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Evaluation of pathogenic potential and survival of *Rhizoctonia solani* isolates in rhizosphere of different wheat genotypes using conventional and real time PCR techniques

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Rhizoctonia solani Kuhn (Teleomorph: *Thanatephorus cucumeris* Donk) is a ubiquitous soil-borne plant pathogenic fungus which causes significant yield losses in many agriculturally important crops. *R. solani* isolates were collected from the diseased root of mung bean (RDLM-1, RMPM-5, RMHM-6, RJHM-20 & RJKM-5), cowpea (RPBC-1) and rice (Rice-17) plants from different locations in India. Mass multiplication of isolates of *Rhizoctonia solani* was done on sorghum grains. Soil was mixed with fully colonized seeds of sorghum grains with *R. solani* isolates at 10 gm per 4 inches pots (containing 1 kg sterilized sandy loam soil in each pot). After proper mixing of inoculum in soil, 20 seed each of seven wheat cultivars viz., HD-2967, Agra Local, Suhzae, Ning-8133, Chiraya-3, Milan and Sonalika was sown. The pots were maintained at 28° C and 95% relative humidity under glass house conditions. Soil sampling were done at 0, 10, 21 days after sowing and after harvesting for quantification of inoculum level in soil. The soil DNA was extracted by using ZR Soil Microbe DNA Kit™. Ning-8133 wheat cultivar found resistant against six *R. solani* isolates (RDLM-1, RPBC-1, RJHM-20, RJKM-5, Rice-17 & RMHM-6) except RMPM-5. RJLM-20 and RMHM-6 were not able to produce symptoms after 14 days of sowing. Isolate RMPM-5 recorded most virulent in all cultivars among all the *R. solani* isolates. *R. solani* inoculum in the rhizospheric soil of different wheat cultivars were quantified at different time interval (0, 10, 21 days after sowing and after harvesting) using serial dilution and specific primer through real time PCR. Maximum concentration of inoculum was observed after 10 days of sowing. Inoculums started decline after 10 days of sowing and it was almost equal to the initial level after the harvest of the crop. Results indicated that *R. solani* disease incidence in wheat varies with cultivar and isolates of the pathogen. Wheat crop is not promoting *R. solani* after seedling stage and not reducing the inoculums concentration also. Information generated will be helpful for the management of pathogen in rice-wheat, mung bean-wheat cropping system.

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Genotype dependent direct embryogenesis and plant regeneration from immature embryos of oil palm *Elaeis guineensis*

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Oil palm accounts for 30% of world oil production and is the largest vegetable oil traded. Production of palm oil from a unit area is 7-10 times more than that of any other oil seed crops. Apart from the numerous edible and non edible uses of palm oil and palm kernel oil this crop is gaining importance as a potential biofuel. Tissue culture of oil palm is of great significance for both multiplications of elite palm and as a means for genetic transformation. We report here an improvement of the already reported protocol for direct embryogenesis. Immature fruits were collected after 120 days of pollination (DOP) from 5 different palms derived from Deli X Ghana crosses. The embryos were excised and cultured in Y3 media with 2, 4-D (25 mg/l), Picloram (12 mg/l), 2, 4, 5-T (4 mg/l), 6-benzyl amino purine (2 mg/l). The response was seen as swelling of the embryos and the globular embryo formation from the cut ends of the embryos. Embryos from all the palms showed direct embryogenesis within a period of one month. After two to three sub-cultures the embryos started forming plantlets. The percentages of response obtained, the number of somatic embryos obtained and the process of plant regeneration is reported in this paper. Using this protocol we could obtain the plant regeneration within a period of 12-15 months.

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