

STUDY OF THE RESIDUE OBTAINED FROM THE PINEAPPLE INDUSTRIALIZATION PROCESS

M.E Ramos -Cassellis^{1,2}, M.E Sánchez -Pardo², R. Mora Escobedo², J.S Hernández –Zepeda¹, M. Huerta Lara¹ and A. Merino-Sánchez¹

Benemérita Universidad Autónoma de Puebla. Av. San Claudio y 18 sur Edif.106, Ciudad Universitaria, Puebla, Pue.²

Instituto Politécnico Nacional. Escuela Nacional de Ciencias Biológicas. Prolongación de Carpio y Plan de Ayala S/N, Col. Sto. Tomás. C.P. 11340, México D.F.

Resources depletion and global warming have driven every industry to move towards a greener and more sustainable industry. One of these strategies is using more naturally abundant material, such as lignocellulose. According to what Kengkhetkit et al. (2012) say, the pineapple (*Ananas comosus*) industry in Mexico would benefit from the usage of lignocellulosic wastes, because the canning industry generates waste from this fruit in an approximate amount of 701,746 metric tons (MT)² Ramos-Cassellis et al., 2014.

The international average pineapple yield is between 35 and 50% of the original weight, however, some companies have exceeded this level of utilization, reaching 60%. Pineapple products' production results from processing around 480 tons/m³ per week, generating a total of 169 tons/m³, which generates a biological oxygen demand of 187 kg per year and 64 tons/m³ of suspended solids per year (Larrauri et al., 1997).

Pineapple canning can generate up to 80% of the original weight of the fruit in waste (crowns, peels, tips, cores, and eyes), which can vary depending on the original size of the pineapple. Additionally, percentage of canning plant pulp can be between 36% for small pineapples and 41.9% for large pineapples. According to the studies carried out by Fernández et al. (2006), the fiber values in pineapple fiber concentrates (dry residues of peel and core) are around 85%; therefore, we can say that residues generated by the industrialization of pineapple are a product with a high content of this residual biomass.

The chemical composition values of pineapple residue biomass reported may vary depending on the species, agricultural and commercial operations, environmental factors, and degree of fruit maturity. According to Ramos-Cassellis et al. (2014), these are in 100 grams of product. These results indicated that the tested samples were composed mainly of cellulose (25-45 %), microfibrils containing hemicellulose (21-28%), and lignin (5-13.8%). From these results, it is likely to state that pineapple residues are a major source of cellulose, hemicellulose, and lignin, which may be used as biodegradable materials or sources of fiber and can be used in solid fermentation as a source of carbohydrates for the production of enzymes and secondary metabolites. The aim of this work was to reduce the lignin content in the residues generated by the pineapple processing industry (crown, peel, and core) and to evaluate the modification in their structural properties and lignocellulosic content.