

ELEVENTH EDITION

CAMPBELL

BIOLOGY

URRY • CAIN • WASSERMAN
MINORSKY • REECE



Chapter 1

Evolution, the Themes of Biology, and Scientific Inquiry

Clicker Questions by
Douglas Darnowski

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- a) systems biology
- b) emergent properties
- c) inductive reasoning
- d) reductionism
- e) genomics

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Which correctly orders the levels of biological organization from smallest to largest?

- a) cells, organelles, organ system, community, ecosystems
- b) molecules, organism, population, communities, biosphere
- c) molecules, cells, tissues, ecosystems, communities
- d) organelles, cells, population, biosphere, ecosystems
- e) cells, organs, population, ecosystems, communities

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Which scientific study is an example of a systems biology approach?

- a) measuring the effect of an invading insect that eats oak leaves on the numbers of oak trees and, subsequently, on the number and types of decomposer fungi in the soil
- b) discovering the structure of an enzyme that is important in digestion of protein
- c) comparing the microscopic structure of leaves of two different species of magnolias
- d) measuring the reproductive rate of emperor penguins during exceptionally warm and exceptionally cold years
- e) comparing the DNA sequence of two closely related plants and inferring their evolutionary histories

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The many blood vessels in elephants' ears help them cool their bodies by radiating heat. Which statement about this radiated energy is accurate?

- a) The original source of the energy is the sun.
- b) The energy will be recycled through the ecosystem.
- c) The radiated energy will be trapped by predators of the elephants.
- d) More energy is radiated in cold conditions than in hot conditions.
- e) More energy is radiated at night than during the day.

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Imagine that you have just discovered a new multicellular microscopic organism in a pond. It is propelled by external cilia. What can you say about the evolutionary relationships of this organism?

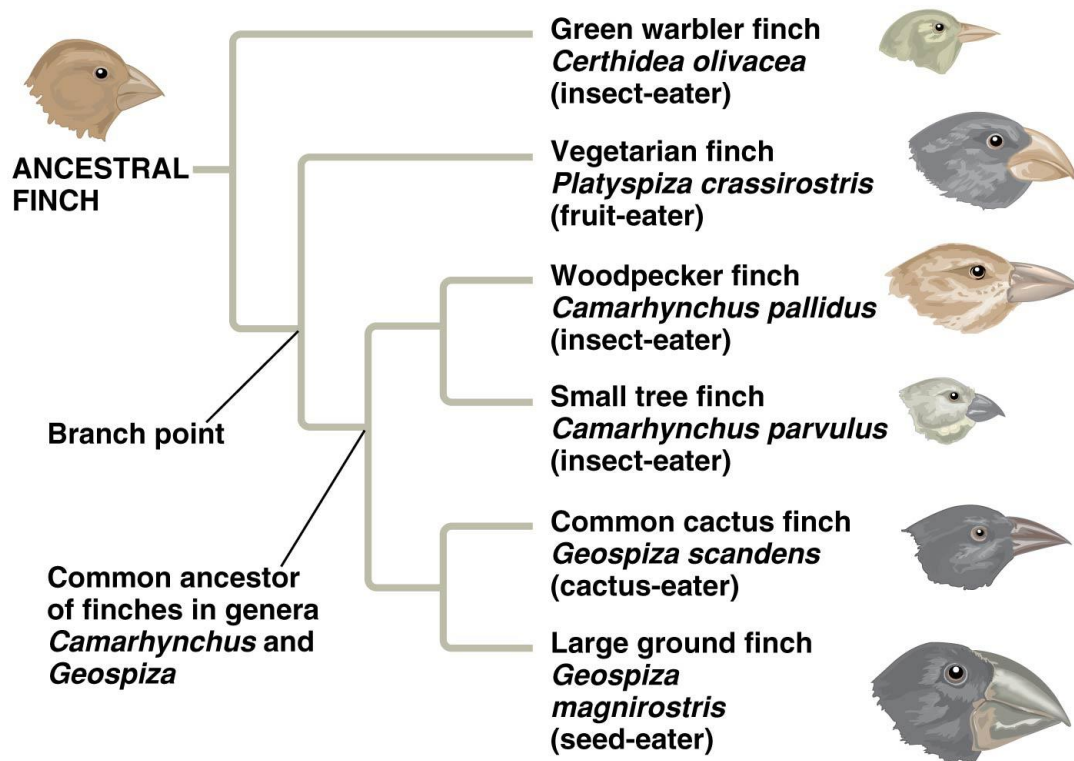
- a) The presence of cilia shows that it is more closely related to *Paramecium* than to humans.
- b) The presence of cilia shows that it shares a common ancestor with *Paramecium* and humans.
- c) It is probably closely related to pond algae.
- d) It is probably most closely related to prokaryotes.
- e) The presence of cilia demonstrates the diversity, but not the unity, of life.

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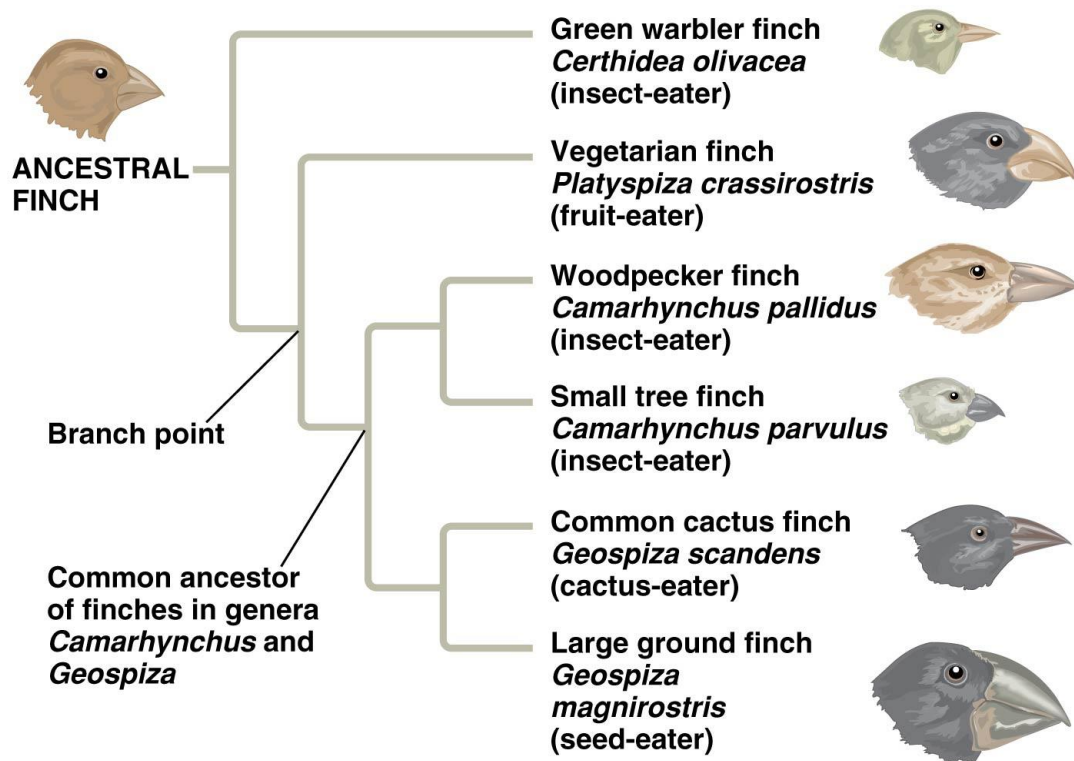
Examine the figure and predict which species pair has the most similar DNA sequence.

- a) vegetarian finch and common cactus finch
- b) small tree finch and common cactus finch
- c) woodpecker finch and small tree finch
- d) vegetarian finch and large ground finch



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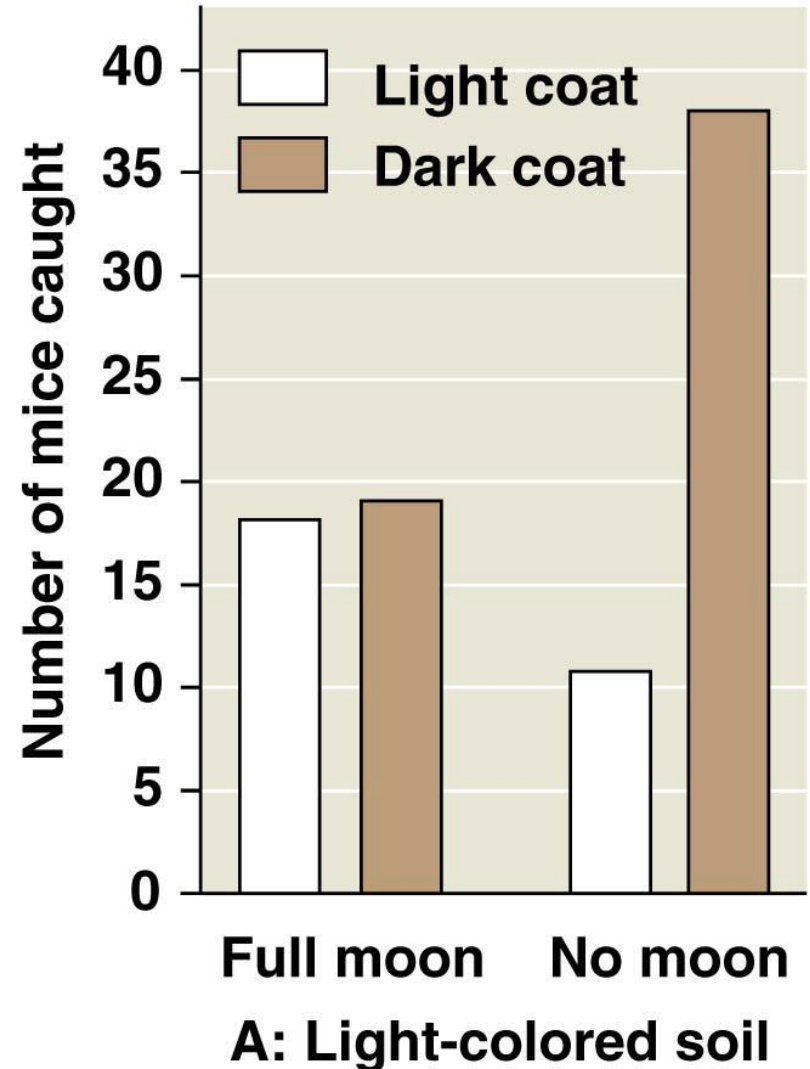
- a) independent variable
- b) dependent variable
- c) hypothesis
- d) theory
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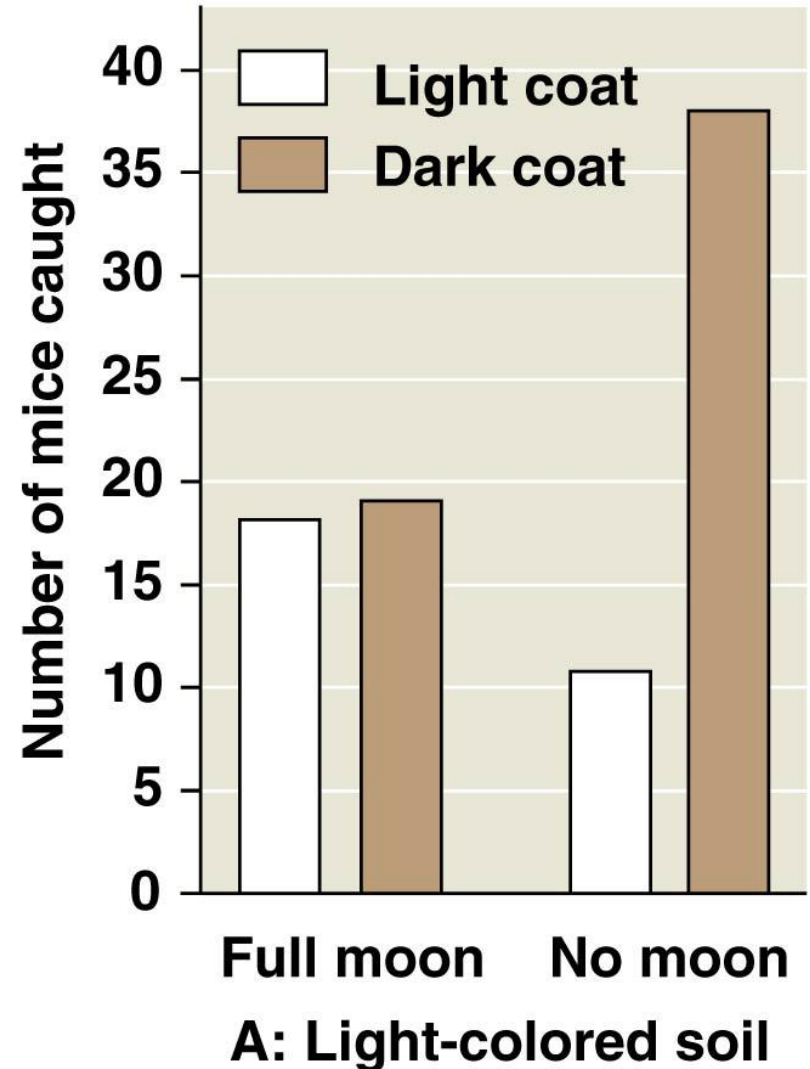
In this figure, what is the dependent variable, the response to the variables being tested?

- a) the presence or absence of moonlight
- b) the mouse coat color
- c) the number of mice caught
- d) the color of the soil



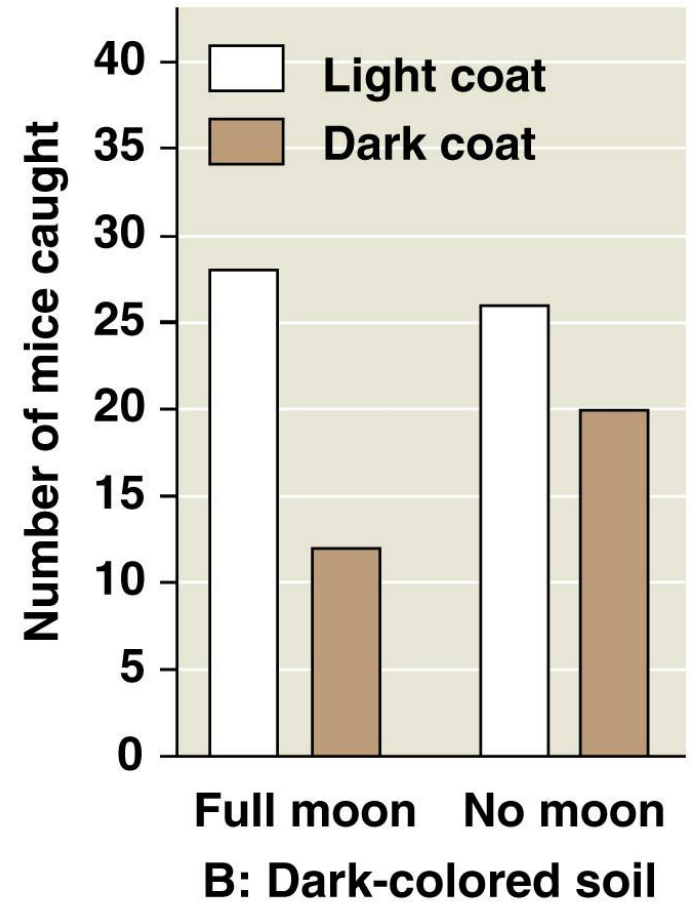
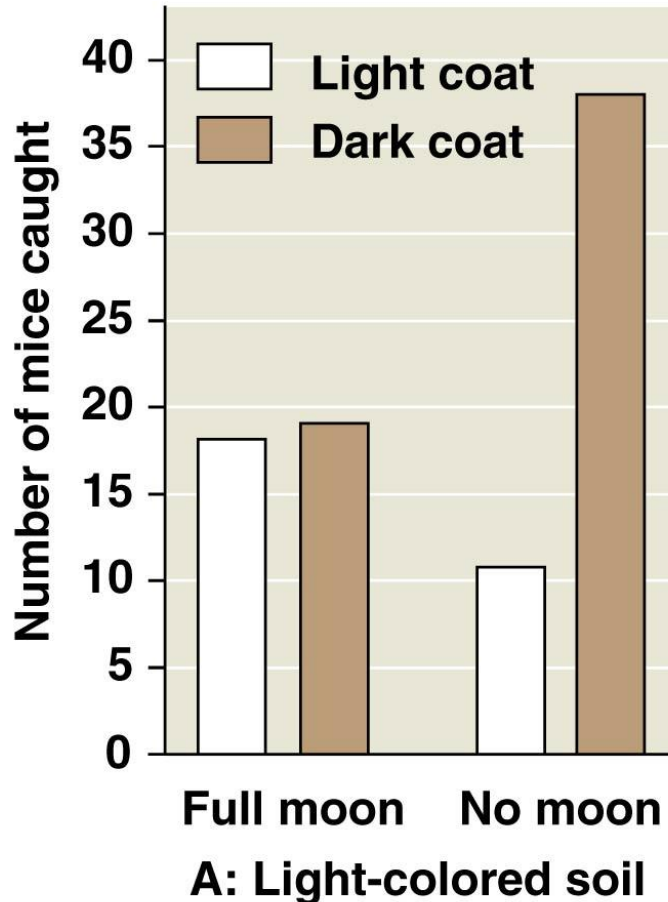
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These data are from two enclosures: one with light-colored soil (left), and one with dark-colored soil (right). How many dark brown mice were caught in the light-colored soil enclosure on a moonlit night?

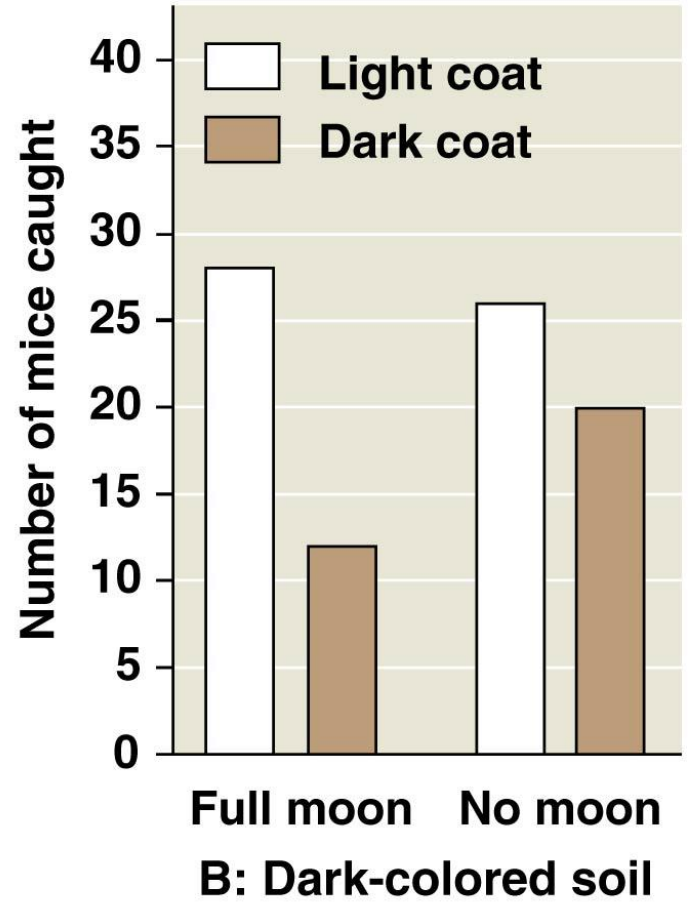
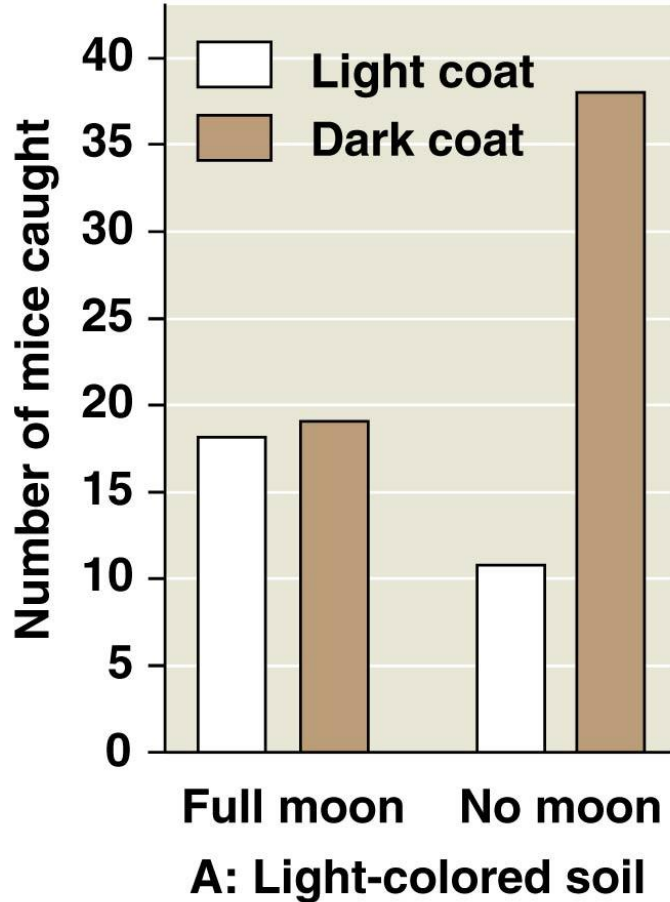
- a) 12
- b) 17
- c) 19
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Data from D. W. Kaufman, Adaptive coloration in *Peromyscus polionotus*: Experimental selection by owls, *Journal of Mammalogy* 55:271–283 (1974).

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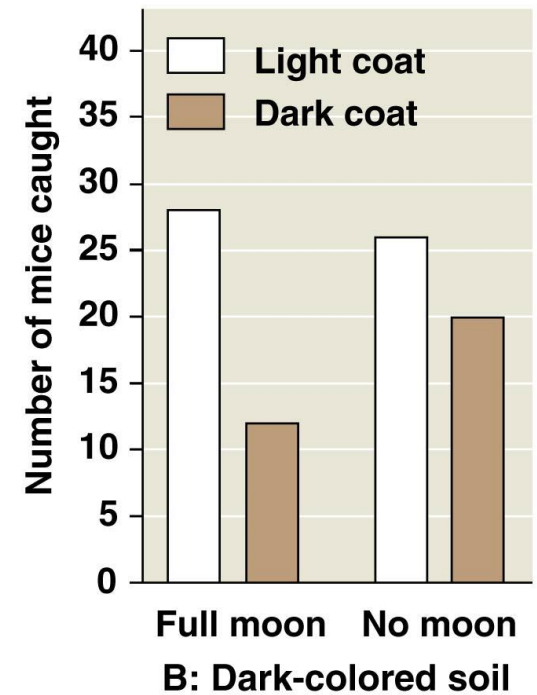
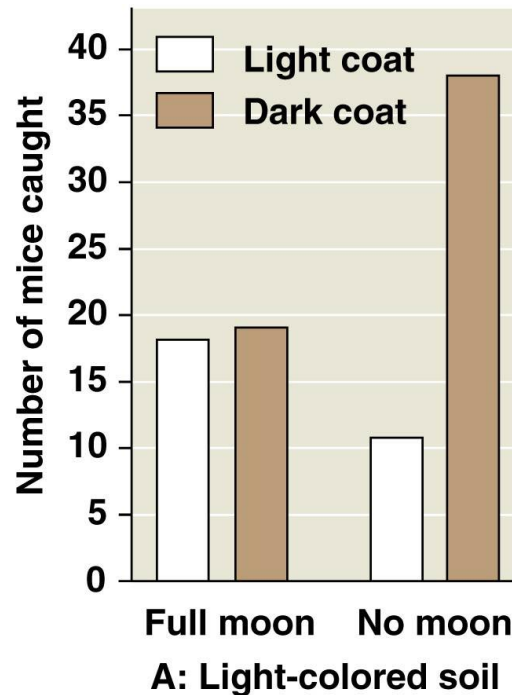
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What combination of independent variables led to the highest predation level in enclosures with light-colored soil?

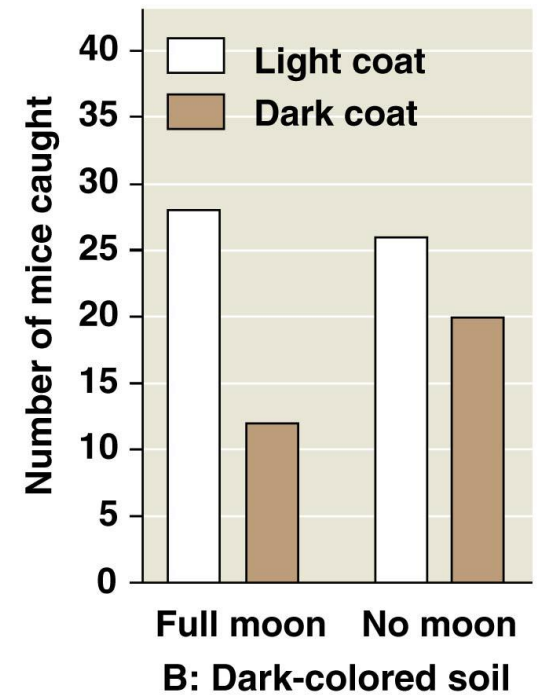
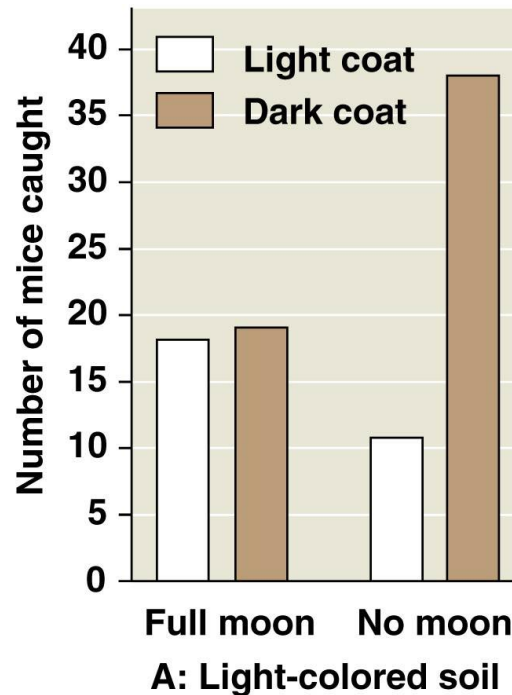
- a) light brown coat with no moon
- b) light brown coat with full moon
- c) dark brown coat with full moon
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Galápagos finches are good examples of _____.

- a) the results of natural selection
- b) hierarchy
- c) communities
- d) chemical cycling