

## On the Question of Prehistoric Rice Cultivation in the Mariana Islands

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**Abstract**—The journals of early European explorers provide inferential evidence for the pre-contact existence of rice. Examination of 5 independent translations of Pigafetta's journal (the only existing first-hand log of Magellan's voyage) revealed a consistent absence of rice in the list of Chamorro foods. This is in direct contrast to Burney who, for inexplicable reasons, adds rice to Pigafetta's food list. The first detailed description of rice in the Marianas comes from Legazpi in 1565, 44 years after Magellan. If rice was present at the time of initial contact, no unambiguous references were found.

Examples of 'traditional' paddy fields, rice types, and patterns of communal labor are cited as evidence of long term use of rice in the Marianas. Given the rapid decline of the native Chamorro population and the influx of peoples and materials into the Marianas following contact, attempts to draw parallels between prehistoric and postcontact cultural practices is tenuous.

Direct archaeological evidence of rice is rare. Burnt rice husks were found covering a burial eroding from a cave on Asuncion. Typical Chamorro stone and shell artifacts were found in association. No chronological determinations were able to be made.

Three rice-impressed sherds were recovered from a *latte* site on Rota. The vertical placement of these sherds is open to question and they may be with the historic component of the site. No other direct data have yet been recovered.

Analysis of existing evidence leads us to argue that there are insufficient data relating to prehistoric rice cultivation in the Marianas. We suggest this problem be examined as an hypothesis to be tested archaeologically.

The cultivation of rice in the Marianas before European contact is well established in the literature. The presence of rice has been used to suggest a number of different interpretations of Marianas prehistory, ranging from identifying possible homelands of the original settlers (Takayama and Intoh 1976) to arguing for a series of later contacts with rice-producing areas to the west (Thompson 1977). Yet, although we might assume that rice was grown in the Marianas prehistorically (i.e., prior to AD 1521), the primary data are, in fact, rather meagre and tentative. For this study, we searched the existing historical, ethnographic, and archaeological literature in an attempt to answer two questions: what evidence exists for prehistoric rice cultivation and what age can confidently be attributed to it?

One major problem we faced was obtaining the primary data. Although there

are many references to rice cultivation in the Marianas, we found that citations of primary sources were rare. We soon got the impression that the presence of rice cultivation in the Marianas has been accepted with no attempt ever made to critically evaluate the evidence.

### Historical Data

Many authors (e.g., Safford 1905; Thompson 1945; Barrau 1961) have stated that Magellan, the first European to land in the Marianas, was presented rice on Guam in 1521. We examined 4 independent translations of Antonio Pigafetta, whose journal is the only existing first-hand account of the voyage (Alderly 1874; Alexander 1916; Paige 1969; Skelton 1969). Although each differs slightly in their translation of Magellan's short stay on Guam, none mention rice or anything which could be inferred as rice. All 4 translators refer to the same 5 items which are contained within a single sentence in Pigafetta's journal:

Ils menget coches/batates  
oyseaux/figures longues/une  
palme/cane douce/poissons  
bolans avec autre chose.

They eat coconuts, yams,  
birds, figs a span long (i.e.  
bananas), sugar cane, flying  
fish and other things.

(This passage is taken from the Nancy-Libri-Phillipps-Beinecke-Yale codes, believed to be the most complete [Skelton 1969].) However, after leaving Guam, these ships put in at Samal in the Philippines where Pigafetta specifically states that rice was obtained.

The idea that rice was presented to Magellan in Guam presumably came from Burney's (1803) account of Magellan's voyage which is cited by both Safford and Thompson. Pigafetta's account was but one of four, the others being collections of accounts gathered after the voyage's conclusion (Skelton 1969: 6-8). Burney's work appears to be taken largely from Pigafetta but it varies significantly on a number of points. For unexplained reasons, Burney adds rice to the above sentence. Later, Burney also states that "The Spanish procured here sugarcane, coconuts, Yams, bananas, and some hogs." Pigs are believed not to be in the Marianas prehistorically (Spoehr 1957; Reinman 1977). In fact, Burney (1803: 139) later contradicts himself by stating that no quadrupeds were to be found on the island. We note that except for rice and hogs, all items on Burney's list were also in the four other translations of Pigafetta. One possible explanation for Burney's inconsistencies may be his reliance upon the postvoyage compilation of officers' and mariners' narratives where specifics pertaining to individual islands may have been confused. We suggest that Pigafetta's journal offers the most accurate observation and that Burney's reference to rice and hogs on Guam is in error.

The first specific observations regarding rice in the Marianas comes from the journal of Miguel Lopez de Legazpi who arrived on Guam in January 1565, 44 years after Magellan. The relevant passages here are:

The island of Goam is high above sea level and throughout, event to the beach, is filled with groves of coconut palms and other trees. It is thickly inhabited. It has fields sown with rice (... *tiene muchas sementeras de arrozales* ...) (Abella 1965: 36).

The natives who came... brought for trade dry and green bananas, rice tamales (*tamales de arroz*), or other foodstuffs of that nature... (Abella 1965: 19).

(Legazpi also described the bales of rice—*fardo de arroz*—he purchased from the Chamorros). Each... apparently measured from 3 to 4 almudas, one almud was equal to about the 12th part of a fanega or an English bushel weight, more or less... (Abella 1965: 20).

Burney's (1803: 257) account of Legazpi's stay on Guam contains only a single reference to rice, simply stating that "Guahan abounded in rice...". By the time of Legazpi's contact, 3 other Spanish explorers had briefly visited Guam (Corey 1968). One of these, Juan Garcia Jofrede Loaysa may have referred to rice there, but since the only translation of his journal we could obtain was in Burney (1803), we are skeptical. If Legazpi is correct—and he is so specific, this seems likely—then by 1565 rice was not only present on Guam but plentiful. We think it unlikely that this could result from an introduction of the grain and cultivation techniques by any of the Spanish voyagers between the time of Magellan and Legazpi. Thus, there is positive inferential ethnohistoric evidence for the presence of rice, at least on Guam, prior to Magellan.

### Ethnographic Data

The only ethnographic data on early post-contact Chamorro culture are short descriptions by explorers and missionaries. The influx of peoples and materials into the Marianas following their discovery and the rapid decline of the native population after 1669 (Underwood 1973), meant local Chamorro culture underwent significant modification. Nevertheless, references are made to 'traditional' rice in the Marianas.

One is presented by Safford (1905) who, almost 400 years after contact, states that 3 types of rice were traditionally grown by the Chamorro. He offers no data to support his contention of early use but, instead, merely names the varieties: red (*agaga*), coarse-grained (*basto*), and *palay aromatico*.

Yawata (1963) describes traditional paddy fields on Rota. A portion of these fields was being cultivated during his visit to the island in 1937. He mentions, as did Safford (1905: 340), that the fields were irrigated by river water. Yawata strongly implies that similar techniques were used prehistorically, but he provides no direct data.

More recently, Solenberger (1967) argues that the early Chamorro settlers brought with them a liking for rice and the techniques for cultivating it. Solenberger

(1967:98) states that the structure of early Chamorro society was such that it could provide the type of communal labor necessary to undertake large-scale rice cultivation. We suspect that if we were to have sufficient data on early Chamorro society, it would show it to be organized like other Oceanic high island societies, in an effective adaptation to its local environment rather than a reflection of local cultivation practices. Solenberger (1967:99) also cites Freycinet (1824) illustration of a rice harvesting implement made from shell and used by the 'ancient inhabitants of Guam'. However, this type of implement has not been recovered from any archaeological context in the Marianas.

### Archaeological Data

Archaeological investigation of the Marianas is still rather sparse. Early attention was drawn to the megalithic foundations known as *latte* found on many of the islands. It was not until after World War II that scientific methods, including systematic survey and excavation, were applied to archaeological fieldwork in Micronesia.

The most frequently cited reference dealing with archaeological evidence of rice in the Marianas is Yawata (1963). This two page article summarizes an earlier paper (Yawata 1940) in which Yawata describes the discovery of two burials eroding out of the mouth of a cave on Asuncion Island located towards the northern end of the Mariana group, approximately 650 km north of Guam. Yawata states that 5 slingstones, a stone ring, and a small shell disk were found in association with the burials and that one burial had been covered with burned rice husks. Although these husks were collected by Yawata, they did not survive the trip back to Japan and were never properly identified. While the associated artifacts fall within the range of Chamorro material culture, no possible chronological determination can be made.

The only other direct, physical evidence of rice is found within the ceramic sample recovered by Takayama and Egami (1971) from a *latte* site on Rota. They excavated 3 sherds with grain impressions, which microscopic analysis indicated were of *Oryza sativa* (Takayama and Egami 1971:27).

Each sherd came from a separate excavation unit and their exact vertical placement, other than major layer, is impossible to determine from the excavation report. Two sherds were found in units (C3; E4) lying between the rows of *latte* uprights while the third was found in unit A1 immediately outside the feature.

Four radiocarbon dates were obtained from the site ranging from  $170 \pm 80$  (M-1, Ca. No. 4) in Layer I to  $615 \pm 100$  (M-1, Ca. No. 1) at 27 cm below the surface in layer II. This latter date came from the same unit (C3) and layer (II) as one of the sherds.

Eleven metal fragments were also recovered from this site. All but one came from Layer I which dates well into the historic period. A single metal sherd was found in unit E3 at a depth of 60 cm. We mention this because Takayama and Egami (1971:25) state that there is "no evidence" that this metal piece was intrusive. In fact, they offer no discussion of any kind regarding possible vertical disturbance within the

*latte*. Nevertheless, Takayama and Egami report the discovery of 16 burials within the rows of uptights, 5 of which were in the same unit as the deeply buried metal sherd.

Takayama and Egami (1971:28) have stated that the sherd recovered from C3 "... provides the evidence that rice cultivation existed on Rota prior to the time of European discovery." Given the amount of disturbance within the *latte* and the existence of a similarly impressed sherd from an apparently undisturbed, historic layer, we are unconvinced of their claim.

No archaeological evidence of irrigation systems or field preparations have been documented in the Marianas. A recent survey of the Ugum River Valley, in the interior of southern Guam, yielded no identifiable agricultural features or artifacts which could be associated specifically with rice cultivation (Dye, Price, and Craib 1978). Nevertheless, this interior portion of Guam was being utilized prehistorically by the Chamorro as evidenced by the ceramic scatters and clusters of *latte* structures along the ridge tops (see also Reinman 1977). Stone mortars were also observed both in association with some *latte* and in apparent isolation. Spoehr (1957:140), has linked stone mortars with rice cultivation, and further states that "evidence of agriculture is limited to finds of mortars and pestles" (Spoehr 1957:173). This is a somewhat dubious association since mortars and pestles were also utilized by strictly hunting-gathering groups (i.e., California Indians). Thompson (1945) mentions the hulling of rice in these mortars as only one of its many functions. Mostly they were used in grinding *Cycas circinalis*, a major staple of the Chamorro (Safford 1905).

Additional indirect evidence of the presence of rice has been offered. Yawata (1963) compares the semicircular, coral capstones sitting atop the pillars of the *latte* foundations with the wooden disks on top of wooden posts supporting granaries in northern Luzon. Thompson (1945) and Solenberger (1967) cite another of Freycinet's illustrations (1824, Plate 62) as depicting an *akoa*, which they claim is a traditional farming implement similar to the metal *fosiño* blade used today. They further cite the occurrence of this tool type in the Hornbostel collection as support of this tool's prehistoric use. (Both Thompson [1945] and Solenberger [1967] refer to Plate 6, specimen K in Thompson [1932] as an archaeological example of an *Akoa*. Their citation is in error. Specimen K is a circular cross-section stone adze. The artifact described by Thompson and Solenberger is actually specimen F in the same Plate 6.) Though Thompson and Solenberger state that *blades* of this type have been found at archaeological sites, there is only a single specimen in the Hornbostel collection which contains thousands of stone and shell tools. Furthermore, there have been no similar specimens reported from any subsequent surface collections or excavations in the Marianas. Reinman (1977:105) reports a broken stone tool which he suggests may be a hoe and cites other reports (Cross 1945; Dilatush 1950) of this type of implement. However, any of the above tools may be associated with general gardening tasks and cannot be related specifically to rice cultivation. Finally, Takayama and Egami (1971:21) suggest that the *Pedalion* cutting tools they recovered in association with the rice-impressed sherds, "may have been used as rice reapers". But no supportive

data are offered to corroborate their contention.

It has been argued explicitly (e.g., Yawata 1963; Solenberger 1967; Takayama and Intoh 1976) that the knowledge of rice cultivation was brought to the Marianas by the earliest settlers. Takayama and Intoh suggest that because rice and red-slipped pottery are found together in Thailand and Taiwan, the presence of red-slipped pottery early in the Marianas is a good indicator of rice cultivation. However, linguists agree that the Chamorro language is most closely related to the Philippines (Bender 1971) and if we accept the date of approximately 3500 B.P., based on Spoehr's (1957: 168) estimate, for initial settlement of the Marianas, it would seem unlikely that the original settlers brought with them the knowledge of rice cultivation, given that rice production in island southeast Asia is believed to postdate their departure (cf. Shutler and Marck 1975; Bellwood 1976). If rice was grown in the Marianas prehistorically, it did not arrive with the original settlers nor would it be expected in the early (i.e., pre-*Latte*) phase of Chamorro prehistory (ca. 3500–1100 B.P.).

Taking a different line, Spoehr (1973: 13) acknowledges that the Chamorro had numerous ties to Malaysia, among which was rice cultivation, but does not attempt to associate that with the early prehistoric period. Rather, he argues (Spoehr 1957: 173):

As the *Latte* phase goes into the historic period, I believe it highly probable that the cultivation of rice was a characteristic of the *Latte* period as a whole.

However, we are still left with the question of how rice came to be in the Marianas and on what basis does Spoehr associate rice with the *Latte* period (because of the presence of mortars?).

Thompson (1977) has argued that the cultivation of rice may be one of many "exchanges" which occurred during, what he termed, "multiple secondary settlements" of the Marianas which he sees as responsible for the development of the *Latte* phase. Although we do not support his notion of foreign influences as the major factor instigating culture change in the Marianas, we agree that there has been little examination of the possibility of late prehistoric contacts with rice-producing areas to the west.

A recent excavation of a *latte* site on Pagan Island in the northern Marianas yielded an assemblage of exotic materials (Egami and Saito 1973). These included 5 pieces of badly decayed metal fragments, 13 sherds of blue and white porcelain (identified as belonging to the Ming period: A.D. 1500–1600), and a bead of reddish-brown chalcedony (not naturally occurring in the Marianas). The site has been dated to A.D. 1355–1665 (Egami and Saito 1973). Since the site contains an otherwise typical late prehistoric assemblage, these exotic items must have been traded into the area but from where is still uncertain.

The historic literature contains many descriptions of lost voyagers drifting into the Marianas after being blown off course. Felipe de la Corte (n.d.) mentions the

discovery of an adult male Chinese who was living near the village of Merizo in southern Guam after being shipwrecked around 1648. Safford (1905) comments that "... there arrived in these islands some Japanese which had been lost, and also some from Liso, Ternate, and Tidore. ..." The occurrence of drift voyages makes sporadic contact with outside areas a distinct possibility.

### Conclusions

This paper has been critical of the existing data relating to prehistoric rice cultivation in the Marianas. More positively, we recommend that this question be framed as an hypothesis to be tested. To research this problem, areas favorable for wet and/or dry rice cultivation should be delineated, with excavation of sites carried out with special attention to soil sampling (careful flotation may retrieve carbonized rice husks), use-wear of the artifact assemblage, and the nonrandom occurrence of specialized types of artifacts.

We conclude by answering the original questions posed. 1) Relatively firm confirmation of rice cultivation on Guam has been documented from the mid-sixteenth century. If it existed at the time of initial European contact, no unambiguous references can be found, though some positive inference for its precontact existence can be made. With the rapid depopulation of native Chamorroes and early, intensive contact with the Philippines, it is difficult to differentiate between traditional Chamorro culture and that observed less than a century and a half after contact. Archaeological evidence for rice is limited to 2 sites, one of which was occupied during the early historic period. Unfortunately, Yawata's cave material can only serve as a tantalizing piece of irretrievable data. 2) Despite the claims of Yawata and others for the great antiquity of rice in the Marianas, the only current archaeological evidence places rice at the beginning of the historic period. We feel there are no substantive data to indicate that rice was grown on these islands prehistorically.

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### Introduction

Anthropologists and demographers long believed that Pacific island population decline was the inevitable result of contact with Europeans, and considerable effort was directed toward explaining what was seen as a universal phenomenon. Despite more well documented cases of depopulation, this view has come under increasing attack (e.g., McArthur 1968, 1970). Much of the earlier evidence for depopulation was found to have been derived from comparing inflated initial population estimates with later counts (McArthur 1970, 1979). The task of the researcher interested in Pacific Island populations has shifted from explaining the mortality to explaining the variation, and as part of understanding the process he must additional find more careful assessments of contact population size and dynamics. Bill McArthur (1970, 1971) has warned of the fallacy of working with most of the estimates of early historical populations. An excellent case is the population estimates for Kosrae Island at contact does indeed raise many questions about their accuracy. But fortunately, there is enough detailed historical information to allow an assessment of these estimates and to determine a reasonable range within which the contact population must have fallen. In this paper, I attempt to derive such a range, making clear the assumptions used in the process. In so doing, I find that the population estimate made by the first European visitors tended to be low rather than high, and I show that Kosrae represents a clear case of massive depopulation.