Anti-Diabetic Ayurvedic Fruit -Noni

Noni Which Helps Mankind

Amareshwar Karatagi [1]
School of Electronics and Communication
REVA University
Bangalore, India

Priyanka Karatagi[2]
MSc in Bio.Technology, PGD in CR & PHV
KSOU, Sysplex Bio & Clinical Solutions
Bangalore, India

Vasudha.R[3]
B.com
Bangalore, India

Abstract*—Morinda citrifolia which is commercially familiar with the name of noni, commonly found in Polynesia and utilizes more than 2000 years. Morinda. citrifolia is a teeny bushy tree 6cmn tall which grows fruit with yellow and it belongs to the coffee family of Rubiaceae. noni has its own therapeutic and nutritional values. Noni is also used in the preparation of chemical reagents, dyes, and preservatives. Noni has a very effective healing power to heal a cold, flu, and high blood pressure. Noni is used in the manufacturing of cosmetics. noni also has its application in the cooking field like in the preparation of jam, jellies, sauce, and curries. Noni has its curing benefits like anti-inflammatory, anti-bacterial, anti-tumor, anti-viral, and also in the reduction of cholesterol. The root of a noni plant can be used in the curing of swelling. Every part of noni is very effectively used in the field of medicine. Noni leaves have a strong antidiabetic and effective antioxidant. noni is mainly used in the treatment of Diabetes mellitus commonly known as Diabetes. The commonly seen 3 types of diabetes are type 1, type 2, and Gestational diabetes. noni is very effectively used in the treatment of type 2 diabetes which is a lifetime disease, cells fail to respond to insulin [insulin resistance].In this paper, we are going to analyze the phytochemical properties and antidiabetic activity of the noni fruit, leaf, and leaves that are available in the market. The main objective is a quantitative analysis of phytochemical compounds present in noni. fruit and juice which is available in the local market. The methods and materials used are collection and extraction of the noni fruit, leaves, and juice; the phytochemical components are found by phytochemical screening c done by Nweze et.al [2004]and Senthilkumar and Reetha[2009]. The anti dietary assay was also carried out by 2 tests namely [1]inhibition assay of alpha-amylase [2]Glucose diffusion assay. Noni[Morinda citrifolia] can be implemented as a healthy daily supplement that offers various benefits. Noni is also recommended for diabetic patients for treatment.

Keywords—Noni: Morinda citrifolia, diabetes, medicinal plant, antioxidant, photochemical

I. INTRODUCTION

Noni is scientifically known as morinda citrifolia; it is found in the pacific island, Australia, the southeast, and India and absorbed over 2000 years.m.citrifolia is a yellow fruit-bearing plant with a height of 6m.[1]. Marinda citrifolia belongs to the coffee family rubiaceae[nelson,2006]. Each part of Morinda citrifolia has its beneficial value for mankind. especially the fruit of noni has nutritional and healing morals, noni is also used in industries as natural preservatives, chemical reagents [2]. In olden dyes, noni was used to make some dyes, for example, red and yellow. Noni fruits are abundantly used in the preparation of juice for diabetics and also curing flu, cold, high blood pressure, fear, and sadness. not only the fruit of a noni plant the timber is used in the building light constructions. cosmetics are also made from the leaves and fruit of the noni. Noni is also used in the treatment of burns, anti-aging, stomach ulcers, stroke, and indigestion. noni helps in the preparation of jam, sauces, and curries.

II. LITERATURE SURVEY

In an authoritative CRC guide, James Duke reported 23 distinct phytochemicals present in Noni, as well as 5 vitamins and 3 minerals.[3]

When Polynesians came from Southeast Asia 2000 years ago, they are said to have taken numerous plants with them as food and medicine[4].

Noni was the second most popular plant utilized in herbal medicines to cure many common ailments and maintain general good health, out of the 12 most common medicinal plants they brought.[5]

Noni, also known as Indian Mulberry, Ba Ji Tian, Nono, or Nono, is the popular name for Morinda citrifolia L. In many civilizations, Nonu, Cheese Fruit, and Nhau are used. All around the globe, It's been said that it has a wide variety of health advantages for cancer, infection, and other diseases Arthritis, diabetes, asthma, hypertension, and pain are all conditions that affect people.[6]

The Polynesians used the whole Noni plant for medical purposes and as a dye for some of thei
r traditional clothing. The roots, stems, bark, leaves, flowers, and other parts of the plant. The fruits of the Noni plant are used in almost 40 herbal treatments that are recognized and documented.[7]

The roots were also used to make a yellow or red dye for tapa textiles and fala (mats), and the fruit was consumed for health and nutrition. Noni was utilized by many heroes and heroines in Polynesian legends to help them escape hunger.

There is a legend about Kamapua'a, the pig deity, who fell in love with Pele, the volcano goddess."I have seen the woman gathering Noni/scratching Noni/pounding Noni," he teased Pele. According to legend, the song alluded to Pele's eyes becoming by the application of Noni leaves to his body.[8]

The fruit of the Morinda citrifolia has a long history of usage as a meal in tropical places all over the world. Written evidence of this fruit's use as a food source dates back to before the nineteenth century. The fruit was consumed in Tahiti, according to Captain James Cook of the British Navy in crimson, and she got so enraged that she fought him. According to a Tongan legend, the deity Maui was brought back to life in the late 1700s [9].

III. METHODOLOGY

Noni a well-known Indian mulberry or Indian noni. The scientific name of the noni is Morinda Citrifolia found in Polynesians. It is an evergreen shrub that bears fruits and flowers for a whole year.M.citrifolia belongs to the coffee family Rubiaceae. Each part of noni is very essential .M.citrifolia is a folk remedy for many diseases. Fruit of noni has very many essential therapeutic values like antiviral,anti-bacterial, anti-tumor, anti-inflammatory, reducing the cholesterol level from the extraction of noni plant root swelling can be reduced. The leaves of the noni have strong antidiabetic and a very strong antioxidant activity. leaves are directly applied to the wounds for better healing. In the noni plant, about 160 phytochemical compounds are found. Diabetes is also known as diabetes mellitus which is relevant to chronic metabolic disorder. .most commonly can see 3 types of diabetics

- Type 1 diabetes.
- Type 2 diabetes.
- Gestational diabetes.

A. Fig:01, Noni Fruit

In type 2 diabetes the cells fail to respond to insulin (insulin resistance does not produce insulin).so the receptor present on the layer of the muscles and the liver will reduce their capacity to respond to the glucose. In this case, noni extraction is very useful to treat type 2 diabetes

1. AIM

To analyze the physicochemical properties and anti-diabetic activity of M.citrifolia leaf and fruit and extract in commercially available noni juice.

2. OBJECTIVE

To study the antidiabetic activities in the extraction of noni fruit, leaf, and juice

To study the qualitative analysis of phytochemicals present in commercial noni fruit and juice extract.

3. MATERIALS AND METHODS

II. Collection of noni fruit

The fresh fruits are collected from plants and washed with distilled water, wiped, and stored in a closed container. squeeze the fruit and collect the extract and use it as a sample.

III. Collection of commercial noni juice

The commercially available fruit juice of noni from the market

IV. Processing of leaf samples

The fresh leaves were collected and washed with normal tap water and rinsed with distilled water. The washed plant material was shade dried and crushed into a mechanical blender. powdered plant material is used for aqueous, chloroform, ethanol, and acetone extracts.

V. Preparations of leaf extracts

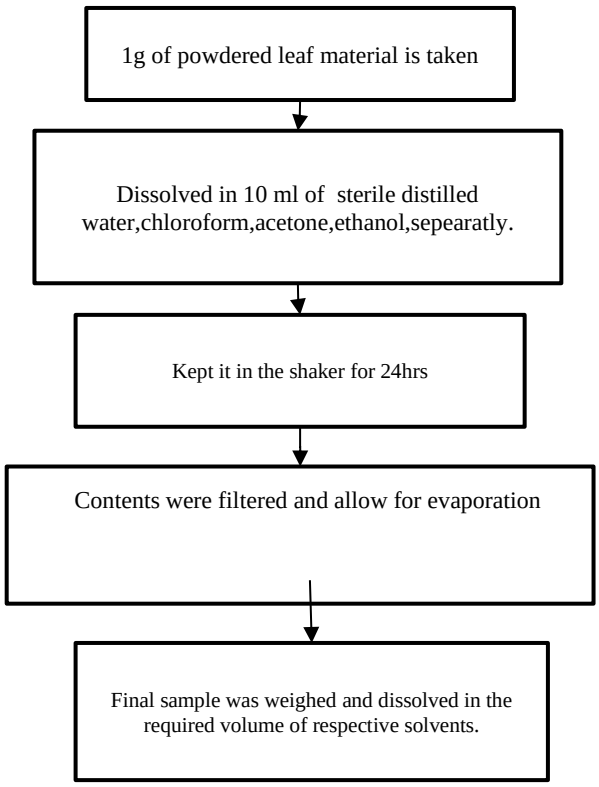

Fig:02 flow chart of preparation of leaf extracts

1 gram of powdered leaf material was dissolved in 10ml of sterile distilled water, chloroform, acetone, ethanol separately and kept in the shaker for 24 hours. The contents were filtered and allowed for evaporation.

The final sample was weighed and dissolved in the required volume of respective solvents.

VI.Screening For Phytochemical Constituents

The Phytochemical screening of the sample was carried out as described by Nweze *et al*.,(2004) and Senthilkumar and Reetha (2009).The samples(fruit flavonoids, Phyto steroids phytosterols and steroids, anthocyanin and betacyanin, phenols and tannins, saponins, glycosides, and proteins.

VII.ANTIDIABETIC ASSAY

The antidiabetic assay was carried out using the following tests

1. Inhibition assay for α-amylase activity
2. Glucose diffusion assay

VIII.DISCUSSION AND RESULTS

Phytochemical screening

The present study reveals that the noni fruit extracts contain carbohydrates, tannis, saponins, alkaloids, proteins, steroids, and phytosterols whereas commercial noni juice was found to contain only carbohydrates and tannin.

IV.ANTIDIABETIC ACTIVITY

Inhibition assay of alpha-amylase activity

The results of leaf extraction in different solvents showed variations in glucose utilization. The lower value of 13% enzyme activity was found in ethanol extract of leaf samples. At all concentrations, noni fruit extract showed maximum enzyme activity with the highest value of 84% at 1ml concentration of fruit extract.

Ethanol extract of noni leaf showed minimum enzyme activity compared to control and noni fruit extract at low concentrations. there was a dose-dependent increase in percentage activity of an α-amylase enzyme.

The ethanol extract of the plant exhibited low amylase activity(13%-68%) than control, noni fruit extract, and commercial noni juice.

> We suggest that you use a text box to insert a graphic (which is ideally a 300 dpi resolution TIFF or EPS file with all fonts embedded) because this method is somewhat more stable than directly inserting a picture.
>
> To have non-visible rules on your frame, use the MSWord "Format" pull-down menu, select Text Box > Colors and Lines to choose No Fill and No Line.

Acarbose as control shows (23%-77%) of α-amylase activity.

Hence the ethanol extract of noni leaf was found to have highα- amylase enzyme inhibition compared with other extracts of noni.

5. SUMMARY AND CONCLUSION

- The recent approval of noni fruit puree as a novel food ingredient, as well as the growing popularity of this fruit in health beverages, will greatly increase its use in foodstuffs and consequently, its consumption among the general population.
- The proximate nutritional, vitamin, mineral, and amino acid contents were determined. The processed noni fruit puree is a potential dietary source of vitamin C, vitamin A, niacin, manganese, and selenium. The major phytochemicals in the puree are iridoids, especially diacetyl asperuloside acid, which are present in higher concentrations than vitamin C (Brette *et al*., 2018).
- The present study analyzed the phytochemical constituents and antidiabetic activity of noni leaf extracts, noni fruit extract, and commercial noni juice.
- We found that the extracts of noni at minimum concentration could be exploited in the treatment of type 2 diabetes mellitus and can be used as a dietary source as they possess essential phytochemicals. Although the effects of *M.citrifolia* extract have been established in vitro, the results indicate that *M.citrifolia* has the potential to be used as a crude drug and a dietary health supplement.
- Further studies on antidiabetic activity have to be carried out to confirm the test results.

6. REFERENCE

[1] Edipo.S Almeida , Debora de oliveira and Dachamin Hortza on "Properties And Applications of Morinda Citrifolia [Noni]
[2] ReemAbou AssiaYusridaDarwisaIbrahim M.Abdulbaqi Arshad A.khanaLimVuanghaobM.H.LaghariaSchool of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Pulau Penang, Malaysia Integrative Medicine Cluster, Advanced Medical and Dental Institute, Universiti Sains Malaysia, Bertam 13200 Kepala Batas, Penang, Malaysia
[3] Duke JA. Handbook of phytochemicals. Boca Raton, FL: CRCPublishing; 1992.
[4] Tabrah FL, Eveleth BM. Evaluation of the effectiveness of ancient Hawaiian medicine. Hawaii Med J 1966; 25: 223-30
[5] Krauss B. Plants in Hawaiian culture. Honolulu: University of Hawaii Press; 1993. p103, p252.
[6] Whistler W. Tongan herbal medicine. Isle Botanica, Honolulu, Hawaii, 1992. p 89-90
[7] Bruggnecate JT. Native plants can heal your wounds. Honolulu Star-Bulletin Local News 1992 Feb 2.
[8] Neal M. Gardens of Hawaii. Honolulu, Hawaii: Bishop Museum Press; 1965. p 804.
[9] Cheeseman TF. The flora of rarotonga, the chief island of the cook group. v 6. London: Linnean Soc;1903. p 261-313