



Moluccan Fighting Craft on Australian Shores: Contact Rock Art from Awunbarna, Arnhem Land

Mick de Ruyter · Daryl Wesley ·
Wendy van Duivenvoorde · Darrell Lewis ·
Iain Johnston

Accepted: 22 June 2022 / Published online: 2 May 2023
© The Author(s) 2023

Abstract Two similar watercraft depicted in rock art at Awunbarna, Arnhem Land, Australia, are unlike the Macassan *prahus* and Western craft shown at other contact sites in northern Australia, but are sufficiently detailed to offer evidence for identification. Both craft appear to display triangular flags, pennants, and prow adornments indicating martial status. By comparing these two depictions with historically recorded watercraft from Island Southeast Asia, their probable origin is shown to have been eastern Maluku Tenggara in Indonesia. These motifs provide the first known direct archaeological evidence for ethnic diversity for the origins of mariners from Island Southeast Asia other than Makassar, Sulawesi. The rock-art depictions are representative of ceremonially decorated fighting craft used to lead trading voyages and raids, and may be linked to trade, fishing, resource exploitation, or slavery. This potentially

unique identification of Moluccan watercraft in Arnhem Land rock art offers evidence of the elusive encounters between the Indigenous people of northern Australia and people from the archipelagos to the north, evidence with which to expand both the nature and context of Australia's contact narrative.

Resumen Dos embarcaciones similares representadas en el arte rupestre de Awunbarna, Tierra de Arnhem, Australia, son diferentes a los *prahus* de Macasar y las embarcaciones occidentales que se muestran en otros sitios de contacto en el norte de Australia, pero son lo suficientemente detalladas como para ofrecer evidencia para su identificación. Ambas naves parecen exhibir banderas triangulares, banderines y adornos en la proa que indican un estado marcial. Al comparar estas dos representaciones con embarcaciones históricamente registradas de la isla del sudeste asiático, se muestra que su origen probable fue el este de Maluku Tenggara en Indonesia. Estos motivos proporcionan la primera evidencia arqueológica directa conocida de la diversidad étnica de los orígenes de los marineros de la isla del sudeste asiático además de Macasar, Sulawesi. Las representaciones de arte rupestre son representativas de embarcaciones de combate decoradas ceremonialmente que se utilizan para liderar viajes comerciales e incursiones, y pueden estar relacionadas con el comercio, la pesca, la explotación de recursos o la esclavitud. Esta identificación potencialmente única de embarcaciones de las Molucas en el arte rupestre de Tierra de Arnhem ofrece evidencia de los escurrid-

M. de Ruyter (✉) · D. Wesley · W. van Duivenvoorde
College of Humanities, Arts and Social Sciences, Flinders
University, GPO Box 2100, Adelaide, SA 5001, Australia
e-mail: mick.deruyter@flinders.edu.au

D. Lewis
Department of Archaeology and Palaeoanthropology,
School of Humanities, University of New England,
Armidale, NSW 2351, Australia

I. Johnston
Australian Institute of Aboriginal and Torres Strait
Islander Studies, 51 Lawson Crescent, Acton Peninsula,
Canberra, ACT 2601, Australia

izos encuentros entre los pueblos indígenas del norte de Australia y la gente de los archipiélagos del norte, evidencia para expandir tanto la naturaleza como el contexto de la narrativa de contacto de Australia.

Résumé Deux navires similaires représentés sous la forme d’art rupestre à Awunbarna, Terre d’Arnhem en Australie, diffèrent du *prao* de Macassar et de l’art occidental qui se trouvent sur d’autres sites de contact dans l’Australie du nord, mais ils sont suffisamment détaillés pour fournir des éléments d’identification. Les deux vaisseaux semblent comporter des pavillons triangulaires, des fanions et des éléments décoratifs sur la proue indiquant un statut militaire. La comparaison de ces deux représentations avec une archive historique de vaisseau issue d’Asie du Sud-Est maritime indique que leur origine probable semble avoir été Maluku Tenggara dans la région Est de l’Indonésie. Ces motifs fournissent les premières preuves archéologiques directes et connues de la diversité ethnique quant aux origines des marins de l’Asie du Sud-Est maritime autres que Macassar, Sulawesi. Les œuvres d’art rupestre représentent des navires de combat arborant des décorations de cérémonie, utilisés pour mener des voyages commerciaux et des raids. Ils pourraient être liés au commerce, à la pêche, à l’exploitation de ressources ou à l’esclavage. Cette identification potentiellement unique d’un navire Moluquois dans la Terre d’Arnhem fournit la preuve des rencontres fugaces entre les populations indigènes de l’Australie du nord et les populations issues de l’archipel du nord. Ces indices permettent d’élargir tant la nature que le contexte du récit de l’Australie relatif aux contacts.

Keywords rock art · culture contact · traditional watercraft · *perahu* · Arnhem Land

Introduction

In this article we consider the origins and significance of two similar watercraft depicted in rock art at Awunbarna, Arnhem Land, in Australia. Early contact history in what is now the Northern Territory, Australia, is dominated by a Macassan-centric narrative of fishing along the Arnhem Land coastline (for example, Chaloupka [1993:191–192, 1996], Clarke and Frederick [2006], Taçon, May, Fallon et al. [2010], and Taçon and May [2013]). The Macassans

were a disparate group of Island Southeast Asian seafarers with a commercial network based in the town of Makassar in Sulawesi, Indonesia. The watercraft discussed here are unlike any of the typical Macassan fishing vessels and other colonial craft illustrated elsewhere at rock-art sites in northern Australia but are sufficiently detailed to offer evidence for a robust identification. Both rock-art depictions appear to display triangular flags, pennants, and prow adornments—prominent decorated prow boards in both cases and a “sun wheel”—a circular device with emanating rays—in one. By comparing the shape, proportions, configuration, and detail of these two craft with historically recorded watercraft from nearby regions, this study shows the probable origin to have been the region of eastern Maluku Tenggara in Indonesia, and possibly the island of Tanimbar in particular. The rock-art depictions are representative of ceremonially decorated fighting craft used to lead trading voyages and raids from Tanimbar, Aru, and Kei to neighboring islands. The detailed illustration implies a degree of intimate knowledge of the craft themselves through long or close observation, or from actually voyaging in them.

This identification of Moluccan fighting craft has significant implications for the reasons mariners from these islands may have been on the northern Australian coastline, and subsequently for the intercultural encounters on the Arnhem Land coast. An underlying reason for Moluccan fighting craft to visit the Arnhem Land coast is likely to be linked to trade, fishing, resource exploitation, or slavery. While the artist(s) potentially observed these craft in the Moluccas rather than in Australia, the presence of such fighting craft would imply either a physically violent context, or conversely a benign projection of power. The very nature of these watercraft being eastern Indonesian fighting vessels is a significant departure from the narrative of Macassan commercial and fishing activities. Furthermore, these two paintings have significant implications for the two competing chronological models for culture contact between northern Australia and Southeast Asia.

The Location and Cultural Context of the Site

The emergence of the trepang fishing industry, usually associated with Makassar in southern Sulawesi,

provides evidence for prolonged interactions between the peoples of Arnhem Land and those of Island Southeast Asia, the latter regularly referred to as Macassans within the literature (Macknight 1976, 2011:128–129). The name Macassan is based on historical and ethnographic evidence to describe the Island Southeast Asian people who were heavily involved in harvesting and processing trepang—holothurians or sea cucumbers—although culturally diverse crews from across the region were involved (Macknight 1976; Taçon and May 2013:128). This trepang industry operated from sometime in the early- to mid-17th century with a proliferation in the 1780s. Archaeological studies in western Arnhem Land now suggest that there was some form of engagement occurring between Indigenous communities and people from Island Southeast Asia from the early 1600s (Taçon, May, Fallon et al. 2010; Wesley, O'Connor et al. 2016; van Duivenvoorde et al. 2019:41). While there is substantial archaeological evidence at northern Australian trepang processing sites (potsherds, metals, coins, glass, fishhooks), there is a scarcity of

materials to be used to distinguish the specific ethnicity, or island of origin, of the trepang fishermen even though historically it is known that crews and boats were sourced from the eastern Indonesian archipelago (Earl 1846:240; Macknight 1976). The common Macassan watercraft that enabled these contacts were known as *perahu*. Following the common usage of modern nautical researchers, the Indonesian word *perahu* is used here as both the singular and plural form in preference to earlier English variants like *prahu*, *prau*, or *proa* (Burningham 1987:103).

Awunbarna, also known as Mount Borradaile, is in northwestern Arnhem Land in northern Australia on the lands of the Amurdak and Mengerdji traditional owners (Fig. 1). The region consists of a series of large sandstone outliers surrounded by a small range of sandstone strike ridges of the Mamadewerre Sandstone. The area is known to contain hundreds of rock-art sites with some of the region's most significant complexes of rock art. Awunbarna, or “the hollow mountain,” is located at the nexus of several Indigenous language groups and at a significant point

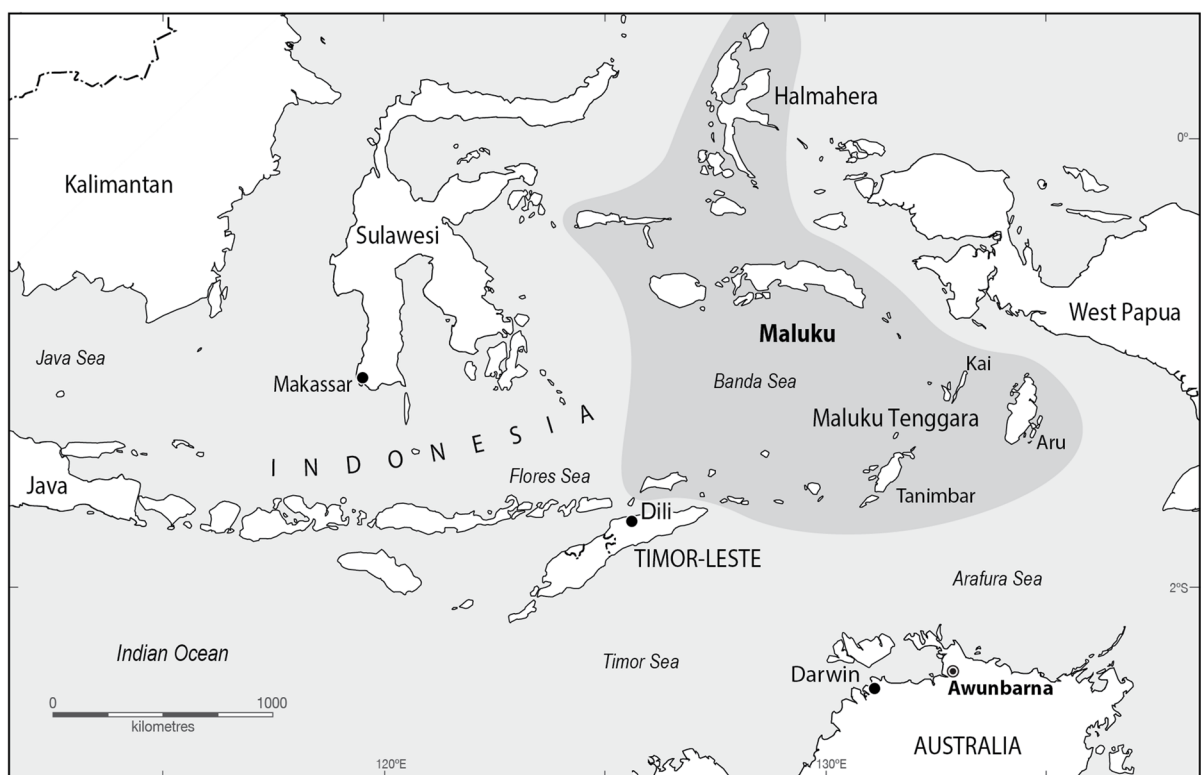


Fig. 1 Arnhem Land and Maluku Tenggara. (Map by Mick de Ruyter, 2022.)

between the coast and the stone country (Roberts and Parker 2003).

The Awunbarna area is well known for the many depictions of European material culture including paddle steamers, steamships, luggers (sailing vessels), houses on stilts, eating implements, letters of the alphabet, and firearms (Chaloupka 1996; Roberts 2004; May, Wesley, Taçon et al. 2013; Wesley 2013). The most prolific of the European imagery are ships and firearms largely relating to the 1870s and early 1900s with images of vessels rigged as sloops, cutters, and ketches that were seen on the coast and East Alligator River during the buffalo shooting and

early mission eras (Roberts 2004; Wesley 2013). The two vessels that are the focus of this discussion were originally described by George Chaloupka in the 1970s and later documented by coauthor Darrell Lewis in 1998. The vessel with the oars, referred to here as Awunbarna 1 and shown in Figures 2 and 3, was later discussed by Roberts (2004:33–34) who speculated that it might be a Chinese junk. Despite the tantalizing possibility that this rock-art motif may represent a non-Macassan contact event there has been limited interest in identifying these vessels, their possible origins, and implications of them representing something other than trepangers.

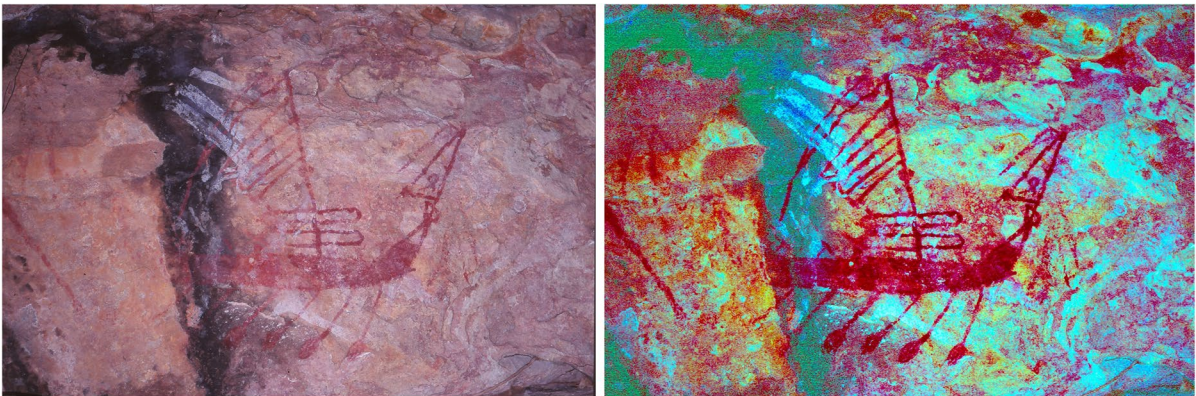


Fig. 2 Awunbarna 1, photo (*left*) taken in 1998 and D-stretch image (*right*). (Images by Darrell Lewis, 1998 [*left*] and Daryl Wesley, 2019, after Darrell Lewis [1998] [*right*].)

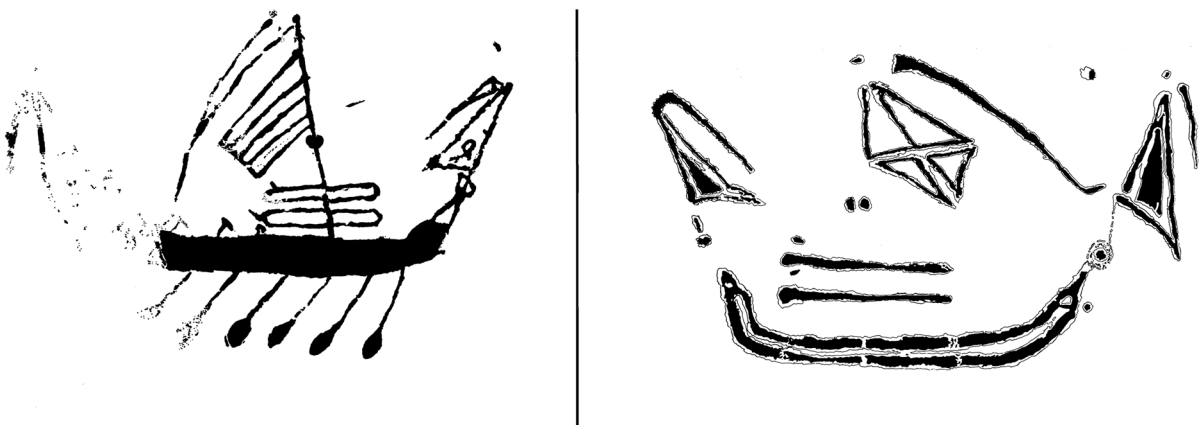


Fig. 3 Drawing of Awunbarna 1 (*left*) and Awunbarna 2 (*right*). (Drawings by Darrell Lewis, 1998.)

Documenting the Site

Lewis documented the Awunbarna watercraft motifs in 1998 while visiting Max Davidson's tourist camp at Mount Borradaile. These boat motifs were not well known at the time, and Lewis managed to photograph Awunbarna 1 and trace them both during the one-day visit. He recorded his observations of the sites in rough field notes.

The site is a very large free-standing boulder with a shelter on one side. The floor of the shelter is an elevated stone shelf. Awunbarna 1 is about 1.5 m above the shelf and around 3 m from ground level. The motif is painted in red ochre pigment with solid infill and is approximately 64 cm long. The painting is situated on a sloping ceiling, low against the shelter wall and higher at the drip line. Standing at the drip line and facing the wall, the boat appears upside down when looking up at the ceiling, such that the oars are on the uphill side of the slope and the masts are on the downhill side. The boat only appears upright when standing against the wall and looking up. Other paintings at this site are of recent styles and not well preserved. At the time of survey in 1998, the site contained poorly preserved images of human figures, fish, a freshwater prawn, and a macropod. The faint remnants of a painted human figure in white pigment overlaps part of the superstructure of the boat at the top left (Fig. 2, left). White pigment is the least stable of the colors used in Australian rock art, so the image was judged to be relatively recent. The styles of the figure and other art suggests that this site was made within the past few hundred years and is not of great antiquity, with no trace of older styles like Dynamic Figures or Yam Figures (for example, Brandl [1988], Lewis [1988], Chaloupka [1993], Jones et al. [2017], and Taçon, May, Lamilami et al. [2020]).

Awunbarna 2 (Fig. 3, right) is in a proper cave, rather than an overhang. Such caves are quite rare in the western Arnhem Land sandstone, with most rock art being in open rock shelters. The cave is a small tunnel in the side of a large outcrop with sheer sides, with the entrance in the side of the outcrop more-or-less at ground level. The cave is cramped but navigable. A short distance into the tunnel it turns to the left, slopes uphill and turns left again to an opening in the side of the outcrop. This opening is a few meters above ground level. The second boat is very close to this opening in a position with plenty of light, but in

a very narrow place. The painting is in too narrow a space to photograph perpendicular to the art surface, and the only oblique angles offered gave unsatisfactory results. Lewis was therefore only able to complete a tracing in the narrow, awkward space. The 65-cm long motif is constructed with separate design elements, each of which is in red ochre and outlined with white pigment.

Similar long, low vessels with raised ends have been identified as Macassan sailing canoes, some possibly suggesting “the presence of Sulu Sea pirate vessels” (Chaloupka 1996:140–141). Vessels similar to the Awunbarna motifs appear as long, low canoes in rock-art sites in Groote Eylandt (Northern Territory) and have been identified previously as Javanese (Burningham 1994:142–143). Bark paintings from Groote Eylandt show Macassan fishing *prahus* (May, McKinnon et al. 2009). Canoes and European luggers are depicted in Kimberley rock art, but no *perahu* (Bigourdan and McCarthy 2007; O'Connor and Arrow 2008; Bigourdan 2013, 2016; Paterson and van Duivenvoorde 2013; McCarthy 2018). In the Wellington Range, northwest Arnhem Land, several Macassan *perahu* have been identified at Djulirri and Malarrak (Wesley, McKinnon et al. 2012; May, Wesley, Taçon et al. 2013:86–88). A purported Moluccan *korakora* with outriggers has been identified at Cape Wessel from a faded image, although this shows no decorations for identification (McIntosh 2018:124, fig. 6). Rock-art imagery of watercraft found in the Torres Strait Islands depict traditional Islander outrigger canoes (Brady and McNiven 2022). The corpus of watercraft motifs in Aboriginal and Torres Strait Islander rock art so far published includes nothing quite like the combination of shape and detail represented in the Awunbarna motifs.

Identifying Watercraft Types

In order to select watercraft motifs for further investigation, they must be intuitively recognizable as watercraft in the first place, which relies to an extent on the observer's cultural perspective. The two Awunbarna images almost certainly represent watercraft, but intuitive deductions are insufficient to identify the type and cultural origin with any degree of certainty. Identifying watercraft in two-dimensional or low-relief motifs of similar form but differing styles requires

a systematic approach that considers all the details depicted and assumes that they are all purposefully illustrated (Burningham 1994; Wesley, McKinnon et al. 2012).

Most generic systems for describing the form or shape of watercraft are directly applicable to full sized three-dimensional craft. Two-dimensional artistic representations or scaled three-dimensional interpretations of vessels are liable to incorporate distortions, however minor, and lack the detail of the original. Iconographic interpretation of watercraft involves, in part, the identification of the full-sized craft that the artist attempted to represent, assuming that was the original intention. It is therefore appropriate to use systems for describing watercraft shape to interpret rock-art motifs while remaining conscious of the potential for distortion and loss of detail. Naval ship recognition methods are designed for a similar scenario: the identification of a ship type from a brief or distant view that potentially suffers from atmospheric distortion and loss of detail (Talbot-Booth 1944:x–xiii).

While training methods in ship recognition have advanced, the classic approach used two-dimensional waterline silhouettes of ships from which it was only possible to discern shape, configuration, and basic detail (e.g., Jane [1914]). The method aimed to achieve swift and accurate identification of vessels at sea in which the observer recognized the whole form rather than discrete elements, although such competence is built through lengthy instruction on the shape and configuration of different types of ship (Talbot-Booth 1944:xi; Renshaw 1945:227–230). This system of ship identification has much to recommend it when seeking to identify watercraft in two-dimensional artistic representations of very similar form but varying detail. Familiarity with the shapes and configurations of historical watercraft aids identification, a form of familiarity comprising the “comparative visual skills” of connoisseurship that enable “precise discriminations based on close visual inspection” of historical sources (Jordanova 2012:211–212). This sort of connoisseurship is common in archaeology, although articulation of an identification in sufficient detail to allow replication, review, and further comparison requires the application of an explicit method. A system that mirrors this approach was developed by Lewis (2017) for the accurate identification of fauna in Arnhem Land rock art where

similar methodological issues occur when attempting to accurately identify faunal species.

The sort of comparison posited here is a simple, visual form of multivariate analysis (Kroonenberg 2021:227–247). By breaking down the images into their principal components, this procedure allows description and comparison of proportions, and mirrors statistical techniques such as principal component analysis and cluster analysis (Kroonenberg 2021:233–235). In its simplest form, principal component analysis is a data reduction technique designed to concentrate most of the variability in as few of the components as possible (Kroonenberg 2021:397). These forms of analyses are achieved relatively easily by human perception in the task of watercraft recognition, where clearly dissimilar forms can be immediately discarded. Larger datasets could benefit from machine learning approaches, although in rock art this is more commonly associated with style and chronology (e.g., Kowlessar et al. [2021] and Kroonenberg [2021:227–247]). The ship recognition method therefore offers a way to articulate an identification of a watercraft by describing the vessel’s shape, proportions, configuration, and detail—the “principal components” of recognition. Watercraft depicted in elevation, or profile, have defined shapes, with elements arranged spatially within the image giving proportions to the shape. Elements indicating propulsion and superstructure are arranged in specific configurations, and the details of those and other elements, such as people, color, and flags, can offer clues to identity.

Identification Features of the Awunbarna Watercraft

The two watercraft motifs at Awunbarna can be described by shape, proportion, configuration, and detail. In the case of Awunbarna 2, the two ends of the hull are almost symmetrical, with two curved, high ends terminating in points. The one end of Awunbarna 1 that can be clearly made out is similar in shape. Both craft have a long low hull. Both craft have a single, rectangular shape that appears as a sail and a double horizontal bar roughly amidships, which may represent a structure commonly used to support the mast and to rest masts and yards (Horridge 1981:40,98). Awunbarna 1 shows a single mast about

a third of the length of the vessel from the presumed bow, while the mast amidships is only implied in Awunbarna 2 by the position of the sail and mast-top pennant. Both craft include detail in the form of triangular shapes at the ends and mastheads, or above the sail in the case of Awunbarna 2, that are likely to represent flags or decorations. Awunbarna 1 has six paddles with the handle of a seventh visible at the left end. The visible prow and stern ends of both vessels terminate in clearly drawn triangles, and Awunbarna 2 has a circular feature atop the end to the right.

This combination of shape, proportion, configuration, and detail is absent from historical or ethnographic sources on Aboriginal or Torres Strait Island watercraft and does not appear to represent any known European or colonial watercraft types (Thomas 1905; Thomson 1952; Haddon and Hornell 1975:179–198; O'Connor and Arrow 2008; May, Wesley, Taçon et al. 2013; Gapps and Smith 2015). High ended and low freeboard “canoes” are represented in rock art elsewhere on Australia’s northern shore (O'Connor and Arrow 2008:400–401; Bigourdan 2016:11, 14–16, 18–22), but none appear with similar details to those at Awunbarna. The nearest candidate is the most elaborate Indigenous Australian vernacular watercraft, the canoes of the Torres Strait Islands (Haddon and Hornell 1975:193–198; McNiven 2015; Brady and McNiven 2022). These canoes are similar in shape and proportion to the Awunbarna motifs but differ in important elements such as configuration and detail. The Torres Strait Island canoes have only one high end, the stern, and the mast, if fitted, is toward the forward end rather than amidships. The shape and detail of the stern decoration is not triangular, and the shape of the sail is also more commonly a vertically oriented rectangle (see figures in McNiven [2015]). The motifs at Awunbarna therefore most probably depict Island Southeast Asian watercraft.

Perahu Types

The type of craft depicted at Awunbarna was easily distinguishable from the common *perahu* employed as a fishing and voyaging vessel by Macassans. The limited seaworthiness of craft with low freeboard like those in the Awunbarna motifs would appear to restrict their range, and Macassan *perahu* were observed in the early 19th century as beamy and high

craft better suited to sea passages than those with low freeboard (Burningham 1987:106). Burningham used 11 historical visual sources, including sketches and photographs, from the 19th and early 20th centuries to reconstruct the appearance of a Macassan *perahu* from that period (Burningham 1987). The full-scale reconstruction *Hati Marege* was built on these plans to represent a 19th-century Macassan *perahu padewakang* (Burningham 1988). Historical visual sources and a translated Macassan boatbuilding treatise suggest that the form of craft depicted at Awunbarna was not a common Macassan design in the 19th and 20th centuries (Burningham 1987). While the typical rocker or curved keel of the Macassan *perahu* is shown in the Awunbarna depictions (Burningham 1987:112–114), this is hardly a distinctive identifying feature. The average mast placement aft of the bow in historical visual sources of Macassan *perahu* is one third of the length of the vessel (Burningham 1987:117), which appears similar to the mast in Awunbarna 1, but not the position implied in Awunbarna 2. Nevertheless, the low freeboard, high ends, and lack of other distinctive *perahu padewakang* features suggest that the Awunbarna vessels are not typical Macassan fishing vessels. Macknight (1980:124) distinguishes the typical Macassan “round” vessels from the “quite different” “long” craft of the Moluccas. The *perahu lambo* is a more modern, “westernized” design claimed to be “amongst the most recently evolved trading sailing vessels in Indonesia” (Burningham 1989:179). The distinctive profile of the *perahu lambo* with a counter, transom, or projecting stern platform make them easy to discount here.

More satisfactory comparators to the Awunbarna motifs among insular Southeast Asian watercraft types may be identified in historical and ethnographic surveys and accounts (Haddon 1920; Horridge 1981). Burningham reviewed a range of watercraft from the lesser Sunda Islands, some with high ends, although none appear in profile like the Awunbarna craft (Burningham 1990). The hull form of the Awunbarna craft appears to represent an expanded dug-out, and there are many of these types of vessels in Indonesia. None of the *sope* or *lepa* types reviewed by Burningham match the profile in the forms or proportions of the ends (Burningham 1993). The Awunbarna depictions are similar in shape to the *perahu jaring* of north Madura (Horridge 1981:38–39), the *golekan* of Madura (Horridge 1981:42–43), and the

leti leti (Horridge 1981:44–45). Each of these can be dismissed for different reasons—the *jaring* is a localized craft and too small to venture far, the *golekan* has a distinctive prow and stern profile, as does the *leti leti*, which is a relatively recent development used for trading and fishing and is not seen with the decorations depicted in Awunbarna. Another option is the *mayang* from Java, although this vessel too has a distinct stern profile and a conspicuous recurved bow form that could not easily be mistaken (Horridge 1981:47–49; Burningham and Stenross 1994). Again, this was a fishing and trading vessel and has not been recorded with the decorations displayed in the Awunbarna craft. Other less common types from eastern Indonesia can be discounted as they lack the requisite profile shape and configuration (Macknight 1980; Henderson and Crawford 1986; Dwyer and Ackerman 1998).

From European records, the *korakora* was the common warship in the southern Philippines and Maluku in the 16th century, each vessel with 100–300 men (Horridge 1981:4). Most early *korakor*s are described with floats and outrigger booms and tripod masts (Horridge 1981:4). Nevertheless, the *korakora* changed over time to a broader hull and lost the outriggers and platforms in the 18th century (Horridge 1981:4). Chaloupka (1996:140) noted that outriggers were not depicted in rock art of *perahu* in Arnhem Land, although he was unaware of the *korakora* depicted with outriggers in the Wessel Islands (McIntosh 2018:124, figure 6).

The modern *belang* of the Aru Islands would appear similar in profile, but commonly has a tripod mast and is used as a fishing vessel only for local waters (Henderson and Crawford 1986:39–44). But in earlier times, the *belang* was the war *perahu* of southern Maluku in the 16th, 17th, and 18th centuries (Horridge 1981:51), and the *orembai* is a similar craft from Maluku (Haddon 1920:118). *Belang* from Tanimbar have their appearance altered with detachable carved prow and stern boards (Fig. 4) (McKinon 1988:169).

Cultural Association by Type

The various types of *perahu* are distributed throughout the island archipelagos to the north of Australia and can be linked to particular regions. The *korakora*,

belang, and *orembai* are the types most similar in shape and general configuration to the Awunbarna motifs. Historical and ethnographic records associate these types of long-hulled vessels with the eastern end of the Indonesian archipelago, and with the Moluccas in particular (Macknight 1980:124–125).

Larger *korakor*s are also known from the southern Philippines where the Sulu Sultanate operated warships like this, along with several other types, during the 18th and 19th centuries. The decorations depicted in the Awunbarna motifs are a clearer indicator of identity than the shape and configuration of the hull and superstructure alone.

After one considers the shape, proportions, and configuration of these watercraft depictions, further clues to identity lie in the detail, in particular that shown at either end of their hulls. Despite previous observations that Aboriginal artists appear to show “little concern with the styling and decoration of Macassan *perahu*” (Burningham 1994:141) in other examples of nautical rock art in northern Australia, these two motifs at Awunbarna show decoration sufficient to encourage closer examination.

The flags depicted at both ends of these motifs are triangular with pennants above. This type of device was commonly associated with power and prestige, a symbol flown by the leader of a fleet (Warren 1981:45), or as a martial indicator of victory or prowess (Scott 1994:63). Examples are known from the Sulu fleets of the southern Philippines and the Moluccas, and even from Vietnam (Warren 1981:45; Vega Pinielle 2018:256). These devices were generally reserved for important or leading vessels in a fleet, “adorned with flags and banners,” and were not usually associated with fishing or trading vessels (Kjellgren 2007:252). The motifs even show shapes or borders on the flags. Pennants on Keiese vessels often bore representations of dragons, birds, or fish (de Jonge and T. van Dijk 1995:83), but the design here is too indistinct. Both of the Awunbarna watercraft motifs also show a long triangular pennant apparently flying from the mast-top.

The display of flags was embedded in complex social systems and carried much symbolism, identified clan group or community association, and warded off evil spirits (Riedel 1886:25,202,234,291). At time of conflict, triangular flags are raised in the vessels’ extremities as an important part of warfare (Riedel 1886:234), whereas they were lowered after conflicts

Fig. 4 A prow board or *kora ulu* on a Moluccan watercraft ca.1924. (Image courtesy of the Nationaal Museum van Wereldculturen, Coll. No. RV-A440-tt-186-268a.)



were settled, magic powers made ineffective, and feasts were organized by each community independently to celebrate a victory (Riedel 1886:234). In the Tanimbar islands the triangular flags at the bow and stern are called *sair* and they are historically associated with clan groups or communities (*negari*)—for example, *perahus* from Tenim carried red flags with black rims, those from Uaratan had white with red *sair*, and those from Rumsalut and Kamatubun white

ones (Riedel 1886:291). Dutch flags were often seen on *perahus*, but they did not necessarily indicate a vessel sailed for the colonial fleet. Placed at the bow and stern, the Dutch flags warded off evil spirits as the local island communities associated disease with the Dutch and considered them to be deliberately sent to wreak havoc (Riedel 1886:25).

Arnhem Land Indigenous society maintained complex processes for signalling through the production

of rock art and decorative material culture (compare painted hands in Arnhem Land in May, Taylor et al. [2020]). Indigenous communities highly valued introduced cloth and textiles traded from Macassans (Warner 1969:449). The use of flags was also adopted from Macassans by Arnhem Land Indigenous communities (Clarke and Frederick 2006; Marika and West 2008). Wesley and Viney (2016) found that designs were incorporated into rock-art motifs influenced by Indonesian textile designs. Therefore, the presence of decorative elements such as colored flags and pennants and their designs would likely

have been keenly observed by Indigenous groups that encountered these vessels.

The shapes on the ends of the hull are triangular in the three instances that can be clearly made out, and the second vessel shows a circular feature below the flag. The positioning of the triangular shapes is consistent with the use of prow boards in *korakoras* and *belangs* from Maluku (Figs. 4, 5, 6, 7, 8) (Barbier and Newton 1988:314–315, pl. 61). Images of Moluccan *belangs* from the 19th and 20th centuries often show them inshore with two flag staffs or masts rather than the apparent single mast shown in the Awunbarna

Fig. 5 A prow board or *kora ulu* from Tanimbar, Maluku Tenggara, late 19th century. (Image courtesy of the Metropolitan Museum of Art, New York, ART597129, accession No. 2004.485.)



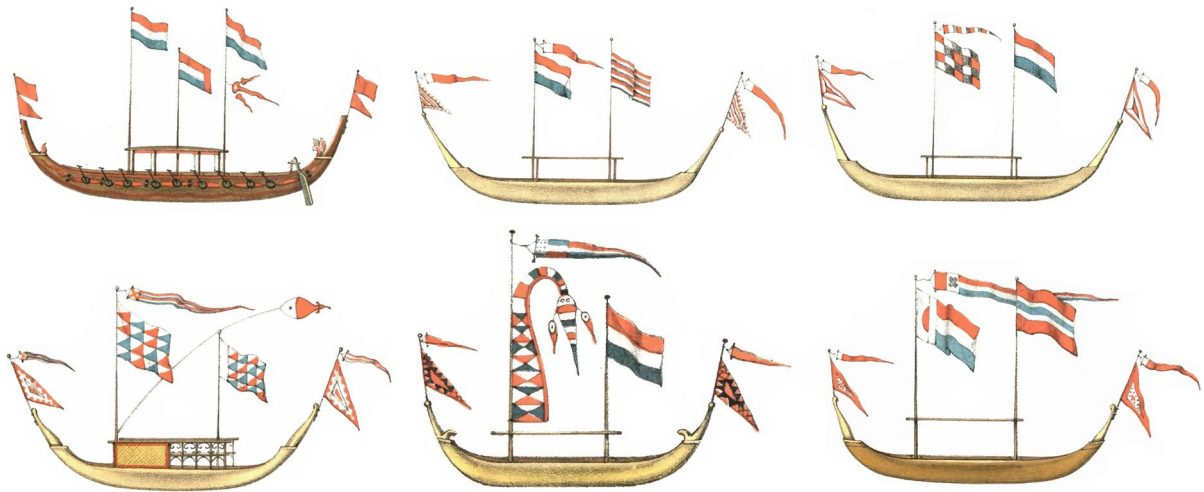


Fig. 6 *Belangs* from the Kei Islands in Maluku Tenggara in the late 19th century. (Figure adapted from Riedel [1886:plates 22,23].)

Fig. 7 Ceremonial *perahu* from the Kai islands, Moluccas. (Photo courtesy of the Nationaal Museum van Wereldculturen, Coll. No. TM-10010578.)



images. Boats from Tanimbar and Kei had open-worked carved prow and stern boards, while those from Aru had animal or fish ornaments on the stern (de Jonge and T. van Dijk 1995:70). In the gendered symbolism of Maluku Tenggara watercraft, the prow boards were “considered to be male symbols of esteem and status” (de Jonge and T. van Dijk 1995:71). The prow board is known as *kora ulu* and the stern board as *kora muri* (McKinnon 1988:163).

Referred to as being “among the most visually complex forms of wood sculpture in Island Southeast Asia,” these boards were only used for important voyages in seagoing craft and were otherwise dismantled and stored away (Kjellgren 2007:250). Prow boards would have been prominent and notable features in these watercraft; a surviving example in the Metropolitan Museum of Art, New York is 163 cm high (Fig. 5) (Barbier and Newton 1988:314–315, pl. 61).



Fig. 8 *Perahu* boat race, Moluccas. (Photo courtesy of the Nationaal Museum van Wereldculturen. Coll. No. TM-60014188.)

Trading and “friendship” or diplomatic voyages were undertaken throughout Maluku (de Jonge and T. van Dijk 1995:80–81), but warfighting and head-hunting voyages, for which the Tanimbarese held a formidable reputation, took place until the early 1900s and were surrounded by elaborate ritual (de Jonge and T. van Dijk 1995:79,81–83). During these warlike voyages the ceremonial *perahu* would be used, decorated with prow and stern boards, pennants, and, in the case of the Tanimbarese vessels, with a sun wheel at the prow, together symbols of prowess, status, and war (de Jonge and T. van Dijk 1995:83–84; Kjellgren 2007:252). The sun wheel, in particular, indicated that the boat was “hot” or warlike, and sun motifs were often tooled into the prows of Malukan boats (Taylor and Aragon 1991:231–233; de Jonge and T. van Dijk 1995:84; Kjellgren 2007:252). The sun wheel is similar to the “rayed concentric circles” of the Dudumahan [Dunwahan] rock-art site in the Kei Islands (Ballard 1988:148, fig. 4a), and to those in sites in Timor Leste (O’Connor 2003:figs.14b,21,27).

The Moluccan Connection

The Moluccas have attracted European interest in the lucrative spice trade since the 16th century, and the islands were all brought under Dutch control in the 17th century. Colonization disrupted established trade and led to resistance, although it also brought an increase in Dutch administrative, travel, and ethnographic record keeping, and from the 1820s Dutch missionaries were active in the islands. Apart from texts, Dutch records include visual sources on watercraft, and numerous models are now in Dutch and Indonesian museums (McKinnon 1988; de Jonge and T. van Dijk 1995). Together these sources offer evidence of the shape, configuration, and ornamentation of Moluccan watercraft over several centuries and provide a basis for comparison with the Awunbarna motifs.

The preminent boat-builders of Maluku prior to the 20th century were the Keiese, who made boats up to 31 m long and sold them as far afield as Ambon

and Banda. The Keiese supplied much of the demand for boats from Tanimbar and Aru, while the Tanimbarese and Aruese copied these Keiese models (Nooteboom 1932:185; de Jonge and T. van Dijk 1995:70,107; Boomgaard and J. van Dijk 2001:461). The Moluccans had extensive trade contacts with people from southern Sulawesi, the Macassars and Buginese (de Jonge and T. van Dijk 1995:23), so they would have known about the opportunities in northern Australia and possibly even experienced demand for Australian-sourced products like trepang.

The watercraft motifs at Awunbarna most probably represent a Moluccan *korakora*, *belang*, or *orem-bai*, vessels similar in profile with or without outriggers. The absence of outriggers generally indicates an *orem-bai* in Maluku (Haddon 1920:118), although later variants of *korakor*s also appear without outriggers. The modern *belang* commonly has a tripod mast and is probably too small to attempt voyages to Australia, but earlier variants described in Dutch colonial records are larger with single masts and were certainly fitted with prow boards (Barbier and Newton 1988:314). The Awunbarna motifs therefore probably represent ceremonially decorated fighting craft from eastern Maluku Tenggara in Indonesia, and possibly Tanimbar in particular. Such vessels were used to lead trading voyages and raids from Tanimbar, Aru, and Kei to neighboring islands and regionally.

What Are Depictions of Mollucans Doing in Arnhem Land?

There are several possible scenarios to explain the encounters that occurred between the Aboriginal artist(s) from Arnhem Land and these Moluccan watercraft. The identification of Moluccan watercraft motifs in Awunbarna does not necessarily imply that these craft visited the north coast of Australia, as Aboriginal people traveled to the Indonesian archipelago in Southeast Asian and colonial watercraft, both voluntarily and under coercion (Earl 1841:116; Lamilami 1974; Mulvaney 1988:45–46; Spillet 1989; O'Connor and Arrow 2008:399; Reid 2013). Those who traveled could have encountered vessels like those depicted at Awunbarna and may have painted these motifs on their return.

It is also likely that the maritime people from the Kei and Tanimbar Islands brought their *perahus* into

Australian waters to fish, collect pearl shells, and/or harvest trepang from 1645, and probably before (Reid 2013). Adriaen Dortsman, who led an expedition to explore the east and southeast of the Indonesian archipelago in 1645 and 1646, reported to the Vereenigde Oostindische Compagnie (Dutch East India Company) Council in Batavia that the inhabitants of the islands southeast of Banda (Maluku Tenggara) left no island unvisited and sailed often to the north coast of Australia (National Archief 1646:folio 371; van Duivenvoorde et al. 2019:41). Dortsman negotiated a trade agreement with the elders in Maluku Tenggara that gave the company exclusive trade rights to turtle shells, slaves, stingray skins, wood, amber, (bees)wax, pearls, pearl shells, and trepang (Riedel 1886:248,276). As well, Dutch sources and photographs show numerous examples of these watercraft in Maluku Tenggara in the late 19th and early 20th centuries (de Jonge and T. van Dijk 1995; Gelman Taylor 2015). Schapper (2021) has recently considered the potential for loan words from Maluku languages in northern Australia, and specifically for “hawksbill turtle.” Schapper posits that “the appearance of this hawksbill turtle lexeme in northern Australia would seem to support the idea that the people of Aru, specifically from the eastern side, may have journeyed there to collect marine products at a time before the Macassan sea cucumber trade” (Schapper 2021:443). It appears that Arnhem Land artists had opportunities to interact with Moluccan vessels in their own country, or perhaps painted these vessels upon returning from a voyage, or possibly even via both scenarios.

Other examples of *korakor*s or vessels with similar profiles in Arnhem Land rock art tend to support this identification of Moluccan watercraft (Chaloupka 1996:141; O'Connor and Arrow 2008:401, fig. 2; McIntosh 2018:124, fig. 6). This also suggests that Moluccan visitation likely played a part in prompting these artistic events, in common with other Macassan and colonial types reliably identified in rock-art assemblages. If the craft depicted at Awunbarna were observed in Indonesian waters, it is notable that of all the watercraft that Aboriginal voyagers might encounter on travels through the archipelago, the artists chose to feature the fighting craft. The association of this artwork with a potential threat corresponds with the interpretation that maritime contact rock art in Arnhem Land represents a more fleeting and

dangerous crosscultural relationship than that enjoyed by Aboriginal people with Macassan fishers (May, Wesley, Goldhahn et al. 2021).

Given the potential martial nature of the painted watercraft, and the common association with Moluccan piracy and transport rather than fishing (Macknight 1980:124), these motifs may be indicative of past acts of physical violence or artists depicting the benign projections of power by outsiders. Tenuous claims were made in the 19th century that fleets identified as Macassan were slaving in Australia, and Aboriginal people were recorded to have been “sold in slave markets in Macassar” (Macknight 1972:289; O’Connor and Arrow 2008:400). While the obscurity of *korakor*s or other fighting craft in Aboriginal rock art suggests that Moluccan raids would have been uncommon, the depiction of the principal watercraft of known slave raiding societies suggests that such raids may indeed have taken place. If so, there will be other evidence in Aboriginal and Moluccan oral histories, and in colonial and potentially archaeological records from Maluku Tenggara. Lexical evidence, such as that advanced by Schapper (2021:442–444), and this rock art may simply be the first evidence explicitly identified as such in a modern context.

Regardless of the motivation that prompted the painting of these vessels, the presence of these fighting ships provides direct evidence of the ethnic diversity of the mariners from Island Southeast Asia known to Arnhem Land artists, and further demonstrates the issues associated with the use of the generic term “Macassan” for depictions of non-European vessels. The presence of Moluccan fighting vessels in Arnhem Land would support a significant departure from the accepted narrative of Macassan coastal trading and fishing activities and has important implications for the two competing chronological models for culture contact with Southeast Asia (Wesley, O’Connor et al. 2016). These motifs support Mitchell’s (1994:42) conclusion that it was “possible that sporadic or accidental voyages from Indonesia to the Australian coastline took place before a regular [trepang] industry developed.” The lack of observation by Europeans of these types of vessels in coastal waters in Australia in the 19th century suggests the timing of visits from fighting watercraft may have been pre-1800. This is further evidence to support a longer and extended engagement with northern Australia by maritime Island Southeast Asians.

Conclusion

Many of the features shown in the Awunbarna watercraft motifs appear on other types of Southeast Asian vessels that are not necessarily fighting craft or from Maluku. However, the interpretation presented here is based on the evidence currently at hand, accounts for all the features depicted, and has been shown to be both spatially and temporally feasible. If accepted, it provides the first archaeological evidence for an ethnic origin of Island Southeast Asian mariners visiting northern Australia other than “Macassan.” The detailed illustrations imply a degree of intimate knowledge of the craft themselves through long or close observation, or from actually voyaging in them. The underlying purpose of why Moluccan fighting craft are found along the Arnhem Land coast in north Australia is likely to be linked to trade, fishing, resource exploitation, head hunting, and/or slavery, and the presence of such fighting craft implies instances of physical violence or at least a projection of power. This potentially unique identification of Moluccan watercraft in Australia offers evidence of the archivally obscure encounters between the Aboriginal people of northern Australia and people from the archipelagos to the north. These Southeast Asian fighting watercraft in Arnhem Land rock art provide evidence that expands both the nature and context of Australia’s contact narrative.

Acknowledgments: The authors would like to acknowledge senior Traditional Owner of Awunbarna Charlie Mangulda, Dr. Sally May at Griffith University, and Dr. Fanny Wonu Feys at the Nationaal Museum van Wereldculturen in the Netherlands for facilitating and supporting this research. This research was supported by Australian Research Council funding for the projects (1) “Before Cook: Contact, Negotiation and the Archaeology of the Tiwi Islands” (DP200100559) and (2) “Art at a Crossroads: Aboriginal Responses to Contact in Northern Australia” (SR200200062).

Funding Open Access funding enabled and organized by CAUL and its Member Institutions

Declarations

Conflict of Interest Statement On behalf of all the authors, the corresponding author states that there is no conflict of interest.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the

original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Ballard, Chris
1988 Dudumahan: A Rock Art Site on Kai Kecil, S.E. Moluccas. *Bulletin of the Indo-Pacific Prehistory Association* 8:139–161.
- Barbier, Jean Paul, and Douglas Newton (editors)
1988 *Islands and Ancestors: Indigenous Styles of Southeast Asia*. Prestel-Verlag, Munich, Germany.
- Bigourdan, Nicolas
2013 Overviews and Developments on Indigenous Maritime Rock Art Studies in Western Australia. *Great Circle* 35(2):16–29.
- Bigourdan, Nicolas
2016 *Aboriginal Watercraft Depictions in Western Australia*. Report, Department of Maritime Archaeology, Western Australian Museum, No. 206. Fremantle, Australia.
- Bigourdan, Nicolas, and Michael McCarthy
2007 Aboriginal Watercraft Depictions in Western Australia: On Land, and Underwater? *Bulletin of the Australasian Institute for Maritime Archaeology* 31:1–10.
- Boomgaard, Peter, and Janneke van Dijk
2001 *Het Indië Boek* (The India book). Waanders, Zwolle, the Netherlands.
- Brady, Liam M., and Ian J. McNiven
2022 The Presence of Absence: Why Does the Post-Contact Rock Art of Torres Strait (Northeastern Australia) Not Include Paintings of European Ships? *Cambridge Archaeological Journal* 32(1):99–115.
- Brandl, Eric J
1988 *Australian Aboriginal Paintings in Western and Central Arnhem Land, Temporal Sequences and Elements of Style in Cadell River and Deaf Adder Creek Art*. Australian Institute of Aboriginal Studies, Canberra, Australia.
- Burningham, Nick
1987 Reconstruction of a Nineteenth Century Makassan *Perahu*. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 4(1):103–128.
- Burningham, Nick
1988 Description of *Hati Marege*, A Replica 19th Century Makassan *Perahu*. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 5(1):155–161.
- Burningham, Nick
1989 Four Double-Ended *Perahu Lambo*. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 6(1):179–193.
- Burningham, Nick
1990 Stemless Boats of Ende Bay. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 7(1):105–119.
- Burningham, Nick
1993 *Bajau Lepa and Sope*: A “Seven-Part Canoe” Building Tradition in Indonesia. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 10(1):193–222.
- Burningham, Nick
1994 Aboriginal Nautical Art: A Record of the Macassans and Pearling Industry in Northern Australia. *Great Circle* 16(2):139–151.
- Burningham, Nick, and Kurt Stenross
1994 *Mayang*: The Traditional Fishing Vessel of Java. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 11(1):73–132.
- Chaloupka, George
1993 *Journey in Time: The 50,000 Year Story of the Australian Aboriginal Rock Art of Arnhem Land*. Reed, Chatswood, Australia.
- Chaloupka, George
1996 Praus in Marege: Makassan Subjects in Aboriginal Rock Art of Arnhem Land, Northern Territory, Australia. *Anthropologie* 34(1&2):131–142.
- Clarke, Anne, and Ursula Frederick
2006 Closing the Distance: Interpreting Cross-Cultural Engagements through Indigenous Rock Art. In *Archaeology in Oceania: Australia and the Pacific Islands*, Ian Lilley, editor, pp. 116–133. Blackwell, Oxford, UK.
- de Jonge, Nico, and Toos van Dijk
1995 *Forgotten Islands of Indonesia: The Art and Culture of the Southeast Moluccas*. Periplus Editions, Hong Kong, China.
- Dwyer, Dan, and Kim Ackerman
1998 The Peledang: The Lashed-Lug Whaling Craft of Lamalera, Lomblen (Lembata), Nusa Tenggara Timur, Indonesia. *The Beagle: Records of the Northern Territory Museum of Arts and Sciences* 14(1):123–147.
- Earl, G. W
1841 An Account of a Visit to Kisser, One of the Serawatti Group in the Indian Archipelago. *Journal of the Royal Geographical Society of London* 11:108–117.
- Earl, G. W
1846 On the Aboriginal Tribes of the Northern Coast of Australia. *Journal of the Royal Geographical Society of London* 16:239–251.
- Gapps, Stephen, and Mariko Smith
2015 Nawi—Exploring Australia's Indigenous Watercraft: Cultural Resurgence through Museums and Indigenous Communities. *AlterNative: An International Journal of Indigenous Peoples* 11(2):87–102.
- Gelman Taylor, Jean
2015 Visual History: A Neglected Resource for the Longue Durée. In *Environment, Trade and Society in Southeast Asia: A Longue Durée Perspective*, David Henley and Henk G. C. Schulte Nordholt, editors, pp. 181–202. Brill, Leiden, the Netherlands.

- Haddon, Alfred C
1920 *The Outriggers of Indonesian Canoes*. Anthropological Institute of Great Britain and Ireland, London, UK.
- Haddon, Alfred C., and James Hornell
1975 *Canoes of Oceania, Vol. II, The Canoes of Melanesia, Queensland and New Guinea*. Reprint of 1937 edition. Bishop Museum Press, Honolulu, HI.
- Henderson, Graeme, and Ian Crawford
1986 Sampans, Belangs, and Junkos: The Pearling Boats of the Aru Islands. *Expedition* 28(1):36–46.
- Horridge, Adrian
1981 *The Prahu: Traditional Sailing Boat of Indonesia*. Oxford University Press, New York, NY.
- Jane, Fred T
1914 *Warships at a Glance: Silhouettes of the World's Fighting Ships*. Sampson Low, Marston and Co., London, UK.
- Jones, Tristan, Vladimir A. Levchenko, Penelope L. King, Ulrike Troitzsch, Daryl Wesley, A. Alan Williams, and Alfred Nayingull
2017 Radiocarbon Age Constraints for a Pleistocene–Holocene Transition Rock Art Style: The Northern Running Figures of the East Alligator River Region, Western Arnhem Land, Australia. *Journal of Archaeological Science: Reports* 11:80–89.
- Jordanova, Ludmilla
2012 *The Look of the Past: Visual and Material Evidence in Historical Practice*. Cambridge University Press, Cambridge, UK.
- Kjellgren, Eric
2007 *Oceania: Art of the Pacific Islands in the Metropolitan Museum of Art*. Yale University Press, New Haven, CT.
- Kowlessar, Jarrad, James Keal, Daryl Wesley, Ian Moffat, Dudley Lawrence, Abraham Weson, Alfred Nayinggul, and Mimal Land Management Aboriginal Corporation
2021 Reconstructing Rock Art Chronology with Transfer Learning: A Case Study from Arnhem Land, Australia. *Australian Archaeology* 87(2):115–126.
- Kroonenberg, Pieter M
2021 *Multivariate Humanities*. Springer, Cham, Switzerland.
- Lamilami, Lazarus
1974 *Lamilami Speaks: The Cry Went Up, a Story of the People of Goulburn Islands, North Australia*. Ure Smith, Sydney, Australia.
- Lewis, Darrell
1988 *The Rock Paintings of Arnhem Land, Australia: Social, Ecological and Material Culture Change in the Post-Glacial Period*. British Archaeological Reports, International Series 415. Oxford, UK.
- Lewis, Darrell
2017 Megafauna Identification for Dummies: Arnhem Land and Kimberley “Megafauna” Paintings. *Rock Art Research* 34(1):82–99.
- Macknight, Campbell C
1972 Macassans and Aborigines. *Oceania* 42(4):283–321.
- Macknight, Campbell C
1976 *The Voyage to Marege': Macassan Trepangers in Northern Australia*. Melbourne University Press, Carlton, Australia.
- Macknight, Campbell C
1980 The Study of Praus in the Indonesian Archipelago. *Great Circle* 2(2):117–128.
- Macknight, Campbell C
2011 The View from Marege': Australian Knowledge of Makassar and the Impact of the Trepang Industry across Two Centuries. *Aboriginal History* 35:121–143.
- Marika, Bandu, and Margie West
2008 *Yalangbara: Art of the Djang'kawu*. Charles Darwin University Press, Darwin, Australia.
- May, Sally K., Jennifer F. McKinnon, and Jason T. Raupp
2009 Boats on Bark: An Analysis of Groote Eylandt Aboriginal Bark-Paintings Featuring Macassan Praus from the 1948 Arnhem Land Expedition, Northern Territory, Australia. *International Journal of Nautical Archaeology* 38(2):369–385.
- May, Sally K., Luke Taylor, Catherine Frieman, Paul S. C. Taçon, Daryl Wesley, Tristen Jones, Joakim Goldhahn, and Charlie Mungulda
2020 Survival, Social Cohesion and Rock Art: The Painted Hands of Western Arnhem Land, Australia. *Cambridge Archaeological Journal* 30(3):491–510.
- May, Sally K., Daryl Wesley, Joakim Goldhahn, Ronald Lamilami, and Paul S. C. Taçon
2021 The Missing Macassans: Indigenous Sovereignty, Rock Art and the Archaeology of Absence. *Australian Archaeology* 87(2):127–143.
- May, Sally K., Daryl Wesley, Paul Taçon, and Michael Pearson
2013 Painted Ships on a Painted Arnhem Land landscape. *Great Circle* 35(2):83–102.
- McCarthy, Michael
2018 Indigenous Maritime Investigations at the Western Australian Museum's Department of Maritime Archaeology: An Overview after Nearly 50 Years. *Australasian Journal of Maritime Archaeology* 42:53–64.
- McIntosh, Ian S
2018 Australia's Kilwa Coins Conundrum. In *Early Maritime Cultures in East Africa and the Western Indian Ocean*, Akshay Sarathi, editor, pp. 113–137. Archaeopress, Oxford, UK.
- McKinnon, Susan
1988 Tanimbar Boats. In *Islands and Ancestors: Indigenous Styles of Southeast Asia*, Jean Paul Barbier and Douglas Newton, editors, pp. 152–169. Prestel-Verlag, Munich, Germany.
- McNiven, Ian J
2015 Canoes of Mabuyag and Torres Strait. *Memoirs of the Queensland Museum—Culture* 8(1):127–207.
- Mitchell, Scott R. A
1994 Culture Contact and Indigenous Economies on the Cobourg Peninsula, Northwest Arnhem Land. Doctoral dissertation, Faculty of Arts, Northern Territory University, Darwin, Australia.
- Mulvaney, J
1988 Aboriginal Australians Abroad 1606–1875. *Aboriginal History* 12:41–48.
- National Archief
1646 Archieven van de Verenigde Oostindische Compagnie, 1602–1795 (Archives of the United East India

- Company, 1602–1795). Deel I/E.5.a Overgekomen brieven en papieren uit Indië aan de Heren XVII en de kamer Amsterdam, Ref. code 1.04.02, inv. no. 1158 1646 HHH, Vierde boek 1646, fols. 371–389 (scans 797–834). 1.04.02 Inventaris van het archief van de Verenigde Oost-Indische Compagnie (VOC), 1602–1795 (1811), National Archief <<https://www.naio.nl/onderzoeken/archief/1.04.02/invnr/1158/file>>. Accessed 17 February 2023.
- Nooteboom, Christiaan
1932 *De Boomstamkano in Indonesië* (The dugout canoe in Indonesia). Brill, Leiden, the Netherlands.
- O'Connor, Sue
2003 Nine New Painted Rock Art Sites from East Timor in the Context of the Western Pacific Region. *Asian Perspectives* 42(1):96–128.
- O'Connor, Sue, and Steve Arrow
2008 Boat Images in the Rock Art of Northern Australia with Particular Reference to the Kimberley, Western Australia. In *Islands of Inquiry: Colonization, Seafaring and the Archaeology of Maritime Landscapes*, Geoffrey Clark, Foss Leach, and Sue O'Connor, editors, pp. 397–409. ANU Press, Canberra, Australia.
- Paterson, Alistair, and Wendy van Duivenvoorde
2013 The Sea, Inland: Aboriginal Rock Art Depictions of Boats from the Western Pilbara. *Great Circle* 35(2):30–54.
- Reid, Anthony
2013 Crossing the Great Divide: Australia and Eastern Indonesia. In *Macassan History and Heritage: Journeys, Encounters and Influences*, Marshall Clark and Sally K. May, editors, pp. 41–53. Australian National University E Press, Canberra, Australia.
- Renshaw, Samuel
1945 The Visual Perception and Reproduction of Forms by Tachistoscopic Methods. *Journal of Psychology* 20(2):217–232.
- Riedel, Johan G. F.
1886 *De Sluik- en Kroesharige Rassen tusschen Selebes en Papua* (The straight- and curly haired races between Selebes and Papua). Martinus Nijhoff, the Hague, the Netherlands.
- Roberts, David A.
2004 Nautical Themes in the Aboriginal Rock Paintings of Mount Borradaile, Western Arnhem Land. *Great Circle* 26(1):19–50.
- Roberts, David A., and Adrian Parker
2003 *Ancient Ochres: The Aboriginal Rock Paintings of Mount Borradaile*. JB Books, Marlestone, Australia.
- Schapper, Antoinette
2021 Beyond “Macassans”: Speculations on Layers of Austronesian Contact in Northern Australia. *Australian Journal of Linguistics* 41(4):434–452.
- Scott, William H.
1994 *Barangay: Sixteenth Century Philippine Culture and Society*. Ateneo de Manila University Press, Manila, Philippines.
- Spillet, Peter
1989 Aboriginal and Makassan Relationships. *The Beagle: Records of the Museums and Art Galleries of the Northern Territory* 6(1):241–243.
- Taçon, Paul S. C., and Sally K. May
2013 Rock Art Evidence for Macassan–Aboriginal Contact in Northwestern Arnhem Land. In *Macassan History and Heritage: Journeys, Encounters and Influences*, Marshall Clark and Sally K. May, editors, pp. 127–139. Australian National University E Press, Canberra, Australia.
- Taçon, Paul S. C., Sally K. May, Stuart Fallon, Meg Travers, Daryl Wesley, and Ronald Lamilami
2010 A Minimum Age for Early Depictions of Southeast Asian Praus in the Rock Art of Arnhem Land, Northern Territory. *Australian Archaeology* 71:1–10.
- Taçon, Paul S. C., Sally K. May, Ronald Lamilami, Fiona McKeague, Iain G. Johnston, Andrea Jalandoni, Daryl Wesley, Ines Domingo Sanz, Liam M. Brady, Duncan Wright, and Joakim Goldhahn
2020 Maliwawa Figures—A Previously Undescribed Arnhem Land Rock Art Style. *Australian Archaeology* 86(3):208–225.
- Talbot-Booth, Eric C.
1944 *What Ship Is That?* Didier, New York, NY.
- Taylor, Paul M., and Lorraine V. Aragon
1991 *Beyond the Java Sea: Art of Indonesia's Outer Islands*. National Museum of Natural History, Smithsonian Institution, Washington, DC.
- Thomas, N. W.
1905 Australian Canoes and Rafts. *Journal of the Anthropological Institute of Great Britain and Ireland* 35(1):56–79.
- Thomson, Donald F.
1952 1. Notes on Some Primitive Watercraft in Northern Australia. *Man* 52(1):1–5.
- van Duivenvoorde, Wendy, Daryl Wesley, Mirani Litster, Fanny Wonu Veys, Widya Nayati, Mark Polzer, John McCarthy, and Lidwien Jansen
2019 Van Delft before Cook: The Earliest Record of Substantial Culture Contact between Indigenous Australians with a Dutch East India Company Expedition Prior to 1770. *Australasian Journal of Maritime Archaeology* 43:27–49.
- Vega Pinielle, Ramón (editor)
2018 *Asia y el Museo Naval* (Asia and the Naval Museum). Ministerio de Defensa, Madrid, Spain.
- Warner, W. Lloyd
1969 *A Black Civilization: A Social Study of an Australian Tribe*. P. Smith, Gloucester, MA.
- Warren, James F.
1981 *The Sulu Zone 1768–1898: The Dynamics of External Trade, Slavery, and Ethnicity in the Transformation of a Southeast Asian Maritime State*. Singapore University Press, Singapore.
- Wesley, Daryl
2013 Firearms in Rock Art of Arnhem Land, Northern Territory, Australia. *Rock Art Research* 30(2):235–247.

- Wesley, Daryl, Jennifer F. McKinnon, and Jason T. Raupp
2012 Sails Set in Stone: A Technological Analysis of Non-Indigenous Watercraft Rock Art Paintings in North Western Arnhem Land. *Journal of Maritime Archaeology* 7(2):245–269.
- Wesley, Daryl, Sue O'Connor, and Jack N. Fenner
2016 Re-Evaluating the Timing of the Indonesian Trepang Industry in North-West Arnhem Land: Chronological Investigations at Malara (Anuru Bay A). *Archaeology in Oceania* 51(3):169–195.
- Wesley, Daryl, and Jessica Viney
2016 South East Asian Influences in Western Arnhem Land Rock Art Decorative Infill. *Journal of the Anthropological Society of South Australia* 40:35–69.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.