

The magic SING Box: addressing the challenges of the long-term and safe preservation of herbarium collections in the tropics

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Effective conservation of the plants on which we rely needs sound data gathered from research. This requires plants to be given names that are then correctly applied, all of which revolves around work based on herbarium collections. Yet, the challenge to ensure the long-term preservation of such collections, particularly in the tropics, cannot be overstated. Pests and high humidity and the associated problems they bring are very difficult to control. Increasing global attention to the health and safety of people working with research collections has curtailed the use of previous pest-control methods, such as regular fumigation and the poisoning of herbarium specimens with mercuric chloride, including at the herbarium of the Singapore Botanic Gardens (SING). Despite the welcome human benefits, these changes could negatively impact the preservation of collections for use by future generations, especially in the most biodiverse regions of the world. Here we discuss how the SING herbarium met the need to update our safety protocols whilst ensuring that long-term herbarium specimen preservation in a tropical environment was not compromised. Central to this strategy was the continuation of the long-established biosecurity protocols for specimens entering the collection but to rehouse the entire collection into bespoke airtight, transparent, freezable, stackable and modular herbarium boxes. We share our experience of the design of the ‘SING Box’ and what we have found in the five years since their deployment. The two main advantages of the SING Box include an effective micro-compartmentalisation of the collections, which limits any serious pest outbreaks, and an ability to better regulate the temperature and humidity of the collections, especially from any fluctuations. As the greatest cost was in the initial design and production of the mould for the boxes, we freely offer the use of our mould to regional herbaria to produce boxes for their own collections.