



Methanogenic Archaea: Tiny Architects, Big Ecological Impacts



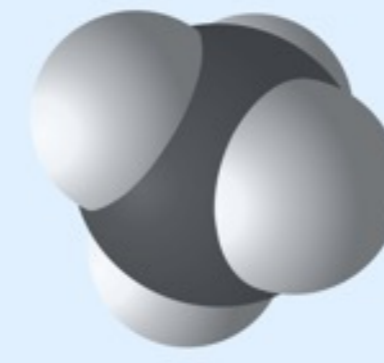
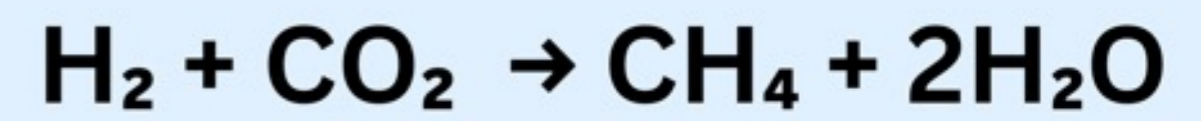
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Background

Methanogenic archaea produce methane in anaerobic environments. Directly and indirectly responsible for the ecological implications:

- 🔦 Greenhouse gas emissions
- 🔦 Carbon cycle influence
- 🔦 Health and function of ecosystems
- 🔦 Microbial interactions

Methanogenesis

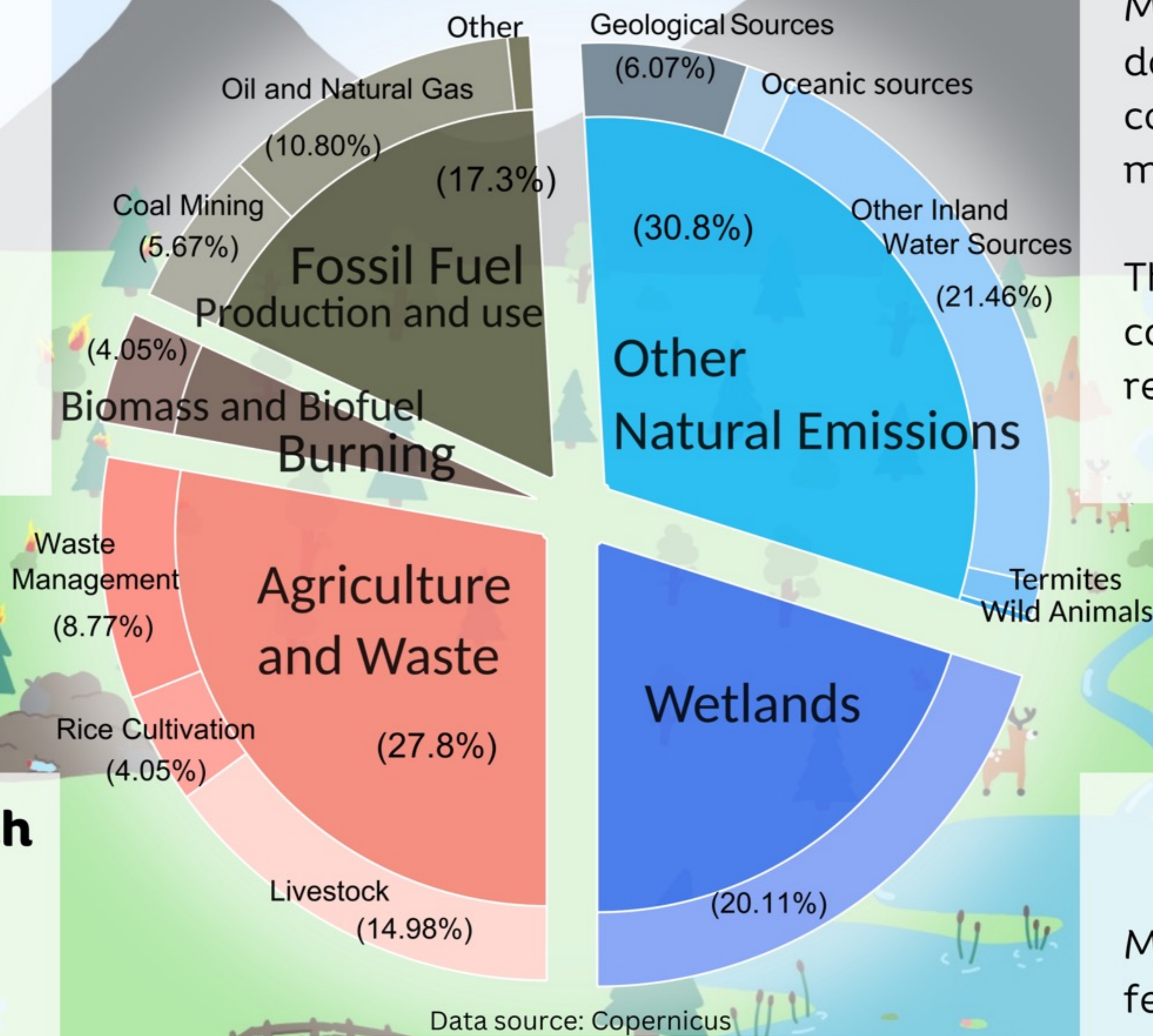


Greenhouse Gas Emissions

Methane gas has warming capacity of 25-26 times greater than CO₂.

Methanogens produce ~73% of methane emissions.

Methane Sources



Carbon Cycling

Methanogens break down organic compounds and release methane anaerobically.

Their activity influences carbon storage and release.

Ecosystem Health and Function

Regulates anaerobic nutrient cycling in the digestive systems of ruminant animals and rice paddies.

Microbial Interactions

Methanogens cross-feed with other microbes to metabolize substrates and products.

Wetlands in natural conditions regulate methane emissions.

Mitigating Methane Emissions from Methanogens:

- 🔦 Dietary changes for livestock.
- 🔦 Reduce tillage practice.
- 🔦 Restore degraded wetlands.
- 🔦 Landfill gas recovery for electricity generation and fuel.

References

