



STUDY OF VANILLA WASTES COMPOSITION FOR BIOTRANSFORMATION

Itzamna Baqueiro-Pena and Josa Angel Guerrero-Beltran. Depto de Ing Quimica, Alimentos y Ambiental. Universidad de las Americas Puebla. Cholula, Puebla 72810, México. itzamna_baqueiro@yahoo.com.mx

Vanilla wastes, phenolic compounds, antioxidant activity.

Introduction. Vanilla is one of the most used spices all over the world. Mexico is the 7th producer of this natural spice around the world. The green vanilla pods have no characteristic aroma; flavor develops after a curing process [1]. After the curing process, vanilla beans are processed to get the vanilla extract; after this activity the vanilla wastes are generated. There are not reports about the composition of vanilla wastes. Many byproducts have been characterized and even used to obtain added value molecules from different byproducts [2].

The goal of this research was to identify the composition of vanilla wastes for flavor and antioxidant production.

Methods. Vanilla wastes were from Gutierrez Zamora, Papantla, Veracruz, Mexico. Successive extractions (10 g: 50 mL) were obtained with hexane, methanol acidified with 1% acetic acid, and 2 M sodium hydroxide, were performed to evaluate the concentration of total phenolics (Folin-Ciocalteu) and antioxidant activity (ABTS). Fractions were analyzed by TLC and also characterized by gas chromatography coupled to a mass detector (GC-MS).

Results. Polyphenol content and antioxidant capability were variable in each fraction. Methanol showed higher antioxidant activity and sodium hydroxide highest polyphenol content (Table 1).

The analysis by TLC (Figure 1), showed the presence of vanillin, vanillic and ferulic acid and two unknown components in sodium hydroxide fraction.

Table 1. Polyphenol content and antioxidant capability of Vanilla wastes fractions

Fraction	Total polyphenol (mgGE/100g d.w)	Antioxidant capability (mgTE/100 g d.w)
Hexane	51.40±4.57	910.66±22.26
Methanol/Water	89.76±0.13	1104.59±26.15
Sodium hydroxide	133.17±0.44	386.79±15.44

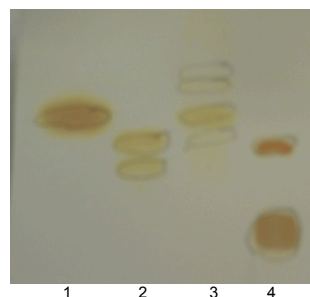


Figure 1. TLC of sodium hydroxide fraction. 1) Vanillin. 2) Vanillic and ferulic acid, 3) sodium hydroxide fraction 4) protocatechuic an ferulic acid

Chromatographic analysis of the three bagasse fractions showed a variety of chemical compounds (Table 2). Hexane fraction showed principally fatty acids, methanolic fraction showed some phenol compounds and sodium hydroxide fraction showed principally monoterpenes

Table 2. Chromatographic characterization of vanilla wastes fractions.

Fraction	Principal compounds
Hexane	Linoleic acid, linoleic ethyl ester, oxalic acid, tricosene, etc
Methanol/Water	2-methoxy-phenol, ferulic, vanillic, vanillin, 4-vinylguaiacol
Sodium Hydroxide	Campheno, β -pinene, limonene, γ -terpene

Conclusions. The composition of the vanilla wastes showed diversity of compounds, like phenolic, fatty acids and monoterpenes. This characteristic makes vanilla waste an economic alternative for obtaining value added molecules.

Acknowledgements. Itzamna Baqueiro Pena is grateful to CONACyT for Pos-Doctoral Fellowship

References.

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