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From the Editor's

Dear Readers,

In the September issue of our Newsletter, we received several popular articles from diverse fields. All the authors deserve great appreciation for sharing articles in huge numbers. Please continue sending articles to our Publication team and share published newsletter with your friends also.

I would like to thank the Editorial team including Print, Designer and Publication committee for their efforts throughout the edition.

Your suggestions are always welcome for improvement.

Dr. R. S. Tomar
Editor-in-Chief

TREE PLANTATION DRIVE AND ENVIRONMENTAL AWARENESS EVENT (19TH AUGUST 2023) REPORT BY YRCU

The Youth Red Cross Unit at Al Falah University, Faridabad organized a noteworthy Tree Plantation Drive on August 19th in collaboration with the MBBS students, along with Dr. Maj. Gen. PK Singh (Principal), Dr. Shweta Sehgal (Prof. Department of Physiology, YRCU convener & Faculty In-charge), Shubh Pratap Solanki (Student President), Wafa Basu (Student Secretary), and Pranshu Srivastav (Student joint Secretary) of the YRCU. The event took place at the Al Falah School of Medical Sciences and Research Centre in Faridabad, and it was graced by the presence of the chief guest, Prof. Javed Ahmad, a distinguished former Professor from the Department of Botany at Jamia Hamdaerd and President, National Environmental Science Academy (NESA), New Delhi.

The event was centred on a collective endeavour to contribute to the environment and in-still a sense of environmental responsibility among the participants. With 250 saplings planted, the attendees were proactive in their efforts to promote greenery and sustainable living.

Prof. Javed Ahmad, the Chief Guest of the event, delivered an insightful lecture on the significance of trees and their impact on the ecosystem. His extensive knowledge and passion for botany left a lasting impression on the audience, especially the MBBS students who gained valuable insights into the environmental sciences. As the President of the National Environmental Science Academy (NESA) in New Delhi, his guidance has been instrumental in shaping environmental policies and thoughts on crucial matters. The organizing committee arranged sweets and sandwiches for each student.

In summary, the Tree Plantation Drive and Environmental Awareness Event on August 19th marked a significant step towards environmental conservation and awareness. With 250 saplings planted, an enlightening lecture by Prof. Javed Ahmad, and the distribution of certificates, the event succeeded in promoting a sense of responsibility towards nature while also acknowledging the creative talents of the youth.

A Group photo of staff members , volunteers with the Chief Guest before administrative block of Al-Falah.

In the lower photographs the students are receiving participation certificates after the lecture of the Chief Guest in the Auditorium

In the last Prof. Javed Ahmad thanked the authorities of the Al-Falah University, members of the organizing team, volunteers, participants and students of the MBBS as well as the horticulture staff of the University.

Medical faculty, students and the Chief Guest during the lecture and plantation drive.








Staff and medical faculty of Al-Falah during plantation drive.

Medical faculty, students and the Chief Guest during plantation drive at Al-Falah University campus.

SINGLE-CELL GENOMICS UNVEILING THE HIDDEN DIVERSITY OF PLANT CELLS

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Introduction

In the world of science, one groundbreaking technology has emerged to change the way we understand and study plant biology: single-cell genomics. Just as a single seed can sprout into a magnificent tree, single-cell genomics allows scientists to uncover the incredible complexity hidden within every individual plant cell. This revolutionary approach is opening new doors in plant research, enabling us to explore the genetic diversity, responses to stress, and developmental mysteries of plants like never before.

It is a revolutionary transformation occurring at the intersection of biology and technology, and it's not limited to plant or animal kingdom. Single-cell genomics, an innovative field, has made its mark in plant science, opening a portal to explore the remarkable diversity and complexity hidden within the world of plant cells. In this chapter, we embark on a journey into the fascinating realm of single-cell genomics for plants, delving into its methodologies, applications, challenges, and the profound impact it's having on our understanding of plant biology.

The Complexity Within a Single Cell

For years, plant biologists have been unraveling the mysteries of plants at the tissue and organ levels. While this has yielded tremendous insights, it's akin to studying a forest but missing the beauty of each individual tree. Enter single-cell genomics, which has given us the power to explore the genetic landscape of an individual plant cell.

Every cell in a plant is unique, with its own set of genetic instructions and responses to the environment. Single-cell genomics allows scientists to isolate and analyze these individual cells, providing an unprecedented view into the diversity of plant biology. From root cells that seek water deep underground to leaf cells that capture sunlight, each has a role to play, and we can now understand how they do it at a molecular level.

The Diversity of Plant Responses

Plants are not passive organisms; they actively respond to their surroundings, adapting to changing conditions. Single-cell genomics has been a game-changer in understanding these dynamic responses. For example, during a drought, some plant cells might activate drought-tolerance genes, while others focus on conserving water. This heterogeneity was difficult to capture with traditional methods but is now within our grasp.

By studying single cells, scientists can decipher the genetic switches that turn on or off in response to stressors like pests, diseases, or changing climate conditions. This knowledge is invaluable for developing resilient crop varieties that can thrive in the face of adversity, ensuring food security for our growing global population.

Plant Development Unveiled

Another exciting area of exploration is plant development. From a tiny seed to a towering tree, the journey of a plant is a masterpiece of nature. Single-cell genomics is helping scientists understand the intricacies of this process at a cellular level. We can now track how a single cell transforms and divides to create the myriad of cell types that form a mature plant.

This knowledge is not limited to crop improvement. It can also lead to breakthroughs in plant-based medicines, biofuels, and even the restoration of ecosystems. By understanding the genetic underpinnings of plant development, we can unlock new possibilities for sustainable solutions.

Pioneering Insights: A Historical Perspective

The roots of single-cell genomics in plants can be traced back to early efforts in plant anatomy, when researchers first began to uncover the differences in cell types. However, it wasn't until the advent of molecular techniques that we could truly peer into the genetic landscape of individual plant cells. Single-cell genomics builds on the rich tradition of plant research, expanding our view from macroscopic to microscopic dimensions.

The Tools of the Trade:
Single-Cell Genomics Technologies

A plethora of innovative technologies has propelled single-cell genomics in plants to new heights. These methods enable scientists to isolate, sequence, and analyze the genetic material of individual plant cells, unraveling the intricate patterns of gene expression and cellular diversity. Techniques such as laser-capture microdissection (LCM), flow cytometry, and microfluidics-driven approaches have revolutionized our ability to dissect the complexity of plant tissues at the single-cell level. Figure 1 explains about the flow of single cell genomics.

Applications in Plant Development and Specialization

Single-cell genomics has illuminated the inner workings of plant development and cellular specialization, casting a spotlight on the genetic choreography that guides plant growth, organ formation, and response to environmental cues.

Roots and Shoots: By analyzing the gene expression

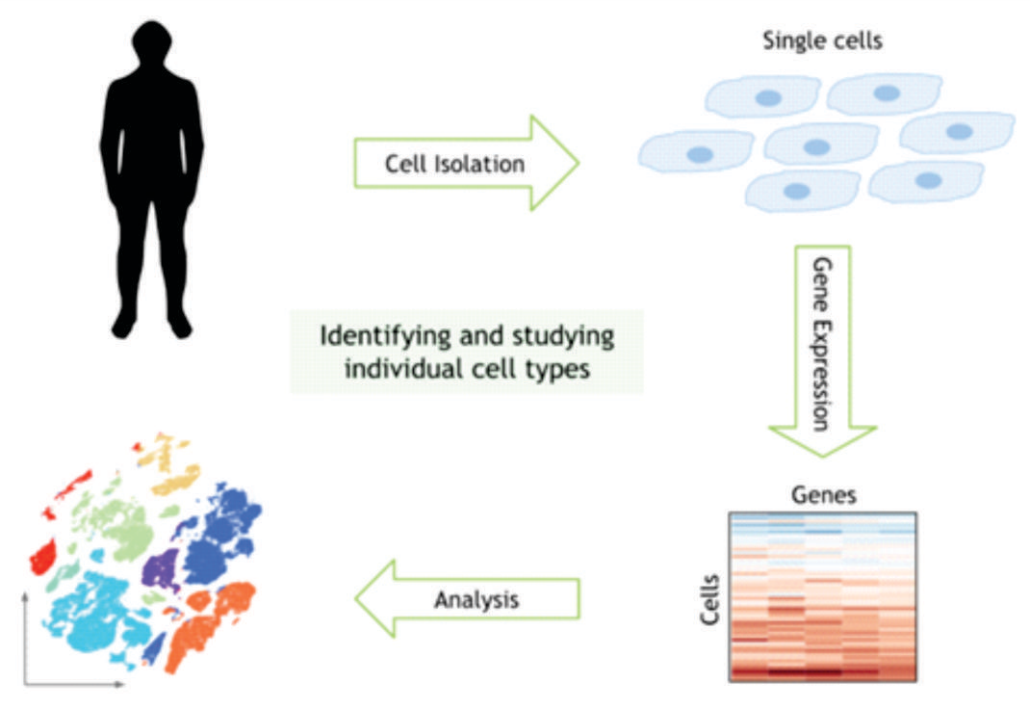

Fig.: 1: Workflow of single cell genomics (Fig adapted from Nvidia Developers)

profiles of root and shoot cells, scientists are gaining insights into how different cell types collaborate to fuel growth, nutrient uptake, and response to stress.

Stomatal Patterning: Understanding the formation and distribution of stomata—tiny pores on leaves that regulate gas exchange—has been a longstanding challenge. Single-cell genomics offers a novel approach to unraveling the intricate signaling pathways that govern stomatal patterning.

Unraveling Plant-Pathogen Interactions

Plants are constantly engaged in a battle for survival against pathogens. Single-cell genomics is providing a window into the molecular dialogues between plants and pathogens, shedding light on the strategies plants employ to defend themselves against infection.

Immune Responses: By studying the expression profiles of individual immune cells during infection, researchers are dissecting the complex defense mechanisms that plants mobilize to fend off pathogens.

Pathogen Strategies: On the flip side, single-cell genomics has revealed the tactics employed by pathogens to infiltrate plant tissues and suppress host immune responses.

Challenges and Future Prospects

While single-cell genomics for plants holds immense promise, it also faces challenges that need to be addressed for the field to reach its full potential.

Cell Wall Challenges: Plant cells are encased in rigid cell walls that can complicate the isolation and analysis of individual cells. Developing techniques to overcome these barriers is essential for comprehensive single-cell genomics analyses.

Data Integration: Integrating single-cell genomics data with other omics datasets (such as proteomics and metabolomics) poses challenges due to the diverse nature of these datasets. Developing methods for cross-omics integration will be crucial.

A Glimpse into the Future: The Evolution of Plant Single-Cell Genomics

The trajectory of plant single-cell genomics points toward exciting directions that promise to reshape our understanding of plants in their entirety.

Spatial Transcriptomics: Advancements in spatial transcriptomics techniques will allow researchers to visualize gene expression within intact plant tissues, providing insight into how cells interact in their native environment.

Climate Resilience: As the world faces climate change, single-cell genomics could offer insights into how plants adapt and respond to changing conditions, potentially guiding crop improvement efforts.

Conclusion

The landscape of plant biology is transforming as single-cell genomics peels back the layers of complexity within individual plant cells. From roots to leaves, from growth to defense, this field is unveiling the dynamic choreography

that governs plant life. As technology and methodology continue to evolve, single-cell genomics for plants holds the promise of unlocking new avenues of discovery and redefining our understanding of the intricate symphony that is plant biology.

APPLICATION AND USES OF THYME : A MEDITERRANEAN HERBAL SPICE

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Thyme (*Thymus vulgaris* Linn.), often known as 'Common Thyme' or 'Garden Thyme,' is a Lamiaceae (Labiatae) family herb spice that has been utilised by humans since ancient times. The herb generates the commercial Red Thyme oil after distillation. Triterpinaoid saponins, flavones, ursolic acid (1.5 percent in tops), caffeic acid, bitter principle, tannins, and resins are the other elements of thyme, in addition to oil. Aside from that, there are a number of other wild species that produce volatile oil. *T.serpyllum* L., *T.zygus* L., and *T.satureioides* Coss and Bal are the species. The main chemicals found in *T.zygus* and *T.serpyllum* are thymol, linalool, and linalyl acetate. Genuine thyme oil is made from *T.zygus* and its var. gracitis.

Chemical constituents

In *T.satureioides*, the primary constituents are thymol, burneol, and -terpineol. In commerce, the oil known as 'oil of thyme' is a colourless, yellow or red liquid with a distinct pleasant odour and spicy flavour. The oil's composition and quality are said to differ depending on the geograpical location. The active principle (Thymol) is present in high concentrations (60 percent) in Spanish oil and low concentrations (20-35 percent) in French and Moroccan oils, although carvacrol is present in modest amounts. ß-pinene, camphene, P-cymene, -terpinene, linalool, l-borneol, geraniol, caryophyllene, an unidentified sesquiterpene and a sesquiterpinic alcohol, 4-terpineol, and trans- 4-thujanol are also found in the oil. Sabinene, verbenene, 1-octen-3-ol, methyl thymol, verbenone, -muurolen, -cadinene, and P-cymen-8-ol are the other other components found in traces. The seeds produce 37% of a drying oil that is primarily made up of linolenic, lindeic, and oleic acids. Furthermore, hydroxy linolenic acid is found. It is one of the most often used spices, both fresh and dried, in a variety of European cuisines.

Uses

The leaves and flowers are used to flavor and season a variety of foods, particularly fish and meat recipes, as well as for garnishing. The leaves are reported to have laxative, stomachic, and tonic effects, as well as being beneficial for the kidneys and eyes and blood purifiers. Insect repellant properties are also present in the herb. It is also utilized in fragrance and the distillation of alcoholic beverages. THYMI HERBA in pharmacy refers to the dried leaves and flower tips of the thyme of trade, which contains less than 3% of stems over 1 mm in diameter and 2% of other organic materials, yielding 4% acid insoluble ash. The extracts from the shoots of flowering thyme plants have antibacterial properties against *Micrococcus pyogenes* var. *aureus* and other germs.

The herb which has a pungent taste is reported to possess antiseptic, anthelmentic, expectorant, carminative, diuretic, alexiteric, emmenogogue and sedative properties; good in liver complaints, pain in the spleen, liver or chest; useful in cold asthma and bronchitis. It thins phlegm and blood. It is used in mouth washes and gargles. Formulation containing thyme oil are available for treatment of whooping caugh and bronchitis. The oil is used as a diffusible stimulant in collapse. It is mixed with olive oil and is used as a rubefacient and counter irritant. It is also used in veterinary medicine. Thyme oil is used in soaps, perfumes and for flavouring food products such as meat, sausages, sauces and canned food. The oil has antifungal and anthelmintic properties and is used as an intestinal antiseptic in treating hookworms. It is also used as a cure for many fungal infections of the skin. The seeds are given as vermifuge. The infusion of the seeds is also used in skin eruptions or diseases. The seed oil has a potential use as a superior drying oil. The plant can be grown for ornamental edging along the path in gardens, and is also suitable for rockeries.

Distribution and production

hyme grows wild in almost all the countries bordering the Mediterranean and also over much of Asia and in parts of Central Europe and best in the hills. It is found in the Western temperate Himalayas, from Kashmir to Kumaon between attitudes of 1525 m and 4000 m. Thyme is grown in Europe, Australia and North Asia. It is now cultivated in France, Germany, Spain, Italy, Greece and North Africa, Canada and the USA. In India thyme may be cultivated in the Himalayas from Kashmir to Kumaon. Among the countries producing thyme oil, Spain stands first followed by France, Morocco and the Mediterranean countries. The bulk of the world demand for this oil is met by Sapin and Turkey.

Description of the plant
T. vulgaris is a low evergreen perennial under shrub reaching a height of 20-30 cm.

Whereas, the wild thyme (*T. serpyllum* L) creeps on the soil surface and has broad leaves with a weaker odour. The roots are fairly robust and the stems are branched. The former will have oblong - lancelolate sessile leaves of 10 mm x 3 mm size with orange - brown, glandular dots and coriaceous. The young leaves are slightly wooly. The flowers are small, purplish or bluish to almost white, united in spikes at the tip of the branches and have a bilabiate, tube - like calyx and a bilabiate, tubular corolla with a 3 - lobed lower lip. Fruit is a nutlet, brown, 4-sectioned, smooth and is found in the remains of the calyx. The entire plant is aromatic.

Propagation
Thyme can be grown both vegetatively and by seed, as well as through division of old plants, cuttings, and stacking of side shoots in March and April. The seeds are planted directly in rows or in well-prepared nursery beds in healthy soils. Because seedlings are small and inconspicuous for several weeks after germination, good soil is preferred for nursery.

Harvesting and yield
Five months after sowing/planting, the leaves and blossoms are harvested which is used for culinary and medicinal reasons. To prevent loss of flavour, the leaves and blossoms are plucked off the plants, or else shoots of about 15 cm are cut off from the plants, dried in the shade or in a dryer, and kept in airtight containers immediately after harvest. The dried leaves are twisted and brownish-green in colour, with a length of around 6-7 mm. Powdered and packed dry shoots are also an alternative forms. Dry herb yields range from 1,100 to 2200 kg per hectare under ideal conditions. During the first year, the yield is relatively low.

After three or four years, the plants become woody, and replanting is required to get the oil. Fresh herb is picked on dry days is best for oil extraction. The herb is harvested when it is just about to blossom. Lower sections of the stem, as well as any yellow or brown leaves, must be eliminated at the time of harvesting.

Distillation of oil and oil yield
The oil is distilled from the fresh flowering tops by steam distillation. The herb contains about 2 per cent essential oil and the oil recovered by distillation is about 21 kg per hectare.

AI-POWERED PRECISION AGRICULTURE: RESHAPING FARMING FOR EFFICIENCY, SUSTAINABILITY, AND GLOBAL IMPACT

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This article delves into the transformative effects of Artificial Intelligence (AI) on precision agriculture, also known as AgriTech or AgTech. The convergence of AI and farming practices reshapes the industry by leveraging machine learning, data analytics, and automation to optimize resource allocation and decision-making. Precision agriculture maximizes crop yields while minimizing waste through real-time data from AI technologies such as remote sensing, satellite imagery, and IoT sensors. AI-driven insights enable precise recommendations for irrigation, fertilization, and pest control, enhancing productivity and reducing environmental impact. Moreover, AI enhances crop health assessment, accelerates genetic research, and fosters climate-resilient crops. The article explores AI's potential in predictive analytics, genetic editing, global food security, and sustainable practices. Automation in agriculture tasks via AI-driven robotics and machinery elevates productivity. While AI offers positive environmental impact through resource optimization and energy efficiency, concerns about energy consumption and hardware management warrant attention. A balanced approach to AI's development, embracing energy-efficient algorithms and renewable energy integration, ensures its positive contribution to sustainable practices. The article concludes by discussing potential research directions and the complex interplay of AI's benefits and environmental concerns.

Keywords: Artificial Intelligence, precision agriculture, AgriTech, resource optimization, crop health assessment, genetic research, sustainable farming, automation, energy efficiency, environmental impact, renewable energy, balanced approach.

Introduction:
Agriculture has always been at the forefront of technological advancements, from mechanization to biotechnology. The emergence of Artificial Intelligence (AI) represents a new era in agricultural innovation, with the potential to reshape the industry in profound ways. The application of AI in agriculture, often referred to as AgriTech or AgTech, encompasses various technologies and methodologies that leverage machine learning, data analytics, and automation to optimize farming practices. The incorporation of AI into this sector has revolutionized traditional practices, offering opportunities to tackle

challenges such as population growth, resource scarcity, and climate change. Artificial Intelligence has made remarkable strides in reshaping industries, enhancing productivity, and improving decision-making processes. This technology's impact on the environment, both positive and negative, is increasingly gaining attention. Precision agriculture aims to optimize farming practices by applying data-driven insights to improve crop yield, resource efficiency, and environmental sustainability. The emergence of AI technologies, including machine learning, data analytics, and sensor networks, has provided unprecedented capabilities to analyze vast amounts of data and extract valuable insights. This article discusses the transformative effects of AI on precision agriculture and its potential to shape the future of farming[1]. The convergence of AI and biotechnology holds the promise of revolutionizing healthcare, agriculture, and industrial processes. AI's capability to handle large volumes of data, identify patterns, and learn from diverse sources positions it as a powerful tool to accelerate research, streamline processes, and drive innovation in biotechnology. The integration of emerging AI technologies into agriculture presents a transformative opportunity to address these challenges and steer the sector toward sustainable growth and development[2].

Advancing Precision Agriculture:
Precision agriculture involves the targeted use of resources to maximize crop yields while minimizing waste. AI technologies such as remote sensing, satellite imagery, and IoT (Internet of Things) sensors provide real-time data on soil conditions, weather patterns, and crop health. Machine learning algorithms can process this data to generate precise recommendations for irrigation, fertilization, and pest control. By adopting these AI-driven insights, farmers can optimize their resource allocation, leading to increased productivity and reduced environmental impact[3].

Crop Health Assessment and Disease Detection:
The fusion of AI with sensors, drones, and satellite imagery has redefined crop health assessment and disease detection. AI algorithms analyze visual and spectral data to identify early signs of plant stress and diseases. This early detection enables timely intervention, preventing yield loss and reducing the need for chemical treatments[4].

Genetic Research and Crop Development:
AI accelerates genetic research by analyzing vast genomic datasets to identify desirable traits in crops. This technology aids in breeding programs, enabling the development of crops that are more resilient to pests, diseases, and changing climatic conditions. AI also expedites the discovery of novel genes and their functions, unlocking possibilities for crop improvement[1]. AI-guided genetic editing holds the potential to create crops that are more resilient to changing climates, diseases, and stressors. Machine learning algorithms can analyze large datasets of genomic information to identify genes associated with desirable traits. This information can then be used to precisely edit the DNA of crops, accelerating the development of varieties with improved yield, nutritional content, and environmental adaptability[5].

Improving Predictive Analytics
Predictive analytics powered by AI can enhance pest and disease management. By analyzing historical data on pest outbreaks, weather patterns, and crop characteristics, AI algorithms can predict potential infestations and diseases. This allows farmers to take proactive measures, such as targeted pesticide applications or implementing disease-resistant crop varieties. The accuracy of these predictions is expected to improve as AI algorithms continuously learn and adapt from new data inputs.

Advancing Genetic Editing
AI-guided genetic editing holds the potential to create crops that are more resilient to changing climates, diseases, and stressors. Machine learning algorithms can analyze large datasets of genomic information to identify genes associated with desirable traits. This information can then be used to precisely edit the DNA of crops, accelerating the development of varieties with improved yield, nutritional content, and environmental adaptability[6].

Ensuring Global Food Security and Sustainability
Perhaps one of the most crucial roles of AI in agriculture is its contribution to global food security and sustainable farming practices. As the world's population continues to grow, there is increasing pressure on agriculture to produce more food while minimizing negative environmental impacts. AI's ability to optimize resource allocation, predict and prevent crop failures, and develop climate-resilient crops can significantly contribute to meeting these challenges.

Automation in Agricultural Tasks: AI-driven automation has transformed labor-intensive tasks in agriculture. Robotics and automated machinery powered by AI technology perform activities such as planting, weeding, and harvesting with precision and efficiency. This reduces the dependence on manual labor, enhances productivity, and lowers operational costs.

Potential Future Developments The evolution of AI will continue to reshape precision agriculture in the following ways:
Enhanced Decision Support Systems As AI algorithms become more sophisticated, decision support systems will offer real-time insights tailored to individual farms. These systems will provide personalized recommendations based on a farm's unique characteristics, enabling farmers to optimize practices and resource allocation. Precision Water and Nutrient Management AI will play a pivotal role

in precise water and nutrient management. By analyzing soil data, weather patterns, and crop requirements, AI can dynamically adjust irrigation and fertilization schedules. This ensures that plants receive the right amount of resources at the right time, minimizing waste and promoting sustainable practices. Climate Resilience AI's ability to analyze climate data will empower farmers to adapt to changing environmental conditions. AI-driven models can identify suitable crop varieties for specific climates, predict extreme weather events, and develop strategies to mitigate climate-related risks[7].

Sustainable Pest Management AI-supported pest management systems will optimize the use of pesticides by accurately identifying pest populations and predicting their dynamics. This targeted approach reduces the environmental impact of chemical usage while maintaining crop health. AI in Drug Discovery AI's predictive algorithms can rapidly analyze molecular structures and interactions, expediting drug discovery by identifying potential drug candidates and optimizing their properties. This significantly reduces costs and time associated with traditional drug development approaches. Biomarker Identification and Disease Diagnosis AI-driven analysis of genetic and proteomic data enables the identification of biomarkers for disease diagnosis, prognosis, and personalized treatment strategies. This facilitates early detection and targeted therapies, enhancing outcomes[8].

Positive Impact of AI on the Environment: AI offers innovative solutions to various environmental challenges, contributing to sustainability and resource efficiency. Examples of its positive impact include:

- **Resource Optimization:** AI algorithms can optimize processes, such as traffic flow, supply chain management, and water distribution, leading to reduced resource consumption and improved efficiency.
- **Energy Efficiency:** AI-driven systems can manage energy consumption in buildings, factories, and transportation, thereby reducing energy wastage.
- **Renewable Energy:** AI aids in enhancing the performance and management of renewable energy sources, making them more reliable and cost-effective.
- **Conservation Efforts:** AI-powered monitoring and analysis tools assist in wildlife protection, deforestation monitoring, and marine ecosystem preservation[9].

Environmental Concerns Associated with AI: Despite its potential benefits, AI's environmental impact cannot be ignored. Two primary concerns include:

- **Energy Consumption:** The training of AI models and operation of data centers demand substantial energy resources, contributing to carbon emissions.
- **Hardware Production and Disposal:** The manufacture and disposal of hardware components for AI systems can result in e-waste accumulation and resource depletion.

Striking a Balance: To harness AI's potential while safeguarding the environment, it is crucial to adopt a balanced approach:

- **Energy-Efficient Algorithms:** Researchers and developers should prioritize energy-efficient AI algorithms to minimize computational demands.
- **Renewable Energy Integration:** Data centers and AI infrastructure should transition to renewable energy sources to mitigate carbon emissions.
- **Hardware Recycling and Circular Economy:** Emphasis on recycling and responsible disposal of AI hardware components can help reduce e-waste.
- **Policy and Regulation:** Governments and regulatory bodies should establish guidelines that encourage environmentally friendly AI development and deployment.

Future Directions: As AI continues to advance, potential avenues for research and development include:

- **Green AI:** The integration of AI and environmental science can lead to the creation of "green AI," focused on addressing environmental challenges directly[10].
- **Life-Cycle Assessment:** Conducting comprehensive life-cycle assessments of AI technologies to identify and mitigate their environmental impacts.

ENROLL YOURSELF TO NESA NEWSLETTER EDITORIAL BOARD MEMBER

Editorial board members of NESA newsletter will be revised for the year 2023. All the interested applicants may send their curriculum vitae to **Editor in Chief** by **15th August, 2023.**

MEMBERS ARE REQUESTED TO PLEASE PLANT ONE TREE IN YOUR NEIGHBOURHOOD AND SEND US A SMALL BRIEF WITH PHOTOGRAPH OF THE TREE / PLANT SO WE CAN PUBLISH IN THE NESA E-NEWSLETTER

Conclusion

The integration of Artificial Intelligence into agriculture represents a paradigm shift in the industry. The future of agriculture is likely to be characterized by precision farming, automation of tasks, improved predictive analytics, advanced genetic editing, and a heightened emphasis on global food security and sustainability. By harnessing the power of AI, agriculture stands to overcome various challenges and usher in an era of efficient, productive, and environmentally responsible farming practices. AI's impact on the environment is a complex interplay of benefits and concerns. While AI presents innovative solutions to environmental challenges, its energy consumption and hardware-related issues warrant attention. A balanced approach that emphasizes energy efficiency, renewable integration, and responsible hardware practices is necessary to ensure that AI contributes positively to environmental sustainability. As AI technologies continue to evolve, ongoing research and collaboration will be essential to fully realize the potential of AI in shaping the future of agriculture.

REFERENCES:

1. **N. N. Misra, Y. Dixit, A. Al-Mallahi, M. S. Bhullar, R. Upadhyay, and A. Martynenko**, "IoT, Big Data, and Artificial Intelligence in Agriculture and Food Industry," *IEEE Internet Things J.*, vol. 9, no. 9, pp. 6305–6324, May 2022, doi: 10.1109/JIOT.2020.2998584.
2. **K. Jha, A. Doshi, P. Patel, and M. Shah**, "A comprehensive review on automation in agriculture using artificial intelligence," *Artif. Intell. Agric.*, vol. 2, pp. 1–12, Jun. 2019, doi: 10.1016/j.aiia.2019.05.004.
3. **A. Sanaeifar, M. L. Guindo, A. Bakhshipour, H. Fazayeli, X. Li, and C. Yang**, "Advancing precision agriculture: The potential of deep learning for cereal plant head detection," *Comput. Electron. Agric.*, vol. 209, p. 107875, Jun. 2023, doi: 10.1016/j.compag.2023.107875.
4. **S. Savary, "A** global assessment of the state of plant health," *Plant Dis.*, p. PDIS-01-23-0166-FE, May 2023, doi: 10.1094/PDIS-01-23-0166-FE.
5. **C. Beans,** "Crop researchers harness artificial intelligence to breed crops for the changing climate," *Proc. Natl. Acad. Sci.*, vol. 117, no. 44, pp. 27066–27069, Nov. 2020, doi: 10.1073/pnas.2018732117.
6. **T. Hanak, C. K. Madsen, and H. Brinch Pedersen,** "Genome Editing accelerated Re-Domestication (GEaReD) – A new major direction in plant breeding," *Biotechnol. J.*, vol. 17, no. 7, p. 2100545, Jul. 2022, doi: 10.1002/biot.202100545.
7. **M. H. U. Khan** *et al.*, "Applications of Artificial Intelligence in Climate-Resilient Smart-Crop Breeding," *Int. J. Mol. Sci.*, vol. 23, no. 19, p. 11156, Sep. 2022, doi: 10.3390/ijms231911156.
8. **M. G. Selvaraj** *et al.*, "AI-powered banana diseases and pest detection," *Plant Methods*, vol. 15, no. 1, p. 92, Dec. 2019, doi: 10.1186/s13007-019-0475-z.
9. **A. Boretti**, "Integration of solar thermal and photovoltaic, wind, and battery energy storage through AI in NEOM city," *Energy AI*, vol. 3, p. 100038, Mar. 2021, doi: 10.1016/j.egyai.2020.100038.
10. **T. Yigitcanlar, R. Mehmood, and J. M. Corchado**, "Green Artificial Intelligence: Towards an Efficient, Sustainable and Equitable Technology for Smart Cities and Futures," *Sustainability*, vol. 13, no. 16, p. 8952, Aug. 2021, doi: 10.3390/su13168952.

LEADING THE WAY: THE REMARKABLE ACHIEVEMENTS OF THE CHINESE ACADEMY OF AGRICULTURAL SCIENCES

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The Chinese Academy of Agricultural Sciences (CAAS) is a renowned research institution at the forefront of agricultural sciences in China. Founded in 1957, it stands as a premier organization dedicated to advancing agricultural research, promoting technological innovation, and contributing to sustainable rural development.

At its core, CAAS aims to address the critical challenges facing agriculture and food security through rigorous scientific investigation. With a wide array of research institutes and experimental stations spread across the country, CAAS covers diverse disciplines such as crop science, plant breeding, soil science, animal science, food science, agricultural engineering, and agricultural economics.

Through its comprehensive research efforts, CAAS plays a pivotal role in developing cutting-edge technologies, improving crop varieties, and enhancing farming practices. By fostering collaboration with domestic and international partners, the academy actively contributes to global agricultural development initiatives.

CAAS recognizes the importance of bridging the gap between theoretical knowledge and practical application. It conducts both fundamental research to deepen our understanding of agricultural systems and applied research to offer tangible solutions for farmers and

policymakers alike. The academy's commitment to innovation and excellence has resulted in numerous breakthroughs that have positively impacted agricultural productivity and sustainability.

Furthermore, CAAS places strong emphasis on knowledge exchange and capacity building. It actively engages in collaborations, scientific exchanges, and training programs to promote the dissemination of expertise and foster the growth of agricultural professionals.

In conclusion, the Chinese Academy of Agricultural Sciences stands as a beacon of excellence in agricultural research in China and beyond. With its multidisciplinary approach, dedication to practical application, and commitment to global engagement, CAAS continues to drive advancements in agricultural sciences, contributing to the welfare of farmers, food security, and sustainable rural development.

OUR FRIENDLY SPARROWS ARE IN DANGER !

S. K. Basu
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Sparrows are small, passerine birds belonging to the family Passeridae. They are known for their small size, typically measuring about 4 to 8 inches (10 to 20 centimeters) in length. Sparrows are characterized by their brownish-gray plumage, conical bills, and a distinctive chirping or twittering song.

These birds are often found in urban, suburban, and rural environments around the world, and they have adapted well to human presence. They feed primarily on seeds and insects, making them common visitors to bird feeders and gardens. Sparrows are social birds and often form flocks, especially during the non-breeding season.

There are many species of sparrows, with the house sparrow (Passer domesticus) being one of the most well-known and widely distributed. Sparrows are an important part of the avian ecosystem and serve as both pollinators and prey for various predators.

Sparrows, once common in many urban and rural areas, have faced population declines in some regions, but it's essential to note that they are not generally considered

globally extinct. However, there are localized declines in some places, and several factors contribute to these declines:

Habitat Loss: Urbanization and changes in agricultural practices have led to the destruction of natural habitats, reducing suitable nesting sites and food sources for sparrows.

Pollution: Air and water pollution in urban areas can harm sparrows and their food sources, affecting their health and reproductive success.

Pesticides: The use of pesticides in agriculture can reduce the availability of insects, which are essential food sources for sparrows.

Severe Competition: In some regions, invasive bird species, such as the house sparrow, have outcompeted native sparrows for food and nesting sites.

Climate Change: Altered weather patterns and changing climate conditions can affect the availability of food and nesting sites for sparrows.

Nest Site Loss: Modern building designs may not provide suitable nesting sites for sparrows, leading to a decline in urban populations.

Food Availability: Changes in agriculture and landscaping practices can reduce the availability of seeds and insects, which sparrows rely on for food.

Conservation efforts are being made to address these issues and protect sparrow populations. This includes creating bird-friendly habitats, reducing pesticide use, and raising awareness about the importance of preserving native bird species. While sparrows may face challenges in some areas, they are not globally extinct, and concerted efforts can help support their populations.

To help save sparrows from declining populations and potential extinction, several actions can be taken:

Create Sparrow-Friendly Habitats: Encourage the planting of native trees, shrubs, and wildflowers that provide food and shelter for sparrows. Install birdhouses or nesting boxes designed for sparrows in gardens and urban areas. Maintain green spaces and gardens with diverse vegetation that supports insect populations, a crucial food source for sparrows.

Reduce Pesticide Use: Promote integrated pest management (IPM) practices in agriculture and urban landscaping to minimize pesticide use. Choose organic or bird-friendly gardening methods that don't harm insect populations.

Education and Awareness: Raise awareness about the importance of sparrows and other native bird species in ecosystems. Educate communities, schools, and individuals about how to provide suitable habitats for sparrows.

Support Conservation Organizations: Contribute to or volunteer with local and national bird conservation organizations working to protect sparrows and their habitats. Participate in citizen science programs that monitor bird populations and behaviours.

Community Engagement: Organize community initiatives to create sparrow-friendly environments, such as planting community gardens or establishing bird-feeding stations. Engage in local efforts to protect and preserve natural habitats where sparrows live.

Urban Planning: Advocate for bird-friendly urban

planning policies that consider the needs of sparrows and other wildlife when designing buildings and green spaces.

Research and Monitoring: Support research efforts to better understand sparrow populations, migration patterns, and the specific threats they face.

Regulate Invasive Species: Implement measures to control invasive species, such as the house sparrow, that may compete with native sparrows for resources.

Climate Action: Support climate change mitigation efforts to reduce the impacts of shifting weather patterns and habitat disruption on sparrows.

Personal Responsibility: Refrain from using harmful pesticides in your own garden or property. Provide food and water sources for sparrows by installing bird feeders and bird baths.

By taking these collective actions at the community, regional, and global levels, we can work towards preserving sparrows and other vulnerable bird species and help prevent their extinction.

ChatGPT: THE TECHNOLOGY OF THE FUTURE AND ITS IMPLICATIONS ON VARIOUS DISCIPLINES OF MODERN SCIENCE AND TECHNOLOGY

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What is ChatGPT?
ChatGPT is a language model developed by OpenAI, based on the GPT-3.5 architecture. It's designed to understand and generate human-like text based on the input it receives. ChatGPT can engage in text-based conversations, answer questions, generate creative content, and perform various natural language understanding and generation tasks.

It has been trained on a diverse range of internet text, which allows it to have knowledge on a wide array of topics up until its knowledge cutoff date in September 2021. ChatGPT has been applied in various applications, including customer support chatbots, content generation, educational tools, and more.

OpenAI has made ChatGPT available to developers and users through APIs, allowing them to integrate its capabilities into their own applications and services. It's important to note that while ChatGPT is a powerful language model, it's not infallible and may generate incorrect or biased information, so it should be used with appropriate caution and oversight.

What are the possible merits and demerits of ChatGPT technology ?

Certainly, ChatGPT technology has both merits and demerits:

Merits:
Natural Language Interaction: ChatGPT enables natural and human-like interactions with machines, making it more accessible and user-friendly for various applications.

Versatility: It can perform a wide range of natural language processing tasks, from answering questions and generating content to language translation and text summarization.

Automation: ChatGPT can automate tasks like customer support, content creation, and data analysis, potentially saving time and resources.

Scalability: It can handle a large volume of text-based queries and tasks simultaneously, making it suitable for applications with high user demand.

Educational Tool: It can assist in education by explaining concepts, providing information, and helping with homework or research.

Multilingual Support: ChatGPT can work in multiple languages, promoting cross-cultural communication and accessibility.

Demerits:
Bias and Inaccuracy: ChatGPT may produce biased or inaccurate information, as it's trained on internet text that may contain biases and errors.

Lack of Context Understanding: It can sometimes struggle to maintain context over long conversations and may produce irrelevant or contradictory responses.

Ethical Concerns: The technology raises ethical concerns about its potential misuse for spreading misinformation, generating harmful content, or engaging in deceptive practices.

Dependency: Overreliance on ChatGPT for critical tasks like medical diagnoses or legal advice can have serious consequences if errors occur.

Data Privacy: Handling sensitive or private information with ChatGPT may raise data privacy concerns if not managed properly.

Energy Consumption: Training and running large language models like ChatGPT consume significant computational resources and energy, contributing to environmental concerns.

Limited Creativity: While ChatGPT can generate creative content, it lacks true understanding and creativity compared to human intelligence.

In summary, ChatGPT technology has the potential to bring many benefits in terms of natural language interaction and automation but also poses challenges related to bias,

accuracy, ethics, and privacy that require careful consideration and oversight in its implementation and usage.

Importance of ChatGPT in biological research:
ChatGPT can be highly valuable in biological research for the following reasons:

Data Analysis: It can analyze vast biological datasets, such as genomics, proteomics, and ecological data, helping researchers identify patterns, potential biomarkers, and genetic variations.

Literature Review: ChatGPT can assist in quickly summarizing and analyzing scientific literature, helping researchers stay updated on the latest findings and research papers.

Hypothesis Generation: Researchers can use ChatGPT to generate hypotheses based on existing data and knowledge, potentially leading to innovative research directions.

Communication: It aids in communicating complex biological concepts to the public and other researchers, promoting scientific literacy and collaboration.

Drug Discovery: ChatGPT can assist in drug discovery by predicting potential drug candidates, target proteins, and interactions through text-based analysis.

Experiment Planning: It can help design experiments, suggesting optimal conditions and variables to test hypotheses efficiently.

Education: ChatGPT can serve as an educational tool, explaining biological concepts, processes, and mechanisms to students and the general public.

In summary, ChatGPT's abilities in data analysis, literature review, hypothesis generation, and science communication make it a valuable asset in advancing biological research, from genetics to ecology and beyond.

Importance of ChatGPT in environmental research:
ChatGPT can play a significant role in environmental research by:

Data Analysis: It can analyze large datasets related to environmental factors, climate change, or biodiversity, helping researchers uncover patterns and insights.

Communication: Researchers can use ChatGPT to communicate findings and engage with the public, making complex environmental issues more accessible.

Simulation: ChatGPT can assist in creating and running simulations to model environmental scenarios and assess their impact.
Education: It can be a valuable tool for educating the public about environmental issues, conservation, and sustainable practices.

Policy Analysis: Researchers can use ChatGPT to assess the potential consequences of different environmental policies and interventions.

Collaboration: It facilitates collaboration among researchers worldwide, allowing them to exchange ideas and knowledge on environmental topics.

Overall, ChatGPT's capabilities in data analysis, communication, and modeling can enhance environmental research and contribute to addressing pressing environmental challenges.

Importance of ChatGPT in agricultural research:
ChatGPT can be valuable in agricultural research in several ways:

Data Analysis: It can analyze vast agricultural datasets, including weather patterns, crop yields, and soil data, helping researchers identify trends and optimize farming practices.

Crop Management: ChatGPT can provide real-time advice on crop management, such as irrigation scheduling, pest control, and nutrient management, based on current conditions and historical data.

Research Collaboration: It facilitates collaboration among researchers by providing a platform for sharing insights, research findings, and best practices in agriculture.

Knowledge Sharing: Researchers can use ChatGPT to disseminate agricultural knowledge to farmers and agricultural communities, promoting sustainable and efficient farming methods.

Decision Support: It assists in making informed decisions about crop selection, planting times, and harvesting strategies by considering various factors and historical data.

Climate Resilience: ChatGPT can help develop strategies to mitigate the impact of climate change on agriculture and adapt farming practices accordingly.

In summary, ChatGPT's capabilities in data analysis, knowledge sharing, and decision support can significantly benefit agricultural research by improving crop yields, sustainability, and resilience in the face of environmental challenges.

Importance of ChatGPT in geographical research:
ChatGPT can play a significant role in geographical research for several reasons:

Data Analysis: It can analyze vast geographical datasets, including satellite imagery, climate data, and land-use data, helping researchers identify trends, patterns, and anomalies.

Geographic Information Systems (GIS): ChatGPT can assist in GIS analysis, helping researchers create maps, visualize spatial data, and perform spatial analysis for various applications like urban planning and disaster management.

Environmental Studies: Researchers can use ChatGPT to analyze the impact of human activities on the environment, assess biodiversity, and model ecological systems.

Place-Based Knowledge: ChatGPT can provide information about specific geographic locations, including historical and cultural context, which can be crucial for understanding local conditions.

Remote Sensing: It can help interpret remote sensing data and provide insights into changes in land cover, deforestation, and climate patterns.

Disaster Management: ChatGPT can assist in predicting and responding to natural disasters by analyzing weather data, historical records, and providing situational awareness.

Collaboration: It facilitates collaboration among geographers and researchers by providing a platform for sharing geographic information and research findings.

In summary, ChatGPT's capabilities in data analysis, GIS, environmental studies, and knowledge dissemination make it a valuable tool for geographical research across various domains, from climate science to urban planning.

Importance of ChatGPT in geological research:
ChatGPT can be highly valuable in geological research for several reasons:

Data Analysis: It can analyze extensive geological datasets, including rock compositions, seismic data, and geological maps, aiding researchers in identifying patterns and trends in Earth's structure and history.

Geological Mapping: ChatGPT can assist in creating geological maps and interpreting geological features, which is essential for understanding the Earth's subsurface and natural resource exploration.

Geospatial Analysis: It helps researchers perform geospatial analysis, such as identifying fault lines, mineral deposits, or potential geological hazards like earthquakes and volcanic eruptions.

Education and Outreach: ChatGPT can serve as a tool for educating students and the public about geological concepts, processes, and phenomena, promoting geological literacy.

Literature Review: Researchers can use ChatGPT to quickly review geological literature, keeping up-to-date with the latest research findings and discoveries.

Hypothesis Generation: It can assist in generating hypotheses based on geological data, potentially leading to innovative research directions and exploration strategies.

Natural Resource Exploration: ChatGPT can aid in locating valuable geological resources, such as minerals, oil, and gas, by analyzing geological data and providing insights into potential deposits.

In summary, ChatGPT's capabilities in data analysis, geospatial analysis, education, and research support make it a valuable asset in advancing geological research and exploration of Earth's geological features and history.

Importance of ChatGPT in chemistry research:
ChatGPT can be highly important in chemistry research for the following reasons:

Data Analysis: It can analyze vast chemical datasets, helping researchers identify trends, patterns, and correlations in chemical reactions, compounds, and properties.

Literature Review: ChatGPT can quickly summarize and analyze scientific literature, assisting researchers in staying up-to-date with the latest findings and research papers in the field of chemistry.

Hypothesis Generation: Researchers can use ChatGPT to generate hypotheses for chemical experiments based on existing data and knowledge, potentially leading to innovative discoveries.

Chemical Modeling: It can help in building and simulating chemical models, predicting chemical reactions, and simulating molecular structures.

Education: ChatGPT can serve as an educational tool, explaining complex chemical concepts, reactions, and principles to students and the general public.

Drug Discovery: It can assist in drug discovery by predicting potential drug candidates, their interactions with target molecules, and pharmacological properties.

Reaction Optimization: ChatGPT can suggest optimal conditions for chemical reactions, helping researchers save time and resources in the lab.

In summary, ChatGPT's capabilities in data analysis, literature review, hypothesis generation, and chemical modeling make it a valuable asset in advancing chemistry research across various domains, from organic chemistry to materials science.

Therefore, we can conclude that ChatGPT has extensive importance in research and development in various disciplines related to sciences, humanities and social sciences. There is no doubt of miss youse and miss application of the ChatGPT technology; however, it is also difficult to underestimate the great power and the potential it has as a new artificial intelligence technology platform. We have to be careful in understanding how ChatGPT can be effectively used in our education and research programs and need to be alert to avoid any misuse and miss application of the technology, or reduce negative application, or misappropriation of this unique artificial intelligence technology platform. The debate on the merits and dependence of ChatGPT will continue to hunters for the coming years; maybe this technology will be replaced by even more powerful technologies in the not so distant future.

But our goal should be to use the sophisticated technology for the betterment of education and research; and for bettering human life, and in protecting and conserving our environment and ecosystems. To my mind, any technology is not harmful or destructive; unless we as humans use the technology for self destructive, as well as degradation purposes. Unless we change our negative attitude with technology use in the right direction, any new technology like ChatGPT will continue to haunt us.

IMPORTANT DAYS AND ACTIVITIES IN SEPTEMBER 2023

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1 September: National Nutrition Week

The purpose of National Nutrition Week, which runs from September 1 through September 7, is to raise awareness among the public about the value of good nutrition for overall health.

2 September : World Coconut Day

Every year on September 2, World Coconut Day is commemorated to raise awareness of the value of this crop in eradicating poverty. This day also honours the Asian Pacific Coconut Community's founding day (APCC).

5 September: International Day of Charity

Every year on September 5, the International Day of Charity is observed in an effort to end poverty in all of its manifestations and dimensions and to further the objectives of sustainable development.

5 September: Teachers' Day (India)

To commemorate the anniversary of the birth of Dr. Sarvapalli Radhakrishnan, India's second President, Teachers' Day is observed on September 5 each year. On this day, we honour and recognise the work that teachers do to help students develop into responsible adults.

8 September: International Literacy Day

Every year on September 8th, International Literacy Day is commemorated to raise awareness of the value of literacy, which is unquestionably an issue of human rights and dignity. It is an important part of the UN's Sustainable Development Goals, let us inform you.

8 September: World Physical Therapy Day

Every year on September 8, World Physical Therapy Day is commemorated to give physical therapists from all over the world a chance to raise awareness about the vital role their profession plays in enhancing public health and well-being.

11 September: National Forest Martyrs Day

The day of September 11 was chosen as National Forest Martyrs Day because of its historical significance. On this date in 1730, more than 360 members of the Bishnoi tribe, led by Amrita Devi, protested the cutting down of trees. They were executed by the king in Khejarli, Rajasthan, because they had protested to save the trees.

11 September: World First Aid Day

It is observed on the second Saturday in September, which falls on September 11 this year. The purpose of the day is to increase public awareness of how emergency first aid may save lives. The International Federation contends that first aid should be available to everyone and an integral element of developing society.

12 September: Grandparents' Day

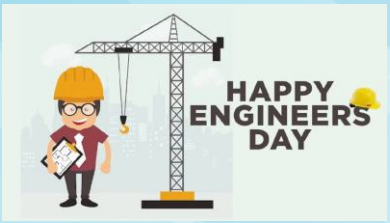
It is observed on September 12 this year. On other dates, it is also observed in a number of other nations. The holiday honours the wonderful relationship between grandparents and their grandchildren, as suggested by its name.

14 September: Hindi Diwas

The day of Hindi Diwas, September 14, commemorates the adoption of Hindi, written in Devanagri script, as the official language of the Republic of India by the Indian Constituent Assembly on this date in 1949.

15 September: Engineer's Day (India)

Every year on September 15, India honours the Indian engineer Bharat Ratna Mokshagundam Visvesvaraya by observing Engineer's Day.



15 September: International Day of Democracy

To remind people that democracy is about people, the 15th of September is designated as International Day of Democracy. This day offers a chance to educate people about the value of democracy and the successful implementation of human rights.

16 September: World Ozone Day

World Ozone Day is held every year on September 16. The Montreal Protocol was formally adopted on this day in 1987. Since its establishment by the UN General Assembly in 1994, World Ozone Day has been observed

17 September: World Patient Safety Day

The holiday is celebrated on September 17. In May 2019, the 72nd World Health Assembly formed it as a result of the passage of resolution WHA72.6 on "Global action on patient safety."

18 September: World Bamboo Day

On September 18, the day is commemorated to raise awareness of bamboo throughout the world.

18 September (Third Saturday) : International Red Panda Day

The day is set aside as a holiday on the third Saturday in September. It occurs this year on September 18. The event raises awareness of the urgent need for conservation.

21 September: International Day of Peace (UN)

On September 21, people all across the world mark the UN's International Day of Peace. The General Assembly passed resolution 55/282 establishing September 21 as the International Day of Peace of non-violence and cease-fire, which was first honoured in September 1982 and again in 2001.

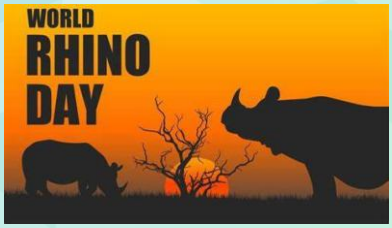
21 September: World Alzheimer's Day

On September 21, World Alzheimer's Day is marked to increase public awareness of the difficulties patients with dementia experience. World Alzheimer's Month was established in 2012.

22 September: Rose Day (Welfare of Cancer patients)

The purpose of Rose Day, which is held on September 22 in support of cancer patients, is to give them hope that their disease is treatable. This day is commemorated in honour of Canadian 12-year-old Melinda Rose, who refused to give up hope after learning that she had a rare kind of blood cancer.

22 September: World Rhino Day



Every year on September 22, it is observed. The day promotes awareness and creates a secure natural environment for this amazing species.

23 September : International Day of Sign Languages

The UN General Assembly declared September 23 to be the International Day of Sign Languages. The day offers a special chance to support and preserve the cultural

diversity and linguistic uniqueness of all sign language users, including the deaf.

25 September: World Pharmacists Day

Every year, it is observed on September 25. In 2009, the World Pharmacists Day was established annually by the International Pharmaceutical Federation (FIP) Congress in Istanbul, Turkey (WPD).

26 September: World Environmental Health Day

The International Federation of Environmental Health has declared the day.

26 September (Fourth Sunday):- World Rivers Day

The final Sunday in September is designated as "World Rivers Day." It falls on September 26 in 2022. The day emphasises the value of rivers, raises awareness of their importance, and motivates people to protect, preserve, and develop rivers all across the world. We must take care of our water supplies.

27 September: World Tourism Day

Every year on September 27, World Tourism Day is observed to raise awareness of how important tourism is in creating jobs and securing the futures of millions of people worldwide.

28 September: World Rabies Day

Every year on September 28, people around the world observe World Rabies Day to raise awareness about rabies prevention and to highlight the progress being made in the fight against this dreadful illness.

29 September: World Heart Day

Every year on September 29, people celebrate World Heart Day. On this day, people are educated about heart disease and stroke, the two main causes of mortality worldwide.

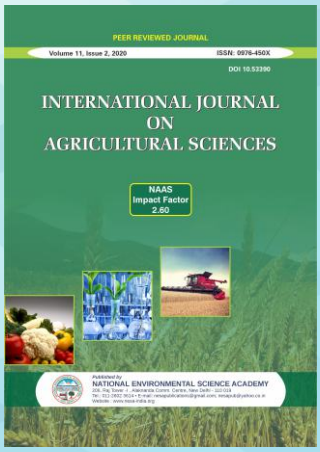
30 September: International Translation Day

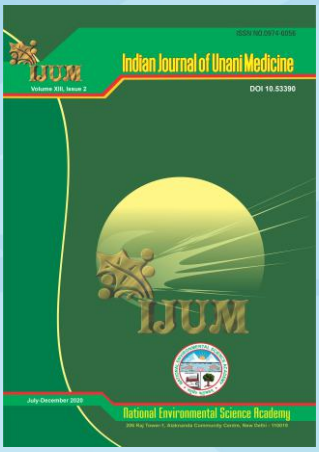
The 30th of September is designated as International Translation Day each year. This day gives us a chance to honour those who work in the language industry. Additionally, it contributes significantly to strengthening international peace and security and bringing together nations.

MEMBERS ARE REQUESTED TO PLEASE PLANT ONE TREE IN YOUR NEIGHBOURHOOD AND SEND US A SMALL BRIEF WITH PHOTOGRAPH OF THE TREE / PLANT SO WE CAN PUBLISH IN THE NESA E-NEWSLETTER

ENROLL YOURSELF TO NESA NEWSLETTER EDITORIAL BOARD MEMBER

Editorial board members of NESA newsletter will be revised for the year 2023. All the interested applicants may send their curriculum vitae to **Editor in Chief** by **30th Sept., 2023.**





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ISSN NO. 0976-450X | NAAS RATING 2.60

INTERNATIONAL JOURNAL ON ENVIRONMENTAL SCIENCES

ISSN NO. 0976-4534

INTERNATIONAL JOURNAL ON BIOLOGICAL SCIENCES

ISSN NO. 0976-4518

INDIAN JOURNAL OF UNANI MEDICINE

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For further details and **NOTES FOR AUTHORS**, please contact Academy at

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National Conference

On

Recent Trends & Challenges in GREEN CHEMISTRY, POLLUTION CONTROL AND CLIMATE CHANGE [GPCC-2023]

14th – 16th December 2023

Venue: CSIR – National Botanical Research Institute, Lucknow

Jointly Organized by

National Environmental Science Academy (NESA), New Delhi

CSIR-National Botanical Research Institute, Lucknow

Thematic Areas of the Conference - GPCC-2023

Abstracts can be submitted under the following sub-themes

SUBMIT ABSTRACT
nesalucknowconference2023@gmail.com

1. Pollution and its Mitigation
- Air Pollution and Mitigation
- Water Pollution and Mitigation
- Soil Pollution and Mitigation
- Wastewater Utilization
- Waste Management

2. Climate Change
- Climate Change Mitigation
- Climate Smart Agriculture
- Renewable Energy
- Application of Remote Sensing and GIS

3. Green Chemistry
- Alternative and Efficient Sources of Energy
- Green Technologies for Zero-waste Processes and Products
- Green Nanomaterials for Environmental and Agricultural Applications
- Cleaner Production

4. Environment and Biotechnology
- Environmental Microbiology and Bioremediation
- Environmental Biotechnology

5. Natural Resource Management
- Biodiversity Conservation
- Environmental Degradation and Eco-restoration
- Geospatial and Ecological Modelling

6. Contemporary Areas
- Environmental Impact Assessment
- Environmental Risk Management
- Environmental Protection
- Environmental Sustainability and Development
- Environmental Education and Sustainable Developments Goals

IMPORTANT DATES

Conference Dates	14th to 16th December, 2023
Registration and Abstract Submission Starts:	10.07.2023
Last Date of Registration without late payment:	31.10.2023
Abstract submission Deadline:	31.10.2023
Intimation of acceptance of abstract:	07.11.2023

REGISTRATION

	Regular Registration (Till 31.10.2023)	Spot Registration* (After 31.10.2023)
Academicians & Scientists	INR 5000.00	INR 6000.00
Research Scholars/ Fellows	INR 2500.00	INR 3000.00
Students (PG)	INR 1500.00	INR 2000.00
Corporate Delegates	INR 10000.00	INR 12000.00

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NOTIFICATION NO. 2

APPLICATIONS ARE INVITED FOR NESA ANNUAL AWARDS – 2023

LAST DATE: 30th September, 2023

This is to notify that applications are invited for the NESA Annual Awards 2023 from the Life Members of the Academy. The prescribed application forms for the following categories can be down loaded from our website: www.nesa-india.org • http://nesa-india.org/award-form-submission/

Separate applications should be submitted for independent awards. For detail guidelines the website of NESA may be approached by logging on.

The last date for the all the categories of awards is 30th September, 2023. The venue and the brochure will he shared soon.

The categories of Awards are given as under:

(1) NESA FELLOWSHIP AWARD
(2) NESA INTERNATIONAL SCIENTIST AWARD
(3) NESA EMINENT SCIENTIST AWARD
(4) NESA INDIGENOUS TECHNICAL KNOWLEDGE (ITK) AGRICULTURE AWARD
(5) NESA SCIENTIST AWARD
(6) NESA ENVIRONMENTALIST AWARD
(7) NESA GREEN TECHNOLOGY INNOVATIVE AWARD
(8) NESA DISTINGUISHED SCIENTIST AWARD
(9) WOMEN EXCELLENCE AWARD
(10) NESA YOUNG SCIENTIST AWARD
(11) NESA JUNIOR SCIENTIST AWARD

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