

# 24

# Speciation and Evolution

Subject Outline  
terms and  
phrases

**speciation, geographically isolated populations, allopatric speciation, sympatric speciation, convergent evolution, niche, succession, divergent evolution, adaptive radiation, genetic diversity, extinction**

1. State three examples of geographical barriers, other than a desert, that could lead to reproductive isolation.

(1) \_\_\_\_\_

(2) \_\_\_\_\_

(3) \_\_\_\_\_

2. Geographical isolation (separation) by itself does not lead to speciation. What else is needed in order for speciation to occur?

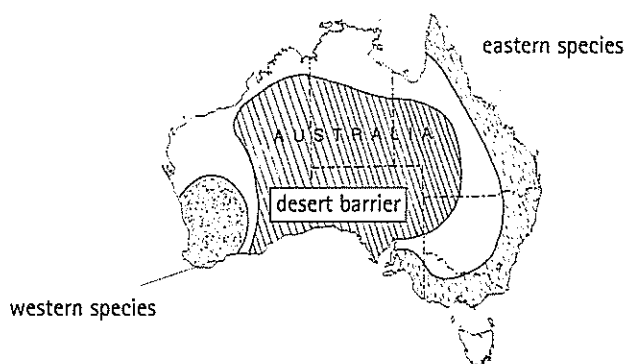
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3. The eastern and western species of parrot have descended from a common ancestor, but have become so different from one another that they are no longer able to interbreed. Use the ideas of **geographical isolation (separation)**, **gene flow**, and **natural selection** to explain how this speciation occurred.

The habitats of two species of parrot are shown on the map below.



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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. State two pre-zygotic and two post-zygotic barriers that maintain reproductive isolation between different species.

two pre-zygotic barriers: \_\_\_\_\_

\_\_\_\_\_

two post-zygotic barriers: \_\_\_\_\_

\_\_\_\_\_

5. Compare **allopatric** and **sympatric** speciation. Give examples to illustrate your answer.

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\_\_\_\_\_

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6. Explain what is meant by **convergent evolution**. Give three examples to illustrate your answer.

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\_\_\_\_\_

7. (a) What is a **niche**?

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\_\_\_\_\_

- (b) What is meant by **adaptive radiation**? Give an example.

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- (c) How does adaptive radiation differ from **divergent evolution**.

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\_\_\_\_\_

8. In the natural community shown below, there could be flood, drought, high temperatures, heavy rain, or fires in the coming year. Choose three of these abiotic factors and describe the changes that they would cause to the populations in this community.

Factor 1: \_\_\_\_\_

\_\_\_\_\_

Factor 2: \_\_\_\_\_

\_\_\_\_\_

Factor 3: \_\_\_\_\_

\_\_\_\_\_



9. Define the following terms.

(a) succession \_\_\_\_\_

\_\_\_\_\_

(b) colonisers \_\_\_\_\_

\_\_\_\_\_

(c) climax community \_\_\_\_\_

\_\_\_\_\_

10. Describe the series of events that could have occurred on each of the following two sites.

(a) The sand dunes in the south-east of South Australia, after they became exposed due to a fall in sea level.

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\_\_\_\_\_

(b) The island of Surtsey, after the bare volcanic rock arose out of the sea.

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\_\_\_\_\_

11. (a) What conditions are necessary for primary succession to occur?

\_\_\_\_\_

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(b) How does primary succession differ from secondary succession?

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12. (a) Give two examples of species with low genetic diversity, and describe how their genetic diversity was reduced.

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(b) What is a possible consequence of low genetic diversity for a species?

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