

Determination of Antigenotoxicity in Guam's Noni Fruit and Avocado Seed

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ABSTRACT

Cancer is a leading cause of mortality in the world, with oral cancer being the fourth most prevalent. Oral submucous fibrosis leading to oral cancer is frequent in areca nut chewers. Areca nut, commonly known as betel nut, is chewed by approximately 600 million people primarily in Southeast Asia and the Pacific Islands including Guam. Arecoline, the major alkaloid of areca nuts, provides the addictive euphoric sensation and causes genotoxic effects in bacterial and human oral cell lines.

Much research has been done to find bioactive plant compounds that will combat cancer. *Morinda citrifolia* (noni) fruit is used in traditional medicinal remedies and has shown promising beneficial effects in cancer treatment. *Persea americana* (avocado) is also known to have anticancer properties. Although tea made from avocado seed is suggested to have anticancer benefits, to our knowledge no specific research has demonstrated such. Plant extracts were evaluated with the Ames Salmonella microsome test, which determines the genotoxicity of potential carcinogens. Extracts of fresh and fermented noni juice and avocado seed tea brewed with hot or room temperature water were tested for antagonistic effects against known mutagens: sodium azide, 4-nitroquinoline N-oxide, and arecoline. Protection against base-pair substitution mutations will be evaluated with *Salmonella typhimurium* TA100 and frameshift mutations with *S. typhimurium* TA98 strain. The hypothesis to be tested is that noni fruit juice and avocado seed tea reduces mutagenicity of carcinogens. We aim to broaden the understanding of local produce used in traditional medicine as an anticancer treatment.

Key words: oral cancer, areca nut, antigenotoxicity, noni fruit, avocado seed