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Role of ascorbic acid in modifying root architecture, growth, and productivity of *Arabidopsis thaliana*

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Ascorbic acid (AsA) participates in several aspects of plant growth, development, and productivity. Under optimum growth conditions, plants accumulate variable amounts of AsA in different organs. This project has examined, in Arabidopsis thaliana, the effect of AsA on growth and seed production through analysis of morphological and physiological parameters. The highest levels of AsA were found in flowering buds, premature siliques, leaves, and stems, respectively. In addition, the AsA level correlated positively with concentrations of indole acetic acid (IAA) but inversely with salicylic acid (SA) concentrations. Plants synthesise AsA through six different pathways and primarily through the galactose pathway. A mutant defective in production of GDP-mannose pyrophosphorylase, vtc1-1, had significantly reduced growth parameters such as root growth rate, root length, number of leaves, leaf area and plant height compared with vtc5-1 (defective in GDP-L-galactose phosphorylase production), dhar1 (defective in mitochondrial dehydroascorbate reductase) apx1 (defective in cytosolic ascorbate peroxidase) and the Col-0 wild type background. The role of AsA as a signal for the promotion of cell expansion was verified in embryonic root cap studies. In addition, AsA promoted cell division by rapid stimulation of differentiation in surrounding cells of the root quiescent centre in Col-0 compared with vtc1-1. A lack of AsA increased the intensity of hydrogen peroxide production in roots and also increased the number of secondary roots. Surprisingly the number of flowers and siliques per plant, the number of seeds per silique and seed size were also all affected in vtc1-1, which indicates a key role for AsA in plants.

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Taxonomic value of leaf micro-morphology and quantitative phytochemistry of *Jatropha integerrima* jacq and *Jatropha podagrica* hook (euphorbiaceous) – known horticultural plants in Nigeria

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The leaf micromorphology and quantitative phytochemical constituents of *JatrophaintegerrimaJacq* and *Jatrophapodagrica* Hook. He studied in his work to access the systematic values of stomata, trichome and the amount of bioactive compounds present in both studied species. A standard method was used for the anatomical and phytochemical analysis. Result shows minor differences between examined species. The microscopic study has revealed that both species are hypostomatic while unicellular trichome is only found on the foliar ad axial surface of *Jatrophaintegerrrima Jacq*. Results from the phytochemical analysis has shown little differences in the amount of bioactive compounds present in both species, phenol contents is the highest in the studies species with 37.65% (14.90±0.84 mg/g) in *Jatrophaintegerrima* and 36.13% (7.95±0.55 mg/g) in *Jatrophapodagrica*. The amount of terpenoids is less significant in the two species. The similarities and differences in the foliar epidermal characters and quantitative phytochemistry in the two studied species are of taxonomic significance and can be used to delimit to two species.

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