

ABSTRACT

Climate change and agricultural land degradation have encouraged the development of alternative technologies to improve nutrient utilization efficiency in crops. One promising approach is the synthesis of nitrate using Plasma Activated Water (PAW). This study aims to determine the optimal synthesis time of PAW using positive corona discharge plasma and to evaluate its effectiveness in enhancing pakcoy growth in an aeroponic system. The plasma activation times used were 10 minutes, 15 minutes, and 20 minutes. The produced PAW was applied as a nutrient solution in the aeroponic system with irrigation frequency variations of 10 minutes, 15 minutes, and 20 minutes. Plant growth parameters observed included plant height, number of leaves, fresh weight, dry weight, and chlorophyll content. The results showed that the optimal PAW synthesis time was 20 minutes, producing the highest nitrate concentration of 0.928 mg/L in every 100 mL of solution. The application of PAW in the aeroponic system indicated that a 20-minute irrigation interval resulted in the best plant growth performance, characterized by higher plant height, leaf number, and biomass compared to other treatments. These findings suggest that PAW synthesized using the corona discharge plasma positive method has potential as an alternative nitrogen nutrient source for aeroponic cultivation systems.

Keywords: *Plasma Activated Water, corona discharge plasma, nitrate, aeroponics, pakcoy.*