



# Stunning Discovery: Octopuses' Ancient Sex Chromosomes Defy Evolution!

## Description

Octopuses might have the oldest sex chromosomes in the animal kingdom. Scientists recently found out that these creatures have a way to determine their sex written in their genes. The discovery was made by researchers at the University of Oregon.

They studied the genes of a California two-spot octopus and found a special chromosome pair. Males have two Z chromosomes, while females have only one. This system is different from humans, where females have two X chromosomes and males have one X and one Y chromosome.

By comparing the genomes of different cephalopods, scientists discovered that the Z chromosome has been around for over 480 million years. This makes it one of the oldest sex chromosomes known. The findings suggest that octopuses could be valuable for studying how sex chromosomes have evolved over time.

The research was published in the journal Current Biology.

## Vocabulary List:

1. **Chromosomes** /'kroʊ.mə.soʊmz/ (noun): Structures within cells that contain DNA and genetic information.
2. **Genomes** /'dʒi:.noʊmz/ (noun): The complete set of genes or genetic material present in a cell or organism.
3. **Cephalopods** /'sef.ə.lə.pədz/ (noun): A class of marine animals that includes octopuses squids and cuttlefish.
4. **Discover** /dɪs'kʌv.ər/ (verb): To find out information or something previously unknown.
5. **Ancient** /'eɪn.fənt/ (adjective): Belonging to the very distant past and no longer in existence.
6. **Evolved** /ɪ'vɑ:lvd/ (verb): Developed gradually especially from a simple to a more complex form.

## Comprehension Questions

### Multiple Choice

1. What is unique about the sex chromosomes of octopuses?

Option: They have the oldest sex chromosomes in the animal kingdom

Option: They have X and Y chromosomes like humans



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Option: They have unique DNA sequences in their sex chromosomes

Option: They have three sex chromosomes

2. How many Z chromosomes do male octopuses have?

Option: One

Option: Two

Option: Three

Option: None

3. Where was the discovery about octopus sex chromosomes made?

Option: University of Oregon

Option: University of California

Option: Harvard University

Option: Stanford University

4. What do female octopuses have in terms of sex chromosomes?

Option: Two Z chromosomes

Option: One Z chromosome

Option: One X and one Y chromosome

Option: Three chromosomes

5. For how long has the Z chromosome in octopuses existed?

Option: Over 100 million years

Option: Around 200 million years

Option: Over 480 million years

Option: Less than 50 million years

6. What can studying octopus sex chromosomes potentially help with?

Option: Understanding evolution of sex chromosomes

Option: Creating new animal species

Option: Improving human fertility

Option: Developing new pharmaceuticals

### **True-False**

7. Octopuses are the only animals with Z chromosomes.

8. The research about octopus sex chromosomes was published in Nature journal.



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9. The discovery about octopus sex chromosomes was made by scientists at Harvard University.
10. Octopuses have a similar sex chromosome system to humans.
11. The Z chromosome in octopuses has been around for less than 100 million years.
12. Studying octopus sex chromosomes is not expected to provide insights into the evolution of sex chromosomes.

### Gap-Fill

13. The Z chromosome has been around for over \_\_\_\_\_ million years in octopuses.
14. Researchers at the University of \_\_\_\_\_ made the discovery about octopus sex chromosomes.
15. Males have two Z chromosomes, while females have only \_\_\_\_\_.
16. Octopuses could be valuable for studying how sex chromosomes have evolved over \_\_\_\_\_.
17. The special chromosome pair found in octopuses is different from the one in \_\_\_\_\_.
18. The study of octopus sex chromosomes was published in the journal \_\_\_\_\_ Biology.

### Answer

**Multiple Choice:** 1. They have the oldest sex chromosomes in the animal kingdom 2. Two 3. University of Oregon 4. One Z chromosome 5. Over 480 million years 6. Understanding evolution of sex chromosomes

**True-False:** 7. False 8. False 9. False 10. False 11. False 12. False

**Gap-Fill:** 13. 480 14. Oregon 15. one 16. time 17. humans 18. Current

### Vocabulary quizzes

**Multiple Choice ( Select the Correct answer for each question. )**



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1. What are the structures that contain genetic information in a cell?  
Option: Proteins  
Option: Chromosomes  
Option: Enzymes  
Option: Lipids
  2. Which term refers to planets that orbit stars outside our solar system?  
Option: Galaxy  
Option: Exoplanets  
Option: Plasma  
Option: Cephalopods
  3. What term describes the variety of different species in an ecosystem?  
Option: Predators  
Option: Complex  
Option: Diversity  
Option: Intermuscular
  4. What is the body's response to injury or infection characterized by redness and swelling?  
Option: Symptoms  
Option: Inflammation  
Option: Resistance  
Option: Ecosystem
  5. What term refers to new findings or revelations?  
Option: Discoveries  
Option: Astronomers  
Option: Solar Systems  
Option: Researchers
  6. Which term describes something from a long time ago?  
Option: Evolved  
Option: Ancient  
Option: Puzzling  
Option: Plasma
  7. What term describes the gradual development or change of something over time?  
Option: Astronomers  
Option: Galaxy  
Option: Evolved  
Option: Ecosystem



8. Who are the individuals who conduct experiments and studies to advance knowledge in a particular field?

Option: Paleontologists

Option: Galaxy

Option: Plasma

Option: Researchers

9. What is the ability to withstand or oppose something?

Option: Inflammation

Option: Symptoms

Option: Resistance

Option: Evolving

10. Which term refers to animals that hunt and feed on other animals?

Option: Intermuscular

Option: Discover

Option: Predators

Option: Plasma

**Gap-Fill ( Fill in the blanks with the correct word from the vocabulary list. )**

11. A collection of an organism's complete set of \_\_\_\_\_ is called a genome.

12. Patients should report any unusual \_\_\_\_\_ to their healthcare provider.

13. Scientists make careful \_\_\_\_\_ to collect data for their research.

14. Technology is constantly \_\_\_\_\_ to meet the changing needs of society.

15. The study results were \_\_\_\_\_ in a scientific journal.

16. The mysterious disappearance of the artifact left archaeologists \_\_\_\_\_ over its whereabouts.

17. Squid and octopus are examples of \_\_\_\_\_.

18. The fourth state of matter after solid liquid and gas is \_\_\_\_\_.

19. Our planetary system is an example of a \_\_\_\_\_.



20. \_\_\_\_\_ study celestial bodies like stars planets and galaxies.

**Matching Sentences ( Match each definition to the correct word from the vocabulary list. )**

21. Athletes focus on building strength in their muscles including those that are .
22. Scientists are always eager to new insights into the mysteries of the universe.
23. use powerful telescopes to observe and analyze distant celestial objects.
24. Our solar system is located in the Milky Way a vast collection of stars and planets.
25. The Amazon rainforest is home to a multitude of plant and animal species forming a complex .
26. study ancient life forms by examining fossils and geological records.
27. The coral reef ecosystem contains a wide of marine organisms in various shapes and colors.
28. Neural networks are powerful tools used to solve problems that traditional algorithms struggle with.
29. Researchers gain valuable into human behavior through psychology studies.
30. In the sun's core hydrogen undergoes fusion to form the hot ionized gas known as .

## Answer

**Multiple Choice:** 1. Chromosomes 2. Exoplanets 3. Diversity 4. Inflammation 5. Discoveries 6. Ancient 7. Evolved 8. Researchers 9. Resistance 10. Predators

**Gap-Fill:** 11. Genomes 12. Symptoms 13. Observations 14. Evolving 15. Published 16. Puzzling 17. Cephalopods 18. Plasma 19. Solar Systems 20. Astronomers

**Matching sentence:** 1. Intermuscular 2. Discover 3. Astronomers 4. Galaxy 5. Ecosystem 6. Paleontologists 7. Diversity 8. Complex 9. Insights 10. Plasma

## CATEGORY

1. Health - LEVEL2

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