Saponin Hydrogel for Controlling Snail Invasion

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Giant African Snails and Siam Cryptozona are one of the world's most invasive species that cause decreases in crop yields and quality fields. Saponin can be used as a biochemical control of the snail. However, the residual saponin caused side effects to nearby crops and animals. Snails move very slowly to climb on the plant or the soil. We, therefore, thought of producing hydrogel that can release saponin on the snails'path. Saponin from Camellia oleifera fruit was selected because of the highest percent yield. Spondias pinnata gum showed higher absorbency rate than sodium alginate and degraded 2.8 times faster than polyacrylate. The Spondias hydrogel containing saponin consistently released the saponin compared to sodium alginate and polyacrylate. And the saponin releasing hydrogel resulted in 100% mortality in 15 hours same as direct spray of saponin extract but the saponin hydrogel lasted 5 times longer and did not caused acute toxicity to nearby plant (lettuce) and animal (earthworm). The biodegradable saponin releasing hydrogels developed in this study can provide economically feasible and environmentally friendly ways to eradicate invasive snail populations.

Awards Won:
Fourth Award of $500