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Gravestone decay and the determination of deciduous bulk canopy resistance to acid deposition

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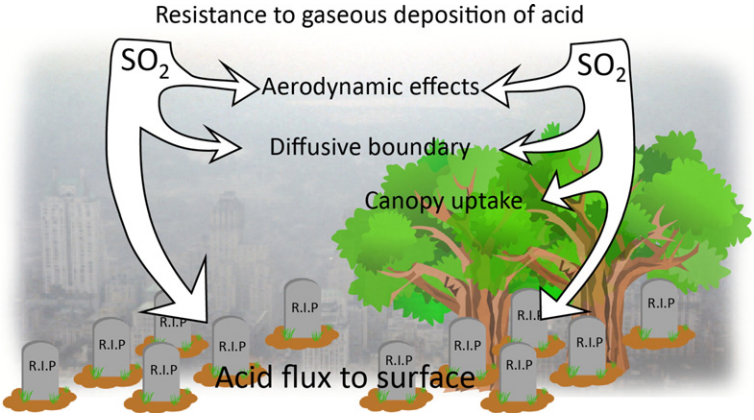
HIGHLIGHTS

- Gravestone decay provides a measure of the flux density (F) of acid.
- Bulk canopy resistance is derived as the difference between deposition velocities.
- Quantitative estimate of tree canopy resistance to gaseous deposition of acid.
- Up to 55% annual reduction in acid deposition under seasonal tree canopy.

GRAPHICAL ABSTRACT



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ABSTRACT

Gravestone decay and atmospheric concentrations of SO_2 are used to determine deposition velocities in two adjacent cemeteries in the Birmingham, UK, Jewellery Quarter. Warstone Lane cemetery is essentially open to the environment with only a limited number of trees. Key Hill Cemetery, located within 100 m, has a continuous canopy of 100+ year-old London plane; gravestone decay at Key Hill is 50% less than at Lane for the period after 1960. This difference is used to calculate canopy resistance as a residual term assuming that aerodynamic and quasilaminar resistances are generally similar at both sites. Calculated resistances range from approximately 300 to 900 sm^{-1} and are consistent with estimated and calculated values from a wide variety of studies.

1. Introduction

Dramatic contrast in decay of lead-lettered marble gravestones between two adjacent cemeteries in Birmingham, UK, allows estimation of the canopy resistance to gaseous deposition of SO_2. Warstone Lane

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