J. Sci. Innov. Nat. Earth: Vol. 5, Issue 1, 2025, Page 12-15 ISSN (Online) 2583-2093

OPEN ACCESS

Journal of Science Innovations and Nature of Earth

Journal homepage : https://jsiane.com/index.php/files/index

International, Double-Blind, Quarterly, Peer-Reviewed, Refereed Journal, Edited and Open Access Research Journal

A Comprehensive Examination About Guava: Assessment of Guava's Medical Effects

Ashutosh Pathak[1, 2*], Desh Deepak Panday[3], Salman Ahmad Khan[1], Sanjay Kumar Yadav[1], Sunil Kumar Yadav[1], Kritika Shukla[1], Riya Vissen[1], Ashish Asthana[4] , Pavan Kumar [2]

[1]Department of Pharmaceutical Chemistry, Institute of Pharmacy, Dr. Shakuntala Misra National Rehabilitation University, Mohan Rd, Sarosa Bharosa, Lucknow, Uttar Pradesh, India – 226017

[2]Institute of Engineering and Technology, Dr. Shakuntala Misra National Rehabilitation University, Mohan Rd, Sarosa Bharosa, Lucknow, Uttar Pradesh, India – 226017

[3]Department of Pharmaceutical Chemistry, Yasraj institute of Pharmacy, Baghamau, Gomati Nagar Extension, Lucknow, Uttar Pradesh, India – 226010

[4]Carrier Ayurveda medical college & Research Centre, IIM road Ghailla, Lucknow, Uttar Pradesh, India – 226020

Corresponding Author E-mail: rrscopashu1986@gmail.com

DOI: https://doi.org/10.59436/jsiane.295.2583-2093

Abstract

Guava (*Psidium guajava* L.) is a tropical fruit indigenous to region of South America. This plant mainly relates to the Myrtaceae family as well-known plant. Guava is a more nutritious alternative since, unlike the rest of the fruit, it is not chemically processed. Guava is widely known for its culinary value. Around the world, it has commonly been utilized as a homoeopathic medicine to cure a wide range of illnesses. Tannins, quercetin, ursolic acid, saponins, lectins, beta-sitosterol, guajanoic acid, carotenoid, amritoside and uvanol are some of the useful chemical constituents in guava. Among its many health benefits, guava has antiseptic, anti-viral, against tussive, against inflammation, against cancer, against hyperglycaemia, as well as anti-oxidant qualities. Approximately 150 guava species are found worldwide, with the common guava, peer guava, cattley guavas being most popular ones. According to guava's nutrient profile, it is high in specific elements, such as protein, carbohydrates, minerals and vitamins, which improve the well-being of people. Guava includes several pharmacologically functional elements that are in charge of a range of physiochemical actions, according to multiple research projects, effects that are covered in more detail in the review, including antipyretic medication, cardiogenic, liver protective, immune-modulation, spasmolytic, and muscular actions.

Keywords: Guava, hepatoprotective, varsities, products, growth, photosynthesis.

Received 03.01.2025 **Revised 05.02.2025** **Accepted 01.03.2025**

Introduction

Vitamins and minerals are abundant in fruits. With a yearly output of roughly 45 milli tonnes, India ranks as the second-largest fruit producer. Guava constitutes amongst best significant and extensively grown fruit crops (Sau *et al*., 2023). It is thought to be among the most beneficial forms of vitamin C. It is accessible in the cold and wet seasons. Twenty to twenty-five percent of guava fruit spoils before it reaches consumer hands as a result of faulty storage, shipping, and processing. Guava's inexpensive price makes it the "apple of the poor." The southern region of Central America and Mexico is where it first appeared.

Guava is identified by the scientific name of *Psidium guajava* L. There are roughly 150+ guava species in the globe. It consists of high dietary fibres, Vit. C and A, Vitamin B9, and aggregates including K(potassium), Cu(copper), Mn(manganese), and many more because of its nutritional makeup . It was first grown in India in the seventeenth century. Numerous types are grown in various Indian states, including Lucknow-49, Allahabad Safeda, Chittidar, Nagpur seedless, Banglore, Dharwar, ArkaAmulya, Harija, Hafshi etc.There are numerous guava-based goods on the market, including squashes, ice cream, yogurt and nectars, jellies, and juices (Guruvayoorappan *et al*., 2015). In addition to actuality consumed freshly, it can also be eaten like sweetened dish like its paste. It is generally grown all over the subtropics and tropics along with India viz, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh, Orissa, West Bengal, Kerala, Karnataka as well as some extra states

Common guavas are grown extensively in Pakistan because of their deliciousness and produce between 100 to 300 fruits per tree. Guava tropical fruit that ripens quickly and is regarded as the most delicate fruit. (Hussain *et al*., 2021) Therefore, guava fruit can be stored at room temperature for two to three days. The distinct musky flavour of guava fruit is diminished by any processing (Kumar *et al*.,2021). Guava fruit typically weighs between 150 to 250 grams. Typically spherical in shape, the fruit has a diameter of 3 to 10 centimetres (Tanwar *et al*., 2014).

Fig1. Guava tree

Taxonomy of Guava:(Naseer *et al*., 2018)

Scientific name	Psidium guajava.
Kingdom	Plantae-Plants
Subkingdom	Tracheobionta Vascular plants
Division	Magnoliophyta Flower Plants
Class	Magnoliopsida Dicotlydonous
Subclass	Rosidae
Order	Myrtales
Family	Myrtaceae
Subfamily	Myrtoideae
Gender	Psidium
Species	Psidium guajava

Nutritional composition and values of guava (200g): (Joseph *et al*.,2011 and Barbalho *et al*., 2012)

Nutritional component	Values
Energy	570g
Carbohydrates	28.64g
Sugars	17.84g
Dietary fiber	10.8g
Fat	1.9g
Protein	2.55g
Vitamin A equivalent	62microgram
Beta-carotene	748microgram
Thiamin(B1)	1.34mg
Riboflavin(B2)	0.08mg
Niacin(B3)	2.168mg
Pantotheric acid	0.902mg
Vitamin(B6)	0.22mg
Folate(B9)	98microgram
Vitamin C	456.6mg
Vitamin K	4.4 microgram
Iron	0.52mg
Magnesium	44mg
Manganese	0.30g
Phosphorus	80mg
Potassium	834mg
Sodium	4mg
Zinc	0.46mg
Lycopene	10408 micrograms

Properties of Guava in treatment of Disease:(Mathpal *et al*.,2022 and Kumar *et al*., 2021).

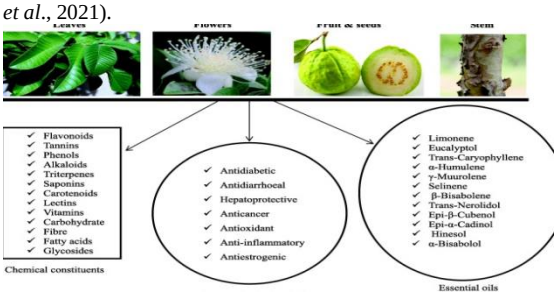
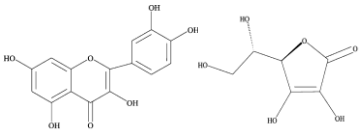


Fig. 2 Biological Activities of Guava



Advantages and applications of guava:(Das *et al*., 2019).

1. As Laxatives	• Guava's leaves and the fruit itself are high in Fiber, which can lead to treat constipation. • Younger delicate leaves have a higher Fiber and food content, which is useful for preventing and treating dysentery and dermatitis. • 200 grams of the fruit of guava is predicted to supply 72 grams of Fiber from diet. • This fruit has the highest amounts of Vit. C in contrast amongst other fruits, with only a single guava providing around twelve percent of the daily energy requirement, making it extremely beneficial for digestion. (Raj *et al*., 2023).
2. Diseases related to the dental cavity	• Periodontal disease is primarily brought on by tooth plaque, that, if ignored, leads to inflammation and periodontal disease. • Guava contains a high concentration of quercetin, which was previously shown to have great antimicrobial properties towards illnesses like these. • In resistant microbes, the proposed action of Quercetin in periodontal disease is the wall of cells disruption and inhibition of important proteins by generating persistent interactions with the proteins (Raj *et al*., 2023). • The extract of guava is effective towards oral infections without altering the dental cavity's homeostasis as well as prevents microorganisms attaching to dental cavities, so it stops the plague and growing anymore. • Gum leaking is the 2nd most common concern affecting the oral cavity (the disease). • Guava contains a significant amount of the antioxidant vitamin C, with some sources stating it has approximately 4 times the vitamin C that is found in an orange, resulting in an ideal choice for treating scurvy(Kapoor *et al*., 2022). • As a consequence, guava is an excellent remedy for oral health disorders.
3. Anti-Malarial	• The green leaves serve to be constituent in the making "green tea". • Additionally, Guavas are employed to be potted herb in a steaming cure for fever (Malaria) (Whistler *et al*., 1985) • Indeed, the primary ethnotherapeutic application in Africa is said to be for dengue. • The laboratory-based anti-plasmodial experiment used a chloroquine-sensitive malaria parasite.
4.Central Nervous System	• An infusion of guava tree leaves is used to treat spasms, seizures and spasm and even cerebral disease. • The tincture was used to treat convulsions in youngsters by massaging it into their Conferring to clinical trials on rats conducted by the Biomedical Research Laboratory, eating guava fruits as well as leaves without the peel might lower blood sugar levels. • The extract is used to treat epilepsy and chorea, which are deteriorating CNS conditions categorized by discontinuous body movement as well as muscles (Elias *et al*., 2014)
6. Anti-Cancerous property:	• Lycopene, a natural anti-oxidant present in it, serves key role in avoidance to prevent cancer and therapy. • Cancer of breast and prostatic adenocarcinoma respond the greatest of altogether. • While guava is sliced, the reddish part consists additional lycopene in comparison to other varieties (Okpashi *et al*., 2023). • Lycopene functions by scavenge harmful free radicals and inhibiting any additional ones from generating (Cuevas-Cianca *et al*., 2023).
7. Anti-inflammatory property:	• The extract of guava in ethyl acetate is being shown to reduce pathogen colonization and nodule development (Gunasekaran *et al*., 2024). • It is capable of working as an antiretroviral treatment. It can enhance the synthesis of messenger Ribo Nucleic Acid(Vanjarapu *et al*.,2024).

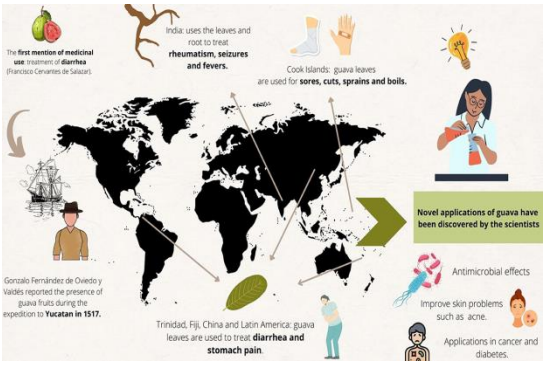


Fig. 3 Ethnomedicinal application in Mexico (Vanjarapu *et al*., 2024).

Guava Fruit: Value addition commercial Products (Bolívar-Anillo *et al*., 2024).

Value added products	Manufacturing and Applications	Diagram
Guava's Pulp	➢ It is made by mixing the pulp of guava with the pulp from different fruits, and it can serve as the foundation for a variety of dishes. ➢ In order to prepare guava pulp, many guava cultivars are investigated. (Ramsis *et al*., 2024). ➢ Following a period of storage at low temperature for approximately 35 and 60 days, the pulp of different type was examined for various characteristics, including acidity, vitamin C, and total solids that are soluble (TSS).(Cid del Prado-Vera *et al*., 2022).	
Guava's Pomace	➢ At the conclusion of the manufacturing process, a form of prepared waste known as guava pomace is supplied. ➢ Fruit of guava were utilized for obtaining its juice. Pomace of Guava was dried using console tray drier that precisely regulates the perfect temperature for drying lies in range of 20 and 150 °C. (Morais-Braga *et al*., 2016). ➢ Guava pomace can be dried at 65 °C because of its high moisture content. (Kumari *et al*., 2017).	
Guava's Leather	➢ A leathery coating of guava's purée is dehydrated to create guava leatherette. Either raw or prepared into the condiment, leathers can be consumed (Bhattacherjee *et al*., 2021). ➢ Compared to other leathers, leather of guava has a higher protein and lipid content. Along with better compositional qualities, it has a considerably stronger fruity scent and is more aesthetically pleasing overall.	
Slices of Dehydrated guava	➢ It includes parched slices of guava and these are made from strong, mature fruits of guava. (Ahmad *et al*., 2008) ➢ Guava fruits were sliced to thick slices of 1.5 cm, corked, and then submerged to different varying meditations of a glucose molasses different lengths of time and temperatures to create osmo-dried guava pieces (Bates *et al*., 2001).	
Guava's Juice	➢ Guava puree can be used to make guava juice. The guava fruits are either diluted with water and then the pulp is filtered, or the pulp and juice is extracted by pressing them via an automatic filter pressing. (Bell *et al*., 2012) ➢ Since the juice is usually creamy, pectic enzymes must be applied in order to create clearer, easier-to-filter juice (Sagar *et al*., 2005).	

Guava' Nectar	➢ A beverage made from guava fruit is called guava nectar. Typically, fresh guava fruits are crushed and the resulting guava pulp is used to make a flavorful, rich, and sweet beverage. ➢ Guava nectar is especially well-liked in tropical nations and can be used for a number of purposes, from blended drinks to pure drinking. Many retailers carry it, and it's usually pasteurized and shelf-stabilized (Kumari *et al*., 2017).	
Guava' Shrikhand	➢ Skim milk was boiled, cooled in an automated pasteurized to 30 °C, and then Lactic Acid Bacteria (LAB) appetiser culture was added and well mixed with help of mixer to form Shrikhand. ➢ Throughout the 8–12-hour incubation period, temperatures of the prior-sterilization container of loading was maintained to 37 °C. Using a fresh, damp muslin towel, the curd was transferred to a different vessel once it had fully set (Taylor *et al*., 2004). ➢ Either by hand or by machine, this chakka has been thoroughly mixed with sugar and guava powdered to get a uniform consistency (Galanakis *et al*., 2019). ➢ Typically, it is stored in a refrigerator and wrapped in polystyrene containers.	

Guava's Utilization to treat diseases as per Nation:(Sau *et al*., 2023).

Nation	Utility
Amazon	Dysentery, diarrhoea, Stomach ache, Menstrual disorder, vertigo
Brazil	Cholera, digestive problem, gastric insufficiency, Ulcers, larynx inflammation, dermatitis and discharge from vagina.
India	Intellectual sicknesses, Epilepsy, nephron inflammation, Icterus, childbirth
Haiti	Piles, skin sores, sore throat, dysentery, scabies, wounds.
Malaysia	Dermatitis, diarrhoea, hysteria, menstrual problems
Peru	Cough, conjunctivitis, digestive problem, gout, vaginal discharge, vomiting.
Philippines	Sores, wounds, as an astringent.

Guava's Flowering Period:(Hinwar *et al*., 2013 and Gavhane *et al*., 2022)

S no.	Genetic composition	Flowering period
1.	Arka Amulya	49-51 days
2.	Hafsi red	38-40 days
3.	Hissar surkha	50-52days
4.	Allahabad safeda	47-49 days
5.	Arka Mridula	40-42 days
6.	Black guava	46-48 days
7.	Behat Coconut	43-45 days
8.	Lalit	51-53 days
9.	p. pumilum	48-50 days
10.	L-49	46-48 days.
11.	Pant Prabhat	45-47 days

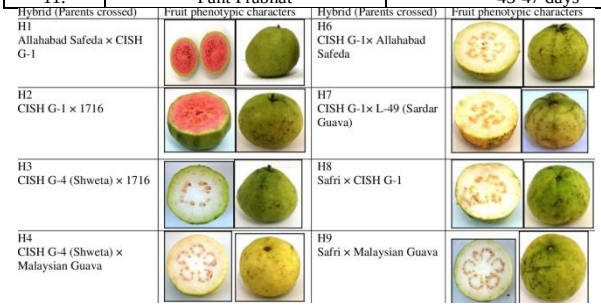


Fig.4 Cross Hybridization of Guava Plant

Conclusion

Psidium guajava L (Guava)., is renowned surrounding the globe to its culinary as well as dietetic value. The fruit guava have been placed on this compilation of extraordinary fruits due to the significant quantities of folic acids, Fiber from the diet, the mineral potassium. Some losses following harvest happened as a result of faulty handling, shipping, and processing, with 20 - 25% of the guava spoiling before it reached consumers. Guava goods such nectar of guava leather of guava, and many more are very essential. The produced goods tasted fantastic, had a high energy content, retained their initial fruit flavor, and were appropriate to consume. Guava also has pharmacological effects were shown to help to cure variety of ailments. Numerous research and published literature have shown that it possesses strong anti-oxidants, anti-parasitic, antiviral, anti-inflammatory, wound healing, and anti-microbial qualities.

Reference

Sau S, Maji S, Ghosh B, Datta P. (2023). Guava. In Tropical and Subtropical Fruit Crops (pp. 351-395). Apple Academic Press.

Bhattacherjee AK, Tandon DK. (2021). Composition and processing. In Guava: Botany, Production, and Uses (pp. 33-63). CABI Wallingford, UK.

Guruvayoorappan C, Sakthivel KM, Padmavathi G, Bakliwal V, Monisha J, Kunnumakkara AB (2015). Cancer preventive and therapeutic properties of fruits and vegetables: an overview. Anticancer properties of fruits and vegetables: A scientific review.

Hussain SZ, Naseer B, Qadri T, Fatima T, Bhat TA. (2021). Guava (Psidium Guajava)-Morphology, Taxonomy, Composition and Health Benefits. In Fruits Grown in Highland Regions of the Himalayas: Nutritional and Health Benefits (pp. 257-267). Cham: Springer International Publishing.

Kumar M, Tomar M, Amarowicz R, Saurabh V, Nair MS, Maheshwari C, Sasi M, Prajapati U, Hasan M, Singh S, Changan S. (2021). Guava (*Psidium guajava* L.) leaves: Nutritional composition, phytochemical profile, and health-promoting bioactivities. Foods. 1;10(4):752.

Tanwar B, Andallu B, Chandel S. (2014). Influence of processing on physicochemical and nutritional composition of *Psidium guajava* L.(Guava) products. International Journal of Agriculture and Food Science Technology.;5(2):47-54.

Naseer S, Hussain S, Naeem N, Pervaiz M, Rahman M. (2018). The phytochemistry and medicinal value of *Psidium guajava* (guava). Clinical phytoscience.4(1):1-8.

Joseph B, Priya M. (2011). Review on nutritional, medicinal and pharmacological properties of guava (*Psidium guajava* Linn.). International Journal of pharma and bio sciences.;2(1):53-69.

Barbalho SM, Farinazzi-Machado FM, de Alvares Goulart R, Brunnati AC, Otoboni AM, Ottoboni BJ. (2012). *Psidium guajava* (Guava): A plant of multipurpose medicinal applications. Med Aromat Plants.1(4):1-6.

Mathpal D, Rathore G. (2022). An Analysis of Health Benefits of Guava. International Journal of Innovative Research in Engineering & Management. 9(1):239-42.

Kumar M, Tomar M, Amarowicz R, Saurabh V, Nair MS, Maheshwari C, Sasi M, Prajapati U, Hasan M, Singh S, Changan S. (2021). Guava (*Psidium guajava* L.) leaves: Nutritional composition, phytochemical profile, and health-promoting bioactivities. Foods.1;10(4):752.

Das M, Goswami S. (2019). Antifungal and antibacterial property of guava (Psidium guajava) leaf extract: Role of phytochemicals. Int. J. Health Sci. Res. 9(2):39-45.

Sam Arul Raj M, Amalraj S, Alarifi S, Kalaskar MG, Chikhale R, Santhi VP, Gurav S, Ayyanar M. (2023). Nutritional Composition, Mineral Profiling, In Vitro Antioxidant, Antibacterial and Enzyme Inhibitory Properties of Selected Indian Guava Cultivars Leaf Extract. Pharmaceuticals. 21;16(12):1636.

Raj MS, Amalraj S, Alarifi S, Kalaskar MG, Chikhale R, Santhi VP, Gurav S, Ayyanar M.(2023) Nutritional Composition, Mineral Profiling, In Vitro Antioxidant, Antibacterial and Enzyme Inhibitory Properties of Selected Indian Guava Cultivars Leaf Extract. Pharmaceuticals.16(12).

Kapoor S, Gandhi N, Kapoor A. (2020). Guava (Psidium guajava). Antioxidants in Fruits: Properties and Health Benefits. :227-49.

Whistler WA. (1985). Traditional and herbal medicine in the Cook Islands. Journal of Ethnopharmacology.1;13(3):239-80.

Elias A. (2014). The Effect Of Psidium Guava Leaf Extract On Blood Pressure In Guinea Pigs, and Weight, Lipid Profiles and Serum Liver Enzymes in Fructose Fed Swiss Albino Mice. Addis Ababa University.

Okpashi VE, Ucho KM, Oyo-Ita EE, Jones BB. (2023). Effect of White Guava (*Psidium guajava* L.) Fruit Puree in Rats Injected with 2, 4, 5, 6 (1H, 3H)-Pyrimidinetetrone. Pakistan Journal of Scientific & Industrial Research Series B: Biological Sciences.1;66(3).

Cuevas-Cianca SI, Romero-Castillo C, Gálvez-Romero JL, Juárez ZN, Hernández LR. (2023). Antioxidant and anti-inflammatory compounds from edible plants with anti-cancer activity and their potential use as drugs. Molecules. 28(3):1488.

Gunasekaran A, Sathya T, Arumugam VA, Balasubramanian B, Robert AA, Meyyazhagan A. (2024). Role of Medicinal Plants Against Cancer. InHarnessing Medicinal Plants in Cancer Prevention and Treatment (pp. 185-215). IGI Global.

Vanjarapu HD, Dukkipati S, Pandy V. (2024). A Review on Phytochemical, Biological, and Pharma-cological Effects of *Psidium guajava* Linn.(Guava). Nanotechnology.17(7):7.

Bolívar-Anillo HJ, Garrido C, Collado IG. (2020). Endophytic microorganisms for biocontrol of the phytopathogenic fungus Botrytis cinerea. Phytochemistry Reviews.19(3):721-40.

Ramsis T, Selim HM, Elseedy H, Fayed EA. The role of current synthetic and possible plant and marine phytochemical compounds in the treatment of acne. RSC advances. 2024;14(33):24287-321.

Cid del Prado-Vera I, Magallanes-Tapia MA, Velasco-Azorsa R, Pérez-Espíndola A. (2022). Organic Amendments and Other Strategies for Management of Meloidogyne spp. and Nacobbus aberrans in Horticultural and Orchard Crops: The Mexican Experience. Sustainable Management of Nematodes in Agriculture, Vol. 1: Organic Management. 13:343-79.

Morais-Braga MF, Carneiro JN, Machado AJ, Dos Santos AT, Sales DL, Lima LF, Figueredo FG, Coutinho HD. (2016). *Psidium guajava* L., from ethnobiology to scientific evaluation: Elucidating bioactivity against pathogenic microorganisms. Journal of Ethnopharmacology. 24;194:1140-52.

Kumari KU, Rishitha G, Prasad KR, Kumar PS. (2017). Value added products of guava. Agric Update. 16;12:2171-7.

Angulo-López JE, Flores-Gallegos AC, Torres-León C, Ramírez-Guzmán KN, Martínez GA, Aguilar CN. (2021). Guava (*Psidium guajava* L.) fruit and valorization of industrialization by-products. Processes. 2021 Jun 20;9(6):1075.

Vikram B, Gautam DK, Tondihal MS, Chaturvedi S, Verma S, Yadav HC, Sonkar A, Nayak T. (2024). Revolutionizing Guava Food Processing: A Fresh Perspective. International Journal of Environment and Climate Change. 30;14(2):14-22.

Kumari KU, Rishitha G, Prasad KR, Kumar PS. (2017). Value added products of guava. Agric Update. 16; 12:2171-7.

Bhattacherjee AK, Tandon DK. (2021). Composition and processing. InGuava: Botany, Production, and Uses 27 (pp. 33-63). CABI Wallingford, UK.

Ahmad I. (2008). Optimization of enzymic extraction process for guava juice and to study its storage stability. Food Technology.

Bates RP, Morris JR, Crandall PG. (2001). Principles and practices of small-and medium-scale fruit juice processing. Food & Agriculture Org.

Bell KL. (2021). Holistic aromatherapy for animals: A comprehensive guide to the use of essential oils & hydrosols with animals. Simon and Schuster.

Sagar VR, Suresh Kumar P. (2005). Processing of guava in the form of dehydrated slices and leather. InI International Guava Symposium 735(pp. 579-589).

Kumari KU, Rishitha G, Prasad KR, Kumar PS. (2017). Value added products of guava. Agric Update. 16;12:2171-7.

Taylor B. (2004) Fruit and juice processing. Chemistry and technology of soft drinks and fruit juices. 1:35-67.

Galanakis CM, editor. (2019). Valorization of fruit processing by-products. Academic Press.

Sau S, Maji S, Ghosh B, Datta P. (2023). Guava. InTropical and Subtropical Fruit Crops (pp. 351-395). Apple Academic Press.

Hinwar DH. (2013). Preparation of shrikhand by using guava pulp. M. Sc. (Agri.) thesis, MPKV, Rahuri, Maharashtra, India.

Gavhane A, Chopade S, Dighe P, Kour A. (2022) .The nutritional and bioactive potential of guava and possibilities for its commercial application in value-added products. Pharma Innov. J.11:2643-7.