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Using Radio Frequency Heat Treatment to Control Seed-borne *Trichoconis padwickii* in Rice Seed (*Oryza sativa* L.)

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Abstract

Trichoconis padwickii is the main seed-borne fungus in many of seed crops especially in rice. They can cause the loss in germination, viability, and vigorous of the rice seeds. This study was to determine and evaluate the proper radio-frequency heat treatment on eliminating the seed-borne fungus, not only on the seed surface, but also inside the seed, which affect the seed qualities at the least. The rice seeds cv. "Khoa Dawk Mali 105" (KDML 105) with the initial moisture 10.4 % and viability of 94 % were treated with radio-frequency (27.2 MHz) at the temperature of 70, 75, 80 and 85°C for 180 seconds. Seed health test was assayed by blotter method and the various seed qualities were determined according to ISTA rules (2004). The existing of *Trichoconis padwickii* after treatment was decreased from 29 % from no treatment to 22.2, 17.8, 16, and 11.7 % respectively. Other fungi were found as *Fusarium* sp., *Curvularia lunata*, and *Bipolaris oryzae*. However, among all fungi, *T. padwickii* found to be the main principle seed-borne in rice. The rice seed qualities assessment, the results showed that their qualities were decreased with the increasing of the temperature used. The viability was reduced from 94 % to 39 % at the temperature 85 °C. Therefore, the radio-frequency had significantly showed the efficiency in controlling *T. padwickii* however it reduced the seed qualities. The best temperature used was at 75°C, *T. padwickii* infestation dropped to 18 % whereas the percentage of seed viability was as high as 82 % and the moisture content dropped to 9.3 %. Longer treatment period and other temperatures used should have further research and investigation.

Keywords: Radio frequency, rice, seed-borne, *Trichoconis padwickii*

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