AQA - Adaptations, interdependence and completion – GCSE Combined Science Biology

1. June/2019/Paper_2H/No.4

0 4 Animals have adaptations to survive in their environment.

These adaptations may be structural, behavioural or functional.

0 4 . 1 Draw **one** line from each animal adaptation to the type of adaptation it is.

[2 marks]

Animal adaptation	Type of adaptation
 Male palm cockatoos use sticks to beat on hollow branches to attract females.	Structural
 The harmless hornet moth has black and yellow stripes to look like a bee or wasp.	Behavioural
 Sea spiders have automatic muscle contractions that move oxygen around their bodies.	Functional

Plants also have adaptations.

There are more than 28 000 known species of orchid plants.

0 4 . 2 Many orchid plants:

- grow attached to other types of plants
- have brightly coloured flowers
- produce large quantities of pollen
- produce thousands of tiny, light seeds.

Describe how these adaptations help orchid plants to survive and compete.

[4 marks]

A rare orchid has been found in the mountains in China.

The orchid has pale yellow flowers.

DNA analysis of the genome shows that it is an ancestral species.

All other present day orchids evolved from this ancestral species millions of years ago.

0 4 . 3 One present day species has bright purple flowers.

Describe how an orchid with bright purple flowers may have evolved from the ancestral species which has pale yellow flowers.

[4 marks]

0 4 . 4 The DNA code determines the sequence of amino acids which are joined together to form a specific protein.

Table 3 shows part of the amino acid sequence for the colour pigment protein in five orchid species.

The rest of the amino acid sequence is the same for all the species.

Table 3

Species	Amino acid sequence	Flower colour
Ancestral species	ala-leu-gly-isoleu-tyr-gly-ala-leu-gly-ala	pale yellow
Species **A**	ala-isoleu-gly-ala-tyr-gly-ala-tyr-gly-ala	pale yellow
Species **B**	ala-leu-ala-isoleu-tyr-gly-ala-tyr-gly-ala	pink
Species **C**	ala-isoleu-gly-ala-gly-tyr-gly-leu-gly-ala	bright red
Species **D**	ala-leu-gly-isoleu-tyr-tyr-ala-leu-gly-ala	purple

Key:
ala = alanine
gly = glycine
isoleu = isoleucine
leu = leucine
tyr = tyrosine

Suggest which orchid species is most closely related to the ancestral species.

Give a reason for your answer.

[2 marks]

Species _____

Reason _____

_____