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Ten years of the international Human-Environment Observatory of Estarreja: evolution and major achievements

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Introduction

During five decades, the liquid effluents from the Estarreja Chemical Complex (ECC) (Figure 1) were discharged to the Ria de Aveiro lagoon or deposited in evaporation ponds, through open channels and pipelines. For this reason, this area has been intensely studied by the scientific community since the 90s of the last century. The first studies about the impact of the industrial activity in Estarreja were focused on the geochemical aspects of contamination, whereas studies regarding the relationship between industrial activities, populations, their health status, and biological ecosystems remained in an early state. The need of interdisciplinary inputs and contributions from the social and health sciences to enlarge the scope of the research carried out in Estarreja was obvious, and the basis for the establishment, in March 2010, of the French Observatoire Hommes-Milieus of Estarreja International (OHM.I-Estarreja), co-constructed with U. Aveiro and U. Paris cité, Babel researchers.

Ten years of OHM.I-Estarreja

- ✓ Since the creation of this observatory there was a shift in the focus of studies conducted, from geochemically based to the assessment of environmental and human health effects, reflected by the target matrix studied (Figure 2).
- ✓ Contamination is the structuring and unifying element of numerous studies and projects that are being conducted under the scope of the observatory (Figure 3a), turning it an object of study focused on the territory and its population (and therefore its health).
- ✓ Since the OHM establishment, different approaches have been considered (e.g.: spatial-temporal evolution of the contamination level; health studies of the population; societal changes in the area), allowing to better understand the risk induced by the ECC.
- ✓ The results obtained in the last 10 years clearly show that interdisciplinarity (Figure 3b) was a key factor to address this complex issue of human-environment interactions.
- ✓ The number of publications and projects submitted to each call for projects is an illustration of a dynamic and a desire to promote and communicate on this research (Figure 4).



Figure 1 – Estarreja Chemical Complex

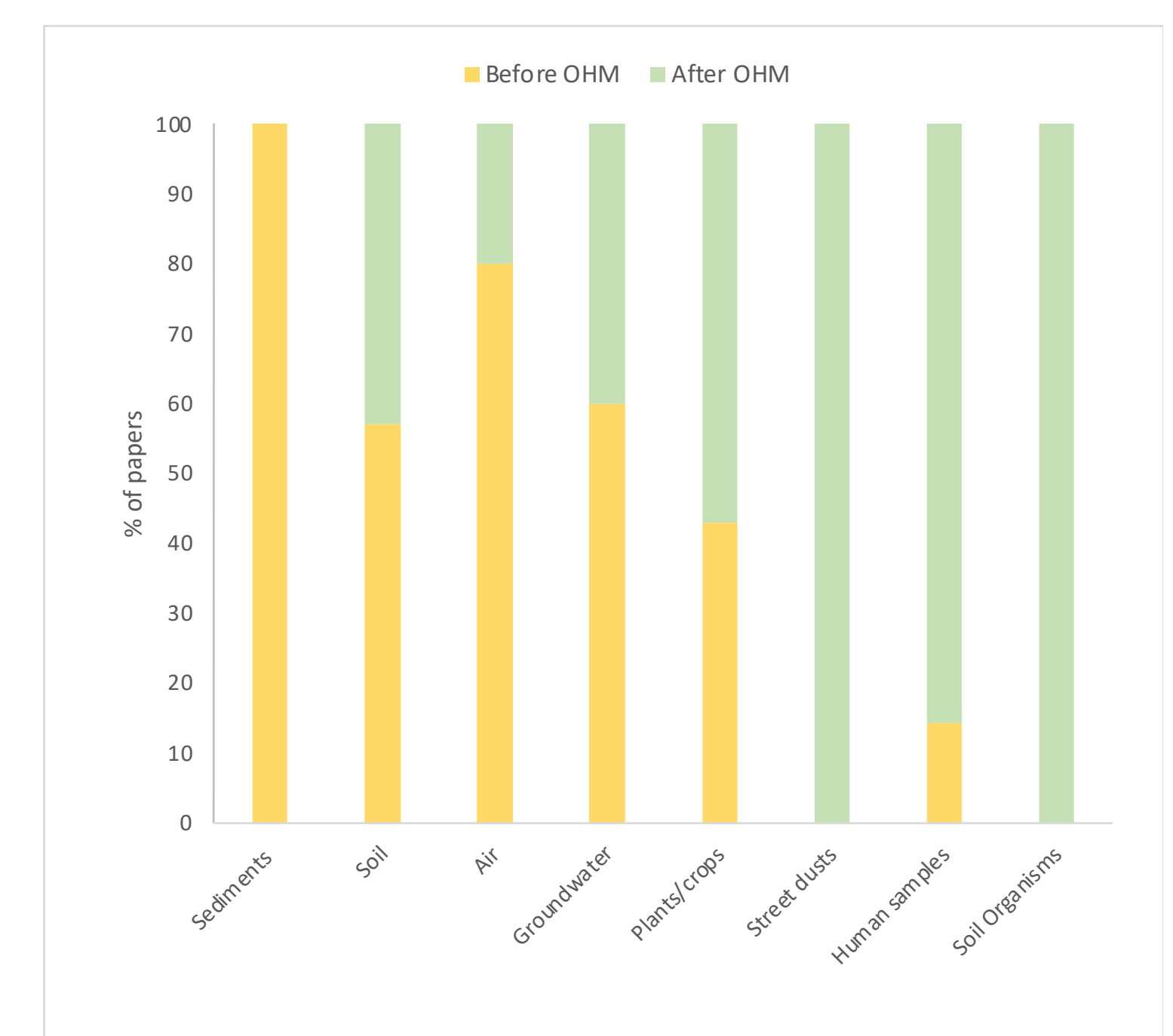


Figure 2 - Distribution of papers by matrix studied, published since 1989 until the OHM creation (before OHM) and during the last ten years (after OHM).

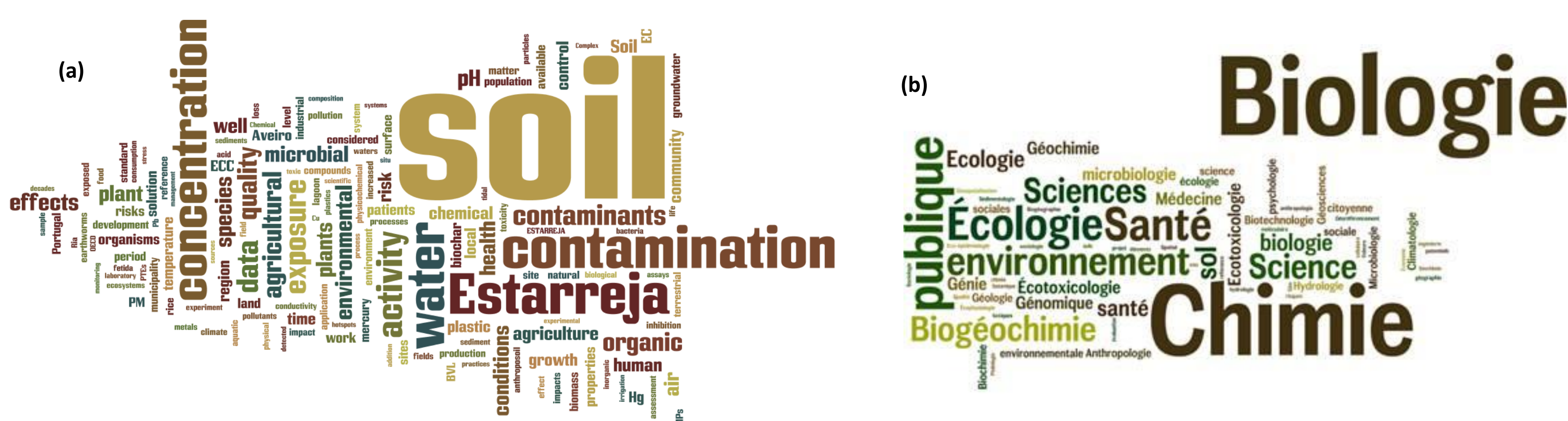


Figure 3 - Visualization of the words cloud and the disciplines present in the projects of the OHM Estarreja.

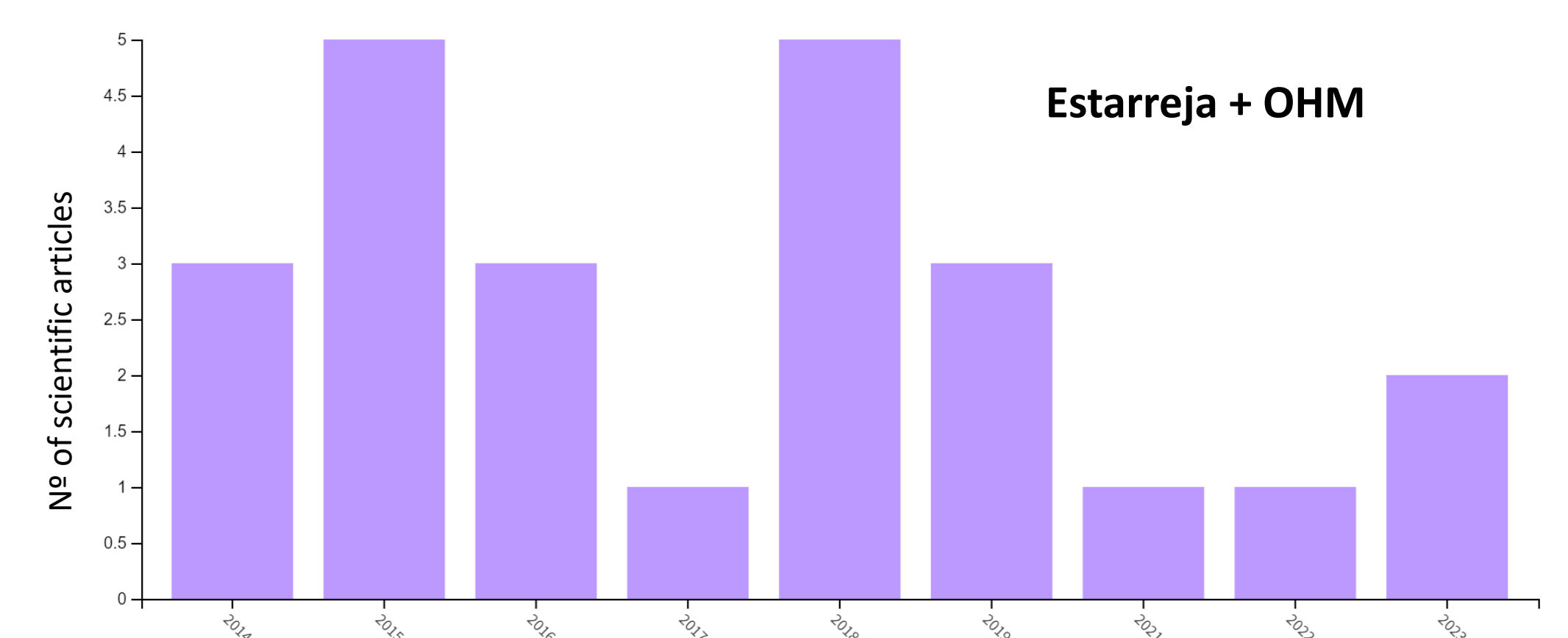


Figure 4 - Publications selected from Web of Science Core Collection searching with words Estarreja plus OHM.

Future Directions

- ✓ Several knowledge gaps were identified (e.g.: toxic elements speciation, biological individual responses to contamination, particularities of family lifestyles) that can contribute to confirm or infirm the relationship between health, contamination and socio-ecosystem.
- ✓ Special attention should be paid to past and present evolution of the relationships between Estarreja population and its environment. The risk perception evolution, the economic crisis, the climate change, are likely to induce modifications in the local ecosystem, and consequently in the welfare of the population.
- ✓ The OHM.I-Estarreja gives the opportunity to catch, in a dynamic way, the adaptive pathways of the population-environment relationships.

Acknowledgments

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