Gene Therapy and Genetic Diseases

Ravi Kant Upadhyay
National Centre of Plant Biotechnology Research
Indian Agricultural Research Institute, New Delhi 110 012

Abstract
In this paper various methods being used in gene therapy have been described. By means of these methods affected cells are genetically transformed to enable them to develop strength to fight against the diseases. Some of the major methods are cloned human genes and transfer of gene segments, oligonucleotide and synthetic gene, chimeric antibodies, recombined immunized antibodies and vaccines, direct DNA & RNA injection, and transformed antigens. Nowadays various recombinant pharmaceutical products are also being developed (and used) by expression cloning. The major ones are: blood coagulating agents, erythropoietin, insulin growth hormone, tissue plasminogen, activator interferon and interleukin, granulocyte colony stimulating factor (GCSF) etc. Among the various gene therapy methods major two are: in vivo and ex vivo gene therapy. Direct injection, particle bombardment, receptor mediated endocytosis and liposomes have been described in detail under gene therapy principle. Relevant intramural liposome La, gene therapy and hydrodynamics based gene therapy, synthetic chromosomes and angiotensin gene therapy have also been included.

Fire Retardant Treatment Technology of Timber: Essential Vacuum and Air Pressure for Optimum Chemical Absorption

N. S. Tyagi, Mahesh Chand & Saheb Singh
Fire Research Laboratory, Central Building Research Institute
Roorki 247 667

Abstract
Timber is a building material having burning properties. However, due to the presence of moisture it does not burn till it dries. The moisture is replaced by air which evaporates in the form of vapour on drying. The timber attains burning properties when dried. The timber can be made fire proof on replacing the air by fire retardant chemical solutions. This process of making the timber fire retardant is termed as full cell process and the plant used is called vacuum pressure impregnation plant. In this paper, the details of the observations and results pertaining to vacuum, pressure and chemical retention with regard to the fire retardant treatment for various timbers have been given.
Vacuum Degassing of Parts in Development of Gain and Phase Matched (CW) Mini Helix TWT

S.M. Sharma, R. K. Sharma, A. K. Sinha
Central Electronics Engineering Research Institute (CEERI), Pilani 333 031

Abstract
Vacuum degassing of the components and prototypes (operating in cw mode) of gain & phase matched miniature helix TWT becomes more stringent and critical as heavy gas load is generated during RF-testing of the tube which may affect its performance adversely. These tubes require ultimate vacuum in the range of 10-7 to 10-8 torr, which is not possible without thorough degassing of the components in the vacuum at different stages of assembly. This paper high lights the different stages of vacuum degassing of parts, components, sub-assemblies etc. in the process of the development and testing of G & P matched (CW) mini helix TWT. In addition to above the vacuum processing of the tantalum sheet to make it suitable for fabrication of components by deep drawing has been presented in this paper.

Influence of Gibberellic Acid (GA-3) on Growth and Flowering in Chrysanthenum (Chrysanthemum morifolium, Ramat) cv. Jayanti

V. N. Gupta, S. K. Datta & B. K. Banerji
Floriculture Section, National Botanical Research Institute
Lucknow 226001

Abstract
‘Jayanti’ is an excellent cut flower variety of Chrysanthenum. The only draw back with this cultivar is its short spray length. Attempts were made to increase the length of spray to desire size through foliar application of GA-3 at different concentrations. GA-3 (100 ppm) showed promising effect by increasing the length of spray by 18.30 cm over control and enhanced plant height and flower yield per plant. This concentration was also induced advanced flower bud initiation and blooming.
A Study on the Effect of Gamma Radiations on Dahlia Cultivar NBRI ‘Pinki’

A. K. Diwedi & S. K. Dutta
Floriculture Section
National Botanical Research Institute, Lucknow, 226001

Abstract
The rooted cuttings of Dahlia cultivar NBRI ‘Pinki’ were treated with different doses of gamma radiations and planted with untreated (control) cuttings. The changes occurred in treated plants at different intervals were studied and they were compared with the untreated ones. In the plants, treated with gamma radiations retarded growth, irregular growth of the leaves and fusion, thick and leathery touch of leaves, change in the stomata number, decline in the wax coating on the surfaces of the leaves were observed. The radio sensitivity of the plants based on different morphological characters were observed in Dahlia ‘Pinki’. Consequently, it was concluded that variegation in the leaves and colour variation among the flowers of Dahlia can be caused by means of gamma radiations.

Piriformospora Indica - An Unique Plant Growth Promoting Fungus

National Botanical Research Institute, Lucknow
*School of Life Sciences, JNU, New Delhi

Abstract
Piriformospora indica is a novel plant growth promoting root endophyte. It is an unique fungus which helps the plant in obtaining the nutrients for their growth in addition to the normal availability. This fungi can grow easily in artificial media and behaves like a mycorrhiza. Since the fungus can grow well in artificial media it can be multiplied easily and as such can assist the plant growth promotion. It colonizes the roots of many important crops like Maize (Zea mays L.), Tobacco (Nicotiana tabacum L.), Paddy (Oryza sativa L.), Sorghum (Sorghum vulgare L.), Wheat (Triticum aestivum L.), Soybean (Glycine max L. Merr.), Gram (Cicer arietinum L.), Artemisia (Artemisia annua L.), Brahmi (Bacopa moniera L. Wett.). The fungus helps in phosphate sublization and also in mobilization of nutrients. It has been mass multiply in by furmantion technique and so also on solid media. The fungus change the future of agriculture and can be a best source of biofertilizer.
Embryo Abnormality in Relation to Seed Sterility in Exotic Pine Species of Kumaon Himalayan Region

Kanak Sahai
National Botanical Research Institute, Lucknow 226001

Abstract
Six exotic species were selected for the present study. Pre and post fertilization stages of embryo showed that in Pinus patula, *P. taeda* and *P. elliottii* degeneration was started mainly at the early stage of embryo development during cell division. In *P. thunbergii* and *P. greggii*, abnormal embryo was developed by uncontrolled division, which was unable to survive for a long period. In *P. echinata* and *P. patula* dead endosperm was found before fertilization and in some places it had been damaged during embryo development. Endosperm is a food reservoir for the embryo, hence absence of food supply caused death of embryo which ultimately produced sterile seeds. Abnormal archegonia were also seen in *P. patula* during the study which might be responsible for seed sterility.

Diversity of *Scendesmus* species in Tola Lake of Mahoba (UP)

Sanjay Diwedi, Kiran Toppo & M. R. Sushila
National Botanical Research Institute, Lucknow 226001

Abstract
Samples of algae were collected for the study of *Scendesmus* species in Tola Lake of Mahoba (UP). Among the lot 17 *Scendesmus* species were detected. In the present paper *Scendesmus* has been classified based on cell structure etc.
Development of High Power Coupled-Cavity Travelling Wave tube (CC-TWT)

Virendra Singh, G. R. Sain, H. Faruki, Manasi & S. N. Joshi
Communication Tubes Group
Central Electronics Engineering Research Institute, Pilani, Rajasthan

Abstract
A 70 KW (pulsed) C-band coupled cavity travelling wave tube (CC-TWT) is under development at CEERI. In this paper development of above tube is presented. A CC-TWT is a high power ultra high vacuum microwave amplifier and this tube has application in Communication and Radar transmitters. The tube has four main parts: 1. Electron gun; 2. Collector; 3. Coupled cavity slow wave structure; and 4. I/P and O/P waveguide coupler with rf window. Electron gun produces electron beam, CCSWS reduces the velocity of rf signal equal to the velocity of electron beam. The interaction takes place between electron beam and rf signal. Electron bunches are formed if signal is amplified. CC-TWT has been designed by CEERI and its development work is in progress. Various subassemblies like Electron gun, CCSWS, I/P and O/P waveguide couplers with rf windows and collectors have been developed. After testing these subassemblies were integrated to make complete CC-TWT.