Engineering a Modified Brewbaker and Kwack Medium for Cucurbita pepo

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The purpose of this project was to modify the Brewbaker and Kwack (BK) pollen tube culture medium for the Cucurbita pepo species. A modified BK medium would allow for in vitro instead of in vivo experiments on important topics including C. pepo pollen fertility, the role of hormones and genetics in reproduction, and experiments in storing C. pepo pollen. Goals for this project included creating a modified BK medium with a 55 percent germination rate, and a cell lysis rate of less than 15 percent. The BK medium must be modified for each species. Testing was conducted by creating variations of the original BK medium, and BK mediums modified for other species. All of the variant recipes were made using boric acid, calcium chloride, magnesium sulfate, and potassium nitrate along with nutrient agar, sucrose, and distilled water. A total of 49 variant recipes were designed, and evaluated under a microscope. Out of the 49 recipes, recipe 32 which consisted of 0.03g boric acid, 0.10g calcium chloride, 0.04g magnesium sulfate, 0.03g potassium nitrate, 13% sucrose, 1% nutrient agar, and 250mL distilled water produced the best results. Recipe 32 was given a visual estimate of 50-60 percent germination, and a 5-15 percent occurrence of cell lysis in the early stages of pollen tube growth. Further assessment of recipe 32 is needed to evaluate actual germination and rates of cell lysis, but the project still provides a base for further research along with a potentially useful BK recipe.