Eco-friendly management of seed borne fungi for sustainable crop production

ABSTRACT

A total of seven seed-borne fungi were detected from forty rice (Oryzae sativa) seed samples (cv. BR11 and BRRI dhan28) collected from two upazilas (Narshingdi Sadar and Shibpur) of Narshingdi district in Bangladesh. The identified species were Bipolaris oryzae, Alternaria padwickii, Sarocladium oryzae, Curvularia lunata, Aspergillus niger and Fusarium spp. The seed samples were composed of apparently healthy seed, spotted seed, discoloured seed, deformed seed, varietal mixture and chaffy grain. Prevalence of fungi and seed germination varied significantly with respect to variety and seed source. Seeds of rice variety BRRI dhan28 carried the lower infection of all the seed-borne fungi than the variety BR11. Seeds collected from Shibpur had higher seed-borne infection. An attempt has been made to control the seed-borne fungi by different plant extracts and chemicals. Garlic extract (1:1) dilution found best which successfully reduced seed-borne infection (80.3%) and also increased seed germination by 10.69% over control. Neem, allamanda and bishkatali extracts also increased seed germination 8.99%, 7.10% and 5.84%, respectively. Seed treating fungicides viz. Vitavax-200, Bavistin 50 WP and Captan were also tested to control seed-borne fungi. Seed treatment with Vitavax-200 @ 0.3% of seed weight eliminated all the seed-borne fungi and increased seed germination by 25.70% over control. Another chemical Bavistin also reduced seed-borne infection (88%) successfully and increased seed germination by 24.67% over control. Considering the high cost and deleterious effect of chemicals on environment, plant extracts may be recommended for controlling seed-borne fungal pathogens of rice as they are cheap, safe and eco-friendly.

Keyword: Management and plant extracts; Rice; Seed borne fungi