

## Eco-physiological Characteristics of *Robinia pseudoacacia* L. and *Salix koreensis* Anderson in Waste and Reclaimed Landfills in Sudokwon, Incheon Republic of Korea<sup>1</sup>

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### ABSTRACT

Tree establishment and growth in landfill sites are potentially affected by a number of environmental factors such as soil condition, precipitation, temperature, etc. Plant species in K-G and Y-G sites showed better growth than those in K-B and Y-B sites. Overall, photosynthetic rate of all species varied for growing season with a minimum in June ( $6\text{--}8\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$  at K and  $4\text{--}5\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$  at Y site) and a maximum in August ( $10\text{--}12\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$  at K and  $8\text{--}9\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$  at Y site). *Robinia pseudoacacia* L. (Locust) and *Salix koreensis* Anderson (Korean willow) in Y site had a relatively lower photosynthetic rate in June ( $4\text{--}5\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$ ) than in August ( $8\text{--}9\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$ ) and October ( $6\mu\text{mol CO}_2\text{m}^{-1}\text{s}^{-2}$ ). The highest total chlorophyll content for all the measurements was  $8.8\text{mg g}^{-1}\text{DW}$  in June for the K-G site of *R. pseudoacacia*. The highest APX activity for all measurements was  $0.11\text{ mmol min}^{-1}\text{mg protein}^{-1}$  in June at K-B site. The highest GR activity was  $5.98\text{mmol min}^{-1}\text{mg protein}^{-1}$  protein in October at K-B site. The reduced photosynthetic rates and chlorophyll contents and the increase in the activities of two antioxidant enzymes (APX and GR) suggest that the physiological traits of the two tree species are adversely affected by exposure to a poor environment for growth. The higher anti-oxidant enzyme activities suggest a typical compensatory strategy for these species.

Keywords : *Ecophysiology*, *Landfill*, *Salix koreensis*, *Robinia pseudoacacia*

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