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Comparison of Neolithic Sites in Southern Vietnam

Introduction: Methodology for comparative research of southern Vietnam neolithic ceramics

Early research in southern Vietnam includes investigations by Henri Fontaine, who referred to the area inclusive of the sites Cù Lao Rùa, Ngái Thẳng, Phước Tân, Hội Sơn and Bến Đò in Đồng Nai Province as the 'Phước Tân Culture' (Fontaine 1972, 1971). Since then, more sites with neolithic and metal age remains have been identified and excavated in southern Vietnam, such as Cầu Sắt and Cái Vạn in Đồng Nai Province, and An Sơn and Rạch Núi in Long An Province. These sites are characterised by a shared tradition of shouldered and unshouldered lithic adzes and stone bangles. Differences have been observed in the sites that share this material culture, in terms of changes in sizes and proportions of the shouldered adzes, most of which were made from basalt. Stone bangles also varied in type between the sites. The pottery in southern Vietnam has been described as 'simple' in comparison to that of the northern and central sites of Vietnam (Hoàng and Bùi 1983: 62).

Hoàng and Bùi (1983) organised the sites of southern Vietnam into four phases from the neolithic to the metal age. The first phase, with some of the earliest occupation in the region, was represented by the site Cầu Sắt; comparable in culture to Phùng Nguyên in northern Vietnam and Long Thành in central Vietnam (Hoàng and Bùi 1983). Shouldered stone adzes and stone 'harvesting knives' were present at Cầu Sắt, while stone bangles were rare. Decoration of the ceramic vessels was described as 'simple' with incision and cordmarking in this phase (Hoàng and Bùi 1983).

The second phase was represented by the sites of Bến Đò, Phước Tân, Hội Sơn and Ngái Thẳng. The lithic tool assemblage included triangular-shaped and shouldered adzes, 'harvest knives', and an increase in large, shouldered 'hoe' adzes compared to the earlier phase. The ceramics from this phase were reported as simple once again, and included *cà ràng* vessels (Hoàng and Bùi 1983).

The third phase was represented by Cù Lao Rùa, Cái Vạn, Gò Đá, and the lower layer of Đốc Chư, and Hoàng and Bùi (1983) suggested An Sơn and Rạch Núi were part of this phase. Shouldered adzes diminished in this period and were replaced by unshouldered rectangular-sectioned adzes. Stone 'harvest knives' with a notch at each end, pottery similar to that of the previous phases, and moulds for metal axes were identified at Cù Lao Rùa and Đốc Chư.

The fourth and final phase was represented by Đốc Chư with the presence of bronze and early iron metallurgical items. While stone adzes were still present, the technology for stone bangles and ceramic vessels changed. It has been suggested that the development in southern Vietnam from Cầu Sắt to Đốc Chư was continuous (Hoàng and Bùi 1983).

While this sequence has been revised by Nishimura Masanari (2002) (as described in Chapter 2), it is important to review the material culture from these sites in greater detail. Due to the increase in archaeological investigations in recent years by The Australian National University, Nishimura and others at An Sơn and Đa Kai (Bellwood *et al.* 2011; Nishimura *et al.* 2009; Nishimura and Nguyễn 2002), and by the Centre for Archaeological Studies of the Southern Institute of Social Sciences, Ho Chi Minh City at Cù Lao Rùa (Nguyễn 2008), clearer information about the occupational sequences and material culture of southern Vietnam is now available.

The comparative analysis of neolithic sites in southern Vietnam in this chapter includes the sites of BẾN ĐỒ, BINH ĐÀ, CÙ LAO RÙA, CÁI VẠN, CẦU SẮT, ĐA KAI, ĐÌNH ÔNG, LỘC GIANG, RẠCH LÁ, RẠCH NÚI and SUỐI LINH, alongside An Sơn. Refer to the map in Figure 1.3 and the summary in Table 3.2 of these sites. An Sơn is divided into early, middle and late phases of occupation for this analysis. Data for a correspondence analysis (CA) (described in Chapter 3) were collected and plotted in terms of the presence or absence of certain variables. Absence was assigned when no information for that variable was available; this does not always mean that the variable concerned was not present, but that there was no evidence for its presence. This chapter firstly outlines earlier published comparisons between sites in southern Vietnam sites, followed by a synthesis for each site to be included in the comparative analysis. A CA between An Sơn and these sites is presented, followed by further discussion in terms of regional developments and material culture relationships during the neolithic phase of southern Vietnam. The methods for data collection from these sites and the CA were described in Chapter 3. The material culture variables, presence and absence data, and the numerical codes for the variables used in the CA are presented in Appendix B.

Previous comparative research in southern Vietnam

Past comparisons of ceramics within southern Vietnam have adopted a traditional approach to analysis by examining vessel form and decoration. The following statistical analysis aims to expand on these previously observed parallels, and to extend them into a comprehensive systematic and intensive comparison with further afield neolithic sites in Southeast Asia (Chapter 9). A summary of the previous comparative research by Nishimura and Vương (1997; see also Nishimura 2002) is first provided, from which subsequent comparisons can develop.

Previous studies once considered Cầu Sắt to be the oldest neolithic site in the ĐỒNG NAI River Basin based on the lithic tool assemblages, but the ceramic sequence displayed similarities with BINH ĐÀ, so these two sites were interpreted as contemporary. In fact, it is incredibly difficult to establish the earliest site amongst An Sơn, Lộc Giang, BINH ĐÀ, RẠCH NÚI and CẦU SẮT because of the ‘scant studies on pottery chronology’, and some researchers have estimated the earliest occupation in southern Vietnam began around the early second millennium BC (Nishimura and Vương 1997: 81).

At BINH ĐÀ, the pottery is characterised by multiple incised lines and simple paddle impressed surfaces, either with cord or fibre impressions, particularly on the shoulder of the body. It has been termed the ‘BINH ĐÀ type’ (Nishimura and Vương 1997: 78), and this characteristic decoration on the pottery was recorded throughout the BINH ĐÀ layers. In basal layer 15 the decorations were multiple wavy lines between two bands of multiple horizontal lines. In layers 9 to 6 they were double bands of multiple horizontal lines. In layers 6 and 5, quarter concentric circles were incised by rocking a comb-like tool, and bands of horizontal lines were transformed into a smoothed wide band. In layers 4 to 2, a single wavy line or diagonal impressions replaced the wavy lines (Nishimura and Vương 1997).

The lowest spit of the 1977 excavation at RẠCH NÚI contained ceramic sherds with the ‘BINH ĐÀ type’ decoration with wavy lines between two bands of horizontal lines. There was also a variant

of this motif with looser wavy lines in the upper layers at Rạch Núi. An Sơn also had some ‘Bình Đa type’ sherds, including quarter concentric circular lines formed by rocking rotation, loose wavy lines in lower layers, and combined with horizontal lines, like in the lower layers of Bình Đa. The styles of these incised waves at An Sơn were not completely identical to those at Bình Đa (Nishimura and Vương 1997).

The nearby site of Lộc Giang had very similar pottery to An Sơn. Among the ‘Bình Đa type’ sherds at Lộc Giang were some with wavy lines combined with horizontal lines at the lowest layers, and looser wavy line decorations in the middle layers. According to Nishimura and Vương (1997: 80), ‘An Sơn type’ sherds also appeared in the lower layers at Lộc Giang. In the upper layers, looser rocking impressions were observed. There was another variant with hatching bounded by horizontal lines. The typical decoration in the lowest layers, at both An Sơn and Lộc Giang, had multiple wavy lines combined with horizontal lines. It has been suggested that the lowest levels of Bình Đa, An Sơn and Lộc Giang were contemporary (Nishimura and Vương 1997: 80). However, there was perhaps an earlier neolithic phase of occupation at An Sơn and Đa Kai (Nishimura 2002).

Due to the presence of such parallels in the southern Vietnamese ceramic assemblages, the possibility of inter-site interaction is likely. At Bình Đa a few ‘An Sơn type’ sherds suggest importation of vessels. Similarly at An Sơn and Lộc Giang the ‘Bình Đa type’ was rare in the assemblage and the ‘An Sơn type’ was dominant. However, greater geographical distance is likely to have exacerbated differences in ceramic assemblages, i.e. sites closer together display similarities in material culture. With less evidence of ‘An Sơn type’ sherds, Rạch Núi may have had more contact with the Đồng Nai sites and related maritime and riverine systems, rather than with sites along the upper Vàm Cỏ Đông River (Nishimura and Vương 1997: 80). The An Sơn and Lộc Giang ceramics are paralleled with burnished wares, rocker/roulette stamping, and impression between incised lines that occur at Samrong Sen, Ban Chiang, Ban Kao, Tha Kae and Khok Phanom Di in Cambodia and Thailand (Nishimura and Vương 1997: 81).

This chapter exposes the intricacies and unsolved questions in terms of relating neolithic sites to one another within southern Vietnam. The nature of interaction between these sites would have been a contributing factor to the way in which material culture and technology were shared between sites. Similarities in material culture may be related to spatial proximity, however material cultural differences can also occur with increased cultural contact, for instance when competition for resources increased between groups (see Rowlands 2007: 57). The comparison between An Sơn and southern Vietnam sites begins by examining the original data from each site in the following section.

Southern Vietnam

This section provides a literature review of the sites included in the comparison with a correspondence analysis (CA). The radiocarbon dates from many of these sites can be deemed inaccurate and from insecure contexts, but they have nevertheless been included to display the past research at each of the sites. More reliable dates have been obtained from the recent excavations at Đa Kai (Nishimura *et al.* 2009) and An Sơn (Bellwood *et al.* 2011) (see Chapter 4). In general, the radiocarbon dates alone are insufficient for studying the neolithic sequence of southern Vietnam, and parallels in material culture must also be considered (Thomas and McLauchlan 2006; Nishimura 2002; Nishimura and Vương 1997). All published uncalibrated dates have been calibrated with OxCal 4.1.7 IntCal09 (Bronk Ramsey 2010; Reimer *et al.* 2009), as presented in Table 3.2 and in this chapter. Refer to site locations in Figure 1.3.

Bến Đò

Bến Đò is located within the city limits of Ho Chi Minh City, along the Đồng Nai River. The site is thought to date to *c.* 3000 BP (Fontaine and Delibrias 1974). Like Cù Lao Rùa, Bến Đò is located on basaltic terrain. This site yielded an assemblage that was similar to An Sơn, including shouldered stone adzes, and incised, cord-marked or paddle linear impressed ceramics. The decorative motifs included incised horizontal lines, diagonal incision in a band between horizontal incision, wavy and horizontal line incision over paddle linear impression or comb incision, and roulette stamped zigzag impression. Bến Đò also contained *cà ràng* and pedestal dishes (Phạm 1977; Fontaine 1975, 1971). Stamped decoration was identified on the shoulders and lips of ceramic vessels, but was more common on the body. External ridges were identified on dishes. Some of these vessel forms are shown in Figure 8.1. The adzes at Bến Đò included unshouldered broad and long, narrow varieties, as well as small, shouldered types. There was substantial reuse and reworking of some lithic tools. Bến Đò also presented clay pellets, stone bangle fragments, pestles, grinders and red ochre (Fontaine 1975, 1972). A summary of the material culture at Bến Đò is listed in Table 8.1.

The data in Appendix B and the CA for Bến Đò were adapted from reported information (Phạm 1977; Fontaine 1975, 1971).

Table 8.1. The material culture contents of the neolithic layers at Bến Đò.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
concave rim restricted independent vessel	shouldered stone adze
concave rim restricted independent vessel with pedestal	stone bangle
simple restricted vessel	stone tools well-worn/reworked
simple unrestricted vessel	clay pellet
<i>cà ràng</i>	
linear incision	
cordmarking	
paddle impression	
roulette stamping	

Source: Data from Phạm 1977; Fontaine 1975, 1971.

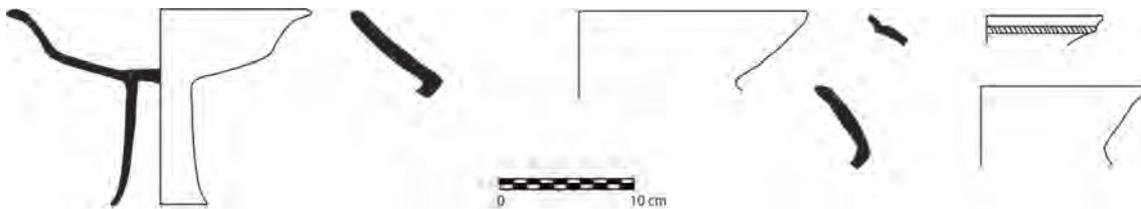


Figure 8.1. Bến Đò vessel forms, 1977 excavation.

Source: Illustrations, C. Sarjeant (After: Phạm 1977: 21).

Bình Đa

Bình Đa is located in An Bình ward, Biên Hòa city, Đồng Nai Province, along the Đồng Nai River. Excavations were conducted at Bình Đa in 1979 and 1993. There is one reported date for Bình Đa, 3180 ± 50 BP uncalibrated (Nishimura et al. 2009), which is 1606–1318 cal. BC (95.4% probability) when calibrated with OxCal 4.1.7 (Figure 8.2).

The 1993 report has the most comprehensive information about the archaeological remains at Binh Đa (Phạm and Nguyễn 1993). The pottery fabrics were dominated by sand tempered wares in all spits, with fibre tempered wares diminishing in the lower layers. Some of the Binh Đa vessel forms are presented in Figure 8.2. Triangular and rectangular-sectioned adzes were identified in the assemblage. Although unshouldered adzes were identified throughout the sequence, shouldered adzes occur in higher quantities than unshouldered in the upper layers. Hammerstones were more frequently observed in the upper layers, and whetstones were present throughout the sequence. Lithophones were only present in the upper layers. Additional material culture included clay figurines, *cà ràng* vessels, ceramic roundels, and clay pellets (Phạm and Nguyễn 1993). A summary of the material culture at Binh Đa is listed in Table 8.2.

The data in Appendix B and the CA for Binh Đa were adapted from reported information (Nishimura et al. 2009; Phạm and Nguyễn 1993; also in Nishimura 2002; Nishimura and Vương 1997), and from personal observations in the Đồng Nai Provincial Museum in 2010.

Table 8.2. The material culture contents of the neolithic layers at Binh Đa.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
concave rim restricted independent vessel	shouldered stone adze
simple restricted vessel	whetstone
simple unrestricted vessel	hammerstone
simple unrestricted vessel with pedestal	lithophone
<i>cà ràng</i>	stone preform
linear incision	ceramic roundel
geometric incision	clay pellet
red paint	
burnishing	
cordmarking	
paddle impression	
roulette stamping	
white lime infill	
ridge/appliqué	
fibre temper	
sand temper	
laterite sand temper	

Source: Data from Nishimura *et al.* 2009; Phạm and Nguyễn 1993; also in Nishimura and Vương 1997, Nishimura 2002, and personal observations.

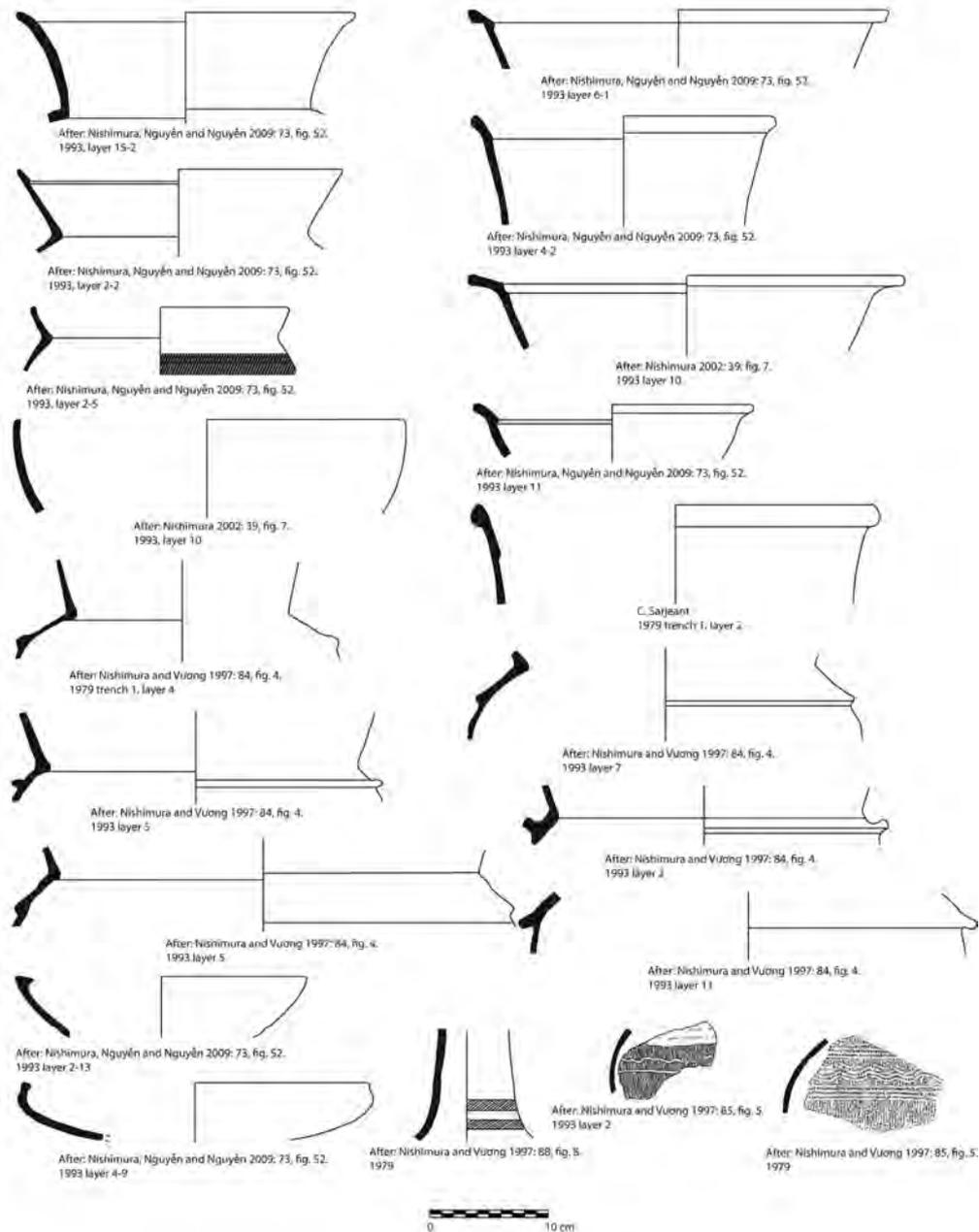


Figure 8.2. Binh Đa vessel forms, 1979 and 1993 excavations.

Source: Illustrations, C. Sarjeant (After: Nishimura *et al.* 2009, Nishimura 2002, Nishimura and Vương 1997, as credited).

Cái Vạn

Located in Long Thành district at the southeastern margin of Đồng Nai Province, Cái Vạn was excavated in 1978 and 1996. Nishimura (2002) considers Cái Vạn to be mostly neolithic, with a bronze age phase at the end of occupation, as evidenced by a few bronze artefacts. The stone adzes and pottery were similar to those at An Sơn and Binh Đa. Very little reported information is available for Cái Vạn. A summary of the material culture at Cái Vạn is listed in Table 8.3 and some of the ceramic forms are shown in Figure 8.3.

The data in Appendix B and the CA for Cái Vạng were adapted from personal observations at the Đồng Nai Provincial Museum in 2010.

Table 8.3. The material culture contents of the neolithic layers at Cái Vạng.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	stone adze
concave rim restricted independent vessel	ceramic roundel
simple restricted vessel	clay pellet
simple unrestricted vessel	
simple unrestricted vessel with pedestal	
cà rang	
linear incision	
geometric incision	
burnishing	
coarse cordmarking	
cordmarking	
paddle impression	
roulette stamping	
coarse punctate stamping	
punctate stamping	
ridge/appliqué	
fibre temper	
sand temper	
laterite sand temper	
calcareous sand temper	

Source: Data from personal observations.

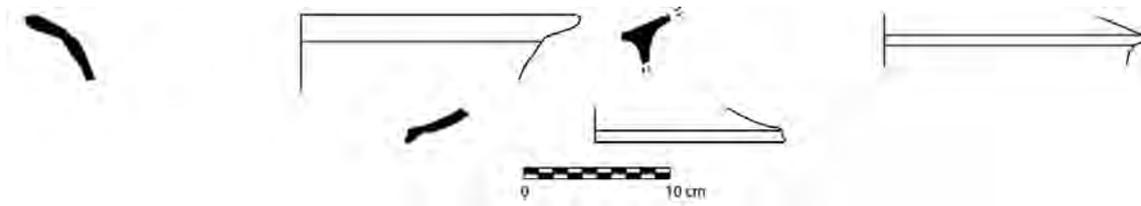


Figure 8.3. Cái Vạng vessel forms.

Source: Illustrations, C. Sarjeant (After: Nishimura 2002: 48, Figure 12).

Cầu Sắt

Cầu Sắt is located in Bình Lộc village, Xuân Lộc district, Đồng Nai Province. There are no reported dates for Cầu Sắt despite claims that it is an early neolithic site. The lithic assemblage included shouldered and unshouldered adzes, drill points, knives, chisels, hammerstones, whetstones, and bangles or rings. Like the early An Sơn adzes, they were small, triangular-shaped and rectangular-sectioned shouldered types. The ceramic assemblage included unrestricted and restricted vessels (Hoàng and Nguyễn 1977; Hoàng *et al.* 1976). One example is an unrestricted vessel with a ridge at the shoulder and a pedestal (Figure 8.4). A summary of the material culture at Cầu Sắt is listed in Table 8.4. The data in Appendix B and the CA for Cầu Sắt were adapted from reported information (Hoàng and Nguyễn 1977; Hoàng *et al.* 1976).

Table 8.4. The material culture contents of the neolithic layers at Cầu Sắt.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
unrestricted independent vessel	shouldered stone adze
simple unrestricted vessel	hammerstone
simple unrestricted vessel with pedestal ridge/appliqué	

Source: Data from Hoàng and Nguyễn 1977; Hoàng *et al.* 1976.

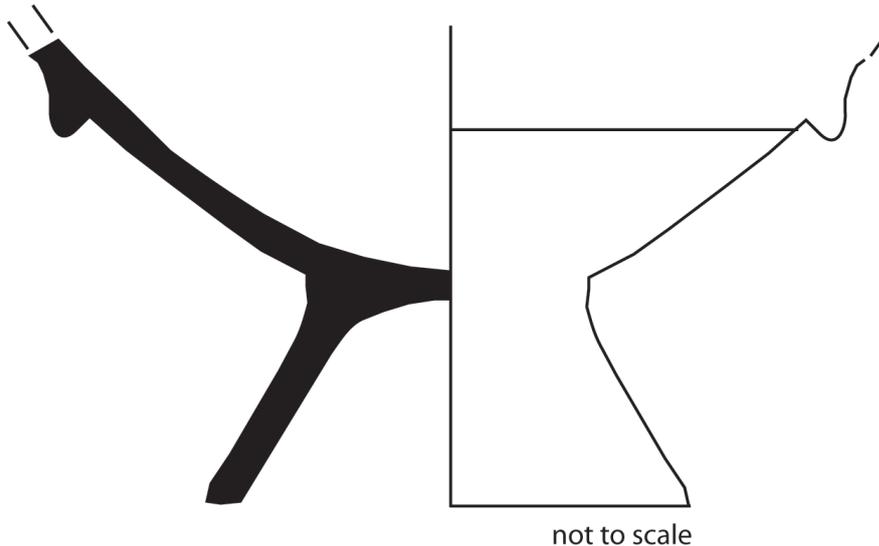


Figure 8.4. Cầu Sắt vessel form. Not to scale.

Source: Illustrations, C. Sarjeant (After: Hoàng and Nguyễn 1977).

Cù Lao Rùa

Cù Lao Rùa is a site in Thạnh Phước village, Tân Uyên district, Bình Dương Province. Cù Lao Rùa is located on the old alluvium, adjacent to the Đồng Nai River. Shallow laterite deposits are present in this area and sites are located on basaltic terrain with red soil on top (Fontaine 1975). Cù Lao Rùa has been a known archaeological site since 1888, when it was reported by Émile Cartailhac. It was later investigated in 1975 and then in 2003 (Nguyễn 2008). Cù Lao Rùa has evidence of metal technology and spindle whorls that are associated with the later occupation. Early reports also indicated that Cù Lao Rùa had ceramics with punctate dots between two incised lines, incised zigzag lines, and incised concentric circle motifs. Pestles and grinders were also identified (Fontaine 1975, 1971).

Cù Lao Rùa was most recently excavated in 2003, during which mortuary remains were recovered, and detailed information about the ceramic vessel forms, decorations and lithic assemblages was revealed (Nguyễn 2008) (see Table 8.5). One uncalibrated date has been reported for Cù Lao Rùa of 2230±40 BP (Nguyễn 2008), which was calibrated to 389–202 cal. BC (95.4% probability) with OxCal 4.1.7 (Figure 8.6), representing the later metal phase occupation (see Chapter 2). Only the material associated with the earlier neolithic occupation is included in the comparison presented in this chapter and in the CA (see also Appendix B).

The Cù Lao Rùa ceramic assemblage excavated in 2003 included forms with incised decoration on the interior of the rim, and decorations that were paralleled at An Sơn including the zigzag

roulette design in a band on the shoulder. The ceramic assemblage also included rounded cà ràng projections. Some of these forms are shown in Figure 8.5. The lithic assemblage Cù Lao Rùa included ground stone tools, such as small, shouldered adzes in both broad and narrow varieties, and some large adzes were also identified. Unshouldered rectangular-sectioned and triangular-shaped adzes were less common. Hammerstones, whetstones and stone bangles were also present (Nguyễn 2008).

The data in Appendix B and the CA for Cù Lao Rùa were adapted from reported information (Nguyễn 2008; Fontaine 1975, 1971), and from personal observations at the Centre for Archaeological Studies of the Southern Institute of Social Sciences, Ho Chi Minh City in 2010.

Table 8.5. The material culture contents of the neolithic layers at Cù Lao Rùa.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
everted rim restricted independent vessel with pedestal	shouldered stone adze
concave rim restricted independent vessel	whetstone
unrestricted independent vessel with pedestal	hammerstone
simple restricted vessel	stone bangle
simple unrestricted vessel	stone preform
simple unrestricted vessel with pedestal	stone tools well-worn/reworked
linear incision	ceramic roundel
geometric incision	clay pellet
red paint	clay anvil
burnishing	
cordmarking	
paddle impression	
roulette stamping	
coarse punctate stamping	
fibre temper	
sand temper	
laterite sand temper	

Source: Data from Nguyễn 2008; Fontaine 1971, 1975, and personal observations.

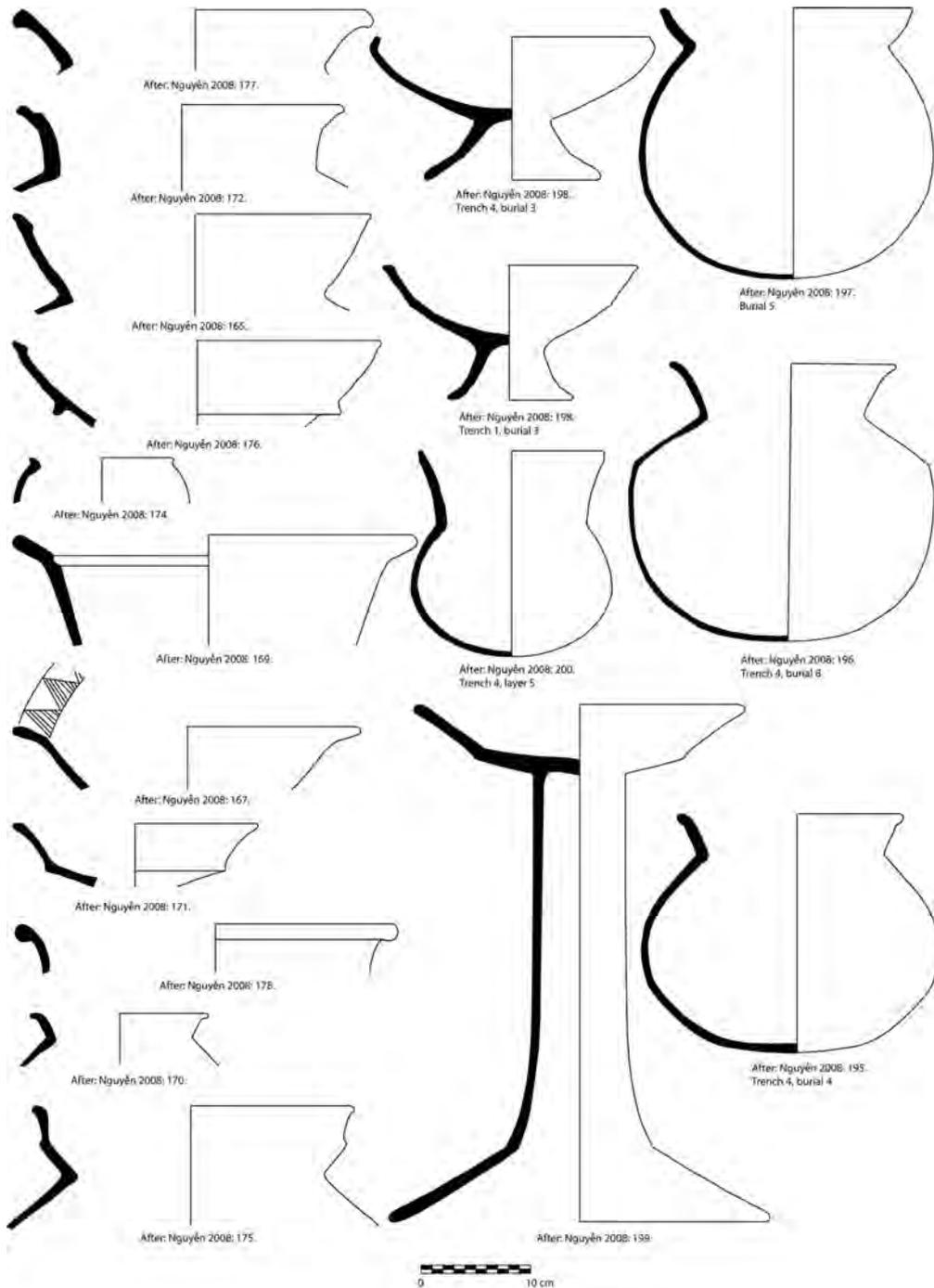


Figure 8.5. Cù Lao Rùa vessel forms, 2003 excavation.

Source: Illustrations, C. Sarjeant (After: Nguyễn 2008, as credited).

Đa Kai

Đa Kai is located in the upper reach of the Đồng Nai River in Đa Kai village, Đức Linh district, Bình Thuận Province. Đa Kai was first identified in 1981 when lithophones were discovered there, and test excavations followed in 1997. Subsequent excavations took place in 1998 and 2005 (Nishimura et al. 2009). Đa Kai is a circular earthwork site (as described in Chapter 2) with a different topography to mounds like An Sơn, and has a largely neolithic occupation, with one

iron age jar burial. Two dates from Đạ Kai have been reported, both of which are from charcoal samples, 3215–3376 cal. BP and 3299–3455 cal. BP, however neither of these dates relate to a specific archaeological context (Nishimura et al. 2009). Only the material associated with the neolithic occupation is included in the comparison presented in this chapter and in the CA (see also Appendix B).

While it was assumed that Đạ Kai was used for burials, bone and shell remains were absent due to the soil chemistry. Parallels between the ceramics, stone tools and site construction of Đạ Kai have been discussed in comparison with the circular earthwork sites of Memot, eastern Cambodia (e.g. Krek), and other neolithic sites of southern Vietnam (e.g. An Sơn, Bình Đạ) (Nishimura et al. 2009) (see Chapter 2). Some of the ceramic vessel forms are shown in Figure 8.6. A summary of the material culture at Đạ Kai is listed in Table 8.6.

The data in Appendix B and the CA for Đạ Kai were adapted from reported information (Nishimura et al. 2009).

Table 8.6. The material culture contents of the neolithic layers at Đạ Kai.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
concave rim restricted independent vessel	shouldered stone adze
simple restricted vessel	whetstone
simple unrestricted vessel	sandstone
simple unrestricted vessel with pedestal	hammerstone
linear incision	stone bangle
geometric incision	lithophone
red paint	stone preform
burnishing	stone tools well-worn/reworked
cordmarking	ceramic roundel
paddle impression	clay pellet
roulette stamping	
white lime infill	
ridge/appliqué	
fibre temper	
sand temper	
calcareous sand temper	

Source: Data from Nishimura *et al.* 2009.

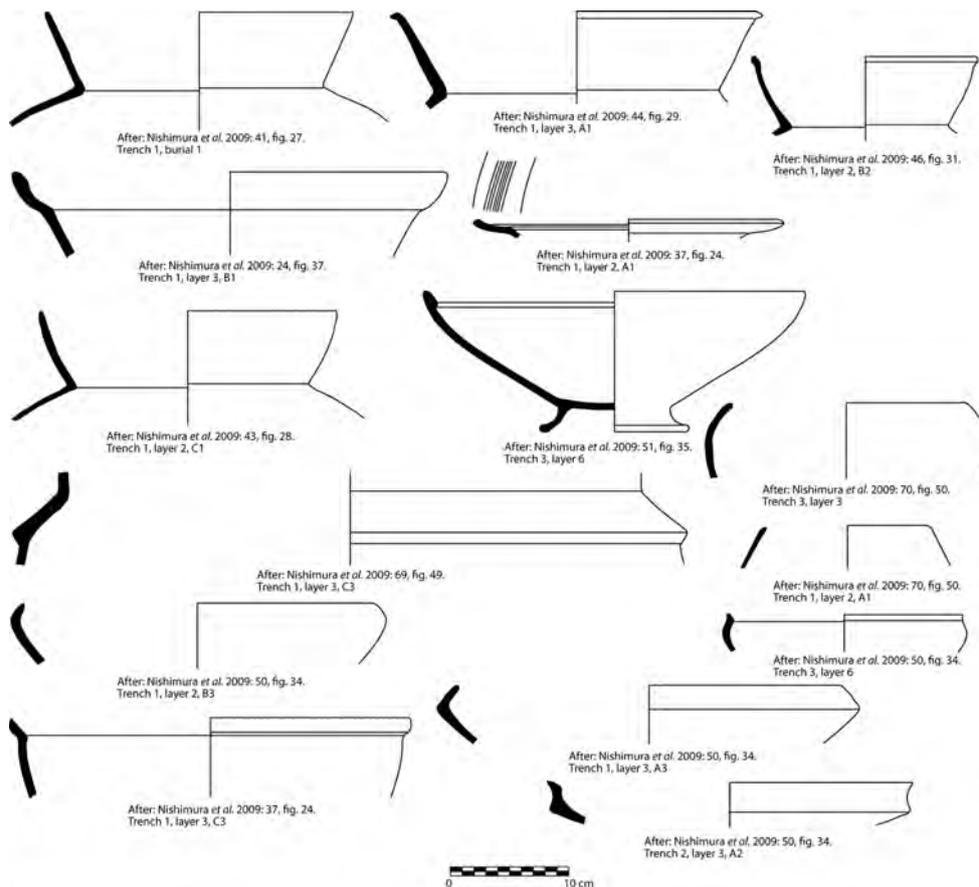


Figure 8.6. Đa Kai vessel forms, 1997 excavation.

Source: Illustrations, C. Sarjeant (After: Nishimura *et al.* 2009, as credited).

Đình Ông

Located in Gò Dầu district, Tây Ninh Province, along the Vàm Cỏ Đông River and north of An Sơn, Đình Ông was excavated by the Centre for Archaeological Studies of the Southern Institute of Social Sciences, Ho Chi Minh City. There is limited reported information about this research, particularly about the non-ceramic assemblages. A summary of the material culture at Đình Ông is listed in Table 8.7.

The data in Appendix B and the CA for Đình Ông were adapted from personal observations at the Centre for Archaeological Studies of the Southern Institute of Social Sciences, Ho Chi Minh City in 2010.

Table 8.7. The material culture contents of the neolithic layers at Đình Ông.

Ceramic vessels
concave rim restricted independent vessel
simple unrestricted vessel
simple unrestricted vessel with pedestal
linear incision
burnishing
cordmarking
paddle impression
roulette stamping
fibre temper
sand temper

Source: Data from personal observations.

Gỗ Cao Su

Gỗ Cao Su is located near An Sơn and Lộc Giang in Đức Hòa district, Long An Province. The site was excavated by the Institute of Archaeology in Hanoi and the Long An Provincial Museum in 1994. It is slightly elevated, and about 2 m of cultural deposit were revealed in the excavation. The ceramics were mostly fibre tempered, and reportedly have parallels with later prehistoric sites of the region. Some later deposits were associated with bronze, iron and stone beads (Nguyễn 2001). Two charcoal dates have been reported, 3370±80 BP uncalibrated from Pit 1, layer 10, and 2650±70 BP uncalibrated from layer 3 (Bùi *et al.* 1997). The dates are 1884–1496 cal. BC and 979–550 cal. BC (95.4% probability), when calibrated with OxCal 4.1.7 (Figure 8.9). There was insufficient information to include this site in the CA.

Lộc Giang

Lộc Giang is a neighbouring site to An Sơn, and is also located near the Vàm Cỏ Đông River in Lộc An hamlet, Lộc Giang village, Đức Hòa district, Long An Province. It was first identified by Louis Malleret in 1963, and surveys took place in 1978, followed by excavations in 1988 and 1993 (Quang and Ngô 1994). One charcoal date has been reported for Lộc Giang, 3950±75 BP uncalibrated from the lowest layer (Nishimura and Nguyễn 2002). This date has been calibrated to 2834–2203 cal. BC (95.4% probability) with OxCal 4.1.7, and is comparable to the earliest dates at An Sơn (Figure 8.10; compare Figure 4.6).

The ceramic assemblage Lộc Giang was generally similar to that at An Sơn in terms of rim form and decoration (Figure 8.7, Figure 8.8). This included square *cà ràng* projections, foot rims, and high pedestals/stems with roulette stamped and incised decoration. Some forms had motifs on the interior of the rim. The paddle linear impressed surface treatment with horizontal and wave incisions overtop was a common decoration at neolithic sites in southern Vietnam, and also occurred at Lộc Giang. The presence of shoulder sherds with a ridge or appliqué and concentric circle, wave or spiral incisions is paralleled at sites in the Đồng Nai region. The 1994 report also states that Óc Eo ceramics were identified in the upper layer at Lộc Giang (Quang and Ngô 1994).

The lithic assemblage at Lộc Giang included broad, rectangular-sectioned shouldered adzes, ground unshouldered rectangular-sectioned and triangular-shaped adzes, points, flake scrapers, chopper-type tools, quadrangular and triangular-shaped axes, and whetstones. The adzes varied in size and the larger were typically unshouldered and rectangular-sectioned (Quang and Ngô 1994). A summary of present material culture at Lộc Giang is listed in Table 8.8.

The data in Appendix B and the CA for Lộc Giang were adapted from reported information (Quang and Ngô 1994), and from personal observations Long An Provincial Museum in 2009 and 2010.

Table 8.8. The material culture contents of the neolithic layers at Lộc Giang.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
concave rim restricted independent vessel	shouldered stone adze
simple unrestricted vessel	whetstone
simple unrestricted vessel with pedestal	lithophone
wavy rim simple unrestricted vessel	stone tools well-worn/reworked
cà ràng	ceramic roundel
linear incision	clay pellet
geometric incision	
red paint	
burnishing	
coarse cordmarking	
cordmarking	
paddle impression	
roulette stamping	
ridge/appliqué	
fibre temper	
sand temper	
phosphate sand temper	

Source: Data from Nishimura and Vương 1997; Quang and Ngô 1994, and personal observations.



Figure 8.7. Lộc Giang incised and roulette stamped sherds. Not to scale.

Source: Photo C. Sarjeant.

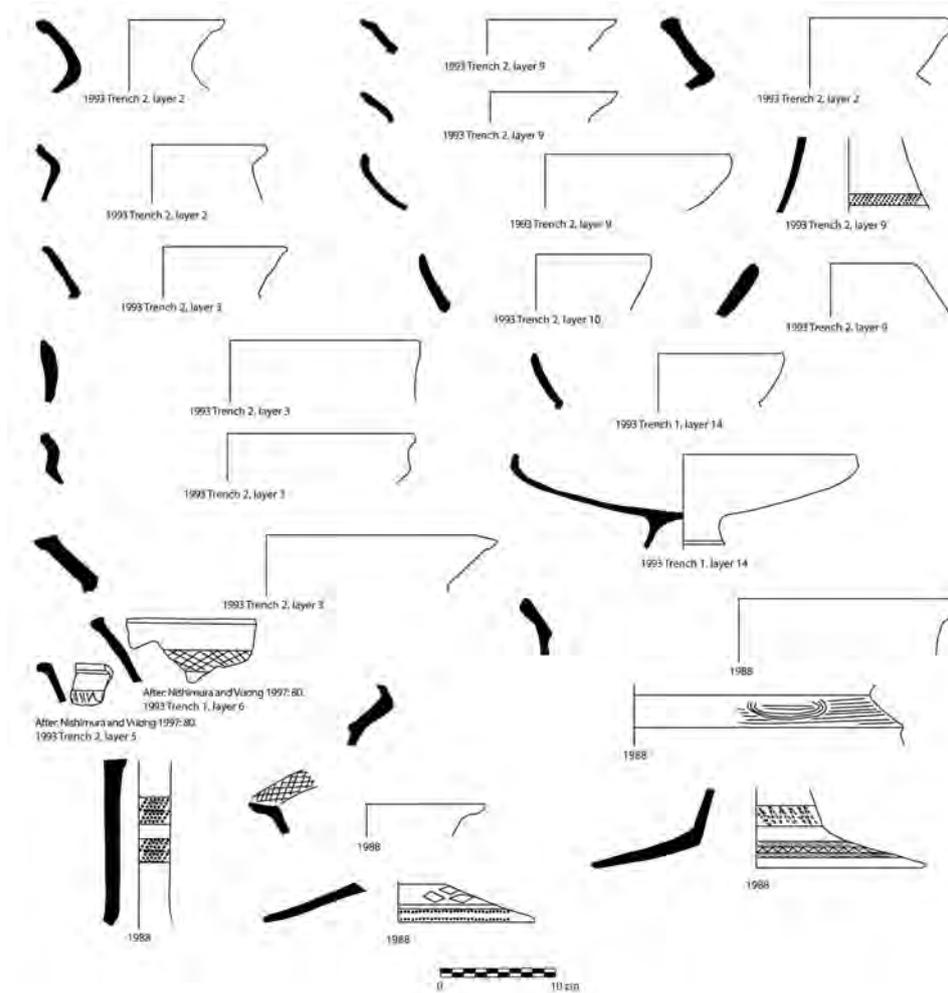


Figure 8.8. Rạch Lúa vessel forms, 1988 and 1993 excavations.

Source: Illustrations, C. Sarjeant (After: Quang and Ngô 1994; except those labelled as Nishimura and Vương 1997).

Rạch Lá

Rạch Lá is located in Quới Thạnh hamlet, Phước An village, Nhơn Trạch district, Đồng Nai Province. There is little reported information available for Rạch Lá, even though the site was excavated in 2002. The reported uncalibrated dates for Rạch Lá are 3790 ± 60 BP, 3900 ± 60 BP, 3960 ± 85 BP, and 4080 ± 90 BP (Unknown author, *The excavation of Rạch Lá* 2002). These dates are 2469–2038 cal. BC, 2566–2203 cal. BC, 2852–2203 cal. BC and 2894–2356 cal. BC (95.4% probability), when calibrated with OxCal 4.1.7 (Figure 8.13).

Rạch Lá is known for its mangrove environment and the preservation of wood remains suggest the use of raised stilt housing. The manufacture of stone tools was thought to have taken place inside houses. This is supported by the 2002 excavations, as knapping debris was often found near the evidence of housing. Similarities have been noted between the ceramics of Rạch Lá, Cái Vạng and Cái Lãng in the Đồng Nai region, but Rạch Lá is considered to have had an earlier occupation because there is no evidence of metal (Unknown author, *The excavation of Rạch Lá* 2002). A summary of the material culture at Rạch Lá is listed in Table 8.9.

The data in Appendix B and the CA for Rạch Lá were adapted from personal observations at the Đồng Nai Provincial Museum in 2009 and 2010.

Table 8.9. The material culture contents of the neolithic layers at Rạch Lá.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	clay pellet
concave rim restricted independent vessel	
simple restricted vessel	
simple unrestricted vessel	
cà ràng	
linear incision	
cordmarking	
paddle impression	
ridge/appliqué	
fibre temper	
sand temper	

Source: Data from personal observations.

Rạch Núi

Rạch Núi is a mound located in Đông Thạnh village, Cần Giuộc district, Long An Province, on salt marshland near the Rạch Cát River. The mouths of the Đồng Nai and Vàm Cỏ Đông Rivers are approximately 20–30 km from the site. Rạch Núi is 100–120 m in diameter and about 7 m high. The site was first surveyed and excavated in 1975, but little was published from this expedition (Bùi *et al.* 1997). Fontaine reported a date of 2400±100 BP uncalibrated from an unknown context (Bùi *et al.* 1997). This has been calibrated to 794–231 cal. BC (95.4% probability) with OxCal 4.1.7 (Figure 8.14).

Phạm Quang Sơn excavated into the top of the mound at Rạch Núi in 1977, and the cultural deposits were about 5 m deep. Material recovered included mollusc shells and the remains of domesticated pigs. The lithic assemblage primarily included untanged rectangular-sectioned adzes, particularly in the upper layers, with very few shouldered types. It has been suggested that less reworking of lithics took place at Rạch Núi in comparison to the stone assemblage at An Sơn (Bùi, Vương and Nishimura 1997). The presence of shouldered turtle bone adzes at Rạch Núi indicates that they may have been used in place of shouldered stone adzes. It has also been hypothesised that exchange goods may have been more accessible to the inhabitants of Rạch Núi than to those at An Sơn (Bùi *et al.* 1997). However, more recent evidence suggests the contrary. If we accept the shouldered to unshouldered transition in adzes over time (as at An Sơn, see Chapter 4), then the absence of shouldered stone adzes at Rạch Núi may indicate a later occupation of the site. Alternatively it may indicate limited access to exchange networks that provided the necessary stone resources at initial occupation and a need to utilise local turtle bone instead. Suitable stone resources are known to exist further north in Đồng Nai Province. Other bone artefacts identified at Rạch Núi included awls, a knife-shaped tool, and ornaments. A summary of the material culture at Rạch Núi is listed in Table 8.10. The ceramic assemblage included *cà ràng* vessels, deep cord-marked round bowl vessels that contributed more than 90% of the assemblage, miniature vessels, and limestone ceramic tempers (Nishimura and Nguyễn 2002; Bùi *et al.* 1997). Examples of these vessel forms are shown in Figure 8.9.

The most recent excavations at Rạch Núi in March–April 2012, revealed extensive evidence of living floors and platforms. These were constructed from local clay, probably imported sand, and burnt shell to create hard lime-rich surfaces. The material culture associated with these floors was minimal, with ceramic sherds the major component, specifically the deep cord-marked round

bowl vessels. These vessels had irregular rim shapes, presumably due to en masse and rapid hand construction of these utilitarian vessels. They were presumably used for cooking, due to their shell and fibre tempers that would have been ideal for heating and cooling. A secondary role of these sherds was to create the living floors, which were flattened as a hard layer between deposits of clay and lime. There were very few sand tempered ceramic sherds, specifically rims, compared to the shell tempered utilitarian bowls, and with further research it may become possible to determine whether these sand tempered vessels were non-local imports. Other Rạch Núi material culture excavated in 2012 included shell beads, unshouldered stone adzes and evidence of reworking these adzes (there was only one shouldered stone adze), turtle shell shouldered adzes and bangles, clay pellets and ceramic roundels.

The data in Appendix B and the CA for Rạch Núi were adapted from reported information (Nishimura and Nguyễn 2002; Bùi *et al.* 1997) and personal observations during the 2012 field season.

Table 8.10. The material culture contents of the neolithic layers at Rạch Núi.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
concave rim restricted independent vessel	shouldered stone adze
simple restricted vessel	ceramic roundel
simple unrestricted vessel	clay pellet
cà ràng	clay anvil
linear incision	shell bead
burnishing	bone/ivory bangle
cordmarking	worked bone
paddle impression	
roulette stamping	
punctate stamping	
ridge/appliqué	
fibre temper	
sand temper	
laterite sand temper	
calcareous sand temper	

Source: Data from Nishimura and Nguyễn 2002; Bùi *et al.* 1997, and personal observations.

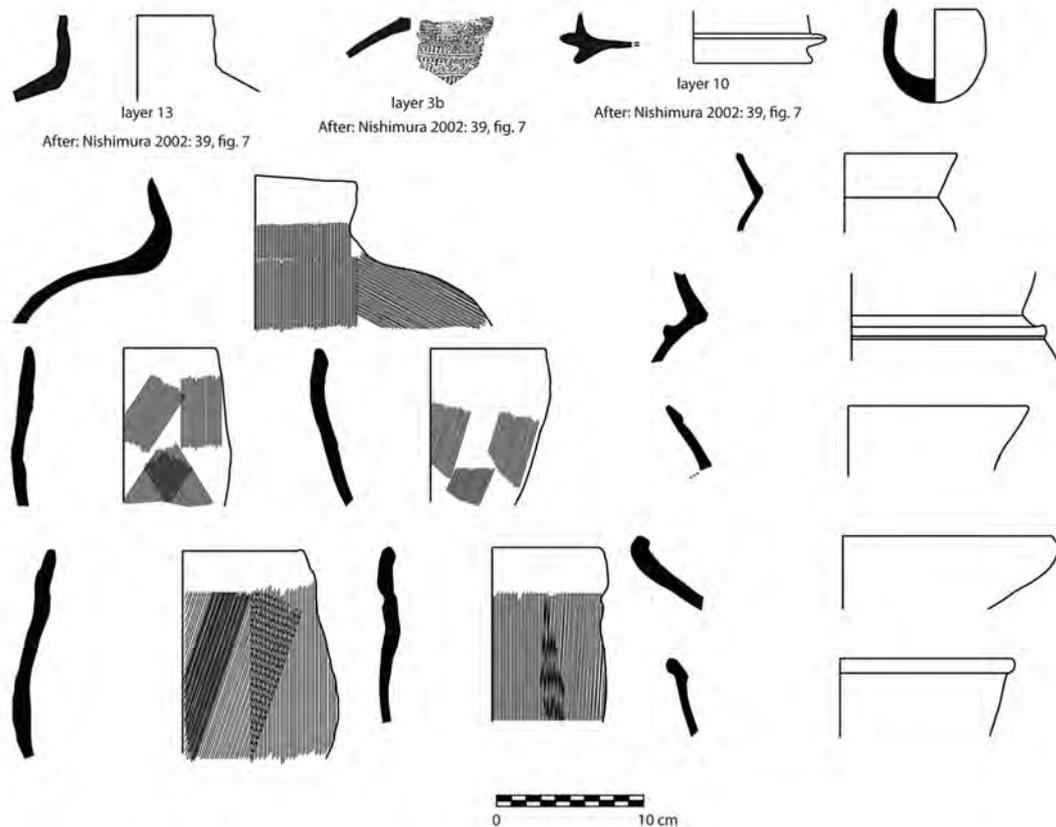


Figure 8.9. Rạch Núi vessel forms, 1977 and 2012 excavations.

Source: Illustrations, C. Sarjeant (except those labelled After: Nishimura 2002: 39, fig. 7).

Rạch Rừng

Rạch Rừng is located in Tân Lập village, Mộc Hoá district, Long An Province, along the Vàm Cỏ Tây River. The site was surveyed by the Long An Provincial Museum in 1990. It is a small mound, but the site has been disturbed by road construction. Stone rings and bangles, ceramic sherds, stone adzes, and animal bones were collected during the survey. Both unshouldered and shouldered adzes were recovered. Excavations at Rạch Rừng revealed human burials and wooden piles that were identified as house remains. Radiocarbon dates of a wood fragment from a burial provided the dates 2780 ± 40 BP and 2800 ± 45 BP uncalibrated (Bùi *et al.* 1997). The dates have been calibrated to 1019–829 cal. BC and 1110–833 cal. BC (95.4% probability) with OxCal 4.1.7 (Figure 8.16). There was insufficient information to include this site in the CA.

Suối Linh

Suối Linh is located in Trị An village, Vĩnh Cửu district, Đồng Nai Province, in the upper reach of the Đồng Nai River. Excavations were conducted at Suối Linh in 1985 and 2002, and it is thought to date to *c.* 3500–2500 BP. Suối Linh is considered to have been a stone workshop site, after the discovery of a comprehensive lithic assemblage with triangular and rectangular-sectioned unshouldered and shouldered adzes, chisels, scrapers, arrowheads, drill points, awls, hammerstones, whetstones, and pestles, as well as stone pellets and bangles. Ceramic pellets, rings, pendants and anvils were also identified in the 2002 excavation. A summary of the material culture at Suối Linh is listed in Table 8.11. The decoration on the Suối Linh ceramics included

geometric incision, wave incision over paddle linear impression, and punctate or roulette stamping, as seen at other neolithic sites of southern Vietnam (Trình 2005; Trình *et al.* 2003). Some of the Suối Linh vessel forms are presented in Figure 8.10.

The data in Appendix B and the CA for Suối Linh were adapted from reported information (Trình 2005; Trình *et al.* 2003), and from personal observations at the Đồng Nai Provincial Museum in 2010.

Table 8.11. The material culture contents of the neolithic layers at Suối Linh.

Ceramic vessels	Other material culture
everted rim restricted independent vessel	unshouldered stone adze
concave rim restricted independent vessel	shouldered stone adze
unrestricted independent vessel	whetstone
simple unrestricted vessel	hammerstone
simple unrestricted vessel with pedestal	stone bangle
linear incision	stone arrowhead
geometric incision	stone preform
burnishing	ceramic roundel
cordmarking	clay pellet
paddle impression	clay anvil
roulette stamping	clay bangle
punctate stamping	
ridge/appliqué	
sand temper	
laterite sand temper	
calcareous sand temper	

Source: Data from Trình 2005; Trình *et al.* 2003, and personal observations.

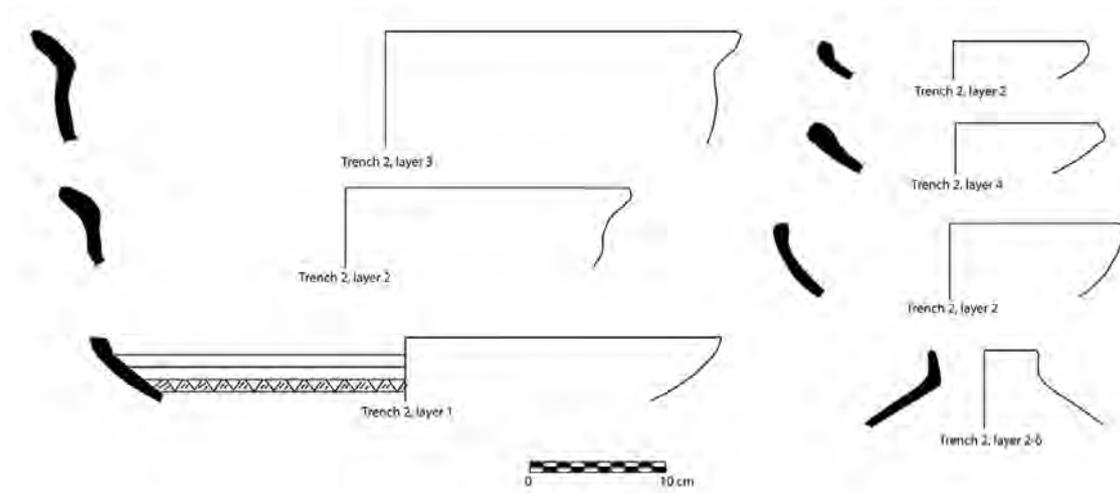


Figure 8.10. Suối Linh vessel forms, 2002 excavation.

Source: Illustrations C. Sarjeant (After: Trình 2005: 51; Trình *et al.* 2003).

Comparison with An Sơn: Correspondence analysis

The identified variables for the CA included ceramic rim forms from the An Sơn categorisation (Figure 5.1), variants of the categorised rim forms (e.g. Figure 5.2), complete An Sơn ceramic vessel forms (Figure 5.14), any anomalous rim forms at An Sơn and the other eleven assessed sites. Variables considered included ceramic modes of decoration and surface treatment, the location of these decorations on vessels, ceramic tempers when possible, the presence (or absence) of stone tools, other stone ornaments, bone/ivory tools and ornaments, and ceramic/clay items like roundels and pellets. The presence and absence data for these variables applied in the CA are in Appendix B. A total of 135 variables were included in the CA, of which 112 were ceramic vessel variables and the remaining 23 were other material culture variables. Two CAs are presented here, one of all material culture variables (Figure 8.11), and one of only the ceramic variables (Figure 8.12). Each CA is separated into two plots, the first plotting the sites and the second the variables. The variables are coded with a number, and this section should be read in conjunction with these codes in Appendix B. To relate the chronology of the analysed sites to the sequence at An Sơn, the material culture at An Sơn is divided into early, middle and late phases of occupation.

The CA plot (Figure 8.11) indicates that many sites cluster together, based on the majority of the included material culture variables. The main cluster of the CA plot includes most of the compared variables and sites, and there are two subgroups. The first subgroup includes the middle occupation at An Sơn, Lộc Giang, Đa Kai and Bến Đò, which correspond with the majority of the variables applied in the analysis, as seen in the central cluster of the variables in Figure 8.12. Lộc Giang corresponds with the variables of roulette stamping in a zigzag shape, fine fibre temper, and rim forms A1e and A1f. The second subgroup includes Bình Đa, Cái Vạn and Suối Linh, which correspond due to the presence of form A1g variants and shoulder sherds with a ridge or appliqué that are decorated with incised swirls/concentric circles. Rạch Lá and Đình Ông somewhat correspond with this subgroup, although not as closely as the aforementioned sites.

Early and late An Sơn, Cù Lao Rùa, Rạch Núi, and Cầu Sắt are all outliers in Figure 8.11. Đình Ông, Cầu Sắt and Rạch Lá are affected by lack of information in the statistical analysis. Cầu Sắt and Suối Linh cluster together when considering the limited available variables, and correspond with the presence of punctate stamped bands on ceramics and triangular-shaped unshouldered adzes. Cù Lao Rùa appears to be distinct from the main cluster, due to its unique vessel forms. Late An Sơn is an outlier in the CA plot (Figure 8.11), due to the presence of ceramic with incised and impressed decoration on high stem and foot rims, phosphate sand temper, rim forms A1i-r, B3a and D2a, and sandstone and shell beads. This suggests that changes occurred towards the end of the neolithic at An Sơn, leading to cultural differentiation between sites within southern Vietnam.

When only considering the ceramic vessel variables similar patterns emerged and some relationships become clearer (Figure 8.12). Two main groups are distinguished once again: one inclusive of the early and middle occupations at An Sơn and Lộc Giang; and the second including Bình Đa, Cái Vạn, Suối Linh, Đình Ông and Rạch Núi. The outliers of this plot were the late occupation at An Sơn, Cù Lao Rùa, Cầu Sắt, Đa Kai, Rạch Lá and Bến Đò. These results suggest a geographic model for the distribution of material culture in southern Vietnam: one group based on the Vàm Cỏ Đông River region that includes An Sơn and Lộc Giang, and a second that includes sites near the Đồng Nai River such as Bình Đa and Rạch Núi. Clarification of the apparent relationship between Đình Ông and the Đồng Nai River sites, rather than with the geographically closer sites of the Vàm Cỏ Đông River region, requires further research. The Vàm Cỏ Đông sites are characterised by class A2 and class D wavy rimmed ceramic vessels (refer to rim form images in Figure 5.1), roulette and punctate stamped decoration, both sand and fibre tempered ceramics, and shouldered stone adzes. The Đồng Nai River sites are characterised by ceramic vessel variants

of form A1g, class B and form C2b, as well as ridge/appliqué on the shoulder of vessels, calcareous tempers, and clay anvils. There was some correspondence between these Đòng Nai River sites and Đa Kai, which is distinguished from the main cluster due to an absence of form C2b variants and coarse punctate stamping, and a presence of zigzag incision and decoration on high-stemmed pedestal vessels (Figure 8.11, Figure 8.12).

Rạch Lá, Cầu Sắt, Suối Linh and Đình Ông are affected by a lack of reported information, and their relationships to the other sites in the CA are not completely clear (Figure 8.12). Bến Đò does not correspond with An Sơn and the main cluster due to a presence of a form C3a variant and A1h vessels. The neolithic occupation of Cù Lao Rùa is also an outlier in the plot, despite its proximity to the Đòng Nai River and sites like Bình Đa. Its distinctiveness is heightened by the presence of form A1 variants, incised and impressed stems of form C1 vessels, and square/rectangular geometric incised decoration. The known bronze age occupation of Cù Lao Rùa may be reflected in the studied neolithic assemblage. The diversity in the material culture assemblage discussed in this chapter, and its divergence from other assemblages in neolithic southern Vietnam, may be indicative of sites with a later neolithic date or transitional occupation into the bronze age, such as Cù Lao Rùa. This divergence is also observed in the late occupation at An Sơn, with different ceramic material culture to the earlier phases and other analysed sites, evidenced by a presence of form A1a variants with incised rims, A1i-r rims, A2 vessels with pedestals, B3a rims, C1b restricted vessels with a pedestal, D2a rims, and phosphate sand tempers (Figure 8.12).

The An Sơn ceramic forms and identified variants and the other included variables in this comparison are shown in Appendix B, alongside the presence and absence data and variable codes. Seven groups have been identified in the CA, and the corresponding variables shared by the sites within each group are summarised in Table 8.12 and presented in the map of Figure 8.13.

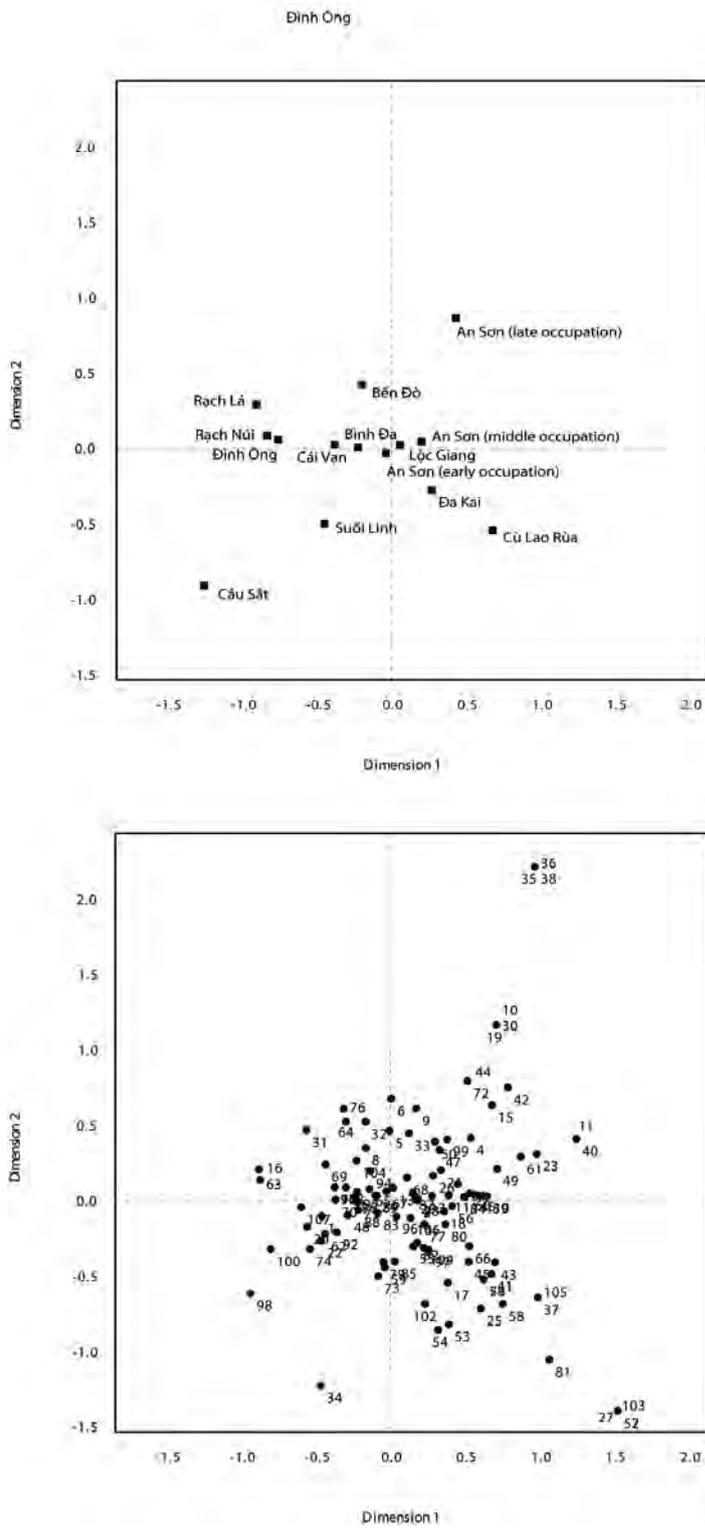


Figure 8.12. CA plots for the southern Vietnam neolithic ceramic vessel variables. Top: sites, bottom: variables. Refer to Appendix B for variable codes.

Source: C. Sarjeant.

Table 8.12. Groups in Figure 8.11 and Figure 8.12 CA plots and the contributing variables. Not all variables are applicable for all sites of each group. Note: the information from Đình Ông, Rạch Lá, Cầu Sắt and Bến Đò is limited in comparison to the other sites. Bình Đa shares variables with both groups 1 and 2. Refer to Appendix B for ceramic form images and presence or absence of the variables at each site.

Group number	Corresponding sites	Corresponding variables
1	An Sơn (early occupation) An Sơn (middle occupation) Lộc Giang	A1 class ceramic vessels A2 class ceramic vessels B1b ceramic vessels C2 class ceramic vessels C3 class ceramic vessels D1 class ceramic vessels E1a cà rang ceramic vessels Incised pedestals A class ridged shoulder sherds Coarse cordmarking Concentric curvilinear incisions Roulette stamping Punctate stamping Fibre temper Sand temper Coarse sand temper Shouldered adzes Lithophones Stone bangles
1/2	Bình Đa	
2	Cái Vạn Đình Ông Rạch Lá Rạch Núi Suối Linh	A1g ceramic vessels and variants B class ceramic vessels and variants C1 class ceramic vessels with pedestal C2b ceramic vessels and variants A class ridged shoulder sherds Ridge/appliqué Lateritic sand temper Calcareous temper Unshouldered adzes Clay anvils Clay bangles Shell beads Bone/ivory bangles Worked bone

Group number	Corresponding sites	Corresponding variables
3	An Sơn (late occupation)	A1i-r ceramic vessels B3a ceramic vessels C1a ceramic vessels with high-stemmed pedestals C1b ceramic vessels with pedestal D2a ceramic vessels Mortuary ceramic vessels Phosphate sand temper Unshouldered adzes Polishing stones Lithophones Shell beads Bone/ivory bangles Worked bone
4	Cầu Sắt	Unrestricted independent vessel with pedestal
5	Bến Đò	A1e ceramic vessels A1f ceramic vessels A1i ceramic vessels C3a ceramic vessel variants E2 cà rang ceramic vessels projections Vertical linear incisions
6	Đa Kai	C class ceramic vessels with pedestals C2b ceramic vessel variants
7	Cù Lao Rùa	A1 class ceramic vessel variants B1b ceramic vessels C1a ceramic vessel variants C1b ceramic vessels with pedestal Incised pedestals Square/rectangular geometric incisions Triangular geometric incisions with diagonal line incision fill Shouldered adzes

Source: Compiled by C. Sarjeant.

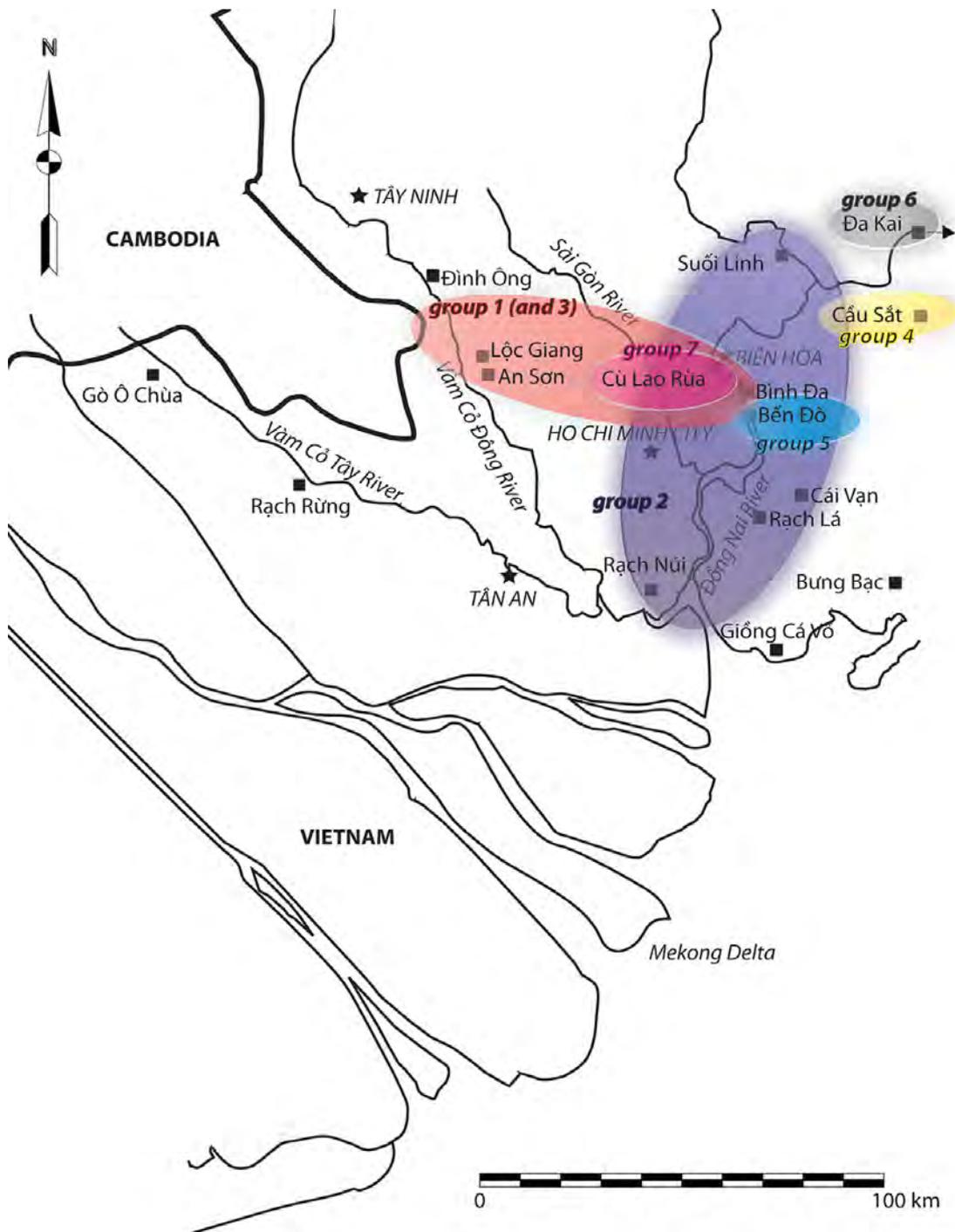


Figure 8.13. Distribution of CA groups in Table 8.12 according to material culture variables in southern Vietnam. Đinh Ông corresponds with group 2 in the CA but further evidence is required to confirm this.

Source: C. Sarjeant.

Summary: The material culture comparison of southern Vietnam

In general, relationships are evident between the sites of southern Vietnam, especially due to geographical proximity. Many of the differences in material culture also relate to chronology, whereby most of the sites correspond with the early to middle occupation at An Sơn. These include Bình Đa, Cái Vạn, Đinh Ông, and primarily Lộc Giang. At this stage, some of the

material culture at Rạch Núi exhibited parallels with early An Sơn. However, since Rạch Núi presents such contrasting evidence overall to An Sơn, it appears to represent different cultural developments closer to the coastline. These contrasts are further discussed in relation to cultural isolation at Rạch Núi in Chapter 10.

Two separate but connected ceramic manufacturing complexes can be identified within southern Vietnam, one in the Vàm Cỏ Đông River region and one in the Đồng Nai River region. These regions share some ceramic traditions, as evidenced by the parallels between Bình Đa and An Sơn, but the commonalities between Lộc Giang and An Sơn within the Vàm Cỏ Đông River region, and between Bình Đa, Cái Vạng, Rạch Núi, and Suối Linh within the Đồng Nai River region, are much clearer.

The large geographical distances between Cù Lao Rùa, Đa Kai, Bến Đò and Cầu Sắt and the other sites may explain why these sites were outliers in the CA plots (Figure 8.11, Figure 8.12). These sites also share some material culture links with the majority of the other sites in southern Vietnam. Given its proximity to Rạch Lá, Cái Vạng would be expected to have had a greater correspondence with this site in the CA, unless they represent different phases within the neolithic sequence. A similar situation also applies to Bến Đò and Bình Đa, but there is currently little information about Bến Đò to expand on such comparisons.

Since Cù Lao Rùa is located within the geographical area of sites in CA group 3 (Figure 8.13), but is an outlier in the plots, Cù Lao Rùa was perhaps occupied at a different, presumably later, time to the other sites of group 3. The limited radiocarbon dating of Cù Lao Rùa is insufficient to confirm this. Marked diversification was presented in the material culture of Cù Lao Rùa during the neolithic occupation, and it is clear that regionalisation increased over time within southern Vietnam, as also observed at An Sơn in the later occupation, when new ceramic forms (e.g. the serrated rimmed D2a) and unshouldered stone adzes appeared.

This text taken from *Contextualising the Neolithic Occupation of Southern Vietnam: The Role of Ceramics and Potters at An Son*, by Carmen Sarjeant, published 2014 by ANU Press, The Australian National University, Canberra, Australia.