



## Exploring subsistence and cultural complexes on the south coast of Papua New Guinea using palaeodietary analyses

Rebecca Kinaston<sup>a,\*</sup>, Hallie Buckley<sup>a</sup>, Andrew Gray<sup>b</sup>, Ben Shaw<sup>c</sup>, Herman Mandui<sup>d</sup>

<sup>a</sup>Department of Anatomy, Otago School of Medical Sciences, University of Otago, P.O. Box 913, Dunedin 9054, New Zealand

<sup>b</sup>Department of Preventative and Social Medicine, Otago School of Medical Sciences, University of Otago, P.O. Box 913, Dunedin 9054, New Zealand

<sup>c</sup>School of Archaeology and Anthropology, AD Hope Building #14, The Australian National University, Canberra, ACT 0200, Australia

<sup>d</sup>National Museum and Art Gallery, P.O. Box 5560, Boroko, Port Moresby, Papua New Guinea

### ARTICLE INFO

#### Article history:

Received 11 December 2011

Received in revised form

29 August 2012

Accepted 1 September 2012

#### Keywords:

Stable isotopes

Carbon

Nitrogen

Sulphur

Nebira

Pacific islands

### ABSTRACT

We present the results of a palaeodietary study of a skeletal sample (~800–300 BP) from the south coast of Papua New Guinea (Nebira, site ACJ) using multiple stable isotope analysis of bone collagen. The carbon, nitrogen and sulphur stable isotope ratios of 28 individuals ( $n = 12$  males,  $n = 13$  females and  $n = 3$  subadults) suggested the diet at Nebira was based on  $C_3$  plants (likely starchy vegetable staples) and included protein resources from the surrounding forested areas and  $C_3/C_4$  savannah grasslands such as wallaby and other wild animals. Domestic species (e.g. *Sus scrofa*, *Canis familiaris* and *Gallus gallus*) may also have been consumed but could not be differentiated from wild species by stable isotope analysis. There were no significant differences in stable isotope values between males and females, but the  $\delta^{34}S$  values of the juveniles suggest they may have consumed varied protein resources. The sulphur stable isotope ratios indicate there was no discernable marine component in the diet of any of the individuals from Nebira. The stable isotope results are interpreted within a wider context of Papuan south coast trade and exchange systems in an attempt to understand local interaction in the region.

© 2012 Elsevier Ltd. All rights reserved.

### 1. Introduction

Within the Pacific islands a number of researchers have used stable isotope analysis for palaeodietary reconstruction, mostly focusing on prehistoric communities from Polynesia (Allen and Craig, 2009; Field et al., 2009; Jones and Quinn, 2009; Richards et al., 2009; Valentin et al., 2006). However, palaeodietary analyses in the Western Pacific remain relatively few (Beavan-Athfield et al., 2008; Leach et al., 2003; Valentin et al., 2010). Papua New Guinea (PNG) is a country with a complex cultural and biological prehistory (Allen, 1977b) and stable isotope analysis may assist in understanding diet and subsistence in the past and how they may have been influenced by social structure and social identity.

Today the south coast of PNG is inhabited by non-Austronesian (NAN) speaking populations already established in PNG before the Lapita expansion into the Pacific from Island Southeast Asia c. 3400–3300 BP, in addition to Austronesian (AN)-speaking people likely descended from these Lapita populations (Bedford and Sand, 2007; Swadling, 1981). Recently discovered Lapita pottery indicates

the arrival of AN-speaking people on the south coast of PNG by 2900 BP (McNiven et al., 2011). Although debate has formed around the settlement history of the Papuan south coast, it is clear there was a substantial amount of settlement and interaction during at least the last 2000 years, which intensified from 1000 to 400 BP (Allen, 1977a, 1977b, 1977c; Bickler, 1997; Irwin, 1991; Summerhayes and Allen, 2007).

Early trade and exchange systems are thought to have influenced the development of seasonal long-distance intensive trading systems established during the Protohistoric Period (AD 1600–1875) along the Papuan south coast. These include the *hiri*, and the emergence of centralised trading systems such as those found on Mailu island (Allen, 1984; Irwin, 1978). In coastal areas settled by the AN-speaking populations there would have been insufficient food resources to support the carrying capacity suggested by the archaeological evidence of habitation sites and historic estimates of population density (Allen, 1977a). In contrast, the inland areas traditionally inhabited by NAN-speaking tribes are more fertile than coastal areas and are extensively used for horticulture today (Vasey, 1982). Historical, ethnographic and oral historical accounts detail trade between AN-speaking coastal Motu tribes and NAN-speaking inland groups, the Koita and Koiari, for essential food items (Allen, 1977a; Dutton, 1969; Oram, 1981). Lawes (1879:373)

\* Corresponding author. Tel.: +64 34703401.

E-mail address: [rebecca.kinaston@gmail.com](mailto:rebecca.kinaston@gmail.com) (R. Kinaston).

noted that “the Koitapu are hunters, not fishermen. They possess no canoes and have nothing to do with the sea; but they excel in hunting the kangaroo and wild pig, and are superior to the Motu in the chase. They barter large quantities of kangaroo meat to them for fish, &c”.

With the exception of the unique faunal assemblage found on the offshore island of Motupore, there is limited evidence available to identify the possible exchange of food items on the south coast of PNG before European contact (Allen, 1977a; Allen et al., 1997). The habitation period of Motupore (a place likely occupied by the ancestors of the coastal dwelling Western Motu) is contemporary with the site analysed in the current study, Nebira, and both sites were abandoned around 300–400 BP. From material evidence of pottery, shell and stone tools, the people living on Motupore were involved in the manufacture of specialised craft items (Allen, 1978, 1985). Over 90% of the terrestrial fauna found on Motupore was identified as Agile wallaby. In conjunction with the material evidence, the age structure and body part analysis of the wallaby remains led Allen (1985) to suggest the people living on Motupore were engaged in specialised trade with inland communities, such as Nebira.

Allen and Duerden (1982) sourced a limited amount ( $n = 23$ ) of pottery sherds excavated from Nebira to Bootless Bay sites including Motupore, indicating at least some pottery was not manufactured at Nebira and must have been brought to the site, most likely as a trade import. Additionally, from isotope analysis, Shaw et al. (2011) suggested that five individuals from Nebira with higher strontium values than the rest of the burials were originally from coastal areas, suggesting a movement of people to inland settlements during the occupation of the site.

In this paper we address questions of diet, subsistence and interaction through the palaeodietary analysis of human skeletal remains from the inland south coast site of Nebira (site ACJ). Multiple stable isotopes of bone collagen (carbon, nitrogen and sulphur) are used to analyse the protein portion of adult and juvenile diets. Stable isotope analysis of the Nebira sample may assist in identifying possible age and sex differences in diet that may be associated with socio-cultural practices, such as preferential treatment, food taboos or labour specialisation (Muldner and Richards, 2007; Prowse et al., 2005; Schulting and Richards, 2001; Turner et al., 2007). Additionally, the presence or absence of marine foods is also assessed within a wider context of south coast trade and exchange systems in an attempt to understand local interaction in the region and may help clarify the movement of people inland from coastal areas as suggested by Shaw et al. (2011). If substantial amounts of marine foods are identified from the current stable isotope analysis, this may help to identify patterns of trade and exchange on the south coast of PNG c. 800–300 BP.

## 2. Materials: Nebira, site ACJ and the burials

Nebira was a double peaked hilltop (recent quarrying has removed both peaks), sixteen kilometres from the ocean located on the south coast of Papua New Guinea (Fig. 1). It lies adjacent to the south bank of the Laloki River and within two kilometres of the Waigani swamp (Bulmer, 1978). The skeletal sample used in this study is from the ACJ site, the only large inland settlement with an associated cemetery excavated in the Port Moresby region (Bulmer, 1978). The name of Nebira has been used to classify a number of closely related sites (ACJ, ACI, ACI/T, ACK and ACL), but in this paper is only used in reference to site ACJ, the site located in the central saddle containing a cemetery complex and the two hilltops (Bulmer, 1978). Radiocarbon dates from one burial (burial 3) and four charcoal samples ranged from  $720 \pm 80$  to  $280 \pm 80$  BP (Bulmer, 1975).

Bulmer (1978) excavated 44 burials from Nebira that were subsequently sorted into 38 individuals, including 5 subadults

(<17 years) (Buikstra and Ubelaker, 1994; Pietruszewsky, 1976; Scheuer and Black, 2000). For the current palaeodietary study, 29 adults ( $n = 15$  males and  $n = 14$  females) and 5 juveniles (aged 10–16 years) were analysed.

Although no substantial midden was excavated from site ACJ, archaeological evidence of subsistence at the site includes 283 shell fragments, of which twenty shellfish species were identified. Around 5–10% of these were endemic to the local mudflat areas close to the site while the remaining shellfish were sourced to ocean reef or reef flat areas, indicating a movement of material from the coast (Bulmer, 1978, 1979). A small amount of faunal material was also found at the site, including pig (*Sus scrofa*), cassowary (*Casuarius casuarius*), dog (*Canis familiaris*), wallaby, dugong (*Dugong dugon*) and fish, although it was not clear whether the fish were from the river, swamp or ocean (Bulmer, 1975). All the faunal remains were found in stratigraphic layers that post-dated the burials and therefore may not be representative of the diet of the people interred in the burial ground. However, they do provide a reference for the potential dietary sources available in the area (Bulmer, 1979).

### 2.1. Environment and possible diet at Nebira

Characterised by dry savannah grasslands, low rainfall (101–127 cm per annum inland and an average of 78 cm per annum for coastal areas) the south coast region is prone to drought and is unique compared to other areas of Papua New Guinea (Allen, 1983, 1977b; Bulmer, 1978). In areas of low rainfall, dry cultivation of  $C_3$  plants such as yam (*Dioscorea* spp.), banana (*Musa* and *Australimusa* spp.) and sweet potato (*Ipomoea batatas*) constitute the principal vegetable foods, although the consumption of sweet potato would be dependent on the date of the introduction of this vegetable to the south coast of PNG (Vasey, 1982). As Nebira is situated near both the Laloki river and Waigani swamp, taro (*Colocasia esculenta*) may have been cultivated and freshwater fish and shellfish were likely available year-round (Bulmer, 1975; Swadling, 1981). A variety of wild fruits, tubers, vegetables and nuts gathered from the bush are also important supplements to garden foods today and likely constituted some of the  $C_3$ -based dietary items available to the inhabitants of Nebira (Oram, 1977).

Large-scale seasonal wallaby drives, involving deliberately setting fire to the grassland, herding wallabies including the Agile wallaby (*Macropus agilis*) and smaller Scrub wallaby (*Thylogale* spp.) into set nets and spearing the trapped animals, are recorded in the ethnographic literature as being a unique form of hunting of the inland NAN-speaking Koita (Stone, 1876). Single hunting drives have been known to catch upwards of 500–1000 animals, the meat of which was smoked and traded for goods, specifically pottery and fish supplied by the nearby coast dwelling, AN-speaking Western Motu (Allen, 1984; Lawes, 1879). Other important protein resources were likely obtained from hunting and trapping terrestrial animals including cassowary (*C. casuarius* and *Casuarius unappendiculatus*), feral pig (*S. scrofa*) and bandicoots (Peramelidae) from the grassland savannah. Forested areas would have provided a variety of species including tree kangaroos (*Dendrolagus* spp.), Grey Dorcopsis wallabies (*Dorcopsis luctuosa*), cuscuses (*Phalanger* spp.), ringtail possums (*Pseudocheirus* spp.), giant rats (*Mallomys rothschildi*) and a wide variety of smaller rodents and marsupials (Bulmer, 1968). Bats, including flying fox (*Pteropus* spp.), lizards and snakes, frogs, birds such as crown pigeons (*Goura* spp.), palm cockatoos (*Probosciger aterrimus*) and hornbills (*Aceros plicatus*), in addition to a variety of invertebrates, would have been widely eaten (Bulmer, 1968). The close vicinity to both the Laloki River and the Waigani swamp would have

Download English Version:

<https://daneshyari.com/en/article/10498988>

Download Persian Version:

<https://daneshyari.com/article/10498988>

[Daneshyari.com](https://daneshyari.com)