

# Applications of FT-IR spectroscopy in the characterization of the main components of bitter cucumber (*Momordica charantia*)

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## Abstract

In the last year, FT-IR spectroscopy has been introduced as a very efficient and non-destructive analytical tool for the reliable identification of triterpenes resulted from various extraction methods. The biological activity and the pharmaceutical properties of plants are strongly dependent on their structure. The FT-IR spectra of have been obtained. The vibrational fundamentals from the IR spectrum, were analyzed and assigned according to the available literature. This work presents a study on bitter cucumber (fruit) at different growth stages, as it is very often used in the pharmaceutical industry.

## Introduction

*Momordica charantia*, known as bitter melon, bitter gourd, bitter squash, or balsam-pear. It is a tropical and subtropical vine of the family Cucurbitaceae. Its many varieties differ substantially in the shape and bitterness of the fruit. The fruit has claimed to contain charantin, steroidal saponin, momordicosides, carbohydrate, mineral matters, ascorbic acid, alkaloids, glucoside (1). With regard to the use of *Momordica charantia* for diabetes, several animal studies and small-scale human studies have demonstrated a hypoglycemic effect of concentrated bitter melon extracts (2).

Vibrational spectral techniques, FT-IR, offer several advantages in the context of current research and using this techniques we can identify molecular components in the samples studied.

## Experimental

The sample from FT-IR spectrum was obtained from 0, 2 mg powder of beech and pine seeds from bitter melon.

Fourier Transform Infrared (FT-IR) spectra were performed in the absorbance with a spectrophotometer FT-IR-4100 Jasco, using KBr pellet technique. Spectral resolution was set at 4 cm<sup>-1</sup> and all spectra were acquired over 256 scans. The spectral data were analyzed using Origin 6.0 software.

## Results

The bands attributable to the *Momordica Charantia* have been analyzed and discussed. In the "fingerprint" region the intense and broad absorption band characteristic of C-C, C-O and C-H is present.

## Aims

Because the plant is used as stomachic, carminative, tonic, antipyretic, antidiabetic, in rheumatoid arthritis and gout, the present investigation was carried to characterize a main components of plant using FT-IR technique.

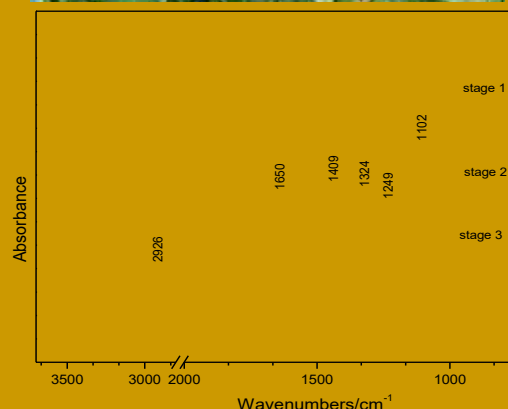


Figure. 1 FT – IR spectra spectrum for the three stages of fruit growth (power)

## Conclusions

Using vibrational spectroscopy, it was proven that we can identify key molecular components in the samples studied and their molecular structure. This study has contributed to the characterization and identification of compounds in *M. charantia* seeds.

1. Oragwa L., Olajide O., Efion O., Okwute Simon K. (2013). Didecanoate compound: Isolated from *Momordica charantia* Linn. seeds from Nigeria. African Journal of Pure and Applied Chemistry 7(11), 375-381.
2. "Bitter Melon". Memorial Sloan-Kettering Cancer Center. Retrieved 17 October 2013.