

BT401 Mid Term Solve Subjective

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Regards VUWAYS Team

Welcome To **vuways** Study Help

1. Forest genetic resources 2

Forest genetic resources (FGR) are the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.

2. Inbreeding depression 2

Inbreeding depression is the reduced biological fitness in a given population as a result of **inbreeding**, or breeding of related individuals.

3. Nagoya Protocol and its components – 3

The *Nagoya Protocol* focuses on the equitable sharing of genetic material (plant, animal, microbial, others) including the traditional knowledge associated with the genetic resources, and the benefits that arise from their use.

Component

- Access to Genetic resources
- Sharing of benefits

4. How overhunting cause to extinction of animals 3

Human hunters are responsible for wiping out the population of large animals. Researchers found that most of the animals that time died because of increased hunting. Horn of Rhino ivory of elephants, the fur and organs of tigers, the deliciousness of tuna and the supposedly medicinal effect of shark's fin etc are some reasons for over-hunting.

CAUSES OF EXTINCTION

The causes of extinction are as follows

1. Climate change
2. Habitat destruction
3. lack of genetic diversity
4. Better-adaptive condition
5. Pollution
6. Human over-population
7. Poaching and hunting

5. Threats on AnGR 5

- Despite the importance of animal genetic resources and their diversity, their diversity has been continually decreasing over time.
- One of the greatest threats to livestock diversity is pressure from large-scale commercial production systems to maintain only high-output breeds.
- Changes in climate will have an impact on livestock and food production in many ways.
- Some major disease threats that livestock currently face include, rinderpest, foot and mouth disease, and Peste des petits ruminants (PPR), also known as sheep and goat plague.

6. Different freezing methods in Cryopreservation 5

- Slow freezing and thawing
- Rapid freezing and thawing
- Vitrification
- Ultrarapid freezing

1. Slow Freezing- Slow thawing

With this method organs are labeled into vials after equilibration with a cryoprotectant solution and then cooled at rate of 0.5-2 °C per minute down to -1 °C. Seeding is then induced and a holding period of 5 to 15 minutes allows equilibration of the temperature. Thereafter embryos are cooled to -60°C or lower at a rate of 0.3 to 0.5°C per minute before being transfer to liquid nitrogen. Frozen embryos must be slowly thawed at a rate of less than 25°C per minute to prevent osmotic shock

2. Rapid cooling and rapid thawing

In this technique, however cooling is terminated at -30 to -40 °C and embryos are then plunged into liquid nitrogen for rapid cooling to -196°C. Thawing is therefore performed rapidly (200 to 500°C per minute) to prevent recrystallization.

3. Vitrification

Vitrification is the process of cooling where the water in the tissue becomes glass rather than crystals. Glass is a liquid that is too cold (too viscous) to flow. In other words vitrification is solidification due to increased viscosity rather than crystallization.

4. Ultrarapid Freezing

In this technique serial equilibration of embryos in high concentration of DMSO (3-5 M) supplemented with sucrose (0.3 to 0.5 M). The embryos are then plunged into liquid Nitrogen. Thawing is then done with warm water bath (approximately 500°C per minute).

Which are the causes of loss of genetic diversity... 2 marks

Anthropogenic activities effecting Genetic Diversity:

Any change in the environment, natural or human induced causes a selection of events that only the fittest survive. Anthropogenic impact is apparent in the coastal zone. Man made activities increases the number of changes occurring to individual and populations. Such pressure is exerted by:

- Artificial selection (harvesting, aquaculture)
- Degradation of habitats
- The release of farmed fish into the wild.

Anthropogenic activities reduce the sum of genes available. It leaves behind a population that is less capable of tolerating any further natural or anthropogenic ally caused changes in environment. **Enlist Extinct animals of Pakistan.. 3 marks**

Extinct animals

1. West African Black Rhinoceros
2. Pyrenean Ibex
3. Passenger Pigeon
4. Quagga
5. Caribbean Monk Seal
6. Seamink
7. Tasmanian Tiger
8. Tecopa Pupfish
9. Great Auk
10. Javan Tiger
11. Bubal Hartebeest
12. Steller's sea cow
13. Dodo

Difference between allopatric and sympatric speciation.. 3 marks

1. Allopatric Speciation

“Gene flow blocked by physical barriers results in Allopatric speciation”

- It is geographical isolation that doesn't allow population of the same species to exchange genetic material
- Physical barriers to gene flow both “natural” and “artificial”
- Natural physical barriers include mountain ranges, oceans or vast deserts
- Artificial physical barriers are man-made barriers such as “The Great China Wall”, barrages or dams etc **Example: Darwin finches (adaptive radiation).**

2. Sympatric Speciation

Sympatric speciation is speciation that occurs when two groups of the same species live in the same geographic location, but they evolve differently until they can no longer interbreed and are considered different species.

This is often result of Reproductive isolation

Examples of Sympatric Speciation: In Apple Maggot Flies

Types Reproductive isolation

- Pre-zygotic isolation
- Post-zygotic isolation

How do allopatric and sympatric speciation differ

Allopatric speciation is speciation that results when a population is separated by a physical barrier. It is also referred to as geographic speciation. Sympatric speciation is speciation that occurs without physical separation of members of the population.

Biometric Gene environment interaction.. 5 marks..

- The biometric (or statistical) conception has its origins in research programs that seek to measure the relative proportions of genetic and environmental contributions to phenotypic variation within populations.
- Biometric gene–environment interaction has particular currency in population genetics and behavioral genetics. Any interaction results in the breakdown of the additivity of the main effects of heredity and environment, but whether such interactions are present in particular settings are an empirical question.
- Biometric interaction is relevant in the context of research on individual differences rather than in the context of the development of a particular organism.

Reproductive isolation... 5 marks.

The mechanisms of reproductive isolation are a collection of evolutionary mechanisms, behaviors and physiological processes critical for speciation. They prevent members of

different species from producing offspring, or ensure that any offspring are sterile. These barriers maintain the integrity of a species by reducing gene flow between related species

Types Reproductive isolation

- Pre-zygotic isolation
- Post-zygotic isolation

Migration with example?

“**Migration** is the relatively long-distance movement of individuals, usually on a seasonal basis.” e.g.

Some crustaceans migrate for breeding

Animal migration is the relatively long-distance movement of individuals, usually on a seasonal basis. It is found in all major animal groups, including birds, mammals, fish, reptiles, amphibians, insects, and crustaceans. Migration is a behavioral adaptation that helps animal's survival.

Trigger for the migration

The trigger for the migration may be:

1. local climate
2. local availability of food
3. the season of the year
4. for mating reasons

Steps of allopatric speciation?

1. A geographic change separates members of a population into more than one group.
2. Different gene mutations occur and build up in the different populations over time.
3. The populations become so different that members of the different populations can no longer breed with each other anymore if were they to be in the same habitat in the same time. If this is the case, allopatric speciation has occurred. **Example: Darwin finches (adaptive radiation).**

Founder effect with example?

In population genetics, the founder effect is the loss of genetic variation that occurs when a new population is established by a very small number of individuals from a larger population.

A founder effect occurs when a new colony is started by a few members of the original population. This small population size means that the colony may have:

- Reduced genetic variation from the original population.
- A non-random sample of the genes in the original population.

Example

The Amish People

Around 200 German immigrants settled in Pennsylvania within community marriages. Developed syndrome named Ellis-van Creveld syndrome.

Write a note on indus dolphin?

The Indus River dolphin is one of the world's rarest mammals. It is second most endangered freshwater river dolphin. Approximately 1,100 specimens of this species exist today in a small fraction of their former range. Population of this species has gradually declined due to various factors e.g. water pollution, poaching, fragmentation of habitat due to barrages and dolphin stranding in the irrigation canals.

Quarantine regulation?

Quarantine practices in most countries have at least three common functions.

1. The first is exclusion or regulatory actions to prevent or reduce the risk of entry of exotic pathogens, pests, or parasites along artificial pathways.
2. Second is the containment, suppression, or eradication of pests or pathogens that have been recently introduced.
3. Third is the assisting of exporters to meet the quarantine requirements of importing countries.

What is special about agricultural genetic resources?

- To feed the world, we all need these resources.
- Agricultural resources have been shared and exchanged over thousands of years. Mostly it is impossible to identify a single country of origin.
- Countries and regions are "interdependent": they all depend for their food and agriculture on crops that originated elsewhere.

What happen when population of moths of white color migrates to another population brown colored moths and mate? (2)

Populations of moths that are white in color migrate to a population of brown-colored moths and successfully mate to give rise to viable offspring. Here, we can say that there is a change in the allele frequency. Over time, the number of these white moths will increase.

Why Hart's Tongue Ferns threatened? 3 marks

Quarrying, recreation and residential development have all destroyed these plants and their habitat. Canadian populations are threatened by lumbering and the development of land for ski resorts and country estates, among other activities.

Write demerits o in situ and ex situ conservation? 3 marks

In-situ Conservation

- Genetic diversity may have already been dramatically decreased
- Conditions that threatened the organisms in the area may still be present, e.g. disease or interspecific competition
- Poachers and Eco tourists may see the thriving area as an opportunity and may cause damage

Ex situ Conservation

- Usually only a small number of individuals can be cared for.
- It can be difficult and expensive to create and sustain the right environment.
- The animals that are habituated (used to) human contact may be less likely to exhibit natural behaviors and may be more likely to catch a disease from humans.
- This type of conservation is usually less successful as many species can't breed successfully in captivity or don't adapt to their new environment when moved to a new location.

Write any five types of genetic resources?

1. Plant genetic resources

Plant Genetic Resources for Food and Agriculture (PGRFA) are the raw material that farmers and plant breeders use to improve the quality and productivity of crops. They can be defined as any genetic material of plant origin of actual or potential value for food and agriculture, e.g. seeds, tubers, mature plants etc.

2. Animal genetic resources

Animal genetic resources (AnGR) is used to include all animal species, breeds and strains that are of economic, scientific and cultural interest to humankind in terms of food and agricultural production for the present or the future.

3. Forest genetic resources

Forest genetic resources (FGR) are the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.

4. Aquatic genetic resources

Aquatic genetic resources also comprise all water-dwelling genetic resources.

5. Genetic resources of micro-organisms

Genetic resources of micro-organisms means genetic material of actual or potential value from microorganisms.

6. Invertebrates Genetic Resources

Invertebrates include a great number of species that perform valuable functions in agro-ecosystems

How a species figure out how they get of any place?

Finding way:

Scientists aren't really sure exactly how some animals figure out how to get to where they are going. They think that:

- Some animals use landmarks like rivers and streams to find their way.
- Some animals may navigate by the position of the sun and stars.
- Some animals use smell to figure out where they are going.
- Some species that may use the Earth's magnetic field to navigate.

Some most endangered species in Pakistan are as follow;

- The Indus River dolphin • Markhor • Mountain Weasel • Asian Black Bear • Snow Leopard

MCQs

1. Genetic resources also called... **germplasm**
2. Landraces is a...**local variety of a domesticated plant species**
3. Which is called rosewood...**Dalbergia Sissoo**
4. Total area under legumepluse crop...**1.5m hectares**
5. Extinc specie..**white rhino**
6. Total remaining snow leopard..remaining population is **7,000 to 10,000 worldwide or only 200 Snow Leopards** left in Pakistan
7. GSPC program founded....The **Global Strategy for Plant Conservation (GSPC)** is a program of the UN's Convention on Biological Diversity founded in 1999.
8. Microorganisms produce.... **antibiotics**
9. According to worlds data base on protected areas there are over.....**210,000 protected areas**
10. Rhino are hunted for...**horn of rhino**
11. Natural selection have results.. in **selection of allele**
 - Cryopreservation in liquid nitrogen..-196degre celciusHow many categories of gene flow....**in two formHorizontal Gene Transfer**

- Vertical Gene Transfer

12. Breeding type that is not related to half sister half brother and cousins..

The strongest effect of genetic drift on... **Genetic drift** is largely influenced by the population size

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Mild inbreeding 2marks

Mating of relatives beyond 2nd generation and upto 6th generation

Disadvantage of inbreeding 3marks

- An increase in the prevalence of inherited disorders
- A decrease in viability
- A decrease in reproductive ability, and
- The loss of genetic diversity (i.e. decrease in genetic variation).
- Developmental disruption, higher infant mortality and a shorter life span □ Reduction of immune system function

uses of sheesham 3marks

- Its leaves are compound, and produces pink-white flowers that resemble a pea flower.
- It gives a dry fruit that is a thin and papery pale brown pod.
- The tree mainly offers timber

What is special about Agricultural genetic resources? (2 marks)

- To feed the world, we all need these resources.
- Agricultural resources have been shared and exchanged over thousands of years. Mostly it is impossible to identify a single country of origin.
- Countries and regions are interdependent: they all depend for their food and agriculture on crops that originated elsewhere.

Bottleneck effect?

It is a sharp lowering of population's gene pool because of environmental or human caused change.

Names of nut trees?

Almonds • Walnut • Tree Nuts

Bt401:-

1. What is Genetic Resources?
2. What is Gene Pool?
3. What is importance of domestic animal Resources?

4. What is successfully quantinent?

5. Ecosystem is facing massive destruction extinction species. How?

6: Hingthon disorder?

mcqs easy thy

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