# PRELIMINARY EVALUATION OF THE PRESENCE OF MICROPLASTICS IN SALIVARY FLUID OF PERUVIAN INDIVIDUALS

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**INTRODUCTION:** Microplastics are small particles ranging from 1 μm to 5 mm and are formed from the degradation of plastic, they can be found in water, soil and air, in their various forms such as granules, fibers and fragments. In recent years, microplastics have been considered an emerging pollutant due to their persistence and interaction with the environment. They have been found inside animals, including humans, and can affect health from intestinal to hepatic damage, and also cause toxicological effects by acting as endocrine disruptors and generating oxidative stress. Lima was considered in 2023 as the capital with the worst air quality (suspended particles) in Latin America, exceeding the WHO recommendations. Microplastics can be considered as possible air pollutants, being suspended due to their size and can enter the body through inhalation and ingestion of food. **OBJECTIVE:** To evaluate the presence of microplastics in salivary fluid of apparently healthy Peruvian individuals residing in the city of Lima. **MATERIALS AND METHOD:** Saliva (5 ml) from five individuals in three different stages: before and after ingesting food and after oral cleaning, was collected. Each sample was treated and untreated with 30% hydrogen peroxide, then placed on a slide and observed under an optical microscope with a built-in camera, total magnification of 400x and 1000x, considering microplastics as a fibrous, fragmented non-refractive material with irregular shapes and sizes as well as different colors. **RESULTS:** The evaluation indicated the presence of microplastics in untreated samples, observed as transparent and colored fibers, there were also yellow angular fragments of different sizes, these results were corroborated in the samples treated with hydrogen peroxide. **CONCLUSION:** Microplastics were found in the salivary fluid of Peruvian individuals in different shapes and sizes, being possible that the presence of microplastics observed came from air, water and food. It is recommended to extend the study with a larger sample size and chemical analysis.

**KEYWORDS:** Microplastics, saliva, microscopy, Peru.

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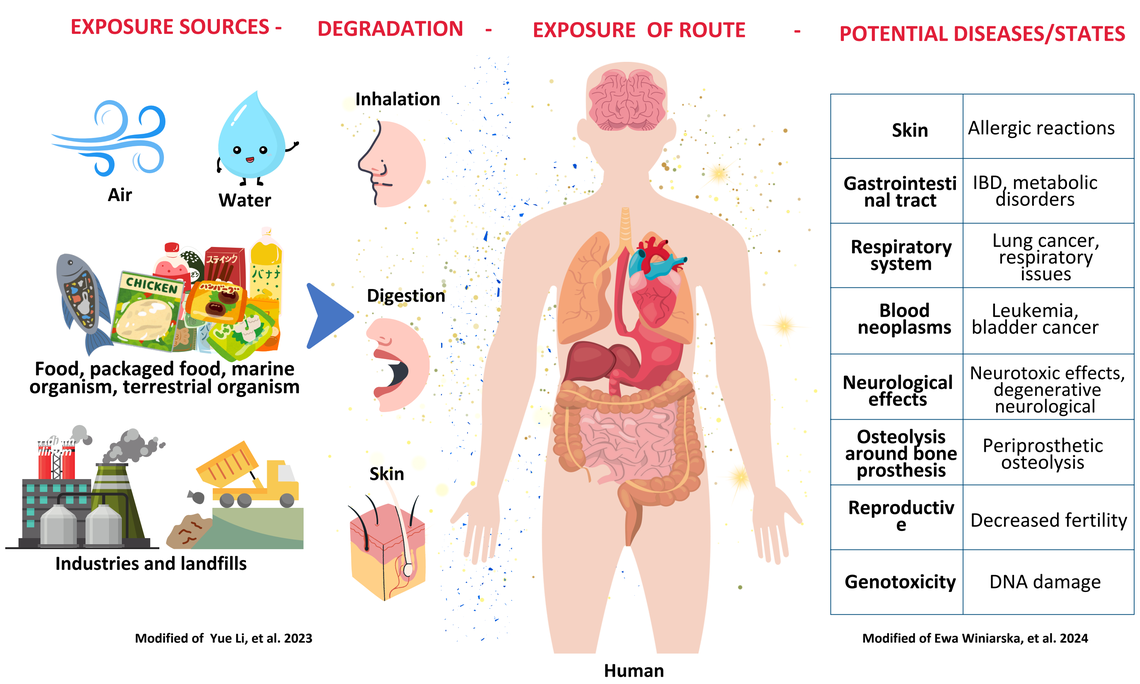
## INTRODUCTION

MP are small particles ranging from 1 µm to 5 mm and are formed from the degradation of plastic, they can be found in water, soil and air, in their various forms such as granules, fibers and fragments. In recent years, microplastics have been considered an emerging pollutant due to their persistence and interaction with the environment.




| | |
|---|---|
| **Skin** | Allergic reactions |
| **Gastrointestinal tract** | IBD, metabolic disorders |
| **Respiratory system** | Lung cancer, respiratory issues |
| **Blood neoplasms** | Leukemia, bladder cancer |
| **Neurological effects** | Neurotoxic effects, degenerative neurological |
| **Osteolysis around bone prosthesis** | Periprosthetic osteolysis |
| **Reproductive** | Decreased fertility |
| **Genotoxicity** | DNA damage |

**Fig. 1. Human exposure to microplastics and potential diseases**

Microplastics can be considered as possible air pollutants, being suspended due to their size and can enter the body through inhalation and ingestion of food.

The objective is evaluate the presence of microplastics in salivary fluid of apparently healthy Peruvian individuals residing in the city of Lima.

## METHODOLOGY

Saliva (5 ml) from five individuals in three different stages: before and after ingesting food and after oral cleaning, was collected. Each sample was treated and untreated with 30% hydrogen peroxide, then placed on a slide and observed under an optical microscope with a built-in camera, total magnification of 400x and 1000x, considering microplastics as a fibrous, fragmented non-refractive material with irregular shapes and sizes as well as different colors.

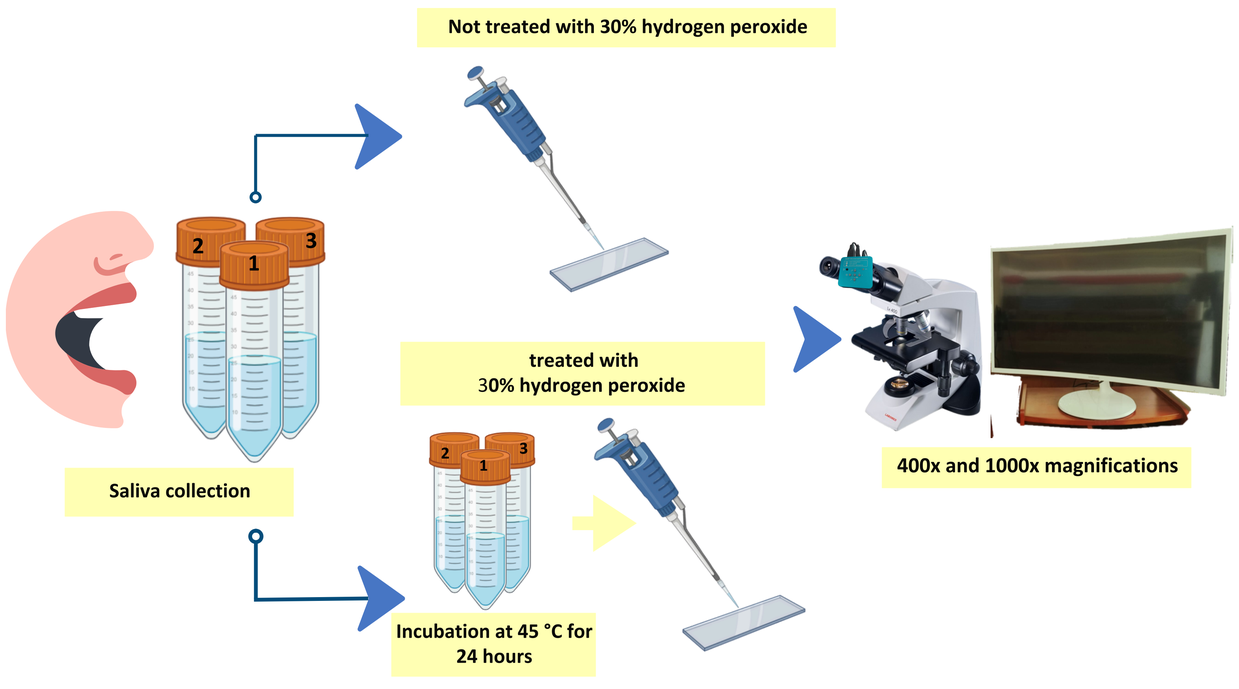



**Fig. 2. Microplastic extraction**

## RESULTS

The evaluation indicated the presence of microplastics in untreated samples, observed as transparent and colored fibers, there were also yellow angular fragments of different sizes, these results were corroborated in the samples treated with hydrogen peroxide.

**Before treatment with 30% hydrogen peroxide**

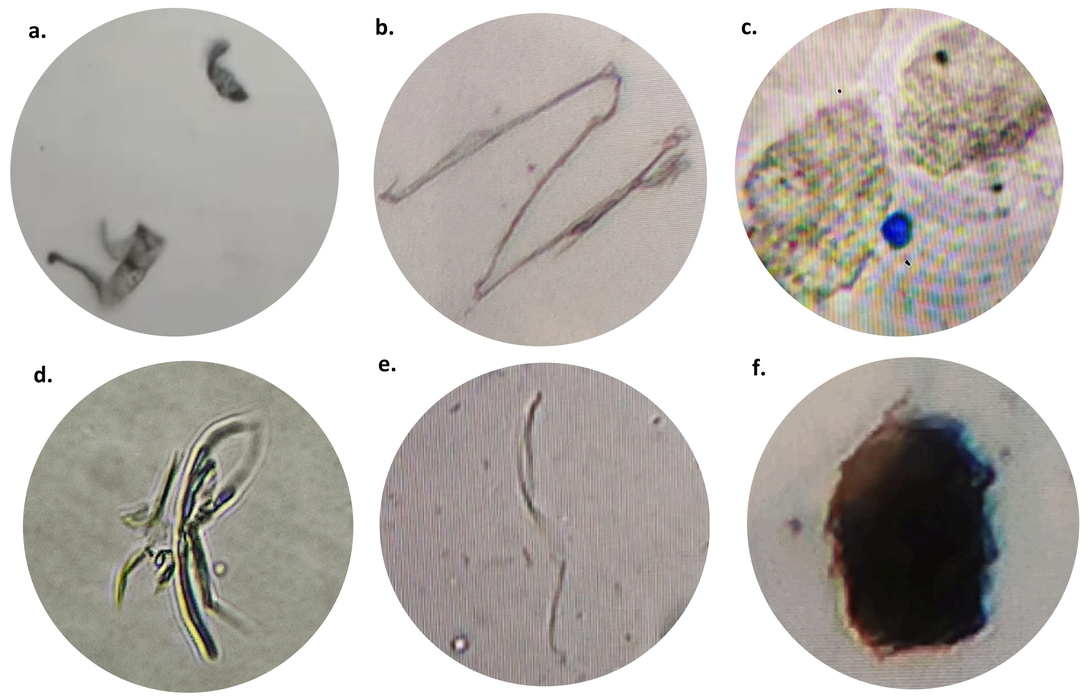



**Fig. 3. Types of MP in salivary fluid: a. Fragments, b. fiber, c. blue fragment, d. fiber, e. white fiber, f. black fragment**

**After treatment with 30% hydrogen peroxide**

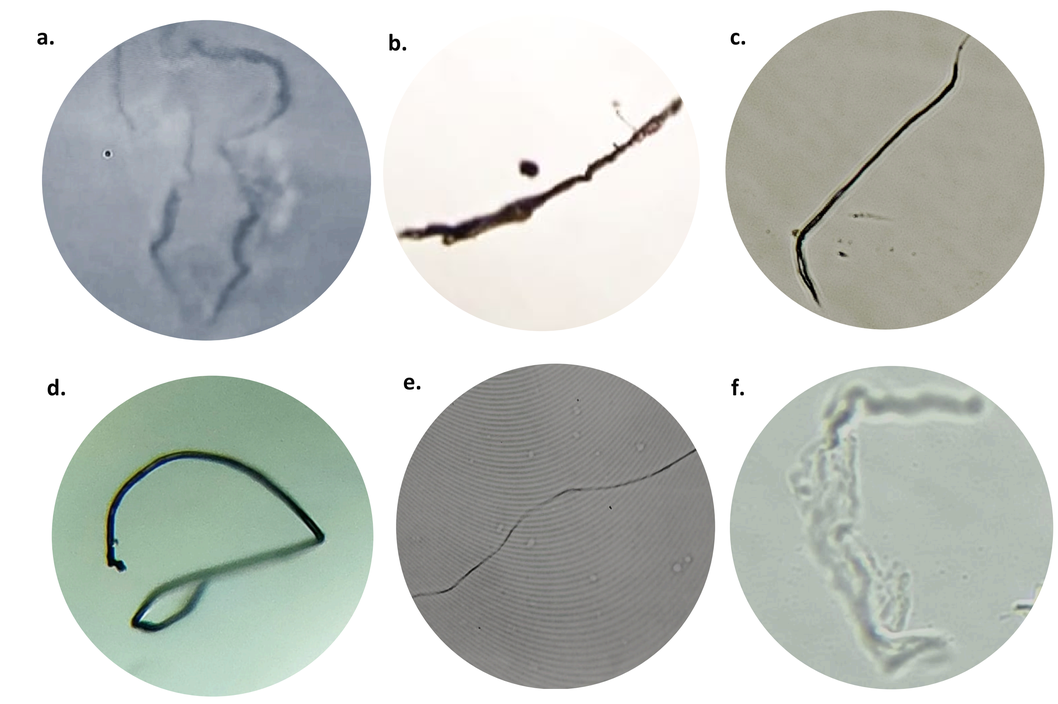



**Fig. 4. Types of MP in salivary fluid: a. Fiber b. dark fiber and fragment, c. dark fiber, d. dark fiber, e. fiber, f. white fiber**

## CONCLUSIONS

Microplastics were found in the salivary fluid of Peruvian individuals in different shapes and sizes, being possible that the presence of microplastics observed came from air, water and food. It is recommended to extend the study with a larger sample size and chemical analysis.

**References:**

1. Li Y, Tao L, Wang Q, Wang F, Li G, Song M. Potential health impact of microplastics: A review of environmental distribution, human exposure, and toxic effects. Environ Health (Wash). 2023;1(4):249–57. 2. Winiarska E, Jutel M, Zemelka-Wiacek M. The potential impact of nano- and microplastics on human health: Understanding human health risks. Environ Res. 2024;251(Pt 2):118535. 3. Gokul GL, Sivakamavalli J, Shantha S. Evaluation of Microplastics in saliva of orthodontic patients with clear aligners with poor and good oral health. Cuest fisioter. 2025;54(4):987–992.