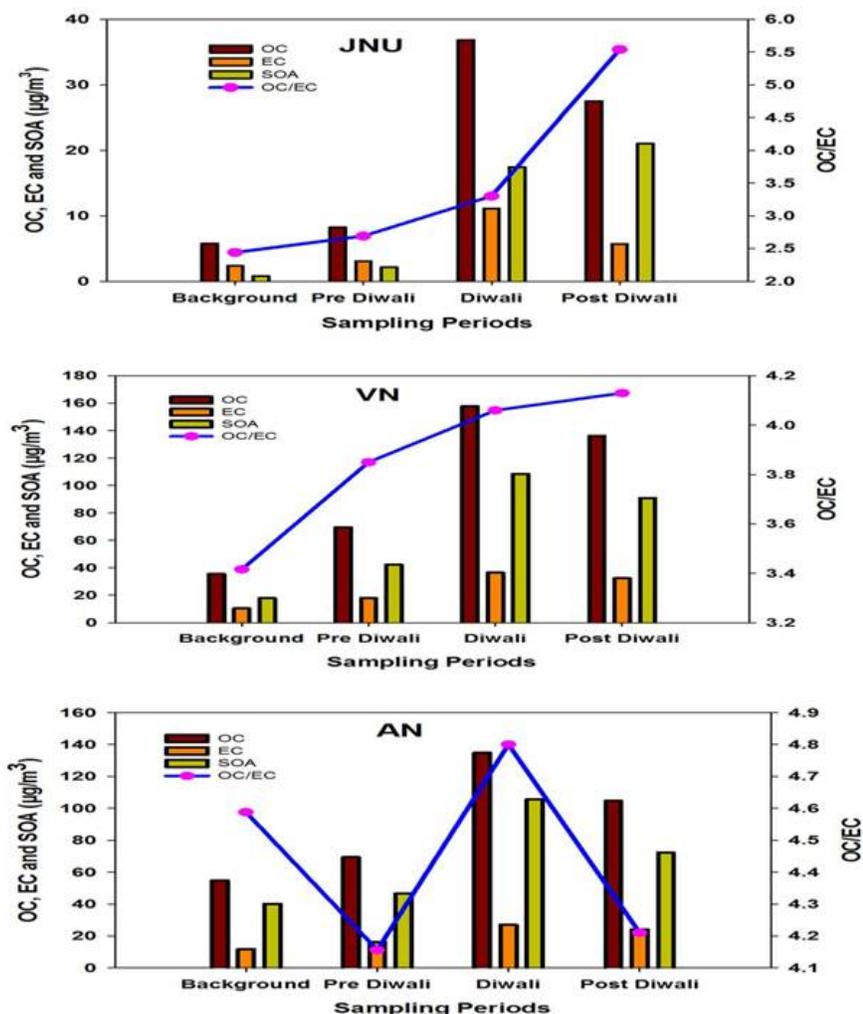


Figure 1. Comparative variation of OC, EC, OC/EC ratios and secondary organic aerosol concentrations on foggy days at different sites during Diwali.