

10.5 Evolutionary Biology Today

KEY CONCEPT

New technology is furthering our understanding of evolution.



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► Fossils provide a record of evolution.

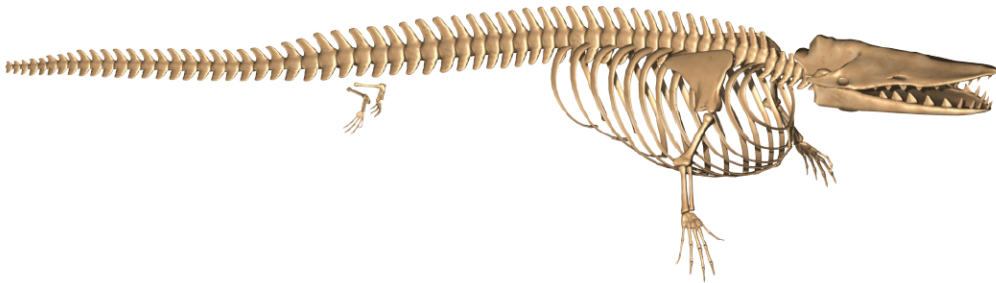
- Paleontology is the study of fossils or extinct organisms.



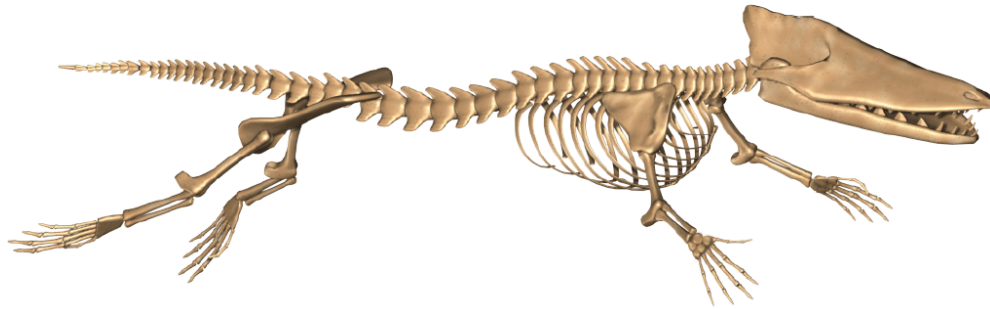
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- Paleontology provides evidence to support evolution.

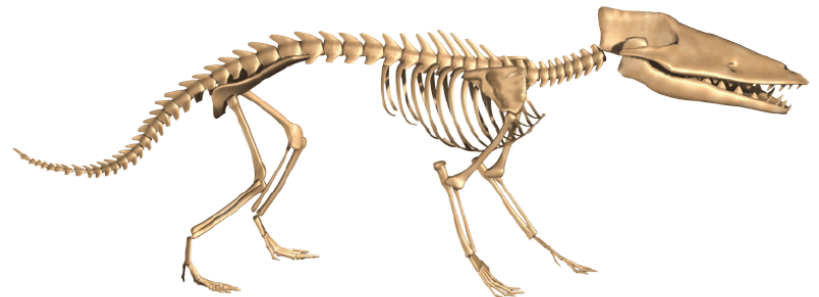
Dorudon 40 million years ago



Ambulocetus natans 50 million years ago



Pakicetus 52 million years ago



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- ▶ **Molecular and genetic evidence support fossil and anatomical evidence.**
- Two closely-related organisms will have similar DNA sequences.

Molecular Evidence

The DNA sequences of whales and ungulates are very similar, as demonstrated by the DNA fragments below.

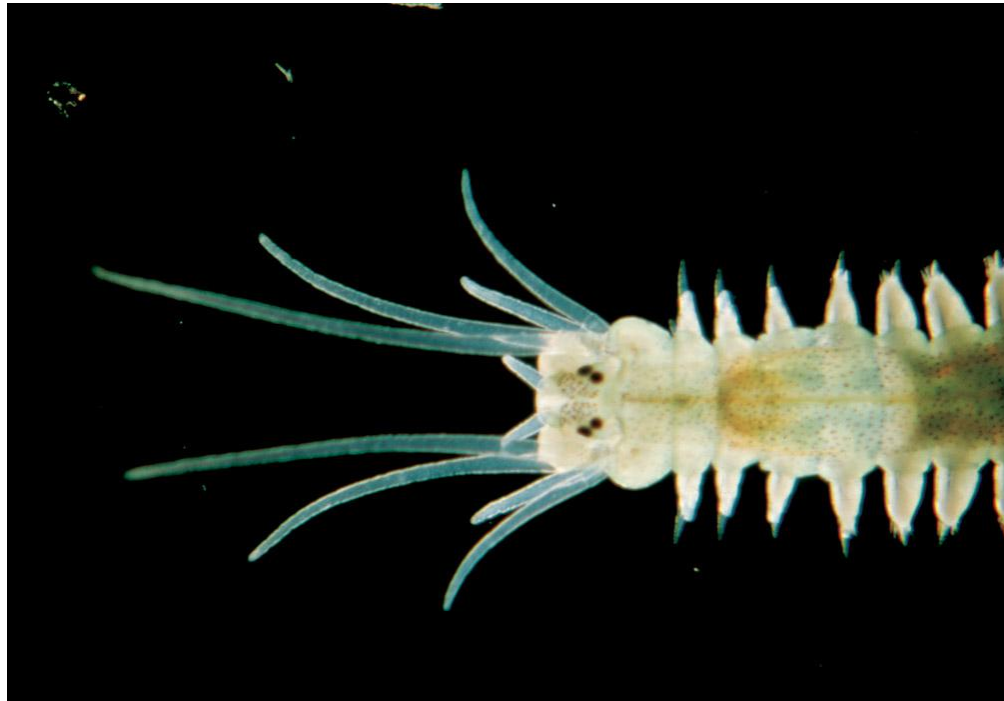
Hippopotamus	TCC TGGCA GTCCA GTGGT
Humpback whale	CCC TGGCA GTGCA GTGCT

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- Pseudogenes are sequences providing evidence of evolution.
 - no longer function
 - carried along with functional DNA
 - can be clues to a common ancestor

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- Hox genes indicate a very distant common ancestor.
 - control the development of specific structures
 - found in many organisms
- Protein comparisons, or molecular fingerprinting reveals similarities among cell types of different organisms.



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► Evolution unites all fields of biology.

- Scientist from any fields contribute to the understanding of evolution.
- The basic principles of evolution are used in many scientific fields.

