

# 10.5 Evolutionary Biology Today

## KEY CONCEPT

**New technology is furthering our understanding of evolution.**



# 10.5 Evolutionary Biology Today

## ▶ Fossils provide a record of evolution.

- Paleontology is the study of fossils or extinct organisms.



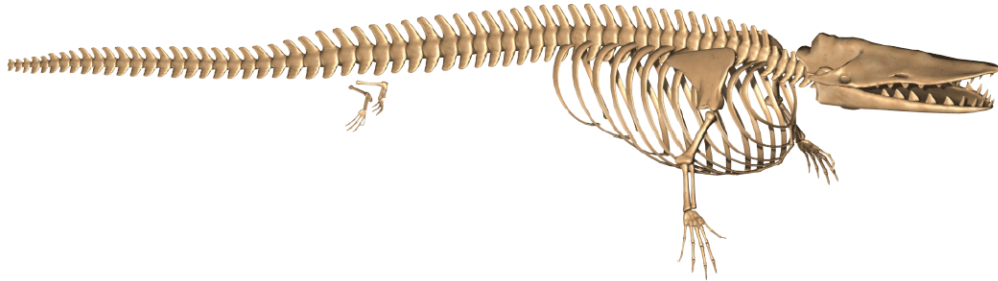


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- Paleontology provides evidence to support evolution.

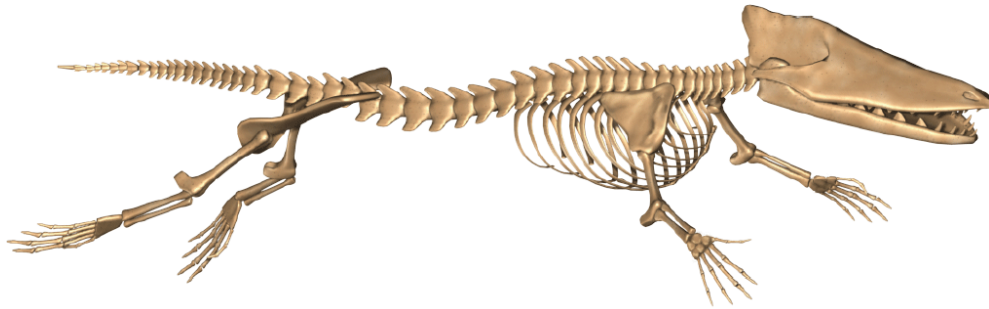
*Dorudon* 40 million years ago

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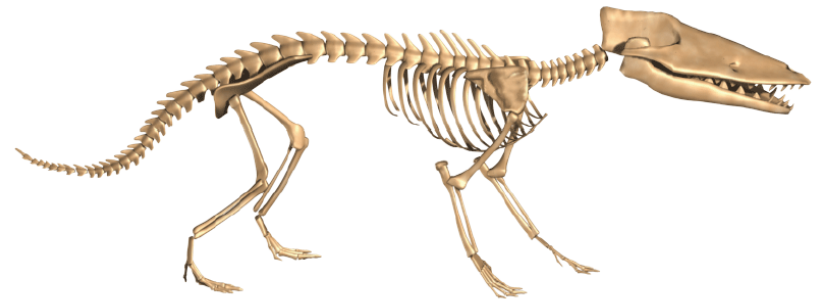
*Ambulocetus natans* 50 million years ago

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*Pakicetus* 52 million years ago

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# 10.5 Evolutionary Biology Today

- ▶ **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.



# 10.5 Evolutionary Biology Today

## ▶ 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.

