

Biotechnological Valorization of Cashew Apple: a Review

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ABSTRACT

*Cashew apple, the peduncle of cashew fruit, is an agricultural waste byproduct from harvesting cashew nuts. Cashew apple juice contains about 10% reducing sugar. Its bagasse contains about 20% of cellulose. The byproducts can be used as a substrate for several microbial fermentation processes. Wine and bioethanol were produced by *Saccharomyces cerevisiae*. Probiotic beverage and lactic acid were produced by *Lactobacillus casei*. Biosurfactants-rhamnolipids, emulsan and surfactin were synthesized by *Pseudomonas aeruginosa*, *Acinetobacter calcoaceticus* and *Bacillus subtilis*, respectively. Tannase and pectinase were produced during solid-state fermentation of *Aspergillus* spp. Prebiotic oligosaccharides were synthesized by the activity of dextransucrase produced by *Leuconostoc* spp. Cashew apple is a potential substrate for producing a variety of products, depending on the type of microorganisms used.*

Keywords: Cashew apple, Ethanol, Biosurfactant, Beverage, Enzyme, Oligosaccharide

CASHEW APPLE

Cashew (*Anacardium occidentale*) is a tropical evergreen tree cultivated in a range of countries, including India, Vietnam, Brazil and Thailand (Clay, 2004). It is grown for the cashew nut industry. The peduncle, or cashew apple (Figure 1), is a waste byproduct of the cashew nut harvest. The cashew apple contains about 10 g of total sugar and 200 mg of ascorbic acid per 100 ml juice, as shown in Table 1 (Figueiredo et al., 2002; Attri, 2009). Most cashew apple is left in the field as agricultural waste (Figure 2). The weight of the leftover cashew apple is about 10 times of the harvested nuts (Attri, 2009). Global production of cashew nuts was 1.6 million tons in 2000, implying almost 16 million tons of cashew apples were underutilized.