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Dendroglyphs, Pictographs and Social Identity in the Wet Tropics Rainforest of Northeastern Australia

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ABSTRACT

This research examines rock art and dendroglyphs in the Wet Tropics of northeast Australia to investigate their relationship to linguistic social identity. The region was selected for its complex socio-cultural landscape, marked by a diversity of languages in a distinct, relatively small area. The study was co-designed with nine First Nations partner organisations representing five language groups and employed rock art methodologies and interviews with First Nation knowledge holders. Findings reveal that neither rock art nor dendroglyph motifs correspond neatly with linguistic boundaries. Within a single language area, stylistic variations were observed—rock art is more figurative in the east and abstract in the west, while dendroglyphs, found only in the eastern Wet Tropics, feature predominantly abstract designs. Rather than signifying socio-cultural differences, the dendroglyphs and rock art illustrate connections. Senior custodians identify dendroglyphs as story places, clan symbols, and sites of cultural significance, reflecting a deep and enduring relationship by First Nations with these rare cultural expressions. This study contributes new insights into dendroglyphs and rock art in Queensland's Wet Tropics rainforests, challenging assumptions that stylistic boundaries align strictly with language groups and significantly broadening knowledge of Australian dendroglyphs.

Résumé

Cette recherche examine l'art rupestre et les dendroglyphes dans les tropiques humides du nord-est de l'Australie afin d'étudier leur relation avec l'identité sociale linguistique. La région a été choisie pour son paysage socioculturel complexe, marqué par une diversité de langues dans une zone distincte et relativement petite. L'étude a été conçue en collaboration avec neuf organisations partenaires des Premières Nations représentant cinq groupes linguistiques, et a utilisé des méthodologies d'art rupestre et des entrevues avec des détenteurs de connaissances des Premières Nations. Les résultats révèlent que ni l'art rupestre ni les motifs de dendroglyphes ne correspondent parfaitement aux frontières linguistiques. Au sein d'une même aire linguistique, des variations stylistiques ont été observées: l'art rupestre est plus figuratif à l'est et abstrait à l'ouest, tandis que les dendroglyphes, que l'on ne trouve que dans les tropiques humides de l'est, présentent des motifs principalement abstraits. Plutôt que de signifier des différences socioculturelles, les dendroglyphes et l'art rupestre illustrent les connexions. Les gardiens principaux identifient les dendroglyphes comme des lieux d'histoire, des symboles de clan et des sites d'importance culturelle, ce qui témoigne d'une relation profonde et durable des Premières Nations avec ces expressions culturelles rares. Cette étude apporte de nouvelles perspectives sur les dendroglyphes et l'art rupestre dans les forêts tropicales humides du Queensland, remettant en question les hypothèses selon lesquelles les frontières stylistiques s'alignent strictement sur les groupes linguistiques et élargissant considérablement la connaissance des dendroglyphes australiens.

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1 | Introduction

As artistic expressions, dendroglyphs (tree images) and pictographs (rock images) provide a unique window into the social context and worldviews of the artists. However, the analysis of dendroglyphs using rock art methodologies is rare. In this paper, I explore whether stylistic patterns in visual expression correspond to linguistic boundaries in the Wet Tropics of Queensland. The Wet Tropics was chosen because it contains a diversity of language groups in a relatively small geographic area, and moveable material culture, such as shield designs, reflects these inter-regional differences. Additionally, Wet Tropics rock art is poorly preserved due to the high humidity. This means that both the rock art and carved trees probably date to the last few hundred years and make Queensland's Wet Tropics provide an excellent opportunity to explore the relationship of social networks and style in two different artistic expression types that are anchored to place.

1.1 | The Wet Tropics

The 'Wet Tropics' is a relatively narrow strip of rainforest approximately 400 km from north to south and 90 km from east to west in northeast Australia (Figure 1). The Wet Tropics sits between Cape York Peninsula to the north, the 'dry tropics' to the south and the Gulf savannah to the west. Rainforest dominates the eastern escarpment, which consists of a series of tablelands and mountain peaks composed of hard-wearing granite. The coast holds a rich marine environment of mangroves, fringing reefs and sandy beaches with rocky headlands, some with shallow, exposed rockshelters in granite, basalt and metamorphic substrates. Creeks, fed by permanent and semi-permanent springs, descend from the Great Dividing Range into the sea in the major river catchments of the Barron, Johnstone, Russell and Daintree Rivers. The Wet Tropics contains one of the most diverse plant communities on the planet, dominated by mesophyll rainforest (Stork et al. 2008). All the known dendroglyphs are located in the dense mesophyll rainforest, which also holds rock art sites in granite, sandstone and basalt substrates.

On the western side of the Wet Tropics, river systems turn into perennial water flows and fire-resistant savannah vegetation. The western environment is open woodland dominated by eucalypts with littoral rainforest lining creeks, patches of cycads (*Cycas media*) and paperbark (*Melaleuca spp.*). The Wet Tropics hold the headwaters of significant western flowing watercourses, such as the Mitchell-Palmer River system, which empties into the Gulf of Carpentaria over 400 km away. Rock art sites on the western side tend to be shallow sandstone overhangs or granite outcrops.

The presence of small, tightly bound language estates is a feature of the Wet Tropics Aboriginal cultural landscape (Lumholtz 1889). Linguistic research began in the Wet Tropics when R. M. W. Dixon began recording rainforest Aboriginal languages in the 1960s, work which he continues with Aboriginal elders today (1972, 1976, 1977, 1983, 1991, 2009, 2015). When Dixon started recording rainforest languages in the 1960s, he quickly became aware of incompatible grammar between Yidin/Djabugay and Dyirbal speakers, whose boundary he identified at Russell River (Dixon 1983). After further linguistic fieldwork Dixon surmised

the GuGu (Kuku) Yalanji language, spoken north of Port Douglas, is not related to either Yidin/Djabugay (spoken from Port Douglas to Russell River) or Dyirbal languages (spoken from Innisfail to Ravenshoe). Dixon's language model contradicted the 'cultural bloc' theory, developed by Tindale and Birdsell (1941), that rainforest Aboriginal people shared social, cultural and genomic traits. On the contrary, the linguistic evidence suggests a rich tapestry of Aboriginal social landscapes with defined boundaries. This rich socio-cultural landscape presents an ideal opportunity to examine the relationship of dendroglyphs, pictographs and language groups.

When Europeans first penetrated the dense jungles of the Wet Tropics in the 1870s, they found large numbers of Aboriginal people who they perceived as being different to other First Australians. Explorer Christie Palmerston considered rainforest people 'as wild and uncultured as the forests they occupy' (Pannell 2008, 61). Palmerston's descriptions reflect early colonists' view of Aboriginal people as a component of the natural environment. The cultural heritage and material culture of rainforest Aboriginal people captured the imagination of ethnographers and collectors who obtained the boldly decorated shields, hardwood swords, unusual stone tools, bicornual baskets and bark blankets and distributed them to museums worldwide (Erckenbrecht 2016; Erckenbrecht et al. 2010; Ferrier 2006; Greer et al. 2016). After European settlement, small numbers of Aboriginal people remained living in pockets of dense and impenetrable rainforest, relatively out of reach from the squatters and miners until at least the 1930s. In the early 20th century, the rainforest was considered one of the last havens of 'traditional' Aboriginal society, garnering interest from anthropologists such as Ursula McConnel, Eric Mjöberg and Hermann Klaatsch, who sought to document the 'last vestiges of a stone age culture' (McConnel 1931, 1935; Mjöberg 1918 [2015]; Erckenbrecht 2016).

1.2 | Co-Designed Research

First Nation communities have gained increasing rights over how their cultural heritage is identified, investigated and reported (Smith and Jackson 2016). Archaeology can, and should, make a difference to people's lives. Archaeology can be engaged, relevant, ethical and sustainable (Atalay 2012). It was important that this research had ongoing benefit for the Aboriginal parties who are the custodians of their cultural heritage. I acknowledge that community and ethnoarchaeological approaches present some limitations. Studies may not be replicable, as the sites visited and information obtained through interviews are guided by community choice, not by researchers. While this means archaeologists need to relinquish some control on project methodologies, co-designed research can yield valuable results not otherwise available (Brady and Kearney 2016).

Working with numerous groups on a regional scale presents unique complexities. Each group has its own (usually unwritten) protocols. Some of the protocols for community-based projects outlined by Smith and Jackson (2008, 177) were transferable to my research project, such as publishing with permission, being flexible in research approaches and respecting existing social and political systems.

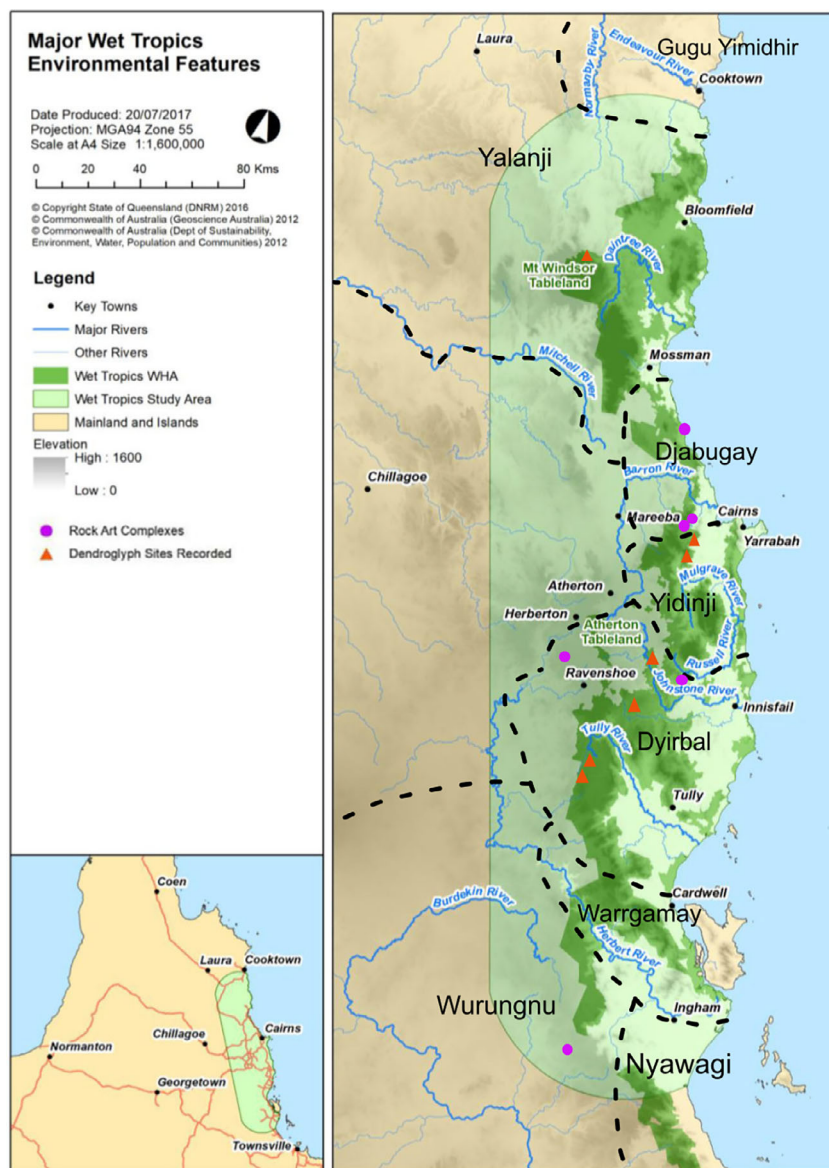


FIGURE 1 | Location of the study showing language groups identified by Dixon (2015, 8).

Protocols needed to be confirmed for each group engaged in the research. Avoiding conflicts between Aboriginal parties is highly challenging in the context of a regional study where custodial ownership is still being decided through native title and other processes. See Buhrich et al. (2019) for details on the community-based model employed in this research.

1.3 | Information Exchange

Analysis of pictographs around the globe has captured the imaginations of archaeologists, and dendroglyphs share similarities that make them suitable for interpretation through rock art methodologies. Pictographs were, and still are, a form of communication, described as a 'language' or 'signposts' that could be read within a cultural framework (Balme et al. 2009; Brady and Bradley 2014; Conkey 1990; Domingo et al. 2016; Taçon 1994). Despite the similarities between rock art and carved trees, few dendroglyph studies have applied rock art research method-

ologies. One exception is Coy (2004), who included a discussion of carved and painted trees in a consideration of rock art of Eastern North America. Coy analysed journals, maps and other historical documents and concluded that dendroglyphs (both carved and painted trees) were a favoured form of communication for the Eastern Woodland tribes of Northeast America and were often placed on trails, campsites, and other conspicuous locations. The markings included directions, warnings, records of events and associations with important people that could be understood by different linguistic groups. While none of the painted or carved trees have survived, there are places that were named after the dendroglyphs by early settlers (e.g., Paintsville, Paint Lick) (Coy 2004, 4). Coy concluded that the dendroglyphs of Northeast America were used much like we use signage on our roads and highways today.

The information exchange theory provides a framework for analysing pictograph style and proposes that choices in technique, application, form and colour can reflect the social and

cultural realms in which artists 'socialised' the landscape (Taçon and Chippindale 1998; Maynard 1976; Wiessner 1984; Wobst 1999). Key to information exchange is that 'outsiders', such as archaeologists, can recognise social differences through analysis of style, without 'insider' knowledge (e.g., McDonald and Veth 2012). Research on the relationship between Australian rock art styles and social boundaries has produced conflicting results. In the Kimberley, Wandjina motifs are painted only by certain clan groups and have been used to illustrate clan boundaries in native title claims (Blundell and Woolagoodja 2012). In Arnhem Land, Taçon (1994) has found that sub-styles of rock art, reflected in colour, subjects and frequency of motifs, correspond to linguistic groups. Similarly, links have been found between language and rock art style in both the Sydney and Pilbara regions (McDonald 2008; McDonald and Veth 2013). In the Pilbara, analysis of style suggests that some rock art styles pre-date current linguistic configurations (McDonald and Veth 2013). Cole (2016), Brady (2008) and Gunn (2011) found no relationship between language and rock art in Laura, Torres Strait and central Australia, respectively. Cole's (2016, 78) long-term research on rock art style in the Laura sandstone identified regional changes in technique and motifs but concluded that style changes were 'diffuse rather than abrupt, involving transitions and interactions rather than closed systems and boundaries'. Brady's (2008) analysis of rock art and material culture motifs in the Torres Straits found Papuan influences in western sites that reflected the 'cultural divide' between horticulturalists and hunter-gatherers rather than language. In central Australia, Gunn (2011) found that regional variations of rock art style do not correlate with language. More regional stylistic studies are needed to understand the role of information exchange in Australian Aboriginal pictographs.

Previous research has found that some aspects of rainforest Aboriginal material culture reflect inter-regional social differences. For example, large, decorated shields were shaped and decorated using clan designs which also reflected language boundaries; in the southern Wet Tropics, shields were kidney-shaped while in the north they were oval (Abernethy 1984). Different designs, painted onto the shields in yellow, red, and white, were used by different groups to represent linguistic identities in *bruns* (inter-tribal gatherings). Rainforest Aboriginal people recognised the different shield designs and understood which languages the designs were affiliated with. The rock art and dendroglyph motifs might be expected to have similar patterns related to social groups.

2 | Methods

The research described here is taken from my doctoral research conducted between 2013 and 2017 at James Cook University (Buhrich 2017).

2.1 | Collaborations With First Nations Custodians

Rainforest Aboriginal people have consistently expressed a desire for researchers to work with them, as research partners, to co-develop and co-deliver research aims and objectives (Review Steering Committee 1998). My research was adapted to suit



FIGURE 2 | Smoking ceremony after visiting carved tree with Mamu custodians.

each group, accounting for each community's aspirations and resources. First Nations research partners were contacted via Registered Native Title Body Corporates (RNTBC) or community leaders where an RNTBC did not exist. Together, we developed mutually beneficial projects that incorporated rock art and dendroglyph research. These projects aimed to produce practical community benefits such as ranger training, preservation assessments and documenting community knowledge of sites and their cultural significance, in addition to academic outputs.

Collaborations with Aboriginal parties provided significant insights into the cultural landscape but also came with limitations. At times, site visits needed to be postponed while internal governance structures and protocols were decided. Site sampling was not an objective, but rather sites were chosen under the guidance of the Aboriginal parties according to local protocols, which were not always openly discussed or transparent. It is possible that I was not taken to places that were physically difficult to access, as a way of custodians exercising their duty of care. Places that were inappropriate to include in my research for cultural reasons may have also been avoided. Fieldwork methods had to be adapted to incorporate the protocols of each First Nation community. Protocols included conducting smoking ceremonies (Figure 2), considering access requirements by Elders, land management activities such as the 'burning' of country and 'giving country a rest' by leaving sites at an appropriate time.

Results were shared with relevant groups through Plain English reports. The reports included a history of site management, collation of relevant published and unpublished information, a catalogue of motifs, analysis undertaken and site plans. Key findings were presented at stakeholder meetings, which provided

an opportunity to discuss how the research could contribute to the overarching aspirations of the relevant Aboriginal custodians. The consultation process aimed at building respectful, reciprocal and lasting relationships.

2.2 | Recording Methods

Information for each rock art and dendroglyph site was recorded using a pro forma, notebook and photographs. Contextual information, including location, environment, preservation issues and cultural knowledge, management issues and contact details for knowledge holders, was made for each site. Recording equipment such as tape measures, cameras and notebooks was kept as simple and lightweight as possible due to the difficult access. In some cases, the equipment was pared to the bare minimum, as access required overnight remote bushwalking through dense rainforest, carrying all food, recording and camping equipment in backpacks.

Site plans were made for each rock art site, showing the location and scale of motifs, rock art panels and their location within the shelter. A photographic record of the site, art panels and individual motifs was made with notes on the technique, colour, infill and superimposition of each motif. Digital photographs of each motif, clusters of motifs and landscape setting were taken systematically from left to right using a Nikon PEN E-3 mirrorless digital camera. Individual motifs were sketched by hand. Motifs and panels were enhanced using DStretch software.

Information recorded about the dendroglyphs included tree species, diameter at breast height, motifs, preservation, relationship to other known sites, other cultural heritage found nearby and cultural knowledge. Motif recordings included a description, dimensions (height, width and depth), and height of the carving above ground level. Other nearby tree species were noted. Dendroglyphs were photographed using a Nikon PEN E-3 mirrorless digital camera.

Rock art and dendroglyph motifs were categorised into levels, based on Brady's (2010) classification system. Only identifiable motifs were included (i.e., background colour or smudges of colour were not included). Rock art enhancement software (DStretch) was used to help classify motifs. While three levels of classification system were used, only level one is described in this paper (for a more elaborate analysis of categories see Buhrich 2017).

2.3 | Interviews

Semi-structured interviews and unstructured conversations were documented by a combination of voice recorder, video and written notes. Interviews were preferably conducted with the same person over multiple sessions. This was useful as it gave interviewees an opportunity to reflect on the site over time and provided an opportunity for a relationship to be built between interviewer and interviewee in which conversations became more comfortable. Photographs, reports and maps were sometimes used as props; for example, if an interview took place off site, a topographic map could be used to identify places that were

discussed. Interviews took place on site, in cars and around the kitchen table. The choice of locations of interviews was guided by the interviewee. Interviews were generally limited to 1 hour out of consideration for the risk of participants, particularly the elderly, becoming fatigued.

Interviews were recorded using an iPhone 4. A video camera was not used, as the aim of the interviews was to let the conversation flow between researcher and interviewee. A camera was considered too invasive, while the mobile telephone was easily transportable and able to be accessed and switched on with relative ease as the opportunity allowed. With permission from the interviewee, the phone was placed on a table, the arm of a chair or another discreet location during conversation. A lapel microphone was attached to the interviewee's shirt in outdoor situations. Permission to use the information was sought at the start of the interview and confirmed after the interview was completed.

Interviews sought to document:

- Stories about the site(s).
- Meaning of individual motifs.
- Significance of motifs and the sites.
- General comments on connection to country.
- History of the Aboriginal use of the sites since colonisation.
- Other topics the Aboriginal custodians wished to document.

Interviews were transcribed and information was ordered into the themes presented below. If requested by the interviewee, sections of the interview (e.g., private recollections not relevant to the project) were removed during the transcription process.

3 | Results

Quantitative and qualitative methods were used to compare patterns in dendroglyphs and rock art to language to determine how the imagery reflected social cultural boundaries. The results are presented in two parts. First, the qualitative results describe the dendroglyph and rock art samples and attributes of these site types. Presence or absence of specific motifs shows distinct differences in the rock art on the east and west sides of the Wet Tropics. Dendroglyph motifs, only present in the eastern Wet Tropics, have distinct similarities with the western-style rock art. Meaning and significance, specifically of the dendroglyph motifs, are explored through qualitative data. Interviews with senior knowledge holders also explore motifs and the socio-cultural landscape, gender and the use of clan symbols.

3.1 | Existing Records

Only a small sample of dendroglyphs is known to survive in the Wet Tropics. The sample consisted of 21 individual trees at 13 sites (Figure 3, for examples, Buhrich et al. 2015 for details). In total, 38 individual dendroglyph motifs were recorded, which includes both carvings recorded by me and those recorded by Grimwade (1990). The sample extends across five Aboriginal clan estates



FIGURE 3 | Example of rainforest dendroglyphs.

TABLE 1 | Dendroglyph locations, Aboriginal parties and language group (some locations have more than one dendroglyph).

Dendroglyph locations	Aboriginal party	Language group
Mount Windsor	Western Yalanji	Yalanji
Freshwater Creek carving	Gimuy Yidinji	Yidin
Koombooloomba	Jirrbal	Dyirbal
O'Leary Road	Jirrbal	Dyirbal
Charappa	Mamu	Dyirbal
South Johnstone	Mamu	Dyirbal

within three language areas, Yalanji, Dyirbal and Yidin; most of the carvings are contained within the Dyirbal-speaking Mamu and Jirrbal estates (Table 1).

Most surviving dendroglyphs are clustered in dense forests on basalt soils. During the logging era, these areas were managed by the Ravenshoe and Millaa Millaa Forestry Offices (Dyirbal language estate), which recognised the carved trees as significant Aboriginal heritage and deliberately protected them from logging. Dendroglyphs have also survived outside the basalt soils, in smaller numbers. One dendroglyph was protected from logging at Mount Windsor (Yalanji language estate), but there may have been more that were not preserved (Buhrich and Murison 2020 provide details on the Mount Windsor dendroglyph). The trunk of one carved tree near Cairns (on the Yidinji language estate) was removed from Freshwater Creek and sent to the Queensland Museum, while another nearby carved tree was left and flooded when the valley was dammed.

While the Wet Tropics hosts over 2800 vascular plant species, dendroglyphs have only been recorded on six tree species. Half of the species with recorded carvings are food-bearing, for example, black walnut (*Endiandra palmerstonii*), yellow walnut (*Beilschmedia bancroftii*) and candlenut (*Aleurites moluccana*). Carvings are found on non-food-bearing trees, including the McIntyre box (*Xanthophyllum octandrum*), silky oak (*Grevillea robusta*) and possibly kauri pine (*Agathis robustus*). Measurements of carved trees identify them as some of the largest examples of their

TABLE 2 | Wet Tropics and margins rock art site clusters, Aboriginal parties and language groups.

Site cluster	Aboriginal party	Language group
Cairns coastal	Yirrganydji	Djabugay
Bare Hill	Bulwai	Djabugay
Davies Creek	Bulwai	Djabugay
Mulgrave	Malanbarra	Yidin
Wooroonooran	Mamu	Dyirbal
Silver Valley	Jirrbal	Dyirbal
Mount Claro	Gugu Badhun	Warungu

species (see Buhrich 2017, 87 for comparison with old growth Wet Tropics species). The carved trees are among the oldest trees surviving in the rainforest, possibly over 600 years old. See Buhrich (2017), Buhrich et al. (2017) and Buhrich and Murison (2020) for more details on the attributes and preservation of rainforest dendroglyphs.

Over 40 rock art sites in granite, sandstone and basalt substrates have been recorded in and around the Wet Tropics in published records, unpublished accounts and state government site files (e.g., Brown 2003; Cosgrove and Rayment 2002; Dixon 1983; Edwards 2007; Gunn and Thorn 1994; Horsfall 1987; McConnel 1931; Seaton 1951, 1952, n.d.). It has been tentatively suggested that the Wet Tropics could hold the largest body of rock art paintings on a granite substrate worldwide (Gunn and Thorn 1994). For this study, seven site clusters of rock art, with a total of 25 sites, were recorded in the estates of seven Aboriginal parties (Table 2, Mulgrave not depicted on Figure 1 at request of Elder). This included sites in five language estates: Yalanji, Djabugay, Yidinji, Dyirbal and Wurungu. A total of 522 individual motifs were recorded.

Rock art in the Wet Tropics often appears within clusters of three to five sites located within 2 km along a single watercourse. Typically, these clusters feature one prominent site displaying between 46 and 119 individual motifs in red, yellow, white and black. Satellite sites contain smaller numbers of paintings in only

TABLE 3 | Patterns in figurative/non-figurative motifs in the dendroglyphs compared to rock art found in the eastern and western sides of the Wet Tropics.

Style Count	Dendroglyph		Rock art—east		Rock art—west	
	Number	Percentage	Number	Percentage	Number	Percentage
Figurative	3	9.37	156	79.6	21	10.77
Non-figurative	27	84.38	40	20.4	172	88.2
Track	2	6.25	0	0	2	1.03
Total	32	100%	196	100%	195	100%

red. Wet Tropics art sites tend to be small with sparse numbers of motifs. The average number of motifs at any site is 21. There does not appear to be a significant pattern between geology and rock art, with painting found in three different geological substrates: granite, sandstone and basalt. Granite shelters, the most prevalent type in the Wet Tropics, host the majority of recorded rock art sites. Sandstone outcrops are rarer; however, the motifs at sandstone sites are nearly double in number compared to other substrates. Basalt shelters, often highly exposed, show poor preservation, which may account for the limited number of motifs observed there. Painted motifs dominate the Wet Tropics' rock art assemblage, with stencils, cupules, and dry pigment sketches appearing in smaller numbers, primarily in western sites. Eastern sites exclusively feature painted motifs, excluding the post-contact prints and engravings recorded at Davies Creek.

3.2 | The Dendroglyph and Rock Art Sample

Images were categorised into figurative, non-figurative and tracks. Thirty-three of the entire sample of 38 dendroglyph motifs were classified as non-figurative, which is 86% of the sample (Table 3). Of the remaining five motifs, three are distinguishable as figurative, and two are classified as tracks (see Figure 4 for examples). Most of the dendroglyph motifs could be classified as abstract shapes, linear designs, parallel lines and arcs. These designs make up 26 of the 38 recorded dendroglyph motifs. Two motifs were classified as tracks, both being bird tracks/tridents. Only one figurative category, anthropomorph, was identified, and all the anthropomorphs were either male or non-gendered.

In the rock art assemblage, 202 motifs were identified as figurative and 417 were identified as non-figurative (Table 3). Tracks and stencilled art are absent from the corpus of Wet Tropics art recorded for this project. Over half of all identifiable figurative motifs are anthropomorphic and more than one-third are zoomorphic. Anthropomorphs and zoomorphs dominate the figurative motifs and are recorded at every rock art site cluster. Non-figurative motifs were often found at multiple site complexes and include arcs, linear designs, tridents, star shapes, dots and ovals.

Eastern rock art sites have a lower ratio of non-figurative designs compared to the western rock art sites. In the eastern sites, 79.6% of all motifs could be identified as figurative, while 84.38% of western motifs were non-figurative (Table 3). There are limitations to the data capture, particularly the subjectivity around how motifs are categorised (Clegg 1978) and interpreting data based

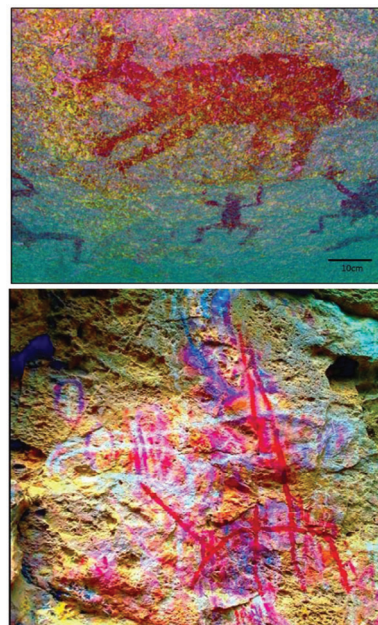


FIGURE 4 | Example of figurative rock art typically found in the east (top) and non-figurative rock art found in the west (bottom) enhanced with Dstretch.

on small numbers of motifs, particularly with the dendroglyph assemblage. Despite these limitations, the different patterns in the use of figurative and non-figurative rock art motifs east and west of the Great Divide are striking. Furthermore, the ratio of figurative to non-figurative dendroglyph motifs mirrors western rock art, although the dendroglyphs are only found in the eastern Wet Tropics.

Motifs common to both carved trees and rock art are male anthropomorphs, arcs and abstract linear designs. Male anthropomorphs are among the most common motifs in the Eastern Wet Tropics rock art and also make up over 10% of the dendroglyphs. There are distinct parallels between painted and carved male anthropomorphs, particularly the Mount Windsor dendroglyph. It is in a full-frontal pose, with arms and legs protruding from a torso, a head, and incorporates features distinct to the Laura 'Quinkan', specifically a helmet-shaped head, a bump on at least one knee, and exaggerated genitals (Cole 1992, 165). Some of these features have also been noted in anthropomorphs painted at Kennedy Valley, Bare Hill and Jiyyer Cave (Brayshaw 1990, 125; Horsfall 1987). Anthropomorphic figures that Brayshaw (1990) called 'Kennedy characters', with head, torso, upturned legs and

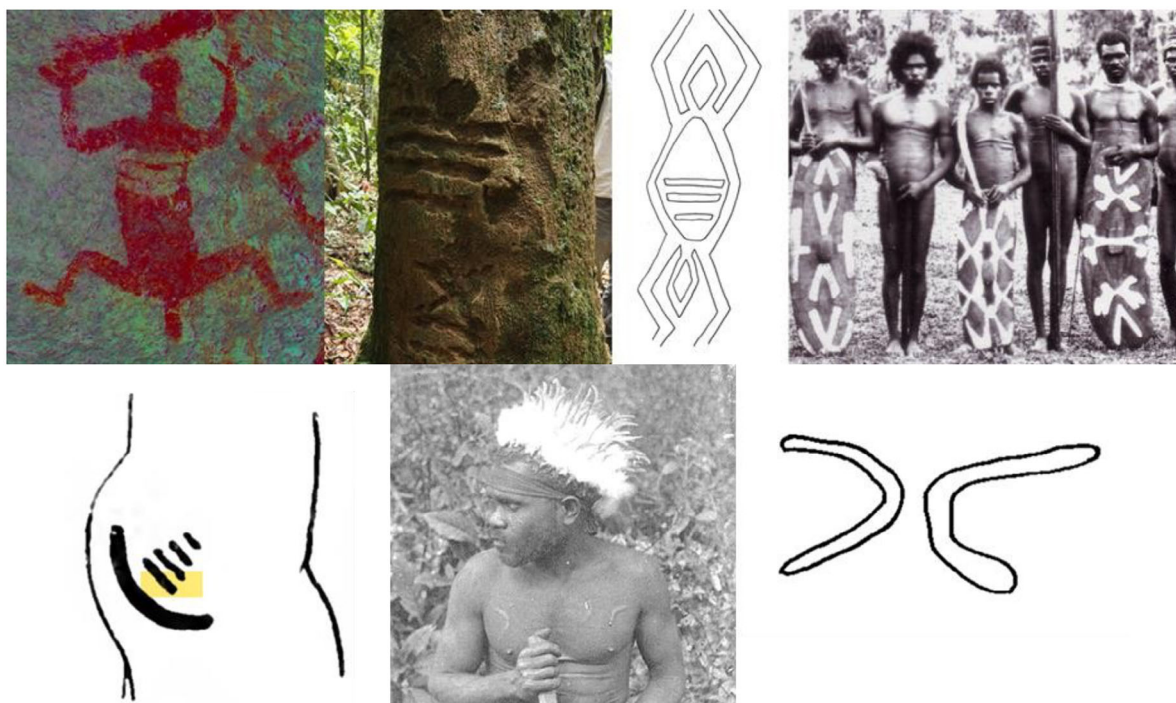


FIGURE 5 | Top, parallel initiation scars from the rock art and carved trees, and on people.

arms, were found in three of the shelters at the southern Wet Tropics but not south of the Wet Tropics. As noted by others, these figures are also present at Bare Hill (Clegg 1978; Cole and David 1992).

Parallel lines mark the chest of one male anthropomorphic dendroglyph motif (Figure 5b). These same ‘chest scars’ are depicted in five male anthropomorphs at Bare Hill, where custodians interpret them as initiation scars (W. Brim pers. comm. 2014). Chest scars are also a feature in photographs and paintings of males in southeast Cape York Peninsula rock art (Huchet 1990) (Figure 5a–d). Female anthropomorphs are not recorded on any dendroglyphs nor in many of the rock art motifs.

Geometric motifs such as arcs, dots, barred ovals and stars are a feature of rock art complexes and dendroglyphs west of the Great Dividing Range but absent from all eastern Wet Tropics art complexes, except Bare Hill. Stars are recorded in two western and two eastern rock art complexes and were also found outside the Wet Tropics (Ellwood et al. 2013). Ovals were recorded in two of the western Wet Tropics complexes and at Bare Hill. Barred ovals and barred combs were only recorded in western sites. Abstract linear designs were recorded at each of the rock art complexes but were absent from dendroglyphs, while ‘X’ shapes were seen in two dendroglyphs but not in rock art complexes. Chevrons are absent from western rock art complexes but are present on dendroglyphs and at one of the eastern rock art sites. They are also commonly found on rainforest shields (Abernethy 1984, 75).

When comparing the rock art and dendroglyph designs, the dendroglyphs found only in the east are dominated by abstract shapes, including parallel lines, arcs, chevrons, ‘X’ shapes and ovals, and appear to be most similar to the western rock art motifs. However, this observation is an oversimplification of the data.

Parallel lines, arcs (often paired) and chevrons make up nearly half of all dendroglyph designs, but of these motifs, only arcs and parallel lines appear in the rock art record. Arcs in the rock art are never displayed in pairs but usually occur in this way on dendroglyphs. Parallel lines are usually depicted vertically in the rock art but only depicted horizontally as dendroglyphs. While there are differences between rock art and dendroglyphs, there are also similarities, particularly in the depiction of male anthropomorphs and the absence of females.

3.3 | Presence/Absence of Motifs in Wet Tropics Rock Art Complexes and Dendroglyphs

Painting is the dominant technique across the whole of the Wet Tropics, with only a small number of stencils and cupules recorded on the southwest and northwest margins. A comparison of motifs revealed different motif forms to the east and west. Coastal sites tend to include anthropomorphic and zoomorphic figures. Red is the dominant colour at all the sites, but orange, white, yellow, mulberry and black are also found. Sites are typically found in a cluster, which features one main site of up to 40 motifs in three or four colours, with smaller satellite sites with paintings in red only.

Although depictions of zoomorphs are common at Wet Tropics art sites, only lizards are repeated in more than one site complex. Lizards were recorded at each of the western rock art site complexes, at Bare Hill and Davies Creek and reported by Seaton (1952) on a dendroglyph which no longer exists. This follows the pattern of southeast Cape York Peninsula sites, where lizards were observed painted in every region except for one (Cole 2016). Other categories of zoomorphs common to both the Wet Tropics and southeast Cape York Peninsula are the eel/catfish, bird,

dingo, echidna and possum; however, in the Wet Tropics, these appear to have very limited distribution. There are also notable absences of zoomorph categories in the Wet Tropics, for example, fish, turtle, crocodile and other marine animals.

Parallel lines are present in both the eastern and western rock art of the Wet Tropics and in the dendroglyphs. Parallel lines are one of the most common motifs in the dendroglyph sample, where they are sometimes depicted on their own and sometimes as chest scars on male anthropomorphs. Parallel lines are different in the eastern and western corpus of rock art. In the eastern Wet Tropics, rows of three to five horizontal lines tend to be depicted on the torso of male anthropomorphs. In western Wet Tropics rock art, parallel lines tend to be in groups of over 10 short vertical lines. Rows of short, vertical parallel lines, virtually identical to parallel lines recorded at each of the western Wet Tropics rock art clusters, have been recorded previously in rock art at Mount Carbine and Chillagoe (David and Chant 1995; Edwards 2007, 67, 93, 168; Winn 2016). At Chillagoe, based on information provided by Wakamin informants, these have been interpreted as initiation scars (Winn 2016). The potential relationship between body scars and horizontal parallel lines is discussed below.

3.4 | Meaning and Significance

Semi-structured interviews regarding the cultural significance of the trees were conducted with nine senior custodians from six clan estates representing four language groups. All of the Aboriginal custodians I worked with had heard about carved trees from their older generations. However, with the exception of the Tully Falls dendroglyph and the carvings stored in the Queensland Museum, the dendroglyphs had not been visited in living memory. Once we started inspecting the dendroglyph motifs, First Nation custodians quickly placed their observations of the trees and the environments into their own understandings of the cultural landscape. They recognised symbols within their broader cultural context and identified relationships with body scars and clan designs. Some of the motifs had direct relevance to clan symbols or story places. These observations provide insights into the ongoing significance of the motifs as symbols of identity and the living connection to country and culture.

There was little consensus in the information provided by the Aboriginal custodians about the purpose of the dendroglyph sites. Dugulbarra informants identified the dendroglyph sites as campsites because they were usually associated with edible nut-bearing trees, walking tracks, were not far from water, and stone tools had been found at some sites. In contrast, Jirrbal informants considered the dendroglyphs to be related to Men's Business, 'although camp sites would have been located nearby' (B. Cashmere pers. comm. 2015). Gimuy Yidinji recognised the dendroglyphs as boundary markers between clan estates. Western Yalanji identified the one recorded dendroglyph on their estate as a story place (Buhrich and Murison 2020).

3.5 | Motifs and the Sociocultural Landscape

One Mamu interviewee, Stephen Purcell, drew attention to the relationships between dendroglyph motifs of parallel lines

and body scars. Talking about the dendroglyphs at Charappa, Uncle Steve Purcell noted, 'they look like initiation scars. You have a look at them they actually started up here. I think some that are in the lower abdomen which were wider around here'.

Arcs are a common dendroglyph motif and were also observed as body scars on rainforest people (Figure 5e–g). Lumholtz (1889, 136) reported body scars, including opposing arcs and parallel lines, on people in the Herbert River. In the Cairns region, photographer Alfred Atkinson captured an image of an Aboriginal man with opposing arc body scars on his chest around 1890. Twenty years later, Roth recorded 'half-moon' scars on women and men on the Tully River:

Here on the Tully River, there is a half moon cicatrix cut on the buttocks of men who are considered to be expert tree climbers. Such a half moon scar (MAL kanren), which may be supplemented with small horizontal cuts, is said to teach the owner how to climb properly.

(Roth 1910, 70)

The marking of expert tree climbers with half-moon scars and horizontal cuts and the presence of these motifs on Dyirbal dendroglyphs indicates some affinity between these initiated men and the carvings and perhaps the trees themselves.

3.6 | Gender

The lack of female anthropomorphs in the rock art and particularly the dendroglyphs is surprising, especially because of the predominance of women depicted in rock art in southeast Cape York Peninsula and elsewhere (Cole and David 1992; McDonald and Veth 2012). In Jowalbinna, for example, Cole (1992) recorded that 19% of all anthropomorphs were women. The relative absence of female figures in the Wet Tropics is intriguing and worthy of further research.

Dendroglyphs were discussed only in terms of male gender by a number of Aboriginal informants. As Jirrbal elder Betty Cashmere explained, 'Women weren't allowed to go. So, whether it was close to the initiation or men's business don't know'. Rainforest Aboriginal men were known to be exceptional tree climbers, accessing the crown of significantly large trees to obtain *wuju* (bush tucker) such as seeds, *gurnyjal* (honey) and *jalgur* (meat). It is notable that at least two dendroglyphs were carved between four and five metres up the trunk of large trees, probably made by climbers using lawyer or other vine slings.

There were suggestions by some of the Jirrbal informants that dendroglyphs represented male sites, and access was restricted only to appropriate men. However, on other estates, the dendroglyphs were carved into trees on known walking tracks, and they appear to have been used as 'signposts', being placed at eye height or higher and clearly visible to anyone using the track. Stone tools, including grindstones, have been located at some of the dendroglyph sites, suggesting they may have been used as campsites where women were present. Discrepancy between the meanings of a dendroglyph is not unusual. For

example, Gitxsan (Canada) and Moriori (Chatham Islands, New Zealand) informants can interpret a single carving in multiple ways (Blackstock 2001; Richards 2007).

3.7 | Clan Symbols and Social Identity

Both Mamu and Jirrbal informants identify dendroglyphs as clan symbols. When locating a cluster of dendroglyphs at Charappa on the Mamu estate, a deep and distinctive bird track/trident shape was found. The first reaction of one Aboriginal custodian was to identify it as a cassowary track and her clan as the cassowary people. ‘Cassowary people’ were discussed on a subsequent field trip to the Charappa site. According to Dugulbarra¹ elder Steven Purcell:

That’s our people from here, that’s Dugulbarra totem. Now remembering the main communal area of Jordan Creek, the people that were there were cassowary people. That’s how they referred to them as cassowary people. And that’s Dugulbarra area all through here. And that’s the cassowary foot.

The relationship between the cassowary motif and the cassowary tribe was noted 60 years earlier by Doug Seaton (n.d.) describing a carved tree at nearby Tchuken bora ground.

The carved figures of the panel have been overgrown with a rough bark which could be easily removed. The panel is 4’8” [142 cm] in height with the bottom 5’ [152 cm] from the ground. The top and bottom margin of the panel is incised three parts round the tree which is still living. Apart from the giant lizard and reptiles, I cannot determine the other figures. 5’3” above the top of the panel is a carved cassowary without legs. The tribe in this area were known as the ‘cassowary tribe’.

4 | Discussion

This study employed qualitative and quantitative methods to explore the relationship between Aboriginal language, dendroglyphs, and pictographs (rock art) in Australia’s Wet Tropics during the Late Holocene. The region was selected for its temporal alignment, where language, dendroglyphs, and rock art coexisted or were created within comparable historical periods. Insights from interviews with senior Aboriginal knowledge holders confirm the continued significance of these sites, their meanings, and their connections to social identity within contemporary rainforest Aboriginal communities. By demonstrating that motifs do not strictly conform to the boundaries of language groups but instead signify broader social interrelations, the research challenges frameworks of stylistic regionalism in Australian rock art, opening avenues for rethinking cultural expressions in diverse environmental and social contexts.

4.1 | Style and Language

Language estates typically ran east to west, incorporating coastal, tableland and savannah environments. The Yalanji, Dyirbal and Djabugay language estates, for example, were composed of clan groups affiliated with the coast, the rivers, tablelands and western fringes of the Wet Tropics. Links between the clan groups meant that people would move between these environmental zones and estates, taking advantage of seasonal resources. If language was the key to communication in rock art, one would expect that style would mirror these east-west language alignments, with similar forms being found on the coast and the western fringes in the Yalanji, Dyirbal and Djabugay speaking estates. Dendroglyphs would also be expected to follow such a pattern. However, the findings (Table 1) were quite different, with stylistic similarities in rock art running north to south, with figurative forms dominating the eastern corpus while non-figurative forms dominate the western side. Dendroglyphs have a different pattern again. Although only found in the eastern Wet Tropics, where figurative rock art dominates, dendroglyphs tend to have a non-figurative style similar to western rock art. This finding suggests that something other than language affiliation is being communicated through visual expression in rock art and dendroglyphs.

At the outset of this study, I anticipated that rock art and dendroglyph designs would correspond to differences in language group areas, particularly because language has been identified in other regions as being central to differences in rock art (e.g., McDonald 2008; McDonald and Veth 2013; Winn 2016); because languages in the Wet Tropics formed such significant social boundaries, according to Dixon (1983); and because designs were used on shield to signify language affiliations (Abernethy 1984). But language is just one expression of social identity in Aboriginal society. For example, in Barunga communities in the Northern Territory Smith (1999) identified five intersecting identities held by individuals—language, moieties, clan, nomenclature and the contemporary community. She notes, like Wood (2016) and Anderson (1984), that language as a social marker has become more important since colonisation, while clan identity has become less important because of difficulties in maintaining a physical relationship with land. This has been influenced particularly by the movement of Aboriginal people off their lands, leading to diminishing physical ties to clan estates. It could be that style is reflecting one of these other layers of social identity, rather than language.

4.2 | Further Research

The interchangeability of signalling systems on different media within any cultural bloc is an interesting area to explore further (see, for instance, McDonald 2018). There are a number of portable expressions of material culture that are unique to the rainforest. Rainforest shields, painted with bold designs that reflected language identity. The shields had a specific use in *bruns* (gatherings where disputes between neighbouring groups were settled) to signal social identity. Some of the patterns used in Dyirbal shields are repeated in Dyirbal dendroglyphs (see Buhrich 2017). Interestingly, rainforest shield designs are found in rock art outside the rainforest margins, suggesting that they

are not marking differences but perhaps highlighting links to neighbours and neighbouring estates (Buhrich et al. 2016).

Stone tools unique to specific areas within the Wet Tropics are another area of potential research. Incised slate grindstones were only used to process food in a specific area (between Cardwell, Babinda and Ravenshoe), although the foods that were processed were not specific to this area. Ooyurkas are a particularly mysterious stone tool type. Ooyurkas are found only in the same area as the incised slate grindstones, often carefully made, highly polished and coveted by collectors. It is unclear why these technologies were not used outside this discrete area when other items of material culture, ideas and images were traded both inside and beyond the Wet Tropics.

One anthropomorphic motif is common across eastern rock art sites and is also seen in the dendroglyphs. The anthropomorph, usually male, has upturned legs and outspread arms and a helmet-shaped head, all common to the 'Quinkan' motif found in southeast Cape York Peninsula rock art. It is carved into a single tree on the Mount Windsor plateau in the north of the study area, is numerous at Bare Hill rock art sites in the central Wet Tropics and has been recorded in rock art sites in the southern Wet Tropics (Brayshaw 1990; Buhrich and Brim 2020; Buhrich and Murison 2020; Cole and David 1992). Rather than being associated with one language area, the Quinkan motif appears to cross multiple language estates, from Laura to Cardwell. This motif covers a distance of over 500 km and crosses at least four language groups.

4.3 | A Reflection on co-designed Research

Community-based archaeology has the potential to balance the requirements of scientific discourse with cultural values by producing research which makes a social contribution while also enhancing our understanding of the past (Brady and Kearney 2016; Greer et al. 2002; Smith and Jackson 2008). For this research, the community-based approach provided insights into the cultural landscape that would not be available without working closely with the relevant Aboriginal custodians. Although the process had limitations, co-designing the research significantly enhanced the overall outcomes by providing insights into the motifs as a component of a living cultural landscape.

4.4 | Limitations

The small sample sizes in both dendroglyphs and rock art are too small and uneven for statistical analysis between language groups. There is potential bias in the site selection, as only sites where custodians chose to participate and only sites the custodians chose to share with me were included. It is possible, for example, that there remain important dendroglyph and rock art sites from the region that were not included because I did not have permission to visit, or people chose not to take me there. Only a small number of dendroglyph motifs have survived and were only re-found because they had been recorded by Grimwade (1990). Classification of motifs was based on observations and interpretations by First Nations custodians. Few custodians had direct knowledge of the meanings of the carvings, and interpreta-

tions were influenced by contemporary worldviews. The findings presented here provide a theory that should be revisited and refined with additional sites and interpretations.

5 | Conclusion

If visual expression reflects social identity, it follows that there might be similar patterns in motif categories of rock art and dendroglyphs in the same geographical area. However, in the Wet Tropics this does not appear to be the case. Despite dendroglyphs only being found in the eastern part of the Wet Tropics, motifs are usually abstract, like western Wet Tropics-style rock art. This suggests that as forms of visual expression, the rock art and the dendroglyphs were communicating different things. Discussions with Aboriginal custodians revealed that despite having little physical contact with the carvings, the dendroglyph motifs and sites are recognised by Aboriginal people as story places, clan symbols and places of special cultural significance.

The results of my investigation show little correlation between language, rock art and dendroglyphs; significant stylistic differences were found within single language estates. Rock art was recorded on the Dyirbal estate in both the east and west sides of the study area. The research found significant differences in rock art style within the Dyirbal-speaking estate, with a higher rate of non-figurative paintings on the western side and a higher rate of figurative paintings on the eastern side. In contrast, dendroglyph motifs were only found in the eastern side of the Dyirbal estate and are dominated by non-figurative designs.

The evidence suggests that, while Information Exchange is demonstrated in other aspects of Rainforest Aboriginal culture, motif patterns identified in dendroglyphs and pictographs do not align with languages. Aboriginal people had multi-faceted identities including language groups, moieties, sections and marriage alliances which cannot be understood without an in-depth knowledge of the cultural systems in which a person existed. It is possible that patterns in visual expression were not reflecting differences, such as in language, but rather signified social connections that crossed language boundaries and extended over considerable distances. These results suggest that rather than thinking of environmental or language 'provinces', the pictograph style of the Wet Tropics connected people through 'strings of connection' that extended beyond the rainforest boundaries (Buhrich et al. 2017). Further regional research is needed to determine if these reflect story lines, trade routes, Ancestral travels, shared ceremonial practices or other connections.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Endnotes

¹Dugulbarra one of five clans that make up the Dyirbal speaking Mamu tribal group.

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