Online Library In Vitro Callus Induction Regeneration And

In Vitro Callus Induction Regeneration And

The RNA World

Plant tissue culture (PTC) technology has gained unassailable success for its various commercial and research applications in plant sciences. Plant growth regulators (PGRs) are an essential part of any plant tissue culture intervention for propagation or modification of plants. A wide range of PGRs are available, including aromatic compounds that show cytokinin activity, promote cell division and micro-propagation, viz., kinetin, N6-benzyladenine and topolin. Topolin is a naturally occurring aromatic compounds that have gained popularity as an effective alternative to other frequently used cytokinins in in vitro culture of plants. Among them, meta-topolin (6-(3-hydroxybenzylamino) purine) is the most popular and its use in plant tissue culture has amplified swiftly. During the last few decades, there have been numerous reports highlighting the effectiveness of meta-topolin in micropropagation and alleviation of various physiological disorders, rooting and acclimatization of tissue culture raised plants.

Plant Tissue Culture

A combination of 1.0 mg/l 2,4-D and 1.0 mg/l BAP produced the highest callus frequency in nodal (93.75%), leaf (78.75%) and roots (70.00%) segments. In case of root tips 1.0 mg/l 2,4-D combined with 3.5 mg/l BAP produced the highest callus (72.5%). Nodal segments required minimum number of 8.25 days while root tips required the maximum 32 days for callus induction. A combination of 2.5 mg/l BAP and 0.6 mg/l NAA produced the highest callus frequency (86.25%) in nodal segments followed by root segments (85.00%). Among the combinations 1.0 mg/l 2,4-D and 1.0 mg/l BAP was the most suitable for producing greenish friable callus and 2.0 or 2.5 mg/l BAP and 0.30 or 0.60 mg/l NAA was suitable for callus induction. A combination of 1.0 mg/l 2,4-D and 0.6 mg/l BAP exhibited 75.00% and 56.0% shoot direct regeneration from nodal segments and leaf segments, respectively. Nodal segments had 70% shoot regeneration via callus on medium with 2.0 mg/l BAP and 0.5 mg/l I-1 BA + 0.2 mg/l GA3. Leaf segments and root tips had equal percentage (65.0) of shoot regeneration upon culture on medium with 2.0 mg/l BAP and 0.2 mg/l I-1 AIA.

Modern Applications of Plant Biotechnology in Pharmaceutical Sciences

Abstract: The effect of different concentrations and combinations of plant growth regulators (BAP, NAA, IAA and kinetin) was studied to develop a protocol for efficient in vitro regeneration of tomato genotypes at the Biotechnology & Genetic Engineering Laboratory of the Department of Genetics and Plant Breeding, Bangladesh Agricultural University, Mymensingh during the period from February to October, 2005. Regeneration ability of five indigenous tomato genotypes; namely V-199, V-241, V-258, V-312 and V-387 was investigated via callus induction using hypocotyl and leaf disc explants of these genotypes. Cultivation in MS medium supplemented with different concentrations and combinations of plant growth regulators. The combination of 2.0 mg/l BAP and 0.2 mg/l NAA was found to be the best for inducing healthy and creamy calliuses at 20 days after inoculation (DAI). Callus formation frequency was 63.64% in hypocotyl and 61.39% in leaf discs. Shoots were induced from callus cultured on MS medium supplemented with different concentrations and combinations of plant growth regulators.

ESSE 2017

The present study was conducted to standardize a suitable protocol of in vitro plant regeneration potentiality of seven strawberry varieties viz. AOG, JP-2, JP-3, Camarosa, Sweet Charly, Giant Mountain and Festival. Young leaves, mature leaves and nodules of seven strawberry varieties were used for callus induction and plant regeneration. Among the seven strawberry varieties AOG was found to be the most responsive genotype for primary culture establishment, callus induction, shoot regeneration and rooting. A total of 40-45 somaclones from each of the tested varieties were established and maintained in the field and were considered as Po plants. There were no plants found resistance to fungal diseases but somaclones showed better tolerance than the donor plants. Majority of plants were found heat sensitive in donor plants but somaclones of AOG & SC showed better performance than other somaclones and donor parents in terms of summer overcoming capacity. These somaclones can be acceptable commercially if the good characters exhibited are transmitted through generations or could be used in future breeding programme for the improvement of strawberry varieties in Bangladesh.

Efficient in vitro callus induction protocol for three endemic medicinal plants (Cyclea peltata, Naegamia alata and Kaempferia galangal Linn.) in Kerala

A simple and reproducible protocol for in vitro callus induction from explants of three endemic plants (Cyclea peltata, Naegamia alata and Kaempferia galangal Linn.) have been developed. Explants collected from the field grown plants were cultured on MS medium supplemented with different concentration/combination(s) of phytohormones. During the study period we evaluated the effect of different growth regulators in callus induction and its morphological analysis of the targeted plants. To optimize the callus induction of three different targeted explants were cultured with different concentration phytohormones. Among which the system of 2,4-D has the most efficient effect on the three plants. Five different concentration taken for each plants, among which Cyclea peltata and Kaempferia galangal Linn. has the highest potential to induce calusing at 2 mg/L of 2,4-D. In this study we found that there was no effect on callusing of the targeted plants was MS medium containing combination of auxin and cytokinin for callusing.

Studies on In Vitro Culture for Callus Induction and Plant Regeneration in Petunia (Petunia Hybrid ViI)

In Vitro Regeneration of Niger (Guizotia abyssinica Cass.)

In Vitro Organogenesis in Ginger

The ability to culture cells is fundamental to mass propagation and as a baseline for the genetic manipulation of plant nuclei and organelles. The introduction to Plant Cell Culture: Essential Methods provides a general background to plant cell culture, including basic principles, technologies and laboratory practices that underpin the more detailed techniques described in subsequent chapters. Whilst each chapter provides a background to the topic area and methodology, a crucial aspect is the provision of detailed protocols with emphasis on trouble shooting, describing common problems and detailed advice for their avoidance. Plant Cell Culture: Essential Methods provides the reader with a concise overview of these techniques, including molecular and cellular expression, proteomics and genomics technologies. This book acts as an essential addition to any plant science laboratory's bookshelf. Highlights the best and most up-to-date techniques for working on plant cell culture Explains clearly and precisely how to carry out selected techniques in addition to background information on the various approaches Chapters are written by leading international authorities in the field and cover both well-known and new, tried and tested, methods for working in plant cell culture An essential laboratory manual for students and early-career researchers.

Meta-topolin: A Growth Regulator for Plant Biotechnology and Agriculture

Includes various protocols and approaches of DH production proven for different germplasm of the same species.

Plant Roots

Recent Advances in Plant in vitro Culture

Transgenic Wheat, Barley and Oats

Different aspects of micropropagation through meristem culture for the production of virus indexed source plants, callus induction followed by subsequent plant regeneration, in vitro tuberization and field evaluation of the in vitro regenerated plants were studied on four commercial cultivars of potato (Solanum tuberosum L.), viz., Diamant, Cardinal, Shilbilati and Lalpakri.
Rooted plantlets of four potato cultivars obtained directly through meristem culture and indirectly via callus phase were gradually acclimatized and successfully established in the field. Visual evaluation of the morphological traits of the meristem-derived plants showed that all plants were normal and free from virus diseases. Substantial yield increase was observed from meristem-derived plants over their source plants. Somaclonal variation among different plants derived from callus was observed. The present investigation also addressed in vitro tuberization in potato. The potato plants derived from microtubers of four varieties under field condition was similar to look as that of normal seed propagated plants.

In Vitro Regeneration in Tomato (Lycoopersicum Esculentum)

The experiment was conducted at Advanced Plant Breeding Laboratory, Department of Genetics and Plant Breeding and Tissue Culture Laboratory, Department of Horticulture, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh. Dehusked seeds of five aromatic rice varieties viz. Radhunipagol, Benaful, Guamuri, Thakurbhog, Padmabhog and Pokkali (used as a control rice variety) were placed on MS media supplemented with three salts (NaCl, Na2SO4 and KCl) at four different levels (0, 2.5, 4.5 and 6.5 g/l). About 3-6 weeks after, the calli were transferred to MS media for regeneration. Out of six varieties, Radhunipagol showed better performance for callusing at NaCl salt and the highest plant regeneration was recorded in Pokkali with Na2SO4 salt. The value of parameters declined with the increase of salinity levels. Radhunipagol (60.7%) performed best for callus induction with Na2SO4 at 2.5 g/l but Padmabhog (65.36%) showed best regeneration with Na2SO4 at 4.5 g/l. So, it is stated that Radhunipagol is more potential variety for callusing against NaCl at 2.5 g/l and Padmabhog is most potential variety for regeneration against Na2SO4 at 4.5 g/l.

Varietal Improvement in Strawberry

History of plant cell culture: Media components and preparation; Contamination; Callus induction; Regeneration and morphogenesis; Woody shrubs and trees; Haploid plants from anther culture; Embryo rescue; Meristem culture for virus-free plants; In vitro propagation for commercial production of ornamentals; Agrobacterium-mediated transformation of plants.

Plant Tissue Culture

Providing a comprehensive and contemporary overview of the status of this particular genus, this book will be of interest to all those concerned with the study and uses of spices, medicinal and aromatic plants.

Plant Tissue Culture

The in vitro requirements for establishment of callus cultures from internodal tissues of Dendrocalamus latifolius cv Machhiku and subsequent plant regeneration were investigated. Callus was induced on Murashige and Skoog's nutrient medium supplemented with 0.1 to 25 ppm, 2,4-dichlorophenoxyacetic acid (2,4-D). Two types of callus were observed the loose and compact types. The compact type callus was produced on media supplemented with 1 ppm 2,4-D. Benzyl adenine (BA) inhibited callus induction, particularly the compact type. The formation of shoot-like structures and plantlets was observed in compact calli subcultured on media supplemented with 1 ppm BA and 2,4-D. [Authors' abstract].

Genetic Manipulation in Plant Breeding

Doubled Haploid Production in Crop Plants

Cell and Tissue Culture in Forestry


Plant Cell Culture

The purpose of this book is to provide the advances in plant in vitro culture as related to perennial fruit crops and medicinal plants. Basic principles and new techniques, now available, are presented in detail. The book will be of use to researchers, teachers in biotechnology and for individuals interested to the commercial application of plant in vitro culture.

Plant Biotechnology 2002 and Beyond

Since the publication of the first edition in 1983, several new and exciting developments have taken place in the field of plant tissue culture, which forms a major component of what is now called plant biotechnology. The revised edition presents updated information on theoretical, practical and applied aspects of plant tissue culture. Each chapter has been thoroughly revised and expanded, and is written in lucid language, includes relevant media protocols, and is profusely illustrated with self-explanatory diagrams and original photographs. This book includes three new chapters: “Variant selection”, “Genetic Engineering” and “Production of industrial Compounds” and contains a complete bibliography and a glossary of terms commonly used in tissue culture literature. This updated version proves to be an excellent text for undergraduate, postgraduate students and teachers in various fields of plant science and a useful reference book for those interested in the application of any aspect of this asceptic technology.

Plant Cell Biotechnology

Modern Applications of Plant Biotechnology in Pharmaceutical Sciences explores advanced techniques in plant biotechnology, their applications to pharmaceutical sciences, and how these methods can lead to more effective, safe, and affordable drugs. The book covers modern approaches in a practical, step-by-step manner, and includes illustrations, examples, and case studies to enhance understanding. Key topics include plant-made pharmaceuiticals, classical and non-classical techniques for secondary metabolite production in plant cell culture and their relevance to pharmaceutical science, edible vaccines, novel delivery systems for plant-based products, international industry regulatory guidelines, and more. Readers will find the book to be a comprehensive and valuable resource for the study of modern plant biotechnology and their pharmaceutical applications. Builds upon the basic concepts of cell and plant tissue culture and recenommint DNA technology to better illustrate the modern and potential applications of plant biotechnology to the pharmaceutical sciences Provides detailed yet practical coverage of complex techniques, such as micropropogation, gene transfer, and biosynthesis Examines critical issues of international importance and offers real-life examples and potential solutions.

In Vitro Plant Regeneration

The 10th IAPTC&B Congress, Plant Biotechnology 2002 and Beyond, was held June 23-28, 2002, at Disney's Coronado Springs Resort, in Orlando, Florida, USA. It was attended by 1,176 scientists from 54 countries. The best and brightest stars of international plant biotechnology headlined the scientific program. The included the opening address by the President of the IAPTC&B, 14 plenary lectures, and 111 keynote lectures and contributed papers presented in 17 symposia covering all aspects of plant biotechnology. More than 500 posters supplemented the formal program. The distinguished speakers described, discussed and debated not only the best of science that has been done or is being done, but also how the power of plant biotechnology can be harnessed to meet future challenges and needs. The program was focused on what is new and what is exciting, what is state of the art, and what is on the cutting edge of science and technology. In keeping with the international mandate of the IAPTC&B, 73 of the 125 speakers were from outside the United States, representing 27 countries from every region of the world. The 10th IAPTC&B Congress was a truly world-class event. The IAPTC&B, founded in 1963 at the first international conference of plant tissue culture organized by Philip White in the United States, currently has over 1,500 members in 85 countries. It is the largest, oldest, and most comprehensive international professional organization in the field of plant biotechnology. The IAPTC&B has served the plant biotechnology community well through its many active national chapters throughout the world, by maintaining and disseminating a membership list and a website, by the publication of an official journal (formerly the Newsletter), and by organizing quadrennial international congresses in France (1970), the United Kingdom (1974), Canada (1978), Japan (1982), the United States (1983, 1986, 2002), The Netherlands (1990), Italy (1994), and Israel (1998). In addition, the IAPTC&B has a long tradition of publishing the proceedings of its congresses. Individually, these volumes have provided authoritative quadrennial reports of the status of international plant biotechnology. Collectively, they document the history of plant biotechnology during the 20th century. They are indeed a valuable resource. We are pleased to continue this tradition by publishing this proceedings volume of the 10th IAPTC&B Congress. Regrettably, we are not able to publish seven of the lectures in full (only their abstracts are included). The American and Canadian chapters of the IAPTC&B, the Plant Section of the Society for In Vitro Biology, and the University of Florida hosted the 10th IAPTC&B Congress. The Congress was a true partnership between academia and industry, and was generously supported by both groups (see list of donors/sponsors on back cover). A number of prominent international biotechnology companies and publishers participated in the very successful Science and Technology Exhibit (see accompanying list of exhibitors) The IAPTC&B awarded 84 fellowships to young scientists from 31 countries (see accompanying list of fellowship recipients) to support their participation in the Congress.
Callus Induction and Plant Regeneration of Sugar Beets Using in Vitro Methods and Cytological Studies

Understanding the physical and genetic structure of cereal genomes and how defined coding and non-coding regions interact with the environment to determine a phenotype are key to the future of plant breeding and agriculture. The production and characterization of transgenic plants is a powerful reverse genetic strategy increasingly used in cereals research to ascribe function to defined DNA sequences. However, the techniques and resources required to conduct these investigations have, until recently, been difficult to achieve or totally lacking in wheat, barley and oat. This book brings together the in vitro methodologies for the transformation, regeneration and selection of both biotic and Agrobacterium tumefaciens appropriate for these three species. It includes two chapters describing in vitro Agrobacterium co-cultivation, one leading to germ line transformation with no need for tissue culture based regeneration. In addition, it has several chapters dedicated to the manipulation of gene expression and characterisation of the recombinant locus and transgenic plants. Finally, it tackles the issues of GM risk assessment, field trials and substantial equivalence in terms of transcriptomics, proteomics and metabolomics.

In Vitro Induction of Callus of the Tuber Crop Yam (Dioscorea SPP.)

In the past there were many attempts to change natural foodstuffs into high-value products. Cheese, bread, wine, and beer were pro duced, traditionally using microorganisms as biological tools. Later, people influenced the natural process of evolution by artificial selection. In the 19th century, observations regarding the depen dence of growth and reproduction on the nutrient supply led to the establishment of agricultural chemistry. Simultaneously, efforts were directed at defining the correlation between special forms of morphological differentiation and related biochemical processes. New experimental systems were developed after the discovery of phytohormones and their possible use as regulators of growth and differentiation. In these systems, intact plants or only parts of them are cultivated under axenic conditions. These methods, called "in vitro techniques", were introduced to modern plant breeding. In the field of basic research, plant cells have been developed to study the biochemical processes and visible cell variations between tissue culture and the plant. It should be possible to manipulate the basic laws of regulation and the respective biochemical processes should be regarded as being independent of morphological processes of plant development.

In Vitro Induction of Callus of the Tuber Crop Yam (Dioscorea SPP.)

Callus Induction, Plant Regeneration and in Vitro Selection for Drought Tolerant Cell Lines in Sunflower

In Vitro Induction of Callus of the Tuber Crop Yam (Dioscorea SPP.)

Some genotypic and physiological aspects of shoot regeneration from hormone autonomous callus of Sugarbeet (Beta Vulgaris L.)

Arnebia hispidissima, wild plant species from Boraginaceae family, accumulating Shikonin fail to produce a sufficient raw material for commercial production of Shikonin. Therefore, biotechnology can be of immense help to circumvent these problems, especially the micropropagation of plants. Additionally, Hairy Root Culture serves as an alternative approach for production of secondary metabolites in vitro. A final push is required to make this technology widely applicable for the production of pharmaceuticals, dyes and fragrances. Demands for natural products for fragrances, dyes and pharmaceuticals are increasing day by day. This technology should be ready to meet the demand in coming decades. The result of present study would be very useful in increasing the yield of Shikonin and its derivatives. This is the first report on high frequency direct plant regeneration, callus induction, plant regeneration from callus cultures, efficient micropropagation, induction of Shikonin production and induction of Hairy Root Cultures through Agrobacterium rhizogenes-mediated genetic transformation studies in Arnebia hispidissima.

In Vitro Culture and Induction of Shikonin Production in Arnebia

Ginger: The Genus Zingiber is the first comprehensive volume on ginger. Valued as a spice and medicinal plant from ancient times both in India and China, ginger is now used universally as a versatile spice and in traditional medicine as well as in modern medicine. This book covers all aspects of ginger, including botany, crop improvement, chemistry, biotechnology, production technology in the major producing countries, diseases, pests, and harvesting. It also explores processing, products, economics and marketing, pharmacology, medicinal applications, and uses as a spice and flavoring. Experts in the areas of genetic resources, botany, crop improvement, and biotechnology of ginger give an in-depth analysis of these key areas, and each chapter concludes with an extensive bibliography.

Plant Tissue Culture: Theory and Practice

Plant Tissue Culture: Theory and Practice is a manual that contains laboratory exercises about the demonstration of the methods and different plant materials used in plant tissue culture. It provides an overview on the plant cell culture techniques and plant material options in selecting the explant source. This book starts by discussing the proper setup of a tissue culture laboratory and the selection of the culture medium. It then explains the determination of an explant which is the ultimate goal of the cell culture project. The explant is a piece of plant tissue that is used in tissue culture. Furthermore, the book discusses topics about callus induction, regeneration and morphogenesis process, and haploid plants from anther and pollen culture. The meristem culture for virus-free plant regeneration, and in vitro propagation for commercial propagation of ornamentals are also explained in this manual. The book also provides topics and exercises on the protoplast isolation and fusion and agrobacterium-mediated transformation of plants. This manual is intended for college students, both graduate and undergraduate, who study chemistry, plant anatomy, and plant physiology.

In Vitro Regeneration of Bitter Gourd from Seedling Explants

Since the first edition of our book "Tissue Culture in Fores try" in 1982 we have witnessed remarkable advances in cell and tissue culture techniques with woody perennials. In addition to forest industry, agriculture and horticulture, and now have molecular biologists and engineers, and biochemists who study the living material of the species. There fore, the time has come for an update of the earlier edition. In our present effort to cover new developments we have expanded to three volumes: 1. General principles and Biotechnology 2. Specific Principles and Methods: Growth and Development 3. Case Histories: Gymnosperms, Angiosperms and Palms The scientific barriers to progress in tree breeding are not so much lack of foreign gene expression in plants but our current inability to regenerate plants in true-to-type fashion on a mass scale. This book is dedicated to the temperate small grain cereals wheat, barley and oats, many of the techniques described could be readily adapted for other cereals or plants generally. We thank all the contributing authors for their timely and informative chapters, the staff of Humana Press, especially John Walker for their guidance, and Helen Jenkins for her proof-reading, word processing and administrative support.

Potato Improvement Through In Vitro Techniques

Online Library In Vitro Induction and Callus Regeneration And
Callus Induction and Plant Regeneration from Internode Tissues of Dendrocalamus Latiflorus Cv Machiku

The third edition of a standard resource, this book offers a state-of-the-art, multi-disciplinary presentation of plant roots. It examines structure and development, assemblage of root systems, metabolism and growth, stressful environments, and interactions at the rhizosphere. Reflecting the explosion of advances and emerging technologies in the field, the book presents developments in the study of root origin, composition, formation, and behavior for the production of novel pharmaceutical and medicinal compounds, agrochemicals, dyes, flavors, and pesticides. It details breakthroughs in genetics, molecular biology, growth substance physiology, biotechnology, and biomechanics.

Genomics of Tropical Crop Plants

For a long time there has been a critical need for a book to assess the genomics of tropical plant species. At last, here it is. This brilliant book covers recent progress on genome research in tropical crop plants, including the development of molecular markers, and many more subjects. The first section provides information on crops relevant to tropical agriculture. The book then moves on to lay out summaries of genomic research for the most important tropical crop plant species.

Studies on Variability, Floral Biology and Effect of the Age of Mother Plant on Callus Induction and Direct Regeneration Under in Vitro Condition in Jatropha (Jatropha Curcas L.)

Environmental science is an interdisciplinary academic field that integrates physical-, biological-, and information sciences to study and solve environmental problems. ESSE - The International Conference on Environmental Science and Sustainable Energy provides a platform for experts, professionals, and researchers to share updated information and stimulate the communication with each other. In 2017 it was held in Suzhou, China June 23-25, 2017.

Saffron

Establishment of Callus Induction and Organ Regeneration Using Eggplant (solanum Melongena L.) Seedlings Via in Vitro System

Thyme

Callus induction and shoot formation from hypocotyls and cotyledons of Guizotia abyssinica Cass. has been achieved. Six to eight-day-old hypocotyl segments and cotyledons were cultured on MS medium containing different concentrations of NAA, IAA and BAP. Among the various concentrations tested, 0.5 mg/l NAA in combination with 1 mg/l BAP was found to be the best for maximum callus induction of hypocotyl explants. Furthermore, 2 mg/l IAA in combination with 1 mg/l BAP was the best for callus induction of cotyledonary explants. Highest percentage of shoot formation (60%) was obtained when cotyledons were cultured on medium supplemented with 3.0 mg/l IAA in combination with 1.0 mg/l BAP. Maximum number of shoots per explant (28.3) was obtained from medium containing 0.1 mg/l NAA in combination with 1 mg/l BAP. The types of explant, growth regulator combinations and genotypes were showed significant effect on shoot regeneration. The elongated shoots were successfully rooted on media supplemented with IBA at a concentration of 0.5 mg/l. The shoots were established in soil where 65% of them survived. Morphologically aberrant plants were not observed.

Copyright code : 9b142c51e78b557a6d93bc4d880f1b12