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Okra: A potential super food for today's generation

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Abstract
Okra (*Abelmoschus esculentus* (L.) Moench) is a vegetable crop that is commercially cultivated in tropical and subtropical regions across the globe. This article presents a comprehensive review of the nutritional composition and potential health benefits associated with okra. Various parts of the okra plant, such as leaves, buds, flowers, pods, stems, roots, and seeds, are utilized for diverse culinary and medicinal purposes. The tender fruits of okra are commonly incorporated into various dishes including salads, soups, and stews, either fresh, dried, fried, or cooked. The mucilaginous nature of the fruit juice is frequently employed to enhance the consistency of several dishes such as stews and sauces. Consumption of okra is linked to aiding the detoxification of the liver by influencing bile acid and cholesterol levels. Notably, okra is rich in soluble fiber, predominantly in the form of gums and pectins, contributing to the reduction of blood cholesterol levels and potentially lowering the risk of heart disease. Furthermore, the insoluble fiber content in okra supports gastrointestinal health, improves bowel movement, and alleviates constipation. Okra seeds serve as a notable source of oil, containing 20% to 40% oil, with up to 47.4% comprising linoleic acid. Due to its robustness, dietary fiber content, and distinctive seed protein composition, balancing both lysine and tryptophan amino acids, okra has earned the moniker "an ideal villager's vegetable." The high protein content, particularly the proportion of essential amino acids, in okra seeds sets them apart from other plant protein sources. Okra's potential health benefits extend to addressing certain serious human ailments, including specific cancers, type 2 diabetes, heart disease, and digestive disorders. Recognized as an extensively cultivated and significant vegetable crop, okra boasts a multitude of nutritional attributes and plausible health advantages. While substantial information exists regarding the utility of okra in treating various diseases and illnesses, there is a noted scarcity of comprehensive studies, underscoring the need for further research in this domain.

Keywords: Okra, nutrition, health, super food, disease-prevention

Introduction
Okra (*Abelmoschus esculentus* (L.) Moench) is a widely cultivated vegetable crop in tropical and subtropical regions on a commercial scale. The nutritional content and possible health advantages of the edible parts of okra are examined in this study. Okra has many uses in the kitchen and medicine. Its fresh leaves, buds, blooms, pods, stalks, and seeds are only a few of its parts (Camciuc *et al*., 1998) [13]. Tender fruits of okra are commonly eaten as vegetables, either fresh or dried, and can be incorporated in stews, salads, and soups, where they acquire a sticky consistency after cooking. The fruit extract from these is commonly used to thicken a range of meals, including sauces and stews. (Ndangui *et al*., 2010) [45]. Therapeutically, okra mucilage finds application as a blood volume expander or plasma substitute, effectively entrapping toxins and bile acids that transport cholesterol secreted by the liver (Sami *et al*., 2013) [60]. Furthermore, okra seeds are found to contain 20% to 40% oil, with a significant 47.4% linoleic acid content, an essential polyunsaturated fatty acid crucial for human nutrition (Calisir *et al*., 2005) [12]. Okra seed oil is an excellent dietary addition because of its hardiness, nutritive fibre, and distinct protein balance (Liu *et al*., 2010) [39]. Okra seed protein complements diets more effectively than legumes or grains, exhibiting a similar amino acid profile to soybeans and a higher protein efficiency ratio (Kumar *et al*., 2011) [36]. Rich in pectins, gums, and essential nutrients, Okra's high soluble fibre content has been shown to lower blood cholesterol and lower the risk of heart disease. Additionally, its insoluble fiber content supports digestive health. Okra is also a good source of phenolic compounds, which are known for their strong antioxidant activity and several health advantages, as well as a

variety of carbs, minerals, and vitamins (Rao *et al*. 1985; Kendall *et al*., 2004) [56, 34]. Okra is an integral component of the human diet and holds significant potential in promoting human health. In addition to its nutritional attributes, okra is highly versatile, finding applications in both food and medicinal uses, thereby contributing to its multifunctional value. The mucilaginous substance derived from okra is employed in both food and medicines, with the green stems used to extract crude mucilage after the fruit is harvested (Oyelade *et al*., 2003) [49]. The mucilage is predominantly composed of long-chain molecules consisting of sugar molecules and amino acids, with a high water solubility and viscosity. Furthermore, Okra pods and seeds contain crucial minerals like Na, K, Mg, and Ca adding to their nutritional significance (Kumar *et al*., 2013) [35].

Nutritional Profile of Raw Okra leaves

One cup of raw okra, weighing 100 g, contains approximately 81.50 g of water, 235.00 kJ (56.00 kcal) of energy, 4.40 g of protein, 0.60 g of fat, 11.30 g of carbohydrates, 2.10 g of fibre, 532.00 mg of calcium, 33 calories, 7 g of carbohydrates, 2 grammes of protein, 0 g of fats, and 3 g of fibre, according to the U.S. Department of Agriculture's National Nutrient Database. 14 percent of the daily value for magnesium; 15% of the daily value (DV) for folate; 14% of the daily value for vitamin A; 26% of the DV for vitamin C; 26% of the DV for vitamin K; and 14% of the DV for vitamin B6 (Gopalan *etal*., 2007, Varmudy, 2011) [75, 76].

Flavonoids and Nutrient Content in Okra Petals and Fruits

The petals produce thirteen flavanoid glycosides, such as hibiscetin and gossypetin. Fresh fruits are rich in oxalic acid, protein, fat, minerals (K, Na, Mg, S, Cu, Mn and I), Ca, and P, as well as glucose. Additionally, they are high in pectin and mucilage (Al-Shawi *et al*., 2021) [7].

Nutritional Composition and Uses of Okra Fruit

Retinol, vitamin B1, B2, B3 and C are other nutrients found in fresh fruits. From the fruit's mucilage, d-galactose, l-rhamnose, and d-dalacturonic acid were additionally extracted. Fruits have been reported to contain flavonoid compounds (Bhat *et al.*,1987) [77]. Tender fruit can be added to soups or cooked on their own; an can be used either in fresh or driedsatate. They are frequently used to thicken soups, stews, and sauces because they are mucilaginous. The fruits are a decent source of calcium and iron and are high in pectin (Durazzo *et al.*,2018) [21]. Okra pods provide the following nutritional values per 100 g of edible portion (81% of the purchased product, with ends trimmed): water 88.6 g, energy 144 kJ (36 kcal), protein 2.10 g, carbohydrate 8.20 g, fat 0.20 g, fiber 1.70 g, calcium 84 mg, phosphorus 9 mg, iron 1.20 mg, β-carotene 185.00 μg, and riboflavin 0.08 mg. Dried okra sauce, a common West African dish made from pods mixed with other ingredients, does not contain β-carotene (vitamin A) or retinol (Avallone *et al*., 2008) [78]. The viscous fiber in fresh okra fruits is a crucial nutrient that can help lower cholesterol (Kendall & Jenkins, 2004) [34]. Fresh okra pods at seven days of maturity have the highest concentration of nutrients (Agbo *et al*., 2008; Kendall & Jenkins, 2004) [79, 34]. Additionally, according to Hirose *et al.* (2004) [80], the polysaccharides found in the mucilage of okra pods exhibit greater variation compared to other plant parts (2009).

Therapeutic Uses of Okra: Diuretic, Emollient, and Demulcent Properties

Young pods have diuretic and emollient properties, which help to releases water buildup that causes edoema and water retention. Leaves have got emollient (poultice) properties; and skin is soothed and made softer (Al-Kanani *et al*., 2019) [6]. The immature capsule decoction has demulcent, diuretic, and emollient properties. Dysuria, gonorrhoea, and catarrhal infections are all treated with it. Fruit mucilage infusion is used to treat dysentery and diarrhea, acute inflammation and irritation of the stomach, colon, and kidneys, catarrhal infections, ardoururinae, dysuria, as well as to act as a diuretic and plasma replacement (Wahyuningsih *et al.*, 2020) [69]. Immature fruit decoction is a demulcent and emollient poultice. Fruit and leaf extracts are demulcent, though less so than okra fruit extracts.

Okra mucilage is a glycoprotein made up of 80% polymeric carbohydrates and 10% protein. Okra seed oil is rich in unsaturated fatty acids, such as linoleic acid, which are essential for human nutrition. Paper manufacturing uses crude fibre from its mature fruit and stems (Arapitsas *et al*., 2008) [11].

Health Benefits and Nutritional Qualities of Okra

Lady finger, a vegetable with low caloric content, is dense in protein, vitamins, minerals, and dietary fiber (Kumar *et al*., 2011) [36]. Table 1 lists the main nutritional elements of okra pods. Prominently, okra has more protein than other fresh vegetables, mostly from its seeds (Sami *et al*., 2013) [60]. Aspartic acid is the principal amino acid in okra protein, encompassing eleven essential amino acids (Petropoulos *et al*., 2018) [52]. While the ratio of essential to non-essential amino acids is similar to that of soybeans, the concentration of essential amino acids is lower than that of non-essential amino acids (Gemede *et al*., 2016) [24]. Despite soybeans currently serving as the main plant protein source, okra has a unique flavour, excellent protein efficiency, and the potential to replace plant protein in a sustainable way (Rao *et al*., 1985) [56].

Vitamins, essential organic compounds vital for maintaining bodily health (Kendell *et al*., 2004) [34], play a vital role in metabolism, growth, development, and overall health (Cook *et al*., 2000) [16]. Prolonged vitamin inadequacy can lead to physiological complications and certain illnesses (Liu *et al*., 2018) [40]. Vitamins A and C, which are vital to human health, are abundant in okra. One hundred grammes of okra pods provide around twenty percent of the daily needed vitamin C intake. Additionally, okra serves as a excellent reservoir of minerals such as Fe and Zn. It is also a rich source of dietary fiber and zinc, crucial for the human immune system. Upon contact with water, dietary fiber swells to form a viscous gel. When combined with chyme, this gel increases the viscosity of food in the stomach, slows gastric emptying, aids in portion control, and contributes to managing blood sugar levels and achieving weight loss.

Table 1: Nutritional importance of okra

Nutritional factors	Quantity
Energy (Kcal)	31
Moisture (g)	90
Protein (g)	2
Fat (g)	0
Mineral (g)	1
Carbohydrate (g)	6
Fibre (g)	1
Calcium (mg)	66
Phosphorius (mg)	56
Iron (mg)	0

Source: Gopalan. C, Rama Sastri B.V. and Balasubramanian, S.C., 2007 [75], Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad

Nutritional and functional characteristics of lady's finger seeds

The essential oil of okra, as reported by Whistler *et al.* in 1954, is composed of cyclohexanol, citral, p-tolualdehyde (found in fruits), a-terpenylacetate (found in seeds), and aliphatic alcohols. Furthermore, β-sitosterol and its 3-β-galactoside are present in the nonvolatile neutral portion (in seeds). After being cooked or mashed into a meal for baking, the seeds can be used to make tempeh or tofu (Ameena *et al*., 2010) [8]. Moreover, coffee can be replaced with the roasted okra seeds. The oil content in the seeds can reach up to 22%, and on a limited basis, okra seeds are used for formation of oil. Depending on the extraction technique, the oil content may vary between 20% and 40%, with linoleic acid constituting the majority (up to 47.4%) of the oil (Savello *et al*., 1980; Andras *et al*., 2005) [61, 81]. Lady finger seeds are filled in hyperoside/hyperin flavonoid glycoside, scopoletin, coumarin, and uric acid. They possess antispasmodic properties that are beneficial for the digestive system. Greek okra seeds have the potential to serve as a high fatty acid oil source, with extraction techniques yielding a range between 20% and 40% (Sorapong, 2012; MEF, 2013) [66, 82].

The protein content in okra seeds makes them a prominent plant-based protein source. Okra seed protein has a higher PER content than soybean seed protein and a similar amino acid profile (Adetuyi *et al*., 2012; Ndangui *et al*., 2010) [83, 45]. Okra seeds are well-recognized for their superior content of protein and indispensable amino acids making them a valuable addition to human nutrition (Farinde *et al*., 2007) [84]. Moreover, the seeds primarily consist of oligomeric catechins and flavonol derivatives, contributing to their dietary significance (Arapitsas, 2008) [11]. Okra seeds are associated with stimulant, pleasant, and antispasmodic properties, as well as having sudorific effects when infused with roasted seeds. They have been used in the treatment of spermatorrhoea and for tumor treatments and Type 2 diabetes. The dried seeds can be used to produce nutrient-rich substances such as vegetable curds or as a coffee substitute (Moekchantuk& Kumar, 2004) [85]. Furthermore, the oil content of okra seeds is similar to that of other oilseed crops, with the exception of oil palm and soybean, and its oil has been shown to have a hypocholesterolemic effect (Sanjeet *et al*., 2010) [86]. Overall, okra seeds possess significant potential as supplier of edible oil, premium protein, and nutrient-rich compound, rendering them appropriate for widespread cultivation and utilization in the food and oil industry.

Okra Roots

The roots, young pods, skin, and leaves contain mucilage with demulcent properties, suitable for replacing plasma. This characteristic, particularly potent in the roots, is used in treating syphilis through root infusion. The topical application of root juice is an established remedy for curing boils, wounds, and various dermal conditions in Nepal. Additionally, root juice serves as a treatment for ailments such as diabetes, ulcers, and jaundice, and is utilized as a stomachic and laxative (Romdhane *et al*., 2020) [58].

Table 2: Summary of medicinal properties of okra

Sl. No.	Medicinal uses / properties	Possible action	References
1.	Diabetes	▪ Peel and seed : lower blood glucose levels by more insulin and less conversion of carbohydrates to glucose ▪ Mimic the effects of insulin; and effectively regulate blood sugar and slows down the intestinal absorption of sugar.	Ilodibia *et al.*, 2017 [29] Omoniyi *et al.*, 2021 [48] Hussain *et al.*, 2012 [28]
2.	Lowers bad cholesterol	▪ Okra's pectin fibre type influences how cholesterol is imbibed , resulting in reduced levels in the body as compared to a control group. ▪ Reduces harmful cholesterol levels; promotes cholesterol breakdown and discourage fat formation within the body. ▪ Reduce overall cholesterol and triglycerides and promotes the elimination of bile acids (which are formed of cholesterol) in the excrement by altering bile production in the intestines.	Vieira *et al.*, 2018 [68] Deng *et al.*,2020 [18]
3.	Gut Bacteria friendly	▪ Probiotics present in okra are beneficial to the digestive flora; okra is known by the microbiome (Probiotic colony) in the Gastrointestinal tract, which manufacture of the B complex; performs similar effect on the small intestine as yoghurt does	Chaemsawang *et al.*, 2019 [14]
4.	Lowering cholesterol; avoids	▪ Fiber of okra is useful for lowering cholesterol and regulating blood sugar; removal of waste from the small intestine, and avoids constipation	Adetuyi *et al.*, 2011 [4]

	constipation		
5.	Lowers risk of colon cancer.	▪ Digestive tract cleanser in intestines, due to its high insoluble fibre content.	
6.	Boosts the immune system	▪ Strengthens the immune system and guards against cell mutations by antioxidants present in okra ▪ Vitamin C and several antioxidants present in okra strengthen the immune system ▪ Calcium, iron, manganese, and magnesium present in okra helps in battling and removing free radicals	Dhruve *et al.*, 2015 [19] Durazzo *et al.*, 2019 [21] Dos Santos *et al.*, 2013 [20]
7.	Pregnancy benefits	▪ Provides retinol, thiamine, riboflavin, Pyridoxine and ascorbic acid; as well as traces of zinc and calcium and also contains folic acid and fiber supplements. ▪ It facilitates the development of the fetal neural tubes, shields them from damage, and mitigates the risk of abnormalities. Additionally, it serves to alleviate constipation during pregnancy and reduce the likelihood of birth defects such as spina bifida.	Falade *et al.*, 2010 [23]
8.	Obesity prevention	▪ Okra consumption can help prevent gaining of weight and ultimately obesity when combined with appropriate eating practises and lifestyle choices. It contains hardly any calories. Additionally, the high fibre content promotes fullness without excessive eating.	Habtamu *et al.*, 2018 [27] Islam *et al.*, 2019 [30]
9.	Genital disorder solutions	▪ It is helpful in curing gonorrhoea, lues, menorrhagia, leucorrhoea, and painful or uncomfortable urination; Improve sexual health and fertility, and it is advantageous to both men and women	Islam *et al.*, 2018 [31]
10.	Liver detoxification	▪ Its slimy substance includes compounds that attach to bile acids and cholesterol, aiding in detoxification of hepatic organ. A strong antioxidant protein molecule- Glutathione that the body naturally produces, is found in okra, and it wards off from the negative effects of bacteria and germs	Jideani *et al.*, 2009 [33] Navarro-González *et al.*, 2015 [44]
11.	Skin cleansing	▪ Vitamin C helps with bodily tissue repair, avoiding skin pigmentation, lowering acne, psoriasis, and other skin disorders, while fibre aids in the removal of harmful waste.	Ndangui *et al.*, 2010 [45]
12.	Makes hair healthy	▪ Okra is an excellent as a hair conditioner. It prevents itchy scalps, gets rid of lice and dandruff, moisturises the scalp well, and makes hair lustrous	Ogungbenle *et al.*, 2015 [46]
13.	Bone health	▪ Okra is packed with phylloquinone, vital nutrient for blood coagulation, osteoporosis prevention, and bone density restoration. Vitamin K plays a pivotal role in calcium balance related to bone metabolism, and facilitates the gamma-carboxylation of osteocalcin, a protein critical for bone mineralization.	Olivera *et al.*, 2012 Oyeyemi *et. al.*, 2017 [47]
14.	Cold and flu treatment	▪ Leaves and blossoms after boiling are effective alternative and all-natural remedy for bronchitis and pneumonia.	Raimi *et al.*, 2014 [54]
15.	Asthma	▪ High vitamin C concentration and powerful anti-inflammatory and antioxidant qualities of okra aid in preventing the development of asthma	Reddy *et al.*,1999 [57]
16.	Prevention of anaemia	▪ Vitamin K, iron, and folate levels of okra aid in the creation of red blood cells and haemoglobin; and also help the blood to clot.	Roy *et al.*, 2014 [59]
17.	Ulcer	▪ Slimy, mucilaginous material in okra is alkaline and it hastens the recovery of peptic ulcers.	Sengkhamparn *et al.*, 2009 [63]
18.	Constipation	▪ Mucilaginous, slimy substance has inherent laxative properties that aids in proper water absorption along the digestive tract. Fibre and mucilaginous substances bind the toxins and lubricate the big intestine. It aids in simple, regular bowel movement and it relieves and prevents constipation.	Sengkhamparn *et al.*, 2010 [62]
19.	Sun strokes	▪ Okra is a natural coolant and prevent sunstrokes.	Sindhu *et al.*, 2016 [64]
20.	Maintain healthy blood vessels	▪ Okra contains both flavonoids and vitamin C, they are good for blood capillaries	Emmanuel *et al.*, 2014 [22]
21.	Eye sight	▪ Okra is rich in lutein, xanthin, and beta-carotenes, which are all antioxidants that protect against glaucoma and cataract development	Gosslau and Chen (2004) [90]
22.	Performance in studies	▪ Flavonoid content (quercetin) has a neuroprotective impact and it improves learning and memory.	Habtamu *et al.*, 2014 [26]

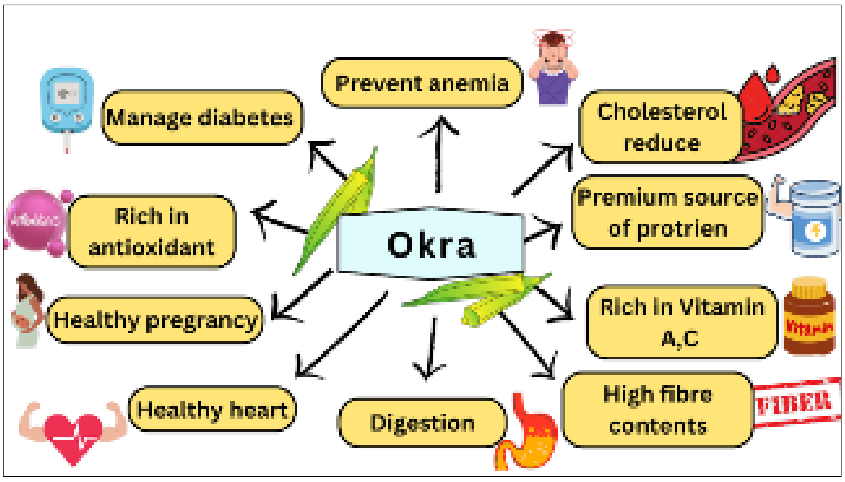

Fig 1: Pictorial representation of the health benefits of consuming okra

Table 3: Pharmacological properties of okra

Sl. No.	Functions	Properties	References
1.	Anti-oxidant activity	▪ Okra flowers, fruits and seeds contain various phenolics and flavanoids like Procycanidin B1. Procycanidin B2, epicatechin, rutin and catechin, which have scavenging and antioxidant activities and prevent cellular damages	Lengsfeld *et al.*, 2004 [37] Sorapong *et al.*, 2012 [66] Messing *et al.*, 2014 [41]
2.	Glucose regulating and Cholesterol-lowering effect	▪ Okra seeds are purported to possess the capacity to control elevated blood glucose concentrations in the realm of traditional medicine. Okra's polysaccharides are known to sequester bile acids, causing decrease in blood cholesterol amount and a probable deterrent against cancer. These properties suggest a potential benefit in the cure of diabetes mellitus. Furthermore, okra obstructs cholesterol absorption, thereby diminishing the presence of lipids and fats in the bloodstream (Rakesh *et al*., 2016) [55].	Adetuyi *et al.*, 2011 [4] Aminigo *et al.*, 2004 [9] Poorva *et al.*, 2017 [53]
3.	Dysentery and stomach inflammations and irritations	▪ Mucilaginous food like okra is effective in the management of inflammatory illnesses and stomach irritations, mucilage composition completely develops in the fruit's fresh juice; . ▪ In Asian medicine, okra mucilage serves as a crucial dietary addition to prevent irritative and inflammatory gastrointestinal disorders.	Liao *et al.*, 2012 [38] Adelakun *et al.*, 2009 [12] Lengsfelf *et al.*, 2004 [37]
4.	Antibacterial activity	▪ The polysaccharides obtained from the fresh juice exhibited potent inhibitory effects. Okra juice shown a high degree of efficacy in preventing bacterial adhesion to the gastrointestinal mucosa.	Muhammad *et al.*, 2014 [43] Acikgoz *et al.*, 2016 [1]
5.	Applications in drug delivery	▪ Gum of okra prolongs the release of 1-(Isopropylamino)- 3-(1 naphthyloxy)-2-propanol hydrochloride in a solid oral dose form. Okra gum is a good tablet binder or film coating agent as indicated from many research reports	Anupam *et al.*, 2014 [10] Jarret *et al.*, 2011 [32] Costantino *et al.*, 2004 [17]; Islam *et al.*, 2019 [30]; Savello *et al.*, 1980 [61]; Tomoda *et al.*, 1989 [67].

Table 4: Pharmaceutical use of Okra Mucilage

Sl. No.	Properties	Functions	References
1.	Binding property	▪ Even at lesser concentrations (4% w/v), the mucilage isolated from okra can function as a suspending medium and is not toxic. Additionally, it has the potential to serve as a pharmacological adjuvant. Mucilage serves as a stabilizer and thickening ingredient in cosmetic, pharmaceutical, and food industries. It can serve as a binder for tablets, an extender for serum albumin, and a suspending agent.	Saha *et al.*, 2011 Zhang *et al.*, 2014 [73] Zhang *et al.*, 2018 [74] BeMiller *et al.*,1993 [89] Ofoefule *et al.*, 2001 [87] Kumar *et al.*, 2009 [88]
2.	Muco adhesive gel for nasal applications	▪ Okra gel was comparable to gels made with artificial macromolecules showing that organic mucilage is appropriate for olfactory gel compositions. This naturally occurring polymeric gel has excellent muco adhesion and penetration characteristics due to its bio degradability and possibly minimal toxicity.	Soma *et al.*, 2019 [65] Geng *et al.*, 2015 [25] Messing *et al.*, 2014 [41]
3.	Antioxidant Properties of Raw and Dehydrated Okra	▪ Regardless of whether the okra seeds were fresh or desiccated, they exhibited higher levels of DPPH scavenging activity, reducing power, total phenolic content, and FRAP activity compared to the pods. Additionally, the functional properties of okra gum indicate that it serves as an effective substitute.	Wang *et al.*, 2013 [70]
4.	Film coating potential of okra gum utilizing paracetamol pills	▪ Okra mucilage-containing formulations with HPMC produced superior medication sustained release and floating properties, while formulations including HPMC showed greater prolonged release of the medication yet had a better floating capability, formulations adding okra mucilage showed poor sustained release.	Alamri *et al.*, 2013 [5] Chen *et al.*, 2014 [15]

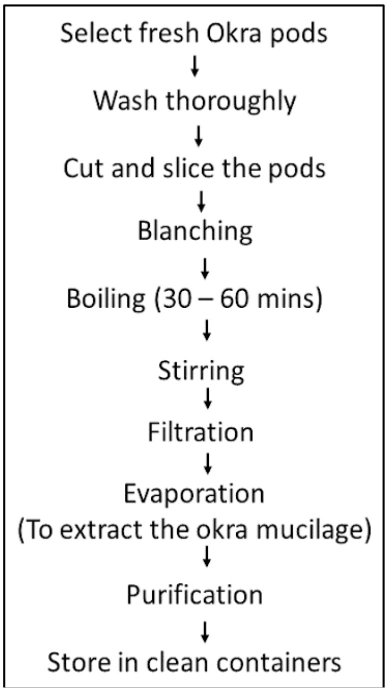

Fig 2: Flowchart of the extraction of the okra mucilage.

Conclusion

Lady's finger (*Abelmoschus esculentus*), a popular vegetable, is well known for its considerable nutritional content. Rich in retinol, tocopherol , and ascorbic acid, as well as microminerals such as iodine, Ni, Fe, Zn it also boasts important minerals like sodium, potassium, magnesium, and calcium. The phenolic compounds, flavonoids, and catechins found in okra seeds give them antioxidant and cell-repair capabilities. Notably, the fruits and seeds are a major provider of raw dietary fiber and essential nutrients, including elevated levels of protein, carbohydrates, dietary fiber, vitamins, oil, and minerals. The phenolic components of okra have demonstrated various bodily functions and biological processes, including antibacterial, antioxidant, and inflammation reducing effects. This can be attributed to phenolic chemicals, carotenoids, vitamins, tocopherols, and minerals which confer biological attributes, including anti-diabetic properties. Across several traditional medicinal practices, okra is utilized as a diuretic, antiulcerogenic, and gastroprotective agent. Furthermore, the dense, greasy polysaccharides present in pods of okra have multiple applications, such as thickening stews and soups or substituting for egg whites in chocolate bar cookies. Okra has shown effectiveness in lowering blood sugar levels, aiding in diabetes management and offering protection against degenerative illnesses caused by long-term free radical damage. Additionally, it is known to aid in skin and hair rejuvenation, manage cholesterol levels, and normalize blood sugar, yielding benefits for individuals with asthma. Studies illustrate the nutritional and pharmaceutical significance of okra and its contribution to improved health and nutrition. It serves as a budget-friendly source of essential nutrients, including carbohydrates, fatty acids minerals, vitamins, protein, and dietary fiber, therefore promoting good health. Although our knowledge about how the edible parts of okra contribute to disease prevention and their mechanisms of action is still limited, scientific research has provided proof supporting the potential positive impacts of okra components in reducing the hazard of numerous persistent illnesses. This is due to the complex etiology of diseases and the multitude of variables influencing their incidence. As such, it is imperative that scientists keep clarifying the mechanisms underlying disease prevention and deepening our knowledge of the physiological interactions of foods high in bioactive compounds, such as okra.

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