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Unknown Biodiversity: Exploring the Uncharted Terrain

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Key to all species present on earth

- Organism has never been collected by a scientist
- Organism has been collected
  - Organism could not be identified
    - Thrown away
    - Still in a natural history collection
  - Organism could be identified
    - Organism will be newly described
    - Organism needs a new name, but nobody had time to do it
    - Organism has a name ...

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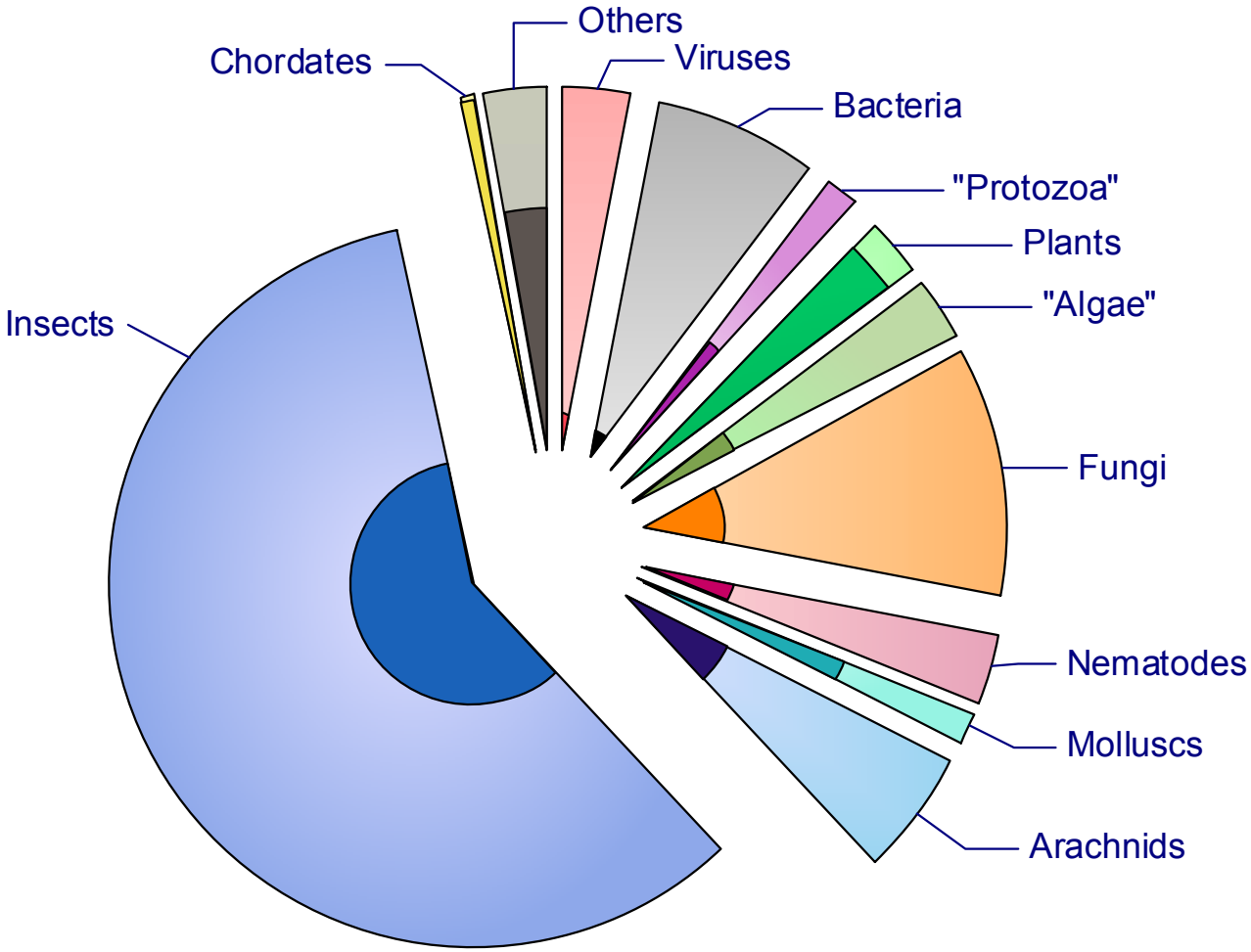
Fundamental questions

- In which groups of organisms do we expect unknown biodiversity?

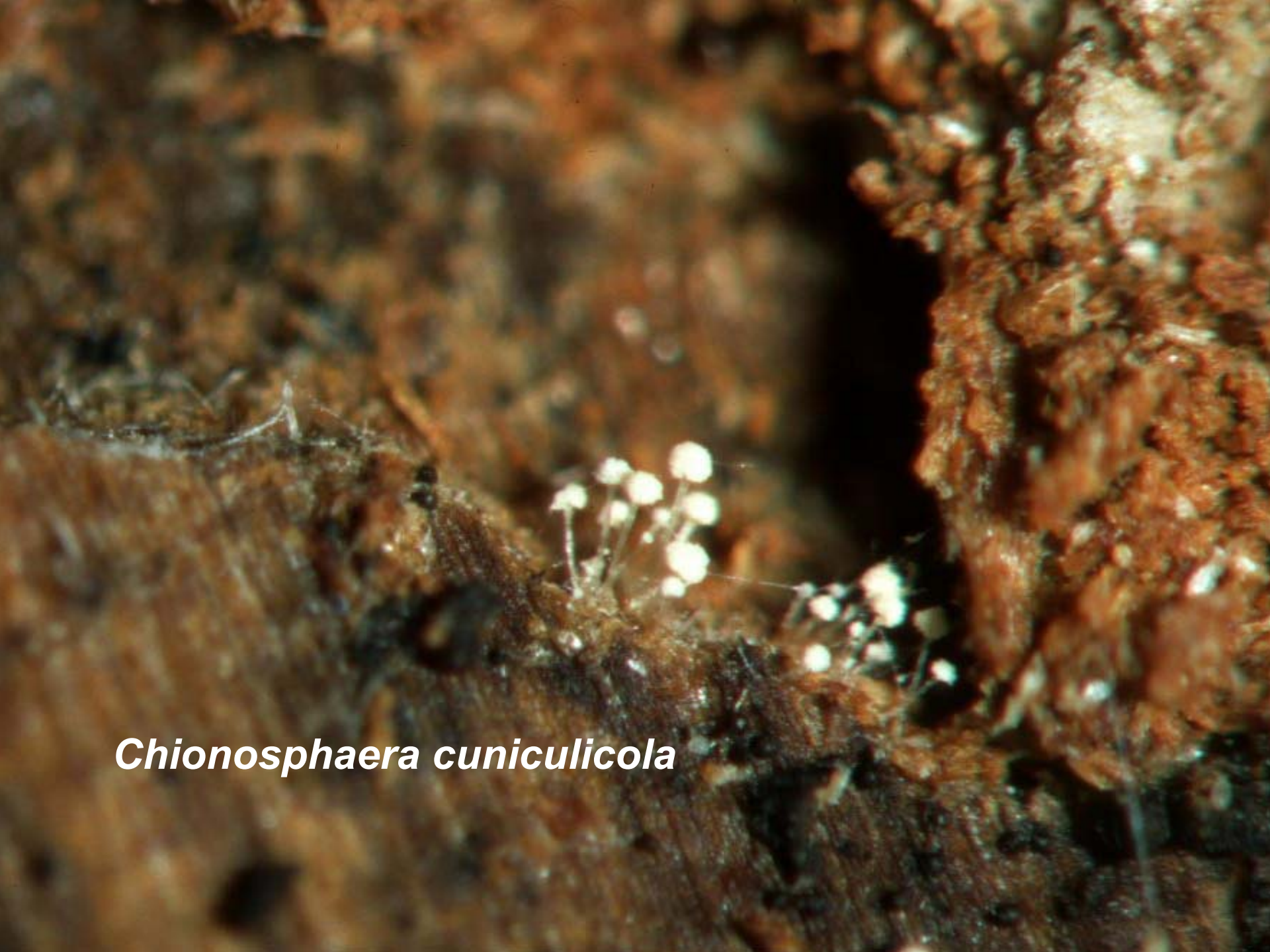
Species diversity of major groups



Purnis & Hektor 2000

Fundamental questions

- In which groups of organisms do we expect unknown biodiversity?
- Where can unknown taxa be found?



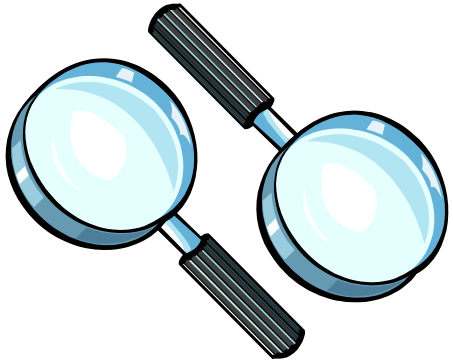
Chionosphaera cuniculicola

Fundamental questions

- In which groups of organisms do we expect unknown biodiversity?
- Where can unknown taxa be found?
- Why are so many species still unknown to science – in spite of several centuries of research?
  - Aspects of organisms investigated – and of the organism investigating!
  - Research conditions
  - Technical aspects (mainly problems) of the recognition of a new species

Aspects of organisms investigated & investigating

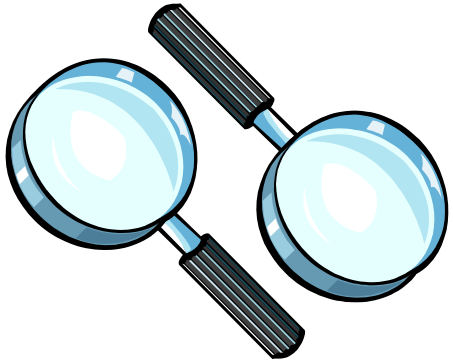
- small size of organisms investigated
- growth in hidden habitats




Entorrhiza sp. nov.

Aspects of organisms investigated & investigating

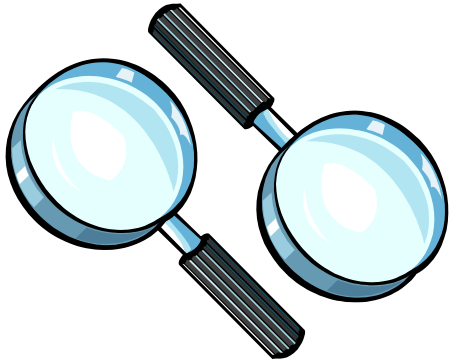
- small size of organisms investigated
- growth in hidden habitats
- organisms not growing in culture or only with difficulties
- strictly interdependent organisms
- “strange” organisms




Ustilago maydis

Aspects of organisms investigated & investigating

- small size of organisms investigated
- growth in hidden habitats
- organisms not growing in culture or only with difficulties
- strictly interdependent organisms
- “strange” organisms
- limitation of human sensory perception



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Research conditions

- Occurrence of new species in remote areas or areas that are difficult to access

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- Occurrence of new species in remote areas or areas that are difficult to access
- Lack of field biologists and taxonomists
- Lack of funding

Recognition of new species

- Study the potentially new organism as comprehensively as possible
- Classify the potentially new species into a group of known species to which it has to be compared
- Know all the literature concerning related species
- Recognize, explain and correct errors in literature
- Locate and analyse often very scarce type or authentic material of all the species your potentially new organism might correspond to
- Study the closely related species as well as possible
- Dare to say that you did these jobs well enough to justify a new species!

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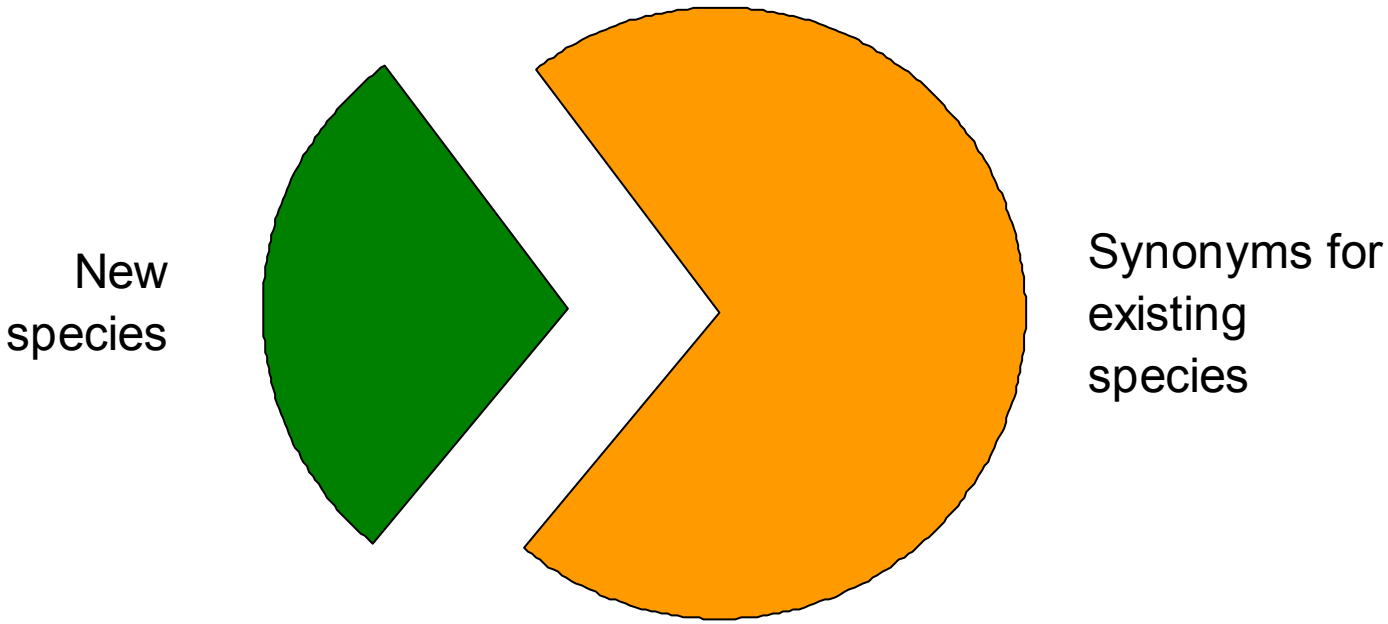
Recognition of new species?

"… mycologists inadvertently redescribe already known species at the rate of about 2.5 : 1" (Hawksworth 1991)



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Evolution of taxonomists ...