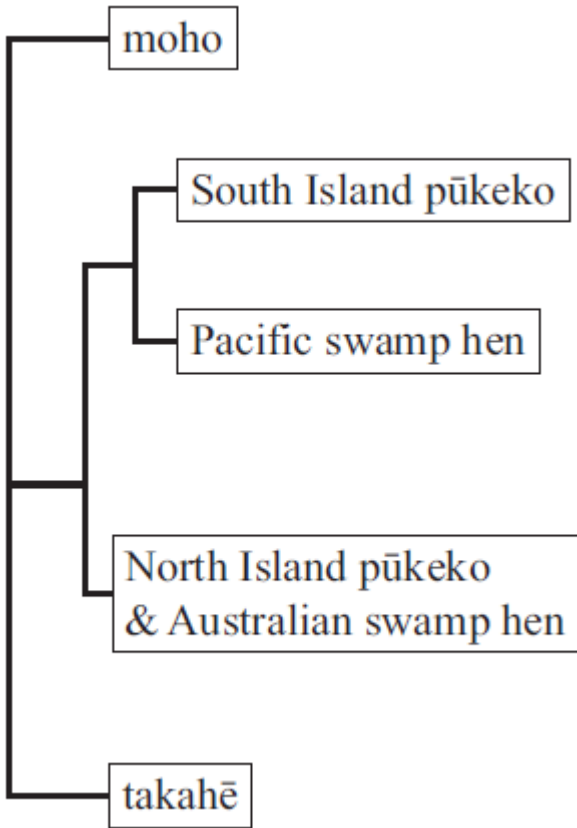


AS 91605 Demonstrate understanding of evolutionary processes leading to speciation

Gradualism and Punctuated equilibrium.

(2013, 2)

Below is the phylogeny for *Dracophyllum*.



Takahē



Pūkeko

Analyse both the pattern of evolution and the processes that have led to the establishment of takahē and pūkeko as separate species in New Zealand.

In your answer:

- describe what is meant by punctuated equilibrium, and explain why the takahē / pūkeko pattern of evolution is an example of this
- explain the evolutionary selection pressures acting on both species over time
- compare and contrast how the takahē and pūkeko became established in New Zealand.

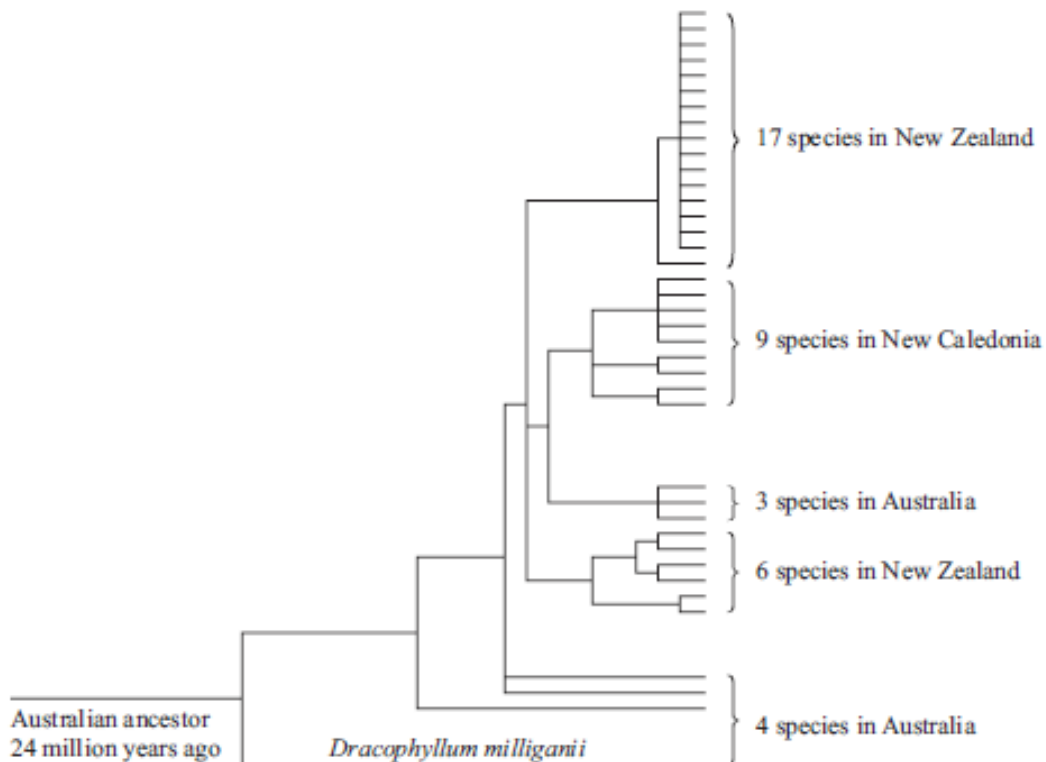
The question below is from the now expired AS 90717 Describe processes and patterns of evolution.

<http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/biology/expired-standards/>

However it may still be useful for AS 91605 **Demonstrate understanding of evolutionary processes leading to speciation**

(2010,3)

Below is the phylogeny for *Dracophyllum*.



- Identify and describe the features on the diagram that indicate evolution by **punctuated equilibrium**.
- Punctuated equilibrium is widely accepted as the main mechanism of evolution. However, long-lived species such as the Australian *Dracophyllum milliganii*, labelled in the diagram opposite, generally show **gradual** evolutionary changes.

Discuss how one species could evolve by **gradualism** while elsewhere species are evolving by **punctuated equilibrium**.