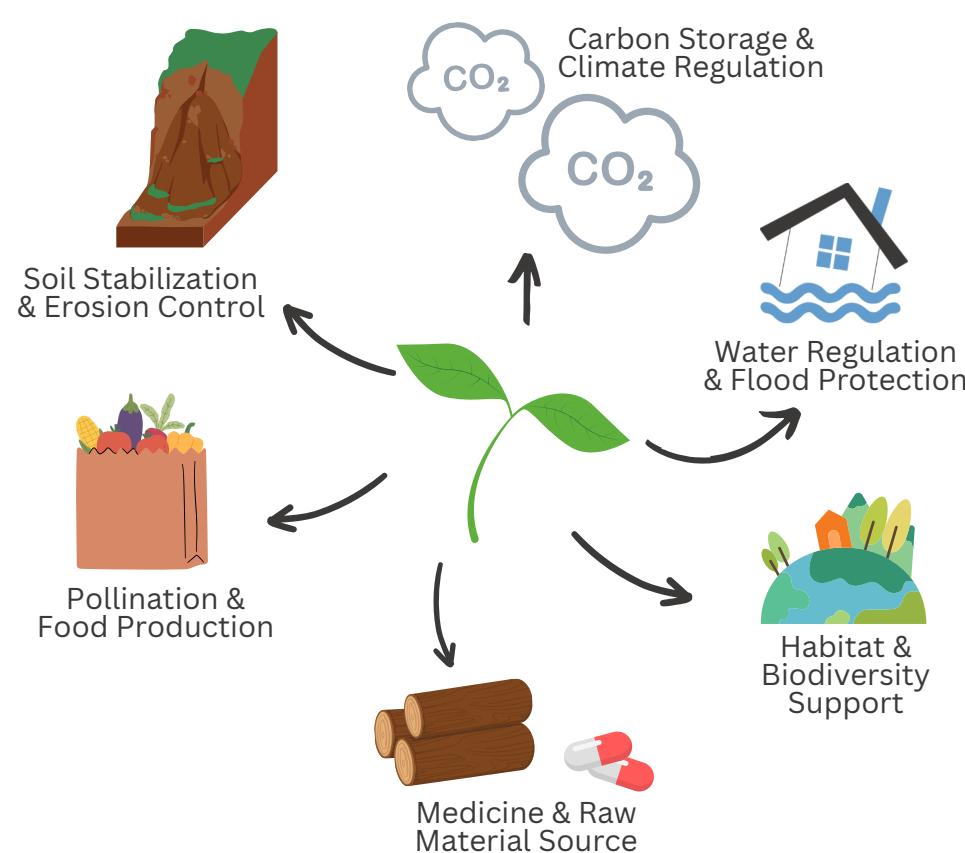


Metabarcoding in Plant Identification



Plants drive terrestrial ecosystems, play significant roles in soil and food webs, and can influence human health.

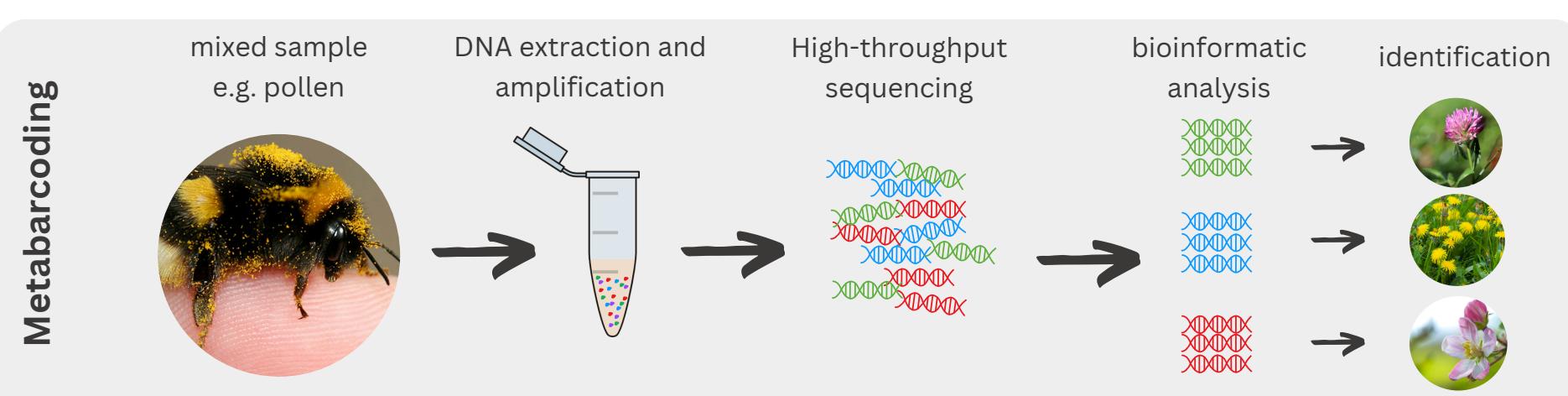
Currently, two out of five plant species are threatened with extinction.

Plant loss will also affect other groups of organisms, as plants have important functional dependencies in complex organism networks, including pollination, mutualism, parasitism, dispersal, and herbivory.



Accelerated identification and monitoring is needed to better understand and mitigate the forces driving the current changes in plant diversity.

Metabarcoding - Modern Plant Identification



Metabarcoding provides a genetic, objective, comparable method for species identification of environmental samples by comparing genetic sequences to reference databases.

Metabarcoding is now widely applied in ecology, environmental monitoring, food safety, and forensics, e.g. by analyzing pollen or fecal samples.

Metabarcoding Infrastructures for Large-Scale Biodiversity Monitoring Needed

Biodiversity monitoring requires fast, standardized, and verifiable species identification methods. Traditional approaches are time-consuming and often inconsistent across regions. To improve efficiency and comparability, we develop:

- **Standardized Field Sampling** – Harmonized protocols ensure reproducible sample collection across Europe.
- **Automated Laboratory and Analysis Pipelines** – From DNA extraction to bioinformatics, minimizing human error and maximizing data consistency.
- **Integrated Metadata Pipelines** – Linking genetic data with AI-driven species identification, existing occurrence records, and literature sources.
- **Enhanced Identification Accuracy** – Combining metabarcoding with additional methods, such as remote sensing and machine learning.

Applications of metabarcoding in plant research



Quality assurance in food control



Pollen forecast



Understanding ecosystem relationships



Monitoring seed dispersal



Identification of food webs



Standardized automated monitoring



Pathogen Detection and Monitoring

Harmonizing Biodiversity Monitoring Across Europe

The MetaPlantCode project plays a key role in standardizing metabarcoding for large-scale biodiversity assessments. By integrating data from different regions and research disciplines, we create a harmonized framework that enables:

- ✓ Cross-border data comparability
- ✓ Scalable and automated biodiversity assessments
- ✓ Improved long-term monitoring strategies



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