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Fair Access or Mirage? A Biodiscovery Case Study at Uluru for Indigenous Benefit-Sharing

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Abstract

International minimum standards for sharing and protecting Indigenous peoples' traditional knowledge have been adopted under United Nations conventions which promote fair and equitable benefit-sharing with Indigenous peoples. However, biodiscovery continues in Australia using Indigenous peoples' traditional knowledge without adequately recognising their rights and interests despite Australia having signed the *Nagoya Protocol*. In this paper, we use legal doctrinal research combined with qualitative analysis and a case study to demonstrate inconsistencies of Australian Commonwealth regulation with the *Nagoya Protocol* for accessing genetic resources and associated traditional knowledge from Commonwealth areas and benefit-sharing with Indigenous communities (Collings 2024). We use an example of biodiscovery at Uluru which is a sacred site where Australian native tobacco species were collected under permit to demonstrate the shortcomings of Australia's Commonwealth access and benefit-sharing regulation. We conclude that regulatory arrangements in Australia for collecting and using biological resources and associated traditional knowledge from Commonwealth areas are inconsistent with international standards and often unenforceable to protect traditional knowledge and provide fair and reasonable benefit-sharing with Australia's Indigenous peoples.

Keywords

Indigenous Knowledges; Australian Native Tobacco; Benefit-sharing; Freedom of Information; Nagoya Protocol

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Introduction

It is widely accepted that cosmopolitanism promotes global unity and inclusion of all peoples while recognising and integrating diverse cultural perspectives and values. The United Nations promotes these ideals through international standard setting. Indigenous peoples have long advocated via various United Nations settings for recognition of their rights as First Nations Peoples and their right of self-determination to maintain, protect and preserve their traditional knowledge. Within the framework of the *Convention on Biological Diversity* (CBD), the United Nations has recognised the importance of respecting, preserving and maintaining Indigenous peoples'[1] traditional knowledge, innovations and practices to conserve biological diversity and to contribute to benefit-sharing with Indigenous communities. Australia's national laws implementing the CBD to access biological resources from Commonwealth areas and for benefit-sharing from utilising such resources and associated traditional knowledge are modelled on different standards of two supplementary instruments of the CBD: the *Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from (Bonn Guidelines)* (Secretariat of the Convention on Biological Diversity 2002) and the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from their Utilisation* (Secretariat of the Convention on Biological Diversity 2011) (Collings 2021). This has resulted in a different level of protection for traditional knowledge in Australian jurisdictions (Collings 2021). The Bonn Guidelines are voluntary and encourage respect for traditional knowledge but without compliance measures for obtaining prior informed consent to utilise traditional knowledge (Collings 2021), whereas the *Nagoya Protocol* is an international agreement signed by the Australian Government in 2012 which is legally binding for Parties, which aims at sharing benefits of the utilisation of genetic resources and associated traditional knowledge with Indigenous communities in a fair and equitable way by mandating Internationally Recognised Certificates of Compliance for obtaining prior informed consent and establishing mutually agreed terms. However, this protocol has not been implemented at the level of domestic law in Australia. Additionally, the regulatory framework for biodiscovery is a maze of inconsistent laws, policies and administrative procedures with minimal assistance to support Indigenous people who want to obtain information about access to and use of biological resources and associated traditional knowledge of their peoples (Collings 2024).

In this paper, we consider an example of biodiscovery at Uluru-Kata Tjuta National Park in the Northern Territory of Australia, which is a Commonwealth area where Australian native tobacco species were collected in 2016. We discuss the barriers to and from participation in benefit-sharing with Indigenous Australians regarding the use of native tobacco species for research and development. We also discuss how this has an impact on Indigenous peoples' rights to maintain, control and develop their traditional knowledge and cultures. We use a case study of Australian native tobacco biodiscovery at Uluru-Kata Tjuta National Park to demonstrate the shortcomings of Australia's access and benefit-sharing regulation and argue that the *Nagoya Protocol* should be ratified and implemented by Australian Governments.

International Standards for Fair and Equitable Access and Benefit-Sharing

The CBD was adopted in 1992 and entered into force in Australia in 1993 by enacting legislation as detailed below in Research Methodology, below. The CBD affirms State sovereignty over natural resources in areas of national jurisdiction and with it the authority to determine access to genetic resources (CBD,

1 The authors refer to First Nations Peoples and Indigenous Peoples or Indigenous Australian Aboriginal Peoples throughout this paper as these are the terms used in the International Conventions, websites, legislation and research papers referred to and to distinguish from Torres Strait Islander Peoples. The first author is of Aboriginal heritage.

articles 4 and 15). 'Genetic resources' are defined in the CBD as 'genetic material of actual or potential value' where genetic material refers to 'material of plants, animals, microbial or other origin containing functional units of heredity' (CBD article 2). With the adoption of the CBD, parties to the document agreed to create conditions for accessing genetic resources in areas of national jurisdiction and fair and equitable benefit-sharing regarding the use of such resources (CBD articles 1 and 15). Indigenous peoples' traditional knowledge was recognised and respected to guarantee its conservation but was not adequately protected from being used for research and development without consent or approval of Indigenous peoples or for benefit-sharing. Benefit-sharing applied only to countries providing genetic resources so that the results of research and development could be shared through the Global Environment Facility and made available to developing countries on mutually agreed terms (CBD, article 19). Much of this research and development involved using Indigenous peoples' traditional knowledge for identifying useful traits and locating biological material. The multiplicity of prior informed considerations for accessing genetic resources led to a decision amongst Parties of the CBD to explore options for the development of guidelines, codes of conduct and guiding principles for access and equitable benefit-sharing. This led to the negotiation and adoption of two supplementary instruments of the CBD: the *Bonn Guidelines* were adopted in 2002; and the *Nagoya Protocol* entered into force in 2014 (Collings 2021). These international instruments were negotiated against the backdrop of advocacy and negotiations for Indigenous peoples' rights and elaborated by the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP), adopted by the United Nations General Assembly in 2007 (United Nations 2007).

The *Bonn Guidelines* are voluntary and intended to assist governments in setting up measures to govern access and benefit-sharing, and promote transparency for accessing genetic resources so that benefits are shared fairly and equitably. The *Bonn Guidelines* recognise the important role of Indigenous communities in monitoring and compliance and in developing and implementing access and benefit-sharing arrangements at the domestic level (*Bonn Guidelines*, para 56). To promote transparency, the *Bonn Guidelines* propose certification of compliance as a mechanism for verifying whether access and benefit-sharing procedures have been followed at the domestic level. As demonstrated in the case study, Indigenous peoples need access to information to monitor how users have accessed genetic resources and the possible use of associated traditional knowledge for benefit-sharing. The first author argued this information is not easily accessible for Commonwealth areas when trying to locate the relevant data about the case study, in particular whether traditional knowledge has been used. When writing this paper, a Freedom of Information request was granted for the access permit application submitted by Kew Gardens for collecting Nicotiana specimens from Uluru (Australian Government, Director of National Parks 2025).

In recognition of the need for more robust compliance measures for access and benefit-sharing, the *Nagoya Protocol* was adopted in 2010. In 2006, the year before the UNDRIP was adopted, negotiations started with the robust participation of Indigenous peoples' representatives through the International Indigenous Forum on Biodiversity and with the participation of civil society and relevant stakeholders, including industry (CBD, International Indigenous Forum on Biodiversity). The *Nagoya Protocol* is significant for acknowledging the UNDRIP (*Nagoya Protocol*, preamble) as a relevant international instrument which affirms Indigenous peoples' rights to participate in decision-making through their own institutions with members that they have chosen, which enhances their rights to maintain, control and protect their traditional knowledge (UNDRIP art 31). The *Nagoya Protocol* emphasises the need for legal certainty and transparency to provide a strong basis for accessing genetic resources, which is important for Indigenous people and resource users (*Nagoya Protocol* introduction).

The *Nagoya Protocol* articulates procedures which aim to ensure that the traditional knowledge of Indigenous peoples is accessed with prior informed consent from or with approval and involvement of Indigenous communities and the establishment of mutually agreed terms (*Nagoya Protocol* art 7). These

provisions for accessing traditional knowledge 'held by' Indigenous communities are intended to 'strengthen the ability of these communities to benefit from the use of their knowledge, innovations and practices' (*Nagoya Protocol* introduction). The rationale is that by 'strengthening opportunities for fair and equitable sharing of benefits from [such] use' these opportunities 'will create incentives to conserve biological diversity for human well-being' (*Nagoya Protocol* introduction). To promote transparency, the *Nagoya Protocol* also establishes a certification of compliance scheme, which, unlike the *Bonn Guidelines*, is centralised so that access permits verifying compliance with access and benefit-sharing procedures are shared by Parties to the Protocol as public documents through the International Clearinghouse Mechanism of the CBD. Transparency is crucial for Indigenous people to monitor how their traditional knowledge is used and verify if commercial use is initiated (*Nagoya Protocol* preamble). The *Nagoya Protocol* is significant for identifying a need to support Indigenous peoples in establishing their own institutions. These institutions are termed 'Indigenous competent authorities' in the *Nagoya Protocol* and are designed to facilitate Indigenous participation in the development of access and benefit-sharing procedures and compliance measures concerning the use of genetic resources from their territories and the use of their traditional knowledge (*Nagoya Protocol* art 5 (5)). Indigenous peoples are often marginalised racial minorities and may need positive and special measures to support their participation in decision-making in matters affecting their rights and interests (*International Convention on the Elimination of All Forms of Racial Discrimination*, art 14 United Nations 1965; Commonwealth of Australia, *Racial Discrimination Act 1975* (Cth)).

The CBD together with the supplementary *Bonn Guidelines* and *Nagoya Protocol* each represent significant milestones in the evolution of international standard setting, which reflect the progressive commitment of the international community to recognise Indigenous peoples' rights to participate in decision-making for self-determination to protect, maintain and enjoy their traditional knowledge. While the *Nagoya Protocol* could be considered to represent a high-water mark in international standard-setting for promoting Indigenous peoples' participatory rights for self-determination, the strength of international standard-setting for fair and equitable benefit-sharing lies in the implementation at the domestic level.

The authors' analysis of Australia's Commonwealth legislation for accessing biological resources from Commonwealth areas poses problems about procedures for accessing information about the use of associated traditional knowledge for research and development. We argue that this could be improved by implementing the *Nagoya Protocol* consistent with other relevant instruments and by introducing legal, administrative and policy measures, especially if the Australian Commonwealth Government issued internationally recognised certificates of compliance for granting access to biological resources and associated traditional knowledge, published with the International Clearinghouse Mechanism of the CBD. The need for the Australian Commonwealth Government to consistently implement such measures on a national basis to promote transparency of access to biological resources and associated traditional knowledge and use is further demonstrated by the case study.

Research Methodology

This paper used three approaches to research. First, it combined two types of legal research methods, which were clearly articulated in the Australian context in the Pearce Report (Pearce et al.1987). The doctrinal legal research approach is the systematic exposition, analysis and critical evaluation of legal rules and their interrelationships. The legal rules that were analysed are part of the international law and Australian legislation. In the second approach, historical reports and government policies and documents were scrutinised. Finally, the paper used a qualitative design, which involved a case study, in which information from public documents and unpublished documents was collected via freedom of information procedures to underpin the legal analysis and support the legal research findings.

Laws, Policies and Procedures for Accessing Biological Resources in Commonwealth Areas and Associated Traditional Knowledge

In 1999, the Commonwealth Government introduced the *Environment Protection Biodiversity Conservation Act 1999* (Cth) (EPBC Act), (Commonwealth of Australia, 1999a), which is national legislation implementing the CBD and provides conditions for accessing biological material and genetic resources from Commonwealth areas of Australia. Commonwealth areas situated throughout Australia include land owned by the Commonwealth or a Commonwealth agency (EPBC Regs 8A.02). The permit procedures and compliance requirements for accessing genetic resources from Commonwealth Areas, including the use of associated traditional knowledge, are set out by the *Environment Protection Biodiversity Conservation Regulations* 2000 (Cth) (EPBC Regulations) and are introduced under s 301 of the EPBC Act. Commonwealth areas are located throughout Australia and are lands and waters owned by the Commonwealth or a Commonwealth agency and airspace of the land, and land held under lease by the Commonwealth (such as Uluru-Kata Tjuta National Park) or a Commonwealth agency and airspace over the land; land in an external territory and Jervis Bay (EPBC Act s 525; Commonwealth reserve means a reserve declared under Division 4 Part 15). Commonwealth areas include airports, military bases (such as Woomera), and Commonwealth marine and terrestrial reserves (such as Uluru-Kata Tjuta National Park, the Great Barrier Reef, and Kakadu National Park). The case study for this paper is the Commonwealth area, Uluru-Kata Tjuta National Park, situated in the Northern Territory.

The Australian Government described Australia's Commonwealth scheme for accessing biological resources and benefit-sharing as consistent with the *Nagoya Protocol* (Australian Government, DCCEEW 2025b). Transparency and legal certainty are promoted by the *Nagoya Protocol* as providing a strong basis for accessing genetic resources. Many aspects of the Commonwealth access scheme are consistent with the *Nagoya Protocol* for facilitating user access and aim at ensuring legal certainty and transparency of decision-making for granting access. However, for Indigenous knowledge holders and other persons with an interest (including relevant stakeholders and the public) the transparency of Commonwealth permit processes for accessing biological resources from Commonwealth areas has diminished in recent years. The scheme provides significant support for applicants and users and far less support for Indigenous persons and interested persons for accessing information about permit decisions, permit compliance and disclosure of any use of traditional knowledge (Collings 2021).

Permission to access genetic resources from Commonwealth areas for commercial or non-commercial purposes requires a permit, granted by the relevant Commonwealth Minister with compliance conditions attached (EPBC regs 8A.11; Collings 2021). Access to biological resources means taking biological resources of native species, if there is a reasonable prospect that resources will be used for research on and development of any genetic resources, or biochemical compounds comprising or contained in biological resources (EPBC regs 8A.03(1); Collings 2024). This use of resources includes analysing and sampling stored material for taxonomic research, other research, and potential commercial product development (EPBC regs 8A.03(1). There are different access requirements for collecting biological resources from Commonwealth areas for commercial or potential commercial purposes, and for a non-commercial purpose (EPBC regs Part 8A; Collings 2021). The EPBC Regulations state that access permits are permission to take biological resources of native species for research on and development of any genetic resources, or biochemical compounds, comprising or contained in the biological resources. But they exclude an activity which includes accessing human remains or taking genetically modified organisms (EPBC regs 8A.03). Commercial purposes or potentially commercial purposes are not defined by the EPBC Act or EPBC Regulations. The Commonwealth model Access and Benefit-Sharing Agreement defines exploitation revenue from commercialisation as monies received from the use of biological resources via transferring,

delivering or providing samples or products, assigning or granting rights in samples or products, including intellectual property (WIPO, n.d.). Exploitation revenue from commercialisation does not include funds received by the Access Party for the explicit purpose of research (WIPO n.d.). A number of access and benefit-sharing agreements have been entered into for a commercial purpose but which are not published by the Commonwealth Government. Non-commercial purposes are also not defined by legislation. Non-commercial access objectives are demonstrated by past access permits granted by the Commonwealth Government, which include taxonomic research and environmental management and conservation (Australian Government, DCCEEW 2023b). Access for either commercial or non-commercial purposes can potentially involve the use of traditional knowledge, as discussed further in the case study below.

Concerning the use of Indigenous peoples' traditional knowledge, one of the purposes of the EPBC Regulations is to 'recognise' the 'special knowledge held by indigenous persons about biological resources' (EPBC regs Part 8A.01). Permit applicants are required to submit a permit application to the Minister in the prescribed form published by the Department of Climate Change Environment Energy and Water (DCCEEW) and must provide a statement confirming whether applicants have used traditional knowledge, in person or from public documents (Australian Government, DCCEEW, 2021b; EPBC regs 17.02(ga)(v)). Benefit-sharing agreements are required for commercial or potential commercial use of biological resources with prior informed consent of access providers and establishment of mutually agreed terms (EPBC regs 8A.07, 8A.08; Collings 2021). Benefit-sharing agreements must also provide 'reasonable' benefit-sharing arrangements with Indigenous communities for using traditional knowledge associated with biological resources as disclosed in the permit application (EPBC Regs 8A.11, 8A.08). The compliance requirements for non-commercial access concerning the use of associated traditional knowledge and disclosure are detailed below in the case study.

In granting access to collect biological specimens from Commonwealth areas, the Minister is required to publish a list of permits granted (EPBC regs 8A.18). Almost all access permits granted since 2006 for accessing biological resources from Commonwealth areas are for non-commercial purposes which do not require a benefit-sharing agreement to be negotiated (Australian Government, DCCEEW 2023b).

Since 2022, issued access permits are no longer published as granted. Instead, a summary list is published in the annual report of the DCCEEW through the Australian Government's 'Transparency Portal', which does not identify species collected or the location where samples will be taken. Prior to 2021, permits were published with details about all the species that were permitted to be sampled and their locations. This is important for identifying species which are culturally significant and their culturally significant locations. The Minister also has discretion to not publish permit information by reasons of 'cultural sensitivity' and 'national interest' (EPBC regs 8A.18).

Members of the public can use freedom of information pathways if approved by the relevant parties and paying for costs to apply for copies of access permits approved by the Minister and permit application documents which the Minister took into consideration in granting approval (*Freedom of Information Act 1982* (Cth)). Permit applications are significant for disclosing whether applicants divulged the use of traditional knowledge. This mechanism is important to promote fairness and transparency, as discussed in the case study.

Case study

The case study analyses the legal and procedural requirements for accessing biological resources from Commonwealth areas of Australia for biodiscovery. The case study analyses the legal requirements for access permitting and transparency of decision-making in granting permits. Furthermore, the case study

demonstrates challenges when accessing information concerning any use of traditional knowledge by permit holders for locating and identifying specimens.

According to Access Permit AU-COM2016-318 granted by the Commonwealth Government, Kew Gardens Herbarium were approved to collect biological samples of eight species of Australian native tobacco from Uluru-Kata Tjuta National Park for non-commercial purposes during the period 28th July 2016 to 16th August 2016. The permit identified species five voucher specimens, 25 leaves (five each from five populations) and 100 seeds from each. The permit was granted to Professor Mark Chase, who led the Hunting the Wild Tobaccos collaborative research project involving researchers from the United Kingdom, Austria and Australia (Royal Botanic Gardens Kew 2021). The project included eight years of fieldwork in the 'outback' of Australia in all States and Territories, except Tasmania.

Kew Gardens Herbarium is one of the largest in the world (Royal Botanic Gardens Kew 2024) with a research facility and in-house 'commercial innovation unit' exploring the application of plants and other biological specimens within its collections for commercial potential (Royal Botanic Gardens Kew n.d.a). Kew Gardens is studying the genetics of Nicotiana species via DNA techniques (Chase 2018). Furthermore, the Kew Gardens Herbarium collection is being digitised to make specimens available online (Royal Botanic Gardens Kew 2025). Science data and digital resources of Kew Gardens are governed by terms of use, which align with the CBD, particularly in relation to the *Nagoya Protocol* (Royal Botanic Gardens Kew, n.d.b).

The access permit granted to the applicant from Kew Gardens was signed by the Minister's delegate and published by DCCEEW in the list of access permits for 2016. Eight species of Australian native tobacco were permitted to be collected, as listed on the permit. These species are *Nicotiana gossei* (commonly known as Rock Pituri), *Nicotiana benthamiana*, *Nicotiana rosulata ssp. Ingulba*, *Nicotiana megalosiphon ssp. Sessilifolia*, *Nicotiana rolsulata ssp. rosulata*, *Nicotiana velutina*, *Nicotiana simulans* and *Nicotiana excelsior*.

Historical background to Uluru and Kata Tjuta National Park

Indigenous Australian Aboriginal peoples have lived in the area around Uluru and Kata Tjuta in Central Australia for at least 30,000 years. They practice Anangu Culture and assert that they have always lived there, and that Uluru and Kata Tjuta were created at the beginning of time by their ancestral beings (Australian Government, Parks Australia 2023; UNESCO 2025).

The first non-Indigenous person to see Kata Tjuta was the explorer, Ernest Giles. He saw large domes while leading a party near Kings Canyon in 1872. The largest was named Mount Olga. One year later, another non-Indigenous explorer, William Gosse, saw Uluru and named it Ayers Rock after the Chief Secretary of South Australia, Sir Henry Ayers (Australian Government, DCCEEW 2023a).

In 1894, a scientific expedition was sent to Central Australia to explore the area around Uluru and researched the local geology, mineral resources, plants, animals and culture. This expedition produced valuable information about the area and confirmed the region was not suitable for farming (Australian Government, Parks Australia 2023).

Subsequently, the SouthWest Reserve was created to provide an area for Indigenous Australians. In 1920, Uluru and Kata Tjuta were added to this reserve (Office of the Administrator 1920). As a result, few non-Indigenous people visited the area until the 1940s, when reserves in Central Australia were reduced in size to allow mineral exploration.

After the construction of a dirt road to Ulura in 1948, miners and tourists began to visit Uluru, Kata-Tjuta and beyond. The Ayers Rock National Park was declared in 1950 (Australian Government, Director of National Parks 2023). In the same year, Alice Springs resident Len Tuit accompanied a party

of schoolboys from Sydney's Knox Grammar (Sydney Morning Herald 1950) on a trip to Uluru. They collected samples of *Nicotiana Gossei* (commonly known as Rock Pituri), which are held by the National Herbarium of NSW (Atlas of Living Australia 1950). Tuit recognised the enormous tourism potential of the rock, and he began offering regular tours in 1955 (National Road Transport Museum, n.d.).

The historic *Aboriginal Land Rights (Northern Territory) Act 1976* (Cth) (ALRA Act) came into force in 1976. It recognised Indigenous land rights and set up processes for Indigenous people to win back land and manage resources. This legislation did not apply to Uluru and Kata Tjuta. The land had been alienated from the ALRA Act by the declaration of the Uluru and Kata Tjuta (Ayers Rock - Mt Olga) National Park in 1977 (Aboriginal Law Bulletin 1985).

After many years of political lobbying and negotiations, the Anangu were able to reclaim ownership of the national park on 26 October 1985, when the Governor-General of Australia returned the title deeds to the park to Anangu in a handback ceremony on the oval in Mutitjulu community (Australian Government, DCCEEW 2023a). In return, Anangu leased the land to the Australian National Parks and Wildlife Service (now Parks Australia) for 99 years (Aboriginal Law Bulletin 1985). The Board of Management was set up in December 1985 with a majority of Anangu members, and the park continues to be jointly managed by Anangu and Parks Australia (Australian Government, DCCEEW 2023a, UNESCO 2025).

Joint management of the Uluru-Kata Tjuta National Park

Under the framework set out in the EPBC Act there is a working relationship between the Anangu traditional owners and the Director of National Parks as lessee of the park. Section 242 provides that Commonwealth reserves can be declared over areas of land or sea that the Commonwealth owns or leases.

Section 363(5) of the EPBC Act states:

> A Commonwealth reserve is a jointly managed reserve if:
>
> (a) it includes indigenous people's land held under lease by the Director; and
> (b) a Board is established for the reserve under Subdivision F.

The Uluru-Kata Tjuta National Park Board of Management was established under the *National Parks and Wildlife Conservation Act 1975* (Cth) and continues under the EPBC Act. The UNESCO World Heritage Convention listing of the park states that:

> **A majority of Board members must be Indigenous persons, nominated by the traditional Aboriginal owners of land in the park. The functions of the Board are to make decisions relating to the management of the park and, in conjunction with the Director of National Parks, to prepare management plans, monitor the management of the park and advise the Minister on all aspects of the future development of the park (UNESCO 2025).**

Significance of Australian Native Tobacco Species

Australian native tobacco, also known as wild tobacco, is endemic to Australia and continues to be used by Aboriginal people since prior to European colonisation of Australia for medicine, for trade, and for ceremony, knowledge which has been passed down from generation to generation (Devanesen 2000; Banks 1770; Chase & Christenhusz 2018). Australian native tobacco or wild tobacco is known as *Pituri*, *mingkulpa* and other names across different Aboriginal languages (Wylie & Li 2022; Hicks & LeMessurier 1935). The cultural significance of Australian native tobacco for Aboriginal people was recognised in decisions

under the *Native Title Act 1999* (Cth), confirming a continuing connection to Country, and affirming the collection and traditional use of native tobacco as a native title right referred to as 'wild tobacco'. (*McNamara on behalf of the Gawler Ranges People v State of South Australia* [2011] FCA 1471). Australian native tobacco does not naturally grow in the Torres Strait Islands, and its use amongst Torres Strait Islander peoples is not documented.

The species of *Pituri* used by Australian Indigenous peoples for chewing refers to *Nicotiana gossei*, *Nicotiana excelsior* and *Nicotiana benthamiana*, a use observed by explorers and botanists since 1770 (Wylie & Li 2022; Johnston & Cleland 1934; Banks 1770). *Pituri* is also used as a wet paste for treating skin conditions including ringworm, bull-ant bite, yellow ant, itchy grub, caterpillar and spider bites and for scabies in hair and skin sores (Ratsch et al. 2017). *Pituri* has also traditionally been used as an anaesthetic (Ratsch et al. 2010). The use of *Pituri* amongst Aboriginal people is restricted to adult men, and the method of its preparation and the location of the plants are 'jealously guarded' (Stack 1988). The collection of plants involves 'dreaming songs' according to strict ritual to ensure their medicinal value (Stack 1988). Historically, *Pituri* was widely traded amongst Australian Indigenous peoples (*Bularnu, Waluwarra and Wangkayujuru People* National Native Title Tribunal, 6 February 1997). For Anangu people of Uluru, *mingkulpa (Pituri)* 'was and is and will be a source of life' (Ratsch et al. 2017).

Australian native tobacco species have been collected from across central Australia for research since Australia was colonised, with the oldest sample of *Nicotiana benthamiana* held by an Australian herbarium dated 1883 (Atlas of Living Australia 1883). There are an estimated 45 species of Australian native tobacco which have been identified, including several new species identified by the Hunting Wild Tobaccos Project (Chase 2018). During the 1930s, groups of explorers travelled to the central desert to collect plant specimens and study medical and cultural aspects of Warlpiri people (Goodin et al. 2008). In field notes and diary notes from these expeditions, the harvesting practices of Warlpiri people, their methods of using wild tobacco, and their preparation methods and customs were observed. (Wylie & Li 2022). Such observations have arguably assisted researchers with locating where to collect plants in locations preferred by Aboriginal people for harvesting and for learning preparation and application methods, and the effects of use (Ratsch et al. 2017). Ratsch's research identifies a place near Uluru as one such location where *Pituri* is known to grow best (Ratsch et al. 2017).

The Atlas of Living Australia (ALA) database provides a list of 'all public biological collections in Australia' and a spatial mapping interface, which identifies species collected, locations, names of collectors and rights holders. Figure 1 and Figure 2 from ALA below show the sampling history for *Nicotiana benthamiana* since 1880 and more recently since 1990 after the CBD was adopted in 1992 and after the Nagoya Protocol entered into force in 2012. The database does not include any entries for duplicate samples collected from Uluru-Kata Tjuta National Park under permit and deposited by Kew Gardens with Australian herbariums.

Nicotiana benthamiana is one species that Kew Gardens was permitted to collect from Uluru. The species has been used extensively for scientific research and development for testing and developing vaccines and as plant bio factories for manufacturing vaccines (Layt 2020). *Nicotiana benthamiana* is 'the most widely used experimental host plant in virology' (Goodin et al. 2008), and there are over 80 patents which have used *Nicotiana benthamiana* (Robinson 2010). Laboratories around the world use a variant of *Nicotiana benthamiana* known as *Benth LAB,* derived from seeds collected in 1936 from Warlpiri Country near The Granites gold mine. The *Benth LAB* variant is described by Australian scientists as 'magic' (QUT 2015) which has unique attributes amenable to testing and manufacturing vaccines. *Benth LAB* has shorter dormancy and matures faster than seeds from plants collected from other locations, which Wylie attributes to Aboriginal traditional knowledge and the 'process of human selection over millennia' (Wylie & Li 2022; Goodin et al. 2008). The *Nicotiana benthamiana* Genome and Transcriptome of *Benth LAB* and a

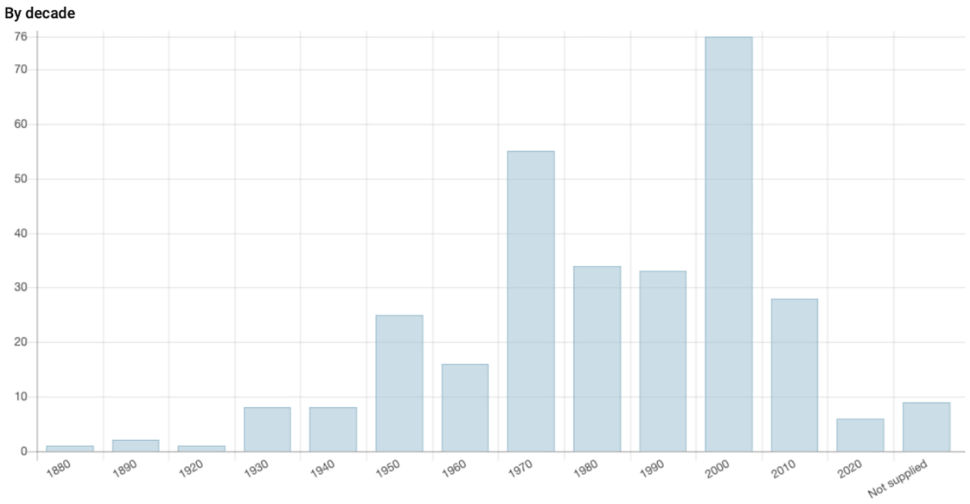

Figure 1. Occurrence records of *Nicotiana benthamiana* by decade
Source: Atlas of Living Australia https://bie.ala.org.au/species/https://id.biodiversity.org.au/node/apni/2912121#records

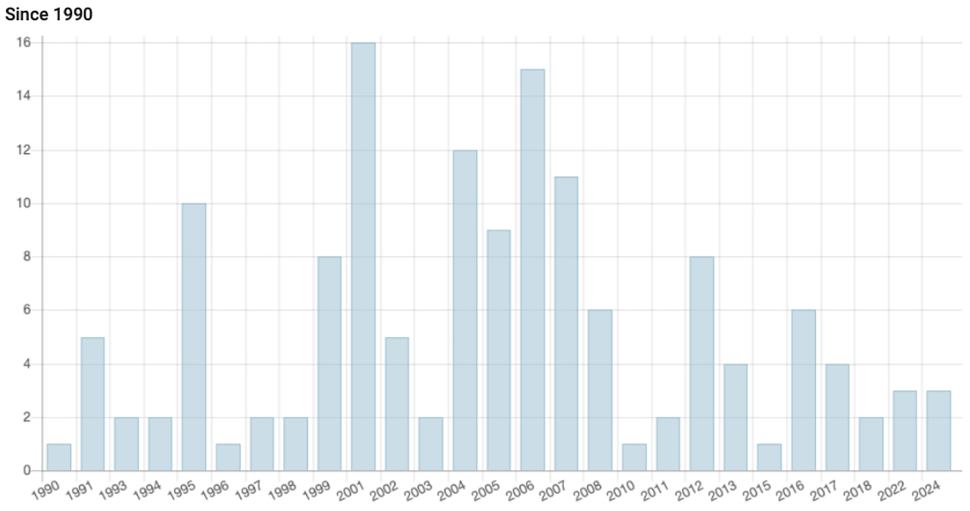

Figure 2. Occurrence records of *Nicotiana benthamiana* since 1990
Source: Atlas of Living Australia <https://bie.ala.org.au/species/https://id.biodiversity.org.au/node/apni/2912121#records>

variant from Queensland known as *QLD genome v183* have been shared by the Queensland University of Technology as open source (QUT 2024).

There is an increasing interest in Australian plants and desert plants as sources of novel genes and microorganisms for scientific use for pharmaceuticals and food, as climatic pressures are having an impact on agricultural systems (Wylie & Li 2022). Scientists consider 'the full potential of *Nicotiana benthamiana* species is yet to be realised, on the basis that the true diversity of *Nicotiana benthamiana* is largely unexplored' (Xu et al. 2022). This potential is amplified by technology enabling the genetic sequence of species including *Nicotiana benthamiana* to be digitised and reformulated for innovative applications using artificial intelligence without needing access to physical material. Kew Gardens is analysing the genetics of native tobacco species collected from Australia (Chase 2018).

Permit granted to Kew Gardens

The permit granted to Kew Gardens is for a non-commercial purpose to investigate how Australian native tobacco plants survive in arid environments (Chase 2018). Access to collect biological resources from Commonwealth areas for a non-commercial or commercial purpose is regulated by the EPBC Act and EPBC Regulations. Permission to collect biological resources for a non-commercial purpose from Commonwealth areas, such as Uluru-Kata Tjuta National Park, requires a permit from the Minister by submitting a permit application and relevant documents in the prescribed form. Permit applications available on the DCCEEW website identify information which must be included and accompany the application. Access to Uluru-Kata Tjuta National Park must also be consistent with any lease of Indigenous peoples' land in the park (EPBC regs 17.03(4)(e)).

Access permit applications must be accompanied by a statutory declaration from the applicant with an undertaking not to undertake commercial research without approval (EPBC Regs 8A.15). Permit applications must provide details of written permissions from each access provider which for Uluru-Kata Tjuta National Park is the National Park Board of Management with Aboriginal members and representatives of Parks Australia. Concerning any use of traditional knowledge, a statement is required from the applicant in the permit application form of any proposed use of Indigenous people's knowledge, whether from public documents or directly from Indigenous persons, in determining biological resources to be accessed or the areas to be searched (Permit application clause 20; EPBC regs 8A.13, 17.02(ga)(v)). Permit applications must also provide details of any agreements with Indigenous persons to use specialised information or information otherwise confidential to the people of the area in connection with the resources for which access is sought (Permit application clause 20). The onus is on applicants to disclose such use to the satisfaction of the Minister in granting the permit. Permit applications are not published.

According to the Commonwealth Government website:

> **Scientific research in Uluru-Kata Tjuta National Park requires a permit. Where access to biological resources is proposed, a benefit-sharing agreement with the access provider is required for commercially oriented research. Simplified arrangements apply for non-commercial research (Australian Government, DCCEEW 2025a).**

The website states further that The Northern Territory Government is responsible for access and benefit sharing agreements, and for providing information on such arrangements within its jurisdiction.

What is referred to as The Competent National Authority for the Northern Territory can provide further advice on arrangements for public and private lands (Australian Government, DCCEEW 2021a). However, the authors could not locate any information about The Competent National Authority for the Northern Territory.

The Consultation Process

When obtaining written permission for accessing Uluru-Kata Tjuta National Park, the permit holder from Kew Gardens presumably consulted the access provider, which is the Board of Management for the national park. Kew Gardens reportedly had 'consent' from the local Indigenous peoples to collect specimens of species, known as *mingkulpa* which is *Nicotiana gossei* from Uluru in connection with the access permit (Chase 2018). Kew Gardens has also published that during the site visit, Park rangers from Uluru-Kata-Tjuta National Park reportedly 'arranged contact with the local people' and 'together with two knowledgeable women […] went on the hunt for native tobacco at Uluru' (Chase et al. 2021). Written permissions are required to be included with the access permit application. As permit applications are not published, the first author applied for the access permit application through the Freedom of Information

Act 1982 that was approved. The permit application and related email correspondence shared with the first author was published by DCCEEW (Australian Government, Director of National Parks 2025).

Access permit holders are required to provide a report to the Commonwealth of the results of research using biological material collected under permit (EPBC Regs Part 8A.13(b)). A report was not provided to the Commonwealth, as confirmed via Freedom of Information (Australian Government, Director of National Parks 2025). However, research findings of one species collected from Uluru *Nicotiana gossei* species was published by Kew Gardens and confirms traditional knowledge of this species was known to researchers who documented their findings (Chase & Christenhusz 2018). The permit application also confirms DNA will be extracted from species collected (Australian Government, Director of National Parks 2025). For Indigenous people and interested members of the public, it is not known how DNA from specimens collected at Uluru will be shared and used. The authors therefore argue that it must be very difficult for Indigenous Australian peoples to enforce their rights for benefit-sharing in this space without access to information to monitor how genetic resources and their associated traditional knowledge are used.

This is relevant for the monitoring of:

- potential commercial use of biological material collected along with DNA digital sequence information; and
- obligations for benefit-sharing together with/requiring the valuing of traditional knowledge.

Although the Minister has discretion to invite public comments for assessing permit applications, which have more than a negligible environmental impact (EPBC regs part 8A.16, 8A.17), the access permit granted to Kew Gardens did not involve public consultation.

Compliance Requirements for Permit Holders and Access Providers and Relevant Documents Subject to Freedom of Information

The permit application must include a statement about the use of any traditional knowledge from Indigenous persons or from public documents associated with biological resources listed on the permit (EPBC regs 17.02(ga)(v); Permit application clause 20). Permit applications should also identify which Australian herbarium will be designated as the location for proposed duplicate samples (Permit application clause 18).

When Kew Gardens submitted the permit application a statutory declaration was required with an undertaking not to use the biological material collected for a commercial purpose and to provide a written report of the results of any research within six months (EPBC regs 8A.13). Permit holders are also required to disclose in the permit application whether any third parties will seek access to use the collected 'biological samples' (EPBC regs 17.02(ga)(ix)). This is relevant to whether material may be used commercially in the future. The permit application requires copies to be attached of any written permissions from access providers. For Uluru-Kata Tjuta, the access provider is the Uluru-Kata Tjuta Board of Management.

After the collection period, permit holders are required to offer a duplicate sample of the collected material to an Australian herbarium, subject to confidentiality requirements of Australian Indigenous people (EPBC regs 8A.13). Permit applications are required to state which herbarium is the proposed location for duplicate samples (EPBC Regs 17.02). It is not known which Australian herbarium holds duplicate samples of Australian native tobacco collected from Uluru-Kata Tjuta. The Atlas of Living Australia is a database repository of samples held by Australian herbaria, it does not cross reference sample data to Commonwealth access permits. Permit holders are also required to keep a copy of records, detailing where samples were

taken and provide a copy of these records to each access provider 'within a reasonable timeframe' (EPBC regs part 8A.19, part 17.02).

Since 2022 details of access permits as granted are no longer published. Instead, a summary list is published on the DCCEEW website (Australian Government, DCCEEW 2023b). The same list with an additional description of permit objectives is listed in DCCEEW annual reports (Australian Government, DCCEEW 2023c; 2024). Neither list identifies which species are permitted to be sampled or the locations where samples are collected. From 2006, when access permitting commenced, up until 2022 access permits were published as granted. This included a list of all species permitted to be collected, the locations, and access conditions. Species information and location are relevant for identifying species which are known to be culturally significant, and the likelihood access permit holders have used traditional knowledge for species selection and for identifying locations (Ratsch et al. 2017).

The Commonwealth Government provides a contact number and email at Parks Australia to assist persons applying for an access permit. The *Nagoya Protocol* also identifies a need to establish and maintain a helpdesk for Indigenous communities and other relevant stakeholders to raise awareness of the importance of traditional knowledge associated with genetic resources and for accessing information (*Nagoya Protocol* art 21). However, a helpdesk for this purpose has not been established.

Conclusion

The case study demonstrates the importance of biological diversity and facilitated access to collected resources for research and development, beneficial to humanity. The access permit granted to Kew Gardens for the Hunting the Wild Tobaccos Project aims to better understand how Australian native tobacco plants grow in extreme arid environments, and helps analyse plant genetics important for food security and other applications in response to climate change. Of concern is the transparency of the access permit process, the use of traditional knowledge associated with Australian native tobacco species collected, and future commercial use of genetic information derived by herbaria, which is decoupled from benefit-sharing requirements of access permits.

The case study highlights the significance of Indigenous peoples' traditional knowledge for locating and selecting biological resources for research and development, which is confirmed in material of the project, published on the Kew Gardens website. The case study also shows that it is important for the Australian Government to keep publishing access permits detailing species permitted to be collected and collection locations for wider research, from which the use of associated traditional knowledge can be inferred. Since 2022, details of access permits have not been published and have not provided such information. If not for the access permit granted to Kew Gardens in 2016 being published by DCCEEW on the list of permits, the species of Australian native tobacco collected under permit and location at Uluru would not be publicly known except perhaps through scientific publications of the project. The list of permits could be considered certification of compliance as promoted by the *Bonn Guidelines*, but it does not encapsulate the details envisaged by the *Nagoya Protocol* certification scheme to promote transparency and fairness for all stakeholders not just one group. To this end, the case study highlights the need for the Commonwealth Government to further implement the *Nagoya Protocol* and introduce procedures for greater transparency of decision-making and to provide support for Indigenous Australians to access information concerning use of their traditional knowledge associated with access to biological resources. These arrangements should be carried out through legislation that is binding on government agencies and herbaria that clearly articulate the requirements of the Nagoya Protocol and also provide for enforcement procedures, e.g. fines or criminal penalties, where such requirements and procedures are not carried out. A final observation concerns the future use of DNA digital sequence information derived from specimens collected by Kew Gardens or by third parties including other research institutions and the private sector and whether there is an obligation

to disclose any such with Indigenous communities involved in collecting original specimens and whose traditional knowledge was used; and negotiate benefit-sharing arrangements. Adoption and implementation of the *Nagoya Protocol* in Australia would require certification of compliance to be issued by the Australian Government and published with the CBD Access and Benefit-sharing Clearinghouse for transparency. Certificates disclose specific biological material permitted to be taken, disclosure of whether associated traditional knowledge is used, and confirmation procedures for prior informed consent and mutually agreed terms for any benefit-sharing have been met. Such information is no longer published in permits for accessing biological resources in Commonwealth areas and which is relevant for Indigenous knowledge holders and their communities to monitor any utilisation of their traditional knowledge associated with biological resources for potential benefit-sharing.

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