Effect of Sodium Chloride on the Growth of Taro (Colocasia esculenta)

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As a result of climate change and sea level rise, low lying areas in the Pacific are vulnerable to saltwater intrusion: the movement of saline water into freshwater. This increases the soil's NaCl (sodium chloride) concentration, which may negatively affect the growth of Colocasia esculenta (taro), a staple crop in American Samoa. The objective was to determine what NaCl concentrations significantly affect the growth of taro. Twenty freshly harvested taro plants (Palau 10 or P10 variety) were irrigated with five NaCl concentrations (0mM, 10mM, 20mM, 40mM, 80mM) using a hydroponic system to imitate the soil in Aunu'u. Plant height and number of leaves were recorded weekly. Plant weight and leaf surface area were measured after seven weeks. It was found that plant height, weight, number of leaves, and leaf surface area of the P10 variety significantly decreased in the plants irrigated with 40mM and 80mM concentrations. In conclusion, NaCl concentrations of 40mM and higher have significantly negative effects on the growth of the P10 variety, indicating a need for salt-tolerant taro varieties to ensure the safety of Aunu'u's food security and economy. Consequently, another trial was conducted; four taro varieties (X, SAM2, P10, 3B) were harvested, weighed, and irrigated with two concentrations of NaCl: 0mM and 40mM. The plant height, number of leaves, and EC (electrical conductivity) of the irrigation water was recorded weekly. Weight and leaf surface area would be measured at the end of the trial to determine which variety is more salt tolerant.

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