The Effect of Two Fungal Species Isolated from Sporocarps of *Marsilea minuta* on Paddy Seed Germination and Early Seedling Growth

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Marsilea minuta is a heterosporous aquatic fern commonly found in paddy field ecosystems. During dry periods, it produces drought-resistant sporocarps that can harbour fungi affecting paddy seed germination and seedling growth. This study identified fungi associated with *M. minuta* sporocarps and evaluated their effects on paddy seed germination and early seedling growth. Fungi were isolated from surface-sterilized and non-sterilized sporocarps using agar plate techniques and identified based on Commonwealth Mycological Institute (CMI) descriptions, followed by DNA sequence confirmation using the internal transcribed spacer (ITS1 and ITS2) regions. The effects of fungal spore suspension (50µL of 10^5 CFU/mL per seed) on germination percentage, root length, and shoot length were assessed using five paddy varieties (BG 367, BG 479, *Hangimutthan*, *Kalumurunga*, and *Suwadal*) with four replicates of 100 seeds per each treatment, compared to an untreated control (seeds treated with sterile distilled water). Seeds were germinated for 14 days at 25°C under a 12 h light/12 h dark conditions. Germination data were analysed using the Kruskal–Wallis test followed by Dunn's *post hoc* test, while root and shoot lengths were analysed using the Wilcoxon rank-sum test at a significance level of $P<0.05$. Two fungal species (*Neopestalotiopsis clavispora* and *Mucor irregularis*) were isolated from sporocarps. *N. clavispora* was detected both externally and internally and did not significantly affect germination but significantly enhanced seedling growth, increasing root length by approximately 11–25% and shoot length by 13–24%, with the greatest response observed in *Kalumurunga* ($P < 0.05$). *Mucor irregularis* was restricted to the sporocarp surface and significantly reduced germination by approximately 6–13% across all paddy varieties, with the greatest reduction observed in BG 367 ($P < 0.05$). It also reduced root length by 2–8% and shoot length by 4–12% in BG 367, *Hangimutthan*, *Kalumurunga*, and *Suwadal*, although a slight growth increase (~4%) was observed in BG 479. These findings demonstrate that *N. clavispora* and *M. irregularis* associated with *M. minuta* sporocarps exert contrasting effects on paddy seed performance. Further, *N. clavispora* shows potential as a bio-stimulant to enhance seedling vigour, whereas *M. irregularis* poses a risk to seed germination in paddy ecosystems.

Keywords: developed varieties, fungal pathogens, its, sporocarp-associated fungi, traditional varieties