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ALLEVIATION OF SEED DORMANCY AND PROMOTION OF GERMINATION IN *Physalis alkekengi* USING ULTRASOUND STIMULATION

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Abstract

Physalis alkekengi (Chinese lantern) is valued for its ornamental and medicinal properties, but exhibits seed dormancy that can impede germination. Ultrasonic waves have shown potential for enhancing seed germination in various species, but limited research explores this in *P. alkekengi*. This study was carried out in completely randomized design to investigate the effects of ultrasonic wave exposure on breaking dormancy and promoting germination in *P. alkekengi* seeds. Treatments involved immersing seeds in an ultrasonic bath at 28 kHz frequency for 5, 10, 15, 30, or 60 minutes. Treated seeds were germinated under controlled conditions and assessed for multiple growth parameters. Results showed that ultrasonic waves significantly influenced germination percentage, rate, time, and seedling fresh/dry weights compared to controls. In particular, 60 minutes ultrasonic treatment markedly improved cumulative germination. Strong correlations existed between treatment duration and germination metrics like percentage and rate. In addition to improving seedling performance, the application of ultrasound represents an environmentally sustainable alternative to chemical or thermal dormancy-breaking methods. It reduces the need for chemical inputs, minimizes environmental contamination, and supports cleaner agricultural practices. Overall, ultrasonic waves effectively alleviated dormancy mechanisms and enhanced *P. alkekengi* seed germination and seedling growth in a time-dependent manner. In conclusion, ultrasound stimulation shows potential as an efficient and eco-friendly technique for promoting germination in *P. alkekengi*.

Key words: Chinese lantern, seed dormancy, seedling growth, ultrasonic waves

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