

Pengaruh Konsentrasi Dan Lama Waktu Perendaman *Spirulina platensis* Terhadap Vigor Benih Cabai Merah (*Capsicum annuum* L.). The Effect of Concentration and Soaking Duration of *Spirulina platensis* on Seed Vigor of Red Chili (*Capsicum annuum* L.). Supervisor by Moch. Rosyadi Adnan, S.Si., M.Sc.

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ABSTRACT

*This study investigated the potential of sugarcane wastewater-cultivated *Spirulina platensis* biomass as a biostimulant for seed priming in red chili (*Capsicum annuum* L.). Using a factorial Completely Randomized Design (CRD), treatments combined *Spirulina* concentrations (30%, 45%, 60%) and soaking durations (1, 2, 3 hours), with controls (no soaking/water soaking). Results demonstrated significant improvements in all germination parameters compared to controls. Optimal germination percentage (97-100%) was achieved at 30% concentration with 2-hour soaking. The 60% concentration reduced mean germination time by 1 day and enhanced vigor index by 385% (52.50% vs control 10.83%). Maximum growth uniformity (85.56%) and biomass accumulation (0.17g dry weight) occurred at 60% with 3-hour soaking. Morphological improvements included 27% longer plumules (2.8cm) and 23% longer radicles (8cm), attributed to *Spirulina*'s phytohormones (auxins, gibberellins) and nutrients. The study recommends 30-60% *Spirulina* solutions with 2-hour soaking as an effective organic priming protocol for sustainable chili cultivation.*

Keywords: *Spirulina platensis*, seed priming, biostimulant, seed vigor, *Capsicum annuum*