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Title:	Plant Nanobionic Effect of Multi-walled Carbon Nanotubes on Growth, Anatomy, Yield and Grain Composition of Rice
Authors:	Joshi, Anjali (/jspui/browse?type=author&value=Joshi%2C+Anjali)
Keywords:	MWCNT Cell viability FESEM Rice Seed yield Seed composition Confocal microscope
Issue Date:	2020
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Citation:	BioNanoScience, 10, pp.4230-445.
Abstract:	Oxidized multi-walled carbon nanotubes (MWCNTs) having a diameter of 14–30 nm and length of 200–300 nm were used to the prime rice seeds with different concentrations of MWCNT (70, 80 and 90 µg/mL). The effects on germination, growth, anatomy, physiology, yield, quantitative seed components and toxicity (using human cell lines) were evaluated. The treatments, when extended to realistic field environments, resulted in significantly better yield and productivity of rice. The MWCNT-treated plants had denser stomata and larger root length, which resulted in faster growth and facilitated both water and mineral uptake, thus boosting the crop yield. Increased vascular tissues enhanced the chlorophyll content and photosynthetic activity. No toxic effects of MWCNT were observed in the DNA of the CNT-treated plants, and in the human cell lines, treated with harvested grain extract of MWCNT-primed plants. This study provides some new insights into the use of nanomaterials in plants and their potential benefits in agriculture thus ushering in a new organic-inorganic interface.
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