

Quercus spp.에서 개화시기와 화분 비산의 시공간적 변화

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Spatio-temporal Variations of Flowering Time and Pollen Dispersal in *Quercus* spp.

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More recently, the incidence of major allergic diseases in Korea has increased dramatically in the conversion of coniferous forests into deciduous broad-leaved forests such as *Quercus* spp., resulting from increased domestic exposure to allergens. However, there is still a limited understanding of a spatio-temporal pollen pattern in forest trees. Therefore, the main aim of this research is to better understand a spatio-temporal dynamic between flowering time and pollen dispersal in the establishment of the Community Multiscale Air Quality (CMAQ)-based pollen dispersion model, which is integrated with the improved oak pollen emission model (PEM-oak). The pollen production increased in *Quercus* spp. grown under elevated carbon dioxide (CO₂) levels compared with levels of CO₂ in the atmosphere. The pollen dispersal of *Quercus* spp. tends to be different depending on the climatic factors, and the climate change due to the increase of CO₂ concentration is expected to increase the air pollen dispersal. The pollen dispersal and production of oak species can be predicted by the interaction between temperature and other climatic factors as well as the complexity of overlapping plant seasonality. To further improve the accuracy of models for predicting pollen dispersal and seasonal length of *Quercus* spp., the application of meteorological factors such as water vapor pressure and precipitation should be considered.

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