

Dental Nonmetric Traits in a Pre-Conquest Sample from Chubut Region of Patagonia, Argentina

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ABSTRACT Dental morphological trait expressions have been used in anthropology and forensic sciences for determination of biological and geographical affiliations. The present study was carried out with a Chubut pre-conquest sample from Patagonia, Argentina. 18 skulls with partial dentitions from Chubut (Patagonia) were analyzed. The ASU Dental Anthropology System was

used to register the expression grade of all dental traits. In spite of small sample sizes, we can conclude that shovel shape (UI1, UI2), two lingual premolar cusps (UP1, UP2), and hypocone (UM1, UM2) frequencies suggest a Mongoloid (Sinodont) origin. *Dental Anthropology* 2008;21(2):50-53.

Dental morphology has been used for determining biological and geographical affiliations. Dental variation has a heritable component, seems to be caused by multiple genes, and is little influenced by environmental factors (Rodríguez-Florez *et al.*, 2006). Dental morphology can provide insights into phenotypic group differences, and these may be suggestive of differences in genotypic affiliation (Varela and Cocilovo, 2000). Nonmetric dental traits seem to be controlled in part by genetics and are relatively free of sex- and age-bias (Scott and Turner, 1997). The analysis of biological relatedness using dental nonmetric traits has been helpful even in commingled samples when standardized procedures are followed (Ullinger *et al.*, 2005). For these reasons, reconstruction of biological relationships among ancient human groups using teeth is an important research problem for South American bioarcheologists.

The present study was carried out with a Chubut human pre-conquest sample from Patagonia, Argentina, with the aim of exploring dental morphological dental patterns in this group (Fig. 1). Researchers describe the people of this region as a group of aboriginal populations named Chonik or Patagones del Sur (Tehuelches). These natives use an aboriginal dialect with “Tchon” linguistic affiliation (Canals Frau, 1953). The objective of this article is to describe the presence of 40 dental nonmetric traits in this pre-conquest sample from the Chubut.

MATERIALS AND METHODS

Pre-conquest human dental remains with reasonably reliable stratigraphic contexts are relatively rare from

Argentina. Marcellino and Colantonio (2000) suggest a Late Period between 0 and 1,500 A.D for the present sample. The sample belongs to División de Antropología del Museo de Ciencias Naturales (La Plata, Argentina), and it is composed of 18 skulls with partial dentitions from Chubut: 1041, 1057, 1060, 1081, E1837, 1083, 1117, 1119, 1165, 1167, 1837, 1067, E1844, 1139, 1167, 1140, 1047, CR (Museum Catalogue references). Forty (40) dental nonmetric traits were recorded using the ASU Dental Anthropology System to register the expression grade of all dental traits (Turner *et al.*, 1991). Recording all of the dental traits was difficult because of environmental issues such as antemortem tooth loss, missing mandibles, postmortem fractures, and pathologies (Fig. 2). Consequently, a dichotomous recording system was used, grouping grade expressions into either “presence” (1) or “absence” (0).

RESULTS

Trait frequencies are listed in Table 1. It was impossible to adequately score three of the traits, namely paraconule (UM1) and the entoconulid (LM1, LM2). Values exceeding 70% were found for six traits – all in the upper arcade; these are shovel shape (UI1, UI2), two

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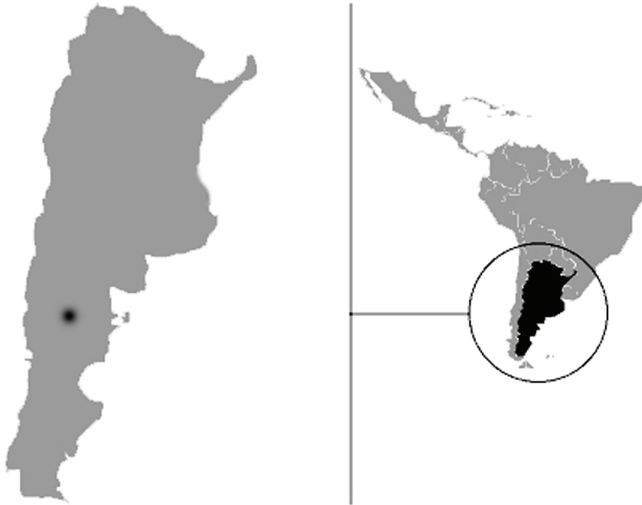


Fig. 1. Map of the Chubut region of Argentina..

lingual premolar cusps (UP1, UP2), and hypocone (UM1, UM2). Traits with frequencies between 10 and 69% were found for 12 traits: shovel shape (LI1, LI2, UC, LC), double shovel (UI1, UI2), tuberculum dentale (UI1, UI2, UC), interruption groove (UI2), two lingual premolar cusps (LP2), and metaconulid (LM1). The remaining 19 traits did not occur in the sample: double shovel (UC, LI1, LI2, LC), tuberculum dentale (LI1, LI2, LC), interruption groove (UI1, LI1, LI2), two lingual premolar cusps (LP1), Carabelli trait (UM1, UM2), paraconule (UM2), metaconule (UM1, UM2), metaconulid (LM2), and protostylid (LM1, LM2).

DISCUSSION

For Argentinean pre-conquest samples, previous studies by Devoto and co-workers describe high



Fig. 2. Upper arcade of a Chubut skull (specimen 1083).

frequencies of shovel shape in the maxillary incisors in early Atacama Indians (1968), pre-columbian Tastilian indians (1971), and a Northwestern Argentinean group from Salta Province (1968). Devoto describes shovel shape (UI1) in 13 specimens studied at 100%. The high prevalence of dental shoveling is considered a prime component of the Mongoloid dental complex (Hanihara, 1968). For Devoto, in spite of his small samples, the data seem to be consistent enough to suggest that the specimens showed well-defined shovel-shaped maxillary incisors similar to well-typified Mongoloid races (DeVoto, 1971).

Pre-conquest samples from Tastil Region have shown similar distributions of some non-metric dental traits as double shovel shape UI2 (0.10), and tuberculum dentale UC (0.31) (Bollini *et al.*, 2008). Comparably, the sample of Araucanos ethnic group exhibit similar distributions of shovel shape UI1 (0.85), and UI2 (0.71), double shovel shape UI1 (0.14), lingual cusp number UP1 and UP2 (1.00), hypocone UM1 (0.83), and metaconulid (0.11) (Bollini *et al.*, 2007). These simple frequency comparisons are helpful in reinforcing the idea of early Sinodont-Mongoloid ancestral groups in this region of Argentina. The frequency of shoveling in the Chubut sample studied here is near to these values, again suggesting a Sinodont pattern.

The use of morphological traits can involve problems of a methodological nature with small archeological samples. A necessary assumption is that dental trait expression is morphologically symmetrical between homologous teeth. In bioarcheology, estimating the frequency of a dental trait is influenced by the availability of samples due preservation, crown wear, and caries (Rodríguez-Florez and Colantonio, 2007). Some authors recommend scoring the higher grade of expression for each dental trait (Turner and Scott, 1977) or counting both the left and right sides for each individual (Haeussler *et al.*, 1988).

The present investigation provides additional information for population dynamics that can help us infer the possible biological factors in the process of South American peopling into regional and temporal ranges on ancient Patagonia, Argentina (Marcellino, 2002).

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TABLE 1. Dental nonmetric frequencies in the sample

Tooth type	Trait	Dichotomy	Presence	Absence	k/n	Frequency
Maxillary Dentition						
UI1	Shovel shape	0 - 3	1 - 3	0	10/11	0.90
	Double shovel	0 - 4	1 - 4	0	3/11	0.27
	Tuberculum dentale	0 - 3	1 - 3	0	4/11	0.36
	Interruption groove	0 - 1	1	0	0/11	0.00
UI2	Shovel shape	0 - 3	1 - 3	0	9/10	0.90
	Double shovel	0 - 4	1 - 4	0	1/9	0.11
	Tuberculum dentale	0 - 3	1 - 3	0	4/10	0.40
	Interruption groove	0 - 1	1	0	2/11	0.18
UC	Shovel shape	0 - 3	1 - 3	0	3/7	0.42
	Double shovel	0 - 4	1 - 4	0	0/10	0.00
	Tuberculum dentale	0 - 3	1 - 3	0	2/10	0.20
UP1	Lingual cusp number	1 - 3	2 - 3	1	11/11	1.00
UP2	Lingual cusp number	1 - 3	2 - 3	1	9/9	1.00
UM1	Hypocone	0 - 3	1 - 3	0	7/7	1.00
	Carabelli complex	0 - 4	1 - 4	0	0/7	0.00
	Paraconule	0 - 1	1	0	-/-	-
	Metaconule	0 - 1	1	0	0/1	0.00
UM2	Hypocone	0 - 3	1 - 3	0	10/10	1.00
	Carabelli complex	0 - 4	1 - 4	0	0/9	0.00
	Paraconule	0 - 1	1	0	0/4	0.00
	Metaconule	0 - 1	1	0	0/6	0.00
Mandibular Dentition						
LI1	Shovel shape	0 - 3	1 - 3	0	1/6	0.16
	Double shovel	0 - 4	1 - 4	0	0/6	0.00
	Tuberculum dentale	0 - 3	1 - 3	0	0/6	0.00
	Interruption groove	0 - 1	1	0	0/6	0.00
LI2	Shovel shape	0 - 3	1 - 3	0	3/8	0.37
	Double shovel	0 - 4	1 - 4	0	0/7	0.00
	Tuberculum dentale	0 - 3	1 - 3	0	0/7	0.00
	Interruption groove	0 - 1	1	0	0/8	0.00
LC	Shovel shape	0 - 3	1 - 3	0	2/7	0.28
	Double shovel	0 - 4	1 - 4	0	0/9	0.00
	Tuberculum dentale	0 - 3	1 - 3	0	0/9	0.00
LP1	Lingual cusp number	0 - 3	1 - 3	0	0/8	0.00
LP2	Lingual cusp number	0 - 3	1 - 3	0	4/8	0.50
LM1	Entoconulid	0 - 1	1	0	-/-	-
	Metaconulid	0 - 1	1	0	1/4	0.25
	Protostylid	0 - 1	1	0	0/10	0.00
LM2	Entoconulid	0 - 1	1	0	-/-	-
	Metaconulid	0 - 1	1	0	0/2	0.00
	Protostylid	0 - 1	1	0	0/9	0.00

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