

APOLLO

# Natural selection

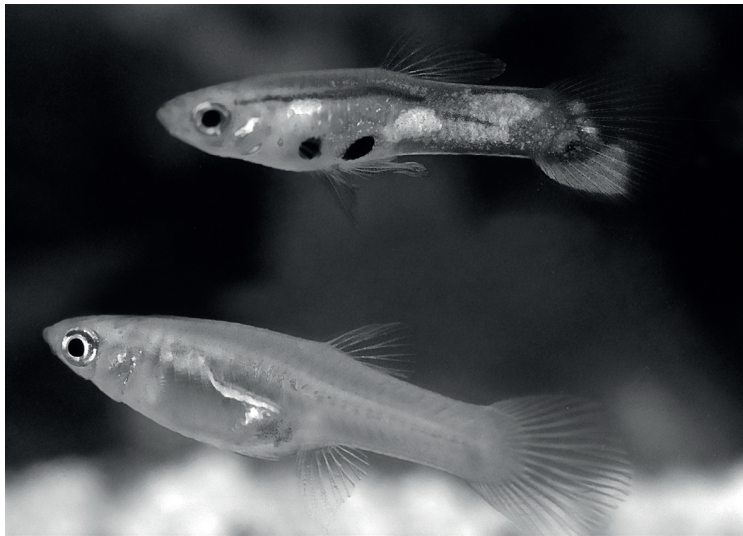
## SL

Biology

First assessment 2025

5 questions | questions

29. John Endler's experiments modelled sexual and natural selection in Trinidadian guppies (*Poecilia reticulata*) by controlling selection pressures.



What did the experiments of John Endler demonstrate?

- A. Guppies have no predators in their natural habitat.
- B. Male guppies prefer dull-coloured females for mating.
- C. Predation influences the colour of guppies in different environments.
- D. Guppies are not affected by the presence of other fish species.

**Turn over**

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

2. Populations evolve by natural selection due to interactions with the environment and other species within the ecosystem.

(a) Identify **one** source of genetic variation in a population. [1]

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(b) Explain how natural selection is influenced by changes in the environment. [2]

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(c) Explain how the loss of a keystone species affects an ecosystem. [2]

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29. A bird of paradise (*Ptiloris victoriae*) has very showy plumage and demonstrates a unique dance.



What type of selection pressure could have caused this plumage to evolve?

- A. Interspecific competition
- B. Abiotic factors
- C. Paradigm shift
- D. Sexual selection

## Section B

Answer **one** question. One additional mark is available for the construction of your answer. Answers must be written within the answer boxes provided.

6. Insect pollinators are vital to maintaining the biodiversity of ecosystems, but they are threatened by some human actions. Some pollinators, such as honey bees (*Apis mellifera*), produce honey, which is rich in glucose.
- (a) Outline how the properties of glucose are linked to their uses in organisms. [5]
  - (b) List human actions that could threaten populations of insect pollinators such as bees. [3]
  - (c) Explain how a plant species may evolve by natural selection over a long period to produce insect-pollinated flowers. [7]

**30.** What is an outcome of natural selection?

- A. Evolution
  - B. Mutations
  - C. Reproductive isolation
  - D. Variation
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**References:**

9. LeavingBio, n.d. [*Unicellular organisms*]. [image online] Available at: <<http://leavingbio.net/amoeba/>> [Accessed 28 July 2020].
11. Miami University, n.d. [*Electron micrograph*]. [image online] Available at: <[http://www.cas.miamioh.edu/~meicenrd/ANATOMY/Ch2\\_Ultrastructure/Tempcell.htm](http://www.cas.miamioh.edu/~meicenrd/ANATOMY/Ch2_Ultrastructure/Tempcell.htm)> [Accessed 28 July 2020].
12. University of Delaware, n.d. [*Model 2*]. [image online] Available at: <<http://www1.udel.edu/chem/white/C527/TransmembraneProteins.pdf>> [Accessed 28 July 2020].
15. Hill, M.A., 2020. *Embryology Trisomy 21*. [image online] Available at: <[https://embryology.med.unsw.edu.au/embryology/index.php/Trisomy\\_21](https://embryology.med.unsw.edu.au/embryology/index.php/Trisomy_21)> [Accessed 28 July 2020].
24. McGuire, J.A., Witt, C.C., Remsen Jr., J.V., Corl, A., Rabosky, D.L., Altshuler, D.L. and Dudley, R., 2014. Molecular Phylogenetics and the Diversification of Hummingbirds. *Current Biology*, 24(8), pp.910–916.
25. Mepps.com Staff, n.d. *Favored temperature range*. [image online] Available at: <<https://www.mepps.com/mepps-tactics/article/how-water-temperature-and-oxygen-affect-fishing/418>> [Accessed 8 December 2020].
27. *Food chain*, 2019. [image online] Available at: <<https://www.tuttee.co/blog/biol-food-chain-and-food-web>> [Accessed 8 December 2020].