



ONLY NEWS PAPER PUBLISHED IN INDIA FOR SCIENTIFIC COMMUNITIES

NESA NEWSLETTER

NATIONAL ENVIRONMENTAL SCIENCE ACADEMY

Vol. 23 Issue - 03 (MONTHLY)

March 2020



SAVE WATER,

AND IT WILL

SAVE YOU.



**WORLD
WATER DAY**
MARCH 22

NESA Annual Award 2020 Notification No. 1

APPLICATIONS ARE INVITED

31st May 2020

(1) NESA FELLOWSHIP AWARD

AGE 45 and above. The recipients shall get Citation, Certificate, Memento and a Gold plated medal, and can suffix F.N.E.S.A. after their names.

(2) NESA EMINENT SCIENTIST AWARD

AGE 40 and above. The recipient shall get Citation, Certificate, Memento and a Gold plated medal.

(3) NESA SCIENTIST OF THE YEAR AWARD

AGE 35 and above. The recipient shall get Citation, Certificate, Memento and a Gold plated medal.

(4) NESA ENVIRONMENTALIST AWARD

AGE Up to 35 and above. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

(5) NESA GREEN TECHNOLOGY INNOVATIVE AWARD

AGE 35 and above. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

(6) NESA YOUNG SCIENTIST AWARD

AGE : Up to 35. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

(7) NESA JUNIOR SCIENTIST AWARD

AGE : Below 35. The recipients shall get Citation, Certificate, Memento and a Gold plated medal. a Gold plated medal.

PREScribed APPLICATION FORMS

The application forms could be downloaded from www.nesa-india.org

Separate application form should be submitted for separate awards. The application forms are non-transferable and it can also be obtained by sending a bank draft of **Rs. 1000/- only** (per form). Drawn in favour of **NATIONAL ENVIRONMENTAL SCIENCE ACADEMY** payable at NEW DELHI.

***Please log on to
our website for Guidelines.**

GENERAL SECRETARY

NATIONAL ENVIRONMENTAL SCIENCE ACADEMY

206, Raj Tower-I, Alaknanda Community Centre,
New Delhi - 110 019 • Tel.: 011-2602 3614

E-mail: infonesa88@gmail.com

Website: www.nesa-india.org

ORGANIC FARMING: A CASE STUDY OF UTTRAKHAND

Faran Ahmad¹, Rahul Kumar¹, Priya Tyagi², Mohd. Tasleem³, and Garima Chouhan²

¹Department of Life Sciences, School of Basic Sciences and Research, Sharda University, 32-34, Knowledge Park-III, Greater Noida, India.

²Department of Biotechnology, School of Engineering and Technology, Sharda University, 32-34, Knowledge Park-III, Greater Noida, India.

³Department of Biotechnology, GB Pant Institute of Engineering and Technology, Pauri Garhwal, Uttarakhand, India.

Email ID: garima.chouhan@sharda.ac.in

There has been a rise in consumers demand for safe & healthy food due to increasing concerns over the quality of food, serious health hazard & environmental issues. This increasing demand has given way to a new stream of agriculture known as Organic Agriculture. Organic Farming practices reduce pollution, conserve water, reduce soil erosion, increase soil fertility & use less energy. Organic food does not contain preservatives that makes it last longer. Results of a 2016 European study show that levels certain nutrients were up to 50% higher in organic meat & milk than in conventionally raised versions.

Nine states have drafted Organic farming policies. Uttarakhand and Sikkim has declared themselves as "Organic States"

Eating Organic Isn't a Trend, It's a Return to Tradition

This paper has reviewed scenario of

Uttarakhand Organic Commodity Board (UOCB) with reference to Organic Farming through analysis of available secondary data. This paper discusses the potential for Organic Farming & argues that Organic Farming is productive & sustainable but there is a need for strong support in it.

PROFILE OF UTTRAKHAND

The total reporting area of Uttarakhand is 53.483 sq. km. 65% of Uttarakhand is covered with forest and 23.6% is under agriculture & allied activities. Organic agriculture was declared as a thrust area by the state as early as 2001-02 wherein a number of policies

decisions were taken. One of them being establishment of Uttarakhand Organic Commodity Board (UOCB).

STATUS OF UOCB

UOCB came in to existence on 19 May 2003 after being registered under the society's registration act 1860. It acts as the nodal agencies to enhance Organic agriculture in & allied sectors throughout the state. The main objectives of UOCB are to provide training to farmers from government line departments, NGOs in the field of production. The functions of UOCB can be summarized as: to assist organic farmers to become organic producers groups and links them to market by developing production plans, followed by generation of resources in the form of finances, human resources for the organic development and the resources centre UOCB provides technical inputs for the organic production which can be used as per standards. Further, problems faced by farmers growing Organic crops are as follows: majority of the farmers felt that market uncertainty was a major

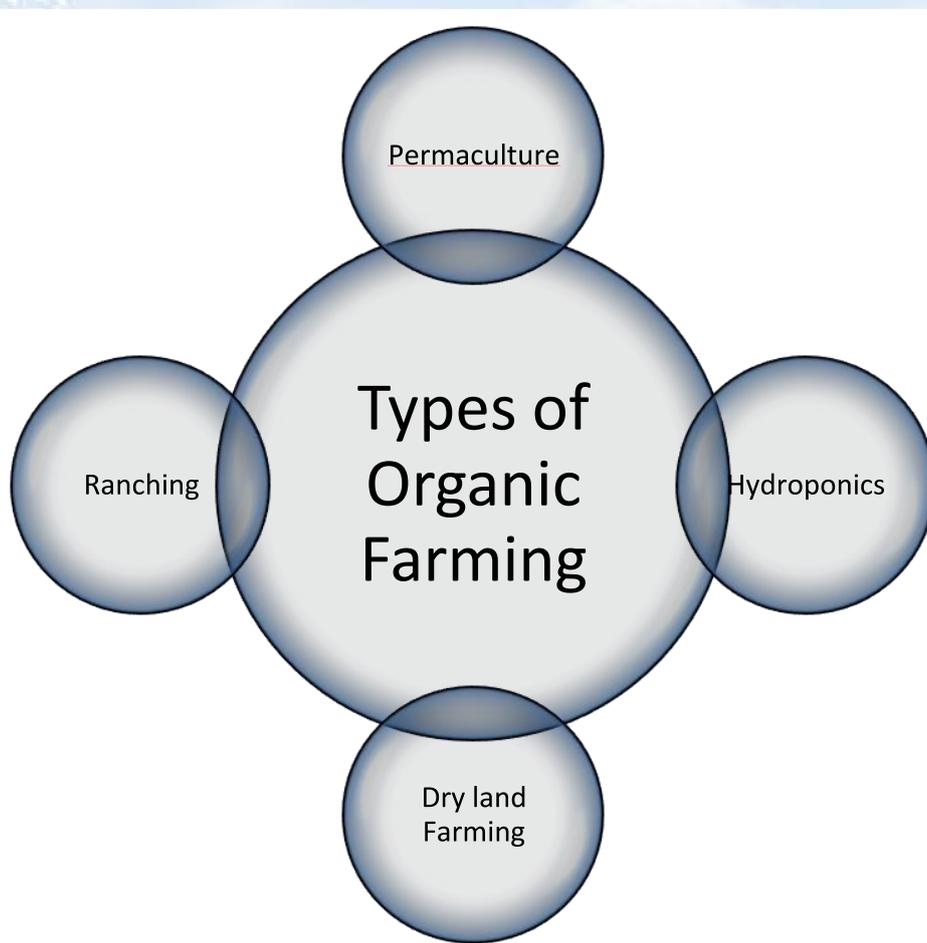
problem; many felt that the price obtained for Organic Baswariya rice was too low. Price declined in recent years and incidence of pest & disease attack more common in organic farming. Some of the farmers reported pests & disease to be important problems.

Certain solutions can be suggested to resolve problems faced by farmers. One, solution can be provision of credit facilities to farmers to have access to bio-control agents through board. Second, communication between the Board, Federations and farmers should be improved. Last but not the least, there is an urgent need to develop market for

organic wheat to increase the overall profitability of organic farmers as wheat is one of the important food crops of the State.

CONCLUSION

Organic farming has strong potential in India especially in state of Uttarakhand where conventional farming is still not widespread. UOCB is playing a crucial role in the promotion of organic farm practices and motivation of farmers to adopt cleaner environmental practices. However, there is a need to construct support infrastructure and provision of technical skills and knowledge as well as financial aid to motivate farmers to switch to Organic farm practices.



JEEVAMRIT - LIQUID ORGANIC MANURE IN ORGANIC FARMING

C. Padmapriya¹ and M. R. A. Manimala²

¹Agricultural officer, Liquid Biofertilizer Production Unit, Dindigul, Tamil Nadu

²Assistant Professor, Mother Teresa College of Agriculture, Pudukottai, Tamil Nadu

Corresponding author: agri.padma@gmail.com

Jeevamrit is a fermented liquid organic manure commonly used among organic growers as plant growth enhancing substances prepared with material available with farmers. It is the rich sources of beneficial micro flora which support, stimulate the plant growth and help in getting better vegetative growth and also good quality yield. Formulations prepared on agricultural by-products, viz., bran of grains, jaggery etc., which are found to support excellent growth carrier and storage media. During the last few years, there has been an increasing interest in the use of jeevamrit and other liquid organic formations in organic agriculture. Many researchers have reported the presence of many beneficial microorganisms viz., nitrogen fixers, phosphorus solubilizers, actinomycetes and fungi in jeevamrit.

Preparation of Jeevamrit:

1. Water (200 lit) + Fresh cow dung (10 kg) + Cow urine (5-10 lit) + Jaggery (gur) (2 kg) + Pulse flour (Besan) (2 kg) + Soil from same farm (100-150g)

2. Add all the material in a plastic drum (220 lit. capacity) and mix thoroughly
3. Keeps the drum in shade covering with gunny bag, cotton cloth or plastic mosquito net
4. Stir the mixture for 5-10 minutes for twice a day (morning and evening) with wooden stick. Jeevamrit ready for application at 9th day and it can be applied up to 12th day

The jeevamrit should be kept in the shade and covered with a gunny bag, cotton cloth, wire mesh or plastic mosquito net to prevent houseflies from laying eggs and the formation of maggots (worms) in the solution. If Jaggery is not available than add 4 Litres of ripened Tender Coconut juice or sugarcane juice. This preparation gives best results when it is applied between 9 to 12 days after preparation. This formulation can be mixed with irrigation water. Also, can spray 10% filtered jeevamrit on the crops. Generally, it is accepted that every 15 days the jeevamrit can be applied.

Nutrient content and microbial population:

Many researchers have reported the presence of many beneficial microorganisms viz., nitrogen fixers, phosphorus solubilizers, actinomycetes and fungi in jeevamrit. In the study it is found that higher microbial population is present in the jeevamrit which is prepared from the dung and urine of cow as compared to buffalo. Moreover, jeevamrit prepared using Indian cow and hybrid cow are have almost equal microbial population.

Table 1: Microbial population and nutrient content in Jeevamrit

Jeevamrit preparation	Jeevamrit preparation		
	Buffalo	Indian cow	Hybrid cow
Microbial counts (cfu/ml)*			
Bacteria	2.6 X 10 ⁶ (1.9 X 10 ³)	8.9 X 10 ⁶ (1.8 X 10 ³)	8.6 X 10 ⁶ (1.8 X 10 ³)
Fungi	1.10 X 10 ⁴ (1.6 X 10 ³)	1.30 X 10 ⁴ (1.8 X 10 ³)	1.35 X 10 ⁴ (1.7 X 10 ³)
Nutrient content (g/l)			
Carbon	5.9	7.19	5.47
Nitrogen	0.22	0.04	0.60
Phosphorous	0.11	0.04	0.06
Potassium	1.09	0.28	0.75
Sulphur	0.46	0.43	0.39

*The figures in parantheses are at the start of the preparation

Table 2: Microbial population of Jeevamrit between 1 to 20 days after preparation

Jeevamrit preparation	Microbial population									
	Days after preparation									
	1	3	5	7	9	11	13	15	17	19
Bacteria (X 10 ⁵)	213	269	361	692	813	843	447	562	402	339
Fungi (X 10 ⁴)	11	6	1	7	32	36	8	18	17	5
Actinomycetes (X 10 ³)	1	1	1	1	12	11	3	6	2	2
N-Fixers (X 10 ⁴)	34	16	23	20	63	67	49	40	90	43
P-solubilizers (X 10 ⁴)	61	12	37	61	50	52	67	34	40	48

Method of application:

Jeevamrit is applied @ 500 lit/ha with irrigation water once or twice in a month as per availability to supplement

nutrients to crops. Jeevamrit can also be applied as foliar spray and its frequency of application and concentration as per crop duration is given in following table:

Table 3: Frequency of application and concentration of jeevamrit for foliar spray

Crop duration	Crop stages and Jeevamrit spray concentration		Total No. of spray
	1st spray & concentration	Interval of subsequence spray & concentration	
Short duration (60-90 days)	21 days after sowing / planting @ 5%	20 -25 days interval @ 10 % concentration	3
Medium duration (90-120 days)	21 days after sowing / planting @ 5%	20 20 -25 days interval @ 10 % concentration	4
Medium-long duration (120-135 days)	21 days after sowing / planting @ 5%	20 -25 days interval @ 10 % concentration	5
Long duration (135-150 days)	21 days after sowing / planting @ 5%	20 -25 days interval @ 10 % concentration	6
Fruit plants	2-5 L of Jeevamrit should be applied in the basin once in a month		

REVIVAL OF CITY BIRDS: PART 1

S. K. Basu

PS, Lethbridge AB Canada T1J 4B3;

E-mail: saikat.basu@alumni.uleth.ca

Birds constitute an important member of our natural ecosystem across the planet. Our precious alien members add to the diversity of animal life in our planet and are known to inhabit every continent and oceans that we could name off. Unfortunately a number of global factors are impacting wild bird populations around the world. Some of these factors include destruction and degradation of natural bird habitats, lack of suitable food sources, foraging, nesting and breeding sites, over exploitation of vulnerable species for food and other needs marginalizing them with extinction, Global Warming and Climate Change, rapid dissemination of serious contagious diseases wiping out massive wild flocks, genetic bottlenecks to mention only a handful. Almost every ecosystem inhabited by different bird species across the planet including the polar regions have been significantly impacted by anthropogenic factors pushing them further towards slow extinction.

Cities are not immune to such negative anthropogenic impacts and in fact are among the worst impacted in the world. The recent

pollution debacle in the national capital Delhi is an example in hand that not only impacted the humans but the significant collateral damage was noticed on local wildlife including helpless birds inhabiting the city. Pollution is just one such challenge of the numerous others faced by city resident birds including kite festival that massacre them in large numbers, illegal poaching and trapping, poisoning (both intentional and accidental), fire hazards and relentless persecution and loss of habitats.

We may have successfully created a jungle of immense concrete in our towns and cities. But this has turned into detrimental for several avian species that inhabited our cities for centuries. The most prominent factor pushing birds out of our urban ecosystem is the lack of open space, gardens and parks as well as suitable water bodies for birds to thrive. The extreme high level of pollution in the cities together with lack of suitable habitats and regular food sources has turned into a serious catastrophe like the domestic sparrow that has been wiped out of our vulnerable cityscape in various parts of India. But this is not the case of India only; but a phenomenon being observed around the world in all major cities impacted by serious anthropogenic factors.

Acknowledgement: Sikkim Express

Photo credit: S. K. Basu





BROKEN BONES TREE OR MIDNIGHT HORROR

Deepa Bisht¹, Mohd Tasleem², Khushboo Dasauni¹, Megha Pant¹ and T.K. Nailwal¹

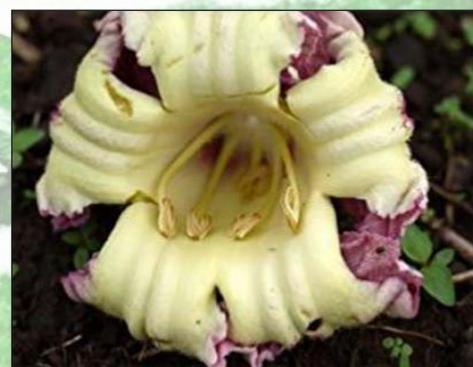
¹Department of Biotechnology
Kumaun University, Bhimtal, Uttarakhand-India

²National Institute for Plant Biotechnology (NIPB)
Pusa Campus, New Delhi-12.

Email: deepabisht523@gmail.com

Oroxylum indicum a member of Bignoniaceae, is a medium-sized (12-15m) deciduous tree that grows in Asian tropical and

subtropical low-altitude open forests and its cultivation is seen on slopes and roadsides upto an altitude of 1200m. The Trumpet Creeper family (Bignoniaceae), is a family of flowering plants with 116-120 genera and there are about 650-750 species. It is commonly known as **Shyonak**, **Trumpet tree** as the flower resembles trumpet instrument, **Tree of Damocles**, **Broken bones tree** because large leaf stalks wither and fall off the tree and collect near the base of the trunk, appearing to look like a pile of broken limb bones. Pods of the plant make noise which at night sounds horrible creating fear, so popularly known as the **Midnight horror** tree. It is chiropterophilous plant as the flowers open at night, producing a powerful stink that allures bats for pollination.



It is an endangered, medicinally vital, indigenous tree of the Indian subcontinent and is found in the Himalayan foothills, Eastern and Western Ghats.

It has been used for centuries as a traditional medicine in Asia in ethnomedicinal systems for the prevention and treatment of several diseases, such as arthritic and rheumatic problems, tumors, jaundice, gastric ulcers, diabetes and dysentery etc.

Phytochemically, it contains flavonoids like baicalein, chrysin, oroxylin A, apigenin, tetuin, and scutellarin. Recent reports have shown flavonoids effectiveness against leukemia, colon carcinoma, lung cancer, skin carcinoma, bladder cancer, breast cancer etc.

The crude extracts and their isolates exhibit a wide spectrum of in vitro and in vivo pharmacological activities such as antimicrobial,

anti-inflammatory, anti-arthritis, anticancer, antiulcer, hepatoprotective, antidiabetic, antidiarrheal and antioxidant activities. India has probably the oldest, richest and most diverse cultural traditions in the use of medicinal plants. Destructive and non-sustainable collection methods coupled with low regeneration and habitat destruction have posed serious threats to the survival and availability of this highly useful tree. The existence of *O. indicum* in natural population is highly threatened and it has been categorized as endangered and vulnerable by IUCN. There have been number of scientific studies conducted to evaluate the toxic effects of the plant. Almost all the studies have shown that *O. indicum* is not toxic to humans and experimental animals even up



to high doses. Every part of this tree possesses medicinal value. It is an important herb in Ayurvedic medicine and indigenous medical system. It is used in many ayurvedic formulations like dashmool, amartarista, dantyadyarista, narayana taila, and chyavanaprasa.

Presently, medicinal plants play a very important role in the modern economy. NTFPs (Non-timber Forest Products) account for 70% of India's forest product exports and the demand for phytochemicals is expected to increase in future as a new frontier for trade. Due to its umpteen pharmaceutical importance conservation of this species has become an immediate need of the country. Research in the frontier of genetically improved varieties, tissue culture using elicitors for secondary metabolites production is essential. For conservation of this species, rapid multiplication and rehabilitation in its natural habitat is necessary. To overcome this threat, a reliable method of quick multiplication like tissue culture and methods of in-situ as well as ex-situ conservation could well provide a viable solution to the problem.

DATURA STRAMONIUM L. AS A POTENTIAL MEDICINAL PLANT

Megha Pant¹, Mohd Tasleem², Khushboo Dasauni¹, and T.K. Nailwal¹

¹Department of Biotechnology

Kumaun University, Bhimtal, Uttarakhand-India.

²National Institute for Plant Biotechnology (NIPB)

Pusa Campus, New Delhi-12.

Email: pantmegha642@gmail.com

D. stramonium a wild growing erect annual herb of family Solanaceae has a long history as a therapeutic plant used by ayurvedic physicians, spiritual purposes and its use in modern remedial drugs all over the world. This plant is known to be a common medicinal plant of Uttarakhand. Commonly it is known

therapeutic purposes. The plant can also be grown as an ornamental plant. *D. stramonium* has a wide range of medicinal properties and applications in the treatment of different diseases.

- People suffering from rheumatism and gout could benefit from this plant as the vapours of leaf infusion could help to ease the pain. The leaves are used to relieve headache. The plant shows antihistaminic activity the smoke from burning leaves could help in asthma and bronchitis.
- It has anticholinergic activity means any agent that blocks the action of neurotransmitter at synapses these agents block neurotransmitter from causing involuntary muscle movements in different parts of the body thus can help treat many conditions. The Scopolamine alkaloid found in *D. stramonium* a potent cholinergic has been used to calm



by many names such as Devil's trumpet, loco weed and Jimsonweed. The plant needs temperate climate to grow. The stem of the plant is hairy, herbaceous and branched and bears trumpet shaped white or purple coloured flowers. It bears large fruits full of thorns hence named "thorn apple." *Datura Stramonium* is easily cultivated, growing well in open, bright conditions with rich calcareous soil. The leaves and seeds of the plant is used in the treatment of different diseases. All parts of the plant are poisonous due to certain alkaloids present i.e. atropine, hyoscyamine, scopolamine as well as proteins and sitosterol are also present. Atropine is found to have more exhilarating properties, while scopolamine has more soothing and mind-altering properties. However, its small quantity is used for

schizoid patients used clinically as anticholinergic agents. The seeds contain the highest concentration of anti-cholinergic compounds.

- It is used as an insect repellent and botanical pesticide the ethanolic extracts from leaf and seed are used to repel spiders and insects. These extract also show anti-inflammatory activity.
- Leaves of *D. Stramonium* contain hyoscyamine and atropine and can be massively used as influential mind-altering drug which is used to treat depression and epilepsy.
- The extract of its fruit is useful to the scalp, to treat hair related problems.

- Work as protective agent in severe organophosphate toxicity.
- They possess anticancer activity a large number of compounds have been isolated and screened which validate their use as anti-cancerous drug.
- An extract of the flowers is used as an anaesthetic lasting about 5 - 6 hours. Further studies could provide the missing link in the current understanding of these plants.

MEIZOTROPIS PELLITA (PATWA): AN ENDANGERED PLANT SPECIES

Khushboo Dasauni¹, Mohd Tasleem², Megha Pant¹,
Deepa Bisht¹ and T.K. Nailwal¹

¹Department of Biotechnology
Kumaun University, Bhimtal, Uttarakhand-India.

²National Institute for Plant Biotechnology (NIPB)
Pusa Campus, New Delhi-12.

Email: dasaunikhushbu14@gmail.com

Deforestation has resulted in many ecological, social and economical problems in our day-to-day life. The abrupt increase in population has brought with it the unappeasable demand for more food, which has led to the exhaustion of forests to generate more land for agriculture. Decrease in forest areas led to biodiversity losses, which comprises of various endemic, medicinally valued and economically important floral species of



Uttarakhand. One such plant species is *Meizotropis pellita*.

This shrub is an endemic species of Patwadanger (an appellation to this shrub Patwa), a site 12 km downhill from Nainital. In the months of April-May blooming occurs in this plant. Due to numerous reasons like destruction of habitat, anthropogenic interference, adverse climatic conditions, the plant population has greatly decreased, and thus, it is categorized as endangered since only 75-100 plants are left there. There was an assumption that the plant was also found at Dhoti district of Nepal, but on today's date, there is no trace of it in other nation apart from India. With this plant being in the verge of extinction, it has become even more important to save this natural wealth and later more research can be done on it in near future for its medicinal and other economical values, if any. This plant has deep penetrating roots, which, also grow horizontally. In nature it does not propagate vegetatively through seeds (because of thick leathery seed coat) but new plants arise from nodes on its horizontal root network system. It preferentially grows on the slopes of hilly terrain and the roots penetrate the slopes both geo-and

ageotropically. It is a robust woody shrub with no grazing pressure, has great potential in checking soil erosion, and prevents frequent landslides on the road network of IHR. Belonging to family Fabaceae, known for biological nitrogen fixation, the shrub can also serve the purpose of nitrogen fixation additionally. Leaves of this plant can have diameter up to 3.0 meters and it is a hard woody shrub with thick stem attaining height of about 6-7 feet. Carbon dioxide and other green house gas emissions are increasing at an exponential rate. Ozone depletion is common consequence after emission of heavy amount of green house gases. Reports say that plants having deep and diffused root system, broad leaves etc., capture carbon efficiently as well as sequester it systematically which can earn carbon credit for the nation. Medicinal or other economic importance of this plant has



not been reported yet. *Meizotropis pellita* is an indigenous shrub of Uttarakhand. Due to its habitat destruction, the population of this plant has decreased and is an endangered species. There has been no report that suggests its existence outside India. Therefore, currently no international

research has been done on this plant. Our laboratory (Department of Biotechnology, Bhimtal) has successfully developed the in-vitro regeneration protocols for *Meizotropis pellita*.

Initially, seeds of Patwa were germinated on basal medium after a standardized protocol for their scarification. Optimization of hormones was done for further micro propagation procedures. The initial work of standardization of micro propagation protocol of this plant along with association, identification of micro biota as well as finding out capability of this plant to fix nitrogen was done. Researchers from other institutes estimated its antimicrobial activity for Gram's positive and Gram's negative bacterial species. Analysis of the bioactive constituents using FTIR and UV-VIS Spectrophotometer of this plant has been done. The data obtained in all the studies were quite good, thus, this plant can serve as a promising natural substitute for synthetic antioxidant in pharmaceutical industries. Institute of Biotechnology (GBPUAT), Patwadanger, conducted phytochemical analysis of Patwa leaves. Presence of different biological molecules like carbohydrates, proteins, alcohols, alkaloids, acids in prominent quantity in Patwa makes it a valuable source of pharmaceutically important bio-products.

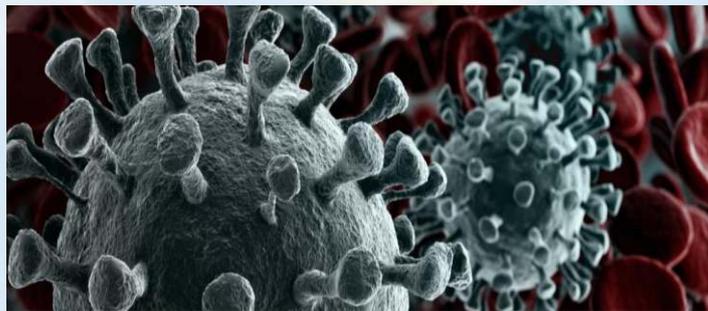
Each One Plant One

THE NOVAL CORONAVIRUS (COVID-19) - SYMPTOMS, PATHOGENESIS, TRANSMISSION AND CONTROL MEASURES

S. Shenbagavalli

Assistant Professor (Environmental Science)
 Dept. of Soil Science and Agricultural Chemistry
 AC & RI, Killikulam-628252, TamilNadu
 E-mail: shenhello@gmail.com

Coronavirus is one of the major pathogens that primarily targets the human respiratory system. Previous outbreaks of coronaviruses (CoVs) include the severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV which have been previously characterized as agents that are a great public health threat. In late December 2019, a cluster of patients was admitted to hospitals with an initial diagnosis of pneumonia of an unknown etiology. These patients were epidemiologically linked to a seafood and wet animal wholesale market in Wuhan, Hubei Province, China. Early reports predicted the onset of a potential Coronavirus outbreak given the estimate of a reproduction number for the 2019 Novel (New) Coronavirus (COVID-19, named by WHO on Feb 11, 2020) which was deemed to be significantly larger than 1 (ranges from 2.24 to 3.58).



Symptoms

The symptoms of COVID-19 infection appear after an incubation period of approximately 5.2 days. The period from the onset of COVID-19 symptoms to death ranged from 6 to 41 days with a median of 14 days. This period is dependent on the age of the patient and status of the patient's immune system. It was shorter among patients >70 years old compared with those under the age of 70. The most common symptoms at onset of COVID-19 illness are fever, cough, and fatigue, while other symptoms include sputum production, head-ache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia (Zhao, et al., 2020). Clinical features revealed by a chest CT scan presented as pneumonia, however, there were abnormal features such as RNAemia, acute respiratory distress syndrome, acute cardiac injury, and incidence of grand-glass opacities that led to death.

Pathogenesis

The severe symptoms of COVID-19 are associated with an increasing numbers and rate of fatalities specially in the epidemic region of China. On January 22, 2020, the China National Health Commission reported the details of the first 17 deaths and on January 25, 2020 the death cases increased to 56 deaths. The percentage of death among the reported 2684 cases of COVID-19 was approximately 2.84% as of Jan25, 2020 and the median age of

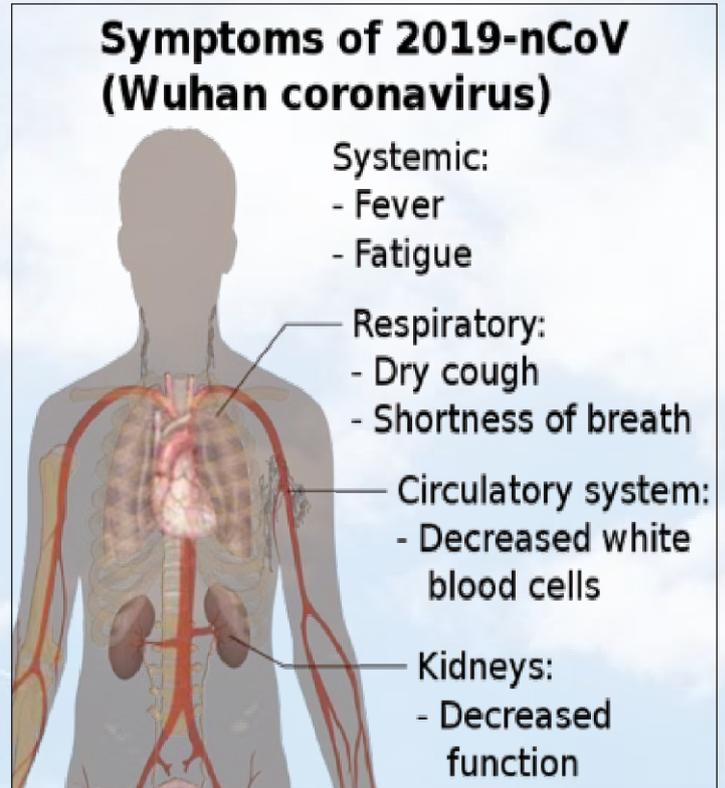


Fig.1: The symptoms caused by COVID-19 infection.

the deaths was 75 (range 48–89) years. Patients infected with COVID-19 showed higher leukocyte numbers, abnormal respiratory findings, and increased levels of plasma pro-inflammatory cytokines. One of the COVID-19 case reports showed a patient at 5 days of fever presented with a cough, coarse breathing sounds of both lungs, and a body temperature of 39.0 °C. The patient's sputum showed positive real-time polymerase chain reaction results that confirmed COVID-19 infection.

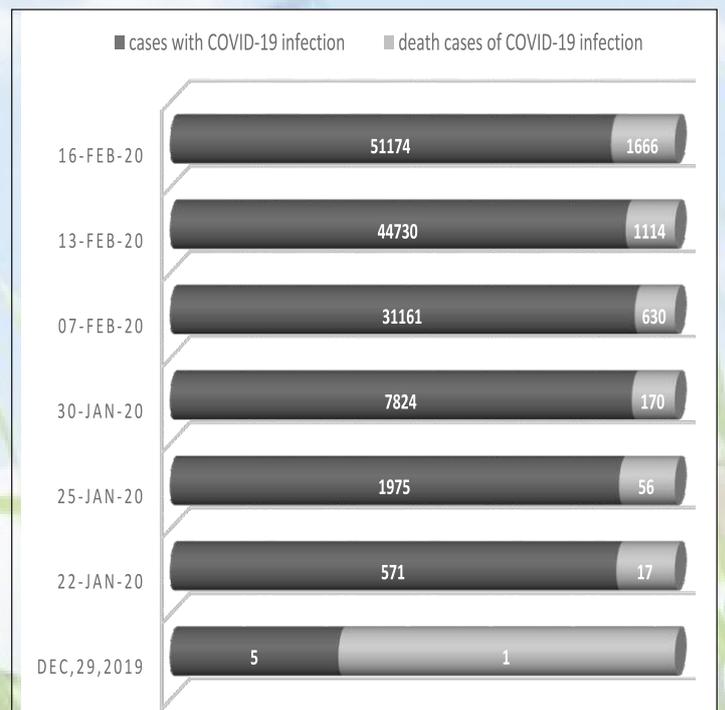


Fig.2: The chronological incidence of COVID-19 infections and death cases in China

Transmission

Based on the large number of infected people that were exposed to the wet animal market in Wuhan City where live animals are routinely sold, it is suggested that this is the likely zoonotic origin of the COVID-19. Efforts have been made to search for a reservoir host or intermediate carriers from which the infection may have spread to humans. Initial reports identified two species of snakes that could be a possible reservoir of the COVID-19. However, to date, there has been no consistent evidence of coronavirus reservoirs other than mammals and birds. Genomic sequence analysis of COVID-19 showed 88% identity with two bat-derived severe acute respiratory syndrome (SARS)-like coronaviruses, indicating that mammals are the most likely link between COVID-19 and humans. Several reports have suggested that person-to-person transmission is a likely route for spreading COVID-19 infection. (Wu et al., 2020). Person-to-person transmission occurs primarily via direct contact or through droplets spread by coughing or sneezing from an infected individual. In a small study conducted on women in their third trimester who were confirmed to be infected with the coronavirus, there was no evidence that there is transmission from mother to child. However, all pregnant mothers underwent caesarean sections, so it remains unclear whether transmission can occur during vaginal birth. This is important because pregnant mothers are relatively more susceptible to infection by respiratory pathogens and severe pneumonia. The binding of a receptor expressed by host cells is the first step of viral infection followed by fusion with the cell membrane. It is reasoned that the lung epithelial cells are the primary target of the virus. Thus, it has been reported that human-to-human transmissions of SARS-CoV occurs by the binding between the receptor-binding domain of virus spikes and the cellular receptor which has been identified as angiotensin-converting enzyme 2 (ACE2) receptor. Importantly, the sequence of the receptor-binding domain of COVID-19 spikes is similar to that of SARS-CoV. This data strongly suggests that entry into the host cells is most likely via the ACE2 receptor (Wan et al., 2020).
Therapeutics/treatment options

The person-to-person transmission of COVID-19 infection led to the isolation of patients that were administered a variety of treatments. At present, there are no specific antiviral drugs or vaccine against COVID-19 infection for potential therapy of humans. The only option available is using broad-spectrum antiviral drugs like Nucleoside analogues and also HIV-protease inhibitors that could attenuate virus infection until the specific antiviral becomes available. The treatment that have so far been attempted showed that 75 patients were administered existing antiviral drugs. The course of treatment included twice a day oral administration of 75 mg oseltamivir, 500 mg lopinavir, 500 mg ritonavir and the intravenous administration of 0.25 g ganciclovir for 3–14 days (Chen et al., 2020). Furthermore, there are a number of other compounds that are in development. These include the clinical candidate EIDD-2801 compound that has shown high therapeutic potential against seasonal and pandemic influenza virus infections and this represents another potential drug to be considered for the treatment of COVID-19 infection. Along those lines, until more specific therapeutics become available, it is reasonable to consider more broad-spectrum antivirals that provide drug treatment options for COVID-19 infection include

Lopinavir/Ritonavir, Neuraminidase inhibitors, peptide (EK1), RNA synthesis inhibitors. It is clear however, that more research is urgently needed to identify novel chemotherapeutic drugs for treating COVID-19 infections (Jin et al., 2020). In order to develop pre- and post-exposure prophylaxis against COVID-19, there is an urgent need to establish an animal model to replicate the severe disease currently observed in humans. Several groups of scientists are currently working hard to develop a nonhuman primate model to study COVID-19 infection to establish fast track novel therapeutics and for the testing of potential vaccines in addition to providing a better understanding of virus-host interaction.

Future directions to control the spread of the disease

Extensive measures to reduce person-to-person transmission of COVID-19 are required to control the current outbreak. Special attention and efforts to protect or reduce transmission should be applied in susceptible populations including children, health care providers, and elderly people. A guideline was published for the medical staff, healthcare providers, and public health individuals and researchers who are interested in the 2019-nCoV. The early death cases of COVID-19 outbreak occurred primarily in elderly people, possibly due to a weak immune system that permits faster progression of viral infection. The public services and facilities should provide decontaminating reagents for cleaning hands on a routine basis. Physical contact with wet and contaminated objects should be considered in dealing with the virus, especially agents such as faecal and urine samples that can potentially serve as an alternative route of transmission.

References

- S. Zhao, Q. Lin, J. Ran, S.S. Musa, G. Yang, W. Wang, et al., Preliminary estimation of the basic reproduction number of novel coronavirus (2019-nCoV) in China, from 2019 to 2020: a data-driven analysis in the early phase of the outbreak, *Int. J. Infect. Dis. : IJID : Off. Publ. Int. Soc. Infect. Dis.* 92 (2020) 214–217, <https://doi.org/10.1016/j.ijid.2020.01.050>.
- Y. Wan, J. Shang, R. Graham, R.S. Baric, F. Li, Receptor recognition by novel coronavirus from Wuhan: an analysis based on decade-long structural studies of SARS, *J. Virol.* (2020), <https://doi.org/10.1128/JVI.00127-20>.
- N. Chen, M. Zhou, X. Dong, J. Qu, F. Gong, Y. Han, et al., Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study, *Lancet* 395 (10223) (2020) 507–513, [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7).
- M. Wang, R. Cao, L. Zhang, X. Yang, J. Liu, M. Xu, et al., Remdesivir and Chloroquine Effectively Inhibit the Recently Emerged Novel Coronavirus (2019-nCoV) in Vitro, *Cell research*, 2020.
- Y.H. Jin, L. Cai, Z.S. Cheng, H. Cheng, T. Deng, Y.P. Fan, et al., A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version), *Mil. Med. Res.* 7 (2020).
- P. Wu, X. Hao, E.H.Y. Lau, J.Y. Wong, K.S.M. Leung, J.T. Wu, et al., Real-time tentative assessment of the epidemiological characteristics of novel coronavirus infections in Wuhan, China, as at 22 January 2020, *Euro Surveill.* 25 (2020).

INTERNATIONAL DAY OF FOREST: NATIONAL BAMBOO MISSION

RS Tomar^{1,2}, Sushma Tiwari³ and AK Pandey¹

¹College of Horticulture and Forestry, RLBCAU, Jhansi, U.P.

²ICAR-NIPB, Pusa Campus, New Delhi-110012

³Dept of plant Molecular Biology and Biotechnology, RVSKVV, Gwalior-474005, M.P.

Email id: rsstomar@rediffmail.com; sushma2540@gmail.com

In every part of the world, International Forest Day is being celebrated on 21st March. To meet the society's need for products produced from the trees is the great challenge faced by the forests. After oil and gas forestry products are the third most valuable commodity. More than 5000 products are used made from the products which include fiber for pulp, paper, packaging and building needs. Fuel obtained from wood is one of the most commonly used byproduct in the world. Forests are very important component of our ecology and ecosystem providing wildlife habitats, controlling soil erosion, purifying water, maintain clean air by inhaling carbon dioxide and emitting oxygen. On looking several aspects they are considered as an essential part needed by us as well as future generations. With the growing demand in the use of wood consumption it is only possible with the increase in tree plantations. Silviculture is the branch of agriculture which deals with trees i.e. how to grow them, how to maximize growth and return, and how to manipulate species composition to meet specific objectives. The need of the hour is

to plant the right tree for the right purpose on a given site. There is lack of sufficient information to produce or select the best genotypes for a particular region. Also the establishment of forests is both time consuming and expensive.

Hence, molecular biological techniques and other biotechnologies are being developed to accelerate the production and selection of optimally adapted genotypes. These genotypes will be selected for their ability to grow and perform specific functions within a defined forest system. Because such developments require multidisciplinary interactions, biotechnological methods are beginning to be utilized in several different areas. Modern biotechnological tools and techniques will provide solution to better understand some of the diverse organisms that occupy forests, as well as to enhance methods for genetically manipulating these organisms. The coming years will be a time of rapid expansion for trees developed through modern techniques in an attempt to fulfill the global demand for forest products and to protect future forests from invasive pests and climate change. The world will benefit from a mechanism to determine which uses of this technology can bring benefit.

Apart from several forest trees, bamboo is also widely used in our day to day life. Bamboo is part of the grass family and is an evergreen perennial flowering Plant. It has a green outer

cylindrical layer with a hollow stem. The outer part of bamboo is known as a culm and the ringed part on the stem is called a node. Bamboo has the ability to re-generate, meaning that it will continue to grow from the root after it has been harvested. Bamboo is one of the fastest growing plants in the world, with one species reaching a record 91cm in just 24 hours. There are many different species of bamboo, but the type of bamboo that is used for flooring and other manufactured products is called Moso Bamboo, or its scientific name is *Phyllostchys Edulis*.

How and where does bamboo grow?

Moso bamboo is native to China and Taiwan. It is classed as a giant bamboo and has been known to reach up to 28 meters tall. It grows very quickly and can reach maturity in around 5 to 6 years. It continually reproduces by sending culms of bamboo from its underground stem (called a rhizome). Moso bamboo does flower but the process is very sporadic and it only happens every 50 to 100 years. The flowers produce seeds which fall to the ground and germinate very quickly to create new Moso bamboo plants. All types of bamboo have self-regenerating properties, which mean that once they have been cut down during a harvest they

will just grow again from the root, which eliminates the need for the re-planting of new crops. The rapid growth and clever regenerating properties of bamboo are making it a popular alternative to hardwood as a material for flooring, furniture and utensils. It is classed as a renewable, eco-friendly and sustainable material.

How is bamboo harvested?

Moso bamboo forests are usually harvested every five to six years.

This is done very carefully, by hand, to ensure the self-regenerating root is not damaged. If the root is in-tact the bamboo will continue to grow and be ready for another harvest in five years' time. During the harvesting season of a bamboo forest, a methodical and systematic approach is used to make sure that the whole forest is not cut. The bamboo forest is usually split into different sections and colour coded so that it is only cut after the fifth year, once it has reached full maturity. This ensures that healthy, abundant crops of bamboo can be harvested each year as a particular section of the forest reaches its maturity.

How strong is bamboo?

Bamboo is an extremely strong natural material. It actually has a higher fibre rating than wood, meaning it can withstand compression better than timber and even concrete. It also has greater tensile strength (its resistance to being pulled apart) than steel. In order to test bamboo in comparison to other flooring materials (in the UK), the Janka Hardness Scale is used. It is a complex test which drives a small steel ball into the wood or bamboo to a certain depth. They are then able to measure the hardness and compare it another species of bamboo or wood. Bamboo flooring rates very highly compared to types of hardwood flooring:



Products made of Bamboo are in use in day to day life.



AMITY INSTITUTE OF ENVIRONMENTAL SCIENCES

ADMISSIONS NOTICE FOR

B.Sc. - Environmental Sc.

M.Sc. - Environmental Sc.

Ph.D - Environmental Sc.

M.Sc. - Environmental Health Science & Management

M.Tech.

Water Technology & Mgmt.

P.G. Diploma

- Environmental Impact Assessment & Management
- Climate Change, Adaptation & Mitigation
- Disaster Management

ADVANTAGE AMITY

- Hi-Tech labs with research facilities for air, water and soil pollution monitoring, environmental toxicology, bio-remediation, solid waste water management etc.
- Govt. Funded projects of over Rs. 6 Cr. from Department of Science and Technology, Ministry of Earth Science, Ministry of Environmental Forest and Climate Change etc.
- Faculty credited with filing patents and contributing peer reviewed high impact research papers in leading journals.
- Collaborations with various National and International Institutions/Organizations like Northampton, Derby UK, Saskatchewan Canada, NYU, UMass, UC Berkley, EPA, NIEHS-USA, NEERI, CPCB etc.
- Hi-end placements and internship at leading MNCs, Research Centre's, Govt. bodies like DPCC, DRDO, NEERI-Nagpur, IARI, NIDM, IMO, CII, CWC, TERI, CSE, JNU, DU, Grassroots, Green-C India, Citizens Environment Improvement Society, CEC-CICI, Welspun Energy Ltd., SCS-India Pvt. Ltd., Dupont etc.
- Regular guest lectures by leading experts from India and abroad
- Scientist of the Year Award -2015 & Environmentalist of the Year Award-2014 by National Environmental Sciences Academy (NESA)
- National and International conferences, workshops, training courses, Environment Day etc.

CAREER OPPORTUNITIES

Positions in diverse environment related fields of teaching and research in educational institutions, Environmental health & safety specialists, corporates, MNCs, Government organizations Analysts in laboratories and research bodies, environmental journalism in media companies, consultants in environment impact assessment, academic institutes and NGOs etc.

ADMISSION ELIGIBILITY

- **B.Sc. Environmental Sciences**
Eligibility: 10+2, PCB (Minimum 55%)
- **B.Sc. + B.Ed. Environmental Sciences**
Eligibility: 10+2, PCB (Minimum 55%)
- **M.Sc. Environmental Sciences / Environmental Health Science & Management**
Eligibility: B.Sc. in any subject of life sciences / Related Discipline, Minimum 50% & 10+2 (Min. 50%)
- **Ph.D Environmental Sciences**
Eligibility: M.Sc. in Environmental Sciences or related field Minimum 55% Marks | CGPA
- **M.Tech Water Technology & Management**
Eligibility: B.Tech., B.E, M.Sc. in any subject of water resources / civil / environment / related discipline Minimum 50%
- **P.G Diploma**
- Environmental Impact assessment & Management
- Climate Change Adaption & Mitigation
- Disaster Management
Eligibility: B.Sc., B.A., B.Com. B.B.A Minimum 50%

PART OF AMITY EDUCATION GROUP

150,000 Students

10 Universities

6,000 Faculty

14 Overseas Campuses

25,000 Scholarships Awarded



Continuous Air Monitoring Station at Amity University Noida Campus



Amity student at Antarctica for environmental research



For further details, please contact:

AMITY INSTITUTE OF ENVIRONMENTAL SCIENCES

J-1 Block, Ground Floor, Amity University, Sector- 125, Noida, U.P. - 201313
Tel.: 0120-4392604 (D), 4392406, 4392950 (O) | Email: tjindal@amity.edu
www.amity.edu/aietsm | www.amity.edu/aies



AMITY UNIVERSITY

From the Editor's

Dear Readers,

I wish my warm wishes!!

As we all know that nowadays the world is suffering from Corona virus (COVID-19) infection. The severity of infection is very strong that world is facing medical emergency. The team of researchers, medical staff and several workers are working day and night to help in the time of crisis. We appreciate their untiring efforts and contribution in the hard times. Hope all will be normal very soon.

In March issue, we recount the various projects and popular articles. This issue includes Annual awards by Academy for its members actively involved in their field or events and activities organised by the Academy. NESA is well known for its environmental awareness activities.

The month of March witnessed for special days i.e. **WORLD WILDLIFE DAY 3rd March**; **WORLD SPARROW DAY 20th March**; **WORLD FORESTRY DAY 21st March**, **WORLD WATER DAY 22nd March**; **WORLD METEOROLOGICAL DAY 23rd March** and **THE EARTH HOUR 28th March**. These were the days which reminded us their importance for existence. The March month showed the relationship between bird, forest, water, meteorology and earth as a whole with its natural resource.

I express my sincere and huge thank to all the persons who contributed writing the wonderful and inspiring articles, without which there wouldn't have been this newsletter issue. Please continue sharing such articles and share with your friends also.

I would like to thank President and General Secretary, NESA, New Delhi, and the Editorial team including Print, Designer and Publication committee for their nonstop support and efforts throughout this edition.

We hope this edition makes an interesting read. Please feel free to offer any suggestions for improvement.

Dr. Sushma Tiwari
Associate Editor

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

APPEAL TO LIFE MEMBERS

NESA Life Members are requested to submit short articles for the NESA e-Newsletter that are consistent with NESA's objectives to improve environment. The articles should focus on topics related to environment and facilitate communication and discussion among researchers, academicians and students. The articles for April edition can be submitted to nesapublications@gmail.com before **15th April, 2020**.

Dr. R.S. Tomar
Editor-in-Chief, NESA E-newsletter

To, _____

Vol. 23 Issue - 03 (Monthly)

March 2020

From
NATIONAL ENVIRONMENTAL SCIENCE ACADEMY
206 Raj Tower -1, Alaknanda Community Centre,
New Delhi -110019. Ph.: 011-2602 3614
E-mails: nesapublications@gmail.com; nesapub@yahoo.co.in



**INVITATION OF RESEARCH ARTICLES
for PUBLICATION in NESA Journals**

INTERNATIONAL JOURNAL ON AGRICULTURAL SCIENCES

ISSN NO. 0976-450X | NAAS RATING 2.60

INTERNATIONAL JOURNAL ON ENVIRONMENTAL SCIENCES

ISSN NO. 0976-4534 | NAAS RATING 3.06

INTERNATIONAL JOURNAL ON BIOLOGICAL SCIENCES

ISSN NO. 0976-4518 | NAAS RATING 3.14

INTERNATIONAL JOURNAL ON CHEMICAL SCIENCES

ISSN NO. 0976-4526

INTERNATIONAL JOURNAL ON PHYSICAL SCIENCES

ISSN NO. 2230-9683

INDIAN JOURNAL OF UNANI MEDICINE

ISSN NO. 0974-6056

These JOURNALS ON DIFFERENT SUBJECTS are being published by this Academy. Send your manuscripts for peer-review by e-mail. **THE AUTHORS MUST MENTION ADDRESS, Contact Nos. and E-MAIL ID** in their forwarding letter. Proof will be sent for correction before publishing. A pledge for originality will be signed by the authors. Five sets of reprints will be dispatched within 30 days after the receipt of the **PROCESSING FEE**, alongwith a press print soft copy of final version of manuscript. All remittances are to be sent by a crossed Bank Draft in favour of **NATIONAL ENVIRONMENTAL SCIENCE ACADEMY** payable at **NEW DELHI**.

For further details and **NOTES FOR AUTHORS**, please contact Academy at nesapublications@gmail.com nesapub@yahoo.co.in