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PROFESSOR KANTHIA KUNARATNAM

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What's inside:

JSA

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*Cover image is AI-enhanced.

President's Message……

It has been a privilege to serve as President of the Jaffna Science Association during this remarkable year.

Alongside our regular activities, we focused on archiving JSA's publications, updating memberships, and our website. Reading past publications and work, I am struck by the quality and range of work produced by earlier committees—often during times of war, limited resources, and economic hardship. Their legacy continues to shape the intellectual and civic life of our region and deserves deeper study.

This year's timely theme, "AI for Science and Society," reflects how Artificial Intelligence has become part of our daily lives. From personalised recommendations to autonomous systems, AI is transforming industries and raising critical, ethical and societal questions. Entire sectors are shifting, and job security is a growing concern. These changes require informed, thoughtful responses. I'm proud that our sessions examined AI not just technically, but also in terms of its social and ethical impact.

Looking ahead, we must extend our reach beyond academia and engage more members of the public in our work. Our programmes should respond to pressing challenges—technological disruption, inequality, and environmental sustainability—while maintaining the scientific rigour we value. I warmly wish the incoming committee every success. May you build on our shared legacy and lead the Association into new and meaningful directions. Our founders have shown what can be done with limited means; let us honour and expand their vision—together.

Dr. Kengatharaiyer Sarveswaran
President (2024/25)
Jaffna Science Association

Professor Kanthia Kunaratnam Gold Medal for Best Oration in Science and Technology (English and Tamil)

Professor Kanthia Kunaratnam, born in 1934, was a renowned Sri Lankan Tamil physicist, academic, and former Vice-Chancellor of the University of Jaffna. A trailblazer in the field of science education in Northern Sri Lanka, he graduated with First Class Honours in Physics from the University of Ceylon, Colombo, in 1958. His unwavering commitment to academic excellence and scientific research left an enduring legacy in the region's higher education landscape.

In honour of his contributions and in remembrance of his passing in 2015, the **Professor Kanthia Kunaratnam Gold Medal for Best Oration in Science and Technology,** was introduced by the Jaffna Science Association (JSA) in 2018**.** Conducted annually in both English and Tamil mediums, the competition continues to serve as a meaningful platform for young students to explore contemporary scientific challenges, cultivate analytical thinking, and enhance their public speaking skills.

Continuing this valued tradition, the JSA successfully conducted this year's competition under the timely and thought-provoking theme: "Artificial Intelligence for Science and Society." This prestigious competition was open to students from Grades 10 to 13 in schools across the Northern Province and was conducted in both Tamil and English mediums. The event aimed to stimulate critical thinking and oratory skills among young minds while encouraging them to explore the evolving role of AI in various fields of science.

First Round – 8th March 2025

The first round took place on 8th March 2025 at 9:00 AM at the JSA Office, located at 46 Wyman Road, Jaffna. Participants delivered orations based on pre-announced titles.

Tamil Medium Titles:

1. விஞ்ஞான ஆராய்ச்சியும் செயற்கை நுண்ணறிவும்: சவால்களும் வாய்ப்புகளும்
2. வடக்கு மாகாணத்தின் அபிவிருத்தியும் செயற்கை நுண்ணறிவும்: சவால்களும் வாய்ப்புகளும்
3. காலநிலை மாற்றமும் செயற்கை நுண்ணறிவும்: சவால்களும் வாய்ப்புகளும்

English Medium Titles:

1. Scientific Research and Artificial Intelligence: Challenges and Opportunities
2. Development of the Northern Province and Artificial Intelligence: Challenges and Opportunities
3. Climate Change and Artificial Intelligence: Challenges and Opportunities

A total of 11 students participated in each medium, showcasing diverse perspectives and in-depth understanding of the theme.

Participants: Tamil Medium

Name	Grade	School
Karnika Ranjithkumar	13	J/Ilavalai Convent M.V
Kokulan Nithursika	11	Allarai GTMS
Diroshini Sivakumar	12	J/ Uduvil Girls' College
Lojaya Angelin Srikanthan	12	J/ Chundikuli Girls' College
T. Thulasika	10	Mu/ Visvamadu maha vidyalaya
Paul Mesiya Croos Clodyans Claret	13	Mn/ Periyapandivirichchan M.V
Kannadas Thamizhventhan	12	J/ St.John's College
Mahendraraja Kiruthika	12	Mu/Vidyananda College
Kaventhika Jeyachandran	12	J/ Jaffna Hindu Ladies' College
Kanesananthan Kanimozhi	12	J/Mahajana College
Sivapriya Sivananthan	10	J/Manipay Ladies college

The same set of students who participated in the Tamil medium also competed in the English medium category. From this pool of participants, five students were selected from each medium—Tamil and English—to advance to the final round of the competition based on their performance in the first round.

Finalists

Tamil Medium

Name	School
Mahendraraja Kiruthika	Mu/Vidyananda College
Lojaya Angelin Srikanthan	J/Chundikuli girls' college
T. Thulasika	Mu/ Visvamadu maha vidyalaya
Kaventhika Jeyachandran	J/ Jaffna Hindu Ladies' College
Kanesananthan Kanimozhi	J/Mahajana College

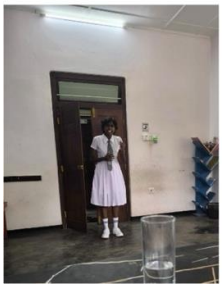
English Medium

Name	School
Thirumayuran Shaamanth	Jaffna Hindu College
Thishanika Prathab	J/ Uduvil Girls' College
Sakana vignesh	J/Chundikuli Girls' college
Benjamin Chevan Ponnudura	St.John's College, Jaffna
Kanesananthan Kanimozhi	J/Mahajana College

Final Round – 29th March 2025



The final round was held on 29th March 2025 at 9:00 AM at the JSA Office, Nallur. Participants were given titles on the spot and 30 minutes of preparation time with access to computers. Each finalist delivered a 10-minute oration.




Tamil Medium Final Round Titles:

1. சுகாதார பராமரிப்பில் செயற்கை நுண்ணறிவு: நோயறிதலிலிருந்து மருந்து கண்டுபிடிப்புவரை
2. திடமான வளர்ச்சிக்கும் சுற்றுச்சூழல் பாதுகாப்பிற்கும் செயற்கை நுண்ணறிவின் பங்கு
3. செயற்கை நுண்ணறிவும் காலநிலை மாற்றமும்: உலக வெப்பமயமாதலை எதிர்க்கும் தொழில்நுட்ப ஆயுதம்
4. தொழில்நெறியில் செயற்கை நுண்ணறிவின் தாக்கம்: அச்சுறுத்தலா? வாய்ப்பா?
5. செயற்கை நுண்ணறிவும் உயிர் பல்வகைமையை பாதுகாத்தலும்: இயற்கையை பாதுகாக்கும் ஒரு முயற்சி

English Medium Final Round Titles:

1. AI in Healthcare: From Disease Diagnosis to Drug Discovery
2. The Role of AI in Sustainable Development and Environmental Conservation
3. Artificial Intelligence and Climate Change: A Technological Weapon Against Global Warming
4. The Impact of Artificial Intelligence on Employment: Threat or Opportunity?
5. AI and Biodiversity Conservation: Protecting the Natural World

The first round of the Professor Kanthia Kunaratnam Gold Medal Competition was evaluated by Ms. G. H. Hensman**,** Dr. J. Jananie, and Ms. Y. Suyothami. For the final round, the panel consisted of Prof. K. Gajapathy**,** Mr. R. Sarweswara, and Dr. J. Jananie, who continued her role as a judge, bringing consistency and valuable insight to the evaluation process.

Winners of the Professor Kanthia Kunaratnam Gold Medal for Best Oration:

- 🥇 **English Medium Gold Medalist:**
  T. Shaamanth (Jaffna Hindu College)
- 🥇 **Tamil Medium Gold Medalist:**
  J. Kaventhika (Jaffna Hindu Ladies' College)


T. Shaamanth
Gold Medalist
English Medium


J. Kaventhika
Gold Medalist
Tamil Medium

These outstanding orators would receive their Gold Medals at the 31st Annual Scientific Sessions of the JSA to be held on 30th May 2025 (Day 3)**.**

This inspiring event served as a powerful platform for nurturing young scientific thinkers and communicators. It enabled students to reflect on how artificial intelligence is shaping the future of science, environment, and society, while also honing their public speaking, analytical, and creative thinking skills**.** The JSA is proud to support and celebrate the talents of the next generation of innovators and thought leaders in the Northern Province.

Jaffna's Humane War on Drugs.

Ms. Viduni Basnayake,
Department of Psychiatry,
Faculty of Medicine,
University of Jaffna, Sri Lanka.

The three-decade-long war in the Northern and Eastern Provinces concluded long ago, but another battlefront, as in many other parts of the country, has opened up in these districts – the war on drugs. Hence, the Jaffna Teaching Hospital, in cooperation with several Government and non-Governmental organisations, has initiated a special programme based on a multi-disciplinary team with the intention of eliminating the drug menace and rehabilitating drug addicts.

According to recent reports, roughly 200 million people worldwide use cannabis, 27 million use amphetamine-type stimulants like "ice" (crystal methamphetamine) and 20 million use cocaine. Among them, 2% have been identified to be Asians. Worldwide alcohol and illicit drug use has also become a leading cause of death, while the increase in drug sales over the dark web has largely increased over the past few years.

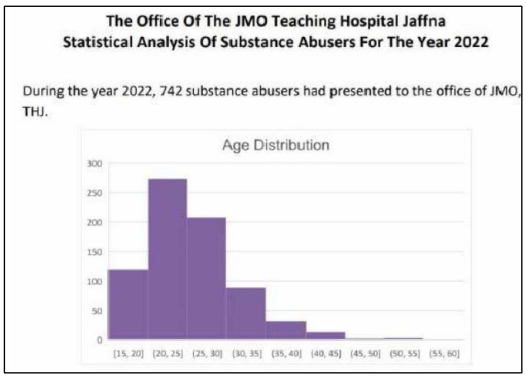
When considering the current situation in Sri Lanka, the National Dangerous Drugs Control Board (NDDCB) or the principal national drug control and monitoring authority in Sri Lanka was within the purview of the Ministry of Defence and is now under the Ministry of Public Security. And, the two compulsory drug treatment centres, Kandakadu and Senapura, are managed by the military.

In the Northern Peninsula, the Jaffna Police Division's Crime Prevention Unit carries out operations every week to apprehend drug peddlers and dealers who target schoolchildren and youths. The Judicial Medical Officer (JMO) of the Jaffna Teaching Hospital provides security institutions, including the Police, with the data collected from patients who visit the hospital with drug-related issues.

According to recent studies, with the use of drugs increasing over the past few years, all forms of crime, including incidents of housebreaking, robbery, theft of property, domestic abuse, and rape, have seen a sharp increase. This programme, which is aimed at eliminating such crimes, particularly by eliminating the drug menace, uses an evidence-based approach by mapping risk factors and pathways, in addition to planning and implementing interventions involving all stakeholders.

Recently collected analytical data show that most drug addicts in the Northern Province are heroin users, followed by those who use crystal methamphetamine and Kerala cannabis. Some have been identified to use multiple drugs and with less health-seeking behaviour (any action undertaken by individuals who perceive themselves to have a health problem or to be ill for the purpose of finding an appropriate remedy).

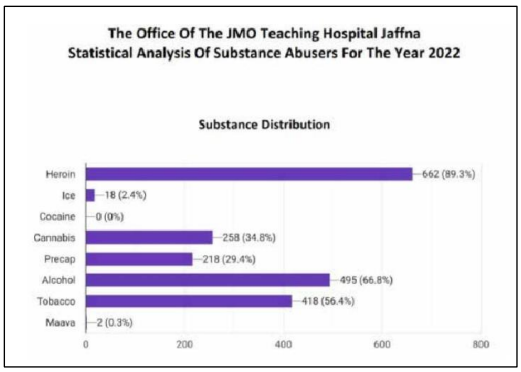
In the course of last year (2022) alone, 742 drug addicts, most of whom were aged between 20 and 25 years, had been presented to the JMO of the Jaffna Teaching Hospital. Most of the said individuals have been discovered to be heroin addicts. Incidents of such youths dying in the Jaffna District due to drug overdose and other drug-related sudden illnesses have also been reported, emphasising the need to take appropriate remedial actions at the earliest possible time.



As no rehabilitation centre is located in the vicinity of the Northern and Eastern Provinces, most parents in these provinces are reluctant to send their children to rehabilitation centres in other parts of the country because of the distance, language-related issues, and the lack of motivational changes. Accordingly, counsellors attached to the multi-disciplinary team work towards supporting Tamil-speaking children undergoing rehabilitation at the Fernham Certified School in Atchuvely, which comes under the purview of the Department of Probation and Child Care Services. The Atchuvely Certified School is the only Tamil-medium school in Sri Lanka certified to provide safe custody and skilled observation of children committed to them by courts. The school provides a disciplined environment which will begin the process of rehabilitation of the child at a time they are experiencing an abrupt break from familiar surroundings and enable information gathering for the assistance of the courts. Recreation is essential for physical and mental growth as well as the wellbeing of every individual. Under the guidance of the multi-disciplinary team, this school provides regular medical inspection and remedial action to rectify defects or deficiencies, and, where necessary, psychiatric examination and treatment through the Jaffna Teaching Hospital and the Atchuvely Divisional Hospital.

The multi-disciplinary team, with the help of the Jaffna Magistrate's Court, has also commenced a mentoring programme for prisoners, where the latter are provided with the opportunity to visit the Jaffna Teaching Hospital for weekly psychiatric clinics. The most important criterion of this procedure is that each person attending the psychiatric clinic has to be followed up each week, and a report be sent to the Jaffna Magistrate once a month. This has helped to reduce the number of drug peddlers in the Jaffna District.

Additionally, the multi-disciplinary team is launching other forms of mentoring programmes as well for those imprisoned over drug-related charges. These programmes are conducted by the relevant community physician who visits prisons with their team on a weekly basis. Under this programme, the unemployed in the area are provided with job opportunities. Plans are underway to implement female empowerment programmes that would ensure the wellbeing of wives and mothers of drug-addicted prisoners and enhance their mental and economical strength.



Jaffna Science Association Partners with National Water Supply and Drainage Board for World Water Day 2025 – Mini Research Symposium

In celebration of World Water Day 2025 and the 50th Anniversary of the National Water Supply and Drainage Board (NWSDB), the Jaffna Science Association (JSA) proudly collaborated with the NWSDB, the University of Vavuniya, Rajarata University of Sri Lanka, and World Vision Lanka to organize a Mini Research Symposium. This initiative was designed as a school-level research competition to inspire scientific inquiry among students and enhance awareness of critical water-related issues in their communities.

The symposium targeted students from Grades 10 and above in both the Northern and North Central Provinces, aiming to promote environmental stewardship and problem-solving through student-led research. Submissions were invited under four key themes:

- Safeguarding Our Water Sources for Future Generations
- Efficient Water Usage: The Role of Students
- Water and Health: Ensuring Safe Drinking Water for a Healthy Life
- Innovative Solutions for Water Conservation

Students were encouraged to submit extended abstracts in Tamil, Sinhala, or English, based on either primary data (such as field studies, experiments, or surveys) or secondary data (such as literature reviews or existing reports). A total of 41 submissions were received from the Northern Province. JSA took a lead role in reviewing all Tamil and English submissions from this region.

The JSA review panel comprised the following esteemed members:
Dr. K. Sarveswaran, Mrs. Shobiya Gobiraj, Mrs. Piratheepa Sivakumar, Prof. K. Gajapathy, Dr. Arumukham Manjceevan, Dr. Suvanthini Terensan, Dr. V. Anavarathan, Mrs. Sasubi Sathees, and Dr. Amirthasingam Manoraj. The review process was primarily supported by Section A and Section C of the JSA, under the leadership of Mrs. K. Losana (Chairperson, Section A) and Dr. A. Manjceevan (Chairperson, Section C). Their meticulous evaluation ensured the selection of high-quality student research aligned with the symposium's themes.

As part of the evaluation process, the top six papers per theme from each province were shortlisted. JSA, in partnership with Rajarata University (responsible for the North Central Province), was entrusted with selecting the top three abstracts per theme for the final-day presentations. Final rankings were based on the quality of student presentations, which served as an essential criterion for evaluating both subject knowledge and communication skills.

The final symposium was held on April 1, 2025, at the Urban Council premises in Vavuniya. The event featured vibrant student presentations, a formal award ceremony, and interactive discussions with participants and guests. One of the key highlights of the symposium was the invitation extended to Dr. Mrs. S. Terensan, General Secretary of JSA, to deliver the keynote address titled: "Empowering Students: Research for Sustainable Water Management and Innovation." Her address emphasized the importance of youth engagement in sustainability-focused, locally relevant research, and inspired students to contribute actively to environmental problem-solving. In addition, she served on the final judging panel, playing a vital role in selecting the winning entries on the final day.

The contribution of JSA was formally recognized, with the association's logo prominently displayed as one of the partner organizations at the event and all the promotional materials. This successful collaboration demonstrated JSA's ongoing commitment to science education, environmental awareness, and youth empowerment, reaffirming the association's role as a catalyst for positive change in the region.

Plastisphere and Its Impact on The Marine Ecosystem

Ms. Malwalage Rithmy Durmila Peiris,
Department of Fisheries,
Faculty of Science,
University of Jaffna, Sri Lanka.

Strength, durability, low cost, lightweight, and corrosion resistance, along with high thermal and insulation properties, have made plastic a widely used and essential component in industry and daily life. Despite of its array of qualities and uses, plastic has become and continue to be a global issue of pollution in terrestrial and aquatic ecosystems, especially the marine ecosystem. Since its introduction into the consumer market less than 60 years ago, plastic has emerged as the predominant type of marine debris. Plastic now accounts for over 80% of all marine litter, making it one of the foremost human-created dangers to ocean life.

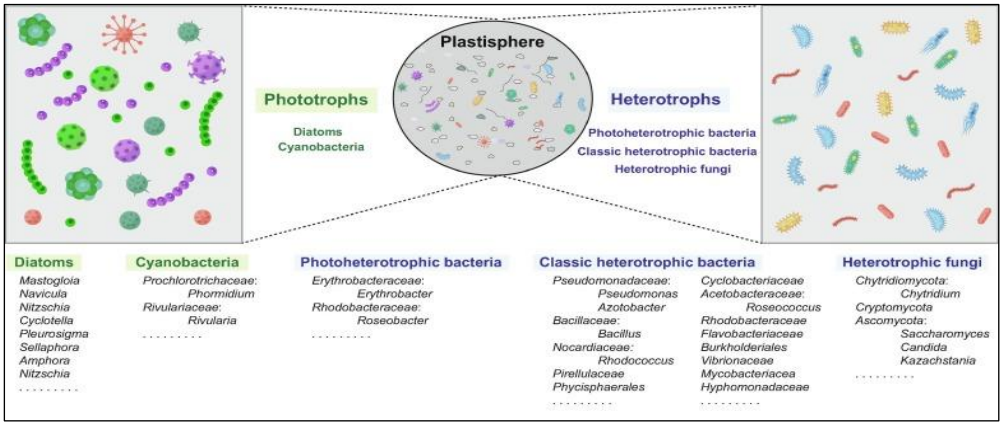
Once entered into the marine ecosystem, plastics can persist for decades resulting in detrimental impacts on marine life. The impacts of plastic can range from entanglement to bioaccumulation. Interactions with marine life, such as entanglement and accidental ingestion, are widely acknowledged issues linked to plastics. Plastics harbor synthetic additives and can additionally accumulate anthropogenic leachates, including persistent organic pollutants and heavy metals, potentially leading to the bioaccumulation of chemicals throughout the food chain, thus introducing potential chemical hazards to all other organisms.

In the marine environment, plastics undergo exposure to ultraviolet radiation (UV-R), temperature variations, and ocean hydrodynamics, potentially leading to the generation of reactive oxygen species (ROS), the leaching of chemical additives like plasticizers, and alterations in plastic surface charge and porosity. This abiotic weathering of plastics is augmented by the formation of biofilms. This microbial colonization of plastics is known as the ‘plastisphere’, a term describing the dynamic ecosystem that forms on these plastic surfaces.

The term ‘plastisphere’ describes a specialized microbial community that adheres to plastic surfaces, distinguishing itself from the surrounding environmental microbiota. Thus, the formation of this novel ecosystem is driven by anthropogenic activity, as the plastic substrates are provided by human actions. Microscopic analysis and molecular sequencing data uncover that the plastisphere is a diverse ecosystem, featuring primary producers, heterotrophs, symbionts, and predators. As observed in both terrestrial and aquatic ecosystems, studies have shown that the plastisphere also undergoes succession over time. The plastisphere generally evolves through stages, including early colonization and mature phases, which determine the structure and diversity of its microbial community.

Microorganisms adhere to surfaces, including plastics, to form biofilms that protect them from environmental stress, nutrient shortages, and predation. Biofilm formation represents a significant shift in a microorganism's lifestyle from a planktonic or motile state, involving the expression of specific genes related to chemotaxis, communication, adhesion, and substrate transport, which allow cells to create a tissue-like matrix and fluid channels for nutrient distribution. Plastic debris offers a resilient platform that microorganisms can settle on and thrive in. Like other biofilms, the

plastisphere typically involves microbial attachment, the secretion of extracellular polymeric substances, and subsequent microbial growth. The physical characteristics of plastics, including hydrophobicity, particle shape, roughness, crystallinity, and surface charge, influence the initial colonization by bacterial communities, which in turn affect the development and composition of subsequent microbial populations on the plastic. Microorganisms can rapidly adhere to the surface of microplastics within minutes; however, the formation of a stable biofilm requires a considerably longer time. Early microorganisms that settle on microplastics are predominantly members of the Gammaproteobacteria and Alphaproteobacteria classes, known as pioneer colonizers, with Gammaproteobacteria typically dominating the early biofilm across most polymer types. In the plastisphere, Gammaproteobacteria include species from Alteromonadales, Pseudomonadales, Vibrionales, and Oceanospirillales. The presence of negatively-charged lipopolysaccharide (LPS) or capsular colonic acid in Gram-negative bacteria improves their ability to form ionic, hydrogen, and covalent bonds with plastic, leading to stronger attachment. As Gram-negative bacteria, Gammaproteobacteria use LPS to adhere to plastic, while Pseudomonadales and Vibrionales enhance their attachment to debris through the expression of type IV pili (Tfp).



As time progresses, secondary colonizers like Bacteroidetes, especially Flavobacteriaceae, become more prevalent due to their wide distribution, adaptability, and capacity to utilize organic substrates released by pioneer colonizers. Although most plastisphere studies primarily investigate bacterial and archaeal diversity with limited focus on eukaryotes, research on natural plastic debris shows that eukaryotic taxa, particularly microbial eukaryotes, are prevalent in the plastisphere. Hence arthropods, sponges, cnidarians, nematodes, and various protists also play a significant role in the diversity of the plastisphere.

In natural settings, the plastisphere's composition is affected by temperature, seasonal and geographical factors, and the type of plastic. Among various factors impacting the plastisphere composition, spatial and temporal variations play significant roles. The composition of plastisphere communities varies significantly across different aquatic environments, primarily influenced by key environmental factors such as temperature, nutrient availability, and salinity. Therefore, location plays a crucial role in determining the community composition of the plastisphere. Several studies have demonstrated that Gammaproteobacteria, Alphaproteobacteria, and Bacteroidetes are the most prevalent bacterial classes found on plastic, irrespective of the location. In warmer climates, plastispheres tend to be more heterogeneous than in temperate climates, due to higher species richness and accelerated microbial growth. Although location plays

a more significant role, plastic type also influences community composition. Seasonal variations and plastic size also play minor roles in shaping plastisphere diversity and composition.

Uncharted Currents: Plastisphere's Impacts on The Marine Ecosystem

A vector for pathogens and harbor for antibiotic resistant bacteria

The plastisphere's capacity to support the survival, transport, and spread of harmful pathogens like *Vibrio spp.*, *Pseudomonas spp.*, and *Escherichia coli* has raised concerns about the increased risk of human and marine life exposure to these dangerous pathogens due to plastics. The Vibrionaceae family, including *V. cholerae*, *V. parahaemolyticus*, *V. anguillarum*, and *V. vulnificus*, can dominate marine plastispheres and are frequently linked to waterborne diseases. This could lead to harmful consequences due to the spread of pathogens through the food chain via nutritional transfer. The plastisphere is recognized as a potential hotspot for antibiotic-resistant bacteria (ARBs). Microbial diseases in fish, crustaceans, and mollusks are a significant cause of loss in aquaculture, where *Vibrio spp.* are the most common pathogens; these facilities can act as reservoirs for pathogenic *Vibrio* species and contribute to the emergence and spread of antibiotic resistance. In aquaculture facilities, the use of plastics for floats, pens, nets, and lines may elevate the risk of harmful bacteria settling on these surfaces.

A facilitator for Horizontal Gene Transfer

Within the plastisphere's microenvironment, the close proximity of organisms and the selective pressures they face can promote the transfer of genes from antibiotic-resistant bacteria to other microbes in the community through horizontal gene transfer (HGT). In the plastisphere, this process boosts the resistance of all microorganisms capable of horizontal gene transfer (HGT) to stressors such as antibiotics. The development of antibiotic resistance on plastic surfaces can also enhance the virulence of the above mentioned potentially pathogenic bacteria.

An island for plastic degrading microbes

For plastics to be degraded by microorganisms, they must first be fragmented by UV light, hydrolysis, and abrasion, with mycelium playing a crucial role in this process, after which macromolecules are hydrolyzed and/or oxidatively cleaved by various enzymes secreted by the microorganisms. The core of microplastic degradation by fungi or bacteria depends on various enzymes, collectively known as plastic-degrading enzymes, which are classified into extracellular and intracellular types. Extracellular enzymes secreted by pioneer bacteria can degrade the hydrophobic groups of plastics, reducing their hydrophobicity and facilitating increased microbial colonization, ultimately leading to the plastic being broken down by intracellular enzymes into harmless substances like CO_2, H_2O, and N_2 that are returned to the biogeochemical cycle.

The plastisphere represents a complex and dynamic ecological niche where plastic debris interacts with microbial communities, profoundly impacting marine ecosystems. It not only provides a habitat for diverse microorganisms but also facilitates the proliferation of antibiotic-resistant bacteria and the transfer of pathogenic genes, with significant implications for both marine life and human health. The interplay between environmental factors and plastic types influences the

composition and function of plastisphere communities, highlighting the need for continued research and effective management strategies to mitigate the ecological and health risks associated with plastic pollution. Understanding the plastisphere is crucial for developing solutions to combat the pervasive issue of plastic waste and its far-reaching consequences.

Jaffna Science Association – Section B (Applied Science)

Call for Articles – Pirayoga Vingnana Sudar

(பிரயோக விஞ்ஞான சுடர்)

The Jaffna Science Association (JSA) – Section B (Applied Science) is now accepting articles for the upcoming issue of பிரயோக விஞ்ஞான சுடர். We invite submissions in the field of applied science including **Agriculture, Computer Science, Engineering and Library Sciences.**

Submission Guidelines

Language: Tamil or English

Format:

Tamil: Bamini, size 11, double-spaced

English: Times and New Roman, size 11, double-spaced

Length of article: Maximum **3 pages** in A4 size

File Type: Submit in **.docx** format

Submission Deadline: 25.03.2025

Submission e-mail: thiruchchelvann@univ.jfn.ac.lk

More information:

JSA Section B Editor at **+94 77 922 5672**

Thumb Sucking in Children: A Comforting Habit or a Cause for Concern?

Ms. Mathanki Sutharsan,
Department of Psychiatry,
Faculty of Medicine,
University of Jaffna, Sri Lanka.

Thumb sucking is a common and natural habit in babies and young children. It usually starts early, sometimes even before birth, and helps children feel calm, safe, and comforted. Many children suck their thumbs when they are tired, bored, scared, or trying to fall asleep. Most children stop this habit on their own by the age of 3 or 4. However, if thumb sucking continues for a long time, especially after the age of 4, it might lead to problems with teeth, speech, or how they interact with others. Understanding why children suck their thumbs and how the habit develops can help parents support their children in a gentle and healthy way.

Thumb sucking is a common habit among young children across the globe, with studies showing that a significant number of infants and toddlers engage in this behavior. It is estimated that about 75% to 95% of infants exhibit thumb sucking at some point during their early years worldwide. The habit tends to decrease naturally as children grow older. However, fewer than 15% of children continuing to suck their thumbs by the age of 4 or 5. Cultural practices, parenting styles, and awareness about oral health can influence the prevalence and duration of thumb sucking in different regions.

In Sri Lanka, thumb sucking remains a widespread habit among children, particularly in rural and suburban communities where traditional parenting and caregiving methods are prevalent. Although exact prevalence data is limited, observations from pediatric and dental health clinics suggest that many Sri Lankan children engage in thumb sucking up to preschool age. Awareness campaigns and pediatric guidance in urban areas are increasingly encouraging parents to monitor and manage this habit to prevent long-term dental and speech complications. Nonetheless, thumb sucking continues to be a natural comfort mechanism for many children in Sri Lanka, reflecting similar patterns seen worldwide.

Thumb sucking begins as a natural reflex in babies, even before they are born. The sucking reflex is essential for feeding, allowing infants to breastfeed or bottle-feed effectively. This reflex not only satisfies their nutritional needs but also provides a soothing effect. As a result, many babies instinctively suck their thumbs or fingers as a way to calm themselves when they are not actively feeding. This automatic behavior often continues into early childhood, especially during times when the child feels the need for comfort or reassurance.

Beyond its origin as a reflex, thumb sucking serves as an important source of comfort for many children. It helps them cope with stress, fear, or discomfort, such as during periods of illness, fatigue, or unfamiliar situations. For toddlers and preschoolers, thumb sucking can be a way to self-soothe when they feel anxious or overwhelmed. It may also occur out of boredom when children seek a repetitive and familiar activity to occupy themselves. This comforting aspect explains why thumb sucking often occurs during bedtime or quiet moments when a child seeks to relax.

Psychological factors also play a role in thumb sucking. For some children, persistent thumb sucking may be linked to feelings of insecurity or anxiety, especially in environments where they feel emotionally vulnerable or uncertain. Changes in routine, separation from parents, or stressful events can trigger or increase thumb sucking as a coping mechanism. In some cases, children who experience attachment difficulties or emotional distress may rely more heavily on thumb sucking to regain a sense of control and comfort.

It is important to recognize that thumb sucking is often a normal developmental behavior influenced by both physical and emotional factors. While most children eventually outgrow the habit naturally, understanding the underlying causes can help parents and caregivers respond with patience and support rather than frustration. Addressing the emotional needs of the child and providing alternative methods of comfort can reduce the reliance on thumb sucking over time.

Thumb sucking is considered a normal and natural behavior in infants and young children, especially during their first few years of life. Most children begin thumb sucking in infancy, and it often peaks between the ages of 18 months and 3 years. During this stage, the habit usually serves as a source of comfort and self-soothing, particularly during times of tiredness or stress. Pediatricians and dentists generally agree that thumb sucking is harmless if it stops by the age of 4 or 5, as the child's mouth and teeth are still developing and less likely to be affected.

However, thumb sucking may become a concern if it continues beyond the age of 5, especially if it occurs frequently and with strong sucking intensity. Prolonged thumb sucking after this age can potentially lead to dental problems such as misaligned teeth, changes in the shape of the roof of the mouth, or bite issues like open bite and overjet. Additionally, persistent thumb sucking might affect speech development and cause social challenges as children may be teased or feel self-conscious among peers. The frequency and intensity of thumb sucking vary widely among children and play a critical role in determining whether the habit could cause problems. Some children suck their thumbs only occasionally, such as when falling asleep, while others may suck their thumbs throughout the day with significant force. Intense, frequent sucking is more likely to influence dental development and create long-term concerns. Understanding these differences helps parents and healthcare providers decide when to intervene and support the child in breaking the habit.

Types of thumb suckers

Children who suck their thumbs can generally be categorized into two types: passive and aggressive thumb suckers. Passive thumb suckers tend to suck their thumbs gently and mostly during specific times, such as when they are tired or falling asleep. This type of thumb sucking is usually less intense and less frequent, often serving as a calming ritual that doesn't exert strong pressure on the teeth or jaw. Passive thumb sucking is less likely to cause dental or speech problems and is more likely to resolve naturally as the child grows.

On the other hand, aggressive thumb suckers apply stronger suction and may suck their thumbs frequently throughout the day, not just during rest or sleep. This intense sucking can put considerable pressure on the developing teeth and oral structures. Aggressive thumb sucking often leads to more noticeable dental issues such as misalignment of the teeth (malocclusion), changes in the shape of the palate, and bite problems like an open bite or overjet. The force exerted can also affect speech development and sometimes lead to calluses or damage on the thumb itself.

The intensity of the sucking habit plays a crucial role in its potential impact on a child's oral health. While gentle sucking is mostly harmless, repeated and forceful thumb sucking can disrupt the normal growth and alignment of teeth and jaws. Therefore, recognizing whether a child is a passive or aggressive thumb sucker helps parents and healthcare professionals decide when intervention is necessary to prevent long-term dental complications.

Effects of prolonged thumb sucking

When thumb sucking continues beyond the early childhood years, it can lead to several dental problems that may require professional treatment. One of the most common issues is malocclusion, which refers to the misalignment of teeth. Prolonged thumb sucking can cause an open bite, where the front teeth do not meet properly when the mouth is closed, or an overbite, where the upper front teeth excessively overlap the lower teeth. These changes occur because the constant pressure from the thumb alters the natural position of the teeth and the shape of the palate. If left untreated, these dental irregularities can affect chewing, speech, and overall oral health.

In addition to dental problems, prolonged thumb sucking may also contribute to speech difficulties. The altered position of the teeth and jaw can affect the tongue's placement during speech, leading to issues such as lisping or difficulty pronouncing certain sounds. This can impact a child's communication skills and may require speech therapy alongside dental correction. Early intervention can help minimize these complications and support proper speech development.

Another physical effect of thumb sucking is skin damage on the thumb or finger. Constant sucking can cause the skin to become dry, irritated, or calloused. In some cases, children may develop infections or even nail deformities due to the repetitive friction and moisture. These visible signs can sometimes cause discomfort and make the habit harder to break if the child experiences pain or soreness.

Management and Treatment Strategies

Managing thumb sucking requires patience, understanding, and gentle intervention from parents and caregivers. It is important to avoid harsh punishment or negative reactions, as these can increase a child's anxiety and make the habit harder to break. Instead, parents should calmly explain why stopping thumb sucking is important and offer comfort and reassurance. Establishing a supportive and positive environment encourages children to gradually reduce their dependence on the habit without feeling pressured or shamed.

Behavioral techniques are among the most effective ways to help children stop thumb sucking. Tools such as reward charts can motivate children by tracking their progress and celebrating

milestones. Offering praise and small rewards when the child refrains from thumb sucking reinforces positive behavior and helps build their confidence. Distraction techniques, like engaging the child in activities that keep their hands busy, can also reduce the urge to suck their thumbs. In some cases, physical aids like thumb guards or gloves can be useful. These devices serve as gentle reminders and make thumb sucking less comfortable or less accessible. Similarly, some parents apply safe, bitter-tasting solutions on the child's thumb to discourage sucking. It is important to use these methods carefully and in combination with positive reinforcement to avoid causing frustration or distress. Consulting a pediatric dentist or healthcare professional before using these aids can ensure they are appropriate and safe for the child.

Overall, positive reinforcement rather than punishment remains the cornerstone of successful thumb sucking management. Encouraging the child with empathy and patience, while providing alternative ways to self-soothe and cope with stress, creates the best conditions for the habit to fade naturally. Early support and consistent strategies help children transition away from thumb sucking in a healthy, confident manner.

Preventing prolonged thumb sucking involves offering children safe and healthy alternatives to satisfy their need for comfort and self-soothing. Providing a favorite blanket, stuffed toy, or soft object can help redirect their urge to suck their thumb. These items can become comforting companions, especially during times of stress or when the child is trying to fall asleep, reducing the reliance on thumb sucking.

Distraction techniques are another useful prevention strategy. Engaging children in activities that keep their hands busy—such as playing with puzzles, drawing, or building blocks—helps divert their attention away from thumb sucking. Encouraging active play and involving them in tasks that require hand use not only distracts them but also supports healthy development. Consistently offering these alternatives early on can reduce the chance that thumb sucking becomes a long-term habit.

New Memberships 2024/2025

No.	Name	Section
1	Ms. Sobiya Gobiraj	Section A
2	Ms. Saruga Kirisanth	Section A
3	Ms. Shajiththa Sureranjan	Section A
4	Ms. B. Abilashi	Section A
5	Dr. J. Samantha Tharani	Section B
6	Dr. Balasubramaniam Janarthanan	Section B
7	Ms. Suloshini Purusoththaman	Section B
8	Ms. Sweshthika Sureshkumar	Section B
9	Ms. Sankavi Mithusan	Section B
10	Mr. Diron Demel D. X.	Section B
11	Ms. Vinothini Rasenthiram	Section B
12	Ms. Sangavi Tharmaratnam	Section B
13	Ms. Kayalvizhy Thapalingasivam	Section B
14	Ms. Keerththiga Raveendrasothy	Section B
15	Ms. Kamshika Kanthappu	Section B
16	Ms. Nirupa Ariyaraththinam	Section B
17	Ms. Sribavatharani Ramakrishnan	Section B
18	Ms. Mathanki Sutharsan	Section C
19	Dr. Vallipuram Anavarathan	Section C
20	Dr. Sunthananthan Sathish	Section C
21	Ms. Mayoori Ambalavanar	Section C
22	Dr. Sarujah Navaratnavelu	Section C
23	Ms. Negetha Subramanieam	Section C
24	Dr. Linthuja Yogenthiran	Section C
25	Dr. Sukantha Rajenth	Section C
26	Dr. Nagarasa Harishanth	Section C
27	Ms. Kavipriya Parthipan	Section C
28	Dr. Karunya Srikrishnarajah	Section C
29	Ms. Swarnalatha Gunachelvan	Section C

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Secretary:	Dr. P. A. Amalraj
Editor:	Ms. S. Gobiraj
Members:	Prof. P. Iyngaran
	Prof. T.W. Shanthakumar
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Section B – Applied Sciences

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	Ms. T. Sivaskaran
	Dr. V. Yogaratnam
	Dr. T. Thevananth
	Dr. J. Thevananth

காலம் தாண்டிய சிந்தனை.....!

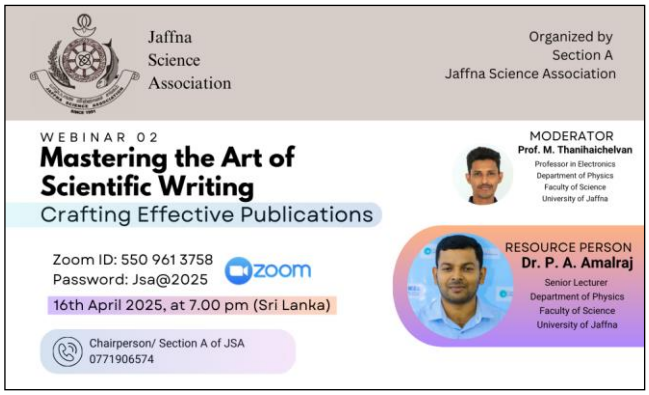
"ஆதிகால மனிதன் உராயும் கற்களில் இருந்து தோன்றிய தீப்பொறி போன்ற இயற்கை நிகழ்வுகளைக் கண்ணுற்று அதிசயப்பட்டான். இதனால் மனிதன் இயற்கை நிகழ்வுகளைக் கூர்ந்து அவதானிக்கவும் அவைபற்றிய தரவுகளைச் சேகரிக்கவும் அத்தரவுகளின் அடிப்படையில் இயற்கை நிகழ்வுகளை விளங்கிக்கொள்ளவும், அவற்றிக்கு விளக்கங்களைக் கொடுக்கவும் பழக்கப்பட்டான். இவ்வாறு நாளடைவில் மனித சமுதாயத்தில் அறிவியலாளர் சமூகங்கள் உருவாகின. இச்சமூகங்களின் அயராத முயற்சியால் ஏற்பட்ட அறிவியல் கண்டுபிடிப்புக்கள் அநேகம். மனிதகுல மேம்பாட்டிற்கு இக்கண்டு பிடிப்புகளின் பயன்பாடுகள் பிரமிக்கத்தக்கவை. நோவின்றி அறுவைச் சிகிச்சை செய்ய லேசர்க் கதிர்த் தொழில்நுட்பம், உலகமே சுருங்கிவிட்டதென்று பிரமிக்கவைக்கும் தொலைத்தொடர்புத் தொழில்நுட்பங்கள், பிரதேசமொன்றின் தட்ப வெட்ப சூழலுக்கு ஏற்ப உயர்விளைச்சலைக் கொடுக்கும் தானிய உற்பத்திக்கு உயிர்த்தொழில் நுட்பம் போன்ற எண்ணற்ற தொழில்நுட்பங்களை உலகுக்குத் தந்து அறிவியலாளர் சமூகம் இன்று உயர்ந்து நிற்கிறது.

இவற்றுக்கெல்லாம் அடிப்படைத்தளமாக அமைந்தது யாது என்பதை யாழ். விஞ்ஞான சமூகம் கவனத்திற்கொள்ள வேண்டாமா? ஒருவன் அறிவியலாளனாகப் பரிணமிக்க அவன் தனது இளமைக்காலத்தில் பெறும் ஆய்வுகூட அறிவின் முழுமைத்துவமே காரணமாகும். இதனாலன்றோ மேற்கத்தைய நாடுகள் பாடசாலைகளில் செயல் விளக்கங்களுடன் கூடிய கற்பித்தலையே ஊக்குவிக்கின்றன. ஆனால் எமது பிரதேசத்தில் நடப்பதென்ன? மேலை நாட்டுக் கற்பித்தலுக்கு எதிர்மாறாக பல பாடசலைகளில் ஆய்வுகூடங்கள் அணுகாத பகுதிகளாக்கப்பட்டு, வகுப்பறைகள் பாடத்திட்டத்தை மட்டும் எடுத்துக் கூறும் பகுதிகளாக்கபட்டுள்ளன. தனியார் கல்வி நிறுவனங்கள் மாணவரை பரீட்சைகளுக்கு மட்டும் முகம் கொடுக்க வல்லவர்களாக்க முனைகின்றன. இவற்றால் அறிவியலில் சாதனையாளராக வல்ல திறமை இருந்தும் எமது மாணவர்கள் சரியான வழியில் நெறிப்படுதலின்றி அறிவியல் மாணவனிற்குரிய குணாதிசயங்கள் கூட அற்றவர்களாகின்றனர். அறிவியலை கற்பதற்கு பக்குவப்படுத்தப்படாமல் பல்கலைக்கழகங்களுக்குச் சென்று அறிவியல் கோட்பாடுகளைச் சீரணிக்கத் திராணியற்றவர்களாக வெளியேறுகின்றனர். எமது இளவல்களின் இந்நிலை எமது பிரதேசத்திற்கும் சமூகத்திற்கும் ஆரோக்கியமானதா? மாற்றப்படவேண்டியதொன்றல்லவா?

இம்மாற்றத்தைத் தூண்டுவது யாழ். விஞ்ஞான சமூகத்தின் கடமையாகும். முயல்வோமா?"

(1994ல் யாழ்ப்பாண விஞ்ஞான சங்கத்தின் இதழில் வெளியான பேராசிரியர் க. கந்தசாமியின் இதழாசிரியர் குறிப்பிலிருந்து)

Sectional Activities



The **JSA Section A** successfully organized a webinar titled "Mastering the Art of Scientific Writing" on 16 April 2025, with around 80 enthusiastic participants joining via Zoom. The session was led by Dr. Amalraj Peter Amalathas, a distinguished academic from the Department of Physics, Faculty of Science, University of Jaffna. His insightful presentation offered valuable guidance on crafting well-structured and impactful scientific manuscripts, covering both foundational and advanced aspects of scientific communication. The event was moderated by Prof. M. Thanihaichelvan, also from the Department of Physics, who ensured the smooth flow of discussions and facilitated an engaging Q&A session. The webinar proved to be a highly beneficial learning experience for researchers, academics, and students seeking to enhance their scientific writing skills.