Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
Impact Factor (RJIF): 6.35
www.phytojournal.com
JPP 2025; 14(5): 108-112
Received: 10-06-2025
Accepted: 12-07-2025

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Pineapple as health healing medicine

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DOI: https://www.doi.org/10.22271/phyto.2025.v14.i5b.15559

Abstract
Ananas comosus (L.) merr is tropical fruit which is native to South America. It is still practices as traditional medicine by various cultures. Its therapeutic nature is mainly due to the high content of an enzyme complex called Bromelain as well as numerous amounts of vitamins, minerals and antioxidants. Beyond the health benefits of pineapple, it also takes part as a vital role in supporting sustainable farming and protection of environment. It has been used for its natural healing properties. It has been used in many cultures as traditional medicine practices since the time immemorial across countries including Asia, Africa and South America. Traditional herbal practices of pineapple have been cultured also in Manipur. It is valued for its natural curing properties. Growing pineapple is also one of the environmental protection acts since practices of sustainable farming implies to protect the environment. Today, pineapple plays an important role in the economy of many countries in the world which provides employment and has high growing revenues among the pineapple producing countries. This paper highlights the nutraceutical properties of pineapple and emphasizes the importance of pineapple in maintaining healthy fits.

Keywords: Pineapple, therapeutics, bromelain, nutrition

Introduction
Native to South America, the pineapple is known for its unique aroma, sweet taste and has also packed with nutrients. *Ananas comosus* (L.) merr is more than a tropical fruit, it holds a symbol of health and well being. The distinctive look of pineapple describes the spiky skin and topped with green crown. The fruit flesh has juicy, golden yellow and slightly crunchy texture with sweet flavor. It has high content of water or moisture and low in calories. It supports the immune system due to rich content of vitamin C. As Pineapple has high antioxidant properties, it also helps in fighting oxidative stress. It is considered as healthy and refreshing diets because it contains a protease enzyme called bromelain which also helps in reducing inflammation. Beyond the health benefits of pineapple, it also takes part as a vital role in supporting sustainable farming and protection of environment. Growing pineapple is also one of the environmental protection acts since practices of sustainable farming implies to protect the environment. Today, pineapple plays an important role in the economy of many countries in the world which provides employment and has high growing revenues among the pineapple producing countries.

Materials and methods
Sample preparation
The fresh pineapple fruits were bought from the local market and the collected pineapple fruits were washed with water and placed in air shed area. The samples that the parts of pineapple like peel, core, stalk, crown and leaves were separated. Then the samples were cut into small pieces and ready to evaluate the following methods:

Methods
For the method of moisture content in pineapple, aluminum foil, desiccator and digital weighing balance were used. The determination of moisture content in pineapple sample includes a known weight of pineapple is first taken and then dried the sample. Finally the weight loss in the sample was measured to calculate the moisture content.
For the method of ash content, the pineapple samples were prepared. It was finely ground and dried thoroughly heated to remove moisture content. A crucible is pre-heated in a muffle furnace. Then the heated samples were then ashed in muffle furnace at 500-600ºC and cooled in desiccators and the weighed in digital weighing balance.

1. Moisture Content

The percentage of water or moisture content in the pineapple sample was determined by drying the sample to a constant weight. The moisture content in the sample is expressed in the form of percentage. It is calculated using the formula equation:

$$W\ \% = \frac{(A-B)}{B} \times 100$$

Where, W % = Percentage of moisture content in the sample,
A = Weight of wet sample,
B = Weight of dry sample

2. Ash Content

The ash content is to determine the remains of inorganic matter when the organic matter burned off. The ash content in the sample is expressed in the form of percentage.

It is calculated using the formula equation:

$$\text{Ash content } (\%) = \frac{A}{B} \times 100$$

Where, A= weight of ash
B = weight of sample

Statistical Analysis

The experimental data were expressed as mean ± Standard Deviation which were analyzed through Microsoft Excel (2010).

Results

As pineapple has high nutrients and antioxidant properties, it has been utilized for a long period of time as traditional medicine. Different parts of pineapple such as peel, pulp, leaves, core, etc were utilized for various therapeutic purposes. Due to its high water content and natural sugar, it is consumed for energy boosting mechanism and hydrating our body. From early periods, people consumed pineapple fruit as a daily food source during summer season because of its long shelf life even after harvest.

Moisture Content

Pineapple contains high amount of moisture which helps in the hydration of human body. With more than 85% of water content, it is a good source of hydration. Apart from the pineapple flesh, pineapple wastes also contain enormous amount of moisture which may vary according to different parts of pineapple.

Table 1: Moisture content in pineapple (%)

Crown - 77.5% ±0.02
Peel - 82.3% ±0.04
Core - 84.5% ±0.16
Stalk - 79.3% ±0.02
Leaves - 82% ±0.02

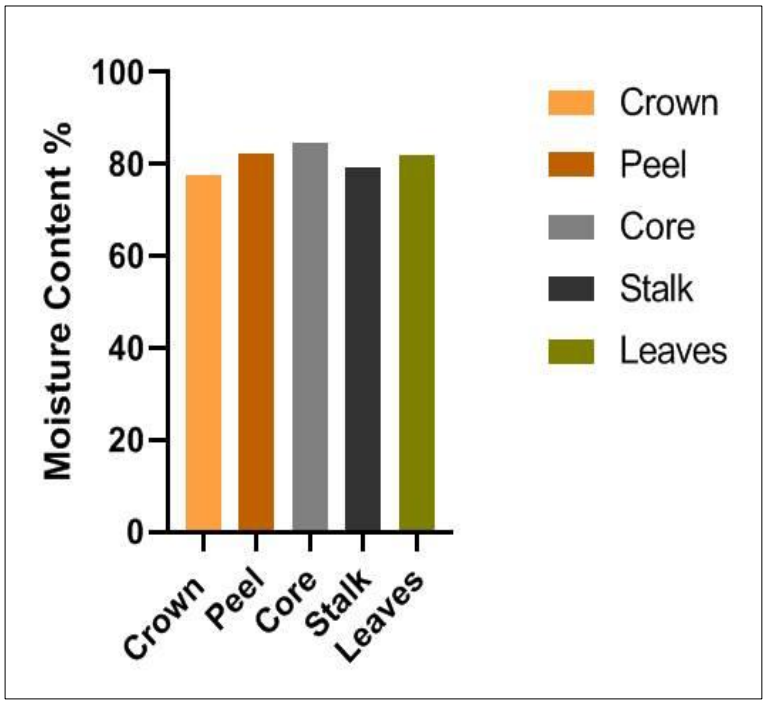

Fig 1: Moisture content %

Ash Content: The ash content in pineapple refers to the measurement of amount of inorganic, non-combustible mineral content. After the completely burned of the samples, the residues contained oxides of the inorganic elements present in the pineapple sample. Parts of pineapple like crown, peel core, stalk and leaves were taken separately and the ash content in these parts was observed.

Table 2: Ash content in Pineapple (%)

Crown - 1.05±0.02
Peel - 7.32±0.04
Core - 8.02±0.12
Stalk - 1.24±0.04
Leaves - 1.46±0.05

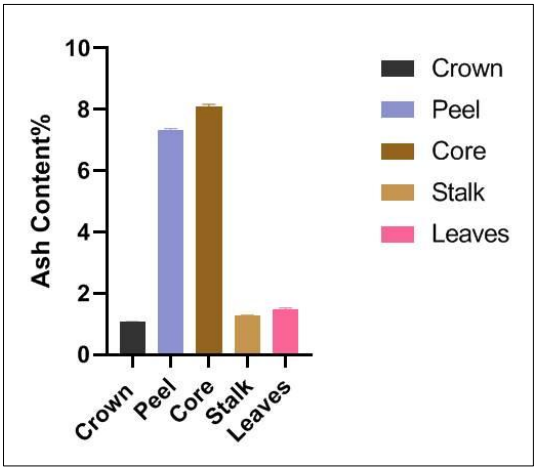

Fig 2: Ash content Ash content

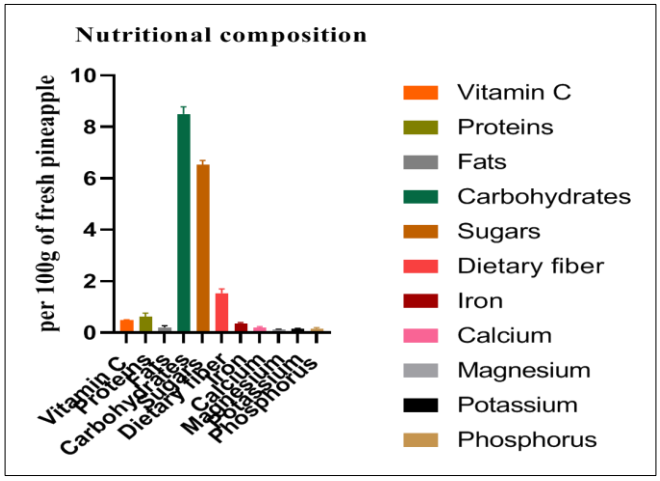

Fig 3: Nutritional composition

The ash content in pineapple was expressed in terms of percentage. However different varieties of pineapple can show different ash content. Low ash content in pineapple indicates the presence of nutritive, organic materials which has the quality and value- added nutrition content in the fruit. Higher the ash contents, more is the non-nutritive and inorganic material content which affect the overall nutritional value.

Table 3: Nutritional composition of Pineapple

Sl. No.	Parameters	Per 100g of fresh pineapple
1	Vitamin C	0.0478±0.002g
2	Proteins	0.52±0.2g
3	Fats	0.15±0.1 g
4	Carbohydrates	8.6±0.1g
5	Sugars (fructose, sucrose and glucose)	6.4±0.2 g
6	Dietary fiber	1.41±0.02 g
7	Iron	0.30±0.01 g
8	Calcium	0.016±0.002g
9	Magnesium	0.013±0.002g
10	Potassium	0.155±0.003g
11	Phosphorus	0.012±0.002g

Pineapple has high source of vitamin C which has approximately 47.8mg that is about 80% of daily needs of vitamin C. Apart from vitamin C, it also contains vitamin A, vitamin B1, B6 and B9. Minerals like manganese, potassium, calcium and iron are present. Since pineapple has high content of manganese, it plays a vital role in bone formation and supports bone health. Pineapple contains ascorbic acid which is a good source of Vitamin C. It supports immune function and iron absorption. Collagen synthesis is one of its function which helps in maintaining youth and healthy skin. About 30-55 mg of ascorbic acid is present in 100g of pineapple. Vitamin C content in pineapple generally helps in increasing the ripeness of its fruit. However prolonged exposure to heat and light may degrade the ascorbic acid content in pineapple.

Medicinal Value

For a good health and hygiene, Pineapple can be used as nutritional as well as supplementary fruit. It has a significant nutraceutical properties due to its high content of bioactive compounds that encounter numerous health problems. Pineapple is also considers as valuable and functional fruit in promoting good health and prevent diseases.

Table 4: Healing properties of pineapple and its functions

Sl. No	Healing properties of pineapple	Function
1	Respiratory Issues:	Due to its mucolytic and soothing effects, boiled pineapple peel with water and its decoction helps to relief coughs and sore throats.
2	Maintain body temperature	Pineapple is considered as cooling fruit. People consume ripe pineapple to lower body temperature and helps in rehydration.
3	Digestive Aid	A protease enzyme called Bromelain is present in pineapple. It helps in digestion and prevents from bloating and constipation.
4	Anti-inflammatory properties	It helps in reducing swelling, inflammation and bruising due to the presence of Bromelain enzyme.
5	Antioxidant Properties	Due to its rich source of vitamins, enzymes and phenolic compounds, it has high content of antioxidant properties. It helps in fighting free radicals and protects against chronic health diseases like cardiovascular diseases. It supports immune health and reduces inflammation.
6	Immunity booster	The high content of vitamin C in pineapple boosts the function of immune system in our body. It helps in fighting body infection, oxidative stress and faster recovery.
7	Women's health	It helps in easing menstrual cramps and discomfort menstruation. It also promotes blood circulation. It helps with indigestion, bloating and maintain healthy gut during the period of women in experiencing hormonal changes.
8	Reproductive health	The Bromelain enzyme may help in uterine lining improvement which is potentially supports fertility of women. Due to its potential uterine-stimulating properties, traditional healers prefer pineapple to stimulate blood flow and menstruation and also to have regular menstrual periods.
9	Anti-aging properties and wound healing	Pineapple helps in producing collagen due to the presence of high amount of Vitamin C. It helps in promoting healthy skin and increases the healing rates and wounds healing from skin issues, cuts, burns and even skin ulcers.
10	De-worming agent	Pineapple exhibits natural de-worming properties due to the presence of Bromelain enzyme. It helps in stimulating digestion and intestinal movement which affects intestinal parasites and expels it from the gastrointestinal tract.

Pineapple is renowned for its numerous healing properties due to its high content of nutrients and enzymes. Bromelain is one of the major enzymes in terms of therapeutic benefits. It is a powerful enzyme that reduces inflammation and supports digestion which digests proteins. Due to the rich source of vitamin C, pineapple helps in boosting immune system and promotes collagen production which has anti-ageing properties and also increases wound healing in case of cellular body damage. It contains manganese which supports bone health and strengthening its metabolic function. With its natural healing properties and immune-boosting qualities, pineapple serves as a nutrient addition to our overall health and also for recovery processes.

Conclusion

Pineapple is more than just fruit, it is a source of health healing medicine and also a symbol of culture, tradition and harmony which represents warm hospitality and friendship. It holds a major benefits both nutritionally and economically to human. Pineapple contributes essential nutrients like antioxidants, vitamin C, manganese and dietary fiber which are the healing properties. These health benefits make pineapple a nutrient rich and a highly valuable fruit. It is mainly consumed for its value addition to our balanced diet and also acts as natural remedy for health and beauty. From promoting health and well-being of human to supporting livelihood, pineapple is truly an important fruit. Pineapple stands out not only as nutritional fruit, but also as environment friendship and innovation in sustainable development. Its ethnobotanical importance reflects how pineapple can impact health, environment, culture and economy which show a deep connection between pineapple and the surroundings. Apart from its nutritional profile, pineapple plays a significant role in agriculture sector and enhances the economy of many countries. The major pineapple exporting countries are Costa Rica, Philippines, Thailand and many other countries which provide opportunities in employment and income for thousands of farmers. The global demand for pineapple highlights the economic relevance in trade internationally. As the conservation of biodiversity grows, pineapple sets an example of nature's beauty and innovations.

Conflicts of Interest

Authors have no conflict of interest.

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