



Ultrasonic Interferometer Spectroscopic Acoustical Parameters of Kalonji in the Diabetic Treatment

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ABSTRACT

The present paper deals with highlights of velocity and acoustical parameters of Kalonji seed powder solution, oil in presence of ultrasonic waves of 3MHz frequency. This technique has been widely used in many industrial and Food Technology areas. Now a day herbal / natural products are more useful rather than synthetic products because of their high medicinal values, biocompatibility availability and cheaper cost. The natural products can be used as routine or health care remedy for balancing many health ailments. The extract oil and powder solution vibrates and produces certain velocity greater than that of sugar solution. This finding helps us to understand that the Kalonji related solutions are very quick and compressible in the blood cells in the non invasive method. Therefore; we conclude that these herbal products can be used as a natural food to balance the blood sugar levels.

KEYWORDS: Ultrasonic Velocity, Compressibility, Frequency, Sugar Solution. Synthetic, Ultrasonic waves, Frequency, glucose.

INTRODUCTION

The Modern India is associated with highest rate of Diabetes mellitus. Diabetes mellitus is lack of metabolism of carbohydrates, proteins and lipids caused by complete or relative insufficiency of insulin secretion or insulin action. Diabetes mellitus is basically of two types. One is Type -I and other is Type -II. Former one is the case where the insulin is not properly secreted whereas later one is the case where the insulin produced is not sufficient to balance the blood sugar levels. To produce or control the blood sugar levels, there are many synthetic products which stabilize the level but they cause side effects in course of time. So to overcome this, Herbal or natural products can be taken

in the routine food or as ayurvedic product. In this Paper Black seed powder and oil are considered as the antidiabetic products for better life.

Black Cumin is a Flowering Plant Which is generally seen in North Africa, America and Some Parts of India which is the Part of South



West Asia. It is known as *Nigella Sativa* or *Black Seeds* which are an annual flowering plant that can grow 8–35 inches (20–90 cm) tall. Its fruits contain numerous black

Seeds that have been used traditionally in Southeast Asian and Middle Eastern Countries to treat diseases and conditions like Diabetes, Piles, digestive tract Problems .Today, It's Known that Kalonji Seeds and Oil contains active compounds called Phytochemicals. These have demonstrated a wide range of therapeutic benefits, including for diabetic treatment.

The particles vibrating with the frequency greater than 20Hz to 20KHz (Human audible range) produces sound which are nothing but known as Ultrasonic Sound. This Sound has the particles travelling in the direction parallel to the longitudinal waves over a short distance. These waves are passed through the medium of length 25mm and micrometer scale marked in units of 0.01mm. At the bottom of the cell ,the Quartz crystal and movable metallic plate are placed parallel so that reflecting waves are produced .The interfering reflecting waves have the separation exactly an integral multiple of half of the wavelength of standing waves .This causes maximum value in amplitude for a particular acoustical resonance .The maximum amplitude implies maximum antinodes current of piezoelectric generator. By using Ultrasonic interferometer 's piezoelectric method, the velocity of the liquid samples of kalonji seed powder, oil, glucose powder are calculated .These velocities calculated are nothing but measurement of the wavelength of sound in a particular medium of the fixed frequency variable path difference .

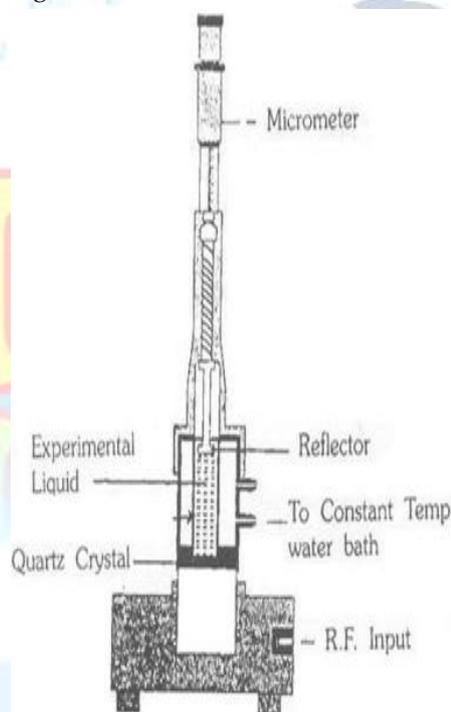
At the particular room temperature ,the apparatus of interferometer is operated .It consists of ultrasonic cell surrounded by double walled brass cell with chromium plated surface having a capacity of 10ml. This double walled surface helps us to maintain constant temperature with water circulation freely. Standing waves are produced at acoustical resonance point where maximum value in amplitude corresponding to maximum current of piezoelectric generator.

METHODS AND MATERIALS:

The Glucose powder, Kalonji seeds and oil are bought from local supermarket, Hyderabad. Ultrasonic interferometer is used from the Department of Physics and Electronics, HRD Degree and PG College, Hyderabad .The seeds are dried under sunlight for 3-4 days .Then crushed into fined powder with the help of

grinder .The distilled water is taken from distilled water plant, Dept. of Chemistry, RBVRRWC, Hyderabad.

At Room Temperature, Ultrasonic Interferometer is operated at the frequency of 3MHz. The samples of 10ml quantity are used in the experimental procedures. As Ultrasonic Interferometer (UI) is used for liquids, the sample should be dissolved in a suitable solvent. The solvent solution considered here is distilled water. Initially, Cell is cleared with distilled water (DW) properly to remove any impurities present. Later, Fill it distilled water and micrometer readings are noted down. Glucose powder (GP), Kalonji seed powder (KP), Kalonji seed oil (KO) are dissolved in the distilled water, filtered and then used for the experiment purpose. All the readings are tabulated in Table I.



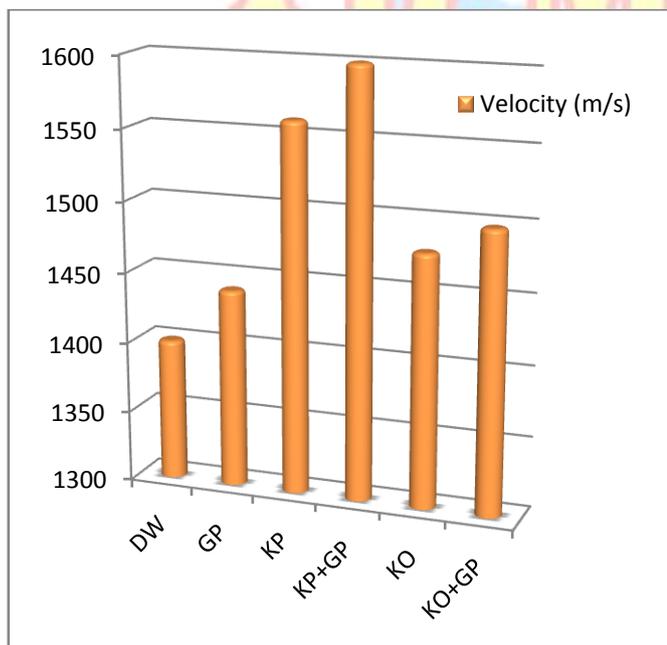
DISCUSSION AND RESULT:

Table I

Name of the liquid	Velocity (m/s)	Density(Kg/m ³)	Compressibility(cm ² /dyne)
DW	1400	0.99	5.1535
GP	1440	1.06	3.5075
KP	1560	0.99	4.1506
KP+GP	1600	1.02	3.8296
KO	1478	0.93	4.9223
KO+GP	1498	1.02	5.0596

CONCLUSION:

This experiment concludes that Ultrasonic velocity changes, when the GP is added to KP.KO.These changes can lead to transformational changes in chemical compounds present in the Plant .This also suggest that KP.KO can act as sugar reducing agent in that glucose solution. Thus, it can be best natural product which has antidiabetic nature .This technique also marks the accurate way in developing biochemistry compounds in Ayurvedic treatment of diabetics and Health care Products.



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