

Introduction

Aim

The presence of microorganisms in ophthalmic instruments and surfaces can lead to the exposure of patients to several infections [1]. However, there is no information regarding fungal and bacteria contamination in optical shops.

This study aims to characterize fungi and bacteria contamination in air and surfaces from 13 optical shops covering also ophthalmic instruments.

Materials and Methods

Air samples were collected through an impaction method onto malt extract agar (MEA) supplemented with chloramphenicol (0.05%) used for fungi and Tryptic Soy Agar (TSA) supplemented with nystatin (0.2%) used for bacteria. Surface and equipment's swab samples were also collected side-by-side. All the collected samples were incubated at 27°C for 5 to 7 days (fungi) or at 30°C for 7 days (bacteria).

Table 1 – Sampling sites (air, surfaces and equipment)

Air		Surfaces		Equipment
Clients/patients room	waiting	Clients/patients room	waiting floor	Trial frames
Optometry office		Optometry office floor		Foropter
Outdoor (reference)				Biomicroscope
				Pupillometer
				Automatic refractometer

Results and Discussion

FUNGI

- 13 different species/genera were found in the air, being the most common *Alternaria* sp. (62.0%).
- 8 different species/genera were identified in the surfaces, ranging from 2 to 5x10⁴ CFU/m², being the most common *A. versicolor* complex and *Penicillium* sp. (40.0%).
- The trial frames were the most contaminated equipment, since 50.0% of the collected samples were with countless colonies.

BACTERIA

- The airborne bacterial population indicated higher concentrations in the contactology office (average: 133 CFU/m³) than in the client's waiting rooms (average: 126 CFU/m³).
- The surface samples indicated bacterial concentrations ranging from 2x10⁴ to 1x10⁶ CFU/m², pointing out the automatic refractometer as the surface with higher bacterial load.

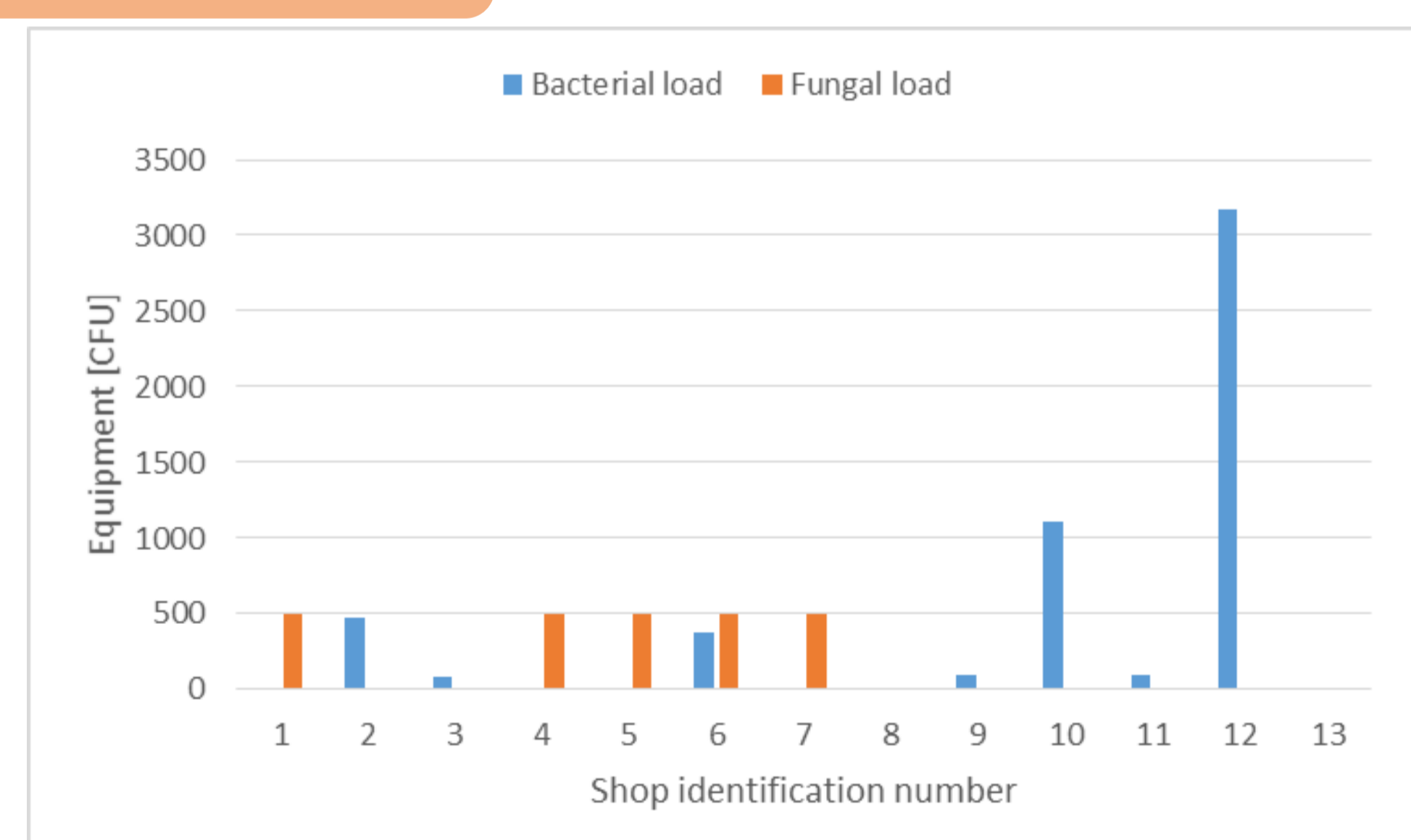


Figure 1 – Total CFU found in the equipment, both for bacteria and fungi

- National legislation does not consider the occupants' susceptibility [2].
- Results should be compared with a more demanding threshold, such as the ones applied in hospital settings [3].

Conclusions

Data obtained reinforces the need to ensure **proper hygienic conditions**. Further investigations regarding sources of biological pollutants would be important **to provide information to the public health stakeholders**.

[1] Szczotka-Flynn et al., (2010) Microbial Contamination of Contact Lenses, Lens Care Solutions, and Their Accessories: A Literature Review, *Eye Contact Lens Sci. Clin. Pract.*, 36(2), 116-129.

[2] Rimac et al., (2010) Exposure to poultry dust and health effects in poultry workers: Impact of mould and mite allergens. *Int Arch Occup Environ Health*; 83: 9–19.

[3] Augustowska and Dutkiewicz (2006) Variability of airborne microflora in a hospital ward within a period of one year. *Annals Agriculture Environmental Medicine* 13: 99–106.