



REVIEW ON- PHYTOCHEMICAL CONSTITUENTS AND ACTIVITY IN PAPAYA EXTRACT

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Abstract

Oxidative stress is caused by a chemical in the balance of antioxidants and pro-oxidants, which has an impact on redox signalling and causes cell and tissue damage. It causes a variety of medical issues such as inflammation, skin ageing, reduce wound healing, chronic disease, and malignancies, however these conditions can be effectively addressed with the help of antioxidants. This review includes several studies that provide an overview of how carica papaya might help prevent oxidative stress to multiple mode of action that are closely related to its antioxidant capabilities, ultimately enhancing management of various oxidative stress associated health issues.

Carica papaya is a tropical plant species that has been discovered to possess high levels of natural antioxidant in its leaves, fruits, and seeds. As a result, it can combat pro oxidant through a variety of signalling pathways that either enhance the development of antioxidant or decrease ROS generation.

Keywords:- *Carica papaya*, Oxidative stress, Antioxidant, Inflammation, ageing, Wound healing

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INTRODUCTION

One of the 22 recognized species in the genus carica of the papaya family is the papaya plant Caricaceae, is known as a papaya, papaw, or pawpaw. It is originated in the Southern Mexico and Central America of the tropic's of America. maybe in Largely made of papaya spread throughout regions that are tropical or subtropical. The fruit is frequently large or cylindrical (0.5 to 2.0 kg) in weight and meaty. The flesh is delicate, juicy, and yellow- orange in color. The overall about 10.0 million metric tones of papaya are produced worldwide each year, mostly in India and Brazil is the largest producer & producing 3.6 and 1.9 million metric tones annually. Most papaya is farmed for manufacturing of papain and for fresh consumption. However it can be used to make pickles, candy, jelly, jam, or more, and their seeds are typically thrown away. Several phytochemicals are found in papaya peel, pulp, and seeds including carotenoids, polyphenols, benzyl isothiocyanates, and benzyl glucosinates among other with level of skin and pulp rising as the fruit ripens. Papaya seeds also contain the prunasin is a cyanogenic chemical. Papaya seeds and their extracts are very nourishing. Have been linked to a variety of health advantages, such as cancer prevention and possesses antioxidant properties [Filbert, & Richter, et al.2007]. The importance and health benefits of several phytonutrients from plant have recently come to light. Fruits and vegetable were sources that had drawn the attention of many food specialists. Also the general public. The natural antioxidant in these compounds typically encouraged because of worries about the toxicity of the synthetic ones. Besides being free antioxidant present in most plants have the ability to scavenge free radicals. Antiviral, antibacterial, anti-ulcer, anti metastatic, anti- mutagenic increasing numbers of antiallergenic, anticarcinogenic effects, and research on lingering sources in switching from synthetic and natural antioxidant are due to the food industry's large interest in recycling. They are performing a significant part in enhancing the full utilization of the residual sources. The trash or food processing leftover, such as the seed and peel of some fruit, which have higher source of putative antioxidant activity in comparison to the edible portion, for example Higher antioxidant activity has been found in pomegranate peel and grape seed compared to their pulp and grape seed compared to their pulp. Antioxidant stop or slow down a free radicals impact on cells. Radical substances that are unstable that the body creates in response to stimulus the environment and other factors. Oxidative stress, which are the cells damage brought on by free radicals, can be defended by

antioxidants. Processes and actions that might result in oxidative mitochondrial activity, severe exercise, tissue damage, and other sources of stress damage from ischemia and reperfusion, inflammation, and specific food consumption foods, particularly those that have been refined and processed, trans fats, artificial sweeteners, smoking, exposure to radiation, some colors and additives, environmental pollution, and industrial solvents, medications like chemotherapy, and chemicals like insecticides, ozone. Cell damage may occur as a result of such exposure and activities. This may then result when free iron or copper ions are released in large amounts, the phagocytes being activated, specific white blood cells taking part in the fight against infection, increased levels of free radical -producing enzyme, and the electron transport chain breakdown. All oxidative stress may come from these. Oxidative stress has resulted in damage that has been associated with eyesight loss, atherosclerosis, and cancer. It is believed that free radicals are to blame for these and potentially other disorders are caused by alterations in the cells. Consumption of antioxidant are thought to lower these risk. Study suggested from trusted source. "Antioxidant function as peroxide, hydrogen donor, electron donor, and radical scavengers," metal, enzyme inhibitor, synergist, singlet oxygen quencher, and chelating agent" appropriate time intervals, the ability of antioxidants. Rutin was prepared as nano phytosomal rutin in pure standard ethanolic solution assessed. Pure rutin's antioxidant capacity reduced as it was being stored. At Period, considering that the exposed rutin might not be able to keep its structural integrity. When the environment is right. But the rutin covered in nanophytosomes technology's antioxidant capability exhibited a negligible decline. These observations clarified how nanophytosome technology protects against environmental circumstances. Bioactive species of free radical. According to Chahbani et al. [2018]. A large number of bioactive chemicals combined, such as phytochemicals such as phenolics, antioxidants, and other substances that are not nutrients whereas tannin was discovered to be the primary natural compound found in papaya byproducts antioxidants. Environmental pollution in the food processing sector is most frequently brought by involved with the breakdown of organic wastes. Decomposition takes place when the substance serves as a source of food for bacteria and biological organisms. In order to prevent using potato waste as an antioxidant in the food system is one such issue, as a result of its high it must contain phenol [Galoburda,et.al. 2015]. Compound

phenols of the potato plant produces its own potato peel.

Reactive oxygen species [ROS]

An crucial chemicals component of aerobic organisms metabolism is oxygen. However, it could result in negative responses, and there has been an increase in interest in examining how its reactive species function. ROS, or reactive oxygen species, are made up of hydroxyl free radicals, For example singlet oxygen radicals. cellular energy produces these reactive substances are byproduct of biological energy generation, which typically takes place in cells. Its functional activities, playing a crucial part in gene regulation, apoptosis, and cell signaling expressiveness and ion movement. However, if ROS levels spike enough, it can damage to several molecules, such as lipids, DNA, protein, and RNA. Because they respond promptly. Moreover, the production of free radicals is just a physiological phenomenon. Regular metabolic function [endogenous sources], while environmental influences [exogenous sources] can also contribute. Pesticides industrial chemicals, ozone radiation, stress, and pollution. When ROS generation is higher compared to biological processes for removing them, it is referred to as oxidative stress. That was formerly linked with a higher risk a number of illnesses, including cancer [**Valko M., 2006**], Diabetes, atherosclerosis, arthritis, and neurodegenerative disorders [**Hadjigogos k. 2003**] or accelerated aging. Antioxidant may protects cells by a number of ways, including the reduction of localized ROS, The process of converting ROS into typical, non-radiative species depends on the antioxidant involved, Moreover, the auto-oxidative chain was broken. Concentration of oxygen [**Getoff N. 2007**]. Exogenous antioxidant that are present in frequently consumed fruits, vegetable, cereals, and drinks, or other dietary products, such as as [vitamin C], tocopherol ascorbic acid polyphenol and carotenoids may help the body's natural antioxidant defense [**Valavanidis A. 2013**].

With the exception of olive waste extract, and grape seed extract few by- product derived antioxidants have been successfully developed due to its papaya has historically been utilized as a therapeutic cure properties. The medicinal qualities as a tropical fruit, it is used in the European food sector. The fruit is full of phytochemicals, including polyphenols and carotenoids. People who reside in tropical nations are also aware of the thirst-quenching properties of papaya. The papaya's skin and seeds are just as valuable as its delicious pulp. Papaya seeds have a number of health benefits. Papaya peel is used in some of the

proper tropical nations to make a variety of cuisines. Despite the fact that papaya seeds and peel have a variety of purposes, the phytochemicals, particularly phenolic compounds, in these portions of the papaya are antioxidant- rich foods. By measuring the total amount of phenols in carica papaya and its ability to function as an antioxidant. Antioxidative potential of these various biochemical's tests used to measure antioxidant capabilities. [**Adebiyi, A., Adaikan, P.G. et al., 2003**].

However, benzyl isothiocyanate, a substance found in crushed papaya seed and thought to have effect against intestinal parasites helminthes, has been proven to have an increased ability to extract oil from the seeds. Vascular contractions utilizing an in vitro model of the canine carotid artery. [**Wilson and Kwan 2002**].

When used in large quantities, papaya seed oil may lower the risk of coronary heart disease. Papaya seeds are rich in high oleic acid content , which amount to fresh fruit has 8 to 15% of its weight in proteins, crude fibers, fatty acids, calcium, and phosphorous. A reddish yellow color could be seen in the papaya seed oil. The papaya seeds have been utilized throughout America. [**Adebiyi Ganesan Adaikan Prasad et al., 2003**].

Aside from that due to its ability to induce labor and promote a healthy menstrual flow, papaya seed preparations have been utilized in traditional medicine [**RAO JAMIR, 1982**] In addition to these uses, papaya seeds are added to black pepper to give it a fiery flavor. [**Curl Fenwick et al., 2009**]. Throughout the year, Papayas are available and are a nutritious powerhouse.. It contain a lot of antioxidant and vitamins [C, A, and E] potassium and magnesium, and the B complex vitamin, and significant levels of fiber. Historical times, it was regarded as a fruit with an unusual look and buttery flavor. Due to its ability to induce labor and promote a healthy menstrual flow, papaya seed preparations have been utilized in traditional medicine. [**RAO, JAMIR et al., 2013**]. Papaya seeds are used to falsify black pepper because of their hot flavor [**CURL FENWICK, et al., 1983**]. The MARFO group reported that crude fibers [22.6%], proteins [27.8%], and fatty acids were all abundant sources. Papaya seeds contain phosphorus and calcium [**MARFO et., 2011**]. Due to the high temperatures utilized un this later process for extracting dried from seeds, pulp, peel, and all those giving extraction recovery, it is expensive both in terms of capital investment and operational costs in the process [**Christensen et al., 2013**].

Papaya seeds and the entire fruit are both members of the Caricaceae family. Some Caricaceae species have been as treatments for various illnesses. Papaya output worldwide averages over 10.0 million metric tones led by India and Brazil. A primary producers, with are the most popular ways to extract oil from papaya seeds. Supercritical fluid extraction, solvent extraction, and extraction. The Syed group a study that described using soxhlet extraction to extract oil.[Syed et al., 2011].

According to the WHO'S 2017 report, 1.9 billion adults worldwide are obese. There are 800 million undernourished individuals in the world, and two billion people have anemia and nutritional deficiencies.[Camaschella 2015]. Low and middle income countries consume very little fruit despite overwhelming evidence of the advantages of regular eating.[Miller et al., 2016].

The health system has consistently promoted nutrition education, yet fruit intake has remained incredibly low.[Bye et al., 2019]. And the extent of supplementing with vitamin A has not proven a sufficient intervention[Lailou et al., 2020].

In addition to its delicious flavour, papayas are an excellent source of antioxidant element, including flavonoids, vitamin B complex, and vitamin c, folate, as well as fibre, magnesium, and other minerals. These substances support. The cardiovascular system work and guards against colon cancer as well. Contrarily, it has been claimed that C papaya leaf has a healing effect on dengue and anti-inflammatory properties as well as malaria.[Owoyele et al., 2008].

Papayas come from Central America initially. They thrive in tropical climates with regular rainfall and little long-term floods. A papaya crop, may be harmed by freezing temperatures.

Nutrients per serving

Approximately 275 gram medium sized papaya contain-

- . 30 grams carbohydrate
- . Less than 1 gram of fat
- . 21.58 gram of sugar
- . 4.7 gram of dietary fibre

Papaya are another excellent source of

- . Copper
- . Fiber

Antimicrobial activity

Papaya leaves were extracted using the disc diffusion method with acetone, water, and ethanol. Results showed that aqueous extracts performed less than organic extracts. Another discovery was that a fresh sample performed better than control against gram-negative microbes and the

effectiveness of the dried sample against both gram negative and gram positive microbes.

For the antihypertensive impact, mature papaya fruit ethanolic extract was used. The renal, and normotensive DOCA-salt hypertensive mice had basal mean arterial blood pressure [MAP] of 93.84.5, 1755.1, and 181362 mm Hg, respectively. Both hydralazine [200 L / 100 g, i.v.] and ethanolic extract of unripe fruit of papaya [20 mg/kg, i.v.] caused a discernible decrease in MAP in renal, normotensive and DOCA-Salt hypertensive animal group compared to control. However, in the hypertensive group, the extract caused a MAP depression that was about 28 percent greater than hydralazine. According to the study, The young papaya fruit showed strong anti- hypertensive properties.

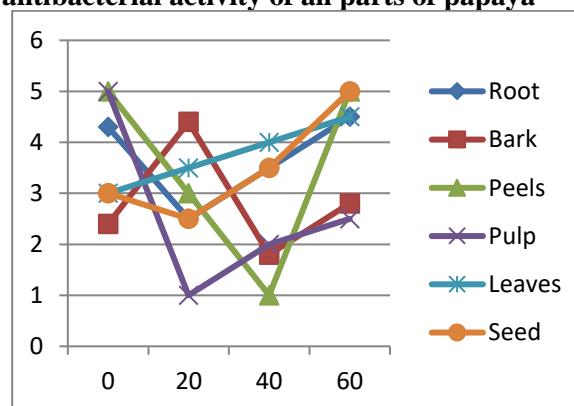
Activity to treat wounds

100 mg of papaya fruit aqueous extract taken daily for 10 days to accelerate the healing of wounds. The wound area is reduced by 77% when the aqueous extract is used to opposed to 59 percent when controls are used. As a result, the finding indicates that papaya aqueous extract had high wound healing activity.

Antifungal activity

Fluconazole and the latex of the papaya work together to inhibit candida albicans growth. Partial cell wall breakdown is the outcome of this synergistic action. The minimal concentration of protein for inducing a full inhibition was reported as being around 138 mg/mL [16], indicating that latex proteins appear to be involved for antifungal activity.

Compositional difference in antioxidant and antibacterial activity of all parts of papaya



Anti-fertility activity

Rat seminiferous tubules exposed to a 5- 10 ml raw papaya extract for 4 weeks show complete loss of fertility due to decreased sperm motility and morphological abnormalities in sperm. The hark

showed that it could function as as male contraceptive in animals and was safe to use.

Diuretic activity

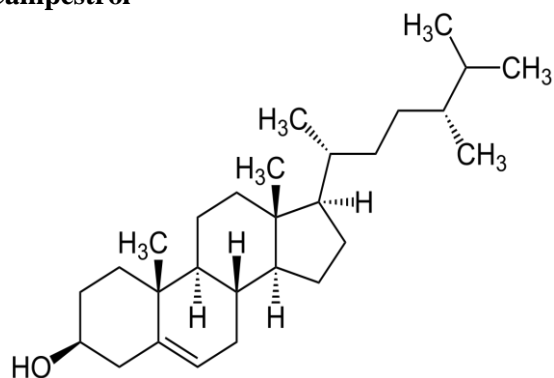
When taken internally at the dose of papaya root extract, rats given 10 mg/kg demonstrated a considerable comparable urinary electrolyte excretion profile to those taking hydrochloro thiazide and an increase in urine output.

Anti-tumor activity

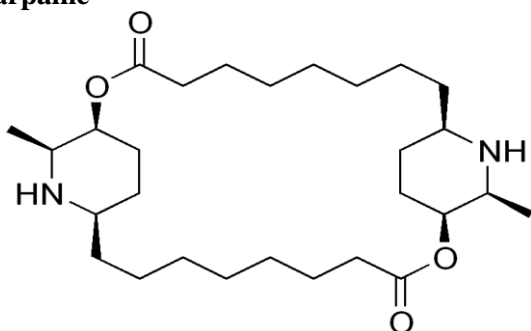
The papaya aqueous extract leaves [0.625-20.00 mg/ml] demonstrate anti tumor action dependent manner, the proliferative c of solid tumour cell lines carcinoma, breast adenocarcinoma, carcinoma, lung adenocarcinoma, pancreatic epithelial carcinoma an mesotelioma

Papaya compound structure

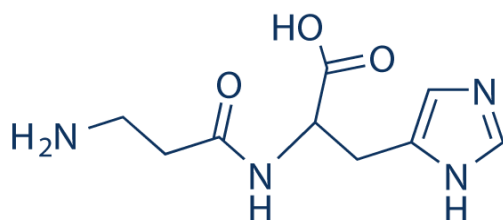
Campesterol



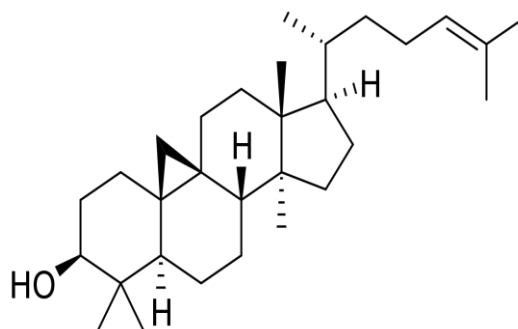
Carpaine



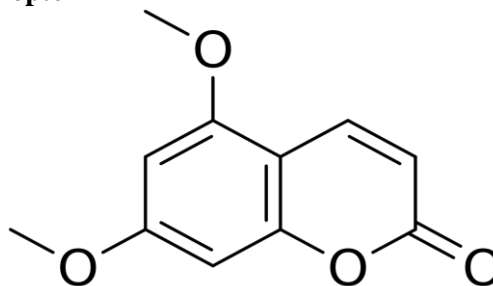
Papain



Cycloartenol



Citropten



Papaya leaves properties

There are countless advantages to papaya leaf. Papaya young leaves are sometimes boiled and consumed like spinach in different Asian areas..

A] Dengue infection - Dr. Sanath Hettige's experiments, which involved 70 suffers with dengue fever say juice from papaya leaves increases white blood cell production regulates clotting, regulates platelets or cells

B] Reduction of Cancer – Latest research on papaya leaf tea extract has demonstrated that it prevents the growth of cancer cells. It seems to increase the production of important Th 1-type cytokines, signalling molecules which assist in immune system regulation.

C] Improve digestion- The chemical compounds of carpain, which often the digestive system, are found in the leaves of papaya plants functions[**Arvind G, Debjit B**]

Papaya fruit

Carotenoids, Vitamin B, lycopene, dietary minerals, provitamin A, Vitamin C and dietary fibre are just a few of the nutrients found in abundance in papaya fruit In the fruit papaya, a phytoalexin named Danielone has been found. This substance demonstrated strong antifungal action.

A] Laxative- The laxative properties of papaya fruit provide bowel movements.

Pawpaw leaves

Aids in cancer treatment
Has anti malaria properties
Good for skin
Aids digestion

Boosts your immunity
 Good for prostate cases
 Reduces heartburn
 Treats diabetes and ulcers
 Good for the liver
 Promotes hair growth
 Maintain healthy blood platelets
 B] Indigestion- The milky juice that is pressed from the mature, green fruit contains papain. While its still attached to the tree. This is utilized in the preparation of several indigestion treatments.

[Marotta F, Weksler M, Natio Y]

Health benefits of papaya seeds

Liver detoxifier- In Chinese medicine, it is believed that a teaspoon of papaya seeds will help detoxify the liver.

Antibacterial properties- Papaya seeds are effective against E. coli, Salmonella, and Staph infections.

Kidney infection- Papaya seed extract may protect the kidneys from toxin induced kidney failure.

Eliminates intestinal parasites- Papaya seeds eradicate intestinal parasites.

Seeds

Papaya seeds are beneficial in preventing and treating bacteria infections caused by Salmonella, E. Coli, and Staphylococcus. They may also shield

the kidneys from toxins renal disease. Using seeds, you can get rid of intestinal parasites and aid in liver detoxification used to reduce fever by irritating the skin. Anthelmintic, antimoebic, and typhoid qualities, as well as a cure for piles. Interestingly, dried papaya seeds appear very similar to peppercorns and have a similar range of applications. Having a few drinks during a meal, especially one high in protein is a quick approach to increase the amount of enzyme in your diet and enhance gastrointestinal health. [Baskaran C]

Peel- Papaya peel is frequently utilized in cosmetic products. Numerous home treatment also employ papaya peel.

A] Sunscreen and claming lotion – The availability of vitamion A aids in rebuilding and restoring damaged skin. Papaya pasted as a skin whitening agent, peel is utilized. Peel was combined with applying honey can hydrate and calm the skin.

B] Reduce dandruff- Lemon juice and papaya juice can be put on the scalp and left on for 20 minutes before shampooing

C] Muscle relaxant- Adding papaya oil essential oils lavender, orange, vinegar rosemary to bath water can be nourishing, reviving, and claming and act as a musle relaxant and painkiller .

Compounds find in different parts of Carica papaya

| Compounds | Plant Part | Amount |
|------------------|----------------|-----------|
| Alkaloids | Leaves | 4000 ppm |
| Butanoic acid | Fruit pulp | 1.2 mg |
| Papain | Fruit, Latex | 53000 ppm |
| Tannins | Leaves | 6000 ppm |
| Flavonols | Leaves | 2000 ppm |
| Chymopapain | Latex, exudate | - |
| Methyl butanoate | Fruit | - |

Processed food using papaya

The Papaya fruit, which is raw and in its natural state, is well known. The availability of papaya food derivatives has increased recently. Pressed papaya nectar is one such item. It can be consumed on its own or as a components of hydrating tropical juices. The papaya fruit puree is also very well liked. Commercially frozen for shipping, it is then defrosted, pureed, and added to ice cream. Jam, jelly, chutney, juices and other deserts.

Even unripe green papayas have been used in cans as a preservatives in sweet syrup. Even the majority of papaya culinary products are made from the fruits flesh, its leaves and enzyme have also been used in chewing gum, brews, and meat tenderizers. Products made from papaya seeds can be found on

the Indian spice market mixed in with black pepper and other seasonings.

Along with baked chips, ice tea powders, candies and fruit cocktails, papaya is also used to make other popular food items.

Phytochemicals

A phytochemicals is a bioactive nutrient found in fruits, vegetables, grains, and other plant foods that may have advantageous effect on health. Phytochemicals such as Kaempferol, Quercetin, and Caffeic acid were found in the papaya fruit. Alkaloids, glycosides, tannins, saponins, and flavonoids, are some of the active ingredients in carica papaya leaf that give its medicinal properties.

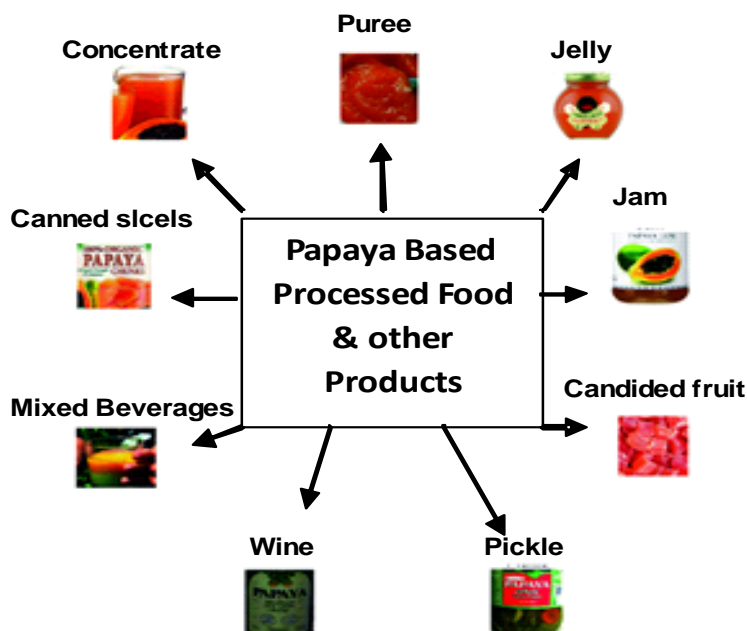
Papaya leaf

The ethanolic extract contained alkaloids, and tannins, and the three extracts contained Quinones, and steroid, according to phytochemicals study.

Papaya seeds

Alkaloids, flavonoids, carbohydrate, and anthraquinones were found in papaya seed

ethanolic extracts after phytochemicals screening. Papaya seeds are full of papain and chymopapain, two enzyme that have been shown to improve digestion, and make it simpler to digest protein. In particular , they support the breakdown of strong protein fibers into smaller protein strings.

**Pharmacological properties of different parts of papaya plant**

| Sr. NO. | Plant part | Pharmacological activities |
|---------|------------|--|
| 1 | Leaf | Antibacterial, Antiviral, Antitumor, Malaria, Anticancer, Chikungunya, Anti-Dengue. |
| 2 | Root | Antiulcer, Urine problem, Dyspepsia. |
| 3 | Flower | Antioxidant, Cytotoxic, Chemo preventive, Diarrhea, Cough. |
| 4 | Latex | Antiviral, Antibacterial, Antioxidant, Anticancer, Antiulcer |
| 5 | Seed | Kidney protector, Antifertility, Diabetes Mellitus, Typhoid, Antiparasitic activity |
| 6 | Peel | Antibacterial, Muscle relaxant, Anticancer, Wound healing property, Induced Apoptosis. |
| 7 | Stem bark | Antibacterial, antiviral, Sore teeth, Antifungal, Jaundice, Antihemolytic activity |

REVIEW OF LITERATURE

The aim of this study was to evaluate the antioxidant capacity of leaves from three different papaya cultivars. growing Indonesia, West Java utilizing ABTS and DPPH assays and correlations of total antioxidant capacity. Total phenolic content, total flavonoid content and total carotene content with their antioxidant properties, Numerous substances, including flavonoids, tannins and the antioxidant anthraquinone, Vitamin A, and vitamin C in papaya utilizing DPPH and b-carotene linoleate bleaching test measure antioxidant activity.

Methanol was used to extract papaya leaves [CPL] and choose two CPLs with high total flavonoid content and antioxidant capacity. The two chosen CPLs underwent additional testing. Primarily young and mature leaves, but with other ages as well. A chosen CPL was further examined with

several extraction solvents. Ferric and diphenyl-1-picrylhydrazyl have a powerful antioxidant effect. [DPPH] and [FRAP] used to measure antioxidant activity.

Papaya leaves belonging to the Caricaceae family. Some Caricaceae family. Some Caricaceae species has been employed to treat various disorders.

Papaya leaves are a type of vegetable food that the majority of people eat of Indonesia, particularly the Javanese. Papaya leaves are a vegetable in addition to being sometimes employed as a conventional herbal remedy thought to stimulate appetite and anti-malaria.

Bioactive substances found in Carica papaya leaves have been shown to enhance blood antioxidant levels and lipid levels are both decreased per oxidation. This substances include ascorbic acid, simopapain, tocopherol, and papain. Glucosinolates, glycosides, & cyanogens. An

earlier study found that papaya leaves contain bioactive substances with anti-cancer properties, including benzilotosianat, tocopherol, and lycopene.

The flavonoids quercetin and kaempferol were also found in papaya shoots, according to **Miean and Mohamed2001**. kind and quantity of flavonoids in plant vary depending on the variety, growth environment, planting method, harvesting, storage and processing condition.

Plant crop variety, pre-treatment with drying, extraction technique, and leaf maturity all have an impact on antioxidant activity and bioactive chemicals [**Nantitanon et al., 2010**]. The extraction is also determined by the solvent extraction choice. Different polarity solvents can create extracts that offer various results. According to research by [**Bimark et al., 2010**], extraction compared to petroleum ether, methanol and ethanol produce extract than yield 70% more extract than with petroleum ether.

To investigate all flavonoids or calming down properties of papaya leaves with various kinds of maturities, solutions was the purpose of this study. Popular fruit papaya is known for its culinary and dietary benefits. This herb is very well known in conventional medical practices.

Significant advancements have been made in the biological activities and medical applications over the previous few decades of papaya and is now valued as a fruit plant for nutraceuticals. Papaya leaf extract made from ethanol and seeds has been developed into a gel mask, and researchers have observed its efficacy in treating pimple. Carica papaya leaf extract has also been studied in relation to its activity in dealing with zits [**Bhande V et al., 2014**].

Antioxidant activity of the papaya fruit extraction in petroleum ether, n-butanol, ethyl acetate, ethanol or water was assessed in this study. A type of tropical evergreen fruit tree is the papaya. The majority of which is from Mexico and Central America scattered over China, including in the provinces of Taiwan, Yunnan and Fujian. Due to the limits of each approach used to test the antimicrobial activity of natural medicines and foods, in order to assess the antioxidant activity of natural materials, many techniques were traditionally applied. [**Haytowitz et al., 2013**].

Using the agar diffusion method, the bioactive component of carica papaya leaf and root extracts was extracted using water and organic solvents and was then tested for antibacterial activity against certain human pathogenic bacteria. The organic

extracts demonstrated greater activity than the root extracts, which had substantial action, with the maximum activity against being seen in methanol extracts having the most activity against the test microorganisms. [**Siegler 2002**].

A member if the cariceae family is the carica papaya. Its common names include papaw tree, papaya, papayer, tinti, and pepol, kavunagaci, kebaya etc.

The leaves, fruit, seed, latex, and root are among the parts that are frequently used. The plant is described as a rapidly growing, upright, mostly unbranched tree or shrub, growing to a height of 7-8 meters, with a trunk that is about 20 centimeters in diameter. The tree it is also listed as acting as an analgesic, amebicide, antibacterial, cardio tonic, cholagogue, hypertensive, laxative, pectoral, stomachic, and vermifuge in documented property forms. It is dispersed throughout Asia, Nigeria etc [**Afolayan et al.,2003**]

There are numerous biochemically active chemicals in Carica papaya. Papain and chymopapain are two crucial substances that are thought to facilitate digestion. Arthritis can be treated with papain, Papaya leaves are used to make soap substitutes that are designed to get rid of spots.

The proteolytic enzyme papain has numerous industrial applications. It has rennet, which helps milk coagulate, and it can break down proteins. Papain is a substance that is used in medicine to treat dyspepsia and additional digestive orders it has been utilized in liquid treatments to reduce enlarged tonsils. Papain is used to treat about 80% of American beer, which digests the protein that may precipitate broke apart, but the beer remained clear after cooling. Papain is used to degum natural silk as well. The majority of papain imported into the United States, however, is used in chewing gum and meat tenderizers. Additionally used to extract tuna liver oil for cosmetic purposes, it is a component of several toothpastes, it is a components of several toothpastes, shampoos, and face-lifting products. [**Munoz et al., 2000**].

There is no doubt that the average individual is aware of the nutritional benefits of fruits and vegetable in terms of preserving health and preventing sickness due to vitamin and other unique functions these substances carry out in the body to maintain their health. Several fruits and vegetables include chemicals that can change a variety of systems that are well-known for their profusion of illnesses. The body may use the remaining nutrients. Though it is generally

acknowledged that these are the fruits and veggies have the potential to lower the incidence of disease linked to oxidative stress.[Dominique B, Martine c et al., 2009].

The significance of dietary component in lowering the risk of chronic illness has been examined in recent studies. The results of these tests showed that if a person made fruits and vegetables a staple of his diet, he may minimize the probability of developing 50% the risk of illnesses brought on by oxidative stress, including cancer, especially gastrointestinal cancer.

Understanding the connection between food nutrients and health is crucial because there are 25,000 or function in a variety of oxidants operating either directly or indirectly in the human body[Zeynep S. Agi et al.,2015]

Here are some recipes that call for a single little papaya

Breakfast- Slice it in half, add Greek yoghurt to each half, and top with a chopped nuts and a few blueberries.

Appetizer- Cut it into strips for the appetizer and round each with a piece of ham.

Salsa- To create salsa finely chop the papaya, tomatoes, onions, cilantro and add the lime juice.

Salad- To make a salad, dice cooked chicken, avocado, papaya and use vinegar and olive oil to dress.

Desert- Chopped the fruit and add 2 teaspoon of chia seeds to the mixture ¼ teaspoon vanilla, 1 cup [240] gram of almond milk, and sesame seeds. Mix well and put in the fridge before eating.

The papaya seed’s health advantages include-

- . Delicious nutrients rich
- . Strong antioxidant impact
- . Anticancer attributes
- . Better your heart health
- . Reduce inflammation
- . Boost digestion

Health benefits of papaya

- Cures skin infection
- Heals wounds
- Prevents wrinkles
- Treats morning sickness
- Prevents arthritis
- Fights kidney disease

Side effect of papaya seeds are-

- . Consuming too much in pregnancy may be harmful to the growing fetus.
- . Regular consumption of papaya seeds may harm men’s ability to conceive the quantity of sperm.
- . Papaya seed ingestion in excess might result in diarrhea.
- . Consuming excessive amounts of papaya seeds in not advised for breastfeeding moms.

Use of Carica in photochemistry, management

Fruits



Anticancer activity
Anti diarrheal responses
Antioxidant activity
Processed foods
Sources of enzymes



Seeds



Wound-healing activity
Anticancer activity
Insecticidal & repellent responses
Biodiesel production



Papaya Peel



In cosmetics
In wastewater Treatment
As a animal feed
In toothpastes
As a binder in ceramics



Nanoparticle synthesis



Leaves



Anti dengue activity
Anti malarial activity
Anticancer activity
Antibacterial activity
Antifungal activity



Commercial Products



Conclusion

The finding suggest that ascorbic acid and phytochemicals antioxidant are both abundant in

papaya seed and pulp. We deduced from this investigation that the papaya pulp and papaya seed contain phytochemicals. That might be attributable to the body's increased ability to access these ingredients. Utilized solvent papaya pulp and papaya juice's antioxidant properties were greatly influenced by extraction seed. High influence of solvent polarity on extractable potential antioxidant compound. The methanol extract of papaya pulp and papaya seed fruit has a strong antioxidant activity with the lowest IC50.

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