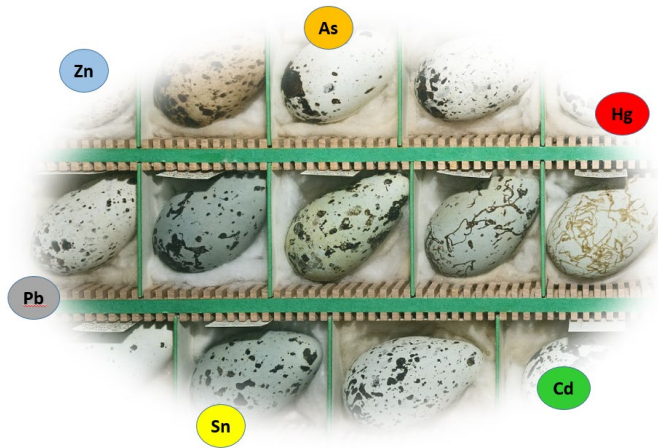


OF METALS AND BIRDS



Supervisors:

Monique Gagnon; Christine Cooper

Project description:

Study of the content of elements in living organisms is essential for assessing spatial and temporal trends in contamination levels. While some elements are essential to life, many non-essential elements such as mercury, lead and cadmium are now found in measurable amounts in all environmental compartments. Birds are no exception, being exposed to metal contamination in urban as well as in rural environments. In fact, birds are considered to be one of the best bioindicators of metal contamination.

Metals accumulated by birds can be partially depurated via egg laying, with metals encapsulated in the calcium matrix of the eggshell. A suite of metals can be quantified in small fragments of eggshells, by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). This method uses a laser to pulverise the surface of the eggshell and subsequently quantifies a suite of metals in the ablated powder.

The aim of the project is to explore spatial and temporal trends in metal contamination, as measured by the heavy metal contents of bird eggshells. Museum eggshell specimens will be used to maximise the temporal (~100 years) and spatial (>250 kms) extent of the study.

The candidate is expected to perform selection of eggshells from the Western Australian museum, and prepare all samples for LA-ICP-MS. Given the complexity of the instruments, experts will conduct the LA-ICP-MS analyses and provide the candidate with the data. This analysis generates thousands of data points which will need to be assessed for quality, relevance and biological significance before analysis and interpretation. It is expected that the candidate will contribute to producing a manuscript for publication from their honours thesis.

References

- Markowski et al. (2013) Avian feathers as bioindicators of the exposure to heavy metal contamination of food. *Bull. Environ. Contam. Toxicol.*, 91; 302-305.
- Bandoniene et al. (2018) Rare earth element labelling as a tool for assuring the origin of eggs and poultry products. *J. Ag. Food Chem.*, 66; 1729-11738.