

Anatomical Study on Translocation of Carbon Nanomaterials Distribution in Leaf and Stem of the Pea Green (*Pisum sativum*) PlantFeyza CANDAN¹, Qi LU²¹ Department of Biology, Faculty of Science and Letters, Manisa Celal Bayar University, Manisa, Turkey² Physics and Engineering Department, Optical Sciences Center for Applied Research, Delaware State University, Delaware, USA
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Aim of the study: The translocation of nanomaterials across the plants have impact for their development and considerably important on their evaluation. Pea green (*Pisum sativum*) is belong to Fabaceae family which has an economic value in the world. According to this study, pea green leaf and stems were used to investigate the anatomical features related translocation and transmission of C₇₀ single-walled carbon nanotubes (SWNTs). The comparisons and results were obtained and the hyperspectral photographs were taken to make comparisons.

Material and Methods: Pea green seeds were exposed to 4 ml C₇₀ single-walled carbon nanotubes (SWNTs) and 15 ml deionized water mixture for 2 days and they were grown in the pots for 3 weeks. Control group of the samples were also grown in another pot. All the plants watered every day only with water in the morning. After 3 weeks, C₇₀ single-walled carbon nanotubes (SWNTs) exposed pea green plants (leaf, stem, and root) and control group were taken from the pots and they were stored at % 70 alcohol. For microscopical investigation, hand cross sections were taken. Cytoviva Hyperspectral Imaging Microscope was used to take C₇₀ single-walled carbon nanotubes (SWNTs) exposed pea green leaf and stem and control group leaf and stem photographs.

Results: Effects of nanoparticles on biologic systems and for the environment is known according to recent researches. According to this study, by comparing most of the photographs, it can be concluded that, C₇₀ single-walled carbon nanotubes (SWNTs) absorbed and translocated to the leaves and transmitted in big rates while photosynthesis is existing. Some C₇₀ single-walled carbon nanotubes (SWNTs) particles were seen on the stem, especially around the vascular bundles. Black aggregates were found easily around the cells near the vascular bundles. There were a few damaged cells seen on the plant. The pea green plants *except* control group were also morphologically seen healthy.

Keywords: Pea green (*Pisum sativum*), C₇₀ single-walled carbon nanotubes (SWNTs), anatomy