



SLMNA NEWSLETTER

SRI LANKA MEDICAL NUTRITION ASSOCIATION OFFICIAL NEWSLETTER

Linking nutrition research to practice...

THIS MONTH'S FEATURED ARTICLES

- Capture of the Month
- Article of the Month
Dietary Habits and Early
childhood caries
- Food of the Month
Curry leaves
- Past Events
- Upcoming Events

Message from editors...

Food and Mood

“Poor nutrition may be a causal factor in the experience of low mood, and improving diet may help to protect not only the physical health but also the mental health of the population”, said Joseph Firth and colleagues.

All of us at some point in our lives, have experienced alterations in food choices or preferences in response to our temporary psychological state such as “comfort foods” in times of low mood, or changes in appetite from stress. There’s a complex, multidirectional nature of relationships between diet and mental health. The relationship between nutrition and longstanding mental illness is compounded by barriers to maintaining a healthy diet. These barriers include the financial and environmental determinants of health and the appetite-inducing effects of psychiatric medications. The most common mental health conditions worldwide are ‘Depression’ and ‘Anxiety’.

The effects of certain foods on glycaemia, immune activation, and the gut microbiome may play a role in the relationship between food and mood.

Mood and carbohydrates

Consumption of highly refined carbohydrates can increase the risk of obesity and diabetes increasing the physical health risks, and these diets with a high glycaemic index and load may also have a detrimental effect on psychological well-being. Research shows an association between a higher dietary glycaemic index and the incidence of depressive symptoms. Although mood itself can affect our food choices, mechanisms exist by which high consumption of processed carbohydrates could increase the risk of depression and anxiety for example, through repeated, rapid increases and decreases in blood glucose.

High dietary glycaemic load, and the resultant compensatory responses, could lower plasma glucose to concentrations that trigger the secretion of hormones such as cortisol, adrenaline, growth hormone, and glucagon. These hormones may cause changes in anxiety, irritability, and hunger. In addition, research has found that recurrent hypoglycaemia is associated with mood disorders.

Immune activation

High-calorie meals rich in saturated fat stimulate immune activation. The inflammatory effects of a diet rich in trans fats and refined carbohydrates, high in calories and saturated fat have detrimental effects on brain health, including cognitive decline, hippocampal dysfunction, and damage to the blood-brain barrier “Dietary inflammation,” is characterised by greater consumption of foods that are associated with inflammation (eg, trans fats and refined carbohydrates) and lower intakes of nutritional foods, which are thought to have anti-inflammatory properties (eg, omega-3 fats).

Message from editors...

Specific nutritional components (eg, polyphenols and polyunsaturated fats) and general dietary patterns like the Mediterranean diet may also have anti-inflammatory effects, which might relieve or prevent depressive symptoms associated with heightened inflammatory status.

Brain, gut microbiome, and mood

Dietary patterns have an effect on the gut microbiome. The gut microbiome interacts with the brain using neural, inflammatory, and hormonal signalling pathways. Research findings suggest a role of altered neuroactive microbial metabolites in depressive symptoms. In addition to genetic factors and exposure to antibiotics, diet is a potentially modifiable determinant of the diversity, relative abundance, and functionality of the gut microbiome throughout life. Low-grade inflammation may decrease the function of the gut barrier referred to as a “leaky gut” and has been linked to an “unhealthy” gut microbiome resulting from a diet low in fibre and high in saturated fats, refined sugars, and artificial sweeteners. Consumption of a diet high in fibres, polyphenols, and unsaturated fatty acids as found in a Mediterranean diet can promote gut microbiome which can metabolize these food sources into anti-inflammatory metabolites, such as short-chain fatty acids.

It is important to remember that there are many causes of mental illness, and they will often present and persist independently of diet and nutrition. Creating environments and developing measures that promote healthy, nutritious diets, while decreasing the consumption of highly processed and refined “junk” food may provide benefits beyond the well-known effects on physical health, by improving psychological well-being. More research is needed to understand the mechanisms that link food and mental well-being and determine how and when nutrition can be used to improve mental health.

Until next time,

Dr. Gayathri and Dr. Nishanthika



CAPTURE OF THE MONTH



**"Autumn set her leaves ablaze with sunlit colour
on the sky's blue face"**

Dietary Habits and Early Childhood Caries

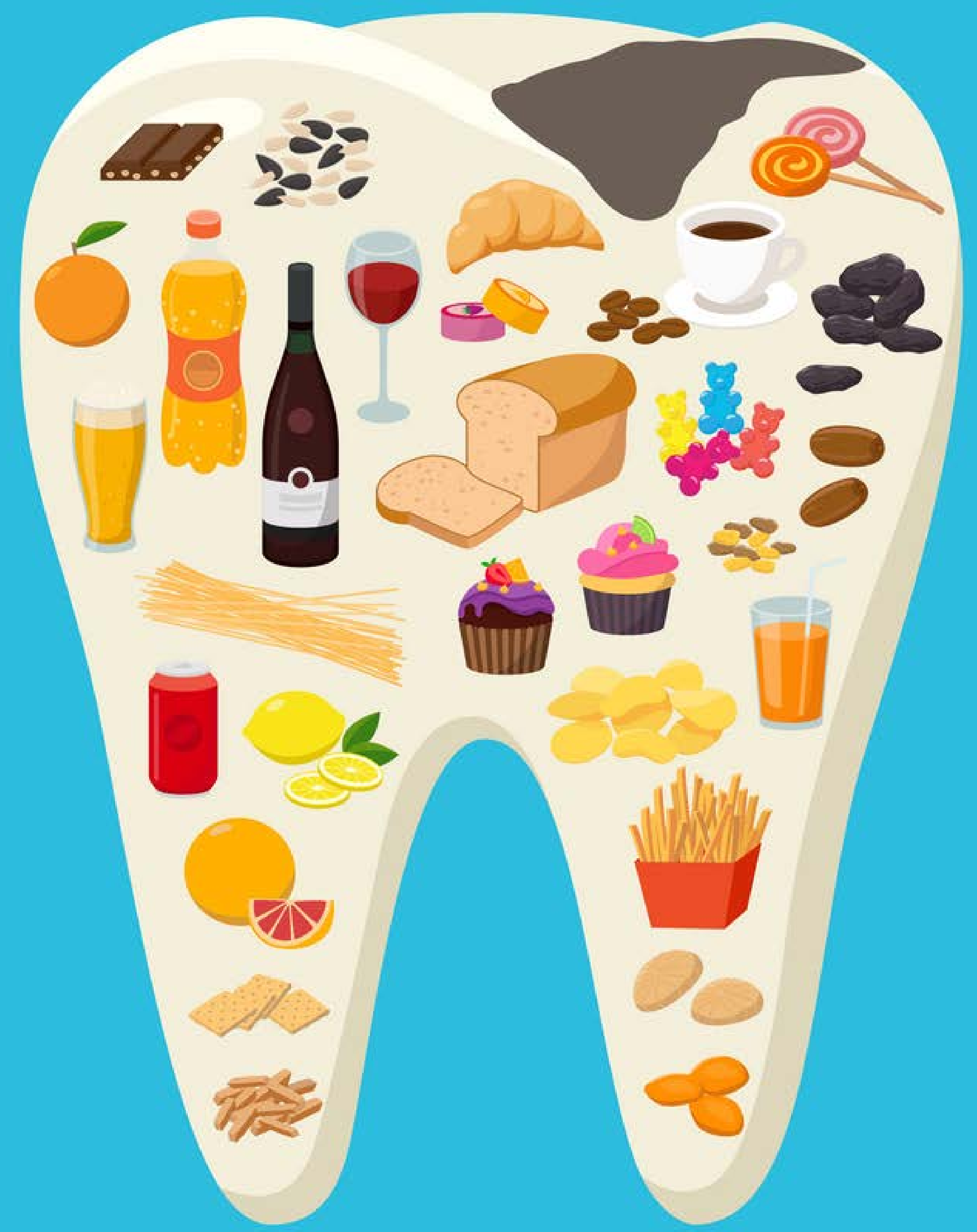
Dr. S.A.V.S. Subasingha

Early Childhood Caries (ECC) is the presence of one or more cavitated or non-cavitated lesions, or missing or filled teeth due to caries in any primary tooth in a child 71 months of age or younger. It is one of the major oral health problems worldwide affecting infants and preschool children, mainly among socially disadvantaged populations. According to the International Journal of paediatric dentistry 2021, the overall global prevalence of ECC is 48%. It varies significantly between and within countries. Oceania, Asia, and North and Central America have a higher prevalence, whereas Africa has a lower prevalence. Europe and America are within the global estimate. The overall prevalence for the past 30 years has been generally consistent.

According to National Oral Health Survey in Sri Lanka, the prevalence of caries in the 5-year-old age group was 63% and the prevalence of active (untreated) caries was 60.7%. Out of these children, 96.2% had active caries. The prevalence of missing teeth was 3.6% and filled teeth was 11.5%.



FOODS THAT DAMAGE TEETH



The aetiology of ECC is complex and multifactorial. Four main factors should be there for the occurrence of an ECC; susceptible surface, substrate, microorganisms, and time factor. The initiation process of ECC is influenced by the predominance of cariogenic microorganisms in dental plaque biofilm.

Other than the above main four factors, there are several predisposing factors that lead to ECC. Behavioural factors such as poor dietary habits, environmental factors such as exposure to polluted water, social factors such as low education levels of mothers, and cultural factors may influence the occurrence of ECC. Exposure to these risk factors may cause an imbalance between the demineralization and remineralization processes of the tooth enamel.

Over time, this process can cause localized destruction of hard dental tissues by weak acids produced by bacterial fermentation of carbohydrates.

In the one to two-year-old age group, inadequate feeding practices such as frequent bottle feeding with sugary liquids and frequent breastfeeding at night are the main reasons for ECC.

Though breastfeeding per se did not contribute to ECC, high-frequency feeding including both breastfeeding and bottle feeding is associated with an increased risk of dental caries in early childhood. Ever-breastfed children have a low risk of ECC compared with never breastfed children.



In the two to three-year-old age group, dietary changes such as increased consumption of sweets, sticky foods, and sweetened beverages with starting preschool and with socialization are the main reason for ECC.

Early detection of caries, classification, and risk assessment, as well as preventive strategies, can reduce the risk of developing advanced disease and may even arrest the disease process.



Prevention of dental caries

Preventive measures of ECC can be divided into, Primary prevention, secondary prevention, and tertiary prevention.

Primary prevention includes health education mainly on diet, brushing techniques, use of fluoridated toothpaste, and preventive restoration (fluoride varnish application).

Secondary prevention is doing basic restoration treatments (filling) whereas tertiary prevention consists of advanced treatment like pulp therapy.

Good diet and dietary practices are more important in the prevention of Early Childhood Caries.

The mothers of breastfeeding children are advised to clean their teeth with a clean wet piece of cloth, especially if the child is frequently feeding at night. Bottle feeding is not advisable. If a child uses a bottle to feed, it is advisable not to use sweetened liquids frequently. Also, it is advised to clean teeth after feeds.

Parents should pay more attention to the child's dental health after introducing solid foods as the child's dietary pattern, consistency, and frequency changes may increase the risk of ECC.

With socialization after starting kindergarten, children experience new foods and develop new dietary practices. Mostly increased consumption of sweets, sticky foods such as biscuits, and other sugary snacks. Some children get sweets every day as a compliment for schooling. Cleaning teeth after having sweets may not be practical every time for parents. These changes increase the risk of ECC in this age group.



Optimum nutrition is essential during both the antenatal period and early childhood, as it is the time of rapid growth, development, and activity. This is also a vital time for healthy tooth development and the prevention of decay.

Importance of healthy diet

Deciduous teeth development happens during the antenatal period and for proper development, the mother's nutrition is more important. After the eruption, deciduous teeth are not dependent on nutrients from the child's diet as their development has been completed in utero. The importance of a healthy diet and good dietary habits at an early age is for the prevention of ECC and for the proper development of permanent teeth in the child.

Most importantly children should get a healthy balanced diet including three main meals. A diet rich in micronutrients such as calcium, phosphate, fluoride, and vitamins C, D, B₆, and K is very important for proper enamel mineralization of teeth. An adequate protein intake to ensure appropriate cell turnover is again important as periodontal lesions and tooth loss can occur due to inadequate protein intake. It is important to minimize excessive intake of foods with high carbohydrates and high amounts of added sugar to avoid the development of early childhood caries.



Frequent snacking should be avoided in children. Snacks with healthy foods such as fruits and nuts are a good option for a child who prefers snacks.

Consumption of sweet sticky foods such as toffees, chocolates, lollypops, biscuits, and cakes should be limited and recommended in small quantities only after main meals. The diets of affected children are assessed by maintaining food diaries.



Along with a healthy diet and good dietary practices, proper tooth brushing is important in the prevention of ECC. Tooth brushing should be started from the first tooth eruption. Children should use a flat surfaced soft kids' toothbrush with a very small amount of fluoridated toothpaste for tooth brushing. Flavoured toothpaste is not recommended as children use to swallow those and it may cause excessive fluoride ingestion. Parents should perform brushing at early ages and should assist younger children. At least twice daily or following main meals brushing is recommended.

Along with all the above preventive measures, dental check-ups at least annually are important for early detection of ECC.

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Curry leaves : Health benefits

Dr. Malithi Kulasinghe

Curry leaves are one of the most commonly used herbs and a flavouring agent in Asia with multiple nutritive benefits and pharmacological benefits.

There are over 2007 species in the Rutaceae family, but only 3 types of cultivars are available in Sri Lanka. They are *C. indica*, *M. minutum*, and *M. koenigii*. Of the three, *M. koenigii* is a fascinating house plant that has been cultivated in Asia and is endemic to Sri Lanka, Bangladesh, and India. It has been known in Sinhalese for centuries under the name "karapincha". A large part of the popularity of *M. koenigii*'s dark green fresh leaflets in Asian cooking is due to its distinctive aroma and numerous therapeutic uses. As a natural flavor, they also give delicate flavors to a variety of food preparations, including vegetables and many other foods. The great nutritional content of kola kanda, or leafy porridge, has made it popular in Sri Lanka.

Nutrition composition of curry leaves

Nutrient	Content
Moisture (g/100g)	69.7 ± 0.7
Ash (g/100g)	2.75 ± 0.05
Protein (g/100g)	15.6 ± 0.4
Carbohydrate (g/100g)	11 ± 3
Fat (g/100g)	2.3 ± 0.4
Fiber (%)	6.3 ± 0.05



Several studies have analyzed the nutritional composition of curry leaves. The nutrition composition of curry leaves is described in the table.

Curry leaves are reported to be rich in carbohydrates, proteins, amino acids, minerals, vitamins, and other phytochemicals (Chathura, P., et al, 2015).

Asparagine, glycine, serine, aspartic acid, glutamic acid, threonine, alanine, proline, tyrosine, tryptophan, amino butyric acid, phenylalanine, leucine, isoleucine, and minute amounts of ornithine, lysine, arginine, and histidine can all be found in curry leaves.

The organoleptic qualities of the curry leaf, such as colour, odour, and flavour, as well as its carbohydrate richness, containing sugars and minerals, are related to its culinary value.



Vitamin content in curry leaves (mg/100g)

According to studies, curry leaves are rich in vitamins A and B (Chathura, P., et al, 2015).

Vitamin	Content
Vitamin A	6.04 ± 0.02
Vitamin C	0.04 ± 0.002
Vitamin E	0.03 ± 0.01
Vitamin B1 (Thiamin)	0.89 ± 0.01
Vitamin B2 (riboflavin)	0.09 ± 0.002
Vitamin B3 (Niacin)	2.73 ± 0.02



Phytochemicals are compounds that have multiple health benefits and most medicinal plants are rich in essential phytochemicals which are responsible for the anti-inflammatory, anti-microbial, anti-oxidant, and various other known biological activities.

Phytochemicals in curry leaves

- Alkaloids
- Flavonoids
- Unsaturated steroids
- Tannins



Mineral content in curry leaves (mg/100g)

Curry leaves are a good source of calcium, magnesium, and sodium. Even though Curry leaves are abundant in calcium, their nutritional availability is hampered by the presence of oxalic acid in high proportions (total oxalates 1.35%, soluble oxalate 1.15%) (Chathura, P., et al, 2015).

Mineral	Content
Calcium (mg/100g)	19.73 ± 0.02
Iron (mg/100g)	0.16 ± 0.01
Magnesium (mg/100g)	49.06 ± 0.02
Sodium (mg/100g)	16.5 ± 0.21
Zinc (mg/100g)	0.04 ± 0.001
Potassium (mg/100g)	0.04 ± 0.001



Numerous functional effects of these phytochemicals in curry leaves include antioxidant, anticancer, antibacterial, anti-diabetic, lipid-lowering, and liver-protective properties (Shehzad, A., et al, 2015). Curry leaves have alkaloids that support their bioactive properties, including anticancer, antidiabetic, antioxidative, and antiulcer.

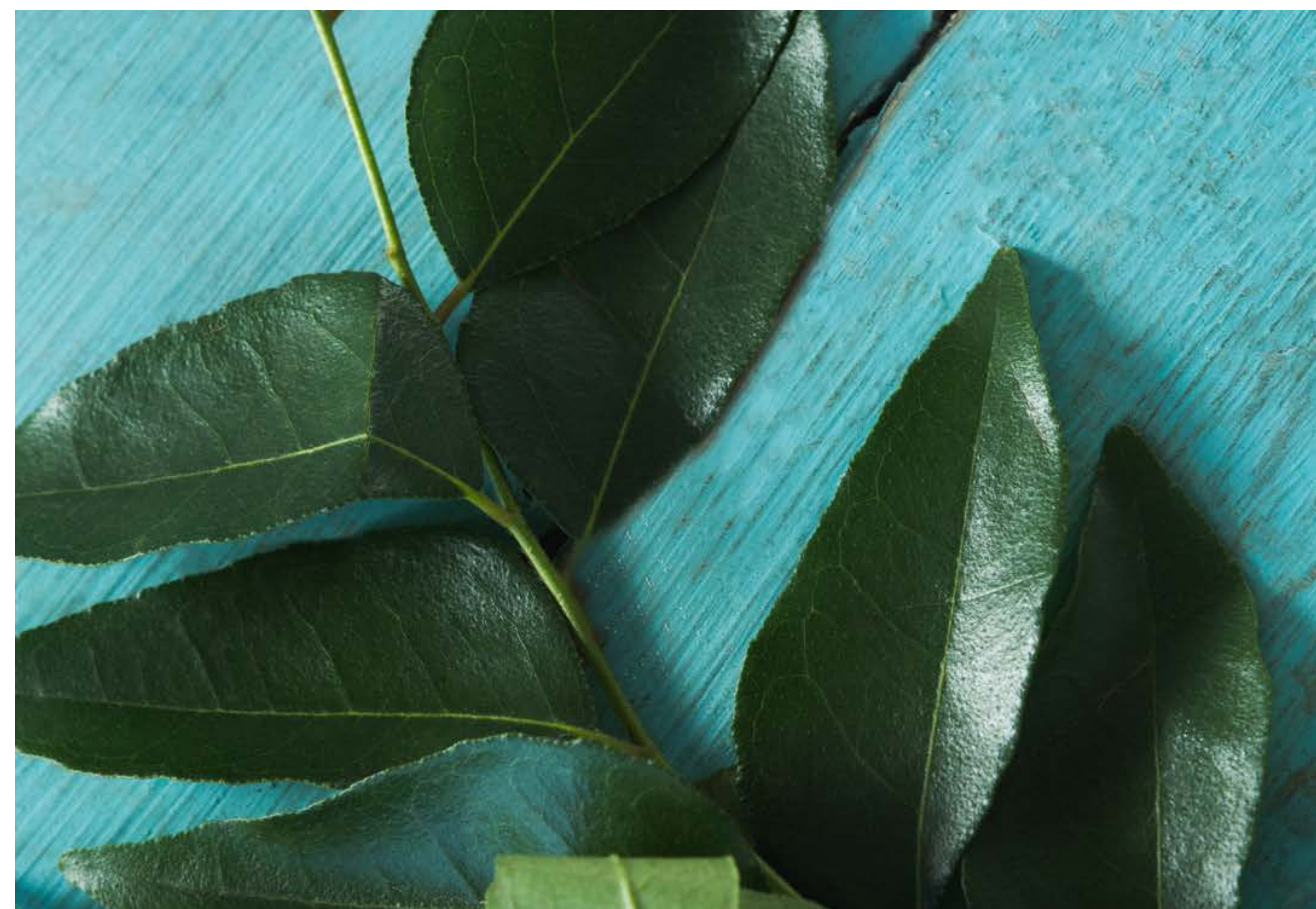
Scientific investigations have shown that curry leaves have bioactive properties, which are discussed below. The leaves, roots, and bark of this plant are all beneficial.

Due to its advantageous properties mentioned below it is used as a traditional functional food, a nutraceutical.

1. Antioxidant properties
2. Lipid-lowering properties
3. Hypoglycemic property
4. Anti-cancer property
5. Anti-bacterial property
6. Anti-aging property

Antioxidant properties

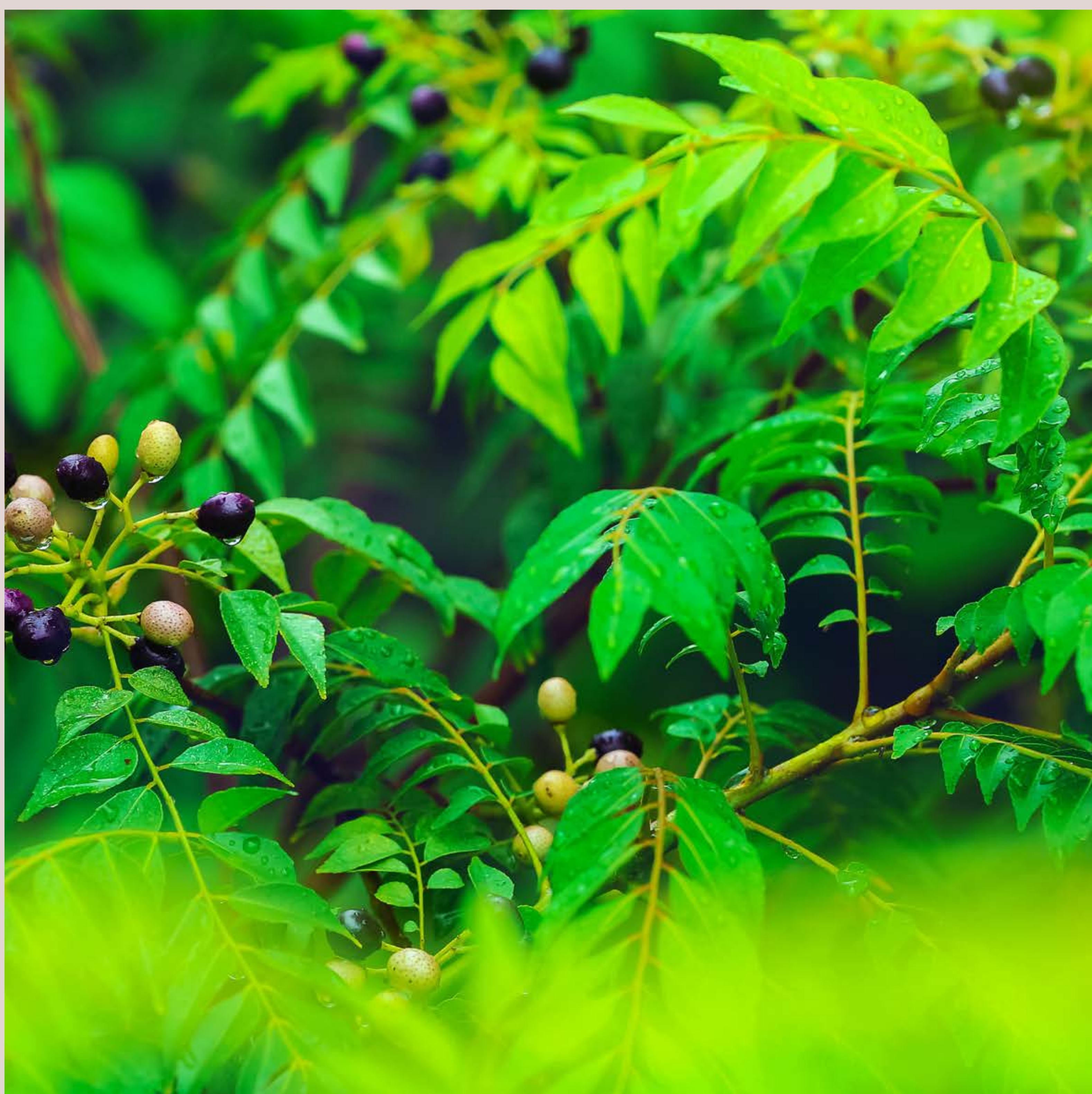
Reactive oxygen species (ROS) are frequently produced as byproducts of cellular metabolic processes and exogenous stimulation. Examples of ROS include singlet oxygen, hydrogen peroxide, the superoxide anion, and hydroxyl radical. These reactive oxygen species cause homeostatic abnormalities that result in oxidative stress, which causes tissue damage and cell death. Biomolecules such as nucleic acids, proteins, and lipids can be harmed by reactive oxygen species when their concentrations are high. Even while anti-oxidant defence mechanisms like enzymatic and non-enzymatic antioxidants



Natural anti-oxidants derived from plants have been touted as a viable treatment for the management and prevention of many illnesses, particularly cancer, cardiovascular disease, and other illnesses as well as neurological disorders. *M. koenigii* contains several naturally occurring bioactive substances that have outstanding antioxidant activities, including mahanine, mahanimbine, isolongifolene, koenimbine, girinimbine, isomahanine, koenoline, and O-methylmurrayamine. (Rehana, D. et al, 2017) (Kesari, A.N. et al, 2005)

Antioxidant properties

Curry leaves have a high concentration of bioactive substances such as polyphenols and alkaloids, which support their antioxidant function. It is known that flavonoids and phenolic acids make up the majority of phenolic compounds with antioxidant action. The primary class of phenolic chemicals found most frequently in plants, particularly in herbs and vegetables, are phenolic acids (Ghasemzadeh, A., et al, 2014).



To assess curry leaves' bioactive components, pharmaceutical grade, and anticancer activity, an experimental research study was carried out in Malaysia. Total phenolic and flavonoid contents, as well as their antioxidant and anti-cancer properties, were examined by using the FRAP (Ferric Reducing Antioxidant Potential) assay and the DPPH (1, 1-Diphenyl-2-picrylhydrazyl) assay, the study has determined that curry leaves are rich in phenolic compounds and flavonoids, which contribute to their antioxidant activity.

Antioxidant properties

Among the three study sites, plants from Kelantan with high concentrations of flavonoids particularly myricetin, epicatechin, quercetin, and phenolic acids particularly gallic acid also demonstrated notable anticancer potential. Therefore, the association between the total phenolic content and antioxidant capacity in curry leaf extracts may be explained by the quantitative and qualitative assessments of the key individual flavonoids and phenolics. Curry leaf extracts may have varying antioxidant activity and a diverse spectrum of flavonoids and phenolic acids according to the growing region, height, climate, temperature, and variety of local natural vegetation. Additionally, the standardization of curry leaf extracts for other pharmaceutical uses may benefit from the composition of phenolic acids and flavonoids and the associated antioxidant activity (Ghasemzadeh, A., et al, 2014).

Curry leaf is rich in two carbazole alkaloids; mahanimbine and koenigine which are found in the leaves and have contributed to higher antioxidant activities.



Hypolycaemic properties

In 2005, an experimental investigation on normal and alloxan-diabetic rabbits was carried out in India to examine the hypoglycemic effects of curry leaves. Its hypoglycemic activity was evaluated scientifically, and the results were contrasted with those of Tolbutamide, a common hypoglycemia medication.

The study found that after 4 hours of ingestion, the aqueous extract exhibited a substantial hypoglycemic impact. This dosage almost exactly duplicates the effects of the synthetic medication tolbutamide (Abeyasinghe, D.T. et al, 2021). The results of this study suggested that an adjuvant to food therapy and medication treatment for diabetes mellitus could be the aqueous extract of these leaves. Curry leaves have hypoglycemic qualities that have been demonstrated in numerous research and can be used as adjuvant therapy in diabetic patients.



Anti - Cancer properties

One of the most effective components behind the preventive effect of diets high in fruits and vegetables on colorectal cancer is flavonoids. Therefore, the anticancer properties of curry leaves may be due to flavonoid molecules. The Murrayakoenigii curry leaf extracts were tested on both normal human mammary epithelial cells and human breast carcinoma cell lines as part of a Malaysian investigation to determine their potential anticancer properties. The fact that curry leaf extracts showed a potential anticancer effect on a human breast cancer cell line is one of the study's more important discoveries. The extracts had significant concentrations of powerful flavonoid components like quercetin, epicatechin, and myricetin, which were potent in slowing the growth of breast cancer cells. According to the study, the curry plants growing in Kelantan, northwestern Malaysia, may be a source of therapeutic substances that fight cancer.



Antibacterial Properties

In vitro, research utilizing *Murraya koenigii* leaves was done in Sri Lanka to investigate the antioxidant and antibacterial properties of curry leaves.

The methanolic leaf extracts from *M. koenigii* demonstrated variable levels of antibacterial activity for the chosen bacterial species in the antibacterial susceptibility test. Ciprofloxacin, a broad-spectrum antibiotic, served as the antibacterial gold standard. It has shown stronger inhibitory capabilities against all of the gram-negative and gram-positive bacterial species that were investigated for the study. *M. koenigii* had the largest zone of inhibition (11.9 mm) against *S. aureus* and the smallest against *E. coli* (6.2 mm). The study concluded that *M. koenigii* extracts would be useful as local applications in treating skin rashes, pulmonary infections, and other urinary tract diseases because they showed maximum activity against *S. aureus*, which is primarily found on most healthy individuals' skin and mucous membranes and causes pulmonary infections, meningitis, and many other urinary tract infections (Ali, S. et al, 2016).



To avoid bacterial infections, curry leaves could therefore be utilized as a natural cure in regular meals. The increasing rise of multi-drug resistant pathogenic bacterial strains that cause diseases that defy standard treatment regimens is a result of the indiscriminate use of antibiotics. Currently, in addition to antibiotics and chemically created medications, there is a growing trend to search for alternative medicine in nature because natural resources are less hazardous and harmful to human health in general. With their antibacterial property, curry leaves have shown tremendous promise as a natural substitute in this situation.



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Events since last publication

SLMNA Monthly Council Meetings

SLMNA monthly council meeting for July and August were held respectively on the 4th of July 2023 and 8th of August 2023 at the Medical Nutrition Unit of the National Hospital of Sri Lanka, Colombo as a hybrid event through the Zoom platform.

SLMNA Emergency Council meetings were held on 11th and 31st of July 2023 to discuss SLMNA Constitution and its reforms at the Medical Nutrition Unit of the National Hospital of Sri Lanka, Colombo

SLMNA Session Organising committee Meeting

The meeting of organizing committee of 8th annual academic session was held on August 22nd, at Medical Nutrition Unit of the National Hospital of Sri Lanka, Colombo



Events since last publication

Clinical Nutrition Lecture Series - SLCNP in collaboration with SLMNA



“Critical Illness and Nutrition, Intensivist’s Perspective” by Consultant Intensivist, Dr. Dilshan Priyankara was held on 19th of July 2023 at NHSL.

Events since last publication

SLMNA bimonthly clinical Meetings (International)

SLMNA bimonthly clinical meeting lecture by a foreign speaker Dr. Prapimporn Chattranukulchai, Consultant in Clinical Nutrition, Thailand on “Nutrition Management in Bariatric Surgery” was held on 18th of July 2023 through the Zoom platform.



The poster is for a SLMNA bimonthly clinical meeting. It features the SLMNA logo (a caduceus with wings) and the SLCNP logo (a stylized 'S' with a leaf). The text reads: 'SRI LANKA MEDICAL NUTRITION ASSOCIATION IN COLLABORATION WITH SRI LANKA COLLEGE OF NUTRITION PHYSICIANS BIMONTHLY CLINICAL MEETING (INTERNATIONAL)'. The topic is 'NUTRITION MANAGEMENT IN BARIATRIC SURGERY'. The speaker is Dr. Prapimporn Chattranukulchai, MD, MSH, Consultant in Clinical Nutrition, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand. The meeting is on 18th July, 2023, at 11.30 AM. A Zoom link is provided: <https://us02web.zoom.us/j/85878122614?pwd=OHdYcmxOcHBZWUJYL29zd1VKOTRpZz09>, Meeting ID: 858 7812 2614, Passcode: 915525.

**SRI LANKA MEDICAL NUTRITION ASSOCIATION
IN COLLABORATION WITH
SRI LANKA COLLEGE OF NUTRITION PHYSICIANS
BIMONTHLY CLINICAL MEETING (INTERNATIONAL)**

**NUTRITION MANAGEMENT IN
BARIATRIC SURGERY**



DR. PRAPIMPORN CHATTRANUKULCHAI
(MD, MSH)
CONSULTANT IN CLINICAL NUTRITION,
DEPARTMENT OF MEDICINE,
RAMATHIBODI HOSPITAL,
MAHIDOL UNIVERSITY,
BANGKOK,
THAILAND.

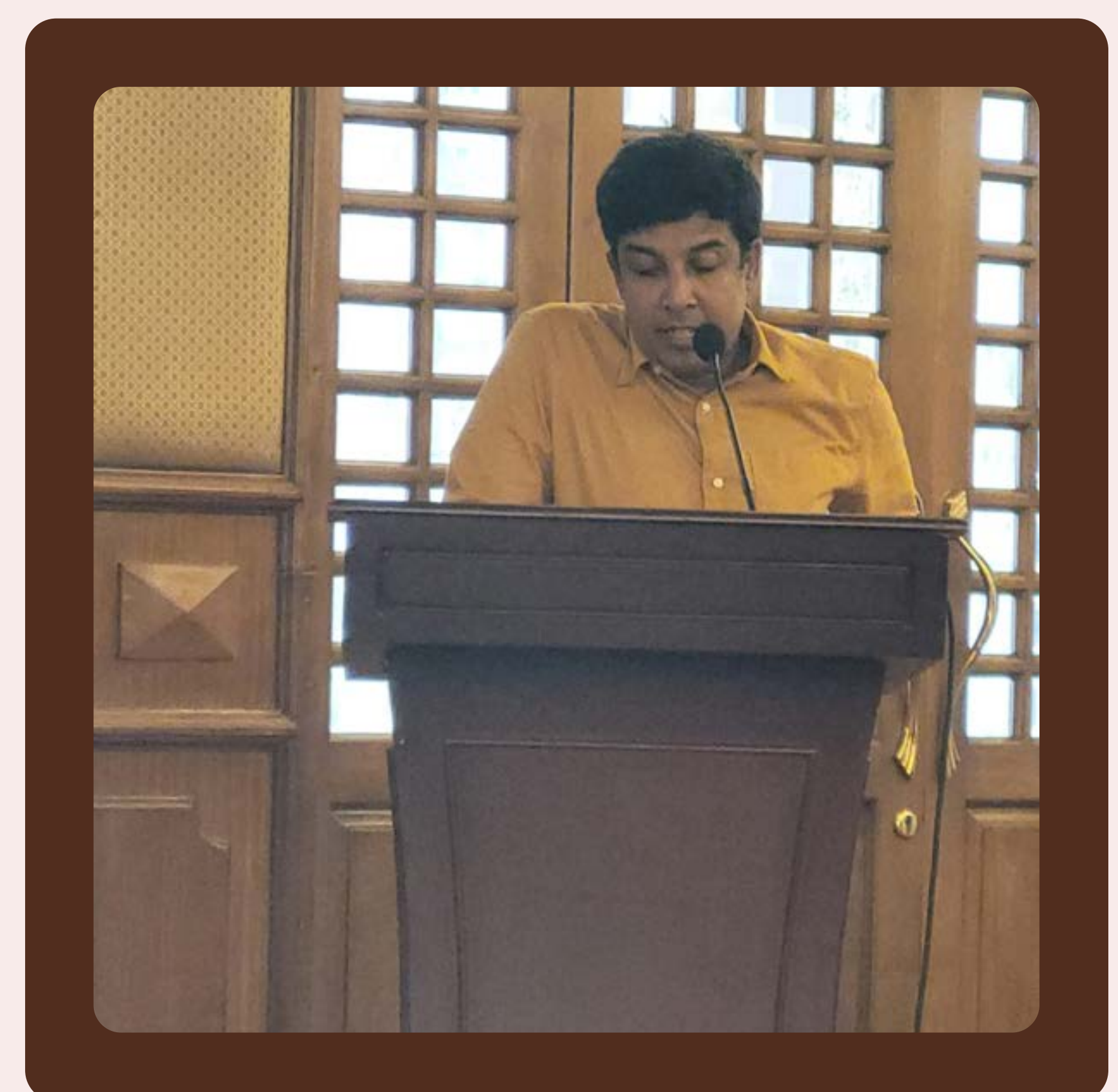
 18th JULY, 2023

 11.30 AM

 Join Zoom Meeting
<https://us02web.zoom.us/j/85878122614?pwd=OHdYcmxOcHBZWUJYL29zd1VKOTRpZz09>
Meeting ID: 858 7812 2614
Passcode: 915525

Events since last publication

Sports Nutrition workshop



Workshop on Sports Nutrition organized by SLCNP and SLMNA was held on the 2nd of July from 8.30 am to 4.30 am at Solis Hotel, Sri Jayawardanapura, Kotte.

Events since last publication

MCQ discussion programme



MCQ Discussion for the Selection Examination in MSc Human Nutrition was held on the Sundays of July 2023.

Events since last publication

Inauguration of 8th Annual Academic Sessions

The inauguration of the 8th Annual Academic Sessions of SLMNA was held on the 25th of August 2023 at the main ballroom, Waters Edge.



Events since last publication

8th Annual Academic Sessions

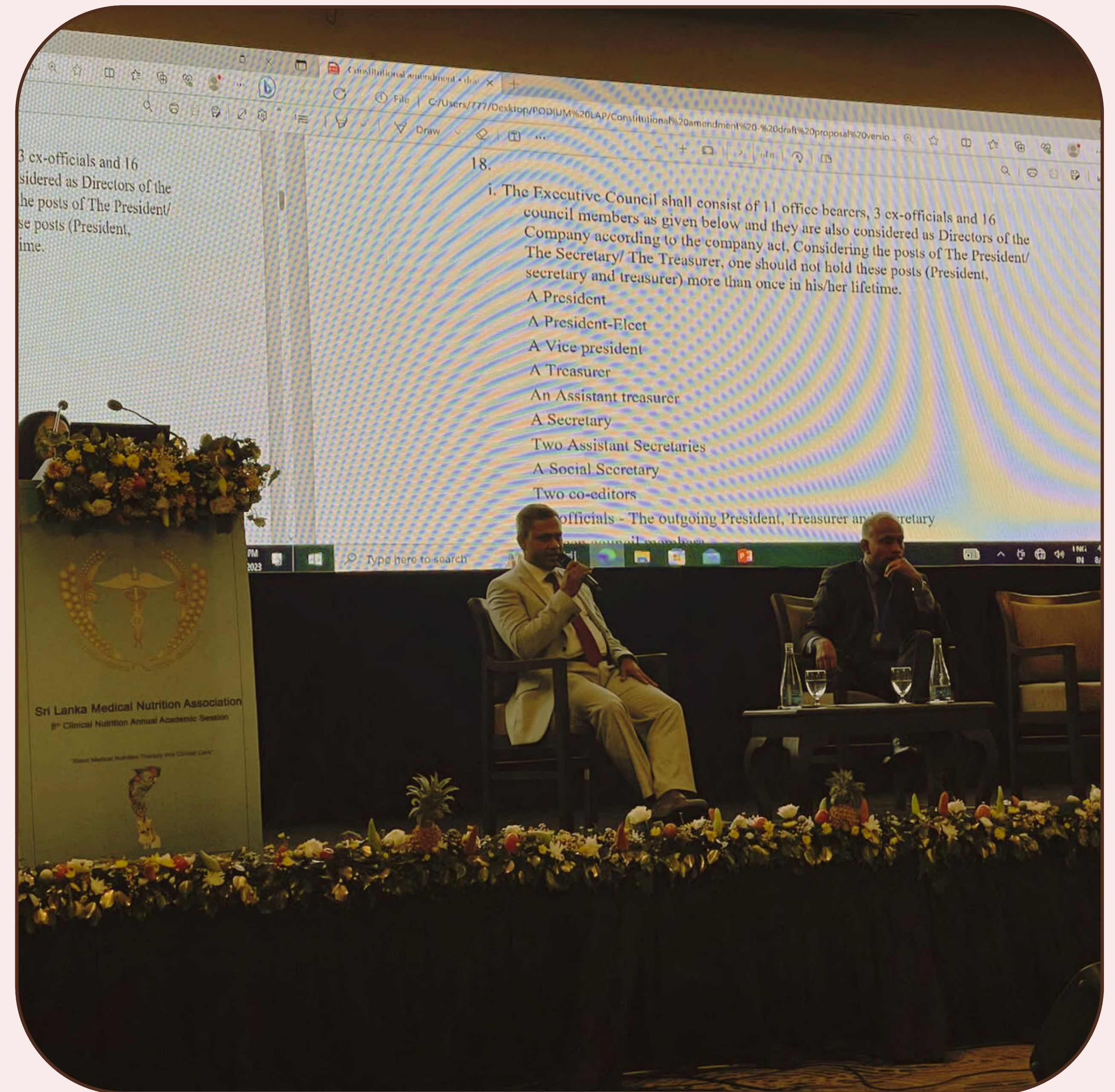
The 8th Annual Academic Sessions of SLMNA was held on the 26th of August 2023 at the main ballroom, Waters Edge.



Events since last publication

Extraordinary General Meeting - SLMNA

An extraordinary general meeting to amend the constitution of the Sri Lanka Medical Nutrition Association based on a request made by a group of members and the concurrence granted by directors was held on August 26, 2023, at 5 p.m. in the Grand ballroom of the Water's Edge Hotel, Battaramulla.



Peripheral activities



The nutrition workshop for nursing officers was held on July 21, 2023, at DGH Kegalle.

Events since last publication

Peripheral activities



Workshop for Public Health Nursing officers on Nutrition was held on July 13, 2023 , at National Hospital Sri Lanka

Events since last publication

Peripheral Activities



Workshop for Medical Officers on Nutrition was held on the July 14, 2023 at NHSL

Events since last publication

Peripheral Activities



A nutrition Program was held at BH Mulleriyawa on August 19, 2023



STAY CONNECTED WITH

SLMNA

**Sri Lanka Medical Nutrition Association,
Email-slmna2015@gmail.com**