

DEVELOPMENT OF INNOVATIVE BIOTECHNOLOGICAL SOLUTIONS FOR BAKERY PRODUCTS BIO PRESERVATION

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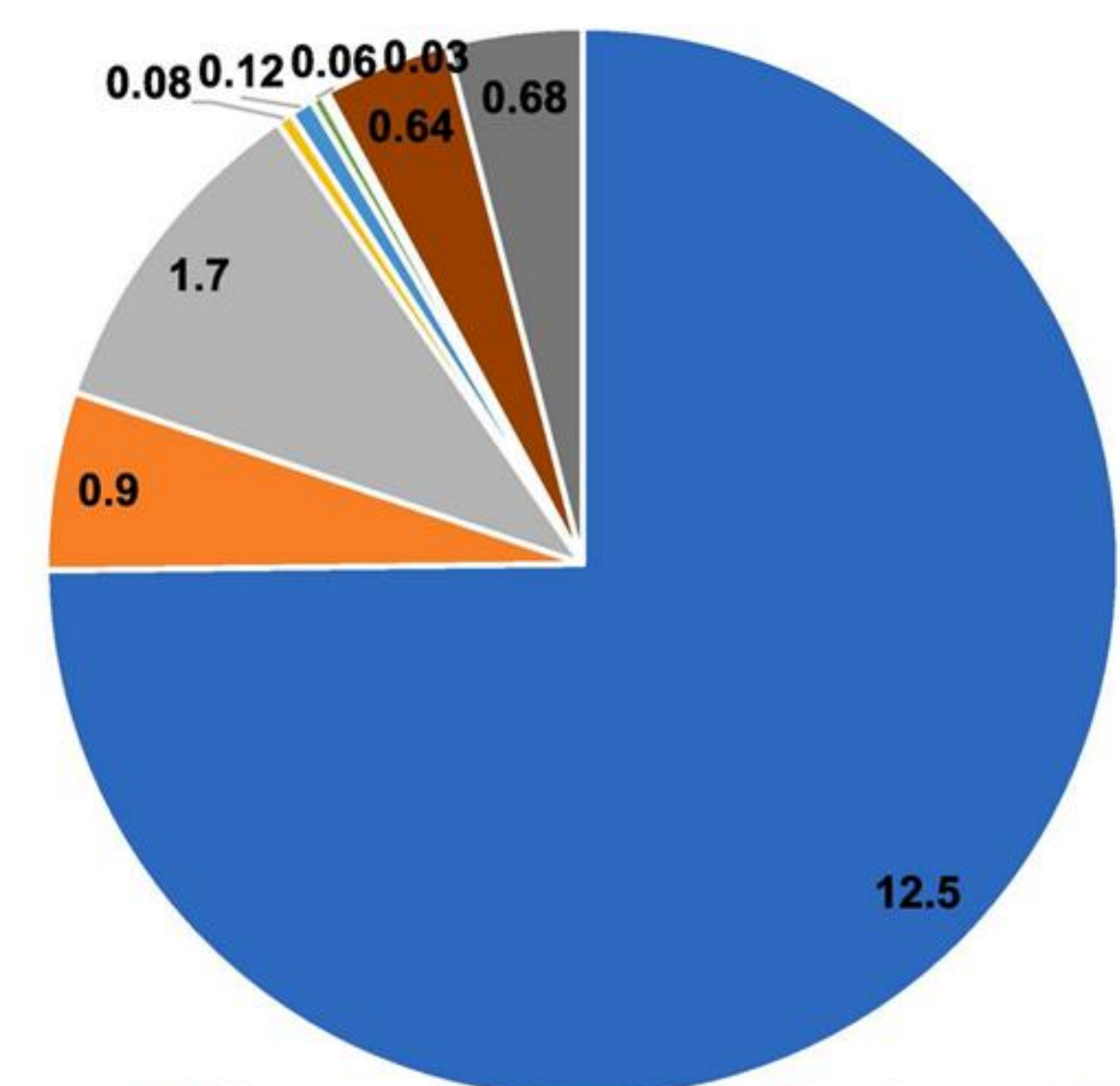
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This study proposes a novel strategy of bread preservation using antifungal peptides from both plants and lactic acid bacteria, focusing on sustainable sources like plant byproducts, to create a safe and cost-effective solution.

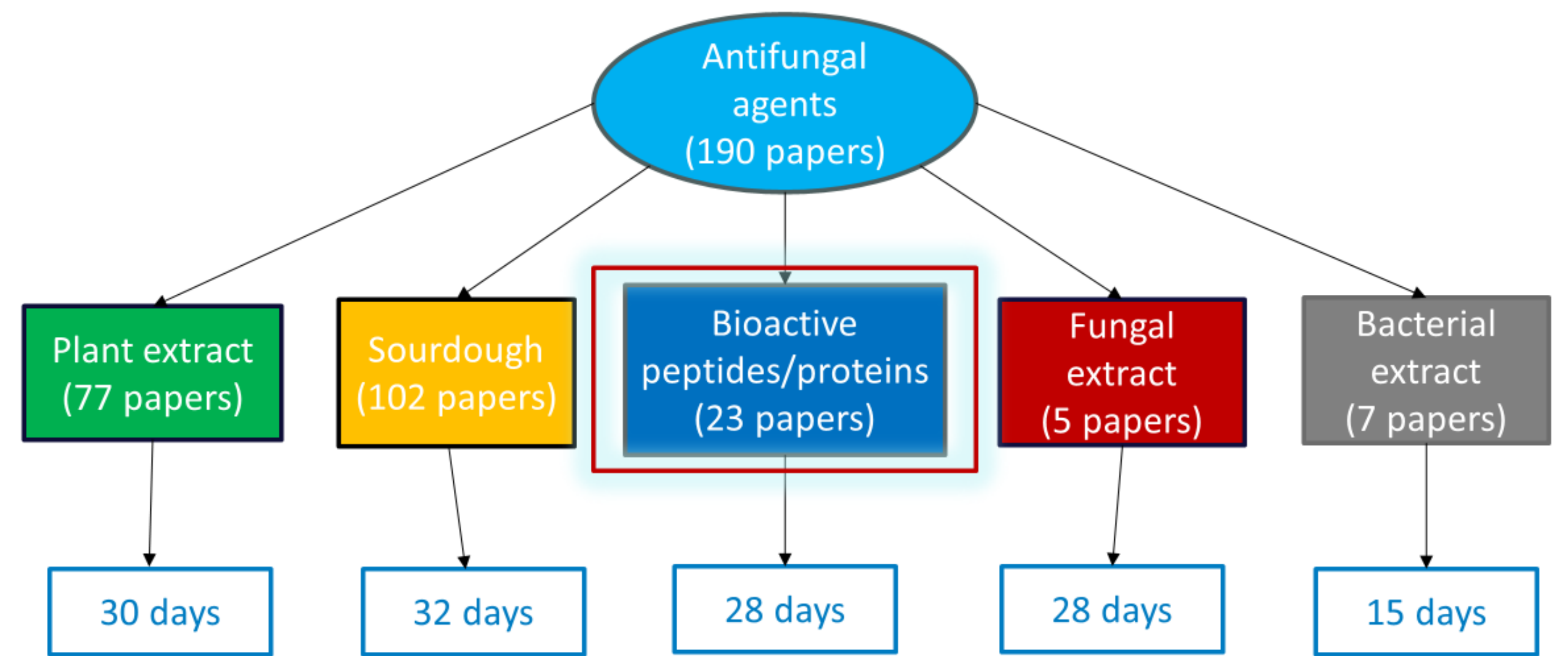
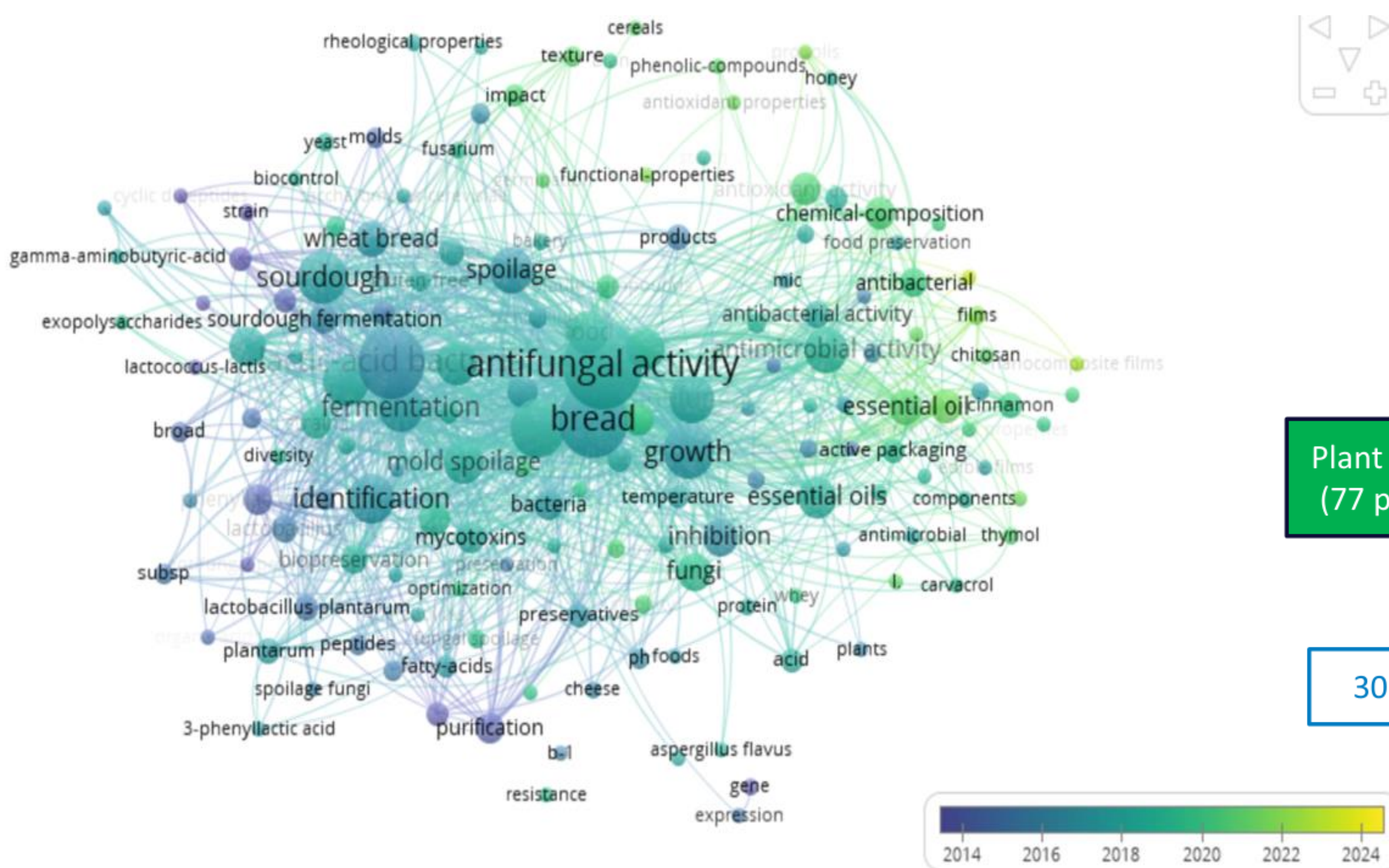
BACKGROUND

- **Bread spoilage** is among the highest food waste generated at **100 million tons** per year.
- **Mold** is the major contaminant, and **chemical preservatives** help extend shelf life, but it poses **safety and consumer concerns**.
- For **natural bread preservation**, current research suggests combining fermentation with **plant-based antifungal extracts**.

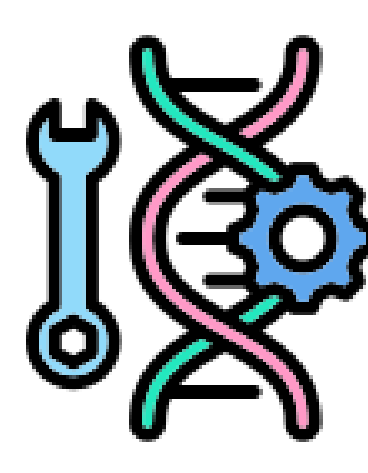
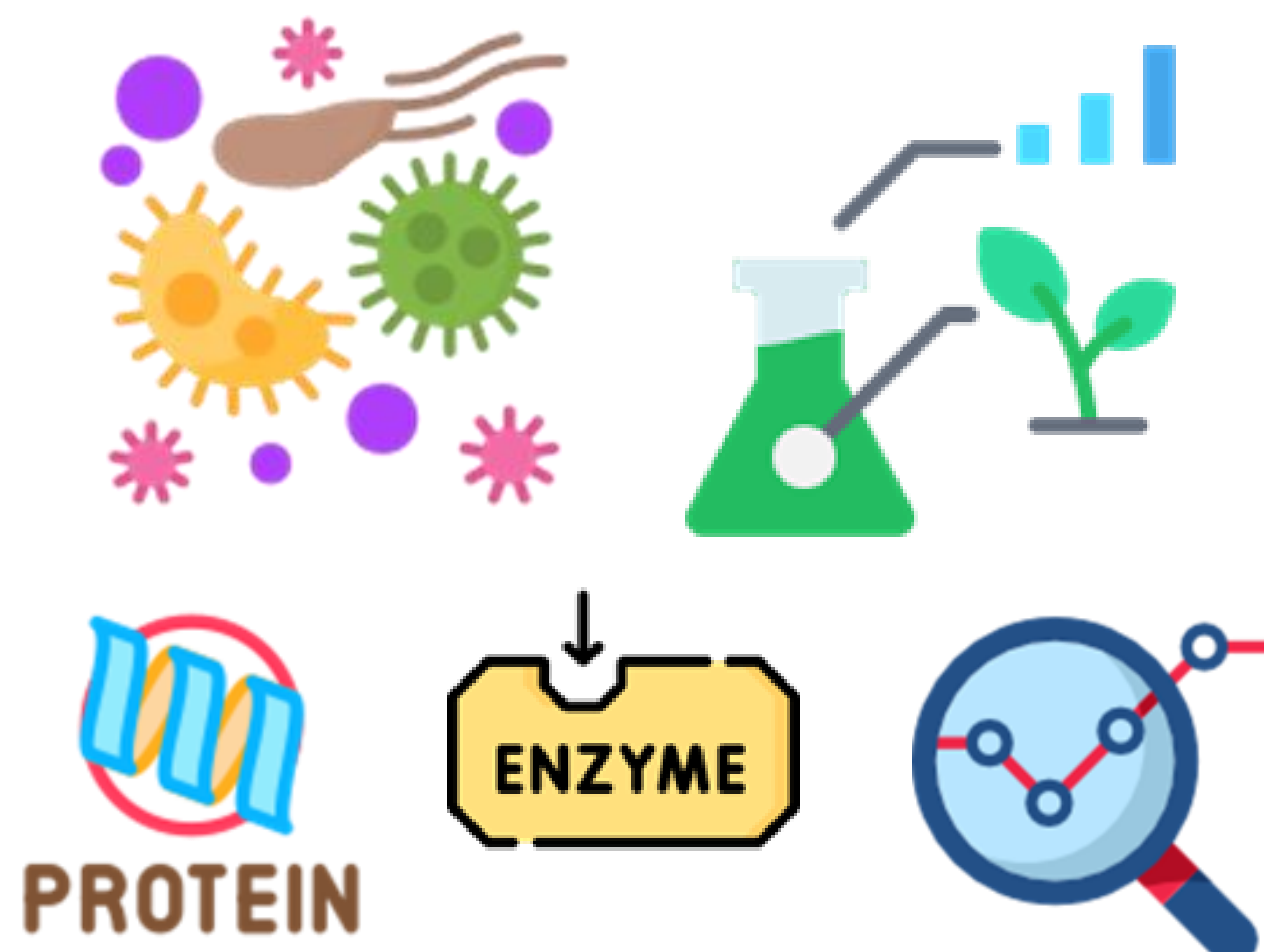
Million tonnes of Bread Waste



USA UK Germany Sweden Netherlands
Spain Denmark France Turkey



OBJECTIVES



- ✓ Selection of plants and microbes
- ✓ Enzymatic hydrolysis and fermentation
- ✓ In silico prediction analysis of peptide sequences and genome mining for proteases

- ✓ Peptides purification and characterization
- ✓ Total protein, organic acids, sugars quantification
- ✓ Trigger production of peptides with metabolic engineering

- ✓ Broad spectrum antifungal susceptibility tests
- ✓ Sensory analysis of bread recipe and bread shelf-life tests

References

- Antifungal peptides from faba bean flour fermented by *Levilactobacillus brevis* AM7 improve the shelf-life of composite faba-wheat bread
- Antibacterial and antifungal activity of kenaf seed peptides and their effect on microbiological safety and physicochemical properties of some food models
- Antifungal effect of bioprocessed surplus bread as ingredient for bread-making: Identification of active compounds and impact on shelf-life