

Genes

1. Variation

CONCEPT 3

IMPORTANCE OF VARIATION

NOTES

Why variation is important.

Variation is vital in enabling the survival of a species. If all the organisms in one species were identical and then the environment changed to make it unfavourable for that species, then this species could die out. If all the organisms had a characteristic, such as flying ability, that varied from bird to bird, then some of the birds may survive a new predator, for example. This is what happened to the Dodo which inhabited Mauritius until around 1861. As there were no predators for the Dodo on Mauritius, the Dodo evolved to become a flightless bird with no variation in flying ability. Unfortunately, when humans and other animals were introduced to the island, they hunted the Dodo. None of the Dodo could fly to escape so their number dwindled over time until eventually the Dodo became extinct. If some of the Dodo's could have flown away, then this would have perhaps enabled the population on Mauritius to survive.

Survival Advantage

If there is variation of a characteristic in a population this might give some organisms in a species a more favourable form of this characteristic, but it can also give them a less favourable version of this characteristic too.

For example, consider the colour of bird feathers.

A brightly coloured set of feathers might be good as it may make the bird more attractive to a mate, e.g. peacocks. However, in another species, a set of brightly coloured feathers might make the bird more visible to predators.

Antibiotic Resistant Bacteria

Species of bacteria also show variation. For example, some bacteria may be resistant to some of the antibiotics we use as a medicine. Antibiotics are medicines that kill or prevent bacteria from reproducing so are often used when a person has a bacterial infection or when someone has had surgery.

When we use antibiotics, we will kill the bacteria that is not resistant to the antibiotic. The antibiotic resistant bacteria will survive however and reproduce to produce more antibiotic resistant bacteria. Soon, the whole population of bacteria is resistant as the genetic information for this resistance is passed down from parent to daughter bacterial cell.

This is already happening in some hospitals and poses a real problem for scientists. There are some bacteria which are resistant to many different antibiotics. We have nicknamed these multi-resistant bacteria "superbugs". One example of a superbug is MRSA (methicillin-resistant Staphylococcus aureus). If a person contracts MRSA it will be very difficult to treat.