

Erisen Rilometo

Mentor: Vincent Enriquez, MA, College of the Marshall Islands Land Grant Program (USDA-NIFA)

Coordinating Center: University of Hawai'i at Manoa

Fungal Endophytes of Ten Commonly Grown Crops in the Marshall Islands

Fungal endophytes are a mixed population of microorganisms that live within plant roots and leaves but do not cause any symptoms of disease. The presence of endophytes has been linked to improved crop yield and increased potential to fight the effects of drought, salinity, and the presence of pests and diseases which are the most common problems of farmers in the Marshall Islands. The study aimed to assess the endophytic diversity in five traditional fruit trees and five commonly grown annual crops. It was hypothesized that diversity would be higher on older plants. Healthy leaves were collected, and sterilized using 95% ethanol and bleach (NAOCl, 5.25% by weight) at different time intervals. Each leaf collected was cut into disc and placed into a Malt Extract Agar (MEA) plates and then incubated for 3-7 days. Out of 150 leaf samples from 10 plants, 78 showed fragments of fungal growth and 42 endophytes were randomly selected for isolation into pure, uncontaminated culture on MEA for identification. A total of 15 different endophytes were isolated. In terms of diversity, endophytes occurred in all leaves in the following order: breadfruit (9), pandanus (7), lime and coconut (5), banana (4), cabbage, okra, and sweet potatoes (3), melon (2), and the lowest found in bush bean (1). Results suggest the higher diversity found in older leaves as hypothesized. It was also noted that these traditional fruit trees are the most resilient in the island. Further study can be employed on the use endophytes as natural pesticides for crop protection.

Key Words: endophytes, diversity, incubate, crop protection, ethanol, natural pesticide

ACKNOWLEDGEMENTS

The STEP-UP HS program is supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health, Grant number: R25DK78386-13