

Title: Ensuring Seed Quality through Genetic Purity and DNA Fingerprinting

Date: 06/03/2019

Resource Person

Dr. Subhadrarani Mallick
(Asst. Agriculture Officer)

Organizing Committee

Sj. Dhiren Kumar Mishra
(Principal)

Dr. Anusuya Chhotray
(Head, Dept. of Botany)

Dr. Niranjana Mohapatra
(Lecturer-in-Botany)

Mrs. Mayuri Senapati
(Demonstrator)

Here is a comprehensive seminar report on genetic purity and DNA fingerprinting for seed quality:

Introduction:

Seed quality is crucial for agriculture, and genetic purity is a critical aspect of it. DNA fingerprinting is a powerful tool for assessing genetic purity and identifying seed varieties. DNA marker is a new approach based on DNA polymorphism among tested genotypes, and thus applicable to biological research. It offers many advantages over other categories of markers such as morphological, cytological or biochemical markers. For example, DNA marker can cover the whole genome and, therefore, is larger in quantity.

Genetic Purity:

1. Definition: Genetic purity refers to the presence of only the desired genetic material in a seed lot.
2. Importance: Ensures consistent crop improvement, yield, and quality.
3. Factors Affecting Genetic Purity: Contamination, genetic drift, and seed admixture, inbreeding depression.

DNA Fingerprinting:

1. Techniques: RFLP, RAPD, AFLP, SSR, and SNP markers.
2. Applications: Variety identification, genetic purity assessment, and seed authenticity verification.
3. Advantages: Highly accurate, speedy, and cost-effectiveness.

Applications of DNA Fingerprinting in Seed Quality:

The usefulness of DNA fingerprinting for cultivar identification in rice was first demonstrated by Dallas in 1988.

1. Variety Identification: Accurate identification and characterization of crop cultivars.
2. Genetic Purity Assessment: Detection of contamination and genetic impurities to measure genetic diversity.
3. Seed Authenticity Verification: Verification of seed origin and authenticity.
4. Seed Certification: Ensuring compliance with seed certification standards.

Case Studies:

1. Cotton Seed Purity Assessment
2. Soybean Variety Identification
3. Rice Seed genetic purity assessment

Challenges and Future Directions:

1. Standardization of DNA Fingerprinting Techniques
2. Development of High-Throughput Markers
3. Integration with Traditional Seed Testing Methods

Conclusion:

DNA fingerprinting is a powerful tool for ensuring genetic purity and seed quality. It has a wide range of application in identification of cultivars, genetic purity assessment, and seed purity check, making it an essential tool for seed industries. Further research and standardizations are very much essential to fully realize its potential.

Recommendations:

1. Establishing DNA Fingerprinting in Seed Testing Laboratories
2. Developing High-Throughput Markers for Large-Scale Analysis
3. Integrating DNA Fingerprinting with Traditional Seed Testing Methods


Principal
D.K.N. College
Eranch, Cuttack

Title: Biodiversity of Mangroves in Odisha: Status, Threats, and Conservation Efforts

Date: 06/01/2020

Resource Person

Dr. Hattanath Subudhi

(Principal Scientist, CRRI, Cuttack) Organizing Committee

Sj. Pravakar Sahoo

(Principal)

Dr. Anusuya Chhotray

(Head, Dept. of Botany)

Dr. Niranjan Mohapatra

(Lecturer-in-Botany)

Mrs. Mayuri Senapati

(Demonstrator)

Here is a comprehensive seminar report on the biodiversity of mangroves in Odisha and its conservation:

Introduction:

Mangroves are salt tolerant plant communities found in tropical and sub-tropical intertidal regions of the world. Such areas are characterized by high rainfall (between 1,000 to 3,000 mm) and temperature (ranging between 260 C-350C). Mangrove species exhibit a variety of adaptations in morphology, anatomy and physiology to survive in water logged soils, high salinity and frequent cyclonic storms and tidal surges.

Biodiversity of Mangroves in Odisha:

The mangroves of the Odisha are distributed in the following three major zones:

1. Mangroves of Mahanadi Delta.
2. Mangroves of the Brahmani and Baitarani Delta (Bhitarkanika).
3. Mangroves of the Balasore-Bhadrak coast.

Bhitarkanika mangroves are most important due to its largest stretch and unique biodiversity. It is also considered as the third largest mangrove zone of the country followed by Sundarban and Andaman & Nicobar Island.

1. Flora: 73 species of mangroves, including Rhizophora, Avicennia, and Sonneratia are reported recently to found in Bhitarkanika
2. Fauna: 185 species of birds, 65 species of fishes, 28 species of prawns, and 16 species of crabs.
3. Microorganisms: Unique assemblages of bacteria, fungi, and algae.

Threats to Mangrove Biodiversity in Odisha:

1. Habitat Destruction: Deforestation, urbanization, and infrastructure development.
2. Pollution: Industrial effluents, agricultural runoff, and domestic waste.
3. Climate Change: Rising sea levels, increased salinity, and altered tidal patterns.
4. Over-Exploitation: Excessive fishing, prawn farming, and fuel wood collection.

Conservation Efforts in Odisha:

1. Protected Areas: Bhitarkanika National Park, Chilika Wildlife Sanctuary, and Gahirmatha Marine Sanctuary.
2. Sustainable Forest Management: Joint Forest Management (JFM) and Community-based Conservation.
3. Research and Monitoring: Studies on mangrove ecology, biodiversity, and climate change impacts.
4. Community Engagement: Awareness programs, education, and livelihood support.

Recommendations:

1. Strengthen Protected Area Management
2. Promote Sustainable Livelihoods
3. Enhance Research and Monitoring
4. Foster Community Participation
5. Develop Climate Change Adaptation Strategies

Conclusion:

Mangrove ecosystems in Odisha are facing many threats, affecting biodiversity and ecosystem services. Conservation efforts are underway, but more needs to be done to protect these unique ecosystems. A joint approach involving government, local communities, and research institutions is essential for effective conservation and sustainable management of mangrove biodiversity in Odisha.


Principal
D.K.N. College
Eranch, Cuttack

Title: Respiration: The Vital Process of Life

Resource Person

Chief Patron

Sj. Fakeer Mohan Dhal
(Lecturer in Botany, Niali College, Niali)

Sj. Jatindra Kumar Mishra
(Principal)

Date: 22/02/2023

Organizing Committee

Dr. Nirajan Mohapatra
(Head, Department of Botany)

Mrs. Mayuri Senapati
(Demonstrator)

Mr. Sudeep Badu
(Demonstrator)

Here is a comprehensive seminar report on respiration:

Introduction:

Respiration involves biological oxidation of organic molecules i.e. breaking up of C-C bonds by using enzymes resulting in release of energy in the form of ATP. It is a vital process that occurs in all living beings, from single-celled organisms to complex multicellular organisms like humans.

Types of Respiration:

1. **Aerobic Respiration:** Occurs in the presence of oxygen, resulting in the complete oxidation of glucose to produce energy (ATP).
2. **Anaerobic Respiration:** Occurs in the absence of oxygen, resulting in the incomplete oxidation of glucose to produce energy (ATP).

***Stages of Respiration in animals-**

1. **Breathing (Ventilation):** The process of inhaling oxygen and exhaling carbon dioxide through the lungs.
2. **External Respiration:** The exchange of gases between the lungs and the environment.
3. **Internal Respiration:** The exchange of gases between the bloodstream and the body's cells.
4. **Cellular Respiration:** The process of generating energy from glucose within the cells.

***Mechanism of Respiration in plants-**

1. **Glycolysis-** Common step of both types of respiration, partial oxidation of glucose to two molecules of pyruvate.
2. **Oxidative decarboxylation-** Pyruvate forms Acetyl coenzyme A in presence of several coenzymes like NAD and Coenzyme A.

3. TCA Cycle- One molecule of ATP, three molecules of NADH₂, One molecule of FADH₂ and Two CO₂ Molecules are released per Acetyl CoA oxidised.

4. ETS- Energy released stored in the NADH₂H⁺ and FADH₂H⁺ and electrons are passed on to O₂ resulting in formation of water. This occurs in inner mitochondrial matrix.

Importance of Respiration:

1. Energy Production: Respiration generates energy for the body's functions.
2. Maintaining pH Balance: Respiration helps regulate the body's acid-base balance in animals.
3. Supporting Metabolic Processes: Respiration provides oxygen for metabolic reactions.

Conclusion:

Respiration is a critical process that sustains life. Understanding its mechanisms and importance can appreciate the intricate processes that occur within our bodies. Any questions or need further clarification?

J. K. Mubhy
Principal
D.K.N. College
Eranch, Cutt-

Title: The Nitrogen Cycle in Agriculture: Understanding the Process and its Importance

Date: - 22/10/2023

Resource Person

Dr. Smitarani Mohanty
(Lecturer in Botany, Stewart Science College, Cuttack)

Organizing Committee

Sj. Markandeswar Mohapatra
(Principal)

Dr. Nirajan Mohapatra
(Head, Department of Botany)

Mrs. Mayuri Senapati
(Demonstrator)

Mr. Sudeep Badu
(Demonstrator)

Here is a comprehensive seminar report on the nitrogen cycle in agriculture:

Introduction:

Nitrogen is the limiting nutrient for plant growth and development in both natural and agricultural ecosystems and the nitrogen cycle plays a critical role in maintaining soil fertility and plant productivity in agricultural ecosystems. It ensures a regular supply of Nitrogen to the plants.

Overview of the Nitrogen Cycle:

The nitrogen cycle involves the conversion of nitrogen between its various forms, including:

1. **Nitrogen Fixation:** Conversion of atmospheric nitrogen (N_2) to a usable form (ammonia or nitrate). Mainly by Biological Nitrogen Fixation by some prokaryotic organisms containing an exclusive enzyme Nitrogenase.
2. **Ammonification:** Decomposition of organic Nitrogen into ammonia by organisms like Actinomycetes.
3. **Nitrification:** Conversion of ammonia to nitrate by soil microbes called nitrifying bacteria which are chemoautotrophs.
4. **Assimilation:** Uptake of nitrate by plants by reductive amination and Transamination reactions.
5. **Ammonia Volatilization:** Loss of ammonia to the atmosphere.
6. **Denitrification:** Some of the nitrates present in soil are reduced to gaseous Nitrogen

Importance of Nitrogen Cycle in Agriculture:

1. **Soil Fertility:** Nitrogen cycle maintains soil fertility and plant productivity.
2. **Crop Yield:** Adequate nitrogen supply is essential for optimal crop yields.

3. Environmental Impact: Nitrogen cycle affects water and air quality.

Factors Affecting Nitrogen Cycle in Agriculture:

1. Soil Type and pH
2. Temperature and Moisture
3. Crop Selection and Rotation
4. Fertilizer Application
5. Microbial Activity

Management Strategies for Optimizing Nitrogen Cycle:

1. Crop Rotation and Intercropping
2. Organic Amendments
3. Precision Fertilizer Application
4. Cover Cropping
5. Integrated Nutrient Management

Conclusion:

Understanding the nitrogen cycle is crucial for maintaining soil fertility, optimizing crop yields, and minimizing environmental impacts in agricultural ecosystems. By adopting appropriate management strategies, farmers can promote a balanced nitrogen cycle, ensuring sustainable agricultural productivity.

Recommendations:

1. Frequent Soil Testing
2. Integrated Management Plans
3. Farmer awareness and Training*
4. Research and Development

I hope this helps! Let me know if you have any specific questions or need further clarification.

NW
22/10/23
Principal
D.K.N. College
Eranch, Cuttac