MUSLIM ARTS COLLEGE

(Affiliated to Manonmaniam Sundaranar University)
Thiruvithancode – 629 174, Kanyakumari District
Tamil Nadu, India.

ISO 9001:2008
Reg. No. : 11091/2688

National Seminar
On

RECENT TRENDS IN AQUATIC AND TERRESTRIAL BIOLOGY

22nd April -2022

Organized by
P.G and Research Department of Zoology

CERTIFICATE

This is to certify that Prof. / Dr. / Mr. / Ms. / .J..VIJILA..JASMIN.,.ASSISTANT..PROFESSOR..IN..ZOOLOGY..DEPT has participated / delivered an invited Lecture / presented a paper entitled .."Nutritional...Phytochemical....Compasition. .and.....Organoleptic...Attributes.of...Limonia..acidissima".. in the National Seminar on Recent Trends in Aquatic and Terrestrial Biology held on 22nd April 2022, organized by the P.G and Research Department of Zoology, Muslim Arts College, Thiruvithancode, Kanyakumari – 629174, Tamil Nadu, India.

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PROCEEDINGS OF NATIONAL SEMINAR ON

RECENT TRENDS IN AQUATIC AND TERRESTRIAL BIOLOGY

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22nd April, 2022

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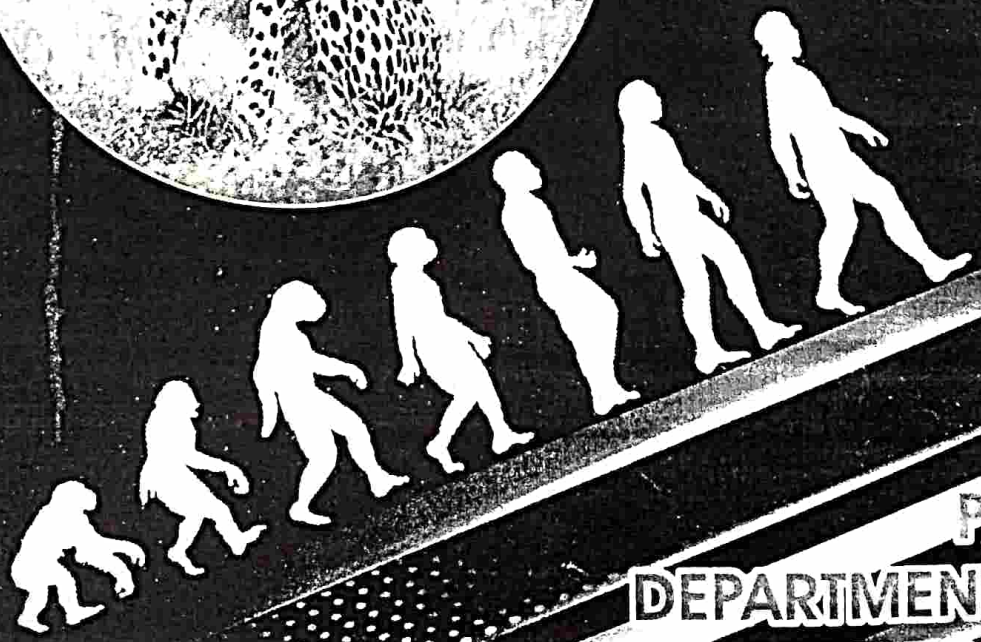

PG & RESEARCH

DEPARTMENT OF ZOOLOGY

MUSLIM ARTS COLLEGE

Thiruvithancode, Pin - 629174

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ISBN : 978-93-84737-33-7

ISBN 978-93-84737-33-7

Published by

Raj Pathippakam,
3E, North Street,
Kurusady,
Nagercoil - 4

13.	**MORPHOMETRICS DIFFERENCE OF MUSSEL *PERNA.* SPECIES COLLECTED FROM ENAYAMCOSAT, KANYAKUMARI DISTRICT.** DR. R. S. DHIVYA	39
14.	**NUTRITIONAL, PHYTOCHEMICAL COMPOSITION AND ORGANOLEPTIC ATTRIBUTES OF *LIMONIA ACIDISSIMA*** T.SHERIN MARY AND J.VIJILA JASMIN	42
15.	**NUTRITIONAL AND SENSORY CHARACTERISTICS OF MULBERRY FRUIT WINE** G.C.GILBIS TAMIL PRIYA, U.V. SUDHA, DR. N.YASMIN	45
16.	**BIOINFORMATICS IN PLANT BIOLOGY AND ITS IMPLEMENTATIONS** B.V.VIBALA, ANOOJ E.S, NISHA RAJ.S, SEKARAN.S, SARITHA SADANANDAN PILLAI , SANA S HUSSAIN, MOHAMMED YASIR, SWARNA BHARATHI.D	48
17.	**PHYTOCHEMICAL COMPOSITION AND ANTIBACTERIAL ACTIVITY OF SEAWEED *CHAETOMORPHA LINUM* FROM KANYAKUMARI COASTAL REGION** D. BEULA SHINY AND J.VIJILA JASMINE	51
18.	**THE MASS CULTURE OF ROTIFERS USING DIFFERENT LIVE FEEDS DIETS** SANTHIYA. R, SREEYAG.NAIR AND CHRISTO QUEENSLY C	55
19.	**IN SILICO VALIDATION OF PROTEIN MODELS AND EVOLUTIONARY ANALYSIS OF *TRICHOPHYTON* FUNGI (RINGWORM DISEASE)** MARLYN SHEKINA T, ANOOJ E.S, B.V.VIBALA	58
20.	**A STUDY ON ECOLOGICAL IMPORTANCE OF ASCIDIANS IN SOUTH INDIA** B.LEKSMI	62
21.	**FLUCTUATING P^H LEVEL, ATTRIBUTED FACTORS IN THE WATER SAMPLES COLLECTED FROM DIFFERENT STATIONS OF RAJAKKAMAMGALAM ESTUARY, THE SOUTH WEST COAST OF INDIA** M.AHAMED BASHEER	65
22.	**ANTIBACTERIAL ACTIVITY OF LEMONGRASS (*CYMBOPOGONCITRATUS*) OIL AGAINST SOME SELECTED PATHOGENICBACTERIAS** *M.PUNITHAVATHI*	67
23.	**STUDIES ON THE IMPACT OF HEAT AND COOL ON THE ENERGY PARAMETERS OF *BOMBYX MORI* L.** T.THANGA SUJI AND DR.M.THILSATH FATIMA QURAIZA	71
24.	**SURVEY OF NATURAL HEMAGGLUTININS IN DIFFERENT SPECIES OF MARINE CRABS** ELAYA BHARATHI, T.,VINOLIYA JOSEPHINE MARY, J	73
25.	***ANNONA MURICATA* LEAVES: PHYTOCHEMICAL ASSESSMENT AND MEDICINAL PROPERTIES** R.RAJILA AND T. KUMARAN	76
26.	**ALTERATIONS IN HAEMATOLOGICAL PARAMETERS OF FRESH WATER FISH*LABEO ROHITA*(Hamilton) EXPOSED TO SUB LETHAL CONCENTRATION OF CYPERMETHRIN** N. BERJIN BEAULA AND C. CHRISTO QUEENSLY	79
27.	**EFFECT OF DIETARY INCLUSION LEVELS OF TAMARIND SEED ON GROWTH PERFORMANCE OF *POECILIA SPHENOPS*** J. RAJASELVAM AND K. ZIPORA	84

NUTRITIONAL, PHYTOCHEMICAL COMPOSITION AND ORGANOLEPTIC ATTRIBUTES OF *LIMONIA ACIDISS*

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Abstract

Limonia acidissima has been traditionally used as an Ayurvedic medicine. It is the only species of its genus, in the family Rutaceae. Different parts of *Limonia acidissima* such as leaves, bark, fruit pulp, rind, roots and flowers contains variety of phyto-constituents such as alkaloids, phenols, tannins, flavonoids, saponin, esters, fat,calcium, iron, coumarin, tyramine etc., and posses multipotent pharmacological activities such as anti-venom, anti-malarial, anti-larvecidal, anti-diarrhoeal, anti- dysentry, cardiac tonic, liver tonic, anthelmentic, antifungal, expectorant, anti- diabetic, anti-cancer, anti-dermatophytic, etc. This plant is used in neutraceuticals, food and herbal cosmetic industry. In the present study, phytochemical analysis of *Limonia acidissima* revealed the presence of phenol, flavonoid, tannin and steroids.Nutrients such as carbohydrate, protein and fat were analysed. Products such as jam, milk peda and nut ball were prepared from *Limonia acidissima* and sensory evaluationof formulated products were done by 20 selected panel members and its acceptance were noted.

Keywords: *Limonia acidissima*, ayurvedic, phytocontituents, alkaloids,pharmacological.

Introduction

Limonia acidissima, belonging to family Rutaceae synonomicaly known as Feronia Limonia Swinglel, Feronia elephantum, Schinus Limonia and commonly also called as Wood apple and elephant apple is native and common in the wild in dry plainsof India and Ceylon and cultivated along roads and edges of fields and occasionally in orchards. It is also grown throughout Asia tropical, Asia temperate, Southern America and Northern Malaysia. (Allen BM, 1967).

Limonia acidissima, is an aromatic, slow growing deciduous tree up to 9m tallgrows all over India. Often polygamomonoecious tree with rough, spiny bark. The leaves are deciduous, alternate, dark-green, leathery, pinnate, with 5-7 leaflets. each leaflet 25-35mm long and 10-20 mm broad. The fruit is round to oval, globose, large, 2 to 5inch wide, with a hard, woody rind, which is grayish-white, scurfy rind. The pulp issticky brown, aromatic odorous, resinous, astringent, acid or sweetish, white seeds scattered through it. Flowers are normally bisexual. In India, the fruits ripen from earlyOctober to March. Seedlings do not bear fruit until the plant is 15 years old. (Pratima Vijayavargia, and Rekha Vijayavargia, 2014).

L. acidissima is a nutrient-rich fruit that contains a surprisingly high amount ofprotein (10%) and also shows good amount of phenolic content and which corresponds to a good source of antioxidants in dried powder. Additionally, the pectin content of the fruit pulp is 3–8%. The fruit contains flavonoids, phytosterols, glycosides saponins tannins, carbohydrates, triterpenoids, vitamins, and amino acids as its chemical constituents. There are reports that some coumarins and tyramine derivatives were also isolated from the fruits of Limonia. (Shreya P.Kerkar,*et al.*,2020).Wood apple fruit is considered to be one of the natural sources of antioxidants due to its potential radical scavenging activity of various phytochemicals. (Nithya and Saraswathi, 2010).The potent antioxidant activity of the fruit and its ability for being used in food and pharmaceutical applications. (Darshini,*et al.*, 2013).

Methodology:

Collection of samples:

The sample used for the present study is *Limonia acidissima*. Fresh, healthy, ripe wood apple was selected for the study. The sample was collected from Market, Marthandam, Kanyakumari district.

Cleaning and Weighing:

Soon after collecting the samples, the fruits are washed with running tap waterto make

the sample free from dust and dirt. Wood apple and other ingredients was measured using weighing mach[illegible]

Phytochemical An[illegible]

Qualit[illegible]ysis of the phytochemical constituents of ***Limonia acidissima*** was analyzed for the pr[illegible] secondary metabolites such as Flavonoids, Saponins, Steroids, Anthocyanin and Tannin[illegible] phytochemicals which showed positive in qualitative analysis were subjected to quantitative analysis.

Nutrient Analysis

The nutrients of the ***Limonia acidissima*** such as carbohydrate, protein, Vitamin C, Calcium and Iron were analyzed.

Formulation of the Products:

Limonia acidissima (wood apple) was selected for the preparation of products. The products such as *Limonia acidissima* Milkpeda (LAMP), *Limonia acidissima* Jam (LAJ), *Limonia acidissima* Nut ball (LANB), were prepared using standard procedures.

Sensory Evaluation of the FormulatedProducts:

The prepared products were subjected to sensory analysis to find out the acceptability. The formulated products were organoleptically evaluated by using numerical score card. Sensory assessment was evaluated on the quality description i.e.,appearance, texture, taste, color, flavor, and over all acceptability. The sensory evaluation was carried out for the products such as *Limonia acidissima* milk peda, *Limonia acidissima* jam and *Limonia acidissima* nutball. The products were evaluated by a panel of 20 semi trained panel members from the Department of Nutrition and Dieteties. Muslim Arts College, Thiruvithancode, Kanyakumari District.

Statistical Analysis:

Statistical analysis of the data obtained for the different variables were carriedout through arithmetic mean and standard deviation.

Result

Phytochemical Analysis: Qualitative analysis

Limonia acidissima were subjected to standard chemical test for the detection of different phytoconstituents and found that flavonoid, saponin, alkaloid, steroid and tannin were present and anthocyanin was absent

Table:1Qualitative analysis of *Limonia acidissima*

S.No	Phytoconstituents	Control	Aqueous Extract
1	Flavonoid	+	-
2	Saponin	+	-
3	Alkaloid	+	-
4	Steroid	+	-
5	Anthocyanin	-	-
6	Tannin	+	-

+ Presence - Absence

Quantitative analysis

The amount of phytochemical was determined by three replicates. The values were tabulated and analyzed.

Nutrient Analysis:

The nutrients of *Limonia acidissima* such as carbohydrate, protein. vitamin-C, calcium and iron were analyzed.

Table:2Quantitative analysis of *Limonia acidissima*

S.No	Phytoconstituents	Control
1	Alkaloid	129.50 ± 0.38
2	Saponin	11.99 ± 0.00
3	Flavonoid	62.12 ± 0.00
4	Steroid	51.97 ± 0.00
5	Tannin	52.50 ±0.000

Each value represents mean value ± SD of experiment carried out with three replicates

Table:3 Nutrient analysis of *Limonia acidissima*

S.No	Phytoconstituents	
1	Carbohydrate	
2	Protein	
3	Vitamin C	10
4	Calcium	.191
5	Iron	79.38±0.912
		491.52±0.523

Each value represents mean value ± SD of experiment carried out with three replicates

Sensory Evaluation

The sensory analysis of the formulated products is given in thefollowing.

Sensory parameters of Limonia acidissima Jam, Limonia acidissima Milkpeda, Limonia acidissima Nutball

Conclusion

From the present study of *Limonia acidissima*, it can be concluded that, this plant is a valuable medicinal plant. Qualitative phytochemical screening of the fruit hasinferred the presence of numerous potential phytochemicals which are the key factor inhaving medicinal values of the fruit. Nutritive analysis of the fruit also shows the presence of various nutrients. In addition, it can be used as a food ingredient to make processed products like jams, milkpeda, and nut ball. Presence of large number of healthbenefits indicate that we can further explore the potential of this fruit and we can look forward to make potent drugs from the fruits.

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