

RESEARCH JOURNAL OF AGRICULTURAL SCIENCES

AN INTERNATIONAL JOURNAL

Proceedings of the International Conference on

“Precision Nutrition and Health: Foresight Future of Disease Prediction and Prevention”

*Jointly Organizing by
The Research Centre of Home Science (Human Nutrition and Nutraceuticals), Fatima College,
Madurai, Tamil Nadu, India and Department and P. G. Department of Zoology
On
20th December 2022*

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Published by:

Center for Advanced Research in Agricultural Sciences
Bhat Complex, N/H 44, Awantipora - 192 122, Jammu and Kashmir, India
01933- 294741

Research Journal of Agricultural Sciences

Vol. 14(Special): 743 - 868 (June 2023)

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Standardization of *Vitex negundo* Leaves Powder Incorporated Food Products

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Abstract

Vitex negundo linn (*Verbenaceae*) is commonly known as five - leaved chaste tree or monk's pepper. It is most familiar in unani medicine. This plant is a small tree. Each part of the plant has discrete medicinal properties & phytochemical constituents. The powdered leaves of *Vitex negundo* were incorporated in five different products like rasam powder, dhal powder, tamarind rice powder, amchoor powder and kasuri methi. The products were prepared by grinding the necessary ingredients with the incorporation of *Vitex negundo* powder at a level of 3% and 3.5% respectively. The Organoleptic parameters like appearance, colour, taste, texture, flavor and overall acceptability of 3.5% of VNLIP secured highest scores than 3% of VNLIP (*Vitex Negundo* Leaves Incorporated Products). Nutrient analysis like moisture, carbohydrate, protein, fat, crude fibre, calcium, phosphorous, iron and vitamin-C were analyzed in control and 3.5% *Vitex negundo* powder products. The results revealed that the nutrients were high in 3.5% *Vitex negundo* powder incorporated products than control samples. The *Vitex negundo* incorporated products can be suggested generally for all age groups because they contain antioxidant, anti – inflammatory, anti – convulsant and especially these leaves of *Vitex negundo* contains an iridoid glycoside component called agnuside exposed the estrogen like activity.

Key words: *Vitex negundo*, Monk's Pepper, Phytochemical constituents, Agnuside, Estrogen

The traditional foods are totally depends upon the herbs and medicinal plants but now in modern life we cross over the herbs only when we are in illness. We can include the medicinal plants in our day today food products. *Vitex negundo* is a Traditional medicinal plant comprises of nearly 250 species. Nirgundi the Sanskrit word of *Vitex negundo* literally means the plant which protects the body from diseases (Ahuja *et.al.*, 2015).

About the plant

Vitex negundo (*Verbenaceae*) is a small tree growing from 2 - 8 metre in height with quadrangular branchlets. The bark is reddish brown in color. The leaves of *Vitex negundo* are 4 - 10 centimeter in length. The flowers are bluish purple in color. The fruit is succulent drupe having 4 millimeter in diameter, rounded to egg shaped (Bano Uzma, *et. al.* 2015). The plants are found throughout India. It is common in waste places around villages, river banks, and moist localities and in the deciduous forests. It is found in China, Nepal, and Thailand (Ahuja, *et.al.*, 2015).

Vernacular names

The other names of *Vitex negundo* is Chinese chaste tree & five leaved chaste tree, Shivari & sawbhalu, Nirgundi, Vellai-nocchi & nirnoch, Vaavili in English, Hindi, Sanskrit, Tamil & Telugu.



Figure 1 *Vitex negundo* leaves

Medicinal properties

Vitex negundo get its common name from the ancient Greece. The Vitex was used as an herbal supplement for numerous effects upon the reproductive system of both men and

women. The whole plant is used during the period of puberty rituals (Ahuja *et.al.*, 2015). Traditionally it is reported to have multifarious activities such as analgesic, antioxidant, anti-inflammatory, insecticidal, antimicrobial, anticancer, galactagogue, tonic, febrifuge, expectorant and diuretic properties (Basri *et. al.*, 2014). The nutrients present in the leaves of five leaved chaste tree are ash content, moisture, crude fat, crude fibre, crude carbohydrate and crude protein. The quantified amount of percentage present in *Vitex negundo* leaves are 5.4 ± 0.35 of ash content, 16.50 ± 1.2 moisture content, 7 ± 0.7 crude fat, 28.02 ± 1.03 crude fiber, 8.5 ± 0.45 carbohydrate and 13.7 ± 1.04 % of crude protein. The energy estimated from *Vitex negundo* leaves is 151.80 Cal/100g (Kumar *et. al.*, 2013). The plant *Vitex negundo* showed significant antioxidant activity. The plant extracts possess potent antioxidant activity, which might be helpful in preventing or slowing the progress of various oxidative stress-related diseases. The methanol leaf extract showed highest (68.72%) DPPH scavenging activity at a concentration of 100 µg/mL (Prakash *et. al.*, 2017). The phytochemical test of medicinal plant found to have many bioactive compounds which are potent source of anticancer property (Roshni *et al.*, 2019). The hepatoprotective activity of Negundoside & agundoside from *Vitex negundo* used in combination with one or more pharmaceutical additives which prevent and treat hepatic diseases (Venkateshwarlu, 2012). *Vitex negundo* possesses significant antimicrobial activity against *S. aureus*. The antibacterial activity of fresh and aqueous extracts of leaves in various dilutions of water, chloroform and methanolic leaf extracts of *Vitex negundo* against *E.Coli*, *S.aureus* and *K pneumonia*. Oral administration of the leaves claims to have antihyperglycemic, antibacterial, antipyretic, antihistaminic agents, anti-implantation activity (Roshni *et.al.*,2019). The oral administration of leaves used for intestinal worm infestation, spleen disorder, abdominal tumour and useful in anorexia, improves intelligence, relieves anxiety, protect from eye diseases, carminative, improves hair quality. It possesses anti-poisonous, anti-spasmodic. The leaves are also useful against cholesterol, wounds, running nose, asthma, bronchitis, and cold cough (Kumar *et. al.*, 2018). Toxicity levels for *Vitex Negundo*

- Doses recommended, in adults are: *Vitex negundo* leaves powder - 1.5 - 3g; dry leaves extract of *Vitex negundo*, 300-600mg (Venkateshwarlu, 2012).

Considering these points, the present study was carried out to standardize the *Vitex negundo* leaves powder incorporated products with the following objectives:

- To standardize the *Vitex negundo* leaves powder incorporated food products.
- To find out the acceptability of the standardized food products.
- To analyze the nutrient content of the developed food products.

MATERIALS AND METHODS

The list of equipment's used for the study and their purpose is mentioned inside the (Table 1). Fresh leaves of *Vitex negundo* were collected and it was cleaned and washed to remove the undesirable materials. The cleaned and washed leaves were dried under the direct sunlight at a temperature of 37°C during the month of February for 6 hours for three consecutive days and it was made into a fine powder by using mixer grinder. Finally, the dried powder was sieved using sieve. *Vitex negundo* leaves powder was incorporated in different products like rasam powder, dhal powder, tamarind rice powder, amchoor powder, kasuri methi at a level of 3% and 3.5% respectively.

Table 1 List of equipment's	
Equipment's	Purpose
Weighing balance	To weigh the raw materials
Electronic balance	To weigh the chemicals
Mixer grinder	For powdering the ingredients
Laminar air flow chamber and incubator	To determine the microbial load of the products
Hot air oven	To determine the moisture content

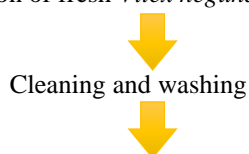
Utensils like Stainless steel vessels, bowls, laddle, frying pan were used for the study.



Figure 2-4: Fresh, dried and powdered leaves of *Vitex negundo*

Flowchart for the preparation of *Vitex negundo* powder

Collection of fresh *Vitex negundo* leaves



Sundry the leaves at 37°C for 3 days

Powdered the dried leaves and sieve to get a fine powder

Vitex negundo powder

Flowchart for the preparation of *Vitex negundo* powder incorporated rasam powder