



## Influence of contemporary carbon originating from the 2003 Siberian forest fire on organic carbon in PM<sub>2.5</sub> in Nagoya, Japan.

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Abstract: In May 2003, high concentrations of organic carbon (OC) in PM<sub>2.5</sub> were measured in Nagoya, a representative metropolitan area in Japan. To investigate the influence of possible forest fires on PM<sub>2.5</sub> in Japan via long-range aerosol transport, the radiocarbon (<sup>14</sup>C) concentrations of PM<sub>2.5</sub> samples from April 2003 to March 2004 were measured. <sup>14</sup>C concentrations in total carbon (TC) from May to early June showed higher values than those in other periods. The OC/elemental carbon (EC) ratios from May to early June were also significantly higher than the ones in other periods. In addition, OC concentrations from May to early June were typically high. These results indicate that the abundant OC fraction from May to early June in Nagoya consisted predominantly of contemporary carbon. Furthermore, simulations of diffusion and transport of organic matter (OM) in East Asia showed that abundant OM originating from East Siberia spread over East Asia and Japan in May and early June. Backward air mass trajectories from this time frame indicate that the air mass in Nagoya likely first passed through East Siberia where fire events were prevalent. However, the backward trajectories showed that the air mass after early June did not originate mainly from Siberia, and correspondingly, the <sup>14</sup>C and OC concentrations showed lower values than those from May to early June. Therefore, the authors conclude that contemporary carbon originating from the forest fire in East Siberia was transported to Nagoya, where it significantly contributed to the high observed concentrations of both OC and <sup>14</sup>C.

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