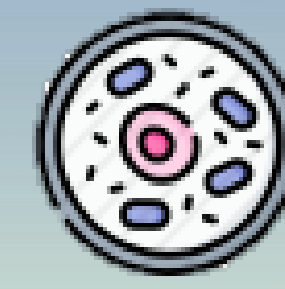


# Fungal contamination and azole-resistance in tea and other medicinal plants commercially available in Portugal

## Introduction

- Tea (*Camellia sinensis*) and other medicinal plants for infusions (eg. *Melissa officinalis*) are common beverages worldwide.
- Contamination of medicinal plants by filamentous fungi, such as *Aspergillus* sp., and fungal byproducts may originate health risks for consumers.
- Exposure of medicinal plants to azole fungicides in conventional agriculture can promote azole-resistance, thus, therapeutic failure of first-line antifungal therapy.

## Objectives



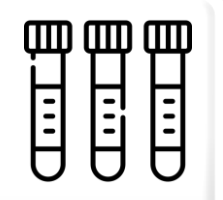
Identify and quantify the mycobiota through microbiological analysis.



Screening of azole resistance in tea and other medicinal plants from conventional and biological agriculture commercially available.

## Methodology

### Samples



- N=40
- Different origins
- Conventional and biological agriculture
- From supermarkets and herbalist shops in January 2021

### Preparation



- Infusion according to ISO 3103:2019
- Extraction with Tween 80 + NaCl Solution

### Inoculation



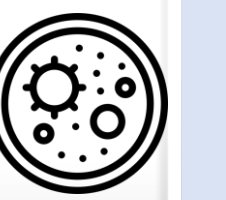
- MEA
- DG18
- SDA supplemented
  - 4 mg/L itraconazole (ITR)
  - 2 mg/L voriconazole (VOR)
  - 0.5 mg/L posaconazole (POS)

### Incubation



- 27°C
- 3 to 7 days

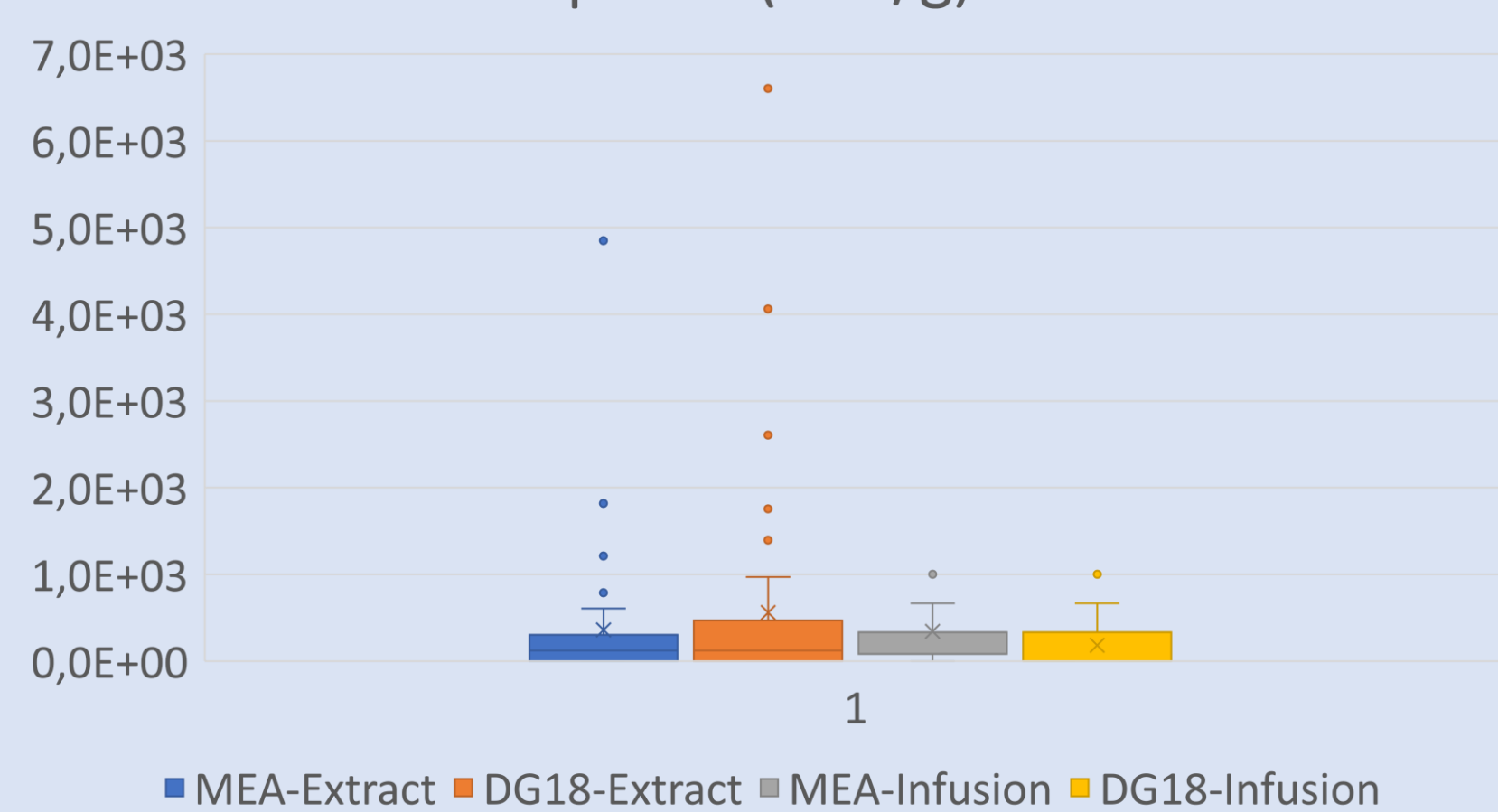
### Mycobiota



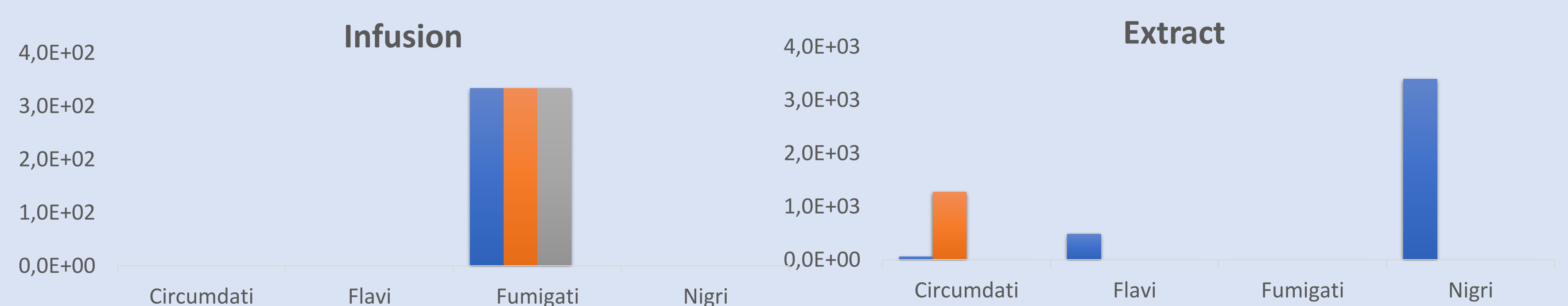
- Fungal counts as colony forming units (CFU) per gram
- Fungal identification by microscopy

## Results

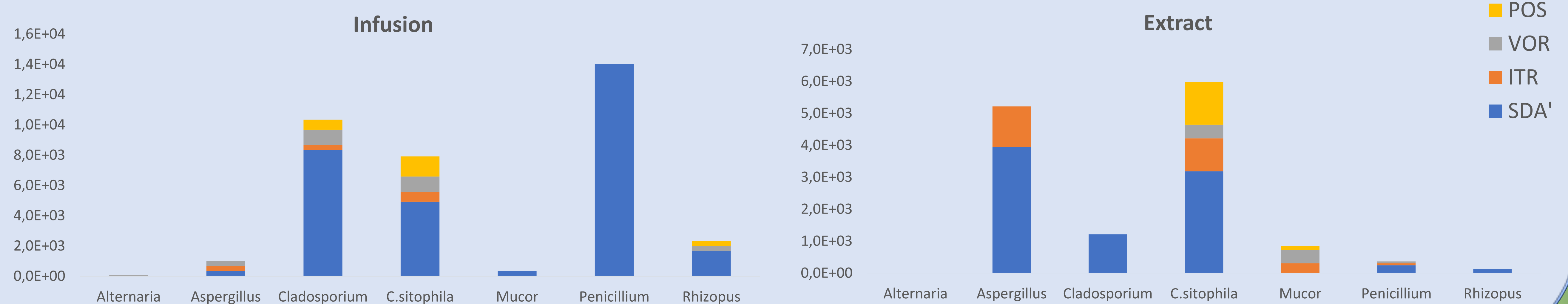
Fungal contamination of tea and medicinal plants (CFU/g)



*Aspergillus* sp. contamination of tea and medicinal plants (CFU/g)



Azole-resistance screening of tea and medicinal plants (CFU/g)



## Relevance

## Conclusion

Fungal contaminants were present in tea samples and medicinal plants for infusion, including azole-resistant fungi such as *Aspergillus* section *Fumigati*.

- The presence of *Aspergillus* sp., particularly section *Fumigati*, resistant to azoles in infusions may represent a health risk for consumers, especially immunocompromised individuals.
- Mycotoxins detection and correlational statistical analysis are ongoing to further determine whether there is a relation between sample origin, fungal contamination and mycotoxigenic profile.