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Abstract Undesired algae competitors invading cultivation systems can interfere via negative allelopathic interactions, causing target cultures to crash. We propose the use of an indole alkaloid allelochemical (gramine) as a model to better understand allelopathy. This study analyzes effects of gramine on *Chlorella sorokiniana* and *Coelastrrella* sp. growth as well as its removal from the water. *C. sorokiniana* and *Coelastrrella* sp. cultures were exposed to 0, 4, 16, 32, and 64 mg gramine L⁻¹ (n = 4) in test tubes in a rotator drum. Our results show gramine significantly inhibits growth of both algae, however *C. sorokiniana* reacts differently (on/off response) to increasing concentration than *Coelastrrella* sp. (gradual response). Gramine is an effective algaecide over the short time period (2-3 days), after which most algae cultures started to recover. HPLC results show only treatments containing algae undergo significant gramine removal from water, suggesting a biological removal mechanism. No gramine removal was detected in the 64 mg gramine L⁻¹ treatment with *C. sorokiniana*. Gramine likely killed all *Chlorella* cells in that particular treatment.

Keywords Microalgae · Gramine · Allelochemical · Algaecide · *Chlorella* · *Coelastrrella*