

# The Islands of Amami and Okinawa

## Where Hunter-Gatherers Once Throve

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### Abstract

Many islands in the world were colonized by *Homo sapiens* (modern human) after 10,000 years ago. Considering the high degree of adaptability of *H. sapiens*, who were all hunter-gatherers prior to 10,000 years ago, to various environments, one might wonder why the colonization of islands was recent phenomenon in human history. Archaeologists and anthropologists have examined human colonization processes to island environments and come up with several reasons: the low level of water crossing technology, difficulties in finding adequate amount of food in newly arrived islands, also difficulties of small human population group avoiding natural disasters and diseases and so on.

Among these the most challenging thing for hunter-gatherers was how to obtain enough food resources in resource poor island environments. Hunter-gatherers move quite often, changing their camps from one place to another. Most archaeologists and anthropologists argue that many islands in the world are/were not large enough for mobile hunter-gatherers successfully colonize them. Therefore, most of them were colonized after agriculture was invented at around 10,000 years ago.

Rarely, exceptions exist. That is small number of islands were colonized by hunter-gatherers. These islands are characterized by as follows: 1) large islands, 2) islands closely located from a continent or large island, 3) large sea mammals more or less constantly available, 4) hunter-gatherers translocated edible plants and animals from their mother lands to islands and 5) if combination of 1) to 4) is possible.

None of these are/were applicable to the islands in the Amami and Okinawa archipelagos. Therefore, some archaeologists and anthropologists proposed the Shellmidden period (ca. 6,500 BP to 1,000 BP) agriculture hypotheses. Archaeologists and anthropologists have worked intensively for the last twenty years or so especially focusing on faunal and plant remains. The former contained only wild animals except the dog. The latter too mainly consisted of wild species except the bottle gourd. The results of the analyses strongly indicate that the hunter-gatherers successfully adapted the islands. The data is an extremely unique and important case in human history.

**Keywords:** archaeobotanical analysis, faunal analysis, *Homo sapiens*, island colonization, the Shellmidden period

## Introduction

*Homo sapiens* (or modern human) emerged in Africa sometime between 200,000 and 100,000 years ago and soon after that they spread from there to all continents, except Antarctica. They reached Australia by about 50,000 years ago, to Europe and East Asia ca. 40,000 years ago. From Siberia, they entered into North America (Alaska) at about 15,000 years ago. Astonishingly, they expanded from the northern North America to the southern tip of South America within less than 5,000 years. This spread from the northern tip to the southern tip by 10,000 years ago demonstrates high degree of adaptability of *H. sapiens* into various environments. Since every human being living at that time was hunter-gatherers, the fact simultaneously indicates high degree of adaptability of hunter-gatherers into different kinds of environments.

While hunter-gatherers adapted into various environments, they had extremely difficult time conquering island environments. Indeed most islands were colonized after 10,000 years ago. The main reason is that hunter-gatherer populations could not or do not colonize small depauperated islands. Thus, it has been hypothesized that in order for modern humans to successfully colonize islands, food production is necessary (CHERRY 1981). Were they hunter-gatherers or farmers who colonized the islands of the Amami and Okinawa archipelagos?

## Background

Prehistory of this region begins with the Paleolithic period (ca. 32,000 to 10,000 BP; see Table 1 for chronology). The earliest known site is the Yamashita cho No.1 cave site, dating to ca. 32,000 years ago, on Okinawa Island. In the Okinawa Archipelago, eight Paleolithic sites are reported. In the Amami Archipelago, the number of known Paleolithic sites is five. The Paleolithic period is followed by the Shellmidden period (ca. 7,000 to 1,000 BP). This period is characterized by the emergence of pottery culture. The earliest pottery in this region until recently is known as the finger-nailed pottery and the plain pottery, dating about 6,500 to 7,000 years ago. Pottery culture might go back to 7,000 to 9,000 years ago by the recent findings from the Kikai sogo ground site, the Minatogawa fissure site, and the Tiiragama site (TAKAMIYA *et al.* unpublished data). At about 1,000 years ago, the Gusuku culture began. This period is characterized by the beginning of food production, the use of iron tools, the long distant exchange and the emergence of the stratified societies.

This brief review of the prehistory of the region shows that agriculture was established by the Gusuku period. Also, since the Paleolithic people were hunter-gatherers worldwide, it implies probably hunter-gatherers lived on the islands during the Paleolithic period too. The

Table 1. Chronology of the Amami and Okinawa archipelagos.

	Amami and Okinawa	Mainland Japan (except Hokkaido)
ca. 1,100/1,200 ~ 1,500 AD	Gusuku	Muromachi-Kamakura
1,400 BP	Shellmidden Late 2	Heian-Asuka
2,600 BP	Shellmidden Late 1	Kofun Yayoi
3,000 BP	Shellmidden Early 5	Final Jomon
4,000 BP	Shellmidden Early 4	Late Jomon
5,000 BP	Shellmidden Early 3	Middle Jomon
6,000 BP	Shellmidden Early 2	Early Jomon
7,000 BP	Shellmidden Early 1	
	Beginning of Pottery culture?	Initial Jomon
10,000 BP }	Paleolithic	Incipient Jomon
32,000 BP		Paleolithic

\*Table shows approximate comparison with the mainland Japan. They do not perfectly correspond between these two regions.

biggest question is whether the people of the Amami and Okinawa archipelagos during the Shellmidden period depended on wild resources or agricultural products.

### **The Shellmidden Islanders: Were They Hunter-Gatherers or Agriculturists?**

As mentioned above, most islands in the world were colonized by hunter-gatherers. Exceptionally, several islands were colonized by hunter-gatherers. These islands are characterized by as follows: 1) large islands, such as Tasmania, 2) islands located closely from a continent or a large island such as the California Channel Islands, 3) islands where sea mammals are reliable as food source such as Kodiak Island, 4) hunter-gatherers translocated edible plants and/or animals from their mother land, such as Manus Island and 5) if

combination of 1) to 4) is possible, such as the California Channel Islands. None of these applies to the islands of Amami and Okinawa prehistorically including the Shellmidden period (TAKAMIYA *et al.* 2016). Therefore, it is extremely important to address the question entitled for this session. In order to answer the question, let me examine faunal remains first, and then review plants consumed by the Shellmidden people.

### **Faunal remains**

Archaeologists constantly collected faunal remains since almost the same time when archaeological work was first introduced into the region, some one hundred years ago. It is important to note that since 1990s, faunal remains have been sampled and analyzed by specialists. TOIZUMI (2014) has been working on vertebrate remain analysis, and KUROZUMI (2014) has been analyzing shell remains from archaeological sites since 1990s. They have applied meticulous methods in order to collect small sized animal remains, such as using 1 mm sized mesh screening. Consequently, they are able to analyze faunal remains larger than 1 mm. TOIZUMI's analysis (2014) has revealed all vertebrate remains recovered from the sites were wild species, except the dog. According to him, important vertebrate animal foods were wild boar and fishes available from the coral reef environment. No site is known where sea mammals preoccupy vertebrate remains. Indeed the carbon and nitrogen isotope analysis demonstrates sea mammals were not important food (TAKAMIYA and CHISHOLM 2004, YONEDA 2010). Also, the vertebrate remains contain no tranlocated animal foods from the outside, except the dog. KUROZUMI (2014) sees no signs of shellfish farming from the shellfish remains from the archaeological sites. Thus, in terms of faunal remains, people lived there during the Shellmidden period relied on wild animal species.

### **Plant remains**

What about plant foods? Compared with faunal remains, since plant remains were small and very fragile, it had been difficult to unearth plant remains. As a result, only two sites in the Amami Archipelago (NAKAYAMA 2009) and eight sites in the Okinawa Archipelago yielded plant remains prior to 1991 (WATANABE 1991). The plant remains recovered and identified from these sites were all wild plants such as nuts. These pieces of information imply that the Shellmidden people were gatherers of the wild plants. However, since the amount of plant remains recovered from these sites are fragmentally, and at the same time since the number of sites which yielded plant remains was only ten, some scholars proposed the Shellmidden agriculture hypotheses (e.g., YANAGITA Kunio, NITTA Jusei, TAKAMIYA Hiroe, SATO Yoichiro, ITO Shinji and TAKAMIYA Hiroto, see TAKAMIYA 2005).

In order to understand subsistence economy of the Shellmidden period, flotation was first introduced into the region in 1992. Flotation was developed by archaeologists in order to collect carbonized plant remains, such as carbonized seeds, efficiently from archaeological

sites. From several archaeological sites dating from the Early 2 to the Late 2 periods, soil samples were collected. Also around 2000, wetland sites were excavated for the first time in this region. From these wetland sites numerous amounts of plant remains were recovered and identified by OMATSU and TSUJI (1999), TAKAMIYA (1999), TAKAMIYA (2006) and TSUJI *et al.* (2007). Below, plant remains recovered from the Shellmidden sites will be briefly introduced.

#### *The Early 1: the Shinjoshichabaru No.2 site*

The site is a wetland site and yielded one of the earliest pottery, finger-nailed pottery. The  $^{14}\text{C}$  date of wild boar was cal. BC 5050–4910. The site unearthed more than 20 taxa of plant remains. All belonged to wild species, such as red bayberry and silvertine (TAKAMIYA 2006).

#### *The Early 2: the Ireibaru site*

This site is also a wetland site and yielded the Sobata pottery. The  $^{14}\text{C}$  dates ranged between cal. BC 4250–3770. TSUJI *et al.* (2007) analyzed plant remains from the site and report numerous amounts of nuts species. In addition to nuts species, they have reported more than 60 taxa, all of which belonged to wild species, except bottle gourds. While plant remains recovered from the Hango site is still in the process of analysis, all plant remains identified so far are nuts (TSUJI *et al.* 2007).

#### *The Early 3 to the Early 4: the Omonawa No. 4 site*

A small amount of soil samples was collected and processed by flotation. Consequently, only few plant remains were collected and identified. They were nuts and silvertine (TAKAMIYA unpublished data).

#### *The Early 4: the Mebaru site*

This site was a wetland site and the  $^{14}\text{C}$  dates range between cal. BC 2300–1940. OMATSU and TSUJI (1999) report 50 taxa and TAKAMIYA (1999) identified at least 30 taxa. They all belonged to wild species. OMATSU and TSUJI (1999) mention a large amount of nuts was recovered. The Kuzuri site, which dates to this period and whose plant remains have been in the process of analysis, has so far yielded only wild species (TAKAMIYA unpublished data).

#### *The Early 5: the Sumiyoshi Shellmidden*

This site unearthed several house pits, and soil samples were mainly collected from these features. The  $^{14}\text{C}$  dates ranged between cal. BC 1540–1210. The result of plant remain analysis showed all plant remains were wild species such as nuts. The Tobaru site, the Nakazato site and the Nishinagahamabaru site, which belong to the Early 5 also yielded only wild species (TAKAMIYA *et al.* 2016).

*The Late 1: the Takachikuchibaru Shellmidden*

The Takachikuchibaru Shellmidden was the first site where flotation was applied in the archipelagos. Therefore, a large amount of soil samples was collected for flotation. While a large amount of soils was processed by flotation, the plant remains from the site did not contain any cultigens. Again, all of them were wild species such as nuts (TAKAMIYA *et al.* 2016).

*The late Late 1 to the Late 2: the Yomisaki, Arago, Matsumoto and Nagarabaru Higashi sites*

The first three are located on Amami-Oshima Island, and the last one on Ie Island in the Okinawa Archipelago. All sites yielded only wild plant remains (TAKAMIYA *et al.* 2016).

*The late Late 2 to the Initial Gusuku period*

Cultigens appear for the first time in flotation samples dating to this period. The Nazakibaru site, Kumuibaru site, Uganhira-hoppo site and Yabumedabaru site on the mainland of Okinawa yielded barley, wheat, foxtail millet and broomcorn millet. The Gusuku site group (among them, plant remains were analyzed from the Yamada-nakanishi, Yamada-handa, Maehata, Kohane and Oufu sites) on Kikaijima Island and Akakina gusuku site on Amami-Oshima Island unearthed barley, wheat, foxtail millet and broomcorn millet. The  $^{14}\text{C}$  dates of these cultigens are between the ninth to twelfth centuries AD, indicating the transition from hunting and gathering to food production took place at about this time. At the same time, it has become evident that people lived on the islands prior to this time (the Shellmidden period) were hunter-gatherers (TAKAMIYA *et al.* 2016).

## Discussion and Conclusion

Were people of the Shellmidden period hunter-gatherers or farmers? Faunal remain analyses have demonstrated that they relied on wild animals for foods. Recent intensive archaeological work focusing on recovering plant remains using flotation successfully collected plant remains from sites dating to the Early 2 to the Late 2. In addition, fortunately enough the wetland archaeological sites were excavated for the first time, and numerous amounts of plant remains were recovered from these sites. The results of plant remains analyses unearthed from most of the Shellmidden sites contained no cultigens but all wild plants. The results strongly indicate that the Shellmidden people were gatherers of the wild plants. Thus the answer to the above question is, they were hunter-gatherers.

In the background section, I have mentioned very rare cases where hunter-gatherers adapted island environments. The Amami and Okinawa archipelagos case do not belong to these five cases. Thus, the Amami and Okinawa case provide a new perspective of

hunter-gatherer adaptation to the islands. While we still need more data, the Early 1 people relied on nuts and wild boar, the Early 2 on nuts and inner bay fishes and from the Early 3 to the Late 2 on nuts and coral reef fishes. Also the shellfish species inhabits in the coral reef environment played important role during the entire Shellmidden period. These are new strategies which enabled hunter-gatherers successfully colonize island environments. The case from Amami and Okinawa archipelagos provides an extremely rare case in human history.

### References

- CHERRY, J. F. 1981. Pattern and Process in the Earliest Colonization of the Mediterranean Islands. *Proceedings of the Prehistoric Society*, 47: 41–68.
- KUROZUMI, T. 2014. *Kairui Itai kara mita Okinawa Shotou no Kankyō Henka to Bunka Henka* (Environmental and Cultural Changes in the Okinawa Archipelago as Seen from Shellfish Remains Analysis). In: *Ryūkyū Rettō Senshi/Genshi Jidai no Kankyō to Bunka no Hensen Vol. 2, Ryūkyū Rettō Senshi/Genshi Jidai ni okeru Kankyō to Bunka no Hensen ni kansuru Jisshū teki Kenkyū Ronbunshū* (The Cultural and Environmental Changes during the Prehistoric and Protohistoric Times in the Ryūkyū Archipelago Vol. 2, The Collections of Papers on the Empirical Studies on the Cultural and Environmental Changes during the Prehistoric and Protohistoric Times in the Ryūkyū Archipelago) (Eds. TAKAMIYA, H. and SHINZATO, T.), 55–70, Rokuichi Shōbō, Tokyo, Japan (in Japanese).
- NAKAYAMA, K. 2009. *Horidasareta Amami* (Excavated Amami), 154 pp., Zaidan Hojin Amami Zaidan, Amami City, Kagoshima, Japan (in Japanese).
- OMATSU, S. and TSUJI, S. 1999. *Mebaru Iseki kara Sanshutsu shita Oogata Shokubutsu Itaigun* (Macro Plant Remains Recovered from the Mebaru Site). In: *Mebaru Isaki* (The Mebaru Site) (Ed. GINOZA-SON KYOUIKU IINKAI), 223–241, Ginoza-Son Kyouiku Iinkai, Ginoza Village, Okinawa, Japan (in Japanese).
- TAKAMIYA, H. 1999. *Saibaishokubutsu no Tansaku* (Search for Cultigens). In: *Mebaru Isaki* (The Mebaru Site) (Ed. GINOZA-SON KYOUIKU IINKAI), 259–275, Ginoza-Son Kyouiku Iinkai, Ginoza Village, Okinawa, Japan (in Japanese).
- TAKAMIYA, H. 2005. *Shima no Senshigaku: Paradaisu deha nakatta Okinawa Shotou no Senshi Jidai* (Prehistory of the Islands: Prehistory of the Okinawa Archipelago Was Not a Paradise), 227 pp., Boder Inku, Naha, Okinawa, Japan (in Japanese).
- TAKAMIYA, H. 2006. *Shokubutsu Itai* (Plant Remains). In: *Aragusuku Shichabaru Dai 2 Iseki* (The Aragusuku Shichabaru No.2 Site) (Ed. OKINAWA-KEN MAIZO BUNKAZAI SENTA), 259–275, Okinawa-Ken Maizo Bunkazai Senta, Nishihara Town, Okinawa, Japan (in Japanese).

- TAKAMIYA, H. and CHISHOLM, B. S. 2004. *Okinawa Shotou Joumon Jidai Bankijin oyobi Kinseijin wa Nani wo Tabetaka* (What Final Jomon and Recent Populations Ate, Based on Carbon and Nitrogen Isotope Analysis). In: *Gusuku Bunka wo Kangaeru* (To Examine the Gusuku Culture) (Ed. NAKIJIN VILLAGE BOARD OF EDUCATION), 401–416, Shin Jinbutsu Ouraisha, Tokyo, Japan (in Japanese).
- TAKAMIYA, H., HUDSON, M. J., YONENOBU, H., KUROZUMI, T. and TOIZUMI, T. 2016. An Extraordinary Case in Human History: Prehistoric Hunter-Gatherer Adaptation to the Islands of the Central Ryukyus (Amami and Okinawa Archipelagos), Japan. *The Holocene*, 26(3): 408–422.
- TOIZUMI, T. 2014. *Sekitsui Doubutsu Itai kara mita Ryuukyuu Rettou no Kankyō Henka to Bunka Henka* (Environmental and Cultural Changes as Seen from Vertebrate Analysis). In: *Ryuukyuu Rettou Senshi/Genshi Jidai no Kankyō to Bunka no Hensen Vol. 2, Ryuukyuu Rettou Senshi/Genshi Jidai ni okeru Kankyō to Bunka no Hensen ni kansuru Jisshou teki Kenkyuu Ronbunshuu* (The Cultural and Environmental Changes during the Prehistoric and Protohistoric Times in the Ryukyu Archipelago Vol. 2, The Collections of Papers on the Empirical Studies on the Cultural and Environmental Changes during the Prehistoric and Protohistoric Times in the Ryukyu Archipelago) (Eds. TAKAMIYA, H. and SHINZATO, T.), 71–86, Rokuichi Shobou, Tokyo, Japan (in Japanese).
- TSUJI, S., OMATSU, S. and TSUJI, K. 2007. *Ireibaru Iseki no Shokubutsu Itaignun* (The Plant Remains Recovered from the Ireibaru Site). In: *Ireibaru Iseki* (The Ireibaru Site) (Ed. CHATAN-CHO KYOUIKU IINKAI), 433–444, Chatan-Cho Kyouiku Iinkai, Chatan Town, Okinawa, Japan (in Japanese).
- WATANABE, M. 1991. *Kyuna Higashibaru Nubataki Iseki Shutsudo no Shokubutsu Itai* (Plant Remains Recovered from the Nubataki Site). In: *Nubataki* (The Nubataki Site) (Ed. GINOWAN-SHI KYOUIKU IINKAI), 114–121, Ginowan-Shi Kyouiku Iinkai, Ginowan City, Okinawa, Japan (in Japanese).
- YONEDA, M. 2010. *Shokuseitai ni miru Joumon Bunka no Tayousei* (The Cultural Diversity of Jomon Based on Consumption Ecology). *Kagaku*, 80(4): 383–390 (in Japanese).