



## Tree bark as a bioindicator of yttrium in urban and suburban areas from Leicestershire, England.

Peña-Fernández A. <sup>\*1,2</sup>, Lobo-Bedmar MC.<sup>3</sup>, Evans MD.<sup>2</sup>, Jagdev GS.<sup>2</sup>, Peña MA.<sup>4</sup>

<sup>1</sup> Faculty of Medicine and Health Sciences, University of Alcalá, Ctra. Madrid-Barcelona, Km. 33.600, 28871 Alcalá de Henares, Madrid, Spain.

<sup>2</sup> Leicester School of Allied Health Sciences, De Montfort University. The Gateway, Leicester LE19BH, UK.

<sup>3</sup> IMIDRA. Departamento de Investigación Agroambiental. "Finca el Encín" Crta. Madrid-Barcelona Km, 38.2, 28800 Alcalá de Henares, Madrid, Spain.

<sup>4</sup> Facultad de Farmacia, Universidad de Alcalá, Crta. Madrid-Barcelona Km, 33.6, 28871 Alcalá de Henares, Madrid, Spain.

Email: [antonio.penafer@uah.es](mailto:antonio.penafer@uah.es)

### INTRODUCTION

Picking-up wild edible mushrooms from Leicestershire (England) is not recommended owing to their content of yttrium (Y) (Peña-Fernández et al., 2023).

**Aim:** To monitor air quality for this element, samples from tree bark were assessed, as they have been described as suitable bioindicators.

### MATERIAL AND METHODS

Initial 2-6 millimetres of bark were collected from 55 different trees across Leicester city and 41 from surrounding rural/suburban areas (Fig 1); samples were taken at 1.50–1.80 metres from the ground to limit contamination from topsoil/dust (Guéguen et al., 2011) from September to November 2018.

- ☐ Y was monitored by ICP-MS in cleaned/ground/homogenised samples (Minganti & Drava, 2018) mineralised with HNO<sub>3</sub>/H<sub>2</sub>O<sub>2</sub> [LoD=0.00073 ng/g dry weight (dw)].
- ☐ Data was processed using statistical methods applied to censored data available in the 'NADA' statistical package.

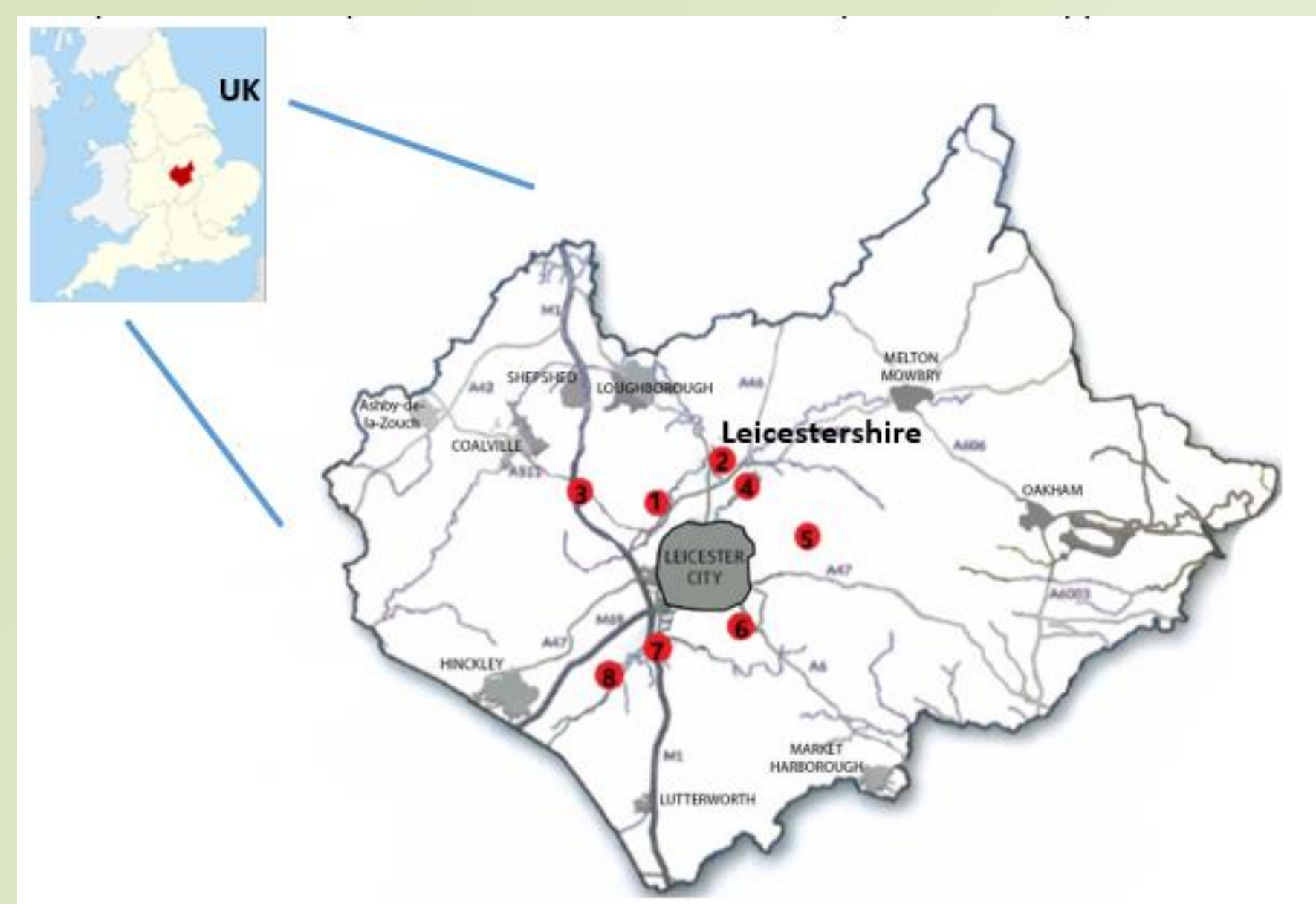


Fig 1. Study area. The city of Leicester is indicated in grey (Leicestershire, UK).



### RESULTS AND DISCUSSION

- ✓ Slightly higher levels were found in bark samples collected from trees across the suburban and rural areas (median and range, in ng/g dw): 6.339 (1.514-48.705) vs. 6.118 (1.832-126.027), suggesting similar airborne contamination by Y in both areas.
- ✓ The presence of Y was slightly higher in wild mushrooms collected from urban parks and green spaces across Leicester city (Peña-Fernández et al., 2023), although mushrooms were only collected from a nature park situated NW of Leicester city, which might explain the differences.

- ✓ Thus, although the content of Y also varied between tree barks collected across the four cardinal subareas in which Leicester city was divided [NW (4.967) < NE (5.946) < SW (11.677) < SE (32.974)], the distribution found matched the same pattern described in the wild mushrooms collected within the city.
- ✓ Levels of Y in the tree bark were lower than the range reported in bark samples collected from Genoa (Italy; 60-1290 ng/g) (Minganti & Drava, 2018), which could indicate a lower airborne contamination by Y in Leicester city.

### REFERENCES

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### CONCLUSIONS

Although our results should be considered as preliminary, in general, **lower atmospheric contamination by Y was determined across Leicestershire**. However, the high presence of Y detected in edible mushrooms recommends a continuous monitoring of this metal in Leicestershire; this could be easily done using tree bark as a bioindicator instead of operating automated monitoring stations, which are more expensive.