

Thousands of native plants are unphotographed, and citizen scientists can help fill the gaps

March 14 2023, by Ben Knight



Almost 20 per cent of native Australian plant species lack a verifiable photograph. Credit: Thomas Mesaglio.

Scientists have documented plant species for centuries to help us

understand and protect the incredible diversity of flora in our world. But according to new research, many have never actually been photographed in their natural habitats—and that's a problem.

Researchers from UNSW Sydney and the Australian Institute of Botanical Science, part of the Royal Botanic Gardens and Domain Trust, surveyed 33 major online databases of plant photographs to examine the photographic record of Australian [plant species](#). The findings, published in *New Phytologist*, reveal out of 21,077 native Australian vascular plant [species](#), almost 20 percent lack a verifiable photograph.

Lead author of the study and UNSW Science Ph.D. student Thomas Mesaglio says Australia is one of the richest areas in the world for [native species](#).

"It was surprising to see how many plant species had just line drawings, illustrations, paintings, or even no media at all," Mr. Mesaglio says.

Dr. Hervé Sauquet, co-author of the study and Senior Research Scientist at the Australian Institute of Botanical Science, is based at the National Herbarium of New South Wales.

"All species of plants ultimately rely on specimens in herbarium collections for their identification," Dr. Sauquet says. "Yet, even in this digital age where most herbarium specimens have been scanned and are accessible on the web, photos of live plants in the wild remain in critical need."

Senior author of the study from UNSW Science Associate Professor Will Cornwell says a lack of detailed photos can have real consequences. Many plant species that are difficult to identify in the wild may go extinct if scientists cannot properly identify them with the help of photos.

"We had assumed every plant species would have simply been photographed by someone, somewhere, throughout history. But it turns out this isn't the case," says A/Prof. Cornwell.

"This is where citizen scientists can come in and help us fill this gap with their photos."

Gaps in the photographic record

Photographs can help botanists and taxonomists who work with [plant specimens](#) by preserving characteristics like flower color that get lost over time in their samples. They can also show additional features, such as the orientation of leaves or bark appearance, and add ecological context.

"Having a comprehensive photographic set helps us to be confident in our identifications," Mr. Mesaglio says. "Particularly when it is practically challenging to collect and preserve the entire plant, photos complement the physical voucher by showing the soil type, the habitat it's growing in, and other species growing alongside it."

But it turns out not all plant groups are photographed equally. Just as some animals receive less attention than others, there might also be a bias against less charismatic plants.

The study found the most well–photographed plant groups tend to be shrubs or trees with more noticeable or spectacular features, such as colorful flowers. *Banksia*, for example, is one of only two Australian plant genera with more than 40 species to have a complete photographic record. Meanwhile, the family with the most significant photo deficit was Poaceae—commonly known as grasses—with 343 unphotographed species.

"We noticed a charisma deficit, so the species that tend to be harder to see are the ones missing out," Mr. Mesaglio says. "They may have innocuous or pale-looking flowers or be smaller and harder to spot grasses, sedges and herbs."

Geography also affected the photographic record. While most species across the south-eastern states of Australia have comprehensive records, Western Australia had the largest void, with 52 percent of all unphotographed species found there.

"The primary 'hotspots' for unphotographed Australian plants are areas with high plant diversity, but the environments are rugged and often difficult to access, particularly by road," Mr. Mesaglio says. "But it means there's an exciting opportunity to visit these locations because we might capture something that has never before been photographed."

Activating citizen scientist snaps

It's one thing to have comprehensive photographic records for professional scientists to use in identification guides. But when the plant world is under threat from multiple fronts, including habitat clearing and climate change, photos can help engage the public in plant science.

"People can engage with, sympathize with, and get much more excited about plants with photographs, which is vital when our natural environments are more at risk than ever," Mr. Mesaglio says.

"Because [digital photography](#) is so accessible now, anyone can also help make a meaningful contribution to science using the camera in their pocket."

Using a platform like iNaturalist, keen citizen scientists can have their snaps identified by experts and share the data with aggregators like the

Atlas of Living Australia and the Global Biodiversity Information Facility to be used in research and conservation.

"Since April last year, we've identified nearly 10 percent of those previously unphotographed species thanks to members of the public uploading their photographs and experts who've kindly identified them," Mr. Mesaglio says. "There could be many more in personal collections or behind paywalls just waiting to be shared."

The researchers recommend a standardized system for scientific plant photography be developed, starting with a requirement in the International Code of Nomenclature for Plants to include at least one field photograph where possible in new species descriptions. They also suggest all new species descriptions be published as Open Access in searchable databases with Creative Commons licensing to maximize their usage.

"We also suspect more photos exist, but they're hidden away on social media or behind scientific paywalls that aren't accessible, discoverable, or searchable," Mr. Mesaglio says.

"Of the species with photographs, many have a single photo. We not only want to capture those unrepresented species but also continue building the photographic record for all species.

"Doing so will help us identify, monitor and conserve our native species for generations to come."

More information: Thomas Mesaglio et al, Photographs as an essential biodiversity resource: drivers of gaps in the vascular plant photographic record, *New Phytologist* (2023). [DOI: 10.1111/nph.18813](https://doi.org/10.1111/nph.18813)

Provided by University of New South Wales

Citation: Thousands of native plants are unphotographed, and citizen scientists can help fill the gaps (2023, March 14) retrieved 23 June 2024 from <https://phys.org/news/2023-03-thousands-native-unphotographed-citizen-scientists.html>

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