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Modern Food Technology Improves Ancient Practice

Noni (*Morinda citrifolia*, L.) is a traditional Polynesian medicinal plant used in the Pacific Islands to treat topical and internal diseases for more than two thousand years. Noni fruit juice is marketed as a dietary supplement for consumers, often advertised as a cure-all product with many unsubstantiated health claims such as a menstrual cycle regulator, anti-cancer agent and blood cleanser. According to scientific literature, more than 150 phytochemicals have been identified from the noni plant. Experiments using noni juice or extracts in vitro or in vivo (conducted in a living cell or organism) show evidence of biological activities such as scavenging for free radicals, stimulating the immune system, and inhibiting LDL oxidation.



antioxidant capacity and 40% of the total phenols of the noni juice when compared to freshly squeezed juice," says Dr. Yang.

Dr Yang and his research team experimented with enzymes to improve the yield and quality of noni juice. Enzyme technology is widely used in fruit juice processing to improve juice yield and quality because enzymes such as cellulases, hemicellulases and pectinase can breakdown cell walls and disintegrate fruit tissues to promote juicing and increase soluble solid content. Using enzymes in noni juice processing also cuts the fermentation time from weeks to hours.

Noni fruit juice is traditionally made by fermentation, in which noni fruits are placed in jars outdoors and left in the sun for weeks to allow the juice to separate from the pulp. In commercial processing and home preparation of noni juice fruits are in packed in sealed containers at ambient temperature and allowed to ferment for a period of time from 10 to 60 days.

The overall moisture content of noni fruit is 89% but the traditional fermentation process only produces a juice yield of 40-50%. Not only is this method inefficient, the juice obtained from the fermentation process is dark in color with an unpleasant smell and taste. "We observed in our experiments that using the traditional method with a one month fermentation period resulted in a loss of 100% of the initial ascorbic acid, 90% of its

Noni juice processed with enzymes possessed the same antioxidant capacity and total phenols as freshly squeezed noni juice. In addition, the noni juice processed with enzymes exhibited improved sensory quality having a lighter color and more desirable taste and flavor than traditionally fermented noni juice. "Instead of needing weeks of fermentation to produce



juice, applying pectolytic and cellulolytic enzymes can successfully make noni juice within several hours with an improvement of juice yield and quality," says Dr. Yang.