

Targeted Readings: Evolution: Species Concepts, Speciation & Phylogenetic Trees

| 3 rd Canadian ed. - Whiskey jack on cover Hard copy | 2019 UBC custom ed. – Frog on cover | 2014-2018 UBC custom ed. – Steller’s Jay on cover |
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| Species Concepts | | |
| Chapter 24: Speciation 24.1 How are Species Defined and Identified? - The Biological Species Concept - The Morphospecies Concept - The Ecological Species Concept - The Phylogenetic Species Concept | Speciation (pp 299-264) 1. How are Species Defined and Identified? - The Biological Species Concept - The Morphospecies Concept - The Ecological Species Concept - The Phylogenetic Species Concept | Chapter 26: Speciation 26.1 How are Species Defined and Identified? - The Biological Species Concept - The Morphospecies Concept - The Ecological Species Concept - The Phylogenetic Species Concept |
| Speciation | | |
| Chapter 24: Speciation Introduction 24.2 Isolation and Divergence in Allopatry 24.3 Isolation and Divergence in Sympatry (Sympatric Speciation by Disruptive Selection only) 24.4 What Happens When Isolated Populations Come into Contact? (Introduction only) | Speciation (300, 304-308) Introduction 2. Isolation and Divergence in Allopatry 3. Isolation and Divergence in Sympatry (Sympatric Speciation by Disruptive Selection only) 4. What Happens When Isolated Populations Come into Contact? (Introduction only) | Chapter 26: Speciation Introduction 26.2 Isolation and Divergence in Allopatry 26.3 Isolation and Divergence in Sympatry (Sympatric Speciation by Disruptive Selection only) 26.4 What Happens When Isolated Populations Come into Contact? (Introduction only) |
| Species Concepts: Specific Learning Goals C3-4 Describe the rationales for having more than one species concept. C3-5 Determine if groups of organisms could be considered Speciation ▪ Broad Learning Goals C3 Explain how each of the four major mechanisms of evolution contribute to divergence and potentially speciation, both in general terms and in specific scenarios. | | |

▪ **Specific Learning Goals**

C3-1 Describe and order the general steps necessary for speciation.

C3-2 Describe the effects of individual evolutionary mechanisms or combinations of mechanisms in either promoting or limiting genetic divergence among populations.

C3-3 Given a scenario, identify specific events in the scenario (reduced gene flow, divergence, and reproductive isolation) and explain how these events contribute to speciation.

C3-6 Describe the possible outcomes of secondary contact or increased gene flow on populations that are diverging or have undergone speciation.

C3-7 Given a scenario, describe, with specific reference to important evolutionary mechanisms, how pre- or post-zygotic isolating mechanisms could evolve following secondary contact among diverging populations or species.

Phylogenetic Trees

Chapter 25: Phylogenies and the History of Life

Introduction

25.1 Tools for Studying History: Phylogenetic Trees (all)

Phylogenies and the History of Life (322-328)

Introduction

1 Tools for Studying History: Phylogenetic Trees (all)

Chapter 27: Phylogenies and the History of Life

Introduction

27.1 Tools for Studying History: Phylogenetic Trees (all)

Bioskills, B.11 (42-43)

Reading and Making Phylogenetic Trees

Bioskill 11 (42-43)

Reading and Making Phylogenetic Trees

Bioskills, B.11 (Appendix B:4-B:5)

Reading A Phylogenetic Tree

▪ **Broad Learning Goals**

D2 Interpret and construct phylogenetic trees in order to describe the evolutionary relationships among the organisms or taxa represented and infer the evolutionary history of specific traits and when they arose within the tree

▪ **Specific Learning Goals**

D2-1 Identify the parts of a phylogenetic tree and explain what each part represents.

D2-3 Determine if two trees for the same taxa show the same pattern of relationship among taxa and justify your conclusion with specific reference to trees.

D2-4 Predict the number of times a trait has evolved based on a phylogeny and knowledge of characteristics of tip taxa.

D2-5 Given a phylogeny, identify the most closely related taxa to a particular taxon and justify your conclusion based on information from the phylogeny.

D2-6 Based on knowledge of extant taxa, infer where in a phylogeny a trait evolved and identify if that trait is homologous or convergent for specific taxa.

D2-7 Given information about specific taxa and their traits, apply the principle of parsimony to draw a phylogeny and map traits to the phylogeny