

## ANPSC Members Meeting, May 2023 “Say ‘cheese-tree’, Australia’s vascular plant photographic record” With speaker Tom Mesaglio

As a stats grad and botany fan, I warmed to Tom Mesaglio’s article in *The Conversation*: “Thousands of our native plants have no public photographs available.”

Would he care to talk to us? Sure. As it happened, Friends of ANBG were already on to him. If we postponed our own member meeting, Tom could do two shows in the one day. Our evening attendance equalled the matinee. Including younger members. Who understood Tom’s technological adaptations, a lot better than I did.

Tom is a PhD candidate, at UNSW Sydney. Working to improve understanding and knowledge of Australian plants. He’s an energetic curator/moderator on global citizen-science platform, *iNaturalist*. He’s published research in marine forensics, bushfire recovery, and invertebrate ecology. He won a 2022 Eureka Prize, for Innovation in Citizen Science.

His subject is the [incomplete] photographic record, among Australia’s 21,000 vascular plant species. Where are the gaps? What drives them? Why is it important to plug them?

To begin with, Tom nods to botanical tradition. We still need old-school physical “vouchers”. Those herbarium records around the world, that must be lodged, before any new plant species can be formally described.



*Our endemic fringe-lily is widely photographed*

Equally, the advantages of photo vouchers are apparent. What if the plant’s key diagnostics are up in the sky? As in, that mammoth blackbutt he shows us. Many of our tropical trees are similar. What if the plant has nasty spines or stingers? Or



*Towering Eucalyptus pilularis, or blackbutt*

it’s rare and you’d rather not collect a physical specimen. For example, endangered and bedraggled *Macrozamia spiralis*. Clinging to a reserve near Tom’s Sydney home.

On the edge of a cliff, it might not be worth your life, to angle for a specimen. Even then, a photo record can capture essential features of a plant. Plus, landscape forms and plant species, with which it associates.

Tom was inspired by a remarkable 2021 paper. Authored by American botanist Nigel Pitman with a footy team of co-writers: “*Identifying gaps in the photographic record of the vascular plant flora of the Americas.*”

Over 90% of North America’s species have been snapped. This falls to 60-70% across Central America and the Pacific side of South America. Then 60% or lower, in Brazil and the Caribbean.

For example, the Americas host an amazing 900 unphotographed species in the common genus *Piper*. It’s all very well, to point at their map locations. But what if it’s thick jungle in a dangerous region?

Tom wondered, how was Australia faring? First, he’d need an authoritative list of all our described, vascular, plant species. Using Australian Plant Census, he considered all taxa described up to 2018. Across our eight states and territories, plus nine other offshore domains. Applying strict rules, he winnowed down to a census figure of 21,077 species, spanning 2,190 genera and 259 families.

Then, Tom waded through 33 online plant photo-resources, governmental and other. From these sources, rules were, he’d only accept actual

photos, of Australian origin. These had to feature a live plant, include a “recognisable” plant part, and be assured in their ID. This second census disgorged a surprising 3,715 unphotographed species. Almost 18% of our vascular flora.

In the charismatic *Banksia* and *Hakea* genera, popular with growers, Tom found not a single unphotographed species. Yet there were 98 gaps in *Acacia* and 78 in *Hibbertia*.

Over 50% of species are unphotographed, in the sedge genus *Fimbristylis*, shrub genera *Triumfetta* and *Heliotropum*, and herb genus *Mitrasacme*. Poorly snapped families are grasses, peas, daisies, myrtles and sedges.

In some genera and families, including the grasses, it’s tedious to tell the individual species apart. You need a lot of markers. It’s harder to get motivated, to snap them.

That can’t explain, wide variations in the photo-record. In NSW, ACT, Victoria, and Tasmania, over 95% of plant species are photographed. Queensland and WA just top 80%.

Tom drills down, to the three photo-impooverished “hotspots” nationally. These are the Far South-West, the Top End, and the Wet Tropics. These are also biodiversity hotspots – meaning there’s more stuff to keep up with. In addition, they are remote and tricky to access.



Charismatic – *Banksia coccinea*

Overall, Australia’s trees have relatively less of a photo-gap. Our herbs and graminoids, relatively more. The latter two types are less charismatic and less obvious.

Via a histogram, Tom displays another curiosity. 50% of our un-snapped species have been formally described after 1993. Despite increasingly cheap and portable cameras. How could that be? Well, some of the newbies have been described from

specimens collected a long time ago. But never worked over.

Oddly enough, some newbies are still being described, via line drawings only. Or, their photos may exist, but not on readily accessible plant-photo databases.



Remote WA habitat of photo-shy *Olearia eremaea*

For me, Tom’s key recommendation looks like a no-brainer. Internationally, Australia’s botanists should push, to help get it up. You ought to be required to include a photo. To formally describe any new plant species.

He decries, formal papers announcing new species, behind paywalls. On the contrary, plant photos should be uploaded, to publicly accessible and searchable databases. Photographers should make use of “Creative Commons” licences. So other citizens can re-use their snaps, for plant IDs.

The good news? Already, Tom has punted 500 species from his “unphotographed” list. Has made a few scoops himself. Sometimes, the species is way the back of beyond. At other times, adjacent to the carpark. Once, he struck gold, via casual conversation with a national *Eremophila* whiz.

Maybe Canberra citizen-scientists could pitch in? As it happens, even the ACT has 17 un-snapped plant species. Mostly those motley grasses, *Poaceae*. But a couple of species, like the daisy *Senecio niveoplanus*, might be lower hanging “fruit” to snap.

What about that cheese-tree? The scientist’s pun is not in his presentation. Distinctive *Glochidion fernandi* extends south of Sydney. Not as far as Bateman’s Bay. Keep dogs leashed. Seems like it’s toxic for them.

*Stephen Saunders, President, ANPSC*