Contents lists available at ScienceDirect



Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

Isotopic perspectives of dietary patterns in Taiwan after the introduction of crops



Cheng-Yi Lee^{a,b,*}, Maa-Ling Chen^a, Mu-Chun Wu^a

^a Department of Anthropology, National Taiwan University, Taipei 10617, Taiwan
^b Institute of History and Philology, Academia Sinica, Taipei 115, Taiwan

ABSTRACT

Bone collagen isotope data of 53 human individuals excavated from 11 sites were collected in order to trace the dietary patterns of these prehistoric people after rice and millet were introduced into Taiwan ca. 5000 cal. yr BP. The 11 sites were separated into two groups, with each belonging to 4600–2000 cal. yr BP and 2000–400 cal. yr BP, respectively. The result indicated that the prehistoric people did not focus on crops after the introduction of crops into Taiwan. A comparison of the diets of the 53 individuals in these two groups revealed that dependence on marine resources may have decreased along the coastal area during the later time interval, i.e. the Iron Age.

1. Introduction

Rice and millet cultivation and animal husbandry increased and stabilized the food supply in prehistoric China, which further supported population growth between 6000 and 4000 cal. yr BP (Fuller and Qin, 2009). This great achievement not only brought about a significant increase in the size and numbers of settlements (Fuller and Oin, 2009; Liu and Feng, 2012), but also triggered population migration and the spread of crops to new areas such as southern China and Taiwan ca. 5000 cal. yr BP, and northern Philippine ca. 4000 cal. yr BP (e.g. Bellwood, 2011; Chi and Hung, 2010; Fuller, 2011). The introduction of new crops is evidenced by the finding of rice grains at the Shixia site in Guangdong, the Tanshishan site in Fujian, and the Nanguanli and Nanguanlidong sites in Taiwan (Chi and Hung, 2010). In addition, foxtail millet grains were also found in Taiwan (Tsang et al., 2006). The emergence of these crops leads to the suggestion that crop cultivation was practiced for the first time in southern China and Taiwan (Chi and Hung, 2010; Tsang et al., 2006). Nevertheless, it seems that such a subsistence mode, i.e. crop cultivation, did not dominate the entire region. For example, in Taiwan, the crop remains were found, always accompanied by large amounts of faunal remains, especially deer, pigs, fish and shellfish, and some wild plant remains, as well as by hunting and fishing tools (Table S1). From this archaeological perspective, it has been suggested that prehistoric people in Taiwan relied on a variety of foods rather than focusing on crops (Tsang, 1999). Such a broad-spectrum subsistence mode, consisting of gathering, hunting, fishing, collection of shellfish, and crop cultivation, seemed to persist in Taiwan from the Neolithic period to the Iron Age (Tsang, 1999).

It is well known that the preservation of floral and faunal remains is strongly affected by the depositional environment (Fraser et al., 2013; Zhao, 2011), and this can hinder archeologists from a comprehensive understanding of the diet of prehistoric people. In addition, the appearance of one kind of ecofact remains is not necessarily evidence that this kind of food was the primary food consumed (e.g. Jørkov et al., 2010; Lightfoot et al., 2013; Liu et al., 2014). Rather, carbon and nitrogen isotopes of bone collagen have been routinely used to assist in confirming paleodietary components (Katzenberg, 2008; Lee-Thorp, 2008) and to estimate the contribution of each kind of food (e.g. Newsome et al., 2004), though some limitations of this technique have been addressed. For example, site-specific baseline requires reconstructing by stable isotope measurements on fauna and flora represented in deposits associated with the human burials (e.g. Milner et al., 2004) Also, it has been suggested that the bone collagen may directly come from the protein part of diet, thus may underestimate the contribution of low-protein foods, such as plants, to human diet (Ambrose and Norr, 1993; Tieszen and Fagre, 1993).

This study collected human bone isotope data that have been published in Taiwan. The objective is to understand the dietary patterns in prehistoric Taiwan after the introduction of rice and millet ca. 5000 cal. yr BP. In order to provide the baseline for the reconstruction of the human diet, the isotope values of potential foods from Taiwan, China and Japan were compiled as well. We found that the prehistoric people did not largely consumed millet and rice even if both crops have been introduced into Taiwan. Besides, marine resources are likely to

https://doi.org/10.1016/j.jasrep.2018.04.039 Received 9 May 2017; Received in revised form 20 April 2018; Accepted 28 April 2018 2352-409X/ © 2018 Elsevier Ltd. All rights reserved.

^{*} Corresponding author at: Institute of History and Philology, Academia Sinica, Taipei 115, Taiwan. *E-mail address:* se2plee@gmail.com (C.-Y. Lee).



Fig. 1. The 11 sites mentioned in this study, open dots indicate the Neolithic sites while black squares represent the Iron Age sites. FSH: Fanshehou; FTY: Fantzuyuan; KT: Kuantu; KS: Kueishan; OLP I: Oluanpi I; OLP II: Oluanpi I; SLT: Sheliaotao; SK: Suokang; TTY: Taotsaiyuan; WKT: Wukueitung; YS: Yuanshan.

have been consumed at lower levels during the Iron Age. Three potential causes for the reduction in exploitation of marine resources are also discussed in this paper.

2. Data source

2.1. Human data

Published isotopic data were collected from the literature. In total, data from 53 individuals were gathered from 11 sites in Taiwan (Fig. 1 and Table 1), including the Fanshehou (FSH), Fantzuyuan (FTY), Kuantu (KT), Kueishan (KS), Oluanpi I (OLP I), Oluanpi II (OLP II), Sheliaotao (SLT), Suokang (SK), Taotsaiyuan (TTY), Wukueitung (WKT), and Yuanshan (YS) sites. All the reported data were produced from bone collagen (Fig. 2), while the mineral phase (apatite) of the

sample from the SK site was also analyzed for its carbon composition (Tsang, 1992).

Chronologically, the dataset is separated into two groups. The first group dated between 4600 and 2000 cal. yr BP, including 17 data from the KT (n = 1), OLP I (n = 4), OLP II (n = 2), SK (n = 1), TTY (n = 2) sites STL (n = 1) and YS (n = 6) sites. The second group consists of 36 data from the FSH (n = 1), FTY (n = 32), KS (n = 2), and WKT (n = 1) sites, all belonging to the Iron Age (2000 to 400 cal. yr BP).

2.2. Data for reconstruction of isotope baseline

Based on the archaeological evidences, seven kinds of wild food are thought to have been consumed in prehistoric Taiwan. They are deer, pigs, freshwater fish, marine fish, shellfish, C₃ plants, and C₄ plants. In addition, rice and millet are also considered since both crops have been Download English Version:

https://daneshyari.com/en/article/7444803

Download Persian Version:

https://daneshyari.com/article/7444803

Daneshyari.com