



One Health
Student Conference
USAMV București



FUNGAL MICROBIOTA OF EDIBLE ROSE FLOWERS

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Introduction

Plants live in association with beneficial and pathogenic microorganisms, which make up the plant microbiota.

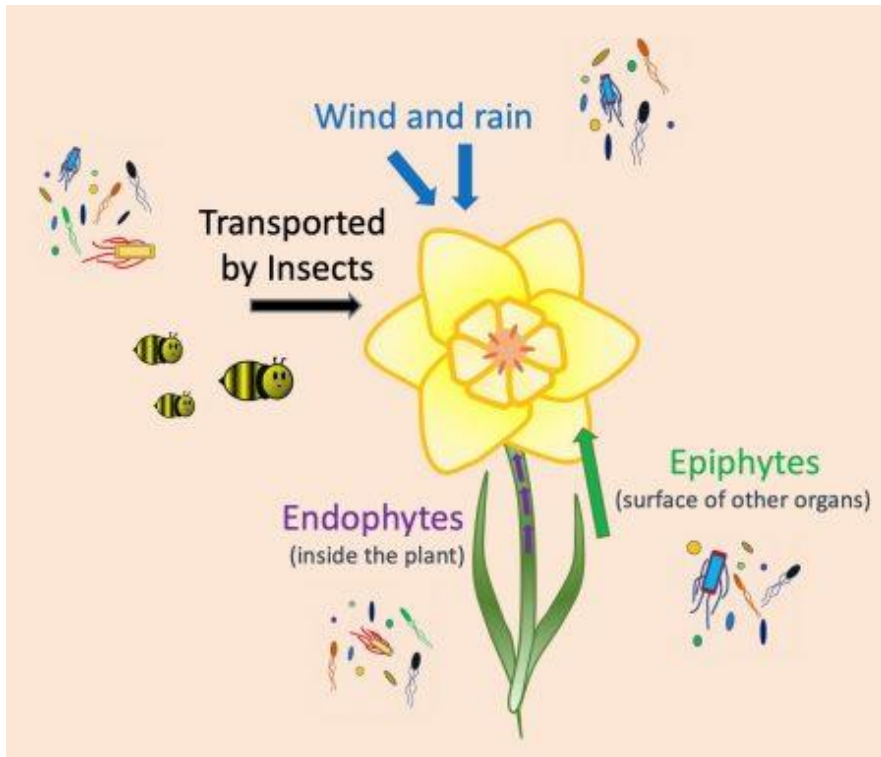
Despite the fact that flowers are directly linked to plant propagation, little is known about the microbiome of flowers and their potential interaction with pathogens.

In contrast to other vegetative organs, such as roots, stems and leaves, which are present throughout most of the plant's life cycle, flowers develop at maturity and are usually present for a limited period. Thus, research characterizing the microbiome of flowers is generally less developed compared to that focused on other organs.

We have much to learn about the microbial communities detected and identified in flowers. It is important to understand the specific roles that flower microorganisms can play for the host. It is also important to understand the specific roles that flower microorganisms can play for the host. Which microorganisms in flowers are beneficial to the plant and in what ways? Which microorganisms are transient resource opportunists?



Introduction



<https://plantaee.org/review-la-vie-en-roses-lilies-and-other-flowers-the-floral-microbiome-annu-rev-ecol-evol-syst/>

The potential role of flower microbial communities throughout the plant's life cycle:

- 1. Lifecycle connection:** The microbes associated with flowers may influence the entire development process of plants, from flowers to fruits, seeds, and eventually back to the mature plant.
- 2. Vertical transmission:** Understanding how microbes are passed from one generation to the next (e.g., through seeds) can clarify if this process is common and significant.
- 3. Local reservoirs:** Identifying which flower microbial communities act as reservoirs for broader plant microbiomes can help pinpoint their role in maintaining plant health and ecological balance.



Objectives



Our research has been directed towards the knowledge of the cultivable microbiota of edible organic rose flowers.



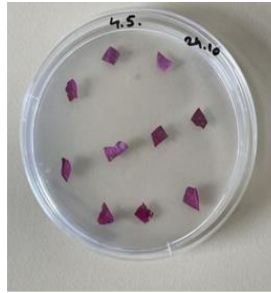
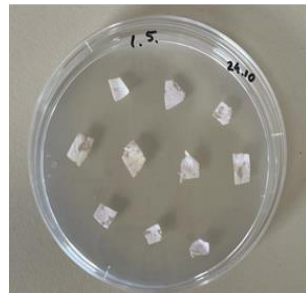
Materials and methods



In October 2023 and May 2024, flowers from three varieties of edible rose in the orchard of USAMV Bucharest were harvested: Brother Cadfael, Crown Princess Margaret, and Falstaff.



Materials and methods



Isolation and identification of petals microbiota
Method: incubation on PDA medium

Petals were sectioned into fragments (0.5/0.5 cm) and placed in Petri dishes on PDA culture medium. Stamens were harvested from the center of the receptacle and placed on PDA culture medium. The Petri dishes were incubated at 22-24°C.

Observations: colonies development

Identification of the isolates was carried out according to the morphology of the colonies (color, pigmentation) and by microscopic examination.

Results: incidence of colonies (%)

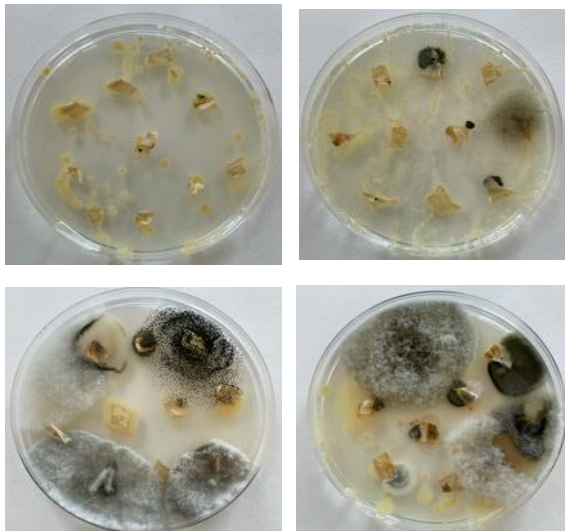


Results and discussions

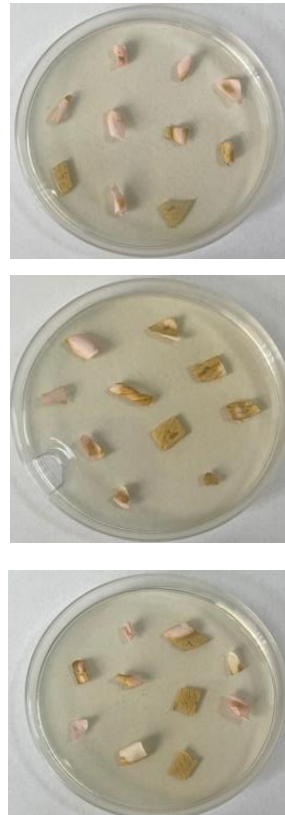
Edible rose petals associated microbiota - Brother Cadfael



October 2023



May 2024



In October 2023, cultivable microbiota of the petals of the Brother Cadfael variety was represented by bacteria and fungi.

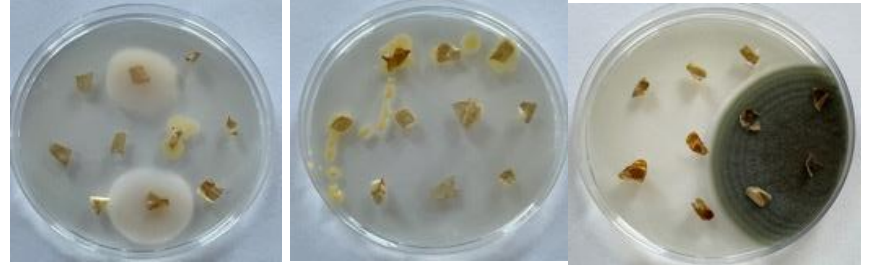
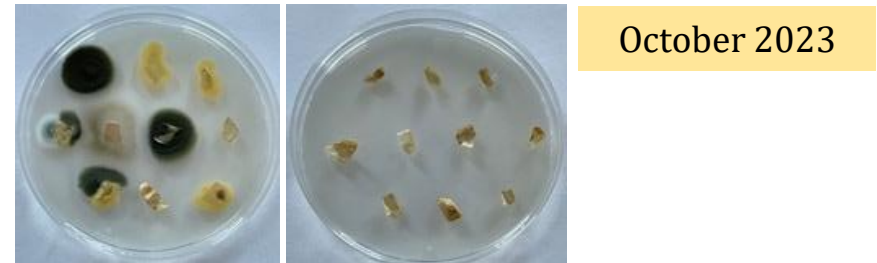
Fungal colonies recorded an incidence of 34,4%. Fungi belonging to the genera *Aspergillus*, *Penicillium*, *Aureobasidium*, *Alternaria* and *Cladosporium* have been identified.

In samples taken in May, no colonies developed from the incubated fragments have been detected.

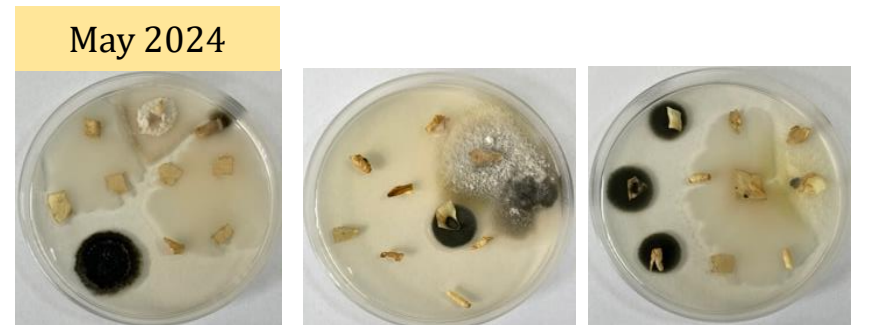
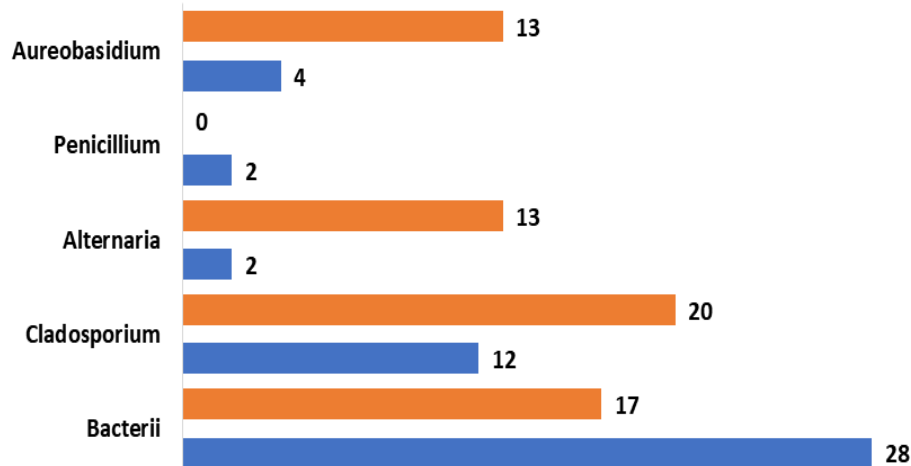


Results and discussions

Edible rose petals associated microbiota - Crown Princess Margaret



Incidence of colonies (%)

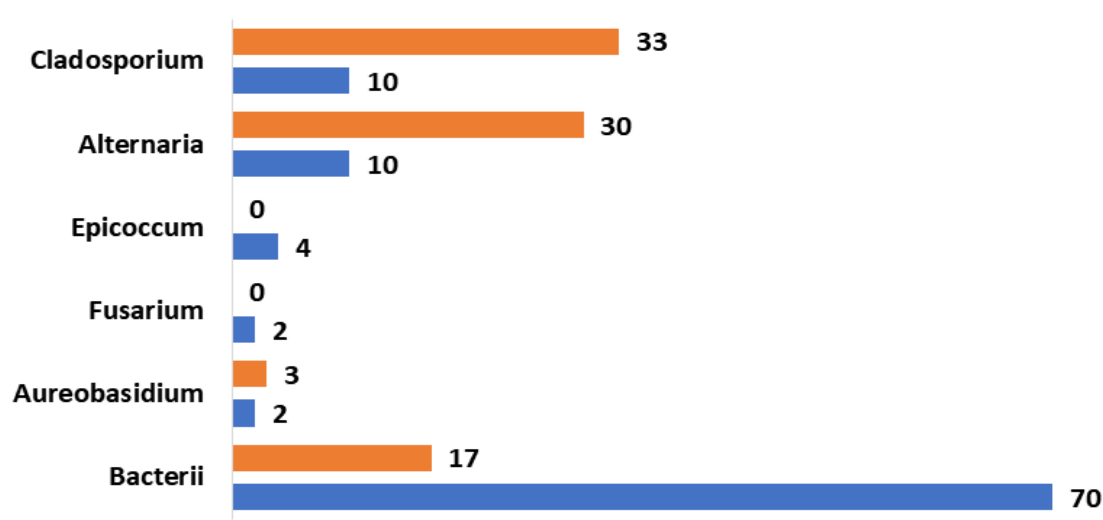




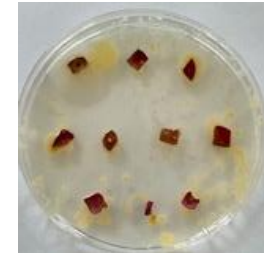
Results and discussions

Edible rose petals associated microbiota - Falstaff

Incidence of colonies %



May 2024

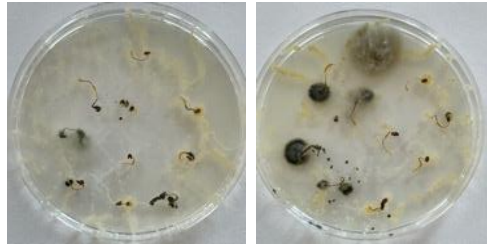


October 2023

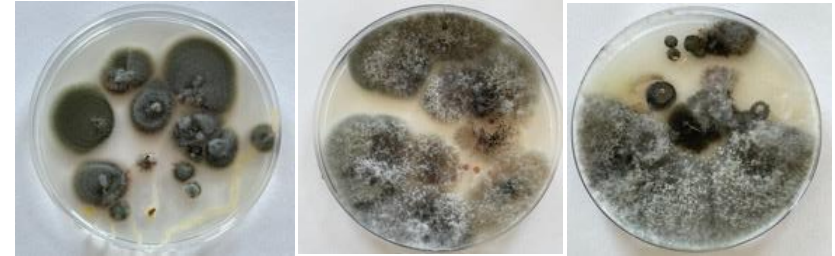


Results and discussions

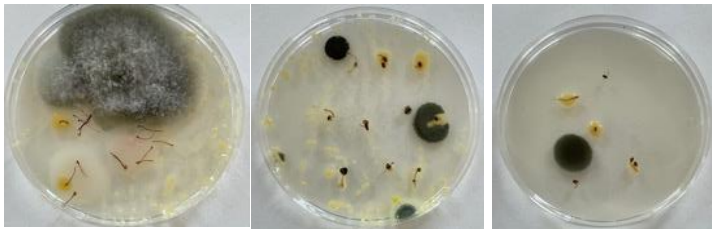
Edible rose stamen associated microbiota



Brother Cadfael



Falstaff



Crown Princess Margareta

Genus	Brother Cadfael		Crown Princess Margarett		Falstaff	
	10.2023	05.2024	10.2023	05.2024	10.2023	05.2024
<i>Alternaria</i>						
<i>Aspergillus</i>						
<i>Aureobasidium</i>						
<i>Cladosporium</i>						
<i>Botrytis</i>						
<i>Penicillium</i>						
Bacteria						



Conclusions and *perspectives*

Microbiota associated with petals and stamens from organic edible rose flowers was detected and identified.

To our knowledge, this is the first report of the cultivable fungal community associated with edible rose flowers in Romania.

Most colonies detected in petals and stamens were bacterial colonies. From the fungal community isolates belonged to the genera *Alternaria*, *Aspergillus*, *Aureobasidium*, *Cladosporium*, *Botrytis*, *Epicoccum*, *Fusarium* and *Penicillium* have been detected and identified.

Isolates belonging to the genera *Aureobasidium* and *Epicococcum* may be of interest to further studies to understand their role in the microbiota of flowers. These genera are known for their species with potential in the biological control of plant diseases.

Understanding the composition and dynamics of these microorganisms, as well as deciphering their relationships with other organisms and among themselves, will prove important for agriculture, plant conservation, and food safety. Due to the transient and discrete nature of flower habitats, microbial communities in flowers will also provide insights into the general ecology of microbial consortia and serve as useful models for investigating microbial assembly and succession.



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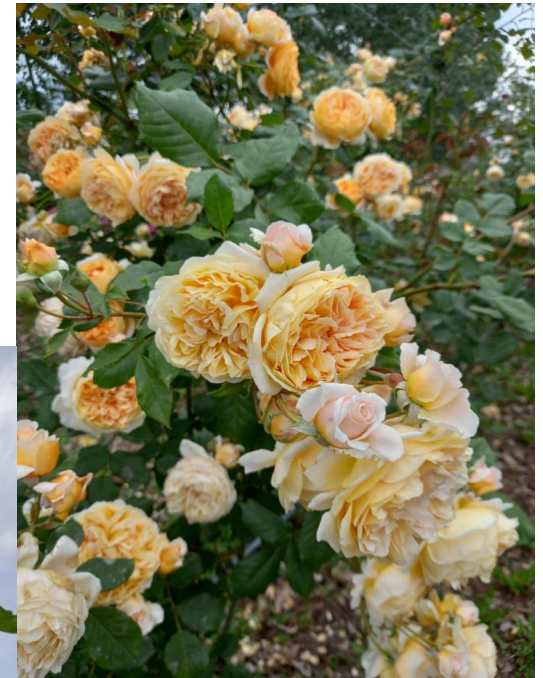
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Thank you for your attention!

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