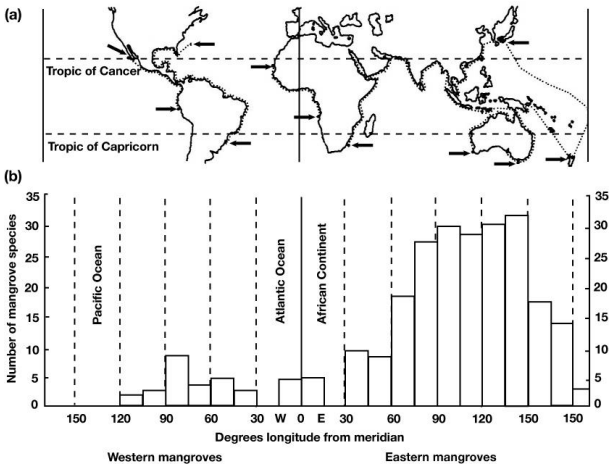
ANSWER **ANSWER** **ANSWER**

Round: 13A



This figure is a histogram depicting the global distribution of mangroves and the approximate number of mangrove species per 15 degrees of longitude

1. a. According to the histogram, which group of mangroves has the highest abundance of species?

Eastern mangroves have the highest number of species diversity. (1 pt)

b. Where is this group found?

They are located primarily in the islands and archipelagos (1 pt) between the Asian continent and Australia (1 pt)

c. Explain the evolutionary process which gave rise to this degree of diversity.

The lack of continuous shoreline OR the geographic barriers posed by the ocean between islands (2 pts) prevents frequent gene flow from occurring between populations (2 pts). These prolonged separations allow time for speciation to occur OR reproductive barriers to develop (2 pts). (ALSO ACCEPTABLE: Taxon pulse for the full 6 pts)

2. In what type of marine environment are mangroves often found?

Estuaries OR brackish waters. (1 pt)

3. Mangroves are members of terrestrial plant families that have adapted to harsh environmental conditions. Identify four (4) challenges mangroves face.

Accept any 3 of the following answers; 1 pt each, 4 pts total:

-High salinity environments
-Low oxygen soils
-Low nutrient soils
-Strong wind action
-Strong wave action
-An unstable substrate.

4. Mangroves have adopted three main strategies to maintain water balance in saline environments. List these three (3) strategies, and explain what they are.

1. Salt exclusion (1 pt): physiological mechanisms precluding salt uptake. (1 pt)
2. Salt secretion (1 pt): allowing salt to enter plant but having effective methods of getting rid of excessive amounts (through glands). (1 pt)
3. Salt tolerance (1 pt): life history adaptations that allow the mangrove to survive high internal levels of salts. (1 pt)

Reference/Copyright Information:
Osborne, Patrick L. Tropical Ecosystems and Ecological Concepts. Cambridge University Press, United Kingdom. 2000. p. 301 fig. 10.2
Tomlinson, P.B. (1986). *The botany of mangroves*. Cambridge University Press, Cambridge.