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Editorial...

I am penning down the last editorial of this News Letter for this year with a heavy heart as we lost millions of people round the globe due to the devastating COVID-19 Pandemic. This covid-19 virus affected people in almost all countries round the globe irrespective of race or religion, rich or poor. Health authorities are trying their best to manage the situation and at present the situation has improved marginally.

Though a few medicines have been repurposed and approved for emergency use, incidentally, new medicines for the treatment COVID -19 are yet to be developed, and a few COVID vaccines are being developed in different countries. Countries like UK, Bahrain, Canada, Mexico, US, Singapore, Oman, Saudi Arabia, Kuwait, Russia and China have already started vaccination but a section of scientists are apprehensive about its safety and efficacy. Another issue is manufacturing of sufficient quantity of vaccines to make it available to each and every human being. To make this possible, we also need sufficient numbers of vaccinators, but presently such number of vaccinators is meagre. Considering this fact, different global agencies and governments are engaging more cadres as vaccinators. As per the reliable sources COVID vaccine developed by Oxford will be approved by appropriate agency in India very soon. With this hope I wish you all a safe, happy and "normal" New Year 2021!

Subhash C. Mandal, Ph.D. -Editor

From Secretary's desk

Dear Friends,

As we close on a most bizarre and challenging year, I hope this final newsletter of 2020 finds that you are planning sometime to relax and enjoy a well deserve break.

Many congratulations to the editorial team for their contributions to release this newsletter regularly even during this tough time. On behalf of the newsletter team, I appreciate the efforts of article contributors, without whom our newsletter would not be possible.

Our newsletter is a group effort and rely on contributions from all SFE-members for the content. So, let's contribute to our own newsletter. We want to know what projects you're working on. What's new with you and your organization. Let's make it a successful mode of exchanging scientific knowledge in the field of ethnopharmacology. I personally thank the members of the executive and editorial board of the newsletter, coordinators for the local chapters and all SFE-India members for their contributions to the society and the webinar series.

I look forward to 2021 and hope to meet and seeing you all face to face again.

**Prof. Pulok K. Mukherjee, FWAST, FRSC, FNASc
Secretary, SFE - India**

Webinar extracts

Role of Ayurveda & Ayurveda Industry Associated in Covid-19



Anurag Sharma, Baidyanath, India

The current Global COVID 19 pandemics has now been declared a health emergency by WHO. The disease which originated in Wuhan, China has now almost affected every country on the planet and India has been no exception. There is a continuous upsurge in cases in India gradually involving almost all the states and cities. It is a challenge for whole medical fraternity to find a way out with minimal mortalities. WHO has set two main goals to contain effects of

COVID 19 to a minimal possible. It is to prioritize and accelerate innovative research to help contain the spread of the epidemic and facilitate care for those affected. The second is to learn from current global pandemic response to better prepare for next unforeseen epidemic.

To curtail the spread of this outbreak and minimize the morbidity, traditional medicine has played significant role in China, where in through the use of traditional Chinese medicine, the symptoms of COVID 19 were reduced to minimum and in due course of time spread was also checked. The most significant effect was that recovery rate of affected patients improved and the disease progression to severe stages was checked leading to lowered mortality. In India, traditional Ayurveda medicines may also be used to enhance the immunity of the diseased individuals to contain the progression of the disease to severe stages which may be helpful in lowering the mortality rate in positive cases.

Ministry of AYUSH has taken good initiatives to make aware the fellow peoples to develop immunity by suggesting AYUSH Kwath like preparations along with Yoga cum berating exercises. Recent data says that 43 clinical trials are registered with CTRI in Ayurveda domain only to generate evidence in favor of New Herbal drugs. Research needs to be conducted to involve Ayurveda along with conventional management to try and reduce the morbidity and mortality caused by the deadly virus. Ayurveda industry come forward with ministry of AYUSH in number of ventures either via supplying quality medicines or via directly conducting Clinical trials to get a breakthrough against this deadly disease.

The Contribution of Chinese Medicine in the Fight Against COVID-19



Rudolf Bauer, Graz, Austria

COVID-19 has become pandemic and a global threat. However, treatment options with antiviral agents are still very limited, and it will take time to develop safe vaccines. Therefore, we should explore also other options, like traditional medicines which have been used for centuries to treat fever and infectious diseases [1].

Chinese Traditional Medicine (TCM) has a long history, and it already played an important role in the treatment of viral infections during the last decades in China. During the first SARS-CoV crisis, 40 to 60% of the infected patients in China received Chinese medicine treatment on top of the standard modern medicine treatment at some stages of the disease [2]. Also, more than 85 % of SARS-CoV-2 infected patients have received TCM treatment during the recent COVID-19 infections in China [3].

However, the efficacy of Chinese medicine in COVID-19 treatment has also been questioned [4]. Therefore, more research is needed in order to provide proof of efficacy and safety of Chinese medicine in Covid19. It is necessary to perform controlled clinical studies, to use standardized products, to elucidate the mode of action and to identify the active principles. There is huge potential, but a lot of basic and clinical research still needs to be done.

Since the public is often concerned about the quality of Chinese medicines, thorough quality control is a must in order to avoid contaminations and adulterations. A holistic approach using omics technologies should be chosen instead of single compound assays.

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Ayurvedic herbs for COVID 19



CK Katiyar, Emami Ltd, Kolkata

COVID 19 pandemic has spread all over the World with great furry resulting in huge mortality also. Top Pharmaceutical ad Biotechnology companies are already working round the clock to develop its remedy be it vaccine, new drug or repurposed drug but so far no definitive hope.

In India Ayurveda has offered some hope by propagating its concept of Rasayan. The word Rasayan should not be confused with Chemical or Chemistry. In Ayurveda it has special significance by providing immunity boosting measures including immunomodulator herbs. Ministry of AYUSH has taken pro active steps and came out with multiple advisories on how to protect oneself by boost immunity through Ayurvedic measures and products like Chyawanprash, Guduchi, Ashwagandha, AYUSH 64 etc. For the purpose of anti SARS-CoV-2 virus research Ayurvedic herbs should be identified using its principles of Rasayana (Immunomodulator, Shwasahar (acting on Respiratory system) and Jwarahar (anti pyretic) Screening of Ayurvedic literature on these parameters for herbs with potential of activity against SARS-CoV-2 has revealed that besides the products like AYUSH 64 there are 8 herbs which should be thoroughly studied using bio activity guided fractionation technique.

The identified herbs are-

Withani somnifera (Ashwagandha)
Tinospora cordifolia (Guduchi)
Ocimum sanctum (Tulasi)
Andrographis paniculata (Kalmegha)
Phyllanthus amarus (Bhumyamalaki)
Coptis teeta (Mamira)
Glycyrrhiza glabra (Madhuyashti) and
Cissampelos pareira (Patha)

Ayurvedic justification and published scientific literature supporting selection of these herbs shall be discussed during the presentation. Currently there are 42 clinical trials on Ayurvedic Medicines are registered on Clinical Trial Registry of India (CTRI) which is maintained by the Indian Council of Medical Research. One clinical trial is also registered for a new class of Pharmaceutical drug called Phytopharmaceutical by Sun Pharmaceuticals on an Ayurvedic medicinal plant derived product. Dread of COVID 19 has led to confluence of medical systems targeting development of remedy against this widely affecting condition. Hopefully Ayurveda would also contribute its share in near future.

Possible role of natural products and Traditional Medicines in the fight against the ever-evolving SARS-COV-2 Virus – Causative agent for COVID-19 disease: Plant-based pharmaceutical and Herbal interventions



Motlalepula G. Matsabisa, South Africa

The novel Coronavirus Disease 2019 (COVID-19) is a contagious disease caused by SARS-CoV-2 virus. Since late December 2019, humans have been under threat due to an outbreak of the COVID-19. There are no immediate and appropriate treatments either as preventative vaccines or even chemotherapeutics against SARS-CoV-2. Current interventions are preventative in nature, based on social and physical distancing and patient ventilation as treatment. Hydroxychloroquine and Chloroquine treatments have been tried but toxicity of these drugs outweighs treatment benefits and so discouraged as treatment option for COVID-19. Use of antiretroviral drugs, Remdesivir, Flavilar have been tried but found ineffective against SARS-CoV-2. Dexamethasone, an old drug used for acute respiratory distress syndrome (ARDS), an anti-inflammatory and immunosuppressant, to counteract the cytokine storm due to COVID-19, has come as a saviour, but drug is only effective in severely ill patients and not recommended for use in asymptomatic cases of COVID-19. The virus seems not to have stopped its devastation of human life; cases of infected persons is on the increase, the death toll is climbing and world hoping and making mathematical calculations on flattening infection curve. The virus continues to intrigue the world - its spread is now understood to be airborne - stays in air for over eight hours; bringing another challenge in terms of prevention and protection. The use of sanitization, washing hands, not touching your face, self-quarantine and use of facemasks all seem to be not ideal prevention strategies. COVID-19 has been understood to be an upper respiratory tract disease but new evidence suggests the disease to be a cardiovascular and causing diabetes. The virus is also seen to be changing and new mutants of the virus are constantly being discovered. The D614G mutation, affects viral spike protein on viral surface, making it easier for the virus to enter host cell. The mutation, known as G variation, is the dominant variant of the virus, while samples of patients from Wuhan in China have shown the D variation. These changes are bringing much debate, as their contribution to virulence and drug resistance are still unknown. The G variant is found to be more infectious and indicating increased replication, infecting cells up to 8 times more than the D variant. Could the now increasing infections be due to the higher infectivity of the G variant? New interventions and research strategies are urgently needed fast to catch-up with the ever evolving SARS-CoV-2 and its variants. In the absence of treatments, plant-based therapies cannot be ruled out. Many plant extracts and their compounds have been reported with specific pharmacological properties, including anti-inflammatory, anti-diabetic, anti-carcinogenic, vasodilator, anti-bacterial, and also antiviral effects. There are known traditional practices that have been used to induce immunity in livestock, the "Herd immunity". There are traditional preparations that have been used in other pandemics such as the Spanish flu and the Russian Pandemic and others that when studied could contribute to the fight against this current pandemic. The talk will take through what is known of COVID-19 and present traditional medicines and traditional treatments used in similar pandemics and those under clinical investigations for COVID-19.

Antiviral activity of artemisinin-type drugs



Thomas Efferth, Mainz, Germany

Traditional Chinese medicine commands a unique position among all traditional medicines because of its 5000 years of history. Our own interest in natural products from traditional Chinese medicine was triggered in the 1990s, by artemisinin-type sesquiterpene lactones from *Artemisia annua* L. As demonstrated in recent years, this class of compounds has activity against malaria, cancer cells, and schistosomiasis. Interestingly, the bioactivity of artemisinin and its semisynthetic derivative artesunate is even broader and includes the inhibition of certain viruses, such as human cytomegalovirus and other members of the Herpesviridae family (e.g., herpes simplex virus type 1 and Epstein-Barr virus), hepatitis B virus, hepatitis C virus, and bovine viral diarrhea virus. A role against SARS-CoV-2

mediated COVID-19 is discussed. Analysis of the complete profile of the pharmacological activities and molecular modes of action of artemisinin and artesunate and their performance in clinical trials have further elucidated the full antimicrobial potential of these versatile pharmacological tools from nature.

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Promising Aspect of Ethnomedicine for Northeast India: Making Medicinal Plant Wealth work



Soso Shaiza, India

The traditional system of medicine plays an important role in the healthcare of rural and tribal people for all types of ailments in Northeast India. Northeast India has India's richest reservoir of plant diversity and supports around 50% of India's total plant diversity. The region also harbours 40% of India's endemic plant species. Medicinal plants are an important bio-resource of Northeast India. The region's diverse physiography helps the growth of diverse species of medicinal plants, many of which are used by various ethnic groups for their primary healthcare needs. The medicinal plant production is traded mainly in the markets of Delhi, West Bengal, Bihar, other cities in India, and Myanmar. For an instant, the root of Himalayan Paris found in Manipur, Nagaland, Arunachal Pradesh, and Meghalaya and is exported to Myanmar.

Some core issues need to be addressed include identification of species-specific pockets through surveys, proper documentation (plant parts used, for which ailment, dosages, method of preparation, harvesting period), proper identification, isolation of active compound, conservation, production of quality planting material, agro-technique development, market infrastructure, establishment of storage facilities and market channels, awareness and capacity building, etc.

A major issue in this sector is the extraction of medicinal plants from their wild population. As a result, their natural population is restricted only to isolated pockets. It has been observed in field surveys that to collect medicinal plants, pharmaceutical companies engage middlemen, who in turn engage local villagers to extract such plants from the wild at low cost. Different parts of different plants are traded. The roots of Himalayan Ginseng, Scented Arum, etc. are used, while fruits of May apple are required. However, whole plants are uprooted in the extraction process, giving the seeds no chance to propagate the species. This is threatening their population as the plants are plucked at a faster rate than they regenerate in the wild. Even after this, sometimes pharmaceutical companies do not purchase the raw material over quality concerns. Adulteration is another problem in promoting certain species, which need to be tackled through modern techniques.

Exploration and finding out unexplored medicinal plants of the region, but also on conservation aspects of the known plants and providing quality planting material to farmers for large scale cultivation. Further, source promotion of commercial cultivation and marketing should be given priority through contract farming. To inform, educate, and empowered the local tribal communities' conferences and seminars should be frequently held targeting the youth. Training programs on the collection, cultivation, preservation, storage, and processing techniques of medicinal plants is important. Establishment of research and Indigenous knowledge-based bioresource centre in the region and incentives for medicinal plant cultivators. Most importantly more grants to local tribal communities should be provided from government and other funding agencies. The ethnomedicine sector in the region has great potential to boost the economy of the Northeast region and employment generation and ecopreneurship.

IS TOBACCO ADDICTION A GLOBAL ENDEMIC? A NEW PERSPECTIVE



Murugesan Thangaraju, India

I will speak about the global consequences of TOBACCO ADDICTION, a well-known preventable situation that is affecting the vast majority of the world population for several decades and remains a big challenge to control effectively. Tobacco use is silently or unnoticeably causing millions of deaths globally, every year.

It is believed that human consumption of tobacco in the form of chewing and smoking during cultural events and religious ceremonies have been in practice as early as 5000-3000 BC. Smoking had become more widespread after the invention of the cigarette making machine in the 1700s, which helped to produce massive numbers of cigarettes. It should be noted that tobacco products are the only category of "consumer products" that kills more than 50% of its users, prematurely.

Despite tremendous efforts and various advancements in tobacco control, tobacco use is remaining the leading cause of preventable deaths, disabilities, and diseases across the globe. Tobacco use is not only impacting health; it severely impacts the world economy and causes catastrophic damages to the environment. We need to realize that TOBACCO ADDICTION is a serious threat to public health and the planet. Therefore, it is imperative to act swiftly and aggressively to save lives by considering that tobacco addiction is a global endemic. I will discuss with you a few constructive action plans to curb tobacco addiction.

Waste water-based epidemiology approach for COVID-19 virus detection



Sunita Varjani and Ashok Pandey, India

Recent outbreak of a novel coronavirus (COVID-19) has posed a notable public health threat globally. It has also adversely affected the economic and social status of many countries. The World Health Organization (WHO) on June 19, 2020 has reported greater than 14,000,000 infected persons in the world. As COVID-19 is a novel human coronavirus, response of public health authorities, researchers and academicians to COVID-19 showed an inevitable lag because of lack of understanding of this virus as well as rapid

detection methods.

The conventional epidemiology depends on systematic diagnosis of samples and clinical symptoms. It is hard to detect the highly infectious disease in a large population in a timely manner. Published literature demonstrates that asymptomatic individuals along with symptomatic patients discharge virus/viral material which ultimately reaches wastewater treatment plants i.e. sewage treatment plants

(STP). It can be shed in faeces for several days, even after the patient stops exhibiting respiratory symptoms. Wastewater-based epidemiology (WBE) offers a promising approach to study/understand disease outbreak status in wastewater. WBE was used as an effective tool during past outbreak of viral diseases, e.g., Norovirus, poliovirus and hepatitis A.

In case of COVID-19 detection, WBE has been proven as an effective tool for monitoring load of virus in wastewater of STP because STP wastewater contains excreta from asymptomatic individuals as well as from symptomatic patients. This can be used as an alarming approach for COVID-19 outbreak in a community. This can also be employed to report efficiency of public health interventions. Recent efforts for enhancing detection of viruses in wastewater matrices will be discussed. Perspectives to develop novel technologies for virus elimination and source control will also be highlighted.

The extractant is a key to unlocking additional value of useful plants to rural communities



Kobus Eloff, South Africa

Although water has been called the universal solvent, no single extractant can dissolve all the different metabolites present in plants. Rural farmers and traditional healers have practically only water available as extractant. This means that mainly water-soluble compounds will be extracted. In many cases the use of aqueous plant extracts for traditional antimicrobial, anti-acaricidal or antiparasitic activity using only water as extractant could not be confirmed under controlled laboratory conditions.

The reasons for this anomaly could be the difference in extraction procedure used, the presence of saponins in plants or the efficacy through alternative mechanisms such as increasing immune response. In a large number of cases intermediate polarity extractants especially acetone had the highest activity in several different applications. Acetone has many advantages e.g. lower toxicity than ethanol or methanol, ease of removal due to its high volatility, large number of compounds extracted from plants. Extractants of increasing polarity of *Combretum woodii* leaves led to the following average MICs against *Enterococcus faecalis*, *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*: hexane 0.38, di-isopropyl ether 0.23, ethyl ether 0.26, methylene dichloride 0.14, ethyl acetate 0.08, tetrahydrofuran 0.15, acetone 0.14, ethanol > 0.79, methanol >0.94 and water >2.5 mg/ml. By bioautography it could be shown that intermediate polarity extractants extract more antimicrobial compounds than polar or non-polar extractants.

In the search for potential new antimicrobials random screening of acetone leaf extracts of 700 acetone extracts of 537 tree species for activity against 8 microbial pathogens, has led to the discovery of many extracts with MICs of 0.04 mg/ml and lower. Because rural inhabitants do not have access to acetone, an alternative approach was investigated. Soap has the ability to solubilize non-polar compounds such as grease in water. A 1% liquid soap extract of *Maerua edulis* had the same in vitro acaricidal activity against ticks than an acetone extract and a commercial acaricidal. By using a mixture of soap, cooking oil (to make the extract stick to animals) and water the extract also had higher activity against ticks in a field experiment than the commercial acaricide used whereas the water extract was not active. The use of a 1% detergent available to rural farmers, may be a key to unlocking additional potential of plant extracts to resource poor farmers and traditional healers in rural areas.

This approach may be useful for treating many indications especially in topical applications where the danger of toxicity is not as great. One of the main challenges in using the plants to increase the quality of life of rural inhabitants is not only to confirm the efficacy of the traditional use of plants for human, animal and plant health but to also investigate other activities and to develop low technology methods to use plants. It may be even more important to provide this information to rural inhabitants and to test it under their conditions.

Role of Indian Essential Oils in Immunity Boosting

To adapt to the new lifestyle and face upcoming challenges one needs to be physically and mentally healthy, the best way to maintain physical & emotional balance in various circumstances is to build a healthy immune system. The Healthy immune system is work as armor, it is responsible for fighting foreign invaders in the body, like pathogenic bacteria and viruses, and also destroy harmful cells within the body. Studies prove that increased age, improper sleep, anxiety, depression, stress, and various health conditions are some of the factors which decrease the immune response. So to maintain immunity, along with proper diet personal care is also important for that we can use natural essential oils in daily routine. Essential oils are secondary metabolites of aromatic plants, which are extracted by hydro or hydro steam distillation. Essential oils are a complex mixture of volatile organic compounds such as hydrocarbons like terpenes, sesquiterpenes, and oxygenated compounds like alcohols, esters, ethers, aldehydes, ketones, lactones, phenols, and phenol ethers because of it they have pharmaceutical & pharmacological activities.

Essential oils help in immunity-boosting by promoting the activity of lymphocytes, increasing phagocytosis, and induce interferon production or by reducing or inhibiting factors affecting immunity.

Role of few important essential oils are:

Eucalyptus (*Eucalyptus globulus*) essential oil has major active component 1,8 cineole, which helps in stimulating the activity of immune cells. It has anti-bacterial, antifungal, anti-inflammatory properties. It is very effective to treat respiratory illness.

Peppermint (*Mentha piperita*) is a potent antimicrobial, antiviral, and antioxidant. The active ingredients in peppermint oil are menthol, and menthone which helps in soothing the respiratory system, and as a natural decongestant, it can provide relief from sinus congestion.

Rosemary (*Rosmarinus officinalis*) essential oil active components are 1.8-cineole, camphor, alpha-pinene, and linalool, which are effective against many harmful bacteria and fungi. Camphor act as a decongestant.

Thyme (*Thymus vulgaris*) essential oil increases the activity of phagocytosis. It acts as antibacterial, antifungal, antiviral & antiseptic. Rosmarinic acid and quercetin, eriocitrin, luteolin, apigenin, serpin exhibit antioxidant activity. Carvacrol/ Thymol inhibits bacterial growth by lactate formation.

Ginger oil (*Zingiber officinale*) Ginger oil can help a compromised immune system by enhancing the antibody immune response. Ginger is antiseptic, anti-inflammatory, and anti-bacterial which makes it exceptionally useful at fighting a wide range of infections, especially respiratory infections. It also improves blood circulation & increases hemoglobin levels. Ginger oil is packed with antioxidants like gingerols, paradols, Zingerone, etc.

Cinnamon (*Cinnamomum zeylanicum*) essential oil contains cinnamaldehydes which shows antifungal, antibacterial, and antimicrobial activity. Cinnamyl acetate present in oil enhances blood circulation. Eugenol acetate acts as antioxidant and eugenol is an analgesic, antiseptic and anti-inflammatory.

Lemongrass (*Cymbopogon flexuosus*) major active component in lemongrass essential oil is citral which acts on the central nervous system and shows an anxiolytic and sedative activity. Lemongrass oil increases metabolism. It is antibacterial, antifungal, analgesic, and antispasmodic.

Basil (*Ocimum basilicum*):-Basil is anti-bacterial, germicidal and fungicidal, as it increases the activity of T helper cells & natural killer cells. A combination of different basil helps in respiratory illness. Inhalation of Basil essential oil helps in balancing the hormones such as cortisol which improves brain functioning.

Vetiver (*Vetiveria zizanioides*), the main constituents are α -Vetivone, β -Vetivone, and Khusinol. Vetiver essential oil works as a natural antioxidant that promotes relief from various types of inflammation. It strengthens the nervous system by sedating the senses and thereby reducing the stress and physical exhaustion linked to low immunity.

Lavender (*Lavandula angustifolia*) Lavender essential oil is antiseptic, analgesic, anti-convulsant, anti-depressant, anti-rheumatic, anti-spasmodic, anti-inflammatory, anti-viral, bactericidal, decongestant, relieving, soothing, vulnerary, sudorific, rubefacient, hypotensive, emmenagogue, diuretic, cytophylactic, carminative. It acts as a sedative and reduces cortisol levels.

Black pepper (*Piper nigrum*) The main chemical components of black pepper essential oil are caryophyllene, limonene, carene, and sabinene. which elevate mood, promote circulation, ease digestion, clear respiratory airways, and provide relief to sore, painful muscles. These monoterpenes & sesquiterpenes are antioxidants

Fucoidan and COVID-19: Some Biomolecular Mechanisms



Alexander N. Shikov

Natural sources such as marine flora is of interest in the development of new effective medicines. In this context, marine algae represent one of the richest sources of bioactive compounds. Fucoidans are biologically active sulfated polysaccharides that are synthesized by brown algae. Their analogues have not yet been found in terrestrial organisms. In recent years, fucoidans have become the subject of increased attention and numerous studies. Fucoidan has displayed potent radical scavenging and reduction power activities. It significantly inhibits the cyclooxygenase-2 (COX-2) enzyme with a greater selectivity index than the synthetic non-steroidal anti-inflammatory drug indomethacin. Fucoidan attenuated the lipopolysaccharide-induced expression of mitogen-activated protein kinase p38. Fucoidan prolongs the activated partial thromboplastin time and thrombin time by. A significant increase of prothrombin time was observed after the concentration of fucoidan was increased above 80 µg mL⁻¹. This evidenced that fucoidan may have an effect on intrinsic/common pathways and little effect on the extrinsic mechanism. Anti-oxidant, anti-inflammatory and anti-coagulant drugs have been used for the management of COVID19 complications. It has been suggested that a proper dose of antioxidants may ameliorate the cardiac injuries of critically ill patients with COVID19. Chinese scientists have come to the conclusion that anti-inflammatory treatment, started at the right time, is crucial in the therapy of patients with COVID19. Prophylactic doses of low-Mw heparins are recommended for all patients who require hospitalization for the management of COVID19 coagulopathy. In summary, fucoidan could be considered as a prospective candidate for amelioration the treatment of patients with COVID19; however, additional research in this field is required.

Natural products in the prevention and management of obesity



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Obesity is characterized by a body mass index (BMI) of 30 or higher. Obesity, a rapidly growing global health problem mainly because of sedentary modern lifestyle, is a metabolic disorder characterized by an excess accumulation of fat in the body due to energy intake exceeding energy expenditure [1]. Obesity is often implicated to serious ailments like diabetes, heart diseases, osteoarthritis and cancer. The COVID-19 pandemic has further highlighted the negative health impacts of obesity, by revealing the fact that obese individuals are likely to suffer more from COVID-19, and they have an increased risk of fatality from COVID-19. Currently, it is estimated that there are over 650 million obese people world-wide, and the number is increasing at an alarming rate.

Traditional medicines, especially of plant origin, have always played an important role in the management of obesity. Natural products derived anti-obesity products can be classified into three categories, food ingredients, herbal ingredients and other functional supplements. As evident from various pre-clinical and clinical trials, purified phytochemicals, e.g., capsaicin, curcumin, celastrol, emodin and gingerol, possess anti-obesity property, which is rendered through several mechanisms

[1]. This talk will present an overview of anti-obesity natural products, their mechanisms of actions, and their potential as anti-obesity therapeutics.

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Southern African Plants for Pharmaceuticals, Cosmeceuticals including COVID-19



Namrita Lall, South Africa

South Africa is third only to Brazil and Indonesia as far as plant-biodiversity is concerned. The purpose of this talk is to provide a holistic overview on the application of medicinal plants for pharmaceuticals (TB, Cancer), cosmeceutical purposes (disorders of the skin such as acne, pigmentary disorders, melanoma and anti ageing) including COVID-19. The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), known to cause the disease COVID-19, was declared a pandemic in early 2020. Numerous scientific reports on the potential of plants and secondary metabolites against SARS-CoV infection were found, providing important information on their possible activity against SARS-CoV-2. Based on current literature, 83 compounds have been identified with the potential to inhibit COVID-19.

Plants and their secondary metabolites, with activity against targets associated with the SARS-CoV infection, could provide valuable leads for the development into drugs for the novel SARS-CoV-2. The plants traditionally used in Southern Africa for symptoms associated with respiratory viral infections and influenza, such as coughs, fever, and colds will be discussed. Only a few of these plants have been screened against SARS-CoV. Natural products hold a prominent role in discovering novel therapeutics to mitigate the current COVID-19 pandemic, however, further investigations regarding *in vitro*, *in vivo*, pre-clinical and clinical phases is still required.

A number of plants have been analysed by our research team for their potential for skin- problems for example; for melasma, pigmentation, acne, melanoma etc. and effective cosmeceutical-prototypes products have been prepared from those lead ones. Twelve patents have been obtained and another 25 filed for these technologies. One pharmaceutical product for skin-hyperpigmentation problem has been commercialised both internationally and locally.

Twelve other pharmaceuticals prototypes have been licensed out to various pharmaceutical companies. The talk will uncover the potential of fermentation of medicinal samples, plant-derived elastase inhibitors and anti-inflammatory agents for possible application in the removal of wrinkles. The findings will highlight biological targets involved in the pathogenesis of ageing cascade as well efficacy of medicinal samples' proven in clinical studies. The significant results obtained from a medicinal plant for its consideration for a possible adjuvant for TB will be presented as well.

Scientific & Technological Advancements to Combat Covid 19 Pandemic: Hope from Natural Medicines



Dilip Ghosh, Australia

Viral infections including coronavirus (CoV), play an important role in human disease spectrum, and recent pandemic of Covid-19 have highlighted again the importance of prevention as a critical issue in safeguarding public health. Despite the progress made in immunization and drug development, many viruses lack preventive vaccines and efficient antiviral therapies. Botanical-derived products provide a rich resource for novel antiviral drug development

based on evidences. Until the world discovered any real solution, evidence-based nutraceuticals/dietary supplement/complementary medicines/herbal medicines (different country coined different regulatory names) may possess some advantages in preventing or treating the SARSCoV-2 infection. Based on many recent mechanistic studies it has been demonstrated that extract of cinnamon-derived procyanidin type A compound would presumably inhibit Covid-19 (SARS-CoV2) at the entry level due to its high affinity towards ACE2 receptor and also via binding to glycans on the viral Spike protein. Few recent clinical trials' outcomes showed very promising results.

Quality, Efficacy and Safety of Herbal remedies are product specific: Strategies and tools with emphasis on effect-directed analysis using HPTLC



Evelyn Wolfram^{1,2}, Pravin Ganesanandamoorthy², Andreas Schönborn²

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The assurance of quality, safety and efficacy of herbal medicinal and other phytotherapeutic remedies requires a much more complex and process-oriented approach along the value chain than for remedies based on APIs from monomolecular substances. Quality and Evidence of herbal medicinal products is product specific due to the unique complex multi-compound mixture of the herbal extract, which is dependent on the source of the plant material, the extraction and refining process. HPTLC is widely used in phytochemical analysis of herbal remedies. In Pharmacopeias, such as the Ph.Eur. [1], it is mainly monographed for the identification of herbal drug raw materials. Furthermore, it can be applied for extraction optimization or stability studies. This method is rapid and simple. However, for the purpose of quality control, a high degree of standardization is required concerning the chromatographic layers and the automation of the chromatographic development and detection. In HPTLC analysis of multicomponent natural mixtures, the analytical result is gained by of is a fingerprint picture sometimes made visible by a derivatization reaction, since the analytes are preserved on the thin layer stationary phase. Therefore, the method is suitable for coupling, also called hyphenation, with further analysis techniques or even bioassays. This allows to gain other molecular and bioactivity information of the multiple analytes in addition to a visual result, only. The presentation demonstrates examples of own studies of coupling of HPTLC with MALDI-TOF-MS [2], with enzymatic (XOD and AChE inhibition optimized on the basis of [3]) and reporter gene bioassays (planar Yeast Estrogen Screen [4]).

An outlook will be given of the applicability of the methods to an activity-based Quality assessment approach for herbal medicinal products, such as Ayurvedic remedies, and the direct safety control of complex mixtures by genotoxicity umuC-Test.

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Articles

Traditional knowledge that only scientifically needs to be validated

Ajay Kakati, Junior Research Fellow, DBT-Twinning Project, Department of Pharmacology and Toxicology, College of veterinary science, Khanapara, Guwahti-22

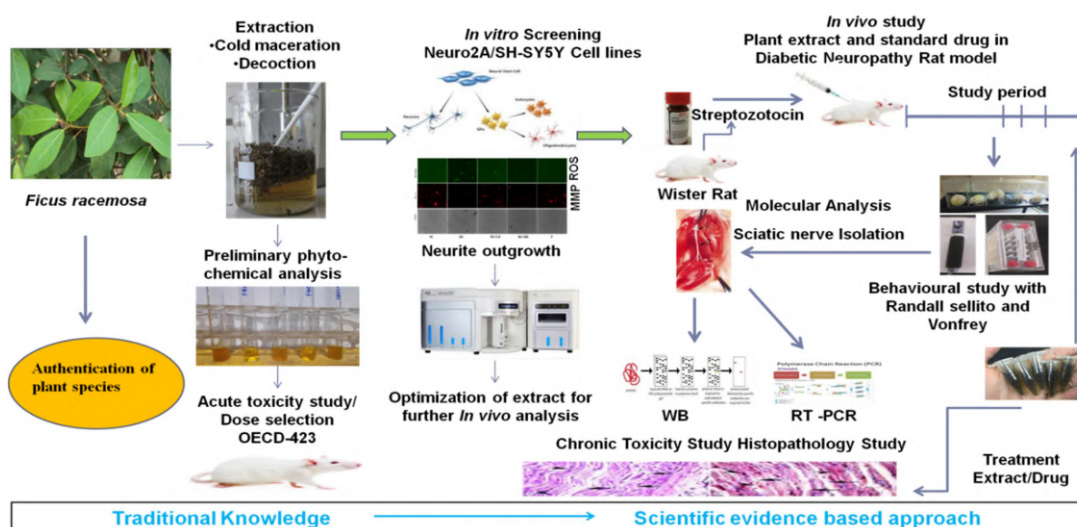
“Looking forward with the hope from nature against diabetic neuropathy”

Traditional knowledge: Northeastern parts of India is the hub of wide flora and fauna; with vigorous literature survey we have selected some of the traditionally claimed plants against diabetes with analgesic potential. Currently, we are working on the traditional plants from the Northeastern part of India, against the secondary complication associated with diabetes mellitus, especially Diabetic neuropathy. One of the plants namely *Ficus racemosa* was selected based on the traditional knowledge and application. Traditionally, this plant has been used for the management of diabetes and also has analgesic activity. Diabetic neuropathy is a secondary complication associated with long term diabetes mellitus which develops pain, decreased motility, and severe complication even amputation may occur. The occurrence of diabetic neuropathy is a long-term uphill process as this complication develops after several years of the initial occurrence of hyperglycemia. Hyperglycemia causes several pathological conditions like oxidative stress in neurons, activates many different biochemical pathways which cause major damage in different neurons which are potential targets in the treatment of diabetic neuropathy.

Scientific evidence-based approach: As this plant has both anti-diabetic as well as analgesic activity, we assumed that this specific plant might have strong potential activity against diabetic neuropathy. Therefore, based on its traditional medicinal values, we have prepared different extracts and these were screened for its activity against diabetic neuropathy. *In vitro* screening using a challenged Neuro2A cell line for the reduction of Reactive Oxygen Species (ROS), improve mitochondrial membrane potential (MMP), and neurite outgrowth. The optimized extract was then further examined using an *in vivo* experimental diabetic neuropathy in rats. The toxicity study and dose selection studies were performed according to OECD guidelines. Blood glucose level, body weight, and behavioral studies including hyperalgesia, mechanical allodynia, exposure to hot and cold stimuli, were recorded with the help of instruments like Randall sellito, Vonfrey, etc. Further, to access the molecular mechanism, experimental rats were sacrificed and sciatic nerve was isolated to evaluate the expression of various proteins and genes using Western blotting and RT-PCR.

Conclusion: Traditional knowledge and a hypothesis got scientifically validated.

Flow chart of scientific validation of plant



Achievements and honours

Heartiest Congratulation to **Prof. Pulok K Mukherjee**. I am happy to inform you that Prof. Mukherjee have been listed amongst the **Top 3 scientists** in India from the field on Medicinal & Biomolecular Chemistry appearing in the list of **Top 2% list** of authors of the World Based on independent report made by Stanford group. (source <https://doi.org/10.1371/journal.pbio.3000918>)

Prof. Pulok Kumar Mukherjee, Director, IBSD listed among the top 2% scientists in the world

IT News
Imphal, Nov 6:

Professor Pulok Kumar Mukherjee, Director of Institute of Bioresources and Sustainable Development (IBSD), Imphal has been named among top 2% scientists in the world as per a subject-wise analysis conducted by a team of scientists at Stanford University, California led by Dr. John PA Ioannidis. Professor Pulok Kumar Mukherjee has also been ranked among top 0.15 percent scientists in India with 211 papers in his name and with a worldwide subject rank of 128 among scientists. He is also ranked 3rd in India in the subject of Medicinal & Biomolecular Chemistry. There are 38 other scientists



in the Medicinal & Biomolecular Chemistry it added.

According to a statement, Prof. Pulok Kumar Mukherjee is working on traditional medicine inspired drug discovery and development from Indian medicinal plants with major emphasis on their validation, formulation and standardization, metabolomic profiling, safety and related aspects. He is a fellow of the National Academy of Science, India

(FNASc) and the Royal Society of Chemistry, UK (FRSC).

The analysis was conducted using citations from Scopus along with data assessing scientists for career-long citation impact till the year 2019 and for citation impact during a single calendar year. The scientists at Stanford University have created a database of over 100,000 top scientists of the world on the basis of standardized citation indicators which include information on citations, H-index, co-authorship and a composite indicator as well.

The scientists were organised into 22 scientific fields and 176 sub-fields using the indicator.

The scientists, staff and students of IBSD congratulated the Director for the remarkable feat.

Heartiest Congratulation



Dr. Subhra Chakraborty,

Director

National Institute of Plant Genome Research (NIPGR)

New Delhi, Govt. of India.

Dr. Subhra Chakraborty obtained her Ph.D in Plant Molecular Biology from Jawaharlal Nehru University in 1997. After a brief career as Research Scientist at the Centre for Plant Molecular Biology, Jawaharlal Nehru University, she joined National Institute for Plant Genome Research in 1998 as one of the founding faculty and has been continuously ascending the ranks ever since. She worked as Visiting Scientist at the Yale University, USA (2007-2008). Trained as a molecular biologist and biotechnologist, she got interested in protein science and was instrumental in initiating and establishing Plant Proteomics and Translational Genomics research in India. The major research interest of her laboratory is focused in the area of Nutritional Genomics, Plant Immunity, Multi-host resistance, Proteomics and Plant Biotechnology. The targeted research in the field has direct implications in plant and human health and vital to food and nutritional security.

Dr. Chakraborty is actively associated with national and international proteomics societies. Currently, she is serving as President, Proteomics Society, India (PSI); Council Member, Human Proteome Organization (HUPO); Co-chair of Food & Nutrition Initiative and HPP-SAB of HUPO; Council Member & Country Representative, Asia Oceania Agricultural Proteomics Organization (AOAPO). She is also serving as member of research bodies and national committees concerning education, academic activities, research funding and policy planning in India. She has been given JC Bose National Fellowship Award, Tata Innovation Fellowship Award, National Young Women Bio-scientist Award, NASI-Reliance Industries Platinum Jubilee Award in Biological Sciences, Technology Development Award, Young Women Bio-scientist of Promise Award, An Inspiring Women Engineer/Scientist, Professor Hiralal Chakraborty Award of ISCA, Platinum Jubilee Lecture Award of ISCA, Overseas Associateship Award, Young Scientist Award of IUBMB, Professor Hiralal Chakraborty Gold Medal from National Botanical Society & University of Calcutta. She is an elected Fellow of the National Academy of Sciences, India; the Indian Academy of Sciences, Bengaluru; the National Academy of Agricultural Sciences, India.



Dr. Arun Bandopadhyay

Director

Indian Institute of Chemical Biology (IICB)

Kolkata, Govt. of India.

Dr. Arun Bandyopadhyay has started his research career from Visva Bharati University after completing M.Sc. M.Tech. and Ph.D. Thereafter he went to Japan to pursue advanced research at Kwangju Institute of Science and Technology, S. Korea as a Post-doctoral fellow. Then he has joined CSIR-IICB, Kolkata as Scientist E1 in the year of 2000 and promoted to Chief Scientist in the year of 2014. He has published more than 50 research articles in international Journals and has four Patents in his credit. Dr. Bandyopadhyay received several awards/fellowships like - Fellow of National Academy of Sciences (FNASc), Fellow of West Bengal Academy of Science and Technology

(FAScT), Sir C. V. Raman Research Fellowship Award by CSIR in 2006, Jimmie Dodd Memorial award for Best poster Presentation in ICCE, Yokohama, Japan in 1997. He has guided 15 research scholars for their Ph.D. degree and 12 Post graduate students for master degree. Dr. Bandyopadhyay is held important posts in Scientific Societies like - Secretary, West Bengal Academy of Science & Technology (WAST), Vice President, Proteomic Society, India. Dr. Bandyopadhyay has been appointed as the Director of CSIR-IICB, Kolkata since 2020.



Dr. Debprasad Chattopadhyay

Director

ICMR-National Institute of Traditional Medicine (NITM),
Belagavi, Govt. of India

Dr Debprasad Chattopadhyay is working as the Scientist G & Director at ICMR-National Institute of Traditional Medicine (NITM), Belagavi Karnataka since August 2016 with a lien from the ICMR-Virus Unit, Kolkata, where he served since 1994 as Scientist B-F. His research field includes search for Ethnomedicinal leads against difficult-to-treat infections through the documentation and validation of purity, safety and potency of traditional practices of Indian tribes with molecular mechanism of action in vitro and in animal model. He has established personal contact with diverse ethnic communities from Onge-Nicobarese-Shompen, Birhore, Kattabhai, Bhil-Kathodi-Padhar, Mina-Baldias-Kannis to Santal-Munda-Oraon-Bhumiji-Lodha to document and validated their age-old health-care practices to translate traditional information into medical innovation. Dr Chattopadhyay is credited with eight patents, four leads, 55 popular-science articles and 138 (111 international) research articles in peer-reviewed Journals of repute including Review and Chapters with 4 Books (RG Score: 37.19; h-Index: 33; i10-Index: 77; Impacts: 517.7; Citations: 3597). He is the Editor in Frontiers in Pharmacology, Section Editor Mini Review in Medicinal Chemistry (Bentham Science), WebmedCentral; Editorial Board Member of Journal of Ethnopharmacology, Current Proteins & Peptides, Current Traditional Medicines etc, and Reviewer of 40⁺ Journals of repute; Examiner, PhD Guide, and visiting Faculty of Universities, and is the recipient of awards like Outstanding Ethnopharmacologist (2016), DST Science Communicator (2009), Prof Amiya Bose Oration (Indian Dietetics Association; 2008), Dr RV Rajam Endowment (Indian Medical Association; 1998), International Society of Chemotherapy Young Scientist (1991) etc. Dr Chattopadhyay is the Fellow of the British Society for Antimicrobial Chemotherapy, Member of DST-SERB PAC, DST-SERB YSLS Expert Committee, Board of Studies of Pharmaceutical Technology, Jadavpur University; Research Advisory Board of Chemical Technology, Calcutta University etc. He has produced 15 PhDs and completed 17 National Task Force Projects on ethnomedicines of marginalized communities of India.

7th Convention of SFE in Media



7th Convention
Society for
Ethnopharmacology, India
&
International Symposium on
"Combating COVID-19 - Ethnopharmacology &
Traditional Food and Medicine"
December 17-19, 2020

PROGRAM SCHEDULE

Organized by:
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Recently Institute of Bioresources and Sustainable Development (IBSD), India in association with the SFE-India, and ISE-Switzerland have collaboratively organized the 7th Convention of Society for Ethnopharmacology (SFE) and International Symposium on "Combating Covid-19 - Ethnopharmacology & Traditional Food and Medicine", at Imphal, Manipur, India during December 17-19, 2020. The congress was organized in hybrid mode (physical at IBSD, Imphal, Manipur, India) and virtually. Scientists from over 20 countries have attended this event to make it a grand success. Success of this event can be measured from the amount of coverage in print and

digital media.

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Imphal Free Press THURSDAY, DECEMBER 17 | 2020 **STATE/REG**

Three-day convention on combating COVID-19 with traditional medicine

By A Staff Reporter
IMPHAL | Dec 16

An international symposium on 'Combating COVID-19- Ethnopharmacology and Traditional Food and Medicine' will be organised where about 20 scientists from across the globe will be taking part on Thursday, the Institute of Bioresources and Sustainable Development, Imphal (IBSD-Imphal) announced on Wednesday.

The three-day convention will be organised in Imphal for the first time in association with Society for Ethnopharmacology, India (SFE-India) and International Society for Ethnopharmacology (ISE), Switzerland.

In a press conference held at conference hall of IBSD, Takyelpat, Imphal, in connection with the convention, director of IBSD, Imphal professor Pulok Kumar Mukherjee said that the convention is being organised to develop the economy of the north eastern region including Manipur.

He said the state has lots of potential in bio-resource especially the traditional foods and its medicinal plants.

In the convention, about 20 scientists across the globe will be delivering their ideas and thoughts about the traditional foods and its medicinal values which could help in combating COVID-19, he said.

He further said Manipur is one of top states having the richest bio resources in the northeastern region. The bio resources in the state include medicinal plants that are used in traditional foods, he said.

Pulok also said that the scientists during the convention will also deliver speech through a visual medium on immune boosting, traditional food that people of the region had been consuming.

The convention will be inaugurated by Lok Sabha MP, RK Ranjan on Thursday.

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