



Original Study

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Obsidian Sourcing and Characterization in the Celebes Region: An Initial Interpretation on the “Celebes Seafaring People”

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Abstract: The peopling of Island Southeast Asia is told through the Austronesian migration theory. During the Neolithic Period (ca. 6000–5000 BP), the Austronesians entered the Philippines altering the cultural landscape and heralding the beginning of the Neolithic. The Austronesian people continued expanding through Island Southeast Asia, the Pacific, and as far as Madagascar. It is the most influential multi-regional archaeological theory in Southeast Asia and the Pacific Region. Although archaeologists, as a whole, generally support this theory, the operations governing the Austronesian migration is still subject to intense debate. Theories suggest that migration is not as straightforward as commonly presented. In spite of their movement towards the Pacific, some Austronesian population stayed in the Celebes area and may have developed a close-knit exchange system with their neighbors powered by sophisticated ancient maritime technology and shared cultural affiliations. This paper calls this maritime network as the “Celebes Seafaring People.” The “Celebes Seafaring People” hypothesis is the first study to focus on a smaller aspect of a much larger theory, allowing a clearer perspective on the early cultures of this Region. Currently, the hypothesis encompasses three island groups: Northern Mindanao, Philippines; Sabah, Malaysia; and Talaud Islands, Indonesia. This is an initial interpretation of the “Celebes Seafaring People” hypothesis through geochemical analysis of obsidian found in the island groups in the Celebes Region. These group of people may have a complex maritime exchange network and share the same cultural affiliation during the Neolithic Period. Further investigation must done to substantiate such theoretical interpretation.

Keywords: Obsidian; Celebes; Celebes Seafaring People; Neolithic; Austronesian

1 Introduction

The spread of the Austronesian language-speaking people throughout the islands in Southeast Asia and the Pacific region has been accepted by archaeologists who aim to understand the Neolithic migration and cultural development in the region (Bellwood, 1989; 1997; Jennings, 1979; and Irwin, 1994). The theory suggests that the Austronesian speakers originated from southern China, as their “homeland” of origin, where Neolithic technologies, i.e. farming and domestication, was developed.

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The “Out-of-China” Austronesian Culture is a popular migration theory of prehistoric people in Island Southeast Asia and more importantly in the Pacific. In fact, a number of Pacific archaeologists have been using this model to understand the movement of the Neolithic Lapita Culture in colonizing and populating the different islands in the Pacific. Unfortunately, less has been known about the Austronesian people who stayed and settled permanently in the Celebes Region.

This paper will present another theory on the diversity of human mobility, during the Neolithic Period, in the Celebes Region anchored on the characterization of obsidian. These sites are located in Northern Mindanao, Philippines; Bukit Tengkorak, Sabah, Malaysia; and Leang Tuwo Mane’e, Talaud, Indonesia (Figure 1). These are sites with group of people who may permanently settled along the coast of the Celebes Sea and fittingly adapt to their diverse coastal Celebes environment. A group of Neolithic people that may circumnavigate the Celebes Region instead of moving and occupying the different islands in the Pacific. If this idea has a substantial evidence to prove the migration of the Celebes people, the theoretical notion that Austronesian people went directly to the Pacific might “challenge” this dogmatic idea posed by the Pacific Archaeologists.

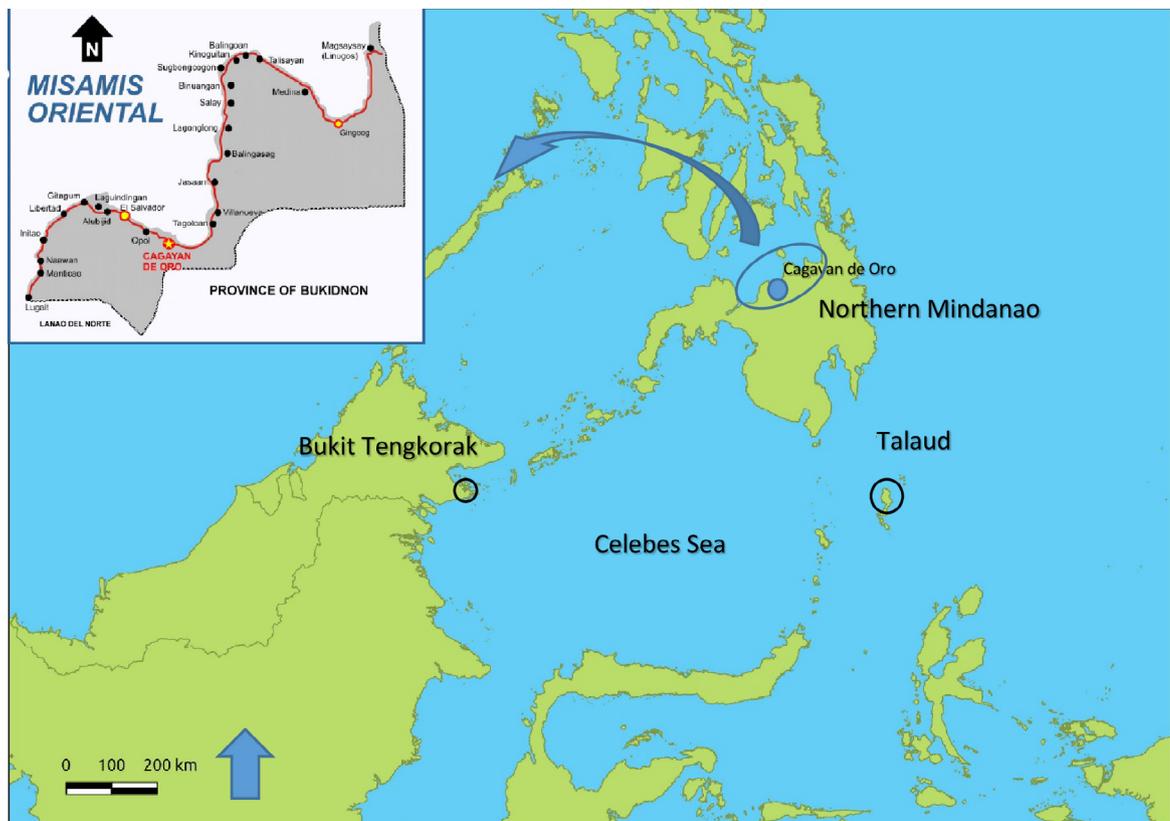


Figure 1. Map of the Celebes Region showing Northern Mindanao, Bukit Tengkorak, and Talaud Sites (Misamis Oriental map courtesy of <https://historyofarchitecture.weebly.com/misamis-oriental.html>).

2 Obsidian in the Celebes Region

The Austronesian speakers left behind a unique archaeological assemblages including red-slipped pottery, adzes, barkcloth beaters, spindle whorls, ornaments made of shell and jade, and obsidian (Bellwood, 2006; Simanjuntak, 2008). The wide distribution of the obsidian assemblages may indicate the diasporic movement of people in the Pacific or direct association of the Austronesian vast expansion of the networks of exchange.

Obsidian is a natural glass produced by the extrusive eruption of a volcano. Geochemically, each obsidian deposit possesses unique chemical trace elements. This allows archaeologists to correlate an

obsidian artifact with its geological source. Provenance studies on obsidian has been applied in different regions of the world for understanding the different cultural interactions, patterns of commercial exchange systems, and reconstructing prehistoric trade routes.

A number of obsidian materials were found in the Celebes Region. Such sites are located in the island of Mindanao, Philippines (Neri, 2011, 2003; Neri et al., 2014, 2009, 2005); Bukit Tengkorak, Sabah, Malaysia (Chia, 2003; Tykot & Chia, 1997; Bellwood, 1989; Bellwood & Koon, 1989); and Leang Tuwo Mane'e, Talaud, Indonesia (Bellwood, 1976; Bird, 1996) (Figure 1). Below are the brief discussion of these archaeological sites and the geochemical characterization of obsidian artifacts identified in the Philippines, Malaysia, and Indonesia.

2.1 Northern Mindanao, Philippines

Neri (2003) conducted a pioneering study of obsidian sourcing at the Huluga Open Site, Cagayan de Oro City, Northern Mindanao (Figure 1). Neri (2005), Bautista (1992), Burton (1975), and Cabanilla (1970) also recovered obsidian artifacts at the site associated with earthenware and tradeware sherds, chert flakes, adzes, glass beads, and animal bones. According to Demetrio (1995) and Cabanilla (1970), the site may have been occupied as early as Late Neolithic until the introduction of tradeware ceramics. But the antiquity of the site may have extended at the Palaeolithic Period on the chopper-chopping tools recovered in the Huluga (Neri, 2011, 2006). Another site in Cagayan de Oro is the Echem and Hipuna Open Sites. These sites are adjacent from each other (ASP, 2009; Neri et al., 2005). A single obsidian in each sites were recovered. Earthenware sherds exhibiting a Sa Huyhn-Kalanay pottery tradition dated in the Late Neolithic or Metal Age Period were also found associated with obsidian (ASP, 2009). The presence of chert and obsidian may indicate the antiquity of the site.

Aside from Cagayan de Oro, Neri (2011) also conducted an archaeological reconnaissance in the coastal area of Northern Mindanao in the province of Misamis Oriental. Forty-one archaeological sites were identified and three sites are positive of obsidian: *Daayata*, *Ilihan na Dako*, and *Calumat Open Sites*. The *Daayata Open Site* is located in the village of Bagoceboc in the municipality of Opol (Neri, 2011; ASP, 2009; Neri & Ragrario, 2008). The *Daayata Open Site* is a limestone hill located inland 20 km south of the village of Poblacion. Artifacts recovered from the surface are composed of earthenware sherds, a number of obsidian and chert flakes, and stone adzes. According to the report of the ASP (2009, p. 33), “the absence of tradeware pottery may indicate that this site might have been inhabited as early as the Neolithic Period.” Further west of the Municipality of Opol is the *Ilihan na Dako Open Site*. The *Ilihan* is located in the Municipality of Initao (Neri, 2011; Neri et al., 2009). The *Ilihan na Dako Open Site* (meaning “big natural fortress”) is located in a limestone hill ca. 90 meters above sea level (masl). A number of obsidian flakes and debitage were found associated with earthenware and stoneware sherds and chert flakes. The site may have been continuously occupied from the Neolithic until the coming of the Spaniards in the 1600s (Neri et al., 2009).

Obsidian materials were also recovered in the *Calumat Open Site* in the village of Poblacion, Municipality of Alubijid (Neri et al., 2014). According to the oral history of Alubijid, *Calumat*, was considered the first settlement of the people in Alubijid before they were transferred to the current site. The *Calumat* is located on top of the limestone hill at ca. 42 masl. A number of obsidian materials were found at the surface of the site associated with chert, andesite, earthenware sherds, and a minimal number of tradeware materials. The presence of these materials may indicate antiquity of the area (Neri et al., 2014). Aside from artifacts, remains of a Spanish structure (measuring 10.5 m x 13.5 m) was also identified and recorded. The structure was made of cut coral stone indicative of the presence of the Recollect Missionaries in the area. The presence of lithic materials and the colonial structure may suggest a continuous occupation of the site from the Neolithic Period until the spread of Christianity in Northern Mindanao.

2.2 Leang Tuwo Mane'e Site, Talaud Islands, Indonesia

Talaud Islands is located in the western part of the Celebes Sea and north of Sulawesi Island in Indonesia (Figure 1). This is geographically located at the southern part of the island of Mindanao. It has an approximate

distance of 200 km south from the islands of Sarangani, Philippines. Talaud is composed of three islands: Karakelang, the largest, and two smaller islands, Salebabu and Kabaruang.

In 1974, Bellwood (1976) conducted an archaeological excavation in the rockshelter of Leang Tuwo Mane'e Site, Karakelang Island. The island was a product of the Pleistocene or Holocene coral limestone uplift (van Bemmelen, 1949). Bellwood's (1976) excavation produces four distinct cultural stratigraphy: Preceramic (4860+/-130 BP); Neolithic (4030+/-80 BP); Early Metal (990+/-100 BP); and Late (410+/-60 BP–250+/-70). This has a good stratigraphic sequence indicative of pre-Neolithic materials until the presence of red-slipped pottery. Recent excavations at the site produced good Neolithic transition dates between 4901–4557 BP and 3808–3433 BP (Spriggs, 2003; Tanudirjo, 2001).

A single piece of obsidian was recovered associated with brown chert at the base of the Neolithic cultural layer. Thus, the use of the obsidian may be dated ca. 5000 BP. So far, this is the only obsidian found in Talaud. Bellwood (1976) believed that the source of the obsidian may come from the district of Minahasa in Sulawesi or one of the islands in Sangihe below Talaud. Of course, this needs to be proven.

2.3 Bukit Tengkorak, Sabah, Malaysia

The Bukit Tengkorak, a Malay word which means “skull hill,” is a rock shelter complex located in Semporna, Sabah, Malaysia (Figure 1). The Bukit Tengkorak is one of the important sites in Southeast Asia related to the mobility of the Lapita people during the Neolithic Period. The site was first excavated by the Sabah Museum headed by Peter Koon and Peter Bellwood in 1987 (Bellwood & Koon, 1989). From their excavation, a total of 188 pieces of obsidian flakes and chips were recovered from a secured stratigraphic context. Majority of these materials were found in layer 3 associated with Early Phase Pottery with decorated pattern similar with the Neolithic tradition of red slipped pottery in the Philippines and Sulawesi (Bellwood, 1989, 1985).

In 1994–1995, Stephen Chia (2001), from the Center for Archaeological Research Malaysia, and the Jabatan Museum in Sabah conducted an archaeological excavation in Bukit Tengkorak. A number of assemblages were recovered such as: pottery sherds, lithic materials (chert, agate, and obsidian), adzes, bark cloth beater, shells, and remains of marine animals. Three cultural phases have been identified in Bukit Tangkorak base on the radiocarbon calibrated dates (Chia, 2001, 2003): Early (4340–1285 BC), Middle (1200–900 BC), and Late (900 BC–50 BC). A total of 552 tiny flakes of obsidian artifacts were recovered during the 1994–1995 field season. These glassy materials varies in colors, lustre, texture, and translucency (Chia, 2003; Tykot and Chia, 1997). Majority of these obsidian were recovered at the Middle Cultural Phase. Unfortunately, based on their geological survey in the Semporna Peninsula, no geological source of obsidian has been identified. Thus, these materials may be exotic and has a valuable resource.

3 Geochemical Characterization

A total of 201 pieces of obsidian, out of the thousand flakes, were randomly geochemically analyzed using portable X-ray Fluorescence Spectroscopy (pXRF) in Northern Mindanao (Table 1). These samples were analyzed using a Bruker AXS Tracer III-V portable EDXRF. The instrument uses an X-ray tube with a rhodium target and a thermoelectrically cooled silicon PIN detector. The instrument was operated at 40 kV, with a 180 second count time, and a secondary target consisting of 6 mil copper (Cu), 1 mil titanium (Ti), and 12 mil aluminum (Al). The reliably quantified elements include Mn (manganese), Fe (iron), Zn (zinc), Ga (gallium), Th (thorium), Rb (rubidium), Sr (strontium), Y (yttrium), Zr (zirconium), Nb (niobium), and Rh (rhodium).

Table 2 is the statistical values of the trace chemical characterization of the obsidian in Northern Mindanao. The results of the elements were then plotted in a ternary diagram, using Rb, Zr, and Nb, to visualize the source variability of given samples (Figure 2). These three elements, aside from being stable and robust diagnostic values, show good elemental distinguishing precision in which the range of values is fairly concentrated and limited to a particular source (Shackley, 2008, 1988; Barker et al., 2002; NROSL, 2000; Hughes, 1998).

Table 1. Obsidian recovered in different archaeological sites in Northern Mindanao.

Archaeological sites	Geographic location	Number of artifacts (N=201)
Huluga	Cagayan de Oro	110
Echem	Cagayan de Oro	1
Hipuna	Cagayan de Oro	1
Ilihan na Dako	Initao	52
Daayata	Opol	33
Calumat	Alubijid	4

Table 2. Descriptive statistics of the Northern Mindanao archaeological sites using pXRF.

TRACE ELEMENT CONCENTRATIONS												
ARCHAEOLOGICAL SITE		MnKa1	FeKa1	ZnKa1	GaKa1	ThLa1	RbKa1	SrKa1	Y Ka1	ZrKa1	NbKa1	RhKa1
MINDANAO												
Calumat Open Site (n=4)	Mean	684	13,691	28	19	18	252	5	35	343	20	0
	S.D.	55	665	7	2	3	15	1	2	23	1	0
Daayata Open Site (n=33)	Mean	584	13,535	89	19	20	248	-1	38	323	23	0
	S.D.	117	1,755	10	1	3	23	8	6	28	2	0
Huluga Open Site (n=110)	Mean	593	13,260	91	18	19	244	1	37	318	22	0
	S.D.	104	2,033	14	1	3	24	9	5	24	2	0
Ilihan na Dako (n=52)	Mean	611	12,669	91	19	19	241	1	38	318	22	0
	S.D.	110	1,481	12	1	3	22	9	6	22	2	0
Hipuna Open Site (n=1)	Mean	719	15,112	86	19	28	257	-6	43	314	23	0
Echem Open Site (n=1)	Mean	785	16,698	101	19	25	291	-8	45	326	23	0

Table 3. Descriptive statistics of the geological source in the Philippines using pXRF.

TRACE ELEMENT CONCENTRATIONS											
GEOLOGICAL SOURCE		MnKa1	FeKa1	ZnKa1	GaKa1	ThLa1	RbKa1	SrKa1	Y Ka1	ZrKa1	NbKa1
NAGCARLAN SOURCE (n=29)	Mean	604	10771	50	18	13	135	90	37	203	11
	S.D.	79	1932	9	2	2	5	5	2	16	1

The Huluga, Daayata, Ilihan na Dako, Echem and Hipuna, and the Calumat Open Sites clustered in the left vertex of the triangle (Figure 2). All exhibited the same chemical group suggestive of one geological source. Further, no geochemical outliers were detected. Using the same trace chemical concentration (Rb, Zr, and Nb), northern Mindanao sites were then compared to the known geological source in the Philippines, the Nagcarlan Source (Table 3). The Mindanao and the Nagcarlan statistical values did not geochemically matched and differ in their elemental pools indicative of different geological characteristics.

The Mindanao statistical values were then compared to the known geological sources in Indonesia and the Pacific (Table 4). The trace element concentrations of Rb, Sr, and Zr of northern Mindanao and the known geological sources show no chemical “match” to the given data. Their elemental values are very different and diverse. Thus, obsidian chemical elements from Mindanao did not come from the known geological sources in Indonesia and the Pacific suggestive of unknown source.

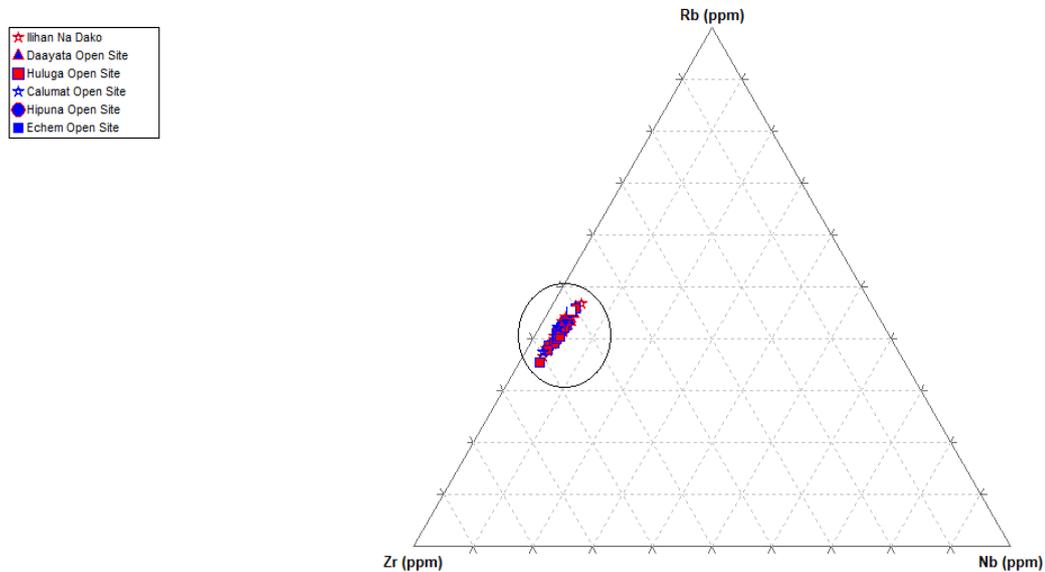


Figure 2. Ternary diagram showing clusters of Mindanao sites.

In Table 5, obsidian that was recovered from Leang Tuwo Mane'e Site in the island of Talaud, Indonesia were geochemically analyzed using PIXE-PIGME. If we were to compare the three stable element values of Rb, Zr, and Nb of the Mindanao and of the Talaud, they seem to have similar characterization. The chemical values are very close for Rb (ranges from 240–290 concentration in ppm), Zr (ranges from 314–344 concentration in ppm), and Nb (ranges from 20–25 concentration in ppm). Thus, they may have the same geological source or quarried in the same outcrop. The use of PIXE-PIGME from the Talaud Island and pXRF from Northern Mindanao are good mechanical extractions of trace chemical elements. Using different analytical methods in comparing the acquired geochemical data may not result to a problematic interpretation. According to Shakley (2005, 1998), Bellot-Gurlet et al. (2005), and Eerkens, et al. (2007), the results of the trace elements on the different machines (XRF, INAA, PIXE-PIGME) are compatible and reliable for comparative data. These different calibrated and standard instruments will provide precise and accurate data and can be used for comparable statistical results.

On the other hand, in Bukit Tengkorak, Sabah, Malaysia, thirty pieces of obsidian flakes were subjected to electron microprobe at the Department of Earth and Planetary Sciences at Harvard University (see Tykot & Chia, 1997 for further discussion of the instrument). A total of 30 pieces of samples were analyzed that were recovered from two trenches (Trench G17 and Trench J19). The results of the analysis were grouped into A (17 samples), B (12 samples) and C (1 sample). These groups were then plotted in a binary diagram using Al_2O_3 vs SiO_2 to examine the elemental combination of two distinct oxides.

The different group of elements were then compared to the known obsidian geological sources of Duerden et al. (1987) in the southwest Pacific. The result of their comparison indicate that, Group A matches the Talasea Source (currently known as Kutau/Bao sub-source), New Britain, Group B matches the Talaud chemical characteristics, Indonesia, and Group C matches the Admiralty Islands (Solang, Umrei, and Wekok). Group A, the Talasea Source (Figure 3), has been an important commodity during the Middle Phase ca. 3000 BP. Bukit Tengkorak and Kutau/Bao has a distance of 3,500 km northwest from the source. Currently, this is the longest traded obsidian route in Southeast Asia. On the other hand, Group B was geographically distributed by ca. 6250 BP and became less important when the Group A source became popular in ca. 3150–2850 BP (Chia, 2003). The result of this study indicates that the Bukit Tengkorak people were actively participating in trading obsidian from different sources as early as 6000 BP (Chia, 2003). Nevertheless, obsidian demonstrated the maritime long-distance exchange networks between Southeast Asia and the Southwest Pacific by the late 5th and 4th millennium BP.

Table 4. Descriptive statistics of the known obsidian sources in Indonesia and the Pacific (Torrence et al., 2013; Reepmeyer et al., 2011).

GEOLOGICAL SOURCES		TRACE ELEMENT CONCENTRATIONS (ppm)									
		MnKa1	FeKa1	ZnKa1	GaKa1	ThLa1	RbKa1	SrKa1	Y Ka1	ZrKa1	NbKa1
Umleang (n=7)	Mean	647	19100	48	17	8	142	72	44	444	47
	S.D.	72	1593	8	1	1	14	7	2	35	5
Umrei (n=10)	Mean	609	19631	44	17	8	147	73	45	452	48
	S.D.	79	1934	8	1	1	13	6	4	33	5
Wekwok (n=4)	Mean	578	16874	41	15	7	153	71	43	374	39
	S.D.	57	1526	7	1	1	15	10	4	25	4
Lou (n=26)	Mean	655	19847	51	17	8	146	76	45	453	48
	S.D.	108	2765	16	2	1	13	12	3	60	7
Pam Islands (n=11)	Mean	564	15655	43	14	7	156	49	44	316	43
	S.D.	44	1569	8	1	1	10	6	3	25	3
Vanuatu											
Vanua Lava (n=18)	Mean	1 023	26 448	89	17	4	105	110	51	350	7
	S.D.	74	1 622	14	1	0	7	10	2	20	1
Fergusson											
East Fergusson (n=6)	Mean	902	25 738	94	31	12	131	2	68	1 210	31
	S.D.	70	2 608	31	9	4	21	1	6	561	12
West Fergusson (n=5)	Mean	443	9 236	34	13	5	124	75	29	297	7
	S.D.	32	1 084	2	1	0	8	21	3	60	1

Table 5. Statistical summary of PIXE-PIGME data of Talaud (taken from Bird, 1996).

		TRACE ELEMENT CONCENTRATIONS (ppm)								
		F	Ti	Mn	Zn	Rb	Sr	Y	Zr	Nb
Talaud	n=4	1270	1289	778	91	274	8	23	344	25
	SD	17	72	61	13	12	3	11	25	4

The geochemical results of Chia (2003) and Tykot and Chia (1997) also confirm the study of Bellwood (1989) in 1987. Bellwood sent twelve pieces of obsidian to the Australian Nuclear Science and Technology Organization (ANSTO) division of Applied Physics in Sydney, Australia. These were subjected to PIXE-PIGME chemical analysis. The result revealed that seven came from an unknown source and five from the Talasea, New Britain. According to Bellwood (1989), the New Britain sources are widely distributed in the Bismarck and Solomon archipelagoes. No known obsidian source/s in Borneo have been identified, and any presence of obsidian may have been brought through exchange.

Given the logical implication of these different geochemical results, what is the cultural connection of these different archaeological sites along the Celebes Sea ca. 6000–5000 BP? Surprisingly, a number of obsidian materials in Celebes Region have the same chemical characterization as the Talaud “signature.” These sites are from Bukit Tengkorak in Sabah, Malaysia and from sites of the coastal areas in Northern Mindanao, Philippines. Since the chemical values of obsidian from Bukit Tengkorak in Sabah has the same source group from the obsidian recovered in Talaud, and Talaud has the same source group from Northern Mindanao, thus, Mindanao and Sabah may indicate the same geological outcrop. This analysis

may imply that all source group of obsidian recovered along the Celebes Region may come from one and single unknown geological outcrop.

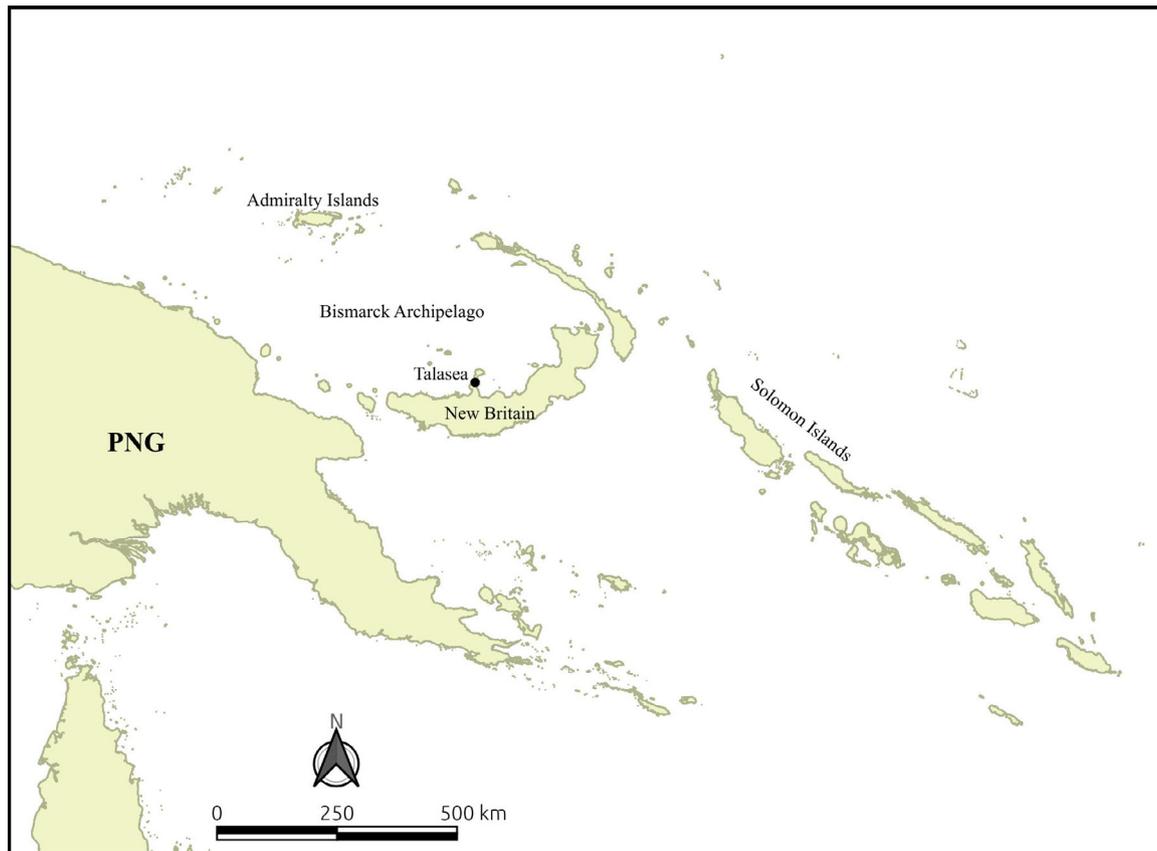


Figure 3. Map of the Bismarck Archipelago showing the geological sources from Talasea, New Britain and Admiralty Islands.

4 Discussion

The results of the geochemical characterization would indicate that the obsidian materials recovered in Northern Mindanao such as: Huluga, Echem, Hipuna, Daayata, Ilihan na Dako, and Calumat have the same chemical source group. This implies that they all came from the same geochemical outcrop. The obsidian recovered from Mindanao did not come from the known geological source in the Philippines or other known sources from the Pacific and Indonesia. Thus, currently, the source of the obsidian from Northern Mindanao is unknown.

The statistical geochemical elements of the Northern Mindanao source group are the same as the one found in the island of Talaud, Indonesia. The Northern Mindanao and Talaud obsidian mean values for the composition of Rb, Zr, and Nb are relatively the same. This may indicate that they may have the same geochemical source and may have acquired their materials in the same outcrop. In Bukit Tengkorak, three compositional clusters were identified, such as: Groups A, B, and C. Group B matches the same chemical elements from the obsidian recovered from the island of Talaud. The result of the geochemical sourcing in Bukit Tengkorak may have a huge implication in the movement and exchange network in the Island Southeast Asia.

Since the statistical elements of the obsidian recovered from Sabah has the same signature as Talaud and Talaud obsidian has the same chemical elements in Northern Mindanao, thus, this may indicate that they may have come from the same geological outcrop. Neolithic people in Northern Mindanao, Talaud,

and Bukit Tengkorak may have already been in contact as early as 6000–5000 BP.

In spite of these maritime connection, one crucial and critical question here is the geological source. Where can be the location of the geological outcrop where these Neolithic Lapita voyagers used to quarry? Since the geological source is not yet identified, proxy data may be helpful in identifying the possible geographical source relative to the cortex and the volume of the artifacts found at the site (cf. Eerkens et al., 2007, 2008; Bayman & Shackley, 1999).

Apparently, the Mindanao sites have the highest number of flakes with presence of cortex and largest volume of obsidian artifacts recovered as compared to Talaud and Bukit Tengkorak. The presence of cortex and the volume of flakes may indicate the proximity of the source. This may suggests that the geological source is locally available in the island of Mindanao. The Mindanao geological source hypothesis was also confirmed by Reepmeyer et al. (2011), Spriggs et al. (2011), and Skinner (pers. com. 2003). Based on the geological study of the island of Mindanao, Spriggs et al. (2011) firmly believed that the source may one day be found in the island. This is not surprisingly impossible considering that there are more than 10 identified volcanoes in the Island (DENR, 1999; PHIVOLCS, 1997; Daligdig, 1988). Unfortunately, at present, the source is nowhere to be found. This may be due to the physical weathering of the outcrop, where the source may have been eroded or redeposited (cf. Matthew, 1966; Adams & Wyckoff, 1971); the source may have been covered by a massive and thick vegetation or geological activities through time (Neri, 2003); and the over exploitation of the resource until it was completely depleted (cf. Jennings and Glascock, 2002). Until the geological source has been physically identified, we can only speculate this much.

Based on the Mindanao-Source hypothesis, we may further speculate that the Neolithic people from Northern Mindanao may have moved in the island crossing the Zamboanga Peninsula towards Sabah and Borneo passing the island of Sulawesi and may have moved back via southern Mindanao crossing the Celebes Sea (Figure 4). These group of seafaring Neolithic people may be coined as the “Celebes Seafaring People.” These Celebes group may already have an advance commercial trading network ca. 6000–5000 BP. They may have sophisticated navigational skills and engaged in commercial activities. The distribution of obsidian assemblages may indicate the movement of people in Island Southeast Asia establishing their vast expansion of their maritime network of exchange and cultural affiliation.

The mobility of the “Celebes Seafaring People” along the Celebes Region may be supported by the movement of the ocean current along the Celebes Sea. There is a major ocean current structure influenced by the monsoon trade wind system moving in the Sulu Sea – Sulu Archipelago – Celebes Sea. According to Wernstedt and Spencer (1967), there is a pattern of water current and air movement around the archipelago, which played a major significance on the economic exploitation in the area. At present, people in Mindanao are still traveling from Zamboanga Peninsula to the island of Sabah via M/V Lady Mary Joy of the Weesam Express Seacrafts Inc.

Further, as early as the Sung Dynasty (ca. 990–672 BP), Butuan, in eastern Mindanao, and Borneo were already mentioned in the Chinese Sung annals (Scott, 1984). In fact, the Taosug language in the archipelago of Sulu have very close linguistic similarities with the eastern Mindanao languages (Pallesen, 1985; Spoer, 1973; Conklin, 1955). Based on the linguistic evidence, Pallesen (1985) and Scott (1984) believed that ca. 950 BP, prehistoric people spread from the eastern part of Mindanao to Zamboanga and Sibuguey, towards Basilan and Sulu archipelago, and to the coastal areas in Sabah due to their commercial trade interest. Even in the 16th-century chronicles of the early Filipinos in Northern Mindanao, a number of migrant people traveled from Butuan to the peninsula of Zamboanga, Sulu, then to the coast of Borneo (Scott, 1997, 1992; Spoehr 1973). Currently, these ethnic group of people are called “Taosug,” meaning “people of the current” who prefer to live along the shore (Scott, 1992).

5 Conclusion

The “Celebes Seafaring People” hypothesis is only anchored on the geochemical characterization of the obsidian recovered from sites in Northern Mindanao, Bukit Tengkorak, and Talaud. The idea of cultural interaction of the Celebes Sea people must be further investigated on the similarities of assemblages and

inferences of the site and how they were culturally link from each other. Currently, the dataset may indicate that not all Neolithic Lapita Culture moved directly towards the Pacific but instead some permanently settled along the coast of the Celebes Sea. While a portion of the population has migrated through to the Pacific, the rest have chosen to stay along the Celebes Region. The “Celebes Seafaring People” are mobile maritime population who constantly engaged in commercial activities in the Celebes Region during the Neolithic Period (ca. 6000–5000 BP). They may have an advance navigational skills, shared the same maritime and cultural affiliation, and engaged in complex maritime commercial network.

In order to understand the nature of the relationships of these cultures, further investigation must be conducted. An archaeological investigations in the island of Mindanao, where the “Celebes Seafaring People” could have originated, must be surveyed and investigated. It is from Mindanao that the Austronesian migrations into the Pacific and Southeast Asia had been hypothesized to have originated. It makes investigations in Mindanao crucial to the development of this Celebes mobile people hypothesis. Further, geological explorations in the island and other neighboring areas must be conducted to find the unknown geological source. Finding this ultimate source may help in the spatial interpretation on how the materials were acquired. Aside from the geological source, an extensive comparable work on the analysis of the archaeological assemblages found in Mindanao, Bukit Tengkorak, and Talaud must be done to assess the reliability and diversity of the archaeological interpretation. This hypothesis is still in its infancy stage. Extensive work must be done to substantiate such hypothesis.



Figure 4. Possible movement of prehistoric seafarers along Celebes Sea during the Neolithic Period.

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