



Durio Zibethinus: An Overview Of Its Pharmacological And Nutritional Properties

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Abstract:

An iconic, tropical and climacteric fruit Durian (*Durio zibethinus*) Family: Malvaceae is cultivated in Malaysia and Southeast Asia. It is also recognized as the King of fruits. This family has 51 genera, and the genus Durio consists of approximately 28 species. Durian is distinguished by its large size and spikey, hard outer shell. The flesh of this fruit smells slightly pungent defined as an onion-like, sulphury aroma and has a texture similar to custard with a large seed. The pulp is found mainly in yellow and white colour and rarely found in red and green colour. This pulp is a good source of nutrients such as carbohydrates, dietary fats, proteins and fibre, and volatile Sulphur compounds. An over-ripped durian consists of polyphenols and flavonoids which are beneficial to human health. Durian leaf and root decoctions have medicinal and anti-malarial properties. Many types of research have claimed that there is great commercial and economical demand for Durian fruits due to their wide significance in the medical field, food industry, Nutraceutical industry and construction.

Keywords: Polyphenols, Antimalarial, Sulphur compound, Tropical, Pulp.

1. Introduction:

Fruits are the most essential part of our daily diet because of their nutritional aspect. All fruits are rich sources of natural antioxidants. Durian is an expensive, continental, tropical and seasonal fruit in many parts of Malaysia, Indonesia, the Philippines, and Thailand. The name Durian primarily comes from the Malay word 'Duri' which means 'thorn' of fruits. The Durian is basically round or oval in shape. The outer covering of this fruit is semi-woody and is completely covered with strong and sharp thorns. The primary part of Durian is its pulp which is yellowish in colour. This pulp is rich in various nutrients and has a creamy sweet flavour. The seeds of this fruit are similar to chestnuts with a light brown coating. Basically, this fruit has typically a sturdy aroma. This rigorous smell (that favours rotten onion or eggs) which is caused by volatile Sulphur compounds regulated by methionine gamma lyases. Durian fruits are also used in the production of wines, fruit juices and many other beverages to eliminate the strong aroma so that they can easily be transported to the global market. This review article highlights the nutritional value, health benefits, chemical composition, emerging applications and potential uses.

2. Taxonomical Classification:

KINGDOM]Plantae
DIVISION	Tracheophyta
SUBDIVISION	Spermatophytina
CLASS	Magnoliopsida
ORDER	Malvales
FAMILY	Malvaceae
GENUS	<i>Durio</i>
SPECIES	<i>Durio zibenthinus Murray</i>

Table 1.1: - Taxonomical classification of Durian

3. Nutritional account of Durian:

Durian the king of fruits in Malaysia is a magnificent source of various nutrients that are important in the human diet. *Devalaraja et al.* have reported that fruit pulp is a rich source of vitamins and minerals such as vitamin A, vitamin C, folic acid, thiamin, riboflavin, niacin, B6, potassium, sodium, zinc and phosphorous. It is also an excellent source of nutrients such as carbohydrates (27%), proteins (1.47%), fibers (3.1%) and dietary fibers (5.33%). The durian fruit pulp also consist of palmitic acid (32.91%),oleic acid (4.68%),palmitoleic acid 99.50%),stearic acid (35.93%),linoleic acid (2.20%),10-octadecenoic acid (4.86%) and myristic acid (2.52%). Basically, durian fruit is well-liked in daily implementation due to its superior flavour and health-promoting compounds such as flavonoids, phenolics and carotenoid contents. Durian peel has an excellent nutritional composition and consists of many bioactive compounds.

4. Medicinal Properties of Durian:

The majority of photo chemicals are the essential part of durian fruit and they are also being used in medicinal formulations. Many health-protective effects of phenolic compounds have been reported because of their antioxidant, antimutagenic, anticarcinogenic, anti-inflammatory, and antimicrobial properties. It has been accounted that durian has additional valuable health properties. The immune system and wound-healing abilities of durian fruit are thought to be among their potential medical and therapeutic benefits. According to reports, durian possesses anti-cancer, anti-cardiovascular, anti-diabetic properties and anti-obesity properties, as well as the ability to enhance digestion, treat insomnia, lower blood pressure, and lessen the signs and symptoms of stress, anxiety, and depressive disorders. Asia has long employed durian leaf and root decoctions as febrifuges and anti-malarial agents since it is thought that they have an antipyretic effect. Phlegm, colds, skin conditions, jaundice, and swellings are also treated with it. Although no clinical studies have been done, it is thought that the durian fruit exerts warming effects on the body. Research has been done to determine the usefulness of durian fruit pulp to treat infertility in PCOS (polycystic ovarian syndrome) and previous research has also suggested that it may be used as a fertility-enhancing agent. Despite the fruit's ability to combat several metabolic syndrome symptoms, further research into the mechanism underlying menstruation and ovulation problems is required. According to Bhat and Paliyath, durian fruit also exhibits anti-proliferative properties. According to Feng and colleagues, the anti-inflammatory compounds in durian peel might reduce lipopolysaccharide-induced NO generation in the RAW 264.7 cell line (*Feng et al., 2018*). The antioxidant and anti-inflammatory properties of the extract from the Monthong cultivar were higher than those of the extract from the Chaneé cultivar (*Chingsuwanrote et al., 2016*). The coumarin propacin found in durian peel greatly reduces the amount of NO and prostaglandin E2 (PGE2) released by LPS in RAW264.7 cells (*Zhan et al., 2021*).

5. Antioxidant activity in Durian:

5.1 Sources of antioxidant activity of Durian:

Typically, across the studies that explored antioxidant activity in durians, phenolic content was determined to be the key contributor to high antioxidant activity in durians (*Charoenkiatkul et al., 2016; Arancibia-Avila et al., 2008; Toledo et al. 2009*). According to a study, the total phenolic content of durians is the key factor in their ability as antioxidants (*Charoenkiatkul et al., 2015*). In a study, the antioxidant capacity was primarily generated from the alcohol-soluble antioxidants, and the antioxidant capacity also had a strong link with polyphenols, indicating that the polyphenols were the main contributors to antioxidant activity (*Arancibia-Avila et al., 2008*). According to a study, the

primary bioactive components of the Mon Thong cultivar were caffeic acid and quercetin, with total polyphenols making up the majority of the durians' overall antioxidant potential (Toledo *et al.*, 2009). In one study, phenols were discovered to have significant antioxidant activity, and flavonoids and flavanols were likely factors in the high antioxidant activity.

5.2 Durians with the highest antioxidant activity:

According to the studies reviewed, immature durians often showed lower antioxidant activity than ripe and overripe durians (Leontowicz *et al.*, 2011; Leontowicz *et al.*, 2007; Haruenkit *et al.*, 2007; Toledo *et al.*, 2009). According to the studies mentioned, the Cha-ni, Kan Yao, and Kra-dum durian cultivars were shown to have lower antioxidant activity than the Mon Thong durian cultivar (Toledo *et al.*, 2009; Leontowicz *et al.*, 2008). In comparison to overripe and mature durians in both investigations (Arancibia-Avila *et al.*, 2008; Leontowicz *et al.*, 2007), the maximum antioxidant capacity and bioactive chemicals were discovered in the ripe durians study, and the highest antioxidant capacity was observed in the other study.

In comparison to immature, mature, and ripe durians, the methanol extract of overripe durians demonstrated the best antioxidant activity, according to a study (Haruenkit *et al.*, 2010). In a related study, it was discovered that durians that were past their prime typically had the most antioxidant potential (Leontowicz *et al.*, 2011) 9. The antioxidant activity of the Mon Thong cultivar was much higher than that of the Kradum and the Kan Yao varieties, according to a study that compared the antioxidant capacity of various durian cultivars (Toledo *et al.*, 2009). In a 2008 study by Leontowicz *et al.*, the antioxidant capabilities and total polyphenol content of Mon Thong and Chani samples significantly increased as measured by the DPPH, -carotene, and Folin-Ciocalteu assays (Leontowicz *et al.*, 2008).

5.3 Durian plant varieties:

The Malaysian Department of Agriculture (DOA) has 15 durian types on file. D24, D99 (kob kecil), D123 (Chanee), D145 (Beserah), and D158 are the 15 variations (Kan yau), Mon Thong, D169, D168 (IOI, Ma Muar), D175 (Udang Merah, An He), D197 (Raja Kunyit, Musang King), D198 (Kim Hong), and D199 are only a few of the names on the list (Bola 828). The MDUR78 (D188, Clone from D24 x D7), MDUR79 (D189, Clone from D24 x D7), and MDUR88 (D190, Clone from D24 x D7) are three further hybrid durian clones that are created utilizing (MARDI). There are seven commercial cultivars of durian in Thailand, according to the Thai Agricultural Standard (TAS 3-2013). According to, these seven types are known by the names Chanee, Monthong, Karnyao, Kradoomthong, Puangmanee, Nualthongchan, and Longlublae. Thailand's commercial cultivation of the Monthong and Chanee cultivars is widespread and well-liked.

6. Conclusion:

Malaysia is home to a wide variety of underused fruits with a wide range of aesthetic and organoleptic traits. Regarding antioxidant phytochemical content and qualitative characteristics, there are significant variances between different durian cultivars. The antioxidant potential of durian is very high. In conclusion, several cultivars of durian include a variety of bioactive substances and have a high level of antioxidant activity. It has been discovered that they have medical qualities, such as anti-inflammatory and anti-diabetic potential. The various durian cultivars and the bioactive substances or antioxidants that have been discovered in them have been compiled in this review. Due to the fact that most of the existing research on the possible health advantages of durians is based on studies on animals, the effect on people may not be as anticipated. To examine and uncover further connections between durians and their direct health advantages for people, more detailed future research on the therapeutic characteristics of various durian cultivars may be conducted.

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