A100 AGSC

Inactivation of water borne plant pathogen *Phytopythium vexans* using UV-C LED irradiation.

Abstract

Phytopythium vexans is an oomycete with a broad host range producing swimming zoospores which may keep circulating in the irrigation water and cause chains of disease outbreak. Irradiating such water with UV could be an alternative to chemicals. In this study, *P. vexans* was grown on V8 in dark conditions at 25°C for 72 hours. V8 media was drained, mycelium was washed thrice and kept in sterile autoclaved distilled water under bright fluorescent light at 26°C and sterile distilled water was refreshed after 48 hrs and kept in the same condition for 72hrs. The water was drained and replaced with fresh 1x PBS and kept in 10°C under bright fluorescent light for 30 mins to release zoospores. The conidia were harvested and suspended in phosphate buffer (pH 7.4). Light absorbance at 276 nm was 7 % lower than 254 nm hence the device with peak irradiance at 276nm and full width at a half maximum (FWHM) of 12 nm was chosen to ensure better light penetration. Average fluence rate (mW.cm-2) was calculated based on the optical properties of the fluid suspension. UV-C dose was calculated as average fluence multiplied by exposure time. Zoospore suspensions were exposed to UV-C exposure doses of 0, 12 and 24 mJ.cm-2. Surviving population was counted after each treatment. The D10 value for this *P. vexans* was calculated to be 12 mJ.cm-2. The results of this study could be used in UV treatment of irrigation water to manage *P. vexans* in the ornamental production systems.