Effect of cold atmospheric plasma seed priming on plant pathogen defense system

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Cold atmospheric plasma(CAP) is developing as a cost effective and eco-friendly option for enhancingthe crop security and productivity in agriculture. CAP induces the level ofreactive oxygen/ nitrogen species in plant which have both toxic and growthinducing effects, depends on dose and time exposure of the CAP treatment. Thetreatment induces the concentration of hydrogen peroxide, superoxide, nitrogenoxide, nitrate and nitrite ion in seed micro-environment which have positiveeffect on seed germination and growth. In past, various researches reported studieson the positive effect of cold plasma seed treatment on plant germinationefficiency. However, the impact of CAP seed priming on pathogen defenseactivity studied is yet to reveal. CAP seed priming comprises exposure of coldplasma to seed prior to germination, which may alter the seeds metabolicactivity and inducing the seed germination, growth and pathogen defenseresponse at vegetative stage. To keep this hypothesis in mind, we treat the seeds with CAP prior to germination andexamining its effect on plant metabolism and pathogen defense system atvegetative stage of plant. Various morphological (such as growth status, rootand shoot length) and biochemical marker (MDA, ROS concentration andantioxidant enzyme assay etc) analysis uses to interrogate the cold plasma seedspriming effects on plant pathogen defense mechanism.