Commercial tea samples: A natural health ally or an *Aspergillus* infusion?

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INTRODUCTION AND PURPOSE

Tea consumption has been increasing in the last years [1]. The lack of specific legislation concerning microbial contamination of teas and infusions might represent a risk for consumers' health [2].

This study characterizes fungal contamination and azole resistance on green and black tea and other infusions commercially available in Portugal.

METHODS

Sample type	Origin	Packaging
Green tea	China; Portugal (Azores); England; Japan; Indonesia, Ceylon (Sri Lanka); Nepal	Bulk (N= 13); Tea bags (N=27)
Black tea		
Other		

Leaves → 1 Extraction with 0.1% Tween™80 saline solution

Infusion → Boil in water + Filtration

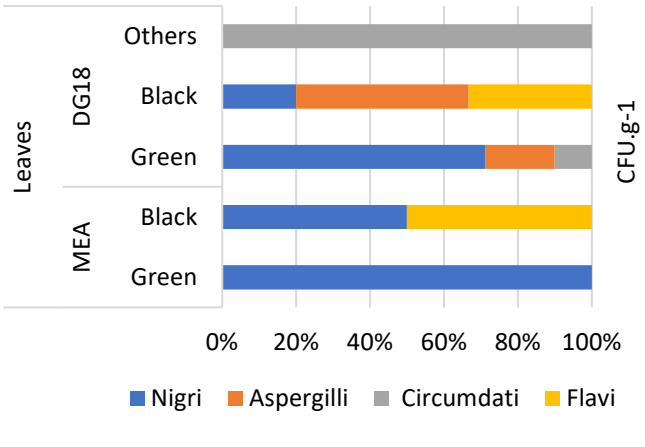
2 **Culture:** 150 µl sample extracts in MEA, DG18 (5-7 days, 27 ºC)

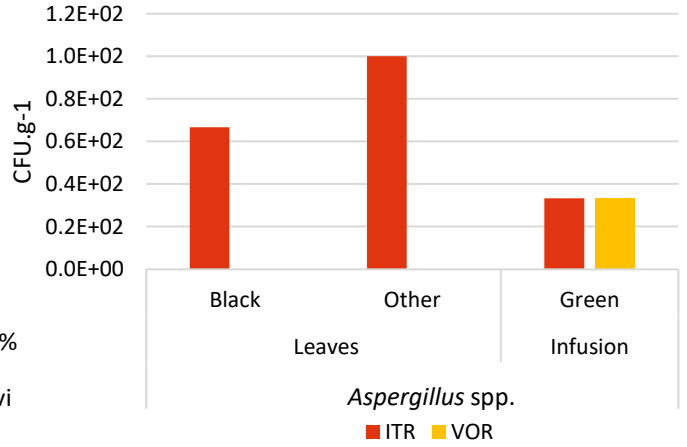
3 **Azole resistance secreening:** 150 µl sample extracts in 4 µg/mL itraconazole (ITR), 2 µg/mL (VOR), 0.5 µg/mL posaconazole (POS) supplemented Sabouraud media (EUCAST) (3-4 days, 27 ºC)

4 **Analysis:** Fungal densities (CFU.g^{-1}) and fungal identification by macro and microscopic morphology

RESULTS

- Highest fungal counts (87.7% MEA; 69.6% DG18) observed in **green tea leaves**.
- ***Aspergillus* spp. detected in green and black tea leaves**, and the most common genus in leaves (67.8% MEA; 91.9% DG18).





Green tea infusion:

- Two *Aspergillus* sections identified on MEA: *Nidulantes* (7.69%) and *Fumigati* (7.69%)
- ***Aspergillus* section *Fumigati* identified on ITR (33%) and VOR (20%)**

CONCLUSIONS

Aspergillus spp. was widespread in tea samples.

The presence of *Aspergillus* section *Fumigati* in MEA and azoles in green tea infusion raises concerns about health risks for consumers due to its clinical relevance.

Further investigation is needed regarding tea consumption and human exposure to fungi.

References:

[1] Assunção R. et al.(2021). Drinking Green Tea: Despite the Risks Due to Mycotoxins, Is It Possible to Increase the Associated Health Benefits? Toxins, 13(2), 119.

[2] Viegas C et al. (2020). Commercial green tea from Portugal: Comprehensive microbiologic analyses. International Journal of Food Microbiology, 333, 108795.

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