

NEW LIGHT ON TAIWAN HIGHLAND PREHISTORY

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ABSTRACT

Compared to the Western Plains and the East Coast, archaeological research in the central Taiwan Highlands has been very limited. In recent decades, not only most CRM archaeology but also the most active archaeological excavations in Taiwan have been conducted in the lowlands, giving results which have greatly enriched our understanding of Taiwanese prehistory. Nevertheless, archaeological study in the mountainous areas, nowadays mostly inhabited by Austronesian-speaking Formosan people, lapsed after the Japanese colonial period (1895-1945). Although some excavation and survey projects have been conducted in the highlands since the 1980s (e.g. Chiu and Gao 1988; Tsang and Chang 1995, 1996; Liu and Ho 1998), the limited literature is mostly based on the work of Japanese archaeologists and ethnologists undertaken over sixty years ago. To have a more comprehensive discussion about prehistoric island-wide population movements and cultural interactions, further archaeological work in the interior mountains of Taiwan is necessary. The National Museum of Natural Science in Taichung commissioned a digital museum project on Tsou culture in 2001 and 2002. During this time, the authors conducted archaeological fieldwork in the Ali Shan area of central Taiwan (Fig. 1). Abundant sites and remains were researched during this project and the results are presented here.

ETHNOLOGICAL BACKGROUND

The Ali Shan (Mt. Ali) area is the traditional territory of the Formosan population known as the Northern Tsou (Cou). The Tsou have a rich oral history that narrates the migrations of the ancestors of each ancient clan into the area between Yu Shan (Jade Mountain – Taiwan's highest peak, 3997 m) and the Chiayi-Tainan Plains of western Taiwan. Eight ancient clans have their own migration routes delineated. Oral accounts state that early settlements were composed of unitary clans, and that the first multiple-clan-settlement, Tfuya, was formed about 400 years ago after a long period of social development. Although the time span of the unitary-clan-settlement stage is difficult to evaluate, ethnologists have proposed that each pause in migration could represent at least three to four generations in the Ali Shan area (Wang et al. 2001: 67-188). Furthermore, the earliest written record on the Tsou, the 1647 Aboriginal Households List from the

Dutch Occupation, states that the largest Northern Tsou settlement, Tfuya, was a settlement with a population of about 300 people at that time. During the Japanese colonial period (1895-1945), four groups of the Northern Tsou are recorded - Tfuya, Tapangꨄ, Imucu and Luhtu (Wang et al. 2001).

Another Formosan group, the Takopulan, also once occupied the Ali Shan area. They are reported to have been a Bunun population who became assimilated into the Tsou. The Takopulan were once a very active and prominent tribe who lived in the areas of Sinvi and Cayamavana (Figure 1). Their largest settlement had a population of about 450 people according to the 1647 Aboriginal Households List. No oral tradition survives to tell us when their ancestors first entered the Ali Shan area.

HISTORY OF RESEARCH

Anthropological research by Japanese archaeologists and ethnologists in the Taiwan central mountains commenced about a century ago. Torii Ryuzo described findings of stone tools and potsherds around Yu Shan and suggested that they belonged to the ancestors of the Tsou and Bunun (Torii 1996:315-22, 606-7). The historical relationship between material remains and aboriginal people was further examined by Kano Tadao, who excavated the sites of Veiyo and Yingiana in northern Tsou territory (Kano 1955:95). The slab graves, flaked and ground stone tools, and plain and impressed potsherds unearthed at Veiyo and Yingiana were attributed to the ancestors of the Tsou. Besides Torii and Kano, most other Japanese researchers also believed that the prehistoric remains in the mountain areas were related to the ancestors of the modern Formosans. After Chen's study (1979) of the collection in the Research Laboratory of Folklore and Ethnology of Taihoku Imperial University, the forerunner of the present-day Department of Anthropology in National Taiwan University, fourteen prehistoric sites in the Ali Shan area were recorded (Table 1).

Archaeology in the Ali Shan area ceased after 1945, until archaeological fieldwork recommenced in Tsou territory in the 1990s. As part of a multidisciplinary project aimed to study environmental change and natural resource management in western Taiwan, Cheng-hwa Tsang directed a three-year archaeological project to investigate prehistoric settlement patterns and ecological adaptations in the upper reaches of the Chenwen River. This project

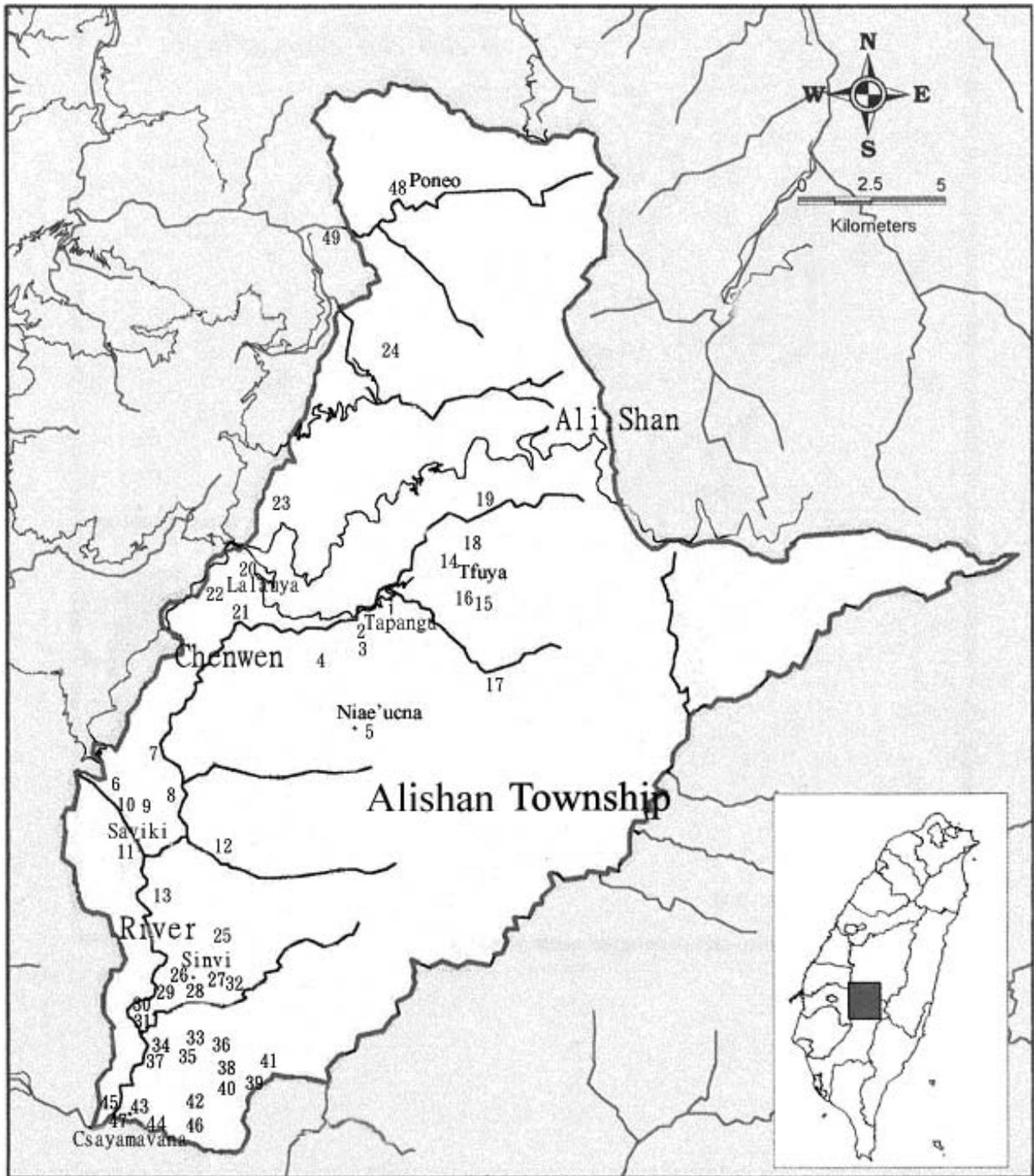


Figure 1. Map of the Ali Shan area and the distribution of prehistoric sites. 1. Tapang; 2. Teova; 3. Taptuana; 4. Niava'hu; 5. Niae'ucna; 6. Cacaya; 7. A'akuni; 8. Tamuana; 9. Yamakayua 1; 10. Yamakayua 2; 11. Saviki; 12. Tanaiku; 13. Bai-nogosi; 14. Tfuya; 15. Yingiana; 16. Fiofions; 17. Yiskiana; 18. Taina; 19. Pasana; 20. Lalauya; 21. Pcopoknu; 22. Ecuu; 23. Veiyu; 24. Voveiveio; 25. Ya'isana; 26. Sinvi; 27. Yaalauya; 28. Nia-hosa; 29. Yaiku; 30. Yunguana 1; 31. Yunguana 2; 32. Epeapi; 33. Yaasayao; 34. Taipicana 1; 35. Taipicana 2; 36. Hcuyu; 37. Yaviana; 38. Cuuc'u 1; 39. Cuuc'u 2; 40. Cuuc'u 3; 41. Cuuc'u 4; 42. Tung'avana; 43. Cayamavana 1; 44. Cayamavana 2; 45. Cayamavana 3; 46. Yazua; 47. Yaicivuya; 48. Poneo; 49. Po'oyuana.

discovered another fourteen prehistoric sites in Tsou territory, giving a total of 28, of which two can no longer be located (see Table 1). Although the remains collected from these sites were similar to those recorded in the Japanese period, Tsang's excavation at Yingiana identi-

fied two cultural phases. The earlier, with pottery related to that of the so-called Fine Cord-Marked Pottery Culture, scattered widely over the Taiwan lowlands, was dated to c.3700 BP. The upper and much later culture at Yingiana, with plain reddish pottery, had two C14 determinations

from 900 to 200 BP and one TL date of 1650±130BP. In addition, a few gray impressed and incised potsherds were also unearthed; whereas the plain reddish pottery tradition was related to the modern Formosan pottery tradition, this gray pottery was considered probably to be related to other lowland prehistoric ethnicities (Chang 1996:127-140; Tsang and Chang 1995:259-96, 1996:373-97).

Very soon after this research, archaeologists from the National Museum of Natural Science discovered two sandstone slab graves at Daimaiyayana, located within the site of Veiyo, originally excavated by Kano Tadao (1955). Unfortunately, no burial goods or human bones remained. Only reddish plain potsherds and several stone tools similar to those of the later culture at Yingiana were unearthed. The excavators suggest that the areas covered by these two burial assemblages indicate a child for burial 1 and an adult for burial 2. Two TL dates on pottery from this excavation are about 2000 BP, but the calibrated age of one C14 sample is 3000-2400 BP. Moreover, a jade earring similar to those from Beinan and the later phase of the Yuanshan culture was found on the site by a Veiyo landowner. This suggests potential interaction between the East Coast and the Ali Shan area (Liu and Ho 1998:41-58, Ho 2001:117-53).

GOALS AND METHODS OF THE 2001-2 RESEARCH

Taking into account the previous archaeological and ethnological data, we formulated three goals for our further study in 2001 and 2002:

1. To improve knowledge of the chronology, cultural assemblages, subsistence systems and settlement patterns in the Ali Shan area;
2. To examine the role of the central highlands in prehistoric Taiwan-wide interaction;
3. To clarify any historical relationships between the prehistoric assemblages and the ancestry of the Tsou and Takopulan people.

Before our fieldwork, twenty-six sites with exact locations were recorded, but only Yingiana had yielded fine cord-marked pottery (Tsang and Chang 1996:373-97). Since fine cord-marked pottery has also been found at the sites of Dong-pu Ti-Yi-lin (Chiu and Gao 1988) and Ubake A (Liu and Chen 1997), it is proposed that people started to expand into the Taiwan highlands during the fine cord-marked pottery phase (Tsang and Chang 1996:373-97; Ho 2001:167). The OxCal Version 10 calibrated age of the fine cord-marked pottery at Yingiana is 4460-4040 BP (Table 2: GX-21386).

Regarding the later plain reddish pottery tradition, its relationship with the earlier fine cord-marked pottery and the ethnographic northern Tsou and Takopulan is still unclear. Although the three available TL dates are from 2220 to 1520 BP, the C14 dates have a much larger span, from 3000 to less than 1000 BP. Also, the affinities of the gray potsherds found at Veiyo (Kano 1955:95) and Yingiana (Kano 1952:95; Tsang and Chang 1996:373-97) remain unknown. If this cultural tradition is related to low-

land traditions (Tsang and Chang 1996:373-97), then gray sherds should be found in other lower altitude sites in Takopulan territory. Their chronological relationship with the plain reddish pottery also needs to be clarified.

RESEARCH RESULTS

During our fieldwork in 2001 and 2002, another 23 sites were discovered, to give a total of 49 sites with exact locations in the Ali Shan area (Fig. 1). Among the total, 26 sites are in northern Tsou territory and 23 are in historical Takopulan territory. Small-scale excavations were conducted at five of these sites, including Taptuana site 3, Nia-hosa, Yingiana, Cayamavana site 1, and Taipicana site 1. Yingiana and Taptuana 3 are located at altitudes of about 1000 meters, the others at about 500 meters above sea level. The small-scale excavations at these sites will help us to understand if sites at various altitudes have different characteristics. Similar to earlier research, the existence of two cultural phases was confirmed, the earlier with red cord-marked pottery and the later with plain reddish pottery, mostly unslipped.

The Earlier Culture

The earlier culture in the Ali Shan area, represented by the fine reddish cord-marked pottery, was only previously discovered at Yingiana. Our survey and two test pits at Yingiana in 2002 did not find any more of this material. However, two more sites yielding reddish cord-marked potsherds in the Ali Shan area were found. Two sherds were recovered from surface survey at Tfuya, and a 30 cm thick layer with 123 reddish cord-marked potsherds and three sandstone axes was found Taipicana 1. Consequently, among the 49 identified sites, only three - Yingiana, Tfuya, and Taipicana 1 - have yielded remains of the earlier phase (Fig. 2).

Hand-building pottery making techniques, including coiling and the use of the paddle and anvil, were used at this time. Temper included small fragments of fired clay, together with fragments of sandstone, schist and quartz. Rims are restricted, and some jars have plain, not cord-marked, ring-feet. Of stone tools, only three fragmentary flaked sandstone axes were found at Taipicana 1. It is not clear if this limited material represents permanent habitation of the fine reddish cord-marked pottery culture in the mountain area, or if it reflects seasonal or temporary exploration from the lowlands, perhaps by people moving between the west and east coasts.

There is one absolute C14 date for the earlier culture from Taipicana 1 that coincide with the previous date from Yingiana, at about 4350-4040 BP (Table 2: Beta-167752). It suggests that the appearance of the fine cord-marked pottery culture in the central highlands was synchronous with that in the lowland areas. However, a TL date from the same context at Taipicana 1 is only 2600 BP, which is almost two thousand years later than the AMS C14 date. This difference needs to be checked with further samples (Table 2).



Figure 2. Remains of the earlier culture from Ali Shan area 1, 3-6 Taipicana 1; 2 Tfuya

The Later Culture

The later culture, represented by reddish plain pottery, occurs in all the 49 recorded sites. It is widely spread over the Ali Shan area, from terraces along the Chenwen River

to sloping territory far from the river course. The sites vary greatly in their contents. Some yield considerable numbers of agricultural stone tools, but few potsherds. They are most likely agricultural field locations, such as

the site of Teova, and are mostly located on sloping ground or relatively narrow river terraces. There are also habitation sites such as Taipicana 1, Yingiana and Taptuana. The cultural deposit of the later culture in these sites is normally about one meter thick, which suggests long term occupation. Besides the many reddish potsherds and stone tools, there are also baked clay spindle whorls and sometimes slab graves. Some of these habitation sites, for instance Veiyo and Nia-hosa, are very large in area and contain exotic artifacts such as jade earrings and glass beads. Therefore, at least three types of site can be identified in terms of size and content, suggesting the existence of a site hierarchy in the later cultural period.

Stone implements

The most numerous stone implements of the later culture from both residential and agricultural sites are sandstone hoes and axes like those shown in Figures 3, 4 and 5. Most are only flaked, but a few have small ground areas and the length range is about 60 to 130 cm. These tools probably indicate shifting agriculture of both hill rice and foxtail millet as the primary subsistence activity of the later culture. Our excavation at Taipicana 1, a typical settlement with burials found on the edge of a river terrace, yielded many of these tools, including many broken ones, and some with ground surfaces.

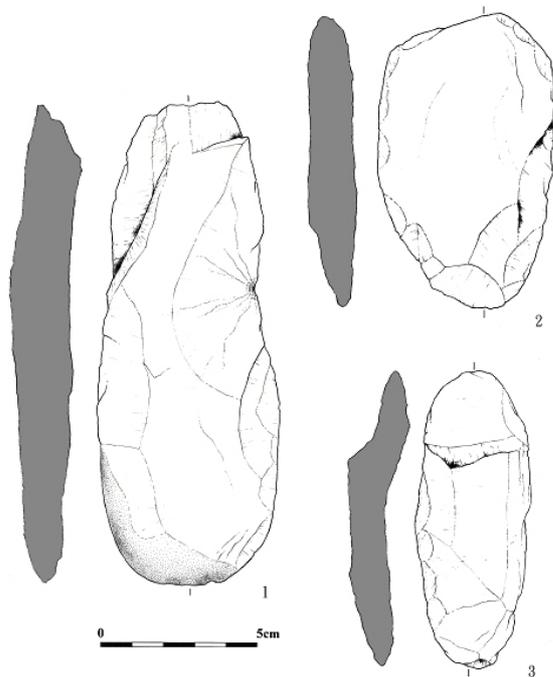


Figure 3. Stone axes from the later culture. 1,3 Nia-hosa burial 2; 2 Nia-hosa burial 3

Ground slate projectile points are also common in the Ali Shan area, suggesting that hunting was also an important subsistence activity for the later culture. Some occur

as burial goods. Six grooved stone net sinkers were found at Cayamavana 1, made either on pebbles or pieces of slate. It is hard to evaluate the importance of fishing for people of the later culture, but it is interesting that Cayamavana 1 is the only site with net sinkers. There are also sandstone or argillite adzes, and a variety of other stone implements such as knives, mortars, drills, grindstones, hammers and anvils.



Figure 4. Sandstone hoes and axes from the later culture

Pottery

Two types of pottery belong to the later phase. The first has a coarse texture, reddish color and plain surface, and accounts for over 90% of the potsherds in each site, except for Cayamavana 1, where the percentage is about 30% to 50%. This reddish plain pottery represents the ceramic tradition of the later cultural phase of the Ali Shan area. Tsang and Chang (1996) reported that some sherds were also red-slipped. Pots were hand-made using a paddle and anvil, and were fired at low temperatures. The main vessel form is a thick-walled jar with a flaring rim and a globular body (Fig. 6). Ring-feet, handles, and impressed rims sometimes occur. There are also spindle whorls made of the same type of clay (Fig. 7). Overall, the variability within the later style of reddish plain pottery is very slight; a unitary and simple ceramic tradition occurs widely over the Ali Shan area during this phase, except for an unusual incised rim from Tung'avana.

The second pottery type is gray in color, thin-walled, fired at a higher temperature and sometimes with impressed or incised rims and shoulders (Fig. 8). The attributes of this gray pottery tradition are very different from those of the other reddish ware tradition. Textures are finer and some parts of the gray pottery have a reddish brown exterior surface. Tempers include small fragments of fired clay, sandstone, schist and quartz. The main coarse gray vessel form is a jar with high neck and narrow throat, sometimes with a collar. Based on samples drawn mainly from Cayamavana 1, about 0.5% of the gray coarse sherds are decorated by incision and impression,



Figure 5. Different types of stone hoe and axe from the later culture. 1, 2 Cayamavana 1; 3, 4 Tung'avana

from the interior surface of the neck around to the exterior surface of the neck and the shoulder (Fig. 8). Until now, only five sites - Taipicana 1, Cayamavana 1, Cuuc'u 2, Veiyo and Yingiana - have yielded coarse gray pottery, mostly fewer than 10% of their total sherds. There is also a finer tempered gray pottery from 2 sites, Taipicana 1 and Cayamavana 1. The vessel forms in this group include jars, basins, bowls and cups. There are also ceramic bracelets and other ornamental pieces with impressed and incised decoration (Fig. 9).

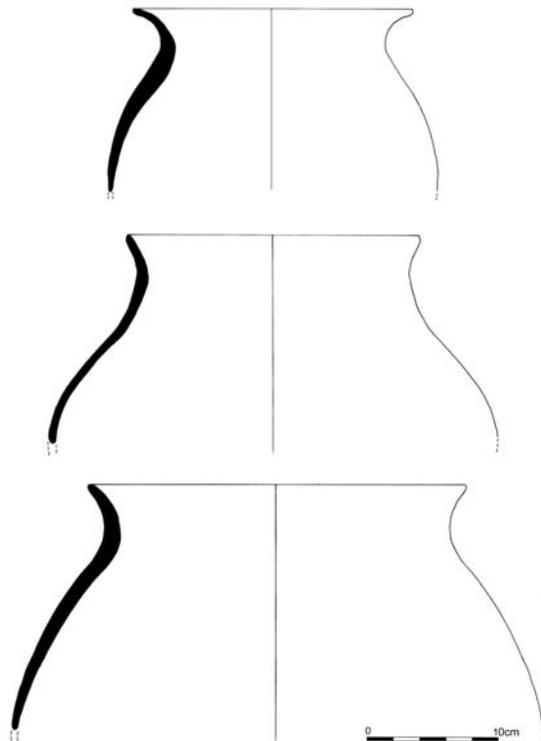


Figure 6. Plain reddish jars of the later culture, Taipicana 1

The limited distribution of the gray pottery contrasts with the widespread occurrence of the reddish plain pottery, even though these two traditions were roughly contemporary. Most of the gray pottery has been unearthed from Cayamavana 1, on a wide terrace of the Chenwen River. Although it might be suspected that the gray pottery is related to the Takopulan (Bunun) groups who occupied this region before the Northern Tsou, we do not find this ceramic tradition at Nia-hosa¹, a former Takopulan settlement. On the other hand, the ceramic remains from other Takopulan sites are mostly similar to those from Northern Tsou territory. This implies that pottery differences do not distinguish the Takopulan from the Northern Tsou. The geographic location of Cayamavana 1 and its large size suggest instead that the gray pottery might reflect active interaction with the lowlands.

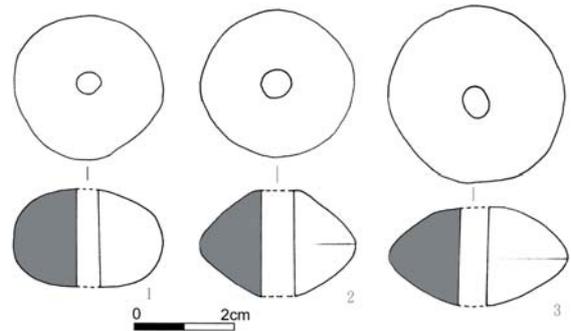


Figure 7. Reddish ceramic spindle whorls from the later culture

Burials

Seven slab graves of the later culture have been unearthed from Nia-hosa, Taipicana 1 and Veiyo. Those from Nia-hosa and Taipicana 1 were placed along the edges of river terraces; however, two at Veiyo and one at Yingiana are in the centers of their sites. In recent Tsou and Takopulan villages the dead are also buried both inside and outside the dwelling area. All the slab graves consist of irregular slabs of non-local sandstone, sometimes flaked, about 80

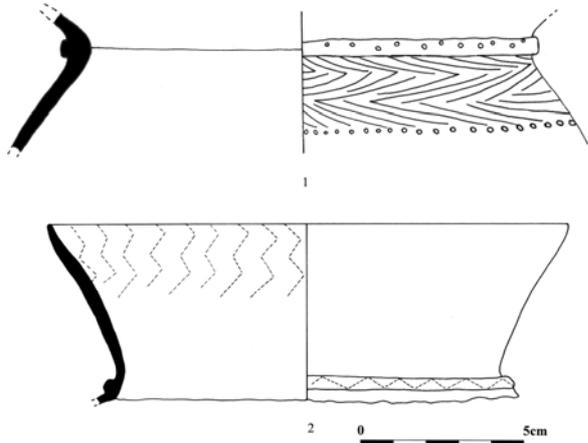


Figure 8. Gray jars of the later culture from Cayamavana 1



Figure 9. Gray bracelets and ornaments of the later culture from Cayamavana 1

to 120 cm in length, 50 to 60 cm in width, and 35 to 45 cm in depth (Fig. 10). No human bones survive, but the posture of the dead was probably flexed since the graves are quite short.

Some slab graves contain grave goods such as stone hoes, axes and projectile points (Fig. 11). Exotic items including a small jade tube and six tiny glass beads were also unearthed from two burials at Nia-hosa. The results of optical and EDS determinations by Yoshiyuki Izuka, Institute of Earth Sciences, Academia Sinica, show that the jade tube is of Fengtien nephrite from near Hualien, East Taiwan. The recorded jade earring from Veiyo (Liu and Ho 1998:41-58) is probable also of Fengtien nephrite, in a style similar to those found from the nearby highland site of Qubing, Nantou (Chen 1994). As for the six glass Indo-Pacific beads, they are about 4 mm in diameter and vermilion, chartreuse and aquamarine in color. Similar beads are found all over Taiwan (Hung 2005:81-94).

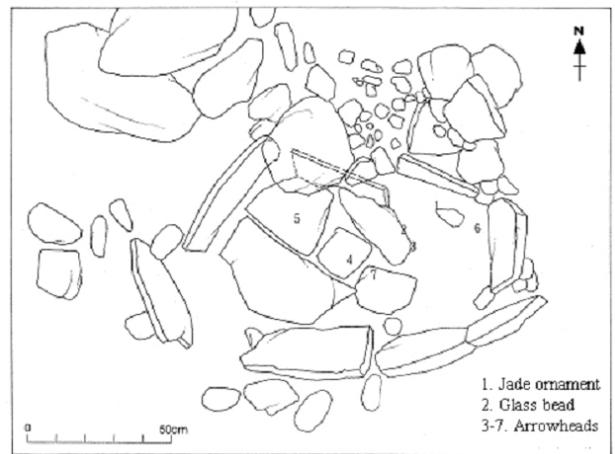


Figure 10. Slab grave 1 at Nia-hosa

Dates for the later culture

For the later culture, there are six C14 dates and fifteen TL dates (Table 3). One very recent AMS C14 date, GX 21384 (255±45BP) from Yingiana, will be excluded from further discussion. With twenty available dates, 75% are in the time span from 2400 to 1300 BP. Of the fifteen TL dates, four are on gray potsherds and eleven on red. 75% of the latter are also in the time span from 2400 to 1300 BP, indicating that this was the most prosperous period of the later culture. The occupation span of the gray pottery is from 2350 to 1410 BP at the one sigma range.

Two TL dates and one C14 date from Cayamavana 1, Nia-hosa and Tamayayana (Veiyo) respectively are in the time span from 3330 to 2400 BP, suggesting that the later culture might have appeared in the lower reaches of the Chenwen River about 3000 BP, but that its early distribution was limited. There is one TL date from Cayamavana 1 of 1250 to 1070 BP, and one C14 dates from Yingiana under 1000 BP (Tsang and Chang 1996).



Figure 11. Burial goods from burial 1 and 2 at Nia-hosa

CONCLUSIONS

From this investigation, we know the archaeological record in the Ali Shan area began 4500 years ago with red cord-marked pottery. Its development was synchronic with the development of the red fine cord-marked pottery cultures in the lowlands (Table 4). Although the available archaeological record is still limited, it is obvious that the central Taiwan highlands were included in island-wide cultural developments from at least the beginning of the Middle Neolithic. Relationships with the other red cord-marked pottery cultures of the lowlands will be a focus for further study.

For the later reddish plain pottery culture, the absolute dates and unearthed remains indicate that it continued from the late Neolithic into the Iron Age. The absolute dates of this later culture are from about 3000 BP to within one thousand years ago, but most are between 2400 and 1300 BP. The period of the exotic gray pottery is also from about 2350 to 1400 BP. If we take this as the most prosperous period of the later culture, then the Indo-Pacific beads could also have been imported to the Ali Shan area during this period, consistent with dates for other Indo-Pacific beads found in lowland sites (Hung 2005: 81-94). The existence of such exotic goods indicates that the central Taiwan highlands were not completely isolated.

The geographic distribution of sites of the later culture corresponds with that of the Northern Tsou and Takopulan peoples recorded by the Dutch and in oral traditions. Although we are still unclear about the relationships between the archaeological record and these ethnographic Formosans, we find no other remains that can be related to their occupation. Considering that Yingiana, Veiyo, Taipicana 1 and Cayamavana 1 were each occupied for over one thousand years, most sites in the Ali Shan area must have been utilised on more than one occasion. Our study suggests that several cultural attributes of the later culture are similar to those of the ethnographically recorded Northern Tsou and Takopulan. The existence of a site hierarchy is evident from variations in site size, in the different quantities of agricultural stone tools and potsherds between sites, and in the existence exotic goods in certain sites. Burials are either divided from the dwelling area or contained within dwelling areas. Large quantities of agricultural stone tools suggest that the primary subsistence activity of the later culture was probably slash-and-burn agriculture. Even if the later culture is not related to the known Formosan people of the region, the archaeological data still offer insights into a long term strategy of mountain region occupation. Further research is planned to re-ignite the study of highland prehistory in central Taiwan.

NOTE

1. Nia-hosa means former settlement. This place was also once called Takopulan, and may have been occupied in the seveneenth century.

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Prof. Shong-shan Wang from the National Museum of Natural Science kindly introduced us to the local Tsou communities, who accommodated our fieldworks. Pastor Xinde Zheng (Pasuya, Tiakiana) confirmed each Tsou site spelling for our records. We also want to express our sincere appreciation to the enthusiasm and generosity of all the Tsou friends we met, who informed us about the archaeological remains they found in their fields, who participated in our surveys and excavations, and who treated us as friends.

REFERENCES

- Chang Kuang-ren 1996. The archaeological new discovery from the upper reaches of the Cenwen River Valley. Paper presented at the Centennial Meeting of Taiwanese Archaeology. Taipei: Academia Sinica. (In Chinese).
- Chen Chung-yu 1979. *Research on Prehistoric Chipped Stone Axes in Taiwan*. M.A. thesis, Department of Anthropology, National Taiwan University. (In Chinese).
- Chen Chung-yu 1994. *Qubing*. Taipei: Academia Sinica. (In Chinese).
- Chiu Min-yung and Youde Gao 1988. *Archaeological Research on Early Human Settlement History at Dong-pu Ti-Yi-lin site in Yushan National park*. Nantou: Yushan National Park Headquarters. (In Chinese).

- Ho Chuan-kun 2001. The record of prehistoric archaeology. In Wang Song-shan et al. (eds), *The record of Ali Shan Township*, pp. 117-153. Chiayi: the Public Institution of Ali Shan Township. (In Chinese).
- Hung Hsiao-chun 2004. A sourcing study of Taiwan stone adzes. *Bulletin of the Indo-Pacific Prehistory Association* 24: 57-70.
- Hung Hsiao-chun 2005. The study of glass beads from the Philippines and Taiwan. In *Imported Goods Found in Taiwan: Glass Beads, Rings, and Earrings*, pp 81-94. Taipei: Academia Sinica. (In Chinese).
- Kano, Tadao 1955 (1952). *Outline Review of the Taiwan Archaeology and Ethnology* (W. H. Sung trans.). Nantou: The Historical Research Commission of Taiwan Province. (In Chinese).
- Liu I-chang and Yu-mei Chen 1997. *The Prehistory and Sites of Kaohsiung County*. Vol.3. Kaohsiung: Kaohsiung County Government. (In Chinese).
- Liu Kehung and Chuan-kun Ho 1998. Daimaeyayana site in Leye town, Ali Township, Jiayi. *Newsletter of the Forum for Museum Ethnography of Taiwan* 1(3): 41-58. (In Chinese).
- Mori Ushinosuke 1902. The survey of Stone Age sites in Taiwan. *Journal of the Anthropological Society of Tokyo* 201: 89-95. (In Japanese)
- Torii, Ryuzo 1996 (1900). *Taiwan Exploration: Torii Ryuzo's Anthropological Travels in Taiwan* (Nanjun Yang trans.). Taipei: Yuanliu press. (In Chinese).
- Tsang cheng-hwa and Kuang-ren Chang 1995. The prehistoric settlement patterns and ecological adaption of the Chenwen River valley: archaeological survey in the upper Chenwen River valley. In Chou Chang-Hung (ed.), *The Study of Environmental change and Natural Resource Management in Western Taiwan: A Collective Report of the Study About the Chenwen River Valley*, Vol. 2, pp. 259-96. Taipei: Academia Sinica. (In Chinese).
- Tsang cheng-hwa and Kuang-ren Chang 1996. The prehistoric remains from the upper reaches of the Chenwen River Valley and the excavation report of *Yingiana* in Ali Mountain township, Jiayi. In Chou Chang-Hung (ed.), *The Study of Environmental Change and Natural Resource Management in Western Taiwan: A Collective Report of the Study About the Chenwen River Valley*, Vol. 3, pp. 373-97. Taipei: Academia Sinica. (In Chinese).
- Wang Shong-shan, Ming-hui Wang and Zhong-cheng Pu 2001. *The History of Formosan Aborigines Tsou*. Nantou: Taiwan sheng wenxian weituanhui. (In Chinese).

Table 1. Prehistoric sites in the Ali Shan area.

	RELATED GROUP	SITE	GRID COORDINATES	REFERENCES
1	Tapang#	Tapang#	E223640xN2594950	Mori 1902; Chen 1979; Tsang and Chang 1995
2		Teova	E222720xN2594340	
3		Taptuana	E222520xN2593640	
4		Niava'hu	E222510xN2592520	
5		Niae'ucna	E220600xN2589250	
6		Cacaya (Tsatsaya)	E214150xN2588900	
7		A'akuni	E215940xN2588390	
8		Tamuana (Damuana)	E215800xN2587900	
9		Yamakayua1	E215600xN2587700	
10		Yamakayua2	E214900xN2587780	
11		Saviki	E215720xN2586270	
12		Tanaiku	E216660xN2586680	
13		Bai-nogosi	E215330xN2585650	
14	Tfuya	Tfuya	E224330xN 2595590	Mori 1902; Chen 1979; Tsang and Chang 1995
15		Yingiana	E224930xN 2595130	
16		Fiofions	E224690xN 2595180	
17		Yiskiana	E225830xN2593110	
18		Taina	E224800xN2596200	
19		Pasana	E224810xN2597600	
20		Lalauya (Ralauya)	E218700xN 2596350	
21	Pcopcoknu	E218880xN 2594220	Chen 1979; Tsang and Chang 1995	
22	Ecuu	E218100xN 2595750	Mori 1902; Tsang and Chang 1995	
23	Veiyu (Vuiyo, Beiyo)	E 219700xN2595610	Tsang and Chang 1995	
24	Voveiveio	E221920xN2604280	Kano 1955; Tsang and Chang 1995	
25	Takopulan	Ya'isana		E217850xN2583080
26		Sinvi		E216530xN2582080
27		Yaalauya		E216640xN2581650
28		Nia-hosa		E216340xN2581370
29		Yaiku		E215780xN2581450
30	Yunguana1	E215320xN2580450	Tsang and Chang 1995	

(continued on next page)

31		Yunguana2	E215170xN2581080	
32		Epeapi	E218180xN2581700	
33		Yaasayao	E216560xN2580280	
34		Taipicana1 (Daibitsana1)	E215710xN2580190	Tsang and Chang 1995
35		Taipicana2	E216130xN2579810	
36		Hcuyu	E216700xN2579720	Tsang and Chang 1995
37		Yaviana	E215500xN2579240	Tsang and Chang 1995
38		Cuuc'u1 (Tsuuts'u)	E216950xN2579060	Tsang and Chang 1995
39		Cuuc'u2	E217290xN2578400	
40		Cuuc'u3	E216880xN2578550	Tsang and Chang 1995
41		Cuuc'u4	E217800xN2579070	
42		Tung'avana	E216150xN2578250	
43		Csayamavana1 (Tsayamavana)	E215010xN2577670	Mori 1902; Tsang and Chang 1995
44		Csayamavana2	E215830xN2577370	
45		Csayamavana3	E214720xN2578540	
46		Yazua	E216530xN2577250	
47		Yaicivuya	E214140xN2576950	
48	Imucu	Poneo	E223650xN2608270	Chen 1979
49		Po'oyuana	E220910xN2607420	
50	?	Alishan		Mori 1902
51	?	Otsu		Chen 1979

Table 2. C14 dates and TL dates of the Earlier Culture

LAB. NO.	SITE	CONTEXT	SAMPLE	LAB. AGE BP	CAL. AGE B.P.	REFERENCE
GX-21386-AMS	Yingiana	T0P0L13	charcoal	3795±60	4460-4040	Chang 1996
Beta-167752	Taipicana1	P1L13-14	charcoal	3780±40	4350-4040	
TD-741	Taipicana1	P1L15	sherd	2670±220	(TL)	

Table 3. C14 dates and TL dates of the Later Culture

LAB. NO.	SITE	CONTEXT	SAMPLE	LAB. AGE B.P.	CAL. AGE BP	REFERENCES
BA-98033	Tamayayana (Veiyó)		charcoal	2610±90	3000-2400	Liu and He, unpublished
Beta-167752	Yingiana	P1L7	charcoal	2300±40	2420-2200	
Beta-167748	Taipicana 1	P1L5-7	charcoal	2270±40	2400-2200	
BA-02135	Taipicana 1	P2L4-L6	charcoal	2060±60	2350-1930	
GX-21385	Yingiana	T0P0L8	charcoal	855±50	960-730 (AMS)	Tsang and Chang 1996
GX-21384	Yingiana	T0P0L6	charcoal	255±45	520-40 (AMS)	Tsang and Chang 1996
TD-743	Cayamavana 1	P3 L9	Red coarse sherd	3080±250	(TL)	
TD-708	Nia-hosa	M1	Red coarse sherd	2980±240		
TD-740	Taipicana 1	P1AL10	Red coarse sherd	2230±180		
TD-744	Cayamavana 1	P2 L7	Grey coarse sherd	2170±180		
TD-745	Yingiana	P1L9	Red coarse sherd	2140±170		
TD-491	Tamayayana (Veiyó)	S.C.	Red coarse sherd	2060±160		Liu and He 1998
TD-490	Tamayayana (Veiyó)	S.C.	Red coarse sherd	1950±150		Liu and He 1998
TD-742	Taipicana 1	P4L2	Red coarse sherd	1773±140		
TD-711	Cayamavana 1	S.C.	Grey coarse sherd	1700±140		
TD-709	Cayamavana 1	S.C.	Grey coarse sherd	1650±130		
TD-707	Taptuana	P1L18	Red coarse sherd	1650±130		
TD-368	Yingiana	T0P0	Red coarse sherd	1650±130		Chang 1996
TD-712	Cayamavana 1	S.C.	Grey fine sherd	1530±120		
TD-739	Taipicana 1	P1BL5	Red coarse sherd	1410±110		
TD-710	Cayamavana 1	S.C.	Red coarse sherd	1160±90		

Table 4. Chronology of the Taiwan Neolithic (after Hung Hsiao-chun 2004, Table 1)

Phase	Date	Pottery / Culture	Regions
Early Neolithic	4000BC-2500BC	Coarse cord-marked pottery Dabenkeng	Island-wide, coastal
Middle Neolithic	2500BC-1500BC	Fine cord-marked with red slipped pottery Xuntangpu Niumatou Niuchouzi Fushan	North Central-west South East
Late Neolithic	1500BC-AD 1	Plain pottery (occasionally with stamped decoration) Yuanshan Zhishanyan Yingpu Dahu Beinan	North North Central-west South East