AP BIO INSTA-REVIEW

TOPIC 7.12

Variations in Populations

SYI-3.D.1

The level of variation in a population affects population dynamics–

a. Population ability to respond to changes in the environment is influenced by genetic diversity. Species and populations with little genetic diversity are at risk of decline or extinction.

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Variations in Populations

SYI-3.D.1

The level of variation in a population affects population dynamics–

b. Genetically diverse populations are more resilient to environmental perturbation because they are more likely to contain individuals who can withstand the environmental pressure.

c. Alleles that are adaptive in one environmental condition may be deleterious in another because of different selective pressures.

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To withstand selective pressures, populations need

A. To have low genetic diversity

B. To have high genetic diversity

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To withstand selective pressures, populations need

B. To have high genetic diversity

As the environment changes, the population must have a trait that allows for the population to survive. The more genetic diversity in the population, the more resilient to changes in the environment (withstand selective pressure)

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Cavendish bananas are triploids and undergo asexual reproduction. Why are the Cavendish bananas at risk?

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Cavendish bananas are triploids and undergo asexual reproduction. Why are the Cavendish bananas at risk?

Due to asexual reproduction, the bananas are genetically identical. Due to the absence of genetic diversity, they are unable to survive some selective pressures.

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Which could cause harmful alleles to be fixed?

A. Bottleneck effect

B. Founder effect

C. Gene flow

D. Natural selection

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Which could cause harmful alleles to be fixed?

A. Bottleneck effect

As the population undergoes a rapid decrease in population size due to random chance, this could cause harmful alleles to be the only allele remaining (fixed).

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An advantageous trait will always be advantageous.

A. True

B. False

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An advantageous trait will always be advantageous.

B. False

Different environments have different selective pressures, so a trait that is advantageous in one area might now be in another area.

Dark mice blend into dark substrate in areas of past volcanic activity, but dark mice will not survive on the light substrate in other areas.

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What is genetic diversity?

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What is genetic diversity?

Range of different inherited traits within species

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A population with little genetic diversity

A. At risk of decline or extinction

B. Favorable in a changing environment

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A population with little genetic diversity

A. At risk of decline or extinction

Due to the little genetic diversity, the population does not have alleles available as the environment changes. Natural selection can only select among available alleles, so less genetic diversity can lead to a decline in population or extinction.

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Why would a population with little genetic diversity be at risk to decline?

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TOPIC 7.12

Why would a population with little genetic diversity be at risk to decline?

There's a lack of genetic diversity to allow for a trait that would provide resistance to potential diseases or changes to the environment.

Recall: Natural selection can only select from the traits that are available in the population. If the trait isn't in the population, they will be unable to survive the infection.

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A favorable trait is always favorable (in any environment)

A. True

B. False

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TOPIC 7.12

A favorable trait is always favorable
(in any environment)

B. False

As the environment changes, the "favorable" alleles change. Just because an allele was favorable in one environment does not mean it will be favorable in all environments.

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What increases genetic variation?

A. Crossing over

B. Independent Assortment

C. Mutations

D. Random Fertilization

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TOPIC 7.12

What increases genetic variation?

C. Mutations

Mutations are changes in the DNA sequence, which leads to changes in the amino acid sequence. These changes lead to an increase in genetic variation as there are new alleles available.

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A variable environment causes mutations

A. True

B. False

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A variable environment causes mutations

B. False

The environment changing is not causing the alleles, it is selecting for alleles that allow the population to be more favorable in the environment.