

लेखों के सारांश अंग्रेजी में

भारतीय वैज्ञानिक एवं औद्योगिक अनुसंधान पत्रिका
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Aromatic Medicinal Plants in the Context of Bioprospection

Janardan Singh, Nagendra Prasad Mishra, Kirti Sinha & Gunjan Joshi
Central Institute of Medicinal and Aromatic Plants
PO: CIMAP, Lucknow- 226016

Abstract

In view of the important role played by medicinal plants, for the development of new medicines, the bioprospection of the plant based on their traditional knowledge have been undertaken more vigorously in recent time in many laboratories of the world. It is expected, through such efforts the medicines for cure or elevation of dreaded diseases such as AIDS/HIV, cancer, heart diseases, hepatic disorders, diabetes etc. would be made available. The use of certain aromatic herbs, their essential oil and aroma chemicals have been critically reviewed in the context of their traditional uses and modern bioprospection in respect of pharmacological and clinical investigations and presented in the article.

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Control of Potyviruses : Enhancement in the Production and Properties of Horticultural and Agricultural Crops

Arpana Mehra, Manoj Kumar Singh, Vanita Chandel, Vipin Hallan & A A Zaidi
Floriculture Division
Institute of Himalayan Bioresource Technology, (CSIR), Palampur, (HP) 176061

Abstract

Potyviruses can cause serious diseases in flowers, fruits, vegetables, ornamental plants and other important agricultural crops. Many viruses of *Potyviridae* family are not only responsible for substantial losses in yield but also affect quality of the different crops. Due to infection by potyvirus, plants grow unhealthy with poor defense system and malformation in flowers and fruits can also be observed. According to the I.C.T.V potyviruses comprise one-third of the plant virus known to us. These viruses can be detected through serological (ELISA, ISEM, RIA, Immunodiffusion and Immunoblotting) and nucleic acid based techniques. Potyviruses under field conditions can be controlled by the use of mineral oil, planting resistant crops and by controlling different vectors. Under laboratory conditions, tissue culture techniques along with chemotherapy and thermotherapy can be applied for the production of virus free plants. For improving the quality and quantity of different crops, stress has been given on the production of virus free plants so, that we get the desired cost in the international agriculture market.

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A survey of abandoned and neglected Tea Plantations in Sikkim for assessing the possibility of their Rejuvenation and Extension

R.K. Sud, Ramdeen Prasad, Brajinder Singh and S.K. Vats

Hill Area Tea Science Division
Institute of Himalayan Bioresource Technology
(CSIR) Palampur-176 061 (H.P.)

Abstract

Sikkim is one of the hilly states in India where tea is cultivated. The developed as well as abandoned and neglected tea plantations exist in the state. A survey of the abandoned and neglected tea plantations in the state revealed that the soil and weather parameters suit the requirements for tea cultivation, and such plantations could be revived by adopting the rejuvenation technology package developed for tea gardens in hills at Institute of Himalayan Bioresource Technology which has been successfully implemented for development of such type of plantations in Himachal Pradesh.

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Viruses of Alstroemeria : Investigation, Control and Production of Virus free Plants

Arpana Mehra, Vanita Chandel, Manoj Kumar Singh, Neeraj Verma, M K Singh & A A Zaidi

Floriculture Division

Institute of Himalayan Bioresource Technology, (CSIR), Palampur, (HP) 176061

Abstract

Alstroemeria is an important cut flower. It is mainly cultivated in Netherlands, Columbia, England and America. Alstroemeria is propagated through the division of rhizomes and once the virus infected material is propagated then the virus can transfer from one generation to the next. There are about ten viruses which infect Alstroemeria plants viz. *Alstroemeria mosaic potyvirus*, *Alstroemeria streak potyvirus*, *Alstroemeria carlavirus*, *Cucumber mosaic cucumovirus*, *Tomato spotted wilt tospovirus/Impatiens necrotic spot tospovirus*, *Alstroemeria ilarvirus*, *Tobacco rattle tobnavirus*, *Arabid mosaic nepovirus*, *Freesia cucumber potyvirus* and *Rhabdovirus*. Potyvirus infection can be easily detected through serological (ELISA, ISEM, RIA, Immunodiffusion and Immunoblotting) and nucleic acid based techniques. Tissue culture accompanied by chemotherapy and thermotherapy are useful for quality planting material from Alstroemeria infected with potyvirus. Besides these, control of aphids, thrips, weeds, nematodes etc. and use of resistant cultivars can also be used for controlling potyviruses. This article emphasizes on number of potyviruses infecting alstroemeria crop, their control and quality improvement so that such virus free planting material be utilized by Indian farmers as a source of employment and income generation.

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A Study of Ecology, Diversity and Ethnobotany of the Species of the Pteridophytic Group of Sonebhadra District of Uttar Pradesh

Prem Behari Khare & Manjari Bajpai
Pteridophytic Laboratory

National Botanical Research Institute, Lucknow 226 001

Abstract

Extensive collections were made over the years for the Sonebhadra district of Uttar Pradesh to explore the pteridophytic flora and its habitat, diversity, distribution and ethnobotany. It has been observed that 18 species of pteridophytes belonging to 15 genera in 14 families are distributed throughout the area. Nine species are identified which are used by the tribal and local inhabitants of the area. Effect of heavy industrialization on the flora in total and pteridophytes in particular has been discussed and several conservational strategies have also been suggested.

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Effects of Different Levels of Cr concentration on the Growth Behaviour of Selected Chromate – Resistant Bacterial Strains

O P Shukla & U N Rai
Ecotoxicology and Bioremediation Group
National Botanical Research Institute
Lucknow – 226 001

Abstract

Chromium is one of the most toxic metals widely found in water bodies. The large scale use of chromium in various industrial processes makes these industries potential source of the chromium pollution. The presence of high levels of chromate in the environment also has an inhibitory effect on most microorganisms. The Cr⁺⁶ compounds are comparatively more toxic than those of Cr⁺³ due to their higher solubility in water, rapid permeability through biological membranes and subsequent interaction with intracellular proteins and nucleic acids. Cr⁺⁶ is highly toxic to plants, which results in reduced roots, phytomass and photosynthetic pigments, chlorosis, stunting and plant death eventually. Non - biodegradability of heavy metals is responsible for their persistent in the environment and subsequent bioaccumulation in the food chain. Bioremediation of the chromium compounds is of a special interest since this metal has found a variety of industrial application and it causes severe environmental problems due to its extreme toxicity to living organisms. The objective of the present work was to isolate chromate – resistant bacterial strains from the tannery sludge and to assess the bioremediation potential of these strains on the basis of growth response in different Cr concentrations. These strains showed multiple metal and antibiotic resistances. Growth behaviour of these strains was tested by applying different chromium concentration. Chromium accumulation of isolates has great bioremediation potentials and it can also help in removal and recovery of chromium from the sludge and effluent. The results have been discussed in relation to the development of an integrated bioremediation system for the treatment of tannery sludge and effluent.

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Management of Gladiolus Corm Rot and Yellows

Anshuman Tripathi, Harikesh Bahadur Singh and Jayandra Kumar Johri
National Botanical Research Institute, Lucknow-226 001 (INDIA)

Abstract

Gladiolus is an important floriculture crop in India, which suffers from an important disease caused by *Fusarium oxysporum* f.sp. *gladioli* causing corm rot and yellows symptoms. The losses by this disease are up to the extent of 80-100%. Attempts were made for the management of the disease. *In vitro* essential oils of Mentha, Neem, Tagetes, and Lemon grass, fungicides (Carbendazim, Vitavax, Chlorothalonil, Captan and Topsin M) and biocontrol agents (different strains) of *Trichoderma harzianum* and *T. virens* were tested. The effective concentrations of different successful fungicides and biocontrol agent in combination with the compatible fungicide were tested in field for three growing seasons. It was found that Chlorothalonil and Bavistin were best in terms of management of disease, germination of bulbs, length of plants/spike and number of flowers per spike. *Trichoderma harzianum* (MTCC3843) was quite effective in the management. However, the same in combination with Chlorothalonil was more effective for the management of the disease.

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Laughing Gas

Amitosh Verma & S N Singh
Environmental Science Division

National Botanical Research Institute, Rana Pratap Marg, Lucknow - 226 001

Abstract

A Laughing gas (chemically known as nitrous oxide) becoming a potential threat to our environment, appears to be a mind-boggling truth, N_2O is not only a potential greenhouse gas, but also implicated in the catalytic destruction of stratospheric ozone layer, which saves us from onslaught of UV-B radiation from the sun. Although its atmospheric concentration, as compared to CO_2 and CH_4 , is very low (310 ppbv), its contribution to greenhouse effect is measured to be 6%, based on high thermal absorption capacity and long residence time in the atmosphere. The thermal absorption of N_2O was estimated to be 150 times higher than CO_2 and 5 times higher than CH_4 . Being a highly non-reactive gas in the troposphere, it moves uninterrupted to the stratosphere to cause damage to ozone layer.

Among the various anthropogenic sources, agriculture is the major contributor to N_2O emission because of high intensification of farming supplemented with the high input of N-chemical fertilizers. According to IPCC (1992) the cultivated soils alone contribute 0.03-3.0 Tg $N-N_2$ /yr, which is about 20% of total N_2O emission to the atmosphere. N_2O is produced in both oxic and partial anoxic conditions by nitrifying and denitrifying bacteria, respectively, and transported to the atmosphere mainly through molecular diffusion and partially through aerenchyma of plants. Its emission to the atmosphere is considered as a colossal loss of N-input to the farming.

In order to save the N-loss in form of N_2O , and to postpone the danger of climate change, a number of options, like matching nitrogen supply with crop demand, Minimization of fallow period, Split application of fertilizers, application of control release fertilizers, foliar application of fertilizers, application of control release fertilizers, foliar application of fertilizers, using nitrification inhibitors, growing weeds during fallow periods etc., have been worked out to attenuate N_2O emission from cultivated soils by manipulating the farm practices, which also results in higher N-use efficiency by crops.

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Effect of Intermittent Mist and Auxins on Rooting in Semi-hardwood Cuttings of *Buddlea asiatica*, L

V N Gupta, B K Banerji & S K Datta

Floriculture Section

National Botanical Research Institute, Lucknow-226001

Abstract

Semi-hardwood cuttings of *Buddlea asiatica* were prepared from vigorously growing shoots. Twenty cuttings were treated with IAA, IBA and NAA each at 0, 1000, 2000, 3000, 4000 and 5000 ppm dissolved in 50% alcohol by quick dip method for 10 seconds. These were planted in pots containing sterilized coarse sand and placed under intermittent mist for rooting. It is concluded that after 60 days of transplanting, the IBA at 4000 ppm proved significantly highest rooting percentage, number of roots, root length and survival of rooted cuttings. Therefore, this species can be multiplied commercially with the help of root promoting hormone IBA at 4000 ppm.

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Effect of Gamma Radiation on the Yield of Button Mushroom (*Agaricus bisporus*) L

D Bahukhandi & R K Sharma

Division of Plant Pathology, IARI, New Delhi-110012

Abstract

Button mushroom (*Agaricus bisporus*) is most popular amongst all cultivated mushrooms. Need of the hour is to increase its production per unit area/quantity of the compost. Physical as well as chemical mutagens are frequently applied to increase the crop production. In an effort, studies were conducted to see the effect of the gamma radiation on vegetative mycelium as well as on productivity of *A. bisporus*. Young-developing mycelium of *A. bisporus*. was subjected to seven different doses of gamma radiation i.e. 0.2 to 1.4 kGy. The spawn obtained by radiated mycelium was inoculated in the compost for mushroom production. It has been observed that gamma radiation up to 1.0 kGy accelerated the mycelial growth as well as crop production in all treatments. The total time period for mycelial run was reduced while the increase in productivity varies from 10 to 50 percent in different doses of gamma radiation except at 1.2 and 1.4 kGy which resulted in deleterious effect. 1-0 kGy dose of gamma radiations showed best results in both the mycelial growth and crop productivity of *A. bisporus*.

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Excess Fluoride in Drinking Water at Kishangarh Tehsil (Ajmer) & Fluorosis (A Study)

C P Pokharna¹ Sharmila Pokarna² & Karuna Shobhawat³

²Malviya National Institute of Technology, Jaipur

³Department of Zoology Govt. P G College, Kishangarh

Abstract

In all 256 samples of Kishangarh Tehsil of Ajmer District of Rajasthan have been analysed during four surveys. Seasonal variation in fluoride concentration in drinking water have been studied. Fluoride concentration ranged between 0.20 to 6.9 mg/L. High concentration of fluoride in drinking water sample of Roopangarh village is alarming.

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Application of Automation in Calibration of Multimeter using Precision Calibrator

Ajeet Singh, Sudhir Kumar Sharma, Shiv Kumar Jaiswal and Vijay Narain Ojha

JVS & DC Standards

National Physical Laboratory

Dr KS Krishnan Road, New Delhi - 110012

Abstract

In computer age, there is an important contribution of automation in improving the error free precision calibration and to save the time. Automatic measurement is normally done using computer in high precision system and calibration.

In the present paper, we discuss in detail about the automatic process and as a case study the precision calibration of digital multimeter by high precision calibrator traceable to "National Standard". The commercial software MET/CAL was used in the automation. We also discuss the process of the validation of this software prior to its use. The uncertainty evaluation reported in this paper is as per the ISO "GUM" document.

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Precision Calibration of Reference Standard of Volt by Primary Standard

V N Ojha and Sudhir K Sharma
JVS & DC Standards
National Physical Laboratory
Dr K S Krishnan Road, New Delhi – 110 012

Abstract

Josephson Voltage Standard is the primary standard of voltage that is used to calibrate the secondary / reference standard of voltage to maintain the traceability. In the present paper, we discuss in brief about the Josephson series array voltage standard and its use in the calibration of reference standard of voltage. Furthermore, we discuss their sources of uncertainty in measurements, uncertainty budget and their evaluation based on the ISO/IEC 17025 guidelines.

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The Impedance Standards at National Physical Laboratory and Global MRA

Om Kar Nath
L F & HF Impedance Standards Section
National Physical Laboratory, New Delhi-12

Abstract

The impedance standards section at the National Physical Laboratory has established primary standards of impedance and associated calibration facilities. These facilities are used to calibrate impedance standards and associated instruments available in echelon II level laboratories in India. As such measurement traceability has been established at national level. International intercomparison of these standards is also done time-to-time with national laboratories of other countries; such as USSR, Germany, Countries of Asia Pasific region and South Africa etc. Thus National Physical Laboratory (India) has established impedance standards having traceability both at national and international level.

As such a well structured measurement system in the area of impedance standardization has been established, which provides a strong foundation for our country to enter in global market for international trade. The above mentioned impedance standards and associated facilities have been included in the BIPM global MRA. This would help to overcome rechnical barriers to trade (TBT) in global market and further strengthen the Indian economy in this area.

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Characterization of Hydrogenated Amorphous Silicon Thin Films by Infrared and EPR Spectroscopy

Manju Arora and S K Gupta

Materials Characterization Division, National Physical Laboratory

Dr. K. S. Krishnan Road, New Delhi – 110 012

Abstract

Hydrogenated amorphous silicon thin films grown by glow – discharge process were characterized by high resolution, non – destructive infrared (IR) and electron paramagnetic resonance (EPR) spectroscopic techniques to investigate different local arrangements formed in the film network like SiH, SiH₂ and (SiH₂)_n bonding groups, defects and microcrystalline silicon during growth. These groups and defects effect the conductivity and recombination process which plays important role in device fabrication. In this work, the vibrational bands pertaining to silicon and hydrogen bonded groups were tentatively assigned to reveal structural details of local bonding arrangements in amorphous and microcrystalline state. Infrared absorptance spectra were measured in the region 4000 – 400 cm⁻¹ at ambient and different low temperatures. In these spectra, absorption bands of SiH, SiH₂, (SiH₂)₂, (SiH₂)_n groups of amorphous hydrogenated silicon coexisted with microcrystalline silicon (mc – Si:H) stretching, bending, breathing, wagging and silicon transverse optic phonon vibrations. The appearance of microcrystalline silicon bands in these film spectra confirms its formation which starts growing due to the reaction of hydrogen radicals with unstable SiH₂ group present at the grain boundary. This chemical etching reaction is exothermic which breaks weak Si-Si and Si-H bonds and form strong Si-Si microcrystalline bonds and silicon particles through re-orientational ordering of silicon hydrogen bonded groups in amorphous film network. Recently microcrystalline silicon find wide usage in optoelectronic devices and these investigations are very important in this context also. Electron paramagnetic resonance studies showed an isotropic single line spectrum due to formation of dangling bonds in amorphous hydrogenated silicon film.

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Platoon Size and Headway for Indian Traffic Condition: A New Approach

Ravindra Kumar*, Bhagwan Singh*, P K Jain**, Sanjay Chaudhary***

Scientist*, Area Coordinator**, Hindi Translator***
Central Road Research Institute, New Delhi

Abstract

A microscopic study has been carried out to investigate the relationship between platoon size and headway of vehicle under mixed traffic condition on different road sections of Delhi. Since size of the platoon mainly depends on headway and traffic densities, so the statistical model has been developed to understand easily about the minimum number of required vehicles for platoon formation and end process. This study helps to understand the various problems associated with Indian traffic and find the solution for uninterrupted and smooth traffic flow.

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Effect of some Heterocyclic Synthetic Nitrogen Regulators for Increasing the Efficacy of Urea in Paddy-wheat Crop Rotation

J P Sharma and Teekam Singh
Division of Soil Science and Agricultural Chemistry
H.K. Taneja and S.S. Tomar
Division of Agricultural Chemicals
Indian Agricultural Research Institute, New Delhi-110012

Abstract

In developing countries urea is the major source of nitrogen, but it is a matter of concern that one-third of urea (30-35%) is only utilized by the plants and the rest two-third (65-70%) is lost by volatilization, denitrification, leaching and absorbed in lower profiles of the soil. Due to this farmers suffer a great economic loss and have to face the polluted environment and contaminated water. This wasteful loss of nitrogen can be controlled to a certain extent by application of some heterocyclic nitrogen regulators like pyrazoles and isoxazoles. The isoxazole regulators can control urea hydrolysis and denitrification, and increase N-uptake and apparent N-recovery by formation of nitrogen complexes in soil which can be easily adsorbed by growing plants. The present investigation was carried out in a IARI farm soil (Typic Haplustept) and urea fortified with different synthetic isoxazole compounds for N-regulation. The study indicated that the test regulators (at 5% of the fertilizer level) significantly retarded the nitrification of soil applied urea. In vitro studies have revealed that whereas 75% soil applied urea-N got converted to nitrate-N within a week's time, the use of test chemicals delayed the urea transformation for 10-14 days to achieve the same level of nitrate-N. These regulators not only increased the dry matter yield by 20-25% over control, but their application along with fertilizer also increased the apparent -N recovery by 20-40% in both paddy and wheat crops. The use of these chemicals was not detrimental to soil health. These nitrification regulators retarded the conversion of ammoniacal-N to nitrate-N without accumulation of nitrite-N, which is supposed to be toxic to the plants.