

Comparison of respiration metabolism in some tree species at the different age groups

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Abstract: Growth in trees denotes the increase in diameter, size and volume of the tree over time. These formations are completed in three different stages, namely as formative, maturity and old age phases. The formation phase is the stage in which the anabolic reactions occur at a high rate due to rapid growth. In the second phase (maturity) metabolic activity slow down but wood morphology and chemistry start to change. In the old age anabolic reactions convert into catabolic reactions. However growth and development in trees occur due to the collective influence of environmental conditions such as the speed of metabolic reactions working in genetic structure, age, growth and development processes of the tree as well as senescence, climate and others abiotic and biotic factories. In this study was compared respiration metabolism in some forest trees at different ages. These are *Abies nordmanniana* Stev. (Fir), *Fagus orientalis* Lipsky. (Oriental beech), *Pinus nigra* Arnold. (Black pine), and *Quercus robur* L. (Peduncle oak) in the Kascılar village of Kastamonu; *Juglans regia* L. (Walnut), in the Esen village of Kastamonu; *Cupressus sempervirens* L. (Italian cypress), in the central of Kastamonu. For this purpose leaf samples were collected from these trees and were measured glucose, pyruvate, and free amino acid. According to the findings, the highest values were found in leaves of oak tree over 30 aged for pyruvate, in leaves of cypress tree over 35 aged for free amino acid, and in leaves of fir tree over 100 aged for glucose content. According to age groups of trees, the high pyruvate value was found in leaves of fir, cypress and beech at over 300 and 500 aged and in leaves of walnut and black pine at over 100 aged. The high free amino acid value was found in leaves of walnut at over 400 aged and black pine and fir at over 100 aged. Glucose content was found high value in leaves of cypress at over 100 aged, in leaves of walnut at over 400 years aged and in leaves of black pine at over 100 aged. As a result, it was concluded that the aging physiology of the trees changed according to tree species and trees's ages. However, pyruvate, from the criteria of catabolic activity, is higher in older trees and lower in younger trees. This situation is signaled that environmental factors and harmful effects also are important on respiration rate.

Keywords: Age-groups, Growth physiology, Kastamonu, Respiration