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NAVBHARAT MEMORIAL FOUNDATION

A Tribute to
Late Shri Narendra Singh Kothari

INTERNATIONAL JOURNAL FOR COMMERCE MANAGEMENT & SCIENCES

(A Bi-lingual Multi Disciplinary Peer Reviewed International Bimonthly Journal)

नवभारत मेमोरियल फाउन्डेशन

स्व. श्री नरेन्द्र सिंह जी कोठारी

1944
2014

परिचय

नवभारत मेमोरियल फाउन्डेशन स्वर्गीय श्री नरेन्द्र सिंह जी कोठारी को समर्पित वह संस्थान है जहाँ जरूरतमंद विद्यार्थियों को आर्थिक तथा तकनीकी सहायता प्रदान की जाती है ताकि वे शिक्षित होकर समाज में अपनी एक स्वच्छ छवि बना सके।

स्वर्गीय श्री नरेन्द्र सिंह जी कोठारी का सम्पूर्ण जीवन हमें जीवन में हर विकट परिस्थिति का सामना करने के लिए प्रेरित करता है। इनकी माताजी का बाल्यकाल में ही देहान्त हो गया था तथा इनके पिता भीलवाड़ा में पुलिस में थानेदार के पद पर थे। एक बार डाकुओं ने इनके पिता को समझौता करने के लिए बुलाया तथा वहाँ धोखे से उन्हें जिन्दा जला दिया। इसके पश्चात् छोटे भाई-बहनों की जिम्मेदारी बाल्यकाल में ही श्री नरेन्द्र सिंह जी को उठानी पड़ी। तब उन्होने कठिन परिश्रम करके शिक्षा की ओर रूझान होने के कारण न केवल भाई -बहन को पढाया अपितु स्वयं भी पढते रहे । गणित और अंग्रेजी उनके प्रिय विषय रहे । विज्ञान संकाय के विद्यार्थी होने के बावजूद भी सभी विषयों को सरल एवं सहज तरीके से छात्रों को समझाने की अदभुद कला के वे धनी थे। 1984 से 1988 तक वे भीनमाल मे अकाल राहत कार्यो में प्रबन्धक के पद पर रहे। इसके बाद 1989 में वे जयपुर आ गए तथा 1989 में इन्होने 2 बच्चो से नवभारत कोचिंग संस्थान की। सन् 1989 से आज तक हजारों बच्चों इस संस्थान से पढ़कर अपने जीवन के चरम को छू चुके है।

स्वर्गीय श्री नरेन्द्र सिंह जी कोठारी ने अपना जीवन शिक्षा का प्रचार -प्रसार करने तथा बच्चों को शिक्षित करने में समर्पित कर दिया। उन्होंने सदैव बच्चों को शिक्षित होने तथा अच्छे संस्कार अपनाने की प्रेरणा दी।

स्वर्गीय श्री नरेन्द्र सिंह जी कोठारी की यादों को शिक्षा जगत् में अक्षुण्य बनाये रखने के लिए ही नवभारत मेमोरियल फाउन्डेशन की स्थापना की गई है जिसका उद्देश्य शिक्षा के क्षेत्र में जरूरतमंद बच्चों को वित्तीय मदद करना तथा सहायता देना है। इसके अतिरिक्त इस संस्थान का उद्देश्य शिक्षा एवं समाज के विभिन्न नवाचारों के लिए कार्य करना है जिससे योग्य एवं जरूरतमंद विद्यार्थी जीवन की नई ऊचाइयों को पा सकें।

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Editorial

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From the Editor's Desk

आ नोभद्राः क्रतवो यन्तुविश्वतः

Let noble thoughts come to us from all sides

(Rigveda, 1.89.1)

Dear Friends,

Greetings. I would like to welcome all the readers on the occasion of releasing the this issue of **"INTERNATIONAL JOURNAL FOR COMMERCE MANAGEMENT SCIENCES"(A Bi-lingual Multi Disciplinary Peer Reviewed International Bimonthly Journal)" having ISSN No** ----------, Successfulness of this journal is the endeavour of our whole team and our prudent contributors. We wish that all the readers and authors may touch the new heights of their career, who are working for advancement of research, development of career, creativity, innovation and entrepreneurship. I am very much glad to present this issue of **"INTERNATIONAL JOURNAL FOR COMMERCE MANAGEMENT SCIENCES "(A Bi-lingual Multi Disciplinary Peer Reviewed International Bimonthly Journal)".** I do believe that you would continue your kind cooperation and support. This journal is going to be presented by Navbharat Memorial Foundation, which is established in the sweet memories of Late Shri Narendra Singh Ji Kothari.

Shri Narendra Singh Ji Kothari, who had devoted his life for education. In his whole life he educated thousands of students. He always motivated to his students to become educated and to adopt good moral. In 2016, Navbharat Memorial Foundation is established to hold the sweet memories of Late Shri Narendra Singh Ji Kothari in the field of education. The basic objective of this foundation is to provide assistance to the needy students in the education sector. Other than that, this foundation has aims to work for education and innovation in the society.

At the end, I would like to convey my thankful gratitude to all contributor scholars for their valuable contributions. I hope that by launching this journal, we will be success to promote creativity, innovation and research activities in the society. I wish you all the best for reading this issue of **"INTERNATIONAL JOURNAL FOR COMMERCE MANAGEMENT SCIENCES "(A Bi-lingual Multi Disciplinary Peer Reviewed International Bimonthly Journal)".** If you have any suggestions, please feel free to send at our email – iccmsss2017@gmail.com.

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INTERNATIONAL JOURNAL FOR COMMERCE MANAGEMENT & SCIENCES
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CONTENTS

Agarose Gel Electrophoresis Protocol Generally Utilised

Jasveer Kaur

Abstract

Agarose gel electrophoresis is a method of gel electrophoresis used in biochemistry, molecular biology, genetics, and clinical chemistry to separate a mixed population of macromolecules such as DNA or proteins in a matrix of agarose, one of the two main components of agar. The proteins may be separated by charge and/or size (isoelectric focusingagarose electrophoresis is essentially size independent), and the DNA and RNA fragments by length.[1] Biomolecules are separated by applying an electric field to move the charged molecules through an agarose matrix, and the biomolecules are separated by size in the agarose gel matrix.[2]

Introduction

Agarose gel is easy to cast, has relatively fewer charged groups, and is particularly suitable for separating DNA of size range most often encountered in laboratories, which accounts for the popularity of its use. The separated DNA may be viewed with stain, most commonly under UV light, and the DNA fragments can be extracted from the gel with relative ease. Most agarose gels used are between 0.7 - 2% dissolved in a suitable electrophoresis buffer.

Materials Required:

Buffers and Solutions:

Agarose solutions.

Ethidium bromide.

Electrophoresis buffer.

Nucleic Acids and Oligonucleotides:

Dna Samples.

Dna Ladders.

(Samples of DNAs of known size are typically generated by restriction enzyme digestion of a plasmid or bacteriophage DNA of known sequence).

The equipment and supplies necessary for conducting agarose gel electrophoresis are relatively simple and include:

- An electrophoresis chamber and power supply.
- Gel casting trays, which are available in a variety of sizes and composed of UV-transparent plastic.
- Sample combs, around which molten agarose is poured to form sample wells in the gel.
- Electrophoresis buffer, usually Tris-acetate-EDTA (TAE) or Tris-borate-EDTA (TBE).
- Loading buffer, which contains something dense (e.g. glycerol) to allow the sample to "fall" into the

sample wells, and one or two tracking dyes, which migrate in the gel and allow visual monitoring or how far the electrophoresis has proceeded.

- Ethidium bromide, a fluorescent dye used for staining nucleic acids.(1,2)
- Transilluminator (an ultraviolet light box), which is used to visualize ethidium bromide-stained DNA in gels.

NOTE:

Always wear protective eyewear when observing DNA on a Transilluminator to prevent damage to the eyes from UV light.

1. Prepare a 50x stock solution of TAE buffer in 1000m of distilled H_2O:

   For this weigh 242 g of Tris base in a chemical balance. Transfer this to a 1000ml beaker. Prepare EDTA solution (pH 8.0, 0.5M) by weighing 9.31g of EDTA and dissolve it in 40ml distilled water. EDTA is insoluble and it can be made soluble by adding sodium hydroxide pellets. Check the pH using pH meter. Make the solution 100ml by adding distilled water. Pipette out 57.1 ml of glacial acetic acid.

   Mix the Tris base, EDTA solution and glacial acetic acid and add distilled water to make the volume to 1000ml

2. Prepare sufficient electrophoresis buffer (usually 1x TAE) to fill the electrophoresis tank and to cast the gel:

   For this we take 2ml of TAE stock solution in an Erlenmeyer flask and make the volume to 100ml by adding 98ml of distilled water. The 1x working solution is 40 mMTris-acetate/1 mM EDTA

   It is important to use the same batch of electrophoresis buffer in both the electrophoresis tank and the gel preparation.(3,4)

3. Prepare a solution of agarose in electrophoresis buffer at an appropriate concentration:

   For this usually 2 grams of agarose is added to 100ml of electrophoresis buffer.

Agarose Concentration in Gel (% [w/v])	Range of Separation of Linear DNA Molecules (kb)
0.3	5-60
0.6	1-20
0.7	0.8-10
0.9	0.5-7
1.2	0.4-6
1.5	0-2-3
2.0	0.1-2

1. Loosely plug the neck of the Erlenmeyer flask. Heat the slurry in a boiling-water bath or a microwave oven until the agarose dissolves. The agarose solution can boil over very easily so keep checking it. It is good to stop it after 45 seconds and give it a swirl. It can become superheated and NOT boil until you take it out whereupon it boils out all over you hands. So wear gloves and hold it at arm's length. You can use a Bunsen burner instead of a microwave - just remember to keep watching it.
2. Use insulated gloves or tongs to transfer the flask/bottle into a water bath at 55°C. When the molten gel has cooled, add 0.5µg/ml of ethidium bromide. Mix the gel solution thoroughly by gentle swirling.

   (For the preparation of ethidium bromide adds 1 g of ethidium bromide to 100 ml of H_2O. Stir on a magnetic stirrer for several hours to ensure that the dye has dissolved. Wrap the container in aluminum foil or transfer the 10 mg/ml solution to a dark bottle and store at room temperature.)
3. While the agarose solution is cooling, choose an appropriate comb for forming the sample slots in the gel.
4. Pour the warm agarose solution into the mold.

   (The gel should be between 3 - 5 mm thick. Check that no air bubbles are under or between the teeth of the comb.)
5. Allow the gel to set completely (30-45 minutes at room temperature), then pour a small amount of electrophoresis buffer on the top of the gel, and carefully remove the comb. Pour off the electrophoresis buffer. Mount the gel in the electrophoresis tank.
6. Add just enough electrophoresis buffers to cover the gel to a depth of approx. 1mm.
7. Mix the samples of DNA with 0.20 volumes of the desired 6x gel-loading buffer.
8. Slowly load the sample mixture into the slots of the submerged gel using a disposable micropipette or an automatic micropipettor or a drawn-out Pasteur pipette or a glass capillary tube. Load size standards into slots on both the right and left sides of the gel.
9. Close the lid of the gel tank and attach the electrical leads so that the DNA will migrate toward the positive anode (red lead). Apply a voltage of 1-5 V/cm (measured as the distance between the positive and negative electrodes). If the electrodes are 10cm apart then run the gel at 50V. It is fine to run the gel slower than this but do not run it any faster. Above 5V/cm the agarose may heat up and begin to melt with disastrous effects on your gel's resolution. If the leads have been attached correctly, bubbles should be generated at the anode and cathode.(5)
10. Run the gel until the bromophenol blue and xylenecyanol FF have migrated an appropriate distance through the gel.

    (The presence of ethidium bromide allows the gel to be examined by UV illumination at any stage during electrophoresis).
11. The gel tray may be removed and placed directly on a transilluminator. When the UV is switched on we can see orange bands of DNA.

Procedure for operating the virtual lab:

Check whether you have done all the steps listed below:

- Prepare TAE buffer.
- Transfer 100ml of the buffer to a conical flask.
- Weigh 2grams of agarose and add to the 100ml buffer solution.
- Keep in oven.
- Take the solution from oven.

- Add ethidium bromide.
- Pour the solution to a gel caster.
- Place the comb.
- Pour the 100ml buffer solution to the electrophoretic chamber.
- Place the gel in the caster in the electrophoretic chamber.
- Connect the electrodes and switch on the current.
- Switch off the power supply.
- Remove the gel from the electrophoretic chamber.
- Place the gel in the UV Transilluminator.
- Switch on the Transilluminator.

Caution:

- Ethidium bromide is a mutagen and should be handled as a hazardous chemical (so wear gloves while handling)

Differences Encountered In Real Laboratory:

1. Make sure that the Agarose is fully dissolved in the buffer. If it is not dissolved well, again melt it some more time to dissolve completely.
2. Before casting the gel, the tray and comb should wipe with ethanol.
3. Make sure that the gel in the Chamber is immersed in the TAE Buffer.
4. Labelings should be proper.
5. Ensure that the connections should be proper.
6. Before the incubation step, ensure that the water bath is set at the correct temperature that we required or not.

Science Mistress,
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Different Types of Skin Allergies – A Mini Review

Dr. Neetu Sidana

ABSTRACT

Irritated skin can be caused by a variety of factors. These include immune system disorders, medications and infections. When an allergen is responsible for triggering an immune system response, then it is an allergic skin condition.

Introduction

Types of Skin Allergies

Atopic Dermatitis (Eczema)

Eczema is the most common skin condition, especially in children. It affects one in five infants but only around one in fifty adults. It is now thought to be due to "leakiness" of the skin barrier, which causes it to dry out and become prone to irritation and inflammation by many environmental factors. Also, some people with eczema have a food sensitivity which can make eczema symptoms worse. In about half of patients with severe atopic dermatitis, the disease is due to inheritance of a faulty gene in their skin called filaggrin. Unlike with urticaria (hives), the itch of eczema is not only caused by histamine so anti-histamines may not control the symptoms. Eczema is often linked with asthma, allergic rhinitis (hay fever) or food allergy. This order of progression is called the atopic march.An inflammation of the skin that produces a red, scaly, itchy rash is known as dermatitis. Two of the most common types are atopic dermatitis (often called eczema) and contact dermatitis.

Eczema is a chronic skin condition that usually begins in infancy or early childhood and is often associated with food allergy, allergic rhinitis and asthma.

Certain foods can trigger eczema, especially in young children. Skin staph infections can cause flare-ups in children as well. Other potential triggers include animal dander, dust mites, sweating, or contact with irritants like wool or soaps.

Preventing the itch is the main goal of treatment. Do not scratch or rub the rash. Applying cold compresses and creams or ointments is helpful. It is important to avoid all irritants that aggravate your condition. If a food is identified as the cause, eliminate it from your diet.

Corticosteroid and other anti-inflammatory creams that are applied to the skin are most effective in treating the rash. Antihistamines are often recommended to help relieve the itchiness. In severe cases, oral corticosteroids are also prescribed. If a skin staph infection is suspected to be a trigger for an eczema flare-up, antibiotics are often recommended.

Contact Dermatitis

When certain substances come into contact with your skin, they may cause a rash called contact dermatitis. There are two kinds of contact dermatitis: irritant and allergic.

Irritant contact dermatitis occurs when a substance damages the part of skin the substance comes in

contact with. It is often more painful than itchy. The longer your skin is in contact with the substance, or the stronger the substance is, the more severe your reaction will be. These reactions appear most often on the hands and are frequently due to substances contacted in the workplace.

For irritant contact dermatitis, avoid the substance causing the reaction. Wearing gloves can sometimes be helpful. Avoiding the substance will relieve your symptoms and prevent lasting damage to your skin. Allergic contact dermatitis is best known by the itchy, red, blistered reaction experienced after you touch poison ivy. This allergic reaction is caused by a chemical in the plant called urushiol. Reactions can happen from touching other items the plant has come into contact with. However, once your skin has been washed, you cannot get another reaction from touching the rash or blisters. Allergic contact dermatitis reactions can happen 24 to 48 hours after contact. Once a reaction starts, it may take 14 to 28 days to go away, even with treatment.

Nickel, perfumes, dyes, rubber (latex) products and cosmetics also frequently cause allergic contact dermatitis. Some ingredients in medications applied to the skin can cause a reaction. A common offender is neomycin, an ingredient in antibiotic creams.

Treatment depends on the severity of the symptoms. Cold soaks and compresses can offer relief for the early, itchy blistered stage of a rash. Topical corticosteroid creams may be prescribed. For severe reactions such as poison ivy, oral prednisone may be prescribed as well.

To prevent the reaction from returning, avoid contact with the offending substance. If you and your allergist cannot determine what caused the reaction, your allergist may conduct tests to help identify it.

Allergic Contact Dermatitis

Allergic contact dermatitis occurs when your skin comes in direct contact with an allergen. For instance, if you have a nickel allergy and your skin comes in contact with jewelry made with even a very small amount of nickel, you may develop red, bumpy, scaly, itchy or swollen skin at the point of contact. Coming in contact with poison ivy, poison oak and poison sumac can also cause allergic contact dermatitis. The red, itchy rash is caused by an oily coating covering these plants. The allergic reaction can come from actually touching them, or by touching clothing, pets or even gardening tools that have come in contact with the oil.

Urticaria (Hives)

Hives are an inflammation of the skin triggered when the immune system releases histamine. This causes small blood vessels to leak, which leads to swelling in the skin. Swelling in deep layers of the skin is called angioedema. There are two kinds of urticaria, acute and chronic. Acute urticaria occurs at times after eating a particular food or coming in contact with a particular trigger. It can also be triggered by non-allergic causes such as heat or exercise, as well as medications, foods, insect bites or infections. Chronic urticaria is rarely caused by specific triggers and so allergy tests are usually not helpful. Chronic urticaria can last for many months or years. Although they are often uncomfortable and sometimes painful, hives are not contagious.

Angioedema

Angioedema is swelling in the deep layers of the skin. It is often seen together with urticaria (hives). Angioedema many times occurs in soft tissues such as the eyelids, mouth or genitals. Angioedema is called "acute" if the condition lasts only a short time such as minutes to hours. Acute angioedema is commonly caused by an allergic reaction to medications or foods. Chronic recurrent angioedema is when the

condition returns over a long period of time. It typically does not have an identifiable cause.

Hereditary angiodema (HAE)

Hereditary angiodema (HAE) is a rare, but serious genetic condition involving swelling in various body parts including the hands, feet, face, intestinal wall and airways. It does not respond to treatment with antihistamines or adrenaline so it is important to go see a specialist.

Skin conditions are one of the most common forms of allergy treated and managed by an allergist / immunologist, a physician with specialized training and expertise to accurately diagnose your condition and provide relief for your symptoms.

Most people are bothered by skin irritations at some point in time. These irritations are so common and varied that they are called by different names, which can lead to confusion. When an allergen is responsible for triggering an immune system response, the irritation is an allergic skin condition. There are several types of allergic skin conditions. An allergist / immunologist, often referred to as an allergist, has advanced training and expertise to determine which condition you have and develop a treatment plan to help you feel better.

Hives

Urticaria is the medical term for hives, which are red, itchy, raised areas of the skin. They can range in size and appear anywhere on your body. Most cases of hives are known as acute and go away within a few days or weeks, but some people suffer from chronic hives with symptoms that come and go for several months or years. Your allergist may prescribe antihistamines to relieve your symptoms. If the cause can be identified, you should avoid that trigger. However, the majority of chronic cases are not related to allergy. Routine testing, such as blood counts or allergy screens, are not recommended as they are unlikely to determine a cause and do not make a difference in treatment strategies.

While related to hives, angioedema is swelling that affects the deeper layers of the skin. It is usually not red or itchy and often involves the eyelids, lips, tongue, hands and feet. Angioedema commonly occurs with hives, but can occur on its own.

Food, drug or insect sting reactions are a common cause of acute hives and angioedema. Viral or bacterial infections can also trigger acute hives. Hives can also be caused by physical factors such as cold, heat, exercise, pressure and exposure to sunlight.

Prevention

Healthy Tips

If you have red, bumpy, scaly, itchy or swollen skin, you may have a skin allergy. Urticaria (hives) are red, itchy, raised areas of the skin that can range in size and appear anywhere on your body. Angioedema is a swelling of the deeper layers of the skin that often occurs with hives. Atopic dermatitis (eczema) is a scaly, itchy rash that often affects the face, elbows and knees. When certain substances come into contact with your skin, they may cause a rash called contact dermatitis.

Feel Better. Live Better.

An allergist / immunologist, often referred to as an allergist, is a pediatrician or internist with at least two additional years of specialized training in the diagnosis and treatment of allergies, asthma, immune deficiencies and other immunologic diseases.

By visiting the office of an allergist, you can expect an accurate diagnosis, a treatment plan that works and educational information to help you manage your disease and feel better.

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Ganodermalucidum Utilization For Textile Dye Waste Water Degradation Process

Garima Sharma

Abstract

Synthetic dyes are widely used in several industries such as textile, paper, printing, cosmetics, pharmaceuticals, colour photography and petroleum (Marmion 1991). Dyes are classified into acidic, basic, disperse, azo, diazo, anthraquinone and metal complex based on their structure. On the basis of the dyeing process, textile dyes are classified as reactive, direct, disperse, acid, basic and vat dyes (Campos et al. 2001). Textile industries utilize large amounts of water during processing and also generate substantial amounts of wastewater (Hutton 1972). About 10–15 % of the dyes are lost in the wastewater during the dyeing process (Zollinger 1987). Coloured wastewater from the textile industries is one of the most obvious indicators of water pollution. Coloured dye wastewater causes severe effects on aquatic environment even in small amounts. Apart from the colour, the dischargeable dye wastewater also contains other pollutants like degradable organics, nutrients, pH altering agent, salts, sulphur, toxicants and refractory organics (Somasiri et al. 2008; Haroun and Idris 2009).

Introduction

In general, physical, chemical and biological methods are used to treat the textile industry wastewater. Physical and chemical methods include adsorption, chemical precipitation, flocculation, photolysis, chemical oxidation and reduction, electro-chemical treatment and ion-pair extraction (Azmi et al. 1998; Moreria et al. 2000; Rajeshkannan et al. 2010, 2011). These methods are mostly ineffective, expensive, produce side reactions, high sludge and by-products, not suited to degrade all dyes, etc. (Krull et al. 1998; Verma and Madamwar 2003). Hence, researchers have focused on biological treatment as the best alternative. The operational cost is relatively low when compared with conventional technologies (Arutchelvan et al. 2003; Jadhav and Govindwar 2006). Many microorganisms, including bacteria, fungi and actinomycetes, have been reported for their ability to decolourize dyes (Chang et al. 2001; Khehra et al. 2005). Among these microorganisms, white rot fungi are the most intensively studied dye decolourizing microbes. These fungi produce large quantities of extracellular enzymes that help to remove dyes from industrial effluent and also have the ability to resist unfavourable environmental conditions (Pointing 2001; D'Souza et al. 2006).

In this study, a white rot fungal strain, *Ganodermalucidum*, was examined for its ability to decolourize the textile dye in industry wastewater. The effect of process variables on textile dye industry wastewater degradation was studied and optimized using response surface methodology (RSM).

Materials and Methods

Textile dye wastewater

The textile dye wastewater was collected from a private small-scale industry located at Erode, Tamilnadu, India. The wastewater was analysed for various parameters as per the procedure given in APHA (1999), as given in Table 1. The wastewater was stored at 4 ± 1 °C in airtight plastic containers.

Ganodermalucidum (MTCC- 1039) is a stock of the Microbial Type Culture Collection Centre (MTCC), Chandigarh, India. It is well preserved in the laboratory. The strain is maintained on solid medium at 4 °C. The media composition and process conditions were: agar 20 g/l; malt extract 20 g/l; temperature 25 °C; pH 6.5; incubation time 10 days.

Decolourization of textile dye wastewater

In this study, a white rot fungi, *Ganodermalucidum*, was utilized to treat the textile dye wastewater. RSM was applied to optimize the process parameters. From the results, it was found that a maximum of 81.4 % colour removal and 91.3 % COD reduction occurs at the optimized condition. The UV spectrum confirms the decolourization. Various models were tried to study the kinetics of textile dye degradation. From the results, it was found that the degradation of textile dye wastewater follows first-order kinetics. Hence, it was concluded that *Ganodermalucidum* could be utilized for the effective treatment of textile dye wastewater.

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Textile Sector In India- An Overview

Manisha Kumari

Abstract

India's textiles sector is one of the oldest industries in Indian economy dating back several centuries. Even today, textiles sector is one of the largest contributors to India's exports with approximately 13 per cent of total exports. The textiles industry is also labour intensive and is one of the largest employers. The textile industry has two broad segments. First, the unorganised sector consists of handloom, handicrafts and sericulture, which are operated on a small scale and through traditional tools and methods. The second is the organised sector consisting of spinning, apparel and garments segment which apply modern machinery and techniques such as economies of scale.

Introduction

The textile industry employs about 45 million people directly and 20 million people indirectly. India's overall textile exports during FY 2015-16 stood at US$ 40 billion.

The Indian textiles industry is extremely varied, with the hand-spun and hand-woven textiles sectors at one end of the spectrum, while the capital intensive sophisticated mills sector at the other end of the spectrum. The decentralised power looms/ hosiery and knitting sector form the largest component of the textiles sector. The close linkage of the textile industry to agriculture (for raw materials such as cotton) and the ancient culture and traditions of the country in terms of textiles make the Indian textiles sector unique in comparison to the industries of other countries. The Indian textile industry has the capacity to produce a wide variety of products suitable to different market segments, both within India and across the world.

Market Size

The Indian textiles industry, currently estimated at around US$ 120 billion, is expected to reach US$ 230 billion by 2020. The Indian Textile Industry contributes approximately 2 per cent to India's Gross Domestic Product (GDP), 10 per cent of manufacturing production and 14 per cent to overall Index of Industrial Production (IIP).

Indian khadi products sales increased by 33 per cent year-on-year to Rs 2,005 crore (US$ 311.31 million) in 2016-17 and is expected to exceed Rs 5,000 crore (US$ 776.33 million) sales target for 2018-19, as per the Khadi and Village Industries Commission (KVIC).

The total area under cultivation of cotton in India is expected to increase by 7 per cent to 11.3 million hectares in 2017-18, on account of expectations of better returns from rising prices and improved crop yields during the year 2016-17.

Indian exports of locally made retail and lifestyle products grew at a compound annual growth rate (CAGR) of 10 per cent from 2013 to 2016, mainly led by bedding bath and home decor products and textiles#. The Government of India targets textile and garment sector exports at US$ 45 billion for 2017-18.

Investment

The textiles sector has witnessed a spurt in investment during the last five years. The industry (including dyed and printed) attracted Foreign Direct Investment (FDI) worth US$ 2.55 billion during April 2000 to June 2017.

Some of the major investments in the Indian textiles industry are as follows:

- Future Group is planning to open 80 new stores under its affordable fashion format, Fashion at Big Bazaar (FBB), and is targeting sales of 230 million units of garments by March 2018, which is expected to grow to 800 million units by 2021.
- Raymond has partnered with Khadi and Village Industries Commission (KVIC) to sell Khadi-marked readymade garments and fabric in KVIC and Raymond outlets across India.
- Max Fashion, a part of Dubai based Landmark Group, plans to expand its sales network to 400 stores in 120 cities by investing Rs 400 crore (US$ 60 million) in the next 4 years.

Government Initiatives

The Indian government has come up with a number of export promotion policies for the textiles sector. It has also allowed 100 per cent FDI in the Indian textiles sector under the automatic route.

Initiative will be taken into consideration by Government of India.

- The Government has planned to connect as many as 5 crore (50 million) village women to charkha (spinning wheel) in next 5 years with a view to provide them employment and promote khadi and also, they inaugurated 60 khadi outlets which were renovated and re-launched during the completion of KVIC s 60th anniversary and a khadi outlet.
- The Textiles Ministry will organise 'HastkalaSahyogShivirs' in 421 handloom-handicrafts clusters across the country which will benefit over 1.2 lakh weavers and artisans.
- The Gujarat government's decision to extend its textile policy by a year is set. It is believes to attract Rs 5,000 crore (US$ 50 billion) of more investment in sectors across the value chain. The government estimates addition till now of a million units of spindle capacity in the spinning sector and setting up of over 1,000 units in technical textiles.

  The key initiatives announced in the Union Budget 2017-18 to boost the textiles sector are listed below:

- Encourage new entrepreneurs to invest in sectors such as knitwear by increasing allocation of funds to Mudra Bank from Rs 1,36,000 crore (US$ 20.4 billion) to Rs 2,44,000 crore (US$ 36.6 billion).
- Upgrade labour skills by allocating Rs 2,200 crore (US$ 330 million)

  Some of initiatives taken by the government to further promote the industry are as under:

- The Government of India plans to introduce a mega package for the powerloom sector, which will include social welfare schemes, insurance cover, cluster development, and upgradation of obsolete looms, along with tax benefits and marketing support, which is expected to improve the status of power loom weavers in the country.
- The Ministry of Textiles has signed memorandum of understanding (MoU) with 20 e-commerce companies, aimed at providing a platform to artisans and weavers in different handloom and

handicraft clusters across the country for selling their products directly to the consumer.

- Memorandum of Understanding (MoU) worth Rs 8,835 crore (US$ 1.3 billion) in areas such as textile parks, textile processing, machinery, carpet development and others, were signed during the Vibrant Gujarat 2017 Summit.
- The Union Minister for Textiles inaugurated Meghalaya's first-ever apparel and garment making centre to create employment opportunities in the region. The Union Minister for Textiles also mentioned Meghalaya has been sanctioned Rs 32 crore (US$ 4.8 million) for promotion of handlooms.
- The Government of India has announced a slew of labour-friendly reforms aimed at generating around 11.1 million jobs in apparel and made-ups sectors, and increasing textile exports to US$ 32.8 billion and investment of Rs 80,630 crore (US$ 12.09 billion) in the next three years.

Road Ahead

The future for the Indian textile industry looks promising, buoyed by both strong domestic consumption as well as export demand. With consumerism and disposable income on the rise, the retail sector has experienced a rapid growth in the past decade with the entry of several international players like Marks & Spencer, Guess and Next into the Indian market. The apparel market in India is estimated to grow at a Compound Annual Growth Rate (CAGR) of 11.8 per cent to reach US$ 180 billion by 2025.

High economic growth has resulted in higher disposable income. This has led to rise in demand for products creating a huge domestic market. The domestic market for apparel and lifestyle products, currently estimated at US$ 85 billion, is expected to reach US$ 160 billion by 2025.

The Indian cotton textile industry is expected to showcase a stable growth in FY2017-18, supported by stable input prices, healthy capacity utilisation and steady domestic demand*.

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Onion Squash Method-detailed Analysis For Mitosis Study

Priyanka Jain

Abstract

A process by which a parent cell divides into two or more daughter cells is called cell division. Cell division is a small part of the cell cycle. In normal eukaryotic cells, the type of cell division is known as mitosis.

Another type of cell division is present in reproductive cells of eukaryotes and is known as meiosis. Cell cycle is mainly classified into two segments: M-phase and Interphase. Interphase is the longer period of cell division. During this phase the cell prepares for its next stage.

This is a period of diverse activities and these activities are a prerequisite for the next mitotic phase. Interphase is mainly divided into three phases: G1 phase, S phase and G2 phase. S phase is the period of replication. G1 and G2 are the two gap phases during which the cell grows, producing proteins and preparing the cells. These phases also have certain check points and the whole cell cycle is strictly regulated.

Introduction

M phase of the cell cycle stands for Mitosis or nuclear division. In eukaryotes, DNA replication is followed by a process called mitosis which separates the chromosomes in its cell nucleus into two identical sets, in two individual nuclei.. Mitosis is followed by cytokinesis. The process of Mitosis is divided into four stages: Prophase, Metaphase, Anaphase and Telophase.(1,2)

Prophase: During this stage, the chromosomes super coil, condense and become visible for first time during the cell cycle. The spindle fibers start forming. The nuclear membrane starts disintegrating.

Metaphase: During this stage, the spindle fibers reach and attach to centromere of each sister chromatids. The chromosomes align along the center plane of the cell. The nuclear membrane disintegrates completely.

Anaphase: During this stage, the centromeres start splitting and the sister chromatids begin to migrating towards the opposite poles of the cell.

Telophase: During this stage, the chromosomes are clustered on the either end of the cell. The nuclear membrane starts reforming. The cell plate (new cell wall) starts to form between the two daughter nuclei. This will be followed by cytokinesis.

Mitosis In Onion Root Tip

The genetic information of all organisms resides in the individual DNA molecules or chromosomes. An onion cell possesses eight chromosomes lwhereas human cells possess forty six chromosomes.

In 1842, C. Nägeli first saw chromosomes and in 1888 W. Waldeyer named them. Walther Flemming studied and named the process of cell division as mitosis. Cell division occurs rapidly in growing root tips of sprouting seeds or bulbs.

The most commonly used root tips in labs to study mitosis are onion, wheat, lentil, barley and alfalfa. An

onion root tip is a rapidly growing part of the onion and thus many cells will be in different stages of mitosis. The onion root tips can be prepared and squashed in a way that allows them to be flattened on a microscopic slide, so that the chromosomes of individual cells can be observed easily. The super coiled chromosomes during different stages of mitosis present in the onion root tip cells can be visualized by treating with DNA specific stains, like Feulgen stain and Acetocarmine stain.(3,4)

Mitotic Index

The percentage of cells undergoing mitosis or it is defined as the ratio of no. of cells in the dividing phase to the total number of cells observed. This will help to identify the region of most mitotic activities. Mitotic index helps us to quantify the cell division. Mitotic index decreases with increasing distance from root tip. That means gradual decrease in cell division as it moves from the zone of cell division to the zone of cell elongation. The meristematic region in the root tip is the actively growing region and thus the mitotic index is high.

Mitotic index = n/N × 100

Mitotic index is used to quantify the differences in cell division when environmental parameters are changed. Studies have already proved that, the plants grown in space in microgravity have a greater mitotic index than plants grown on the ground. The gravity sensing signals in the root cap are unable to send proper orientation signals which inhibit growth in the cells that are distant from the root tip and root cap junction when kept in zero gravity. This leads to mitosis in greater number of cells and plants also produce secondary roots at a high rate.

Karyotype And Karyotype Analysis

A karyotype is a technique that allows researchers to visualize the chromosomes under the microscope with the help of proper extraction and staining techniques. The karyotype is an organized profile of an organism's chromosomes arranged in pairs. In a karyotype, the chromosomes are arranged and numbered, based on size from largest to smallest, centromere position and banding pattern (due to staining) of chromosomes. This technique helps scientists identify any chromosomal abnormalities and alterations that may result in genetic problems and disorders.(5,6)

Karyotype of any organisms is obtained easily by serious of small steps. For that, first simulate the cell division of the cells. After simulating the cell division, the cells are arrested by cholchine treatment at metaphase stage of the cell division by preventing the formation of spindle fibers. The chromosomes shorten and become more tightly coiled making their shapes more distinct and become more visible under the light microscope during the metaphase stage of the cell division.

This cholchine treated cell mixture is centrifuged and the resulting pellet is immersed in a hypotonic solution that causes the cell to swell and so allows more space for chromosomes to spread. Then a fixing agent is applied on the cell to freeze the chromosomes from moving and a stain is used to visualize the chromosomes and their banding pattern. A photograph of the chromosomes is taken, cut, paired and rearranged to give a karyotype.

Karyotype Of Human Male And Female

The karyotype analysis displays the banding pattern of the chromosomes. This banding pattern allows scientists to recognize specific parts of the chromosomes and to identify the deletions and translocations that occurred in the chromosomes. This helps to identify different genetic disorders in humans and other

organisms. The number, shapes and sizes of the condensed chromosomes vary for each species and so the closely related species can be distinguished from each other.

In order to perform onion root tip karyotype analysis, the procedure is a little different and less complex from the above one since this is a plant source. The onion roots were grown in water and its tips were subsequently cut off and fixed in 3:1 ethanol: glacial acectic acid.

The sample is then stained with DNA specific stains like Acetocarmine or Feulgen stain in acectic acid and was subjected to squash method. Then the thin layer of cell squash on the slide was viewed under the light microscope. Then the cell was photographed and documented. By using actively dividing cells in the onion root tip, this experiment aims to obtain a karyotype from the sample and to determine the purpose of each step used in the procedure.

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SPECIMEN OF A RESEARCH PAPER

Specimen of a Research Paper

The following is a suggested format for your course-related research or term paper. The general guidelines are followed by sample title pages.

Page 1 Title page should contain all of the following (see the sample title pages below):
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Name of author
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"Research Paper for ECE *x*", where *x* is the course number (252B, 254B, etc.)
Course name
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"ABSTRACT"
Body of abstract (summary of contributions and/or results; approx. 1 line per page)
"*Keywords:*" followed by 5 to 10 keywords and key phrases describing the content

Pages 2–*k* "1. INTRODUCTION"

Give background on the topic (provide context and include references on prior work), justify your interest in the topic, prepare the readers for what they will find in later sections, and summarize (in a few sentences) your main findings and/or contributions. This section must be kept short. If it exceeds, say, 3 pages, you may wish to break it up by including an additional section that covers the *necessary* details for one or more of the above aspects. Use a descriptive title such as "2. REVIEW OF PRIOR WORK" or "2. NOTABLE APPLICATIONS OF ... " for this section.

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Crowl, L.A., "How to Measure, Present, and Compare Parallel Performance", *IEEE Parallel & Distributed Technology* (now *IEEE Concurrency*), Vol. 2, No. 1, pp. 9-25, Spring 1994.

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Zobel, J., *Writing for Computer Science*, Springer, 2nd ed., 2004. [T11.Z62 2004]

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