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An Comparison of Two Numerical Models on Photosynthetic
Response of *Quercus mongolica* Leaves to Air Pollutants

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A multiple regression model was formulated for estimating the effect of major air pollutants on Pn (net photosynthetic rate) of *Quercus mongolica* leaves and its model was compared with the process oriented model including the same variables. Photosynthetic capacity depended primarily upon as a function of PPFD (Photosynthetic photon flux density), air temperature and O_3 concentration. The photosynthetic capacity responded negatively to O_3 concentration, which indicated a potential growth reduction of *Q. mongolica* forests due to ambient O_3 concentration in the urban area of Korea. We assessed the contribution to the multiple regression model and the process oriented model on ambient O_3 concentration affecting Pn of *Q. mongolica* leaves. Although the observed value and the theoretical value predicted from each model were similar each other, the per cent reduction of Pn in the multiple regression model (= 12.6%) by ambient O_3 concentration was higher than that of the process oriented model (= 5.6 %). The mean difference in the multiple regression model (= 0.806 $\mu mol\ m^2s^{-1}$) for the original data was smaller than that in the process oriented model (= 0.319 $\mu mol\ m^2s^{-1}$). The results of this study suggest that although the predictions of two models for Pn of *Q. mongolica* leaves were similar, the contribution to two numerical models of specific air pollutant may considerably different.

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대기오염에 대한 리기다소나무 침엽 표면의 미세구조 및

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야외에서 대기오염에 대한 리기다소나무 잎의 반응을 알아보기 위하여 서울의 동쪽 11 km에 인접한 아차산을 오염지역으로, 서북쪽으로 30 km 거리에 위치한 경기도 파주를 대조지역으로 선정하여 침엽 표면의 미세구조를 관찰하고, 큐티클층의 왁스 함량을 정량하며, pressure-volume curve를 계산하여 조직탄성지수 (tissue elastic modulus)를 계산함으로써 잎의 수분관계를 밝히고, 광합성능을 측정하였다. 그리고 두 지역 토양의 물리화학적 성질도 조사하였다. 리기다소나무 침엽 표면은 오염지역이 대조지역보다 더 많은 분진과 표면침식이 관찰되었고 큐티클의 왁스 함량은 약간 적었으며, 조직의 탄성도가 낮았고, 광합성능도 낮았다.