

The medicinal qualities of the Bioactive compounds in Zingiberofficinale

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ABSTRACT:

Zingiberofficinale, commonly known as Ginger is a spice consumed worldwide for culinary and medicinal purposes. The plant has a number of chemicals responsible for its medicinal properties. It has been used as an anti-arthritic, anti-inflammatory, antifungal, anticancer agent. The study was designed to spectroscopically analyse the second eluate of ginger. Zingiberofficinale was collected, washed, dried, ground and then extracted using 96% ethanol. The ethanol extract was fractionated using column chromatography and then analyzed spectroscopically using GC-MS and FTIR. The findings of this study showed the presence of the following compound. benzene 1,3-dichloro, benzene, 1,2- dichloro, tricosene. 2-methyl-ocatane, undecane, 5-methyl cetene, 1-nonadecene, oleic acid, and 9-octadecenal. These compounds confers to ginger its ability to cure various ailments and in supplementing and supplanting human health and welfare.

KEYWORDS: Zingiberofficinale, anti-inflammatory, antifungal, anticancer

I. INTRODUCTION

Ginger (Zingiberofficinale), which belongs to the Zingiberaceae family and the Zingiber genus, has been commonly consumed as a spice and an herbal medicine for a longtime. Ginger root has long been used to treat several common diseases, such as headaches, colds, nausea and emesis. The use of ginger in traditional medicine has been reported since antiquity, as early as 3500 BC. Ginger is now one of the most important and popular spices on the international market and the total global production of ginger is estimated at 100,000 tons a year. All over the world, the ginger rhizome is appreciated for its taste, therefore, it is used as a spice, flavouring agent, and as an additive in the preparation of meals [1].

It is also used as an ingredient in dietary supplements such as pills, syrups, and orates. The ginger rhizome or extracts have been found to show strong antiemetic activity and it now used to treat motion sickness, morning sickness, and post chemotherapy nausea. Ginger contains various phytochemicals and biologically active compounds, such as phenolics and flavonoids [2].

Medicinal plants play an important role in traditional health care systems as well as in international herbal and pharmaceutical markets. Patients with chronic and painful diseases often seek alternative therapy and currently ginger is one of the most popular herbal medications for inflammatory diseases [3].

Ginger indicates great potential as a functional ingredient for herbal tea and spices production that can be consumed as dietary supplement and for medicinal purposes. Accordingly, it is being used in antioxidant therapy and acts as a protective defense against oxidative stress and improve fertility parameters [4].

II. EXPERIMENTAL

500 grams of Zingiberofficinale was washed with distilled water and dried in an oven at the temperature of 50°C for 5 hours. The dried samples were then crushed with mortar and pestle to powdery form and soaked in 1000 mL of 96% ethanol in a plastic container and covered.

The mixture was agitated hourly for 3 days after which it was filtered using muslin cloth followed by filtration by Whatman No 1 filter paper. The extract was heated in a water bath to evaporate the ethanol and recover the crude extract [5].

The slide for thin layer chromatography was prepared by mixing silica gel and ethanol using mortar and pestle and poured on two glass slides. The slides were dried in an oven at 80°C.

The crude extract was dropped on the thin layer chromatography slide and dipped into the beaker containing the mixture of N-Hexane, chloroform and ethyl-acetate with the side containing the drop of crude extract above the reagent.

The second slide with the drop of the sample crude extract was dipped into a beaker containing a mixture of n-Hexane and chloroform.

Silica gel, crude extract of the sample and N-Hexane was mixed together in a mortar with pestle. The mixture was then dried in an oven at 63°C.

The column burette was clamped to a retort stand. The prepared dried sample powder was filled

into the column burette and connected to a vacuum pump. The N-Hexane was poured into the burette and the N-Hexane fraction collected in a conical flask. Afterwards chloroform was poured into the sample in the column burette and the chloroform fraction collected in another conical flask.

Lastly, the ethyl-acetate was poured and the ethyl-acetate fraction was also collected in a separate conical flask [6].

The eluates were separately concentrated in a rotary evaporator connected to the vacuum pump at temperature of 70°C. The eluates were subjected to GC-MS analysis.

III. RESULTS AND DISCUSSION

Table 1.1: Results of the GC-MS analysis of

Zingiberofficianleextract .

1,3-dichloro-benzene
2-methyl tricosane
3,4,5,6-tetramethyl- octane
cetene
oleic acid

1,3-Dichloro-benzene is used for the treatment of certain blood disorder, such as polythemia and malignant lymphoma. Treatment of polythemia are based on the patients risk for clothing complication [3].

2-Methyl tricosane, detected in various plants has been used in food and medicinal application. It is a metabolic product of the decarboxylation metabolism. 3,4,5,6-Tetramethyl-octane is traditionally used for diagnosis or treatment of rheumatoid arthritis, ankylosing spondylitis and osteoarthritis.

It has some side effects such as abdominal pain, abdominal bleeding, and allergic reactions, when used symptomatically with non-steroidal and steroid anti-inflammatory drugs.

Cetene is traditionally being used in the treatment of leprosy, eye disorders and post partum protection. Oleic Acid is most commonly used for preventing heart disease and reducing cholesterol. It is also used for preventing cancer and other conditions but there is no much scientific evidence to support these other uses [7,8,9].

IV. CONCLUSION

Gas chromatography coupled with mass spectrometry is a commonly used technique for separating and identifying the components of complex volatile mixtures, it can be a valuable tool

assisting in the separation and identification of isolated components. GC is known for its high resolution separation of structurally similar compounds. The use of electron ionization in the mass spectrometry produces distinctive mass spectral fragmentation patterns enabling mass spectra for unknown to be searched against libraries. Zingiberofficinale, commonly known as Ginger is a spice consumed worldwide for culinary and medicinal purposes. The plant has a number of chemicals responsible for its medicinal properties. It has been used as an anti-arthritis, anti-inflammatory, antifungal, anticancer agent.. The findings of this study showed the presence of the following compound. benzene 1,3-dichloro, benzene, 1,2-dichloro,tricosene. 2-methyl-ocatane, undecane, 5-methyl cetene, 1-nonadecene, oleic acid, and 9-octadecenal. Result obtained from the GC-MS and FTIR analysis of Zingiberofficianlereveled several bioactive compounds that have numerous biological properties and immense medicinal potentials.

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