

Utilization of *Cinnamomum Camphora* Leaves as a Renewable Energy Source

Everett Meijer*

Managing Editor, Bioenergy and Bioresource: Open Access, Chaussee de la Hulpe 181, Brussels, Belgium

Corresponding Author*

Everett Meijer
Managing Editor,
Bioenergy and Bioresource: Open Access, Chaussee de la
Hulpe 181, Brussels, Belgium.
E-mail: Bioenergy@scholarlypub.org

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Abstract

Cinnamomum camphora is an evergreen tree that originates from China and is common in some Asian countries. Its leaves are rich in biologically active compounds and its medicinal effects are well known. A powerful method to extract and preserve biologically active substances is important for downstream applications such as bioenergy and chemicals. During this study, the metabolic profiles of *Cinnamomum*. After extraction with three different solvents, ethanol, benzene and acetone, the camphors were analyzed in detail by IR-Fourier and GC-MS. The identified chemical compounds were classified into different functional groups in support of the previous study. Our result indicates the application of *Cinnamomum camphora* in the field of biomedicine, bioenergy and chemical raw materials.

Introduction

Population growth has a significant impact on energy consumption, which largely relies on non-renewable energy sources such as fossil fuels, oil, coal and gas to support human demand. So far, only 11% of energy is produced from renewable energy sources due to some limitations such as capacity and resources. That is why the researcher started to investigate sources like *Cinnamomum camphora* as an alternative to fossil fuels. *Cinnamomum camphora* (Lauraceae), commonly known as the camphor tree is cosmopolitan in subtropical regions including southeastern China and northeastern Australia. *Cinnamomum Camphora* is known for its decorative, economic and medicinal value. In particular, *Cinnamomum camphora* contains exocrine gland cells that are used to extract camphor oil. Essential oil has antifungal, insecticidal and repellent properties, antioxidant, anti-aging, antibacterial and anti-inflammatory properties. Its bark is used to treat arthritis and the fruit *Cinnamomum Camphora* has properties to reduce fever and treat common fever and diarrhea. Base *Cinnamomum Camphora* improves blood circulation, treats rheumatism, treats indigestion and ulcers. The uses of camphor oil are not limited to medical purposes, but are also used in fragrances, soaps, dyes, mineral mining, plastic polymers, explosives and defense. *Cinnamomum camphora* leaf powder was reported to absorb and remove color, copper (II) and lead (II) ions from solution. C. Camphor emulsion is a new green material in the formulation of palladium nanoparticles to replace synthetic nanoparticles. To work with resources, supplies used as renewable energy.

The large-scale production of camphor was established by the micropropagation method. In order to fully utilize the resources of *Cinnamomum camphora*, the biosynthetic pathway for the production of secondary metabolites has also been well investigated. Volatile compounds of *C. camphora* such as camphor, eucalyptol, linalool, nerolidol, limonene, beta-pinene, terpineol and other volatiles were detected and identified. In particular, the biosynthetic pathway for the production of secondary metabolites is also well studied. The components of the oil composition are also reported. However, there is no complete list of metabolite profiles for different types of solvents, so it is difficult to recommend an optimal extraction method for *Cinnamomum camphora*. Since we all know that different types of solvents are associated with different types of metabolites and lead to the extraction of different functional groups, we tested three types of solvents and listed the metabolite profiles of the three solvents.

Conclusion

Increase the practical value of *S. Camphora* leaves, the influence of different extraction methods on the biochemical compositions of *Cinnamomum camphora* leaves was investigated. The three common solutions of ethanol, acetone and benzene without extracting the substance from camphor leaves. There are significant differences in the types and proportions of bioactive compounds obtained by the three extraction methods. FT-IR results show that ethanol can effectively extract bioactive compounds in *Cinnamomum*. GC-MS results of camphor leaves showed that more amines and alcohols were obtained from *Cinnamomum camphora* using ethanol as a solvent. Amines are mainly used in cosmetics and medicine, so alcohols are widely used in industrial fields. Aldehydes, ketones, alkenes and esters in ethanol solvent can be used in the chemical, biomedical, bioenergy and spice industries.