

# Evaluation Of Nutrient, Anti-nutrient And Anti Inflammatory Properties Of Mesocarp Of Cocos Nucifera

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**Abstract** - The present studies of chemical components which contribute to its bioactivity are essential to the plant industry, biotechnology and biomedical fields. Coconut, being a refreshing beverage, provides important health benefits. Undoubtedly, most important phytochemicals are present in coconut water. Significant advances were made in understanding the biological functions of the various components in both plant and human systems. The potential anti-inflammatory properties of specific mesocarp could bring encouraging and novel perspectives in finding cures for the different types of human disease. The recent discovery of other medicinal values of coconut signifies a good potential in improving human health. Better insights and understanding of the functions and properties of the individual components of coconut mesocarp will, therefore, help us to better utilize this marvelous and multidimensional mesocarp with special biological properties from nature. As a result shows a medicinal value of novel compounds are present in the coconut.

**keywords** - Coconut Mesocarp, phytochemicals, Anti Inflammatory Activity, biological properties.

## INTRODUCTION

Coconut water and coconut meat is one of the natural food products to quench thirst and easily available in most of the countries. Both water and meat of tender coconut refresh the body by providing nutritious content. Health and medicinal applications of tender coconut product gets research interest in recent years. It contains several biologically active components namely sugars, proteins, free amino acids, vitamins, minerals and growth promoting factors.

India is the third largest coconut producing country, after Indonesia and the Philippines, having an area of about 1.78 million hectares under the crop. Annual production is about 7562 million nuts with an average of 5295 nuts/hectare. In India, the four south Indian states namely Kerala, Tamil Nadu, Karnataka and Andhra Pradesh account for around 90% of the coconut production in the country. The overall state wise coconut production is depicted. For thousands of years, coconut products have held a respected and valuable place in Indian folk medicine. It is believed to be antibleorrhagic, antibronchitis, febrifugal, and antingivitic [1, 2].

Virgin coconut oil (VCO) is processed natural oil obtained from fresh, mature coconut kernel [3]. It displays several biological activities like anticancer, antimicrobial, analgesic, antipyretic, and anti-inflammatory properties *in vivo* [4, 5 & 6]. Traditionally, coconut oil is used to moisturize and treat skin infections. The emollient effect of coconut oil has been successfully demonstrated in atopic dermatitis patients, thereby showing that coconut oil is a potent natural emollient to be used in treatment of xerosis. The effectiveness and safe use of VCO for its application as a therapeutic moisturizer has been reported earlier for mild to moderate xerosis [7].

In Ayurvedic medicine, the oil, milk, cream and water of the coconut are all used to treat hair loss, burns and heart problems. In India, the use of coconut for food, and its applications in the Ayurvedic medicine were documented in Sanskrit 4 000 years ago. Records show that in the United States, coconut oil was one of the major sources of dietary fats, aside from dairy and animal fats, prior to the advent of the American edible oil (soybean and corn) industry in the mid 1940s. Virgin coconut oil (VCO) is completely non-toxic to humans [8], and is referred to as the “drugstore in a bottle”. In India, the coconut has religious connotations; it is described as “The fruit of aspiration” and a coconut is offered to the gods and cut at the start of many new projects. Coconut water is produced by a 5 month old nut that during World War II, was used in emergencies, and put directly into a patient’s veins. From ancient times the coconut is used as a very effective remedy for intestinal worms of all kinds. Boiled toddy, known as jiggery, with lime makes a good cement. Nutmeat of immature coconuts is eaten or extracted cream is used on various foods. The present study aimed to know the anti-nutrient and anti inflammatory properties of *Mesocarp of Coccus Nucifera*.

## MATERIALS AND METHODS

### SAMPLE COLLECTION

The healthy and young *coconuts* were collected from the local market area of Pondicherry. Then the sample was packed and taken to the laboratory. The part of *mesocarp* were removed and homogenized for preparation crude aqueous extract and kept for incubation for overnight. Homogenized aqueous crude extract stored at 4°C for further use.

### ESTIMATION OF TOTAL ASH

Empty crucible was taken and weighed ( $w_1$ ). 1 gm each of sample was taken in a pre weighed crucible and weight was noted with sample ( $w_2$ ). The sample was charred on electric hot plate or oven low flame in a fume cupboard it has ceased smoking. After charring the crucible with charred sample was transferred in a cold muffle oven and the temperature was raised to 550°C. The sample was ignited for 2 hours at least 105°C. Preferably lower. The crucible was transferred in to a desiccator using tongs. The crucible were covered the desiccator was closed. After cooling the crucible was weighed ( $w_3$ ).

#### SAMPLE EXTRACTION FOR TOTAL PROTEIN

The *mesocarp* pulps were macerated using a pestle and a mortar with Phosphate Buffer to make homogenization respectively for the sample taken. The mixture was agitated over a mechanical shaker for few minutes using Vortex mixer. The resulting mixture was filtered, and the filtrate was concentrated into a residue over water bath [9], then the Total protein was estimated by Lowry method [10].

#### SAMPLE PREPARATION FOR CARBOHYDRATE ESTIMATION

Weighed out 100 mg of the sample in a boiling tube, hydrolyzed and keeping it in a boiling water bath for 3 hrs with 5 ml of 2.5N HCl and cooled in room temperature. Add solid sodium carbonate for neutralization until the effervescence ceases. Made up the volume to 100 ml with distilled water and centrifuged. Collect the supernatant and taken 0.5 ml and 1 ml aliquots for analysis. The Total carbohydrate was estimated by Anthrone method, and also lipid level using Folch method [11].

#### ESTIMATION OF IRON

To an aliquot of the mineral solution (cookie) enough water was added to make up to a volume of 6.5 ml followed by 1 ml of 30 % Sulfuric acid, 1 ml of Potassium per sulfate solution and 1.5 ml of 40 % Potassium Ferri cyanide solution. Mix the content thoroughly and incubate the mixture for 20 minute at room temperature and the measurement of iron content was spectrophotometrically read at 540 nm

#### DETERMINATION OF CHLORIDE IN SOLID SAMPLE AND PHYTIC ACID

The unknown was dried at 110 °C for 1 hour and cooled in a desiccator. Individual samples were weighed into 250-mL Erlenmeyer flasks and dissolved in about 100 mL of distilled water. Small quantities of NaHCO were added until effervescence ceased. *Phytic acid* content were determined by the procedure of Lucas and Markakas [12].

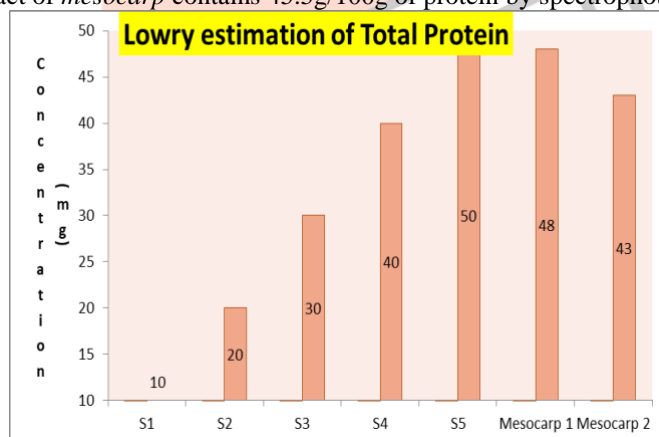
#### ANTI INFLAMMATORY ACTIVITY

The *coconut mesocarp* was evaluated for its Anti-Inflammatory capacity by using serum albumin denaturation and measured at 660 nm which exhibited denaturation.

### RESULTS

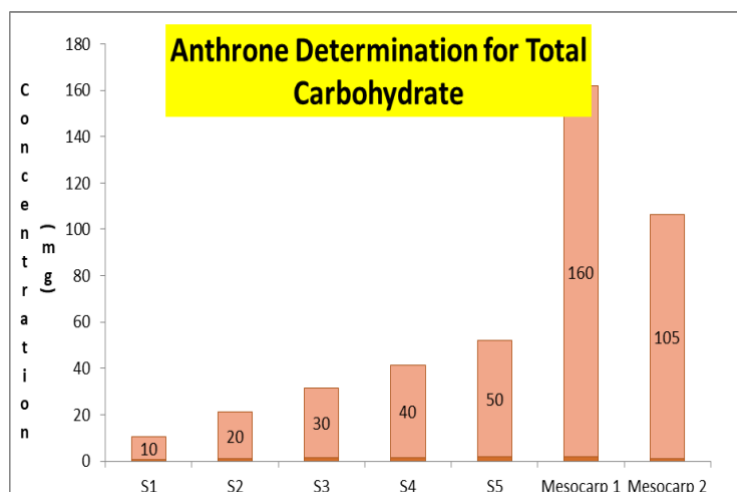
#### PROTEIN CONCENTRATION IN C.NUCIFERA MESOCARP

The aqueous extract of *mesocarp* contains 45.5g/100g of protein by spectrophotometric determination.



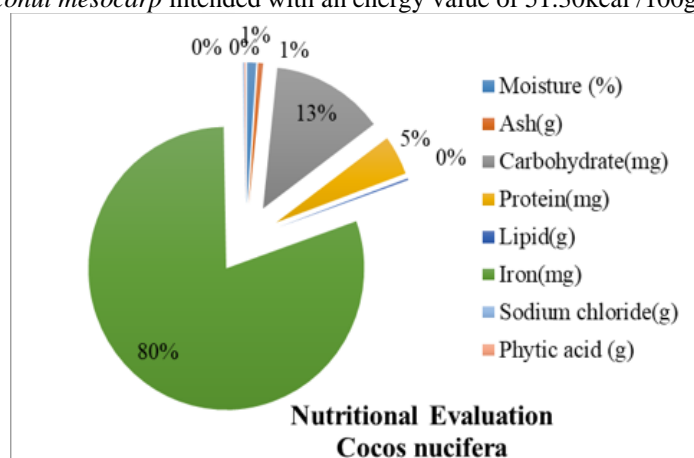
#### CARBOHYDRATE QUANTIFICATION IN COCONUT MESOCARP

The aqueous extract of *mesocarp* contains carbohydrate was 132.5g/100g aided with spectrophotometric determination.



### NUTRITIONAL CONTENT OF COCOS NUCIFERA

The total mineral content of the *mesocarp* ash containing 6g and the iron content 805 mg and the salt Sodium chloride possessing 1.46 g/100 g. Potential capacity the *coconut mesocarp* evaluated for its total *Phytic acid* by titrimetric determination which yielded 1.69 g. The *coconut mesocarp* intended with an energy value of 51.30kcal /100g.



### ANTI-INFLAMMATORY PROPERTY OF C.NUCIFERA MESOCARP-DENATURATION ASSAY

The *coconut mesocarp* was evaluated for its Anti-Inflammatory capacity by using serum albumin denaturation and measured at 660 nm which exhibited denaturation % as 58.21 % and 29.32 %.

### PERCENTAGE DENATURATION CAPACITY OF C.NUCIFERA MESOCARP

Sample	$\lambda_{max, 660 \text{ nm}}$	% of Denaturation
Control	1.381	***
Mesocarp 1	0.577	58.21
Mesocarp 2	0.976	29.32

### DISCUSSION

Coconut, with its many applications, is one of the world's most versatile natural products. This refreshing beverage is consumed worldwide as it is nutritious and beneficial for health. The wide applications of coconut can be justified by its unique chemical composition of sugars, protein, total mineral, *Phytic acid* and salts [13]. This estimation attempts to summaries and evaluate the chemical composition and biological properties of coconut. The part of *mesocarp* were removed and homogenized for preparation crude aqueous extract. Homogenized aqueous crude extract were centrifuged for pure extract through centrifugation. The pure extract was subjected into proximate composition to check it out which are the nutritional component are present in the *coconut mesocarp* [14]. The aqueous extract of *mesocarp* contains 45.5g/100g of protein and carbohydrate was 132.5g/100g aided with spectrophotometric determination, the fat content was 2.14g/100g of the *mesocarp*. The total mineral content evaluated by incinerating the *mesocarp* using furnace which retain ash containing 6g and the iron content determined using ash by Wong spectrometric method provides 805 mg and the salt Sodium chloride possessing 1.46 g/100 g of *mesocarp*, as salts is the basic essential element in coconut development as seed. *Phytic acid* is also known as inositol hexaphosphate, which serves as a storage form of minerals and absorption of nutrients. With these potential capacity the *coconut mesocarp* evaluated for its total *Phytic acid* by titremetric determination which yielded 1.69 g. The *coconut mesocarp* intended with a energy value of 51.30kcal /100g can be adopted in food fortification as it contain rich amount of iron, *Phytic acid* etc.,

On a conclusive part, the *coconut mesocarp* was evaluated for its Anti-Inflammatory capacity by using serum albumin denaturation and measured at 660 nm which exhibited denaturation % as 58.21 % and 29.32 % as the denaturation capacity decreases with increase in *mesocarp* concentration [11].

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## CONCLUSION

The chemical composition of coconut water is affected by several factors. Soil and environmental conditions also affect the chemical profile of coconut. A study which was done in Brazil demonstrated that the physical properties of coconut water were affected by varying nitrogen and potassium application. Hence, future studies should be carried out to determine the factors that produce the desirable chemical composition for a specific purpose. Breeding studies can also be carried out to produce coconut water enriched with specific chemical compounds. Although coconut is already well studied in terms of its chemical content, there may still be unknown solutes which contribute to its special biological effects. With the development of more advanced detection techniques, screening can be intensified to detect novel compounds of medicinal values present in coconut.

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