Physical Anthropology

A New Early Human Skeleton from Brazil: Support for the "Two Main Biological Components Model" for the Settlement of the Americas

Mark Hubbe, Walter A. Neves, João Paulo V. Atui, Castor Cartelle, and Miya A. Pereira da Silva

Since late 1980s, one of us (WAN) has been suggesting that the cranial morphology of the first Americans (culturally called Paleoindians) is very different from that of late and modern Native Americans, and late and modern Northern Asians (Neves and Pucciarelli 1989, 1990, 1991). This finding was reinforced by further analysis involving other early South, Central and North American human skeletons (Brace et al. 2001; Chatters et al. 1999; Gonzaléz-José et al. 2002; Jantz and Owsley 2001; Munford 1999; Munford et al. 1995; Neves and Blum 2000, 2001; Neves et al. 1993, 1996, 1998, 1999a, 1999b, 2003; Powell and Neves 1999; Steele and Powell 1992, 1994, 1999). In brief, while the first South and Central Americans display a cranial morphology similar to that seen today among Africans and Australo-Melanesians, their contemporaries in North America tend to cluster morphologically with South Asians and Ainu-Polynesians (but see Powell et al. 1999 for an example of Australo-Melanesian morphology in USA).

Here we present further evidence from South America supporting the view that the peculiar morphology of the first Americans is a real trend of this population and not the result of sample bias (Dillehay 2000; Roosevelt et al. 2002) acting on a highly variable population (Van Vark et al. 2003).

Toca das Onças is a rich paleontological site located in the State of Bahia, Northeastern Brazil, explored by one of us (CC) in the late 1970s (Cartelle and Bohórquez 1982). Human skeletal remains pertaining to at least two individuals (one adult and one adolescent) were found in the same locus of

Mark Hubbe[1], Walter A. Neves[2], João Paulo V. Atui, Laboratório de Estudos Evolutivos Humanos, Departamento de Biologia, Instituto de Biociências, Universidade de São Paulo, C.P. 11461, 05422.970 São Paulo, SP, Brazil; e-mail: [1]mhubbe@ib.usp.br [2]waneves@ib.usp.br

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Castor Cartelle, Museu de Ciências Naturais, Pontifícia Universidade Católica de Minas Gerais, Av. Dom José Gaspar, 290/40, 30535.610 Belo Horizonte, MG, Brazil.

Miya A. Pereira da Silva, Laboratoire d'Anatomie Comparée, Musée de L´Homme, Palais de Chaillot, Place du Trocadéro, 75 016 Paris, France.

the cave where different species of extinct mammalian megafauna (*Eremotherium laurillardi, Glyptodon clavipes, Pampatherium paulacorti* and *Smilodon populator*) were also uncovered. However, no clear stratigraphic association between the human and the megafauna remains could be established owing to damages caused by previous work of fossil hunters on the site. AMS radiocarbon dating proved impossible owing to insufficiently preserved collagen in the human specimens.

Different methods of multivariate analyses were applied to assess the morphological affinities of the adult male found at Toca das Onças. Howells's databank (Howells 1973, 1989, 1995) was used as comparative material, supplemented by a series of late Paleoindians from Lagoa Santa (Prous and Fogaça 1999) and two late-Archaic coastal populations (Tapera and Base Aérea) from southern Brazil (Neves 1988).

The results obtained by Principal Components Analyses (size and shape, and shape alone) based on 35 craniometric traits are shown in Figure 1. In both graphics the specimen shows an unequivocal association with Lagoa Santa and the African and Australo-Melanesian series, while the two Brazilian late-Archaic samples are clearly associated with present Amerindians. Discriminant Function Analysis (size and shape) was also performed based on 31 craniometric variables. The specimen was classified as Lagoa Santa, Tolai, and Teita, in this order. Mahalanobis distances performed between the isolated specimen from Bahia and the comparative samples resulted in the following figures:

	D^2	Typicality (%)	Posterior probability (%)
Lagoa Santa	31.2	45.4	39.6
Teita	40.0	12.8	11.2
Tolai	40.4	12.0	10.5

The remaining comparative series generated typicalities and posterior probabilities smaller than 10.0 percent.

Our results support the conclusion that the adult early male specimen from Toca das Onças, Bahia, exhibits the same cranial morphological pattern as other Paleoindian samples from South and Central America, and is very likely of an early-Holocene antiquity. The idea that the peculiar "Australo-Melanesian" morphology of the first Americans can be simply explained by sampling bias acting on a highly variable population is becoming more and more indefensible, as several isolated individuals from very different parts of the continent generate convergent results.

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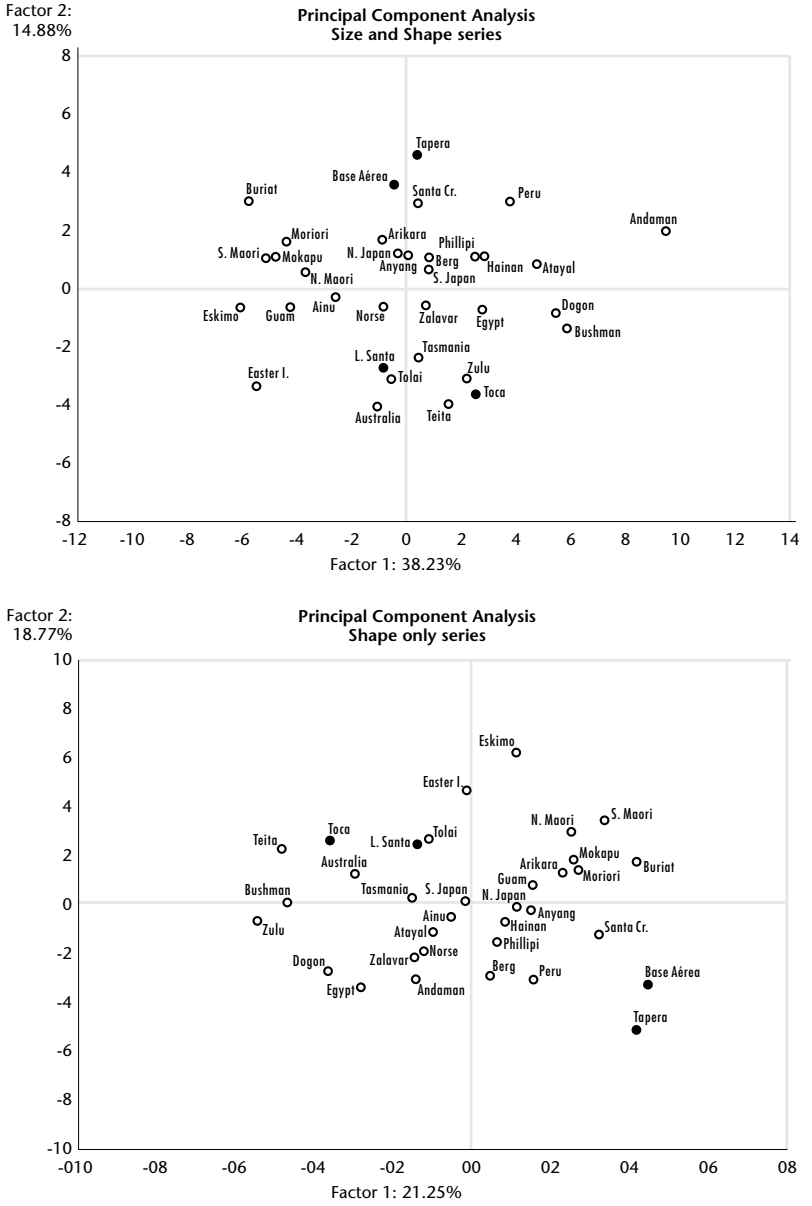

Figure 1. Relationship between the series analyzed as seen through the first two Principal Components. The upper graphic shows the series without size correction, and the lower one shows the series corrected for size effects. Note the clear association of Toca das Onças (TOCA) with Lagoa Santa (LSANTA) and African and Australo-Melanesian series. Both analyses were performed based on the following Howells variables: GOL, NOL, XCB, XFB, ZYB, AUB, ASB, OBH, OBB, MDB, FMB, NAS, DKB, WNB, IML, XML, MLS, WMH, SOS, GLS, FRC, FRS, FRF, PAC, PAS, PAF, OCC, OCS, OCF, NAR, DKR, ZOR, FMR, EKR and ZMR.

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